

# Summit Scientific

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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 #2502410

Enclosed are the results of analyses for samples received by Summit Scientific on 02/24/25 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 09:37

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
PWV/AST E01 Wall - 4Ft	2502410-01	Soil	02/24/25 12:10	02/24/25 16:30
PWV/AST N02 Wall - 4Ft	2502410-02	Soil	02/24/25 12:20	02/24/25 16:30
PWV/AST N03 Wall - 4Ft	2502410-03	Soil	02/24/25 12:30	02/24/25 16:30
PWV/AST Floor 03 - 5Ft	2502410-04	Soil	02/24/25 12:40	02/24/25 16:30

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# SUMMIT SCIENTIFIC

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

Lab ID

Page 1 of 1

2502410

Send Data To:

Send Invoice To:

Client: Fremont Environmental

Project Manager: Pat Henahan

Company: Noble/Chenlon

Address: 8305 6th St.

E-Mail: (Chevron Dist List, FDC Dist List, Civitas Dist List, Fremont Dist List, paul, mikeG,

Project Name/Location:

City/State/Zip: Wellington, CO

nickL, (chamB) jeffG, christ, stacy, aaronO, joshB, (jordanS) tammyA, Reports (@fremontenv.com)

AFE#:

Phone: 303-261-6246

Project Name: Pappenheim 2-32 Excavation

PO/Billing Codes: WDRWE-A3114-EMV

Sampler Name: Stanley Gilbert

Project Number: 1023-174

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	Field Table 915-1 (Soil)	Field Table 915-1 (GW)	NETEX, TMBs	TPH (C6-C26)	PAHs		SAR, EC, pH, Boron	Table 915-1 Metals	TDS, Chloride, Sulfate	
1	PWV/AST EOI Wall-4F+	2/24/25	12:10	2			X			X												
2	PWV/AST NO2 Wall-4F+		12:20	1			X			X												
3	PWV/AST NO3 Wall-4F+		12:30	1			X			X												
4	PWV/AST FLOOR03-5F+		12:40	1			X			X												
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

Relinquished by: [Signature] Date/Time: 2/24/25 14:30

Received by: [Signature] Date/Time: 2/24/25 14:30

TAT Business Days:  Same Day  Field DO

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

Relinquished by: [Signature] Date/Time: 2/24/25 16:30

Received by: [Signature] Date/Time: 2/24/25 16:30

1 Day  Field EC

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

2 Days  Field ORP

Temperature Upon Receipt: 44

Corrected Temperature: 5

IR gun #: 1

HNO3 lot #: \_\_\_\_\_

3 Days  Field pH

Standard  Field Temp.

Field Turb.

# S<sub>2</sub>

S2 Work Order# 2502410

### Sample Receipt Checklist

Client: Framont 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) 44 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? <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.	-			<u>none</u>
If custody seals are present, are they intact? <sup>(1)</sup>	-			
Are samples due within 48 hours?	-			<u>Same day</u>
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, Total Residual Chlorine (TRC)		-		
Is a chain-of-custody (COC) form present and filled out Completely? <sup>(1)</sup>	-			
Is the COC properly relinquished by the client w/ date and time recorded? <sup>(1)</sup>	-			
Were all samples received intact? <sup>(1)</sup>	-			
Was adequate sample volume provided? <sup>(1)</sup>	-			
Were samples provided in appropriate bottle ware?	-			
Does the COC agree with the number and type of sample bottles received? <sup>(1)</sup>	-			
Do the sample IDs on the bottle labels match the COC? <sup>(1)</sup>	-			
For volatiles in water – is there headspace present? If yes, contact client and note in narrative.			-	
Are any samples/bottles preserved (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.			-	
If samples are acid preserved for metals, is the pH ≤ 2? <sup>(1)</sup> 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		-		
<u>Additional Comments (if any):</u>				

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

Control Form #: SRC-001

SN  
Custodian Printed Name2/24/25  
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 09:37

**PWV/AST E01 Wall - 4Ft**  
**2502410-01 (Soil)**

**Summit Scientific**

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

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Benzene	ND	0.0020		mg/kg	1	BIB1372	02/24/25	02/24/25	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: **02/24/25 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: 1,2-Dichloroethane-d4	0.0398	99.4 %		50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0398	99.5 %		50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0389	97.3 %		50-150		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
C10-C28 (DRO)	<b>670</b>	50		mg/kg	1	BIB1376	02/24/25	02/25/25	EPA 8015M	
C28-C36 (ORO)	<b>590</b>	50		"	"	"	"	"	"	

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit								
Surrogate: o-Terphenyl	11.2	89.3 %		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 09:37

**PWV/AST E01 Wall - 4Ft  
2502410-01 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0265	03/05/25	03/13/25	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: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0152	45.7 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0140	42.1 %	40-140		"	"	"	"	

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

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1378	02/25/25	02/25/25	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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 09:37

**PWV/AST E01 Wall - 4Ft  
2502410-01 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.50	0.200	mg/kg dry	1	BIB1405	02/25/25	02/25/25	EPA 6020B	
Barium	68.7	0.400	"	"	"	"	"	"	
Cadmium	0.231	0.200	"	"	"	"	"	"	
Copper	4.17	0.400	"	"	"	"	"	"	
Lead	7.40	0.200	"	"	"	"	"	"	
Nickel	4.67	0.400	"	"	"	"	"	"	
Silver	0.0387	0.0200	"	"	"	"	"	"	
Zinc	25.1	0.400	"	"	"	"	"	"	
Selenium	ND	0.260	"	"	"	"	"	"	

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: 02/24/25 12:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1401	02/25/25	02/25/25	EPA 7196A	

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

Date Sampled: 02/24/25 12:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	377	0.0500	mg/L dry	1	BIB1373	02/24/25	02/26/25	EPA 6020B	
Magnesium	84.6	0.0500	"	"	"	"	"	"	
Sodium	40.7	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: 02/24/25 12:10

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.493	0.00100	units	1	BIB1536	02/26/25	02/26/25	Calculation	

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

Date Sampled: 02/24/25 12:10

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 09:37

**PWV/AST E01 Wall - 4Ft  
 2502410-01 (Soil)**

**Summit Scientific**

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

% Solids	87.1	%	1	BIB1379	02/25/25	02/25/25	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.65	0.0100	mmhos/cm	1	BIB1375	02/24/25	02/25/25	EPA 120.1	

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

Date Sampled: **02/24/25 12:10**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.64		pH Units	1	BIB1374	02/24/25	02/25/25	EPA 9045D	

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

**Reported:**  
03/27/25 09:37

**PWV/AST N02 Wall - 4Ft  
2502410-02 (Soil)**

**Summit Scientific**

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

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	BIB1372	02/24/25	02/24/25	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: **02/24/25 12:20**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4	0.0447	112 %	50-150	"	"	"	"	"	
Surrogate: Toluene-d8	0.0402	101 %	50-150	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0401	100 %	50-150	"	"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	BIB1376	02/24/25	02/25/25	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl	11.8	94.8 %	30-150	"	"	"	"	"	

**PAH by EPA Method 8270D SIM**

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Project Manager: Paul Henchan

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03/27/25 09:37

**PWV/AST N02 Wall - 4Ft**  
**2502410-02 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0265	03/05/25	03/13/25	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: **02/24/25 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0168	50.4 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0190	57.0 %	40-140		"	"	"	"	

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

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1378	02/25/25	02/25/25	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **02/24/25 12:20**

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 09:37

**PWV/AST N02 Wall - 4Ft  
2502410-02 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Arsenic	4.15	0.200	mg/kg dry	1	BIB1405	02/25/25	02/25/25	EPA 6020B
Barium	119	0.400	"	"	"	"	"	"
Cadmium	0.343	0.200	"	"	"	"	"	"
Copper	3.98	0.400	"	"	"	"	"	"
Lead	8.03	0.200	"	"	"	"	"	"
Nickel	4.77	0.400	"	"	"	"	"	"
Silver	0.0340	0.0200	"	"	"	"	"	"
Zinc	19.9	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: 02/24/25 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1401	02/25/25	02/25/25	EPA 7196A	

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

Date Sampled: 02/24/25 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	46.0	0.0500	mg/L dry	1	BIB1373	02/24/25	02/26/25	EPA 6020B	
Magnesium	3.57	0.0500	"	"	"	"	"	"	
Sodium	23.0	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: 02/24/25 12:20

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.879	0.00100	units	1	BIB1536	02/26/25	02/26/25	Calculation	

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

Date Sampled: 02/24/25 12:20

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

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 03/27/25 09:37

**PWV/AST N02 Wall - 4Ft  
 2502410-02 (Soil)**

**Summit Scientific**

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

% Solids	92.1	%	1	BIB1379	02/25/25	02/25/25	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.216	0.0100	mmhos/cm	1	BIB1375	02/24/25	02/25/25	EPA 120.1	

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

Date Sampled: **02/24/25 12:20**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.64		pH Units	1	BIB1374	02/24/25	02/25/25	EPA 9045D	

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 09:37

**PWV/AST N03 Wall - 4Ft  
2502410-03 (Soil)**

**Summit Scientific**

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

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Benzene	ND	0.0020	mg/kg	1	BIB1372	02/24/25	02/24/25	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: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 1,2-Dichloroethane-d4	0.0379	94.6 %	50-150		"	"	"	"	
Surrogate: Toluene-d8	0.0404	101 %	50-150		"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0385	96.2 %	50-150		"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>C10-C28 (DRO)</b>	<b>190</b>	50	mg/kg	1	BIB1376	02/24/25	02/25/25	EPA 8015M	
<b>C28-C36 (ORO)</b>	<b>310</b>	50	"	"	"	"	"	"	

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl	12.8	102 %	30-150		"	"	"	"	

**PAH by EPA Method 8270D SIM**

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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 09:37

**PWV/AST N03 Wall - 4Ft**  
**2502410-03 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0265	03/05/25	03/13/25	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: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0154	46.3 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0161	48.3 %	40-140		"	"	"	"	

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

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1378	02/25/25	02/25/25	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **02/24/25 12:30**

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 09:37

**PWV/AST N03 Wall - 4Ft  
2502410-03 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Arsenic	3.23	0.200	mg/kg dry	1	BIB1405	02/25/25	02/25/25	EPA 6020B
Barium	72.8	0.400	"	"	"	"	"	"
Cadmium	0.348	0.200	"	"	"	"	"	"
Copper	3.80	0.400	"	"	"	"	"	"
Lead	8.38	0.200	"	"	"	"	"	"
Nickel	4.79	0.400	"	"	"	"	"	"
Silver	0.0341	0.0200	"	"	"	"	"	"
Zinc	23.1	0.400	"	"	"	"	"	"
Selenium	ND	0.260	"	"	"	"	"	"

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: 02/24/25 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1401	02/25/25	02/25/25	EPA 7196A	

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

Date Sampled: 02/24/25 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	58.2	0.0500	mg/L dry	1	BIB1373	02/24/25	02/26/25	EPA 6020B	
Magnesium	3.56	0.0500	"	"	"	"	"	"	
Sodium	16.9	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: 02/24/25 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.581	0.00100	units	1	BIB1536	02/26/25	02/26/25	Calculation	

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

Date Sampled: 02/24/25 12:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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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 09:37

**PWV/AST N03 Wall - 4Ft**  
**2502410-03 (Soil)**

**Summit Scientific**

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

% Solids	89.0	%	1	BIB1379	02/25/25	02/25/25	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	0.209	0.0100	mmhos/cm	1	BIB1375	02/24/25	02/25/25	EPA 120.1	

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

Date Sampled: **02/24/25 12:30**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	8.28		pH Units	1	BIB1374	02/24/25	02/25/25	EPA 9045D	

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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 09:37

**PWV/AST Floor 03 - 5Ft  
2502410-04 (Soil)**

**Summit Scientific**

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

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Benzene	ND	0.0020	mg/kg	1	BIB1372	02/24/25	02/25/25	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: **02/24/25 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: 1,2-Dichloroethane-d4	0.0369	92.3 %	50-150	"	"	"	"	"	
Surrogate: Toluene-d8	0.0403	101 %	50-150	"	"	"	"	"	
Surrogate: 4-Bromofluorobenzene	0.0409	102 %	50-150	"	"	"	"	"	

**Extractable Petroleum Hydrocarbons by 8015**

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
C10-C28 (DRO)	ND	50	mg/kg	1	BIB1376	02/24/25	02/25/25	EPA 8015M	
C28-C36 (ORO)	ND	50	"	"	"	"	"	"	

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting		Dilution	Batch	Prepared	Analyzed	Method	Notes
		Limit	Units						
Surrogate: o-Terphenyl	7.65	61.2 %	30-150	"	"	"	"	"	

**PAH by EPA Method 8270D SIM**

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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 09:37

**PWV/AST Floor 03 - 5Ft  
2502410-04 (Soil)**

**Summit Scientific**

**PAH by EPA Method 8270D SIM**

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Acenaphthene	ND	0.00500	mg/kg	1	BIC0265	03/05/25	03/21/25	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: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: 2-Methylnaphthalene-d10	0.0188	56.5 %	40-140		"	"	"	"	
Surrogate: Fluoranthene-d10	0.0163	48.8 %	40-140		"	"	"	"	

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

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Boron	ND	2.00	mg/L	1	BIB1378	02/25/25	02/25/25	EPA 6020B	

**Total Metals by EPA 6020B**

Date Sampled: **02/24/25 12:40**

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 09:37

**PWV/AST Floor 03 - 5Ft  
2502410-04 (Soil)**

**Summit Scientific**

**Total Metals by EPA 6020B**

Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Arsenic	2.32	0.200	mg/kg dry	1	BIB1405	02/25/25	02/25/25	EPA 6020B	
Barium	26.1	0.400	"	"	"	"	"	"	
Cadmium	0.261	0.200	"	"	"	"	"	"	
Copper	7.78	0.400	"	"	"	"	"	"	
Lead	14.9	0.200	"	"	"	"	"	"	
Nickel	3.49	0.400	"	"	"	"	"	"	
Silver	0.0539	0.0200	"	"	"	"	"	"	
Zinc	25.5	0.400	"	"	"	"	"	"	
Selenium	ND	0.260	"	"	"	"	"	"	

**Hexavalent Chromium by EPA Method 7196**

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Chromium, Hexavalent	ND	0.30	mg/kg dry	1	BIB1401	02/25/25	02/25/25	EPA 7196A	

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

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Calcium	378	0.0500	mg/L dry	1	BIB1373	02/24/25	02/26/25	EPA 6020B	
Magnesium	83.2	0.0500	"	"	"	"	"	"	
Sodium	52.3	0.0500	"	"	"	"	"	"	

**Calculated Analysis**

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Sodium Adsorption Ratio	0.635	0.00100	units	1	BIB1536	02/26/25	02/26/25	Calculation	

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

Date Sampled: **02/24/25 12:40**

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 09:37

**PWV/AST Floor 03 - 5Ft  
 2502410-04 (Soil)**

**Summit Scientific**

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

% Solids	81.3	%	1	BIB1379	02/25/25	02/25/25	Calculation
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**Specific Conductance by EPA Method 120.1, Saturated Paste Extraction**

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Specific Conductance (EC)	2.21	0.0100	mmhos/cm	1	BIB1375	02/24/25	02/25/25	EPA 120.1	

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

Date Sampled: **02/24/25 12:40**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
pH	7.78		pH Units	1	BIB1374	02/24/25	02/25/25	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 09:37

### 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 BIB1372 - EPA 5030 Soil MS

##### Blank (BIB1372-BLK1)

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

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	0.0394		"	0.0400		98.6	50-150			
Surrogate: Toluene-d8	0.0403		"	0.0400		101	50-150			
Surrogate: 4-Bromofluorobenzene	0.0395		"	0.0400		98.8	50-150			

##### LCS (BIB1372-BS1)

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

Benzene	0.0935	0.0020	mg/kg	0.100		93.5	70-130			
Toluene	0.0964	0.0050	"	0.100		96.4	70-130			
Ethylbenzene	0.101	0.0050	"	0.100		101	70-130			
m,p-Xylene	0.178	0.010	"	0.200		89.1	70-130			
o-Xylene	0.0879	0.0050	"	0.100		87.9	70-130			
1,2,4-Trimethylbenzene	0.0815	0.0050	"	0.100		81.5	70-130			
1,3,5-Trimethylbenzene	0.0857	0.0050	"	0.100		85.7	70-130			
Naphthalene	0.0810	0.0038	"	0.100		81.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0400		"	0.0400		100	50-150			
Surrogate: Toluene-d8	0.0429		"	0.0400		107	50-150			
Surrogate: 4-Bromofluorobenzene	0.0390		"	0.0400		97.5	50-150			

##### Matrix Spike (BIB1372-MS1)

Source: 2502405-03

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

Benzene	0.575	0.0020	mg/kg	0.100	0.205	370	70-130			QM-05
Toluene	1.02	0.0050	"	0.100	0.714	305	70-130			QM-05
Ethylbenzene	0.197	0.0050	"	0.100	0.0758	121	70-130			
m,p-Xylene	0.691	0.010	"	0.200	0.411	140	70-130			QM-05
o-Xylene	0.324	0.0050	"	0.100	0.208	116	70-130			
1,2,4-Trimethylbenzene	0.202	0.0050	"	0.100	0.112	89.6	70-130			
1,3,5-Trimethylbenzene	0.0774	0.0050	"	0.100	0.0468	30.6	70-130			QM-05
Naphthalene	0.122	0.0038	"	0.100	0.0420	80.0	70-130			
Surrogate: 1,2-Dichloroethane-d4	0.0386		"	0.0400		96.5	50-150			
Surrogate: Toluene-d8	0.0432		"	0.0400		108	50-150			
Surrogate: 4-Bromofluorobenzene	0.0391		"	0.0400		97.6	50-150			

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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 09:37

**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 BIB1372 - EPA 5030 Soil MS**

Matrix Spike Dup (BIB1372-MSD1)	Source: 2502405-03			Prepared: 02/24/25 Analyzed: 02/25/25						
Benzene	0.629	0.0020	mg/kg	0.100	0.205	424	70-130	8.94	30	QM-05
Toluene	1.03	0.0050	"	0.100	0.714	320	70-130	1.39	30	QM-05
Ethylbenzene	0.192	0.0050	"	0.100	0.0758	116	70-130	2.55	30	
m,p-Xylene	0.655	0.010	"	0.200	0.411	122	70-130	5.32	30	
o-Xylene	0.322	0.0050	"	0.100	0.208	114	70-130	0.743	30	
1,2,4-Trimethylbenzene	0.209	0.0050	"	0.100	0.112	97.2	70-130	3.69	30	
1,3,5-Trimethylbenzene	0.0920	0.0050	"	0.100	0.0468	45.2	70-130	17.3	30	QM-05
Naphthalene	0.124	0.0038	"	0.100	0.0420	82.0	70-130	1.68	30	
Surrogate: 1,2-Dichloroethane-d4	0.0408		"	0.0400		102	50-150			
Surrogate: Toluene-d8	0.0418		"	0.0400		105	50-150			
Surrogate: 4-Bromofluorobenzene	0.0377		"	0.0400		94.3	50-150			

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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 09:37

**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 BIB1376 - EPA 3550A**

**Blank (BIB1376-BLK1)**

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

C10-C28 (DRO)	ND	50	mg/kg							
C28-C36 (ORO)	ND	50	"							
Surrogate: <i>o</i> -Terphenyl	11.9		"	12.5		95.1	30-150			

**LCS (BIB1376-BS1)**

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

C10-C28 (DRO)	648	50	mg/kg	500	28.0	130	70-130			
Surrogate: <i>o</i> -Terphenyl	11.7		"	12.5		93.2	30-150			

**Matrix Spike (BIB1376-MS1)**

Source: 2502405-03

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

C10-C28 (DRO)	552	50	mg/kg	500	28.0	105	70-130			
Surrogate: <i>o</i> -Terphenyl	7.75		"	12.5		62.0	30-150			

**Matrix Spike Dup (BIB1376-MSD1)**

Source: 2502405-03

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

C10-C28 (DRO)	583	50	mg/kg	500	28.0	111	70-130	5.44	20	
Surrogate: <i>o</i> -Terphenyl	7.15		"	12.5		57.2	30-150			

Summit Scientific

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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 09:37

**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 BIC0265 - EPA 5030 Soil MS**

**Blank (BIC0265-BLK1)**

Prepared: 03/05/25 Analyzed: 03/12/25

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	0.0221		"	0.0333		66.4	40-140			
Surrogate: Fluoranthene-d10	0.0267		"	0.0333		80.2	40-140			

**LCS (BIC0265-BS1)**

Prepared: 03/05/25 Analyzed: 03/12/25

Acenaphthene	0.0286	0.00500	mg/kg	0.0333		85.8	40-140			
Anthracene	0.0303	0.00500	"	0.0333		91.0	40-140			
Benzo (a) anthracene	0.0333	0.00500	"	0.0333		99.9	40-140			
Benzo (a) pyrene	0.0295	0.00500	"	0.0333		88.5	40-140			
Benzo (b) fluoranthene	0.0306	0.00500	"	0.0333		91.7	40-140			
Benzo (k) fluoranthene	0.0291	0.00500	"	0.0333		87.2	40-140			
Chrysene	0.0287	0.00500	"	0.0333		86.1	40-140			
Dibenz (a,h) anthracene	0.0285	0.00500	"	0.0333		85.5	40-140			
Fluoranthene	0.0308	0.00500	"	0.0333		92.5	40-140			
Fluorene	0.0296	0.00500	"	0.0333		88.7	40-140			
Indeno (1,2,3-cd) pyrene	0.0209	0.00500	"	0.0333		62.8	40-140			
Pyrene	0.0295	0.00500	"	0.0333		88.5	40-140			
1-Methylnaphthalene	0.0259	0.00500	"	0.0333		77.7	40-140			
2-Methylnaphthalene	0.0278	0.00500	"	0.0333		83.5	40-140			
Surrogate: 2-Methylnaphthalene-d10	0.0250		"	0.0333		75.1	40-140			
Surrogate: Fluoranthene-d10	0.0296		"	0.0333		88.8	40-140			

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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 09:37

**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 BIC0265 - EPA 5030 Soil MS**

<b>Matrix Spike (BIC0265-MS1)</b>	<b>Source: 2502398-01</b>			<b>Prepared: 03/05/25 Analyzed: 03/12/25</b>						
Acenaphthene	0.0259	0.00500	mg/kg	0.0333	ND	77.7	40-140			
Anthracene	0.0271	0.00500	"	0.0333	ND	81.2	40-140			
Benzo (a) anthracene	0.0304	0.00500	"	0.0333	ND	91.1	40-140			
Benzo (a) pyrene	0.0264	0.00500	"	0.0333	ND	79.1	40-140			
Benzo (b) fluoranthene	0.0278	0.00500	"	0.0333	ND	83.3	40-140			
Benzo (k) fluoranthene	0.0266	0.00500	"	0.0333	ND	79.7	40-140			
Chrysene	0.0259	0.00500	"	0.0333	ND	77.6	40-140			
Dibenz (a,h) anthracene	0.0233	0.00500	"	0.0333	ND	69.9	40-140			
Fluoranthene	0.0277	0.00500	"	0.0333	ND	83.0	40-140			
Fluorene	0.0272	0.00500	"	0.0333	ND	81.6	40-140			
Indeno (1,2,3-cd) pyrene	0.0175	0.00500	"	0.0333	ND	52.4	40-140			
Pyrene	0.0282	0.00500	"	0.0333	ND	84.6	40-140			
1-Methylnaphthalene	0.0207	0.00500	"	0.0333	ND	62.2	40-140			
2-Methylnaphthalene	0.0227	0.00500	"	0.0333	ND	68.0	40-140			
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0194</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>58.3</i>	<i>40-140</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0266</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>79.9</i>	<i>40-140</i>			

<b>Matrix Spike Dup (BIC0265-MSD1)</b>	<b>Source: 2502398-01</b>			<b>Prepared: 03/05/25 Analyzed: 03/12/25</b>						
Acenaphthene	0.0272	0.00500	mg/kg	0.0333	ND	81.6	40-140	5.01	30	
Anthracene	0.0282	0.00500	"	0.0333	ND	84.7	40-140	4.27	30	
Benzo (a) anthracene	0.0310	0.00500	"	0.0333	ND	93.0	40-140	2.08	30	
Benzo (a) pyrene	0.0270	0.00500	"	0.0333	ND	81.0	40-140	2.33	30	
Benzo (b) fluoranthene	0.0281	0.00500	"	0.0333	ND	84.4	40-140	1.20	30	
Benzo (k) fluoranthene	0.0264	0.00500	"	0.0333	ND	79.1	40-140	0.740	30	
Chrysene	0.0264	0.00500	"	0.0333	ND	79.1	40-140	1.95	30	
Dibenz (a,h) anthracene	0.0230	0.00500	"	0.0333	ND	69.1	40-140	1.23	30	
Fluoranthene	0.0275	0.00500	"	0.0333	ND	82.5	40-140	0.614	30	
Fluorene	0.0284	0.00500	"	0.0333	ND	85.2	40-140	4.30	30	
Indeno (1,2,3-cd) pyrene	0.0167	0.00500	"	0.0333	ND	50.1	40-140	4.52	30	
Pyrene	0.0287	0.00500	"	0.0333	ND	86.1	40-140	1.81	30	
1-Methylnaphthalene	0.0264	0.00500	"	0.0333	ND	79.3	40-140	24.2	30	
2-Methylnaphthalene	0.0288	0.00500	"	0.0333	ND	86.3	40-140	23.7	30	
<i>Surrogate: 2-Methylnaphthalene-d10</i>	<i>0.0254</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>76.3</i>	<i>40-140</i>			
<i>Surrogate: Fluoranthene-d10</i>	<i>0.0268</i>	<i>"</i>	<i>"</i>	<i>0.0333</i>	<i>"</i>	<i>80.5</i>	<i>40-140</i>			

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 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 09:37

**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 BIB1378 - EPA 3050B**

**Blank (BIB1378-BLK1)**

Prepared & Analyzed: 02/25/25

Boron ND 2.00 mg/L

**LCS (BIB1378-BS1)**

Prepared & Analyzed: 02/25/25

Boron 4.89 2.00 mg/L 5.00 97.7 80-120

**Duplicate (BIB1378-DUP1)**

Source: 2502410-01

Prepared & Analyzed: 02/25/25

Boron 0.146 2.00 mg/L 0.170 15.3 20

**Matrix Spike (BIB1378-MS1)**

Source: 2502410-01

Prepared & Analyzed: 02/25/25

Boron 4.08 2.00 mg/L 5.01 0.170 78.0 75-125

**Matrix Spike Dup (BIB1378-MSD1)**

Source: 2502410-01

Prepared & Analyzed: 02/25/25

Boron 4.26 2.00 mg/L 5.01 0.170 81.6 75-125 4.37 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 09:37

**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 BIB1405 - EPA 3050B**

**Blank (BIB1405-BLK1)**

Prepared & Analyzed: 02/25/25

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 (BIB1405-BS1)**

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

Arsenic	36.2	0.200	mg/kg wet	38.5	94.1	80-120
Barium	37.7	0.400	"	38.5	98.0	80-120
Cadmium	1.92	0.200	"	1.92	99.7	80-120
Copper	39.5	0.400	"	38.5	103	80-120
Lead	18.9	0.200	"	19.2	98.4	80-120
Nickel	39.0	0.400	"	38.5	101	80-120
Silver	1.90	0.0200	"	1.92	98.7	80-120
Zinc	37.5	0.400	"	38.5	97.5	80-120
Selenium	4.12	0.260	"	3.85	107	80-120

**Duplicate (BIB1405-DUP1)**

Source: 2502407-01

Prepared & Analyzed: 02/25/25

Arsenic	3.29	0.200	mg/kg dry	2.94	11.0	20
Barium	66.7	0.400	"	59.6	11.1	20
Cadmium	0.215	0.200	"	0.200	7.19	20
Copper	5.31	0.400	"	4.86	8.77	20
Lead	8.56	0.200	"	7.33	15.5	20
Nickel	5.26	0.400	"	4.76	10.0	20
Silver	0.0404	0.0200	"	0.0349	14.6	20
Zinc	19.6	0.400	"	18.1	7.90	20
Selenium	ND	0.260	"	ND		20

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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 09:37

**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 BIB1405 - EPA 3050B**

<b>Matrix Spike (BIB1405-MS1)</b>	<b>Source: 2502407-01</b>			<b>Prepared: 02/25/25 Analyzed: 02/26/25</b>								
Arsenic	50.8	0.200	mg/kg dry	49.6	2.94	96.5	75-125					
Barium	115	0.400	"	49.6	59.6	112	75-125					
Cadmium	2.72	0.200	"	2.48	0.200	101	75-125					
Copper	35.0	0.400	"	49.6	4.86	60.6	75-125					QM-05
Lead	32.4	0.200	"	24.8	7.33	101	75-125					
Nickel	34.6	0.400	"	49.6	4.76	60.2	75-125					QM-05
Silver	2.50	0.0200	"	2.48	0.0349	99.5	75-125					
Zinc	48.8	0.400	"	49.6	18.1	61.9	75-125					QM-05
Selenium	5.18	0.260	"	4.96	ND	104	75-125					

<b>Matrix Spike Dup (BIB1405-MSD1)</b>	<b>Source: 2502407-01</b>			<b>Prepared: 02/25/25 Analyzed: 02/26/25</b>								
Arsenic	49.5	0.200	mg/kg dry	49.2	2.94	94.5	75-125	2.74	25			
Barium	109	0.400	"	49.2	59.6	101	75-125	5.34	25			
Cadmium	2.80	0.200	"	2.46	0.200	106	75-125	3.05	25			
Copper	34.8	0.400	"	49.2	4.86	60.8	75-125	0.490	25			QM-05
Lead	34.6	0.200	"	24.6	7.33	111	75-125	6.50	25			
Nickel	33.8	0.400	"	49.2	4.76	59.0	75-125	2.42	25			QM-05
Silver	2.50	0.0200	"	2.46	0.0349	100	75-125	0.0127	25			
Zinc	49.7	0.400	"	49.2	18.1	64.3	75-125	1.85	25			QM-05
Selenium	4.93	0.260	"	4.92	ND	100	75-125	4.99	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 09:37

**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 BIB1401 - 3060A Mod**

**Blank (BIB1401-BLK1)**

Prepared & Analyzed: 02/25/25

Chromium, Hexavalent      ND      0.30 mg/kg wet

**LCS (BIB1401-BS1)**

Prepared & Analyzed: 02/25/25

Chromium, Hexavalent      22.6      0.30 mg/kg wet      25.0      90.4      80-120

**Duplicate (BIB1401-DUP1)**

**Source: 2502324-01**

Prepared & Analyzed: 02/25/25

Chromium, Hexavalent      ND      0.30 mg/kg dry      ND      20

**Matrix Spike (BIB1401-MS1)**

**Source: 2502324-01**

Prepared & Analyzed: 02/25/25

Chromium, Hexavalent      27.0      0.30 mg/kg dry      27.0      ND      100      75-125

**Matrix Spike Dup (BIB1401-MSD1)**

**Source: 2502324-01**

Prepared & Analyzed: 02/25/25

Chromium, Hexavalent      26.0      0.30 mg/kg dry      26.4      ND      98.2      75-125      3.80      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 09:37

**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 BIB1373 - General Preparation**

**Blank (BIB1373-BLK1)**

Prepared: 02/24/25 Analyzed: 02/26/25

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

**LCS (BIB1373-BS1)**

Prepared: 02/24/25 Analyzed: 02/26/25

Calcium	5.10	0.0500	mg/L wet	5.00	102	70-130				
Magnesium	4.49	0.0500	"	5.00	89.7	70-130				
Sodium	4.50	0.0500	"	5.00	89.9	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 09:37

**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 BIB1379 - General Preparation**

**Duplicate (BIB1379-DUP1)**

**Source: 2502403-29**

Prepared & Analyzed: 02/25/25

% Solids	93.9		%		94.0			0.180	20	
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Summit Scientific

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 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 09:37

**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 BIB1375 - General Preparation**

**Blank (BIB1375-BLK1)**

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

Specific Conductance (EC) ND 0.0100 mmhos/cm

**LCS (BIB1375-BS1)**

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

Specific Conductance (EC) 1.40 0.0100 mmhos/cm 1.41 99.6 95-105

**Duplicate (BIB1375-DUP1)**

Source: 2502407-01

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

Specific Conductance (EC) 0.240 0.0100 mmhos/cm 0.240 0.00 20

Summit Scientific

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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 09:37

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

**Summit Scientific**

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

**Batch BIB1374 - General Preparation**

**LCS (BIB1374-BS1)**

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

pH 9.24 pH Units 9.18 101 95-105

**Duplicate (BIB1374-DUP1)**

Source: 2502407-01

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

pH 8.81 pH Units 8.83 0.220 20

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 09:37

### Notes and Definitions

- 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