

Summit Scientific

4653 Table Mountain Drive, Golden, Colorado 80403

303.277.9310

March 27, 2025

Paul Henchan

Fremont Environmental

PO Box 1289

Wellington, CO 80549

RE: Noble - Pappenheim 02-32 Excavation

Work Order #2502363

Enclosed are the results of analyses for samples received by Summit Scientific on 02/20/25 16:30. 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



Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174

Project Manager: Paul Henchan

Reported:
03/27/25 09:20

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PWV/AST W01Wall - 4Ft	2502363-01	Soil	02/20/25 13:40	02/20/25 16:30
PWV/AST W02Wall - 4Ft	2502363-02	Soil	02/20/25 13:50	02/20/25 16:30
PWV/AST W03Wall - 4Ft	2502363-03	Soil	02/20/25 14:00	02/20/25 16:30

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

Lab ID

Page 1 of 1

2502363

Send Data To:

Send Invoice To:

Client: Fremont Environmental

Project Manager: Paul Henchan

Company: noble / chevron

Address: 8305 6th St.

E-Mail: Chevron Dist List, FDC Dist List, Civitas Dist List, Fremont Dist List (paul.H, mike.G,

Project Name/Location:

City/State/Zip: Wellington, CO

nickL, ctanB, jeffG, chrisL, stasJ, aaronO, joshB, JordanS, tammyA, Reports (@fremontenv.com)

AFE#:

Phone: 303-261-6246

Project Name: Pappenheim 2-32 Excavation

PO/Billing Codes: UWRWE-A3114-EM

Sampler Name: Stanky Gilbert

Project Number: C023-174

Contact: Dan Peterson

ID	Sample Description	Date Sampled	Time Sampled	# of containers	Preservative				Matrix		Analysis Requested							Special Instructions			
					HCl	HNO3	None	Other	Water	Soil	Air-Canister #	Other	Full Table 915-1 (Soil)	Full Table 915-1 (GW)	NETEX, TMBs	TPH (C6-C9)	PAHs		SAR, EC, pH, Boron	Table 913-1 Metals	TDS, Chloride, Sulfate
1	PWV/AST W01 Wall - 4ft	2/20/25	13:40	2			X			X											
2	PWV/AST W02 Wall - 4ft	2/20/25	13:50	2			X			X											
3	PWV/AST W03 Wall - 4ft	2/20/25	14:00	2			X			X											
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					

Relinquished by: Date/Time: 2/20/25 16:20

Received by: Date/Time: 2/20/25 16:20

TAT Business Days: Same Day Field DO

Notes: Dist. Repon. to parties circled in the email line(s) only.

Relinquished by: Date/Time: 2/20/25 16:30

Received by: Date/Time: 2/20/25 16:30

1 Day Field EC

2 Days Field ORP

Relinquished by: _____ Date/Time: _____

Received by: _____ Date/Time: _____

3 Days Field pH

Standard Field Temp.

Temperature Upon Receipt: 2.1

Corrected Temperature: 6

IR gun #: 1

HNO3 lot #: _____

S₂

S2 Work Order# 2502303

Sample Receipt Checklist

Client: Fremont Client Project ID: Rapenheim 2-32 ExcavationReceived Via: H.D./P.U./FedEx/UPS/USPS/Other Airbill #: _____Matrix (Circle all that apply) Air/Soil/Water/Other Temp (°C) 2.1 Thermometer # 1Bottle ware (Circle all that apply) Glass/Jar/Voa/Amber/Poly/Other

	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.	-			M20E
If custody seals are present, are they intact? ⁽¹⁾	-			
Are samples due within 48 hours?	-			Same day
Are water samples with short hold times present? Note the short hold analysis in the comments column - pH, Nitrate/Nitrite, Ferrous Iron (Fe ²⁺), Hexavalent Chromium (Cr ⁶⁺ , Cr VI), COD, Total Residual Chlorine (TRC)		-		
Is a chain-of-custody (COC) form present and filled out Completely? ⁽¹⁾	-			
Is the COC properly relinquished by the client w/ date and time recorded? ⁽¹⁾	-			
Were all samples received intact? ⁽¹⁾	✓			
Was adequate sample volume provided? ⁽¹⁾	✓			
Were samples provided in appropriate bottle ware?	✓			
Does the COC agree with the number and type of sample bottles received? ⁽¹⁾	✓			
Do the sample IDs on the bottle labels match the COC? ⁽¹⁾		✓		NO sample times
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			✓	
Are any samples/bottles preserved (excluding cooling)? ⁽¹⁾ Note the type of preservative in the comments column – HCl, H ₂ SO ₄ , NaOH, HNO ₃ , etc.			✓	
If samples are acid preserved for metals, is the pH ≤ 2? ⁽¹⁾ Record the pH in Comments.			✓	
If dissolved metals are requested, were samples field filtered?			✓	
Are there requested analysis that cannot be performed by S2? Note analysis in the comments column		✓		
Additional Comments (if any):				

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

Control Form #: SRC-001

AS
Custodian Printed Name

2/20/25
Date/Time



Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

PWV/AST W01Wall - 4Ft
2502363-01 (Soil)

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BIB1193	02/20/25	02/21/25	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: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0462	115 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0396	98.9 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0411	103 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BIB1191	02/20/25	02/21/25	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	7.15	57.2 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

**PWV/AST W01Wall - 4Ft
2502363-01 (Soil)**

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0031	03/03/25	03/09/25	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: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0162	48.7 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0159	47.7 %	40-140		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1201	02/21/25	02/22/25	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

**PWV/AST W01Wall - 4Ft
2502363-01 (Soil)**

Summit Scientific

Total Metals by EPA 6020B

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	8.58	0.200	mg/kg dry	1	BIB1207	02/21/25	02/21/25	EPA 6020B	
Barium	42.0	0.400	"	"	"	"	"	"	
Cadmium	0.352	0.200	"	"	"	"	"	"	
Copper	4.71	0.400	"	"	"	"	"	"	
Lead	6.44	0.200	"	"	"	"	"	"	
Nickel	9.02	0.400	"	"	"	"	"	"	
Silver	0.0270	0.0200	"	"	"	"	"	"	
Zinc	44.8	0.400	"	"	"	"	"	"	
Selenium	ND	0.260	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1210	02/21/25	02/21/25	EPA 7196A	

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

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	108	0.0500	mg/L dry	1	BIB1194	02/20/25	02/24/25	EPA 6020B	
Magnesium	35.4	0.0500	"	"	"	"	"	"	
Sodium	29.9	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.638	0.00100	units	1	BIB1541	02/26/25	02/26/25	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project Number: UWRWE-A3114-ENV CO23-174
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Reported:
 03/27/25 09:20

PWV/AST W01Wall - 4Ft
2502363-01 (Soil)

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Physical Parameters by APHA/ASTM/EPA Methods

% Solids	94.8	%	1	BIB1206	02/21/25	02/21/25	Calculation
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Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.689	0.0100	mmhos/cm	1	BIB1197	02/20/25	02/23/25	EPA 120.1	

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

Date Sampled: **02/20/25 13:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.08		pH Units	1	BIB1196	02/20/25	02/23/25	EPA 9045D	

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Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

**PWV/AST W02Wall - 4Ft
2502363-02 (Soil)**

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BIB1193	02/20/25	02/21/25	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: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0359	89.8 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0413	103 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0422	105 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BIB1191	02/20/25	02/21/25	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	7.67	61.4 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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03/27/25 09:20

PWV/AST W02Wall - 4Ft
2502363-02 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0031	03/03/25	03/09/25	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: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0183	54.8 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0180	53.8 %	40-140		"	"	"	"	

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1201	02/21/25	02/22/25	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

**PWV/AST W02Wall - 4Ft
2502363-02 (Soil)**

Summit Scientific

Total Metals by EPA 6020B

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.44	0.200	mg/kg dry	1	BIB1207	02/21/25	02/21/25	EPA 6020B	
Barium	53.3	0.400	"	"	"	"	"	"	
Cadmium	0.248	0.200	"	"	"	"	"	"	
Copper	5.48	0.400	"	"	"	"	"	"	
Lead	7.19	0.200	"	"	"	"	"	"	
Nickel	7.13	0.400	"	"	"	"	"	"	
Silver	0.0280	0.0200	"	"	"	"	"	"	
Zinc	35.1	0.400	"	"	"	"	"	"	
Selenium	ND	0.260	"	"	"	"	"	"	

Hexavalent Chromium by EPA Method 7196

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1210	02/21/25	02/21/25	EPA 7196A	

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

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	126	0.0500	mg/L dry	1	BIB1194	02/20/25	02/24/25	EPA 6020B	
Magnesium	35.3	0.0500	"	"	"	"	"	"	
Sodium	21.8	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.442	0.00100	units	1	BIB1541	02/26/25	02/26/25	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

PWV/AST W02Wall - 4Ft
2502363-02 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	94.9	%	1	BIB1206	02/21/25	02/21/25	Calculation
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Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.739	0.0100	mmhos/cm	1	BIB1197	02/20/25	02/23/25	EPA 120.1	

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

Date Sampled: **02/20/25 13:50**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.04		pH Units	1	BIB1196	02/20/25	02/23/25	EPA 9045D	

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Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

**PWV/AST W03Wall - 4Ft
2502363-03 (Soil)**

Summit Scientific

Volatile Organic Compounds by EPA Method 8260B

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BIB1193	02/20/25	02/21/25	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: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0362	90.5 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0416	104 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0412	103 %	50-150		"	"	"	"	

Extractable Petroleum Hydrocarbons by 8015

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
C10-C28 (DRO)	ND	50	mg/kg	1	BIB1191	02/20/25	02/21/25	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	8.06	64.5 %	30-150		"	"	"	"	

PAH by EPA Method 8270D SIM

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Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

PWV/AST W03Wall - 4Ft
2502363-03 (Soil)

Summit Scientific

PAH by EPA Method 8270D SIM

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0031	03/03/25	03/14/25	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: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0123	36.9 %	40-140		"	"	"	"	S-02
Surrogate: Fluoranthene-d10	0.0109	32.6 %	40-140		"	"	"	"	S-02

Total Metals by EPA 6020B Hot Water Soluble Extraction

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1201	02/21/25	02/22/25	EPA 6020B	

Total Metals by EPA 6020B

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Fremont Environmental
PO Box 1289
Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

PWV/AST W03Wall - 4Ft
2502363-03 (Soil)

Summit Scientific

Total Metals by EPA 6020B

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Arsenic	4.82	0.200	mg/kg dry	1	BIB1207	02/21/25	02/21/25	EPA 6020B
Barium	131	0.400	"	"	"	"	"	"
Cadmium	0.423	0.200	"	"	"	"	"	"
Copper	7.78	0.400	"	"	"	"	"	"
Lead	9.57	0.200	"	"	"	"	"	"
Nickel	9.91	0.400	"	"	"	"	"	"
Silver	0.0341	0.0200	"	"	"	"	"	"
Zinc	43.5	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

Hexavalent Chromium by EPA Method 7196

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1210	02/21/25	02/21/25	EPA 7196A	

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

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	415	0.0500	mg/L dry	1	BIB1194	02/20/25	02/24/25	EPA 6020B	
Magnesium	55.6	0.0500	"	"	"	"	"	"	
Sodium	114	0.0500	"	"	"	"	"	"	

Calculated Analysis

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	1.39	0.00100	units	1	BIB1541	02/26/25	02/26/25	Calculation	

Physical Parameters by APHA/ASTM/EPA Methods

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Fremont Environmental
 PO Box 1289
 Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
 Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

PWV/AST W03Wall - 4Ft
2502363-03 (Soil)

Summit Scientific

Physical Parameters by APHA/ASTM/EPA Methods

% Solids	93.5	%	1	BIB1206	02/21/25	02/21/25	Calculation
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Specific Conductance by EPA Method 120.1, Saturated Paste Extraction

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.04	0.0100	mmhos/cm	1	BIB1197	02/20/25	02/23/25	EPA 120.1	

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

Date Sampled: **02/20/25 14:00**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.87		pH Units	1	BIB1196	02/20/25	02/23/25	EPA 9045D	

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Fremont Environmental
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Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

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 BIB1193 - EPA 5030 Soil MS

Blank (BIB1193-BLK1)

Prepared: 02/20/25 Analyzed: 02/21/25

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	0.0383		"	0.0400		95.8	50-150			
Surrogate: Toluene-d8	0.0409		"	0.0400		102	50-150			
Surrogate: 4-Bromofluorobenzene	0.0386		"	0.0400		96.4	50-150			

LCS (BIB1193-BS1)

Prepared: 02/20/25 Analyzed: 02/21/25

Benzene	0.0899	0.0020	mg/kg	0.100		89.9	70-130			
Toluene	0.0952	0.0050	"	0.100		95.2	70-130			
Ethylbenzene	0.104	0.0050	"	0.100		104	70-130			
m,p-Xylene	0.186	0.010	"	0.200		93.2	70-130			
o-Xylene	0.0938	0.0050	"	0.100		93.8	70-130			
1,2,4-Trimethylbenzene	0.0864	0.0050	"	0.100		86.4	70-130			
1,3,5-Trimethylbenzene	0.0898	0.0050	"	0.100		89.8	70-130			
Naphthalene	0.0827	0.0038	"	0.100		82.7	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0365		"	0.0400		91.4	50-150			
Surrogate: Toluene-d8	0.0427		"	0.0400		107	50-150			
Surrogate: 4-Bromofluorobenzene	0.0394		"	0.0400		98.4	50-150			

Matrix Spike (BIB1193-MS1)

Source: 2502361-01

Prepared: 02/20/25 Analyzed: 02/21/25

Benzene	0.0759	0.0020	mg/kg	0.100	ND	75.9	70-130			
Toluene	0.0831	0.0050	"	0.100	ND	83.1	70-130			
Ethylbenzene	0.0915	0.0050	"	0.100	ND	91.5	70-130			
m,p-Xylene	0.169	0.010	"	0.200	ND	84.6	70-130			
o-Xylene	0.0796	0.0050	"	0.100	ND	79.6	70-130			
1,2,4-Trimethylbenzene	0.0766	0.0050	"	0.100	ND	76.6	70-130			
1,3,5-Trimethylbenzene	0.0804	0.0050	"	0.100	ND	80.4	70-130			
Naphthalene	0.0676	0.0038	"	0.100	ND	67.6	70-130			QM-05
Surrogate: 1,2-Dichloroethane-d4	0.0354		"	0.0400		88.4	50-150			
Surrogate: Toluene-d8	0.0420		"	0.0400		105	50-150			
Surrogate: 4-Bromofluorobenzene	0.0384		"	0.0400		96.1	50-150			

Summit Scientific

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Fremont Environmental
 PO Box 1289
 Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1193 - EPA 5030 Soil MS

Matrix Spike Dup (BIB1193-MSD1)	Source: 2502361-01			Prepared: 02/20/25 Analyzed: 02/21/25						
Benzene	0.0811	0.0020	mg/kg	0.100	ND	81.1	70-130	6.57	30	
Toluene	0.0855	0.0050	"	0.100	ND	85.5	70-130	2.85	30	
Ethylbenzene	0.0966	0.0050	"	0.100	ND	96.6	70-130	5.45	30	
m,p-Xylene	0.179	0.010	"	0.200	ND	89.3	70-130	5.42	30	
o-Xylene	0.0841	0.0050	"	0.100	ND	84.1	70-130	5.46	30	
1,2,4-Trimethylbenzene	0.0800	0.0050	"	0.100	ND	80.0	70-130	4.33	30	
1,3,5-Trimethylbenzene	0.0838	0.0050	"	0.100	ND	83.8	70-130	4.24	30	
Naphthalene	0.0722	0.0038	"	0.100	ND	72.2	70-130	6.44	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	<i>0.0372</i>		<i>"</i>	<i>0.0400</i>		<i>93.1</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>0.0398</i>		<i>"</i>	<i>0.0400</i>		<i>99.4</i>	<i>50-150</i>			

Summit Scientific

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Fremont Environmental
 PO Box 1289
 Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
 Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

Extractable Petroleum Hydrocarbons by 8015 - Quality Control
Summit Scientific

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

Batch BIB1191 - EPA 3550A

Blank (BIB1191-BLK1)

Prepared: 02/20/25 Analyzed: 02/21/25

C10-C28 (DRO)	ND	50	mg/kg							
C28-C36 (ORO)	ND	50	"							
Surrogate: <i>o</i> -Terphenyl	12.2		"	12.5		97.3	30-150			

LCS (BIB1191-BS1)

Prepared: 02/20/25 Analyzed: 02/21/25

C10-C28 (DRO)	437	50	mg/kg	500		87.5	70-130			
Surrogate: <i>o</i> -Terphenyl	9.45		"	12.5		75.6	30-150			

Matrix Spike (BIB1191-MS1)

Source: 2502361-01

Prepared: 02/20/25 Analyzed: 02/21/25

C10-C28 (DRO)	431	50	mg/kg	500	4.39	85.3	70-130			
Surrogate: <i>o</i> -Terphenyl	7.50		"	12.5		60.0	30-150			

Matrix Spike Dup (BIB1191-MSD1)

Source: 2502361-01

Prepared: 02/20/25 Analyzed: 02/21/25

C10-C28 (DRO)	441	50	mg/kg	500	4.39	87.4	70-130	2.45	20	
Surrogate: <i>o</i> -Terphenyl	8.54		"	12.5		68.3	30-150			

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Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation
Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

PAH by EPA Method 8270D SIM - Quality Control

Summit Scientific

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

Batch BIC0031 - EPA 5030 Soil MS

Blank (BIC0031-BLK1)

Prepared: 03/03/25 Analyzed: 03/09/25

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	0.0202		"	0.0333		60.7	40-140			
Surrogate: Fluoranthene-d10	0.0230		"	0.0333		68.9	40-140			

LCS (BIC0031-BS1)

Prepared: 03/03/25 Analyzed: 03/09/25

Acenaphthene	0.0207	0.00500	mg/kg	0.0333		62.2	40-140			
Anthracene	0.0208	0.00500	"	0.0333		62.5	40-140			
Benzo (a) anthracene	0.0207	0.00500	"	0.0333		62.1	40-140			
Benzo (a) pyrene	0.0185	0.00500	"	0.0333		55.6	40-140			
Benzo (b) fluoranthene	0.0190	0.00500	"	0.0333		56.9	40-140			
Benzo (k) fluoranthene	0.0198	0.00500	"	0.0333		59.5	40-140			
Chrysene	0.0206	0.00500	"	0.0333		61.8	40-140			
Dibenz (a,h) anthracene	0.0169	0.00500	"	0.0333		50.6	40-140			
Fluoranthene	0.0197	0.00500	"	0.0333		59.2	40-140			
Fluorene	0.0207	0.00500	"	0.0333		62.2	40-140			
Indeno (1,2,3-cd) pyrene	0.0155	0.00500	"	0.0333		46.4	40-140			
Pyrene	0.0206	0.00500	"	0.0333		61.8	40-140			
1-Methylnaphthalene	0.0218	0.00500	"	0.0333		65.4	40-140			
2-Methylnaphthalene	0.0239	0.00500	"	0.0333		71.6	40-140			
Surrogate: 2-Methylnaphthalene-d10	0.0200		"	0.0333		59.9	40-140			
Surrogate: Fluoranthene-d10	0.0205		"	0.0333		61.5	40-140			

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Fremont Environmental
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Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

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 BIC0031 - EPA 5030 Soil MS

Matrix Spike (BIC0031-MS1)	Source: 2502331-01			Prepared: 03/03/25 Analyzed: 03/09/25						
Acenaphthene	0.0213	0.00500	mg/kg	0.0333	ND	63.9	40-140			
Anthracene	0.0203	0.00500	"	0.0333	ND	61.0	40-140			
Benzo (a) anthracene	0.0200	0.00500	"	0.0333	ND	60.1	40-140			
Benzo (a) pyrene	0.0178	0.00500	"	0.0333	ND	53.3	40-140			
Benzo (b) fluoranthene	0.0181	0.00500	"	0.0333	ND	54.3	40-140			
Benzo (k) fluoranthene	0.0189	0.00500	"	0.0333	ND	56.7	40-140			
Chrysene	0.0197	0.00500	"	0.0333	ND	59.2	40-140			
Dibenz (a,h) anthracene	0.0166	0.00500	"	0.0333	ND	49.7	40-140			
Fluoranthene	0.0190	0.00500	"	0.0333	ND	57.1	40-140			
Fluorene	0.0199	0.00500	"	0.0333	ND	59.8	40-140			
Indeno (1,2,3-cd) pyrene	0.0163	0.00500	"	0.0333	ND	48.9	40-140			
Pyrene	0.0208	0.00500	"	0.0333	ND	62.3	40-140			
1-Methylnaphthalene	0.0224	0.00500	"	0.0333	ND	67.1	40-140			
2-Methylnaphthalene	0.0241	0.00500	"	0.0333	ND	72.3	40-140			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0211</i>		<i>"</i>	<i>0.0333</i>		<i>63.3</i>	<i>40-140</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0196</i>		<i>"</i>	<i>0.0333</i>		<i>58.7</i>	<i>40-140</i>			

Matrix Spike Dup (BIC0031-MSD1)	Source: 2502331-01			Prepared: 03/03/25 Analyzed: 03/14/25						
Acenaphthene	0.0138	0.00500	mg/kg	0.0333	ND	41.5	40-140	42.4	30	QR-03
Anthracene	0.0126	0.00500	"	0.0333	ND	37.9	40-140	46.6	30	QM-05
Benzo (a) anthracene	0.0127	0.00500	"	0.0333	ND	38.2	40-140	44.4	30	QM-05
Benzo (a) pyrene	0.0131	0.00500	"	0.0333	ND	39.4	40-140	30.1	30	QM-05
Benzo (b) fluoranthene	0.0120	0.00500	"	0.0333	ND	35.9	40-140	40.7	30	QM-05
Benzo (k) fluoranthene	0.0121	0.00500	"	0.0333	ND	36.2	40-140	44.2	30	QM-05
Chrysene	0.0133	0.00500	"	0.0333	ND	39.8	40-140	39.2	30	QM-05
Dibenz (a,h) anthracene	0.0200	0.00500	"	0.0333	ND	60.0	40-140	18.9	30	
Fluoranthene	0.0135	0.00500	"	0.0333	ND	40.4	40-140	34.3	30	QR-03
Fluorene	0.0131	0.00500	"	0.0333	ND	39.3	40-140	41.5	30	QM-05
Indeno (1,2,3-cd) pyrene	0.0280	0.00500	"	0.0333	ND	83.9	40-140	52.6	30	QR-03
Pyrene	0.0186	0.00500	"	0.0333	ND	55.8	40-140	11.0	30	
1-Methylnaphthalene	0.0129	0.00500	"	0.0333	ND	38.8	40-140	53.4	30	QM-05
2-Methylnaphthalene	0.0129	0.00500	"	0.0333	ND	38.8	40-140	60.3	30	QM-05
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0175</i>		<i>"</i>	<i>0.0333</i>		<i>52.4</i>	<i>40-140</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0174</i>		<i>"</i>	<i>0.0333</i>		<i>52.2</i>	<i>40-140</i>			

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Fremont Environmental
 PO Box 1289
 Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1201 - EPA 3050B

Blank (BIB1201-BLK1)

Prepared & Analyzed: 02/21/25

Boron ND 2.00 mg/L

LCS (BIB1201-BS1)

Prepared & Analyzed: 02/21/25

Boron 5.22 2.00 mg/L 5.00 104 80-120

Duplicate (BIB1201-DUP1)

Source: 2501182-01

Prepared & Analyzed: 02/21/25

Boron 0.214 2.00 mg/L 0.246 14.0 20

Matrix Spike (BIB1201-MS1)

Source: 2501182-01

Prepared & Analyzed: 02/21/25

Boron 4.28 2.00 mg/L 5.00 0.246 80.7 75-125

Matrix Spike Dup (BIB1201-MSD1)

Source: 2501182-01

Prepared & Analyzed: 02/21/25

Boron 4.46 2.00 mg/L 5.00 0.246 84.4 75-125 4.31 25

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Wellington CO, 80549

Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

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 BIB1207 - EPA 3050B

Blank (BIB1207-BLK1)

Prepared & Analyzed: 02/21/25

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 (BIB1207-BS1)

Prepared: 02/21/25 Analyzed: 02/26/25

Arsenic	33.6	0.200	mg/kg wet	40.3	83.3	80-120
Barium	34.3	0.400	"	40.3	85.1	80-120
Cadmium	1.75	0.200	"	2.02	86.7	80-120
Copper	36.9	0.400	"	40.3	91.5	80-120
Lead	17.3	0.200	"	20.2	86.0	80-120
Nickel	36.5	0.400	"	40.3	90.5	80-120
Silver	1.72	0.0200	"	2.02	85.4	80-120
Zinc	34.5	0.400	"	40.3	85.5	80-120
Selenium	3.63	0.260	"	4.03	90.1	80-120

Duplicate (BIB1207-DUP1)

Source: 2502355-01

Prepared & Analyzed: 02/21/25

Arsenic	2.88	0.200	mg/kg dry	2.97	3.17	20
Barium	78.7	0.400	"	92.5	16.1	20
Cadmium	0.209	0.200	"	0.222	6.09	20
Copper	4.56	0.400	"	4.66	2.26	20
Lead	5.39	0.200	"	5.55	2.94	20
Nickel	5.54	0.400	"	5.90	6.27	20
Silver	0.0234	0.0200	"	0.0200	16.1	20
Zinc	21.4	0.400	"	22.7	5.49	20
Selenium	ND	0.260	"	ND		20

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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

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 BIB1207 - EPA 3050B

Matrix Spike (BIB1207-MS1)	Source: 2502355-01			Prepared: 02/21/25 Analyzed: 02/26/25								
Arsenic	43.1	0.200	mg/kg dry	42.0	2.97	95.6	75-125					
Barium	84.5	0.400	"	42.0	92.5	NR	75-125					QM-05
Cadmium	2.44	0.200	"	2.10	0.222	106	75-125					
Copper	31.5	0.400	"	42.0	4.66	63.8	75-125					QM-05
Lead	27.3	0.200	"	21.0	5.55	103	75-125					
Nickel	32.6	0.400	"	42.0	5.90	63.5	75-125					QM-05
Silver	2.14	0.0200	"	2.10	0.0200	101	75-125					
Zinc	44.4	0.400	"	42.0	22.7	51.8	75-125					QM-05
Selenium	4.57	0.260	"	4.20	ND	109	75-125					

Matrix Spike Dup (BIB1207-MSD1)	Source: 2502355-01			Prepared: 02/21/25 Analyzed: 02/26/25								
Arsenic	41.5	0.200	mg/kg dry	40.4	2.97	95.3	75-125	3.91	25			
Barium	99.1	0.400	"	40.4	92.5	16.2	75-125	15.9	25			QM-05
Cadmium	2.34	0.200	"	2.02	0.222	105	75-125	4.39	25			
Copper	30.5	0.400	"	40.4	4.66	64.0	75-125	3.12	25			QM-05
Lead	25.6	0.200	"	20.2	5.55	99.2	75-125	6.27	25			
Nickel	31.4	0.400	"	40.4	5.90	63.0	75-125	3.79	25			QM-05
Silver	2.05	0.0200	"	2.02	0.0200	101	75-125	4.14	25			
Zinc	42.6	0.400	"	40.4	22.7	49.4	75-125	4.21	25			QM-05
Selenium	4.31	0.260	"	4.04	ND	107	75-125	5.99	25			

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Project: Noble - Pappenheim 02-32 Excavation
 Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1210 - 3060A Mod

Blank (BIB1210-BLK1)

Prepared & Analyzed: 02/21/25

Chromium, Hexavalent ND 0.30 mg/kg wet

LCS (BIB1210-BS1)

Prepared & Analyzed: 02/21/25

Chromium, Hexavalent 22.1 0.30 mg/kg wet 24.3 91.0 80-120

Duplicate (BIB1210-DUP1)

Source: 2502231-01

Prepared & Analyzed: 02/21/25

Chromium, Hexavalent ND 0.30 mg/kg dry ND 20

Matrix Spike (BIB1210-MS1)

Source: 2502231-01

Prepared & Analyzed: 02/21/25

Chromium, Hexavalent 27.1 0.30 mg/kg dry 28.8 ND 94.4 75-125

Matrix Spike Dup (BIB1210-MSD1)

Source: 2502231-01

Prepared & Analyzed: 02/21/25

Chromium, Hexavalent 28.4 0.30 mg/kg dry 31.1 ND 91.4 75-125 4.69 20

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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1194 - General Preparation

Blank (BIB1194-BLK1)

Prepared: 02/20/25 Analyzed: 02/24/25

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

LCS (BIB1194-BS1)

Prepared: 02/20/25 Analyzed: 02/24/25

Calcium	6.34	0.0500	mg/L wet	5.00	127	70-130				
Magnesium	5.49	0.0500	"	5.00	110	70-130				
Sodium	5.49	0.0500	"	5.00	110	70-130				

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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1206 - General Preparation

Duplicate (BIB1206-DUP1)

Source: 2502220-01

Prepared & Analyzed: 02/21/25

% Solids	82.4		%		81.9			0.642	20	
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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1197 - General Preparation

Blank (BIB1197-BLK1)

Prepared: 02/20/25 Analyzed: 02/23/25

Specific Conductance (EC) ND 0.0100 mmhos/cm

LCS (BIB1197-BS1)

Prepared: 02/20/25 Analyzed: 02/23/25

Specific Conductance (EC) 1.44 0.0100 mmhos/cm 1.41 102 95-105

Duplicate (BIB1197-DUP1)

Source: 2502360-01

Prepared: 02/20/25 Analyzed: 02/23/25

Specific Conductance (EC) 0.332 0.0100 mmhos/cm 0.332 0.00 20

Summit Scientific

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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
 Project Manager: Paul Henchan

Reported:
 03/27/25 09:20

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 BIB1196 - General Preparation

LCS (BIB1196-BS1)

Prepared: 02/20/25 Analyzed: 02/23/25

pH	9.25	pH Units	9.18	101	95-105
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Duplicate (BIB1196-DUP1)

Source: 2502360-01

Prepared: 02/20/25 Analyzed: 02/23/25

pH	8.46	pH Units	8.29	1.96	20
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Project: Noble - Pappenheim 02-32 Excavation

Project Number: UWRWE-A3114-ENV CO23-174
Project Manager: Paul Henchan

Reported:
03/27/25 09:20

Notes and Definitions

- S-02 The surrogate recovery for this sample cannot be accurately quantified due to matrix interference. Matrix interference was verified via reanalysis.
- QR-03 The RPD value for the sample duplicate or MS/MSD was outside of QC acceptance limits due to matrix interference. Sample results were accepted based on LCS and/or LCSD recoveries and/or RPD values.
- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to matrix interference. Sample results were accepted based on LCS and/or LCSD recoveries and/or RPD values.
- 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