

October 17, 2024

Noble – WPF III T6N-R64W-S18 L01

Groundwater Monitoring Report

SWSW Sec 18, T6N, 64

40.480540, -104.601317

Weld County, Colorado

Fremont Project No. C023-007

Facility # 483054, Remediation # 25398

Site Overview – Site History

A legacy release was identified on January 10, 2023, at the WPF facility separator during facility decommissioning. Approximately 1,160 cubic yards of petroleum-impacted soil was removed from the site by excavation between August 2023 and September 2023 following the abandonment of the facility.

Conceptual Site Model*

* Data presented represents the most recent sampling event

- **Land Use** – Rangeland/Cropland
- **Soil Type (USCS)** – Silty Clay (CL)
- **Potential Receptors within ¼ mile** – livestock 1,240 ft S, occupied building 353 ft SW, and water well 362 feet ESE
- **Inferred Groundwater Gradient (Ft/Ft) and Flow Direction** – 0.080 ft/ft NW
- **Average Depth to Groundwater** – 6.5 feet
- **Impacted Media and Extent** – Soil and groundwater
- **LNAPL Present** – No
- **Points of Compliance** – Yes, in all cardinal directions
- **Number of Consecutive ECMC Compliant Quarters** – One
- **Remediation Type** – Excavation, MNA

Contaminants of Concern (COC)

The laboratory data indicate that the dissolved phase organic constituents were below their respective ECMC Table 915-1 standards in all of the wells sampled during the August 2024 quarterly monitoring event. The groundwater analytical data are summarized in Table 1 and illustrated on Figure 4. A copy of the laboratory's report, quality control data, and chain-of-custody documentation is attached.

Remedial Actions

Monitored natural attenuation (MNA) will be implemented at the site to address dissolved phase groundwater impacts. A no further action designation will be requested from the ECMC following observation of four consecutive quarters of groundwater compliant with the applicable ECMC Table 915-1 standards, under static conditions, at the site.

Remarks

The discussion and conclusions contained in this report represent our professional opinions. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

Please contact me at (603) 477-6907 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

This report was prepared by **FREMONT ENVIRONMENTAL INC.**




10/18/2024

Date _____

Chris Lattes

Consultant

Reviewed by:



10/18/2024

Date _____

Ethan D. Black, P.G.

Geologist

Attachments:

Tables

Figures

Laboratory Report

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA AND ORGANIC CHEMISTRY DATA
NOBLE 100322
WPF III T6N-R64W-S18 L01, WELD COUNTY, COLORADO
REM # 25398

Sample ID	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	Naphthalene (µg/L)	1,2,4- Trimethyl- Benzene (µg/L)	1,3,5- Trimethyl- Benzene (µg/L)	TOC Elevation (ft)	Depth to Groundwater Below TOC (ft)	Groundwater Elevation (ft)	LNAPL Thickness (ft)
ECMC Table 915-1 Limits		5.0	560	700	1400	140	67	67				
MW-1	08/19/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4682.19	6.42	4675.77	NP
MW-2	08/19/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4682.76	9.50	4673.26	NP
MW-3	08/19/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4683.17	6.20	4676.97	NP
MW-4	08/19/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4682.92	6.41	4676.51	NP
MW-5	08/19/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	4682.19	6.53	4675.66	NP

1. Bold values exceed the ECMC limit(s)

2. Red highlighted groundwater analytical values indicate a regulatory exceedance

NP - No measurable LNAPL, NA - Not Analyzed, NL - No Limit, INA - Inaccessible, IW - Insufficient Water, DES - Destroyed

TABLE 2
SUMMARY OF INORGANIC GROUNDWATER CHEMISTRY DATA
NOBLE 100322
WPF III T6N-R64W-S18 L01, WELD COUNTY, COLORADO
REM # 25398

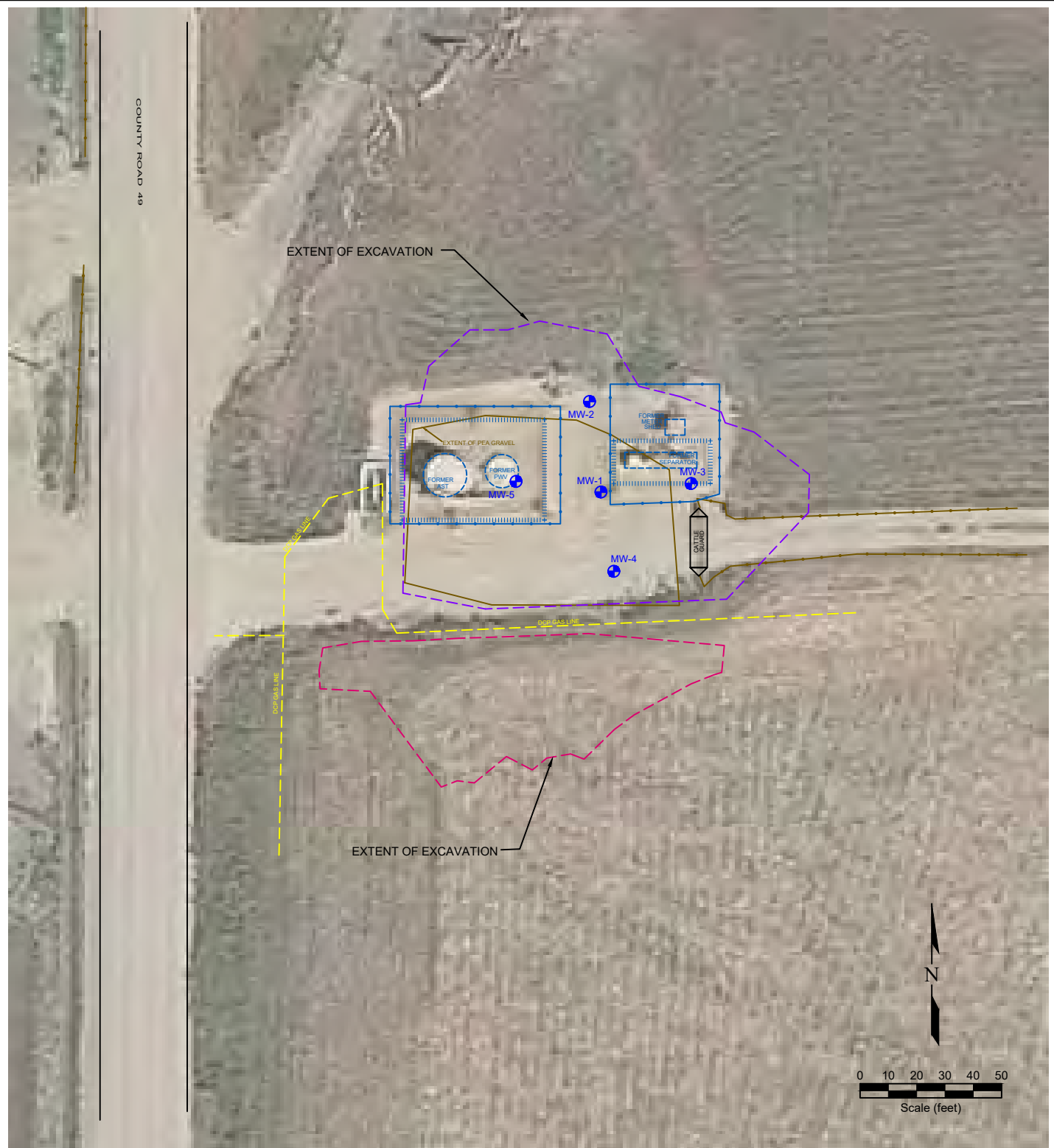
Sample ID	Sample Date	Total Dissolved Solids (mg/L)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)
ECMC Table 915-1 Limits*		<1.25 x local background	250 or <1.25 x local background	250 or <1.25 x local background
MW-1	08/19/2024	2400	179	2090
MW-2	08/19/2024	2850	368	2400
MW-3	08/19/2024	3230	317	2630
MW-4	08/19/2024	2350	143	2050
MW-5	08/19/2024	2310	131	2030
Background Concentration (Current)		-	-	-

1. Bold values exceed the ECMC limit(s)

2. Blue highlighted groundwater analytical values indicate a regulatory exceedance

NP - No measurable LNAPL, NA - Not Analyzed, INA - Inaccessible, IW - Insufficient Water, DES - Destroyed

*Dissolved metals refer to Colorado Regulation 41 Standards



LEGEND

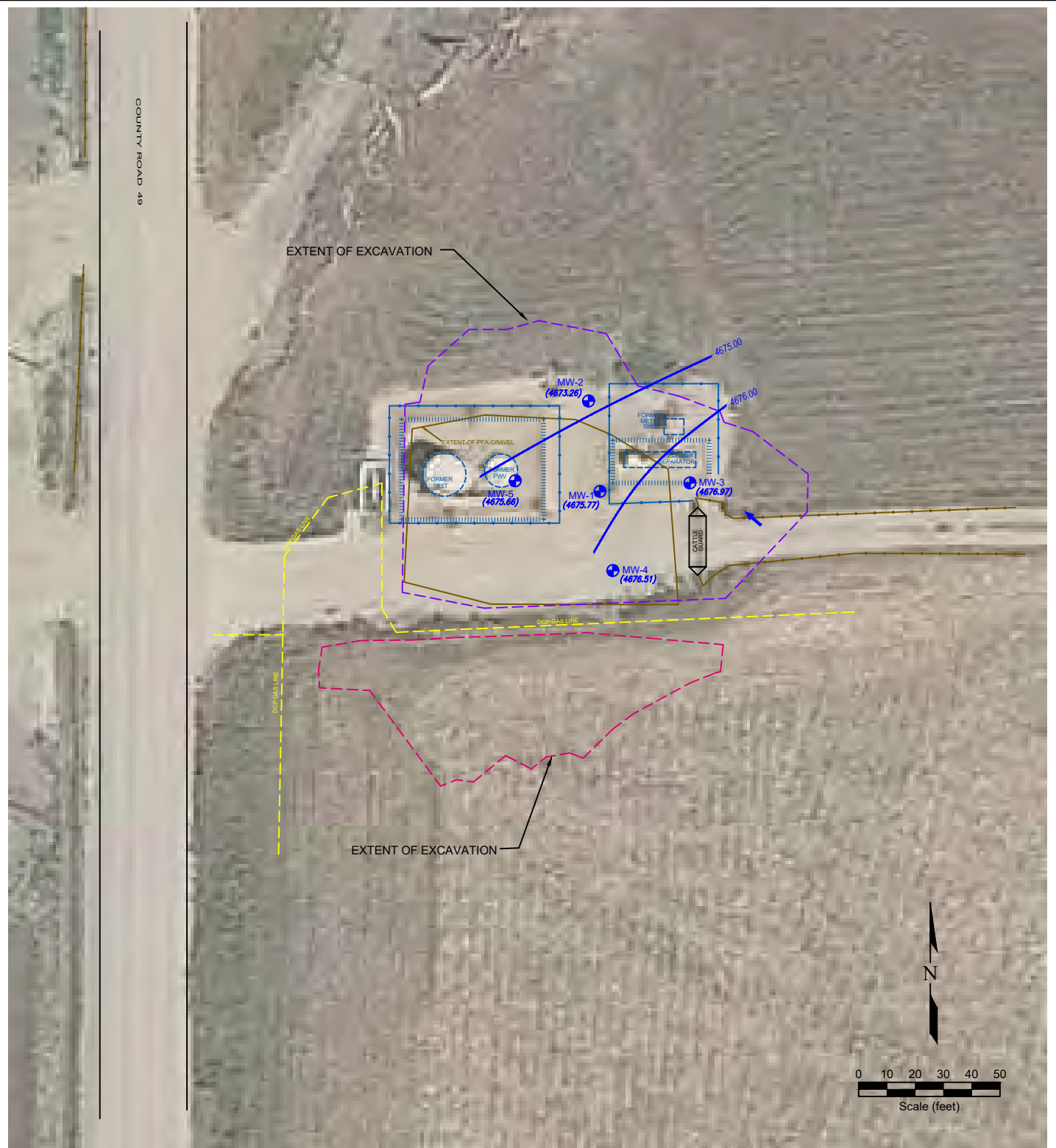
- MONITORING WELL
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- CONTAINMENT BERM
- FENCE LINE
- DCP GAS LINE
- EXTENT OF PEA GRAVEL
- SOUTH EXTENT OF EXCAVATION
- NORTH EXTENT OF EXCAVATION

Figure 2
SITE MAP

Noble Energy, Inc. ~ WPF III T6N-R64W-S18 L01
 SWSW Sec. 18, T6N, R64W, 6th PM
 Weld County, Colorado
 40.480540°, -104.601317°

Project No. C023-007	Facility # 483054	API#
Date 10/12/24	Remediation # 25398	Filename 23007Q6





LEGEND

- MONITORING WELL
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- DCP GAS LINE
- SOUTH EXTENT OF EXCAVATION
- NORTH EXTENT OF EXCAVATION
- EXTENT OF PEA GRAVEL
- CONTAINMENT BERM FENCE LINE

- (4675.77) GROUND WATER ELEVATION
(ft above arbitrary datum)
NOT MEASURED
- WATER TABLE CONTOUR
- GROUND WATER FLOW DIRECTION

Figure 3

INFERRED GROUNDWATER CONTOUR MAP


August 19, 2024

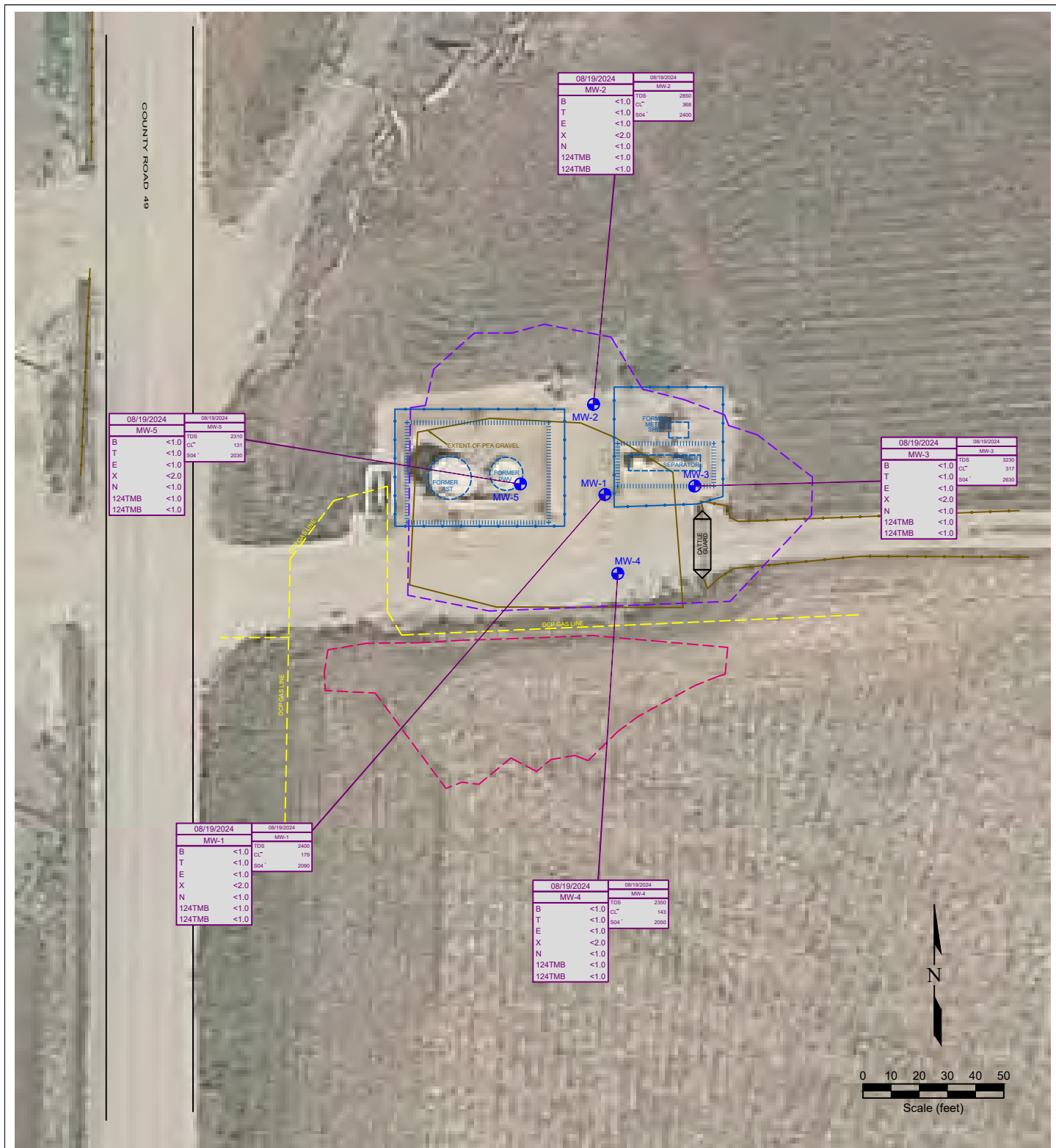
Noble Energy, Inc. ~ WPF III T6N-R64W-S18 L01

SWSW Sec. 18, T6N, R64W, 6th PM

Weld County, Colorado

40.480540°, -104.601317°

Project No. C023-007	Facility # 483054	API#	
Date 10/17/24	Remediation # 25398	Filename 23007Q6	



LEGEND



08/19/2024	DATE SAMPLED
MW-1	SAMPLE ID
B	<1.0 BENZENE (ug/L)
T	<1.0 TOLUENE (ug/L)
E	<1.0 ETHYLBENZENE (ug/L)
X	<2.0 TOTAL XYLENES (ug/L)
N	<1.0 NAPHTHALENE (ug/L)
124TMB	<1.0 1,2,4-TRIMETHYLBENZENE (ug/L)
124TMB	<1.0 1,3,5-TRIMETHYLBENZENE (ug/L)

08/19/2024	DATE SAMPLED
MW-1	SAMPLE ID
TDS	2400 TOTAL DISSOLVED SOLIDS (mg/L)
CL ⁻	179 CHLORIDE ION (mg/L)
SD4 ⁺	2090 SULFATE ION (mg/L)

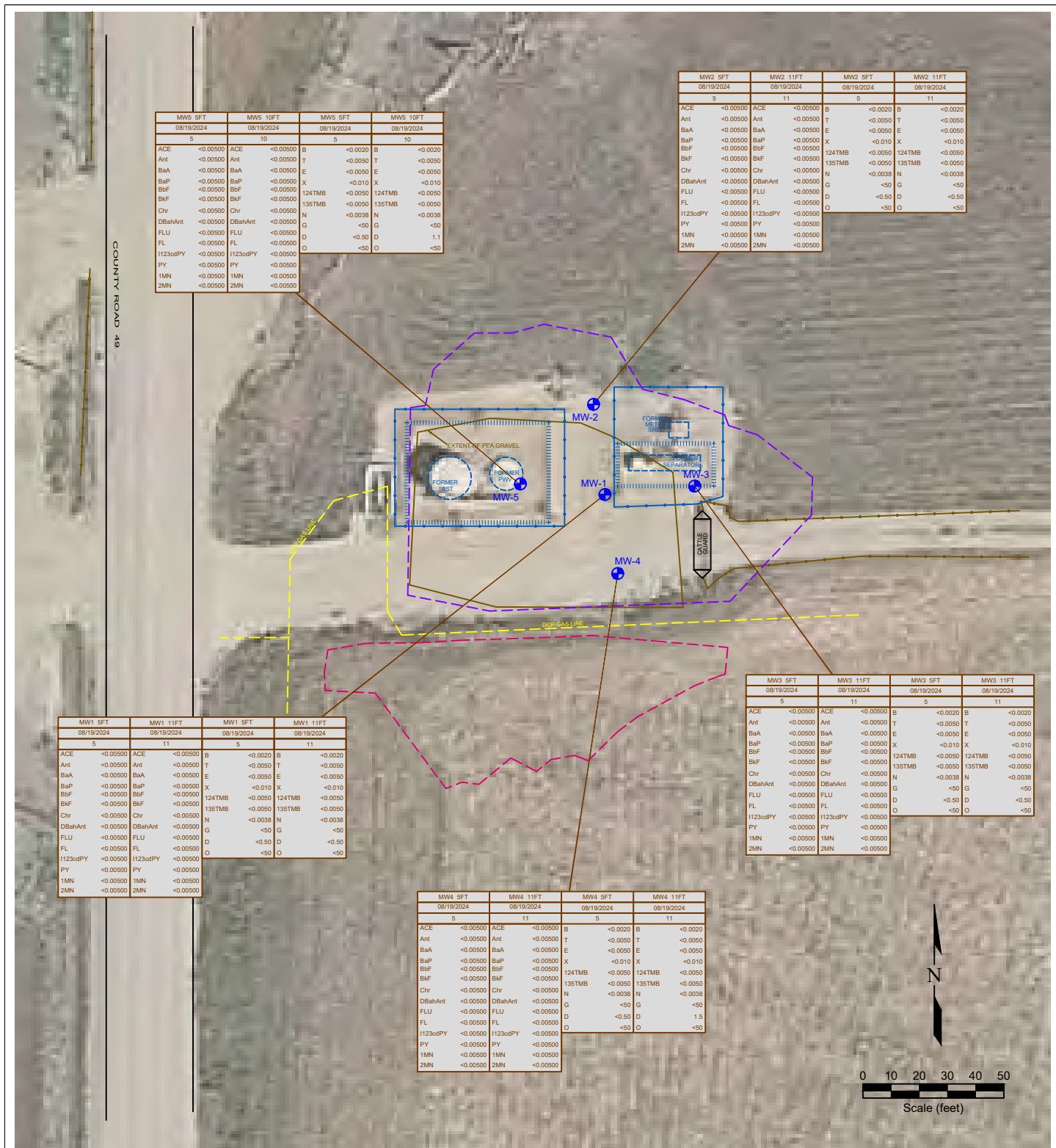
Figure 4

GROUNDWATER CHEMISTRY MAP

Noble Energy, Inc. ~ WPF III T6N-R64W-S18 L01
 SWSW Sec. 18, T6N, R64W, 6th PM
 Weld County, Colorado
 40.480540°, -104.601317°

Project No. C023-007	Facility # 483054	API#
Date 10/12/24	Remediation # 25398	Filename 23007Q6





LEGEND			
	MONITORING WELL		ABOVE GROUND STORAGE TANK
	FORMER FACILITY		CONTAINMENT BERM FENCE LINE
	DCP GAS LINE		EXTENT OF PEA GRAVEL
	SOUTH EXTENT OF EXCAVATION		NORTH EXTENT OF EXCAVATION
	NOT ANALYZED		

SAMPLE ID	SAMPLE ID	SAMPLE ID	SAMPLE ID
DATE	DATE	DATE	DATE
DEPTH	DEPTH	DEPTH	DEPTH
ACE	<0.0050	ACE	<0.0050
Ant	<0.0050	Ant	<0.0050
BaA	<0.0050	BaA	<0.0050
BaP	<0.0050	BaP	<0.0050
BbF	<0.0050	BbF	<0.0050
BkF	<0.0050	BkF	<0.0050
Chr	<0.0050	Chr	<0.0050
DBahAnt	<0.0050	DBahAnt	<0.0050
FLU	<0.0050	FLU	<0.0050
FL	<0.0050	FL	<0.0050
1123cdPY	<0.0050	1123cdPY	<0.0050
PY	<0.0050	PY	<0.0050
1MN	<0.0050	1MN	<0.0050
2MN	<0.0050	2MN	<0.0050

SAMPLE ID	SAMPLE ID	SAMPLE ID	SAMPLE ID
DATE	DATE	DATE	DATE
DEPTH	DEPTH	DEPTH	DEPTH
ACE	<0.0050	ACE	<0.0050
Ant	<0.0050	Ant	<0.0050
BaA	<0.0050	BaA	<0.0050
BaP	<0.0050	BaP	<0.0050
BbF	<0.0050	BbF	<0.0050
BkF	<0.0050	BbF	<0.0050
Chr	<0.0050	Chr	<0.0050
DBahAnt	<0.0050	DBahAnt	<0.0050
FLU	<0.0050	FLU	<0.0050
FL	<0.0050	FL	<0.0050
1123cdPY	<0.0050	1123cdPY	<0.0050
PY	<0.0050	PY	<0.0050
1MN	<0.0050	1MN	<0.0050
2MN	<0.0050	2MN	<0.0050

Figure 5
ORGANIC SOIL CHEMISTRY MAP
 Noble Energy, Inc. ~ WPF III T6N-R64W-S18 L01
 SWSW Sec. 18, T6N, R64W, 6th PM
 Weld County, Colorado
 40.480540°, -104.601317°

Project No. C023-007	Facility # 483054	API#	
Date 10/12/24	Remediation # 25398	Filename 23007Q6	

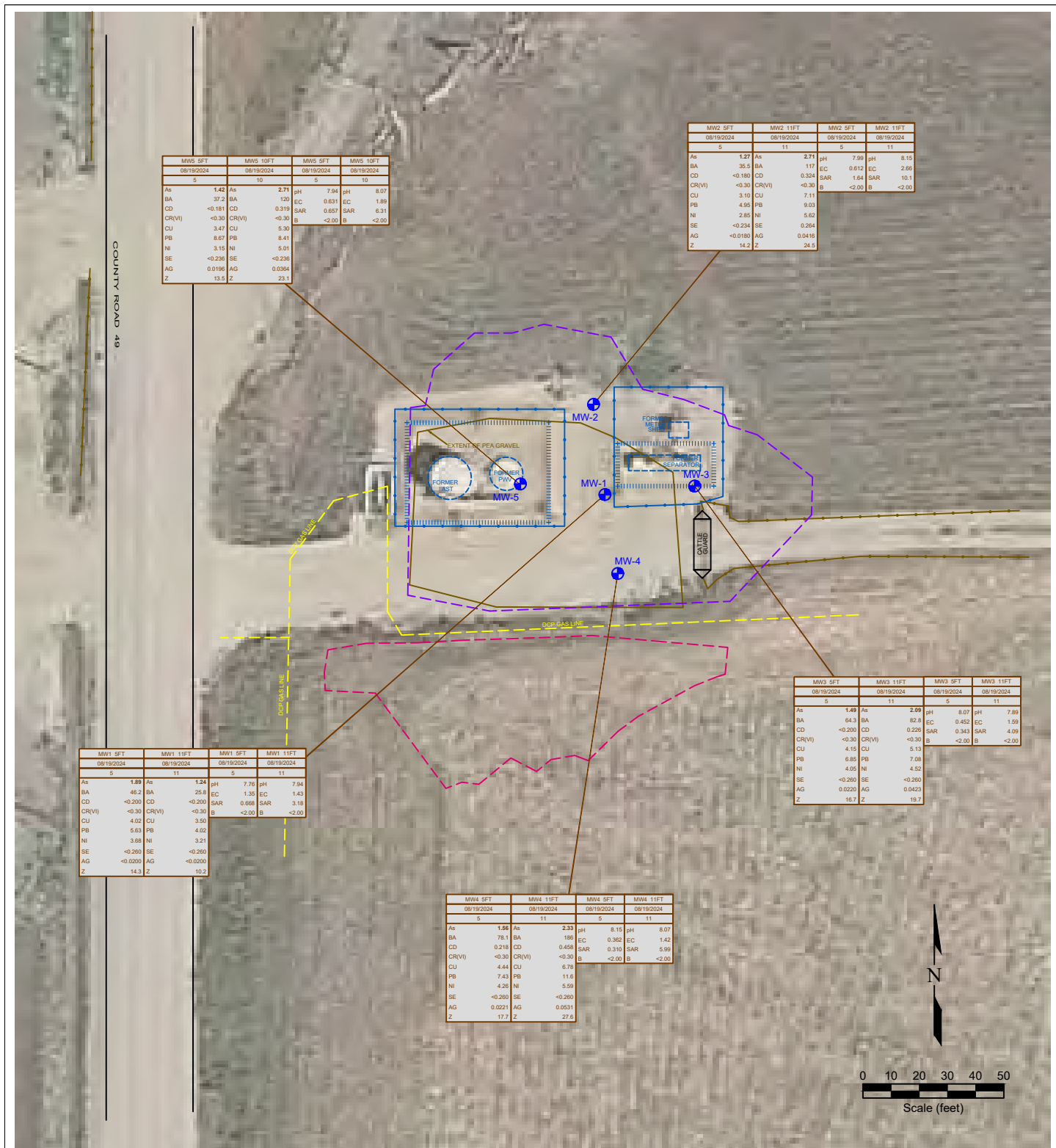
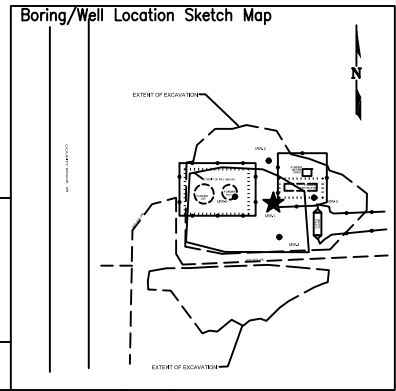


Figure 6
METALS AND INORGANIC SOIL CHEMISTRY MAP

Noble Energy, Inc. ~ WPF III T6N-R64W-S18 L01
 SWSW Sec. 18, T6N, R64W, 6th PM
 Weld County, Colorado
 40.480540°, -104.601317°

Project No. C023-007	Facility # 483054	API#	
Date 10/12/24	Remediation # 25398	Filename 23007Q6	

BORING/WELL CONSTRUCTION LOG

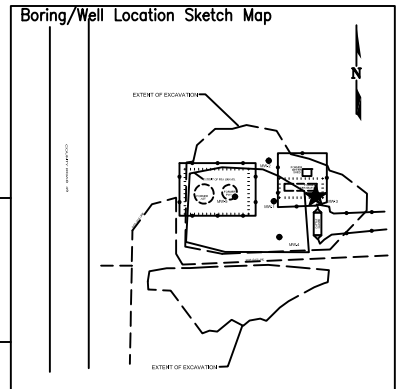


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Boring/Well No. MW-1		Total Depth 16'	Location Noble Energy, Inc. WPF III T6N-R64W-S18 L01 SWSW Sec. 18, T6N, R64W, 6th PM Weld County, Colorado		
Project No./Name C023-007 / Noble WPF III T6N-R64W-S18 L01			Approved By		
Drilling Contractor/Driller DrillPro			Geologist/Office Aaron Otilar / Fremont Environmental, Inc.		
Drilling Equipment/Method Geoprobe		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 8/19/2024	
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"			
Elevation of: (ft. above datum)	Ground Surface 105.40	Top of Well Casing 5.425	Top of Screen .	Bottom of Screen .	Ground Water Surface/Date Measured 9.50 8/19/2024

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank	FILL	Fill from excavation/reclamation				0.1
			GW	Gravel from old road base		50%		0.2
			SW	Sand, brown, fine to medium grain size, well sorted, increasing saturation				0.1
5								0.1
								0.3
								0.2
				Sand, brown, fine to medium grain size, well sorted, wet		80%		0.2
								0.2
			GP	Gravel backfill from excavation, poorly graded				0.2
10	#10-20 Silica Sand	1" Screen	CH	Fat clay, dark gray, high plasticity, wet		10%		0.3
								0.4
			NR	No recovery				0.2
				Unable to sample past 12' due to fat expanding clays, clogging sampler		0%		NA
15								NA
								NA
								NA
20								NA

BORING/WELL CONSTRUCTION LOG

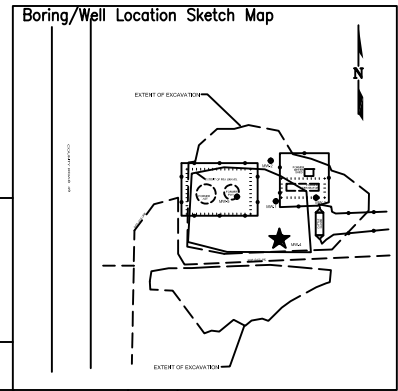


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Boring/Well No. MW-3		Total Depth 16'	Location Noble Energy, Inc. WPF III T6N-R64W-S18 L01 SWSW Sec. 18, T6N, R64W, 6th PM Weld County, Colorado			
Project No./Name C023-007 / Noble WPF III T6N-R64W-S18 L01			Approved By			
Drilling Contractor/Driller DrillPro			Geologist/Office Aaron Otilar / Fremont Environmental, Inc.			
Drilling Equipment/Method Geoprobe			Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 8/19/2024	
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"				
Elevation of: (ft. above datum)	Ground Surface 105.40	Top of Well Casing 5.93	Top of Screen .	Bottom of Screen .	Ground Water Surface/Date Measured 6.20 8/19/2024	

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank	FILL	Fill from excavation/reclamation				
			GW	Gravel from old road base		70%		
5			SW	Sand, brown, fine to coarse grain size, well sorted, increasing saturation				
			CL	Clay, gray, low to medium plasticity, wet		80%		
			GP	Fill from excavation, poorly sorted gravel, 1/4 inch diameter				
10	#10-20 Silica Sand	1" Screen	CL	Fat clay, high plasticity, wet, light tan		80%		
			NR	No recovery				
				Unable to sample past 12' due to fat expanding clays, clogging sampler		0%		
15								
20								

BORING/WELL CONSTRUCTION LOG

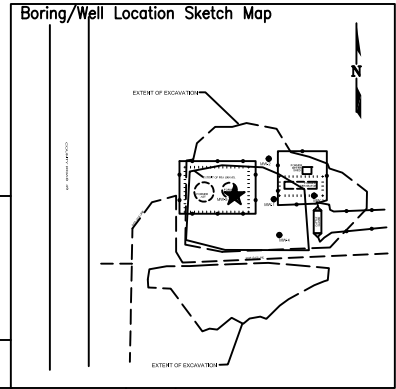


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Boring/Well No. MW-4	Total Depth 16'	Location Noble Energy, Inc. WPF III T6N-R64W-S18 L01 SWSW Sec. 18, T6N, R64W, 6th PM Weld County, Colorado		
Project No./Name C023-007 / Noble WPF III T6N-R64W-S18 L01		Approved By		
Drilling Contractor/Driller DrillPro		Geologist/Office Aaron Otilar / Fremont Environmental, Inc.		
Drilling Equipment/Method Geoprobe		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 8/19/2024
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"		
Elevation of: (ft. above datum)	Ground Surface 105.40	Top of Well Casing 5.715	Top of Screen .	Bottom of Screen .
		Ground Water Surface/Date Measured 6.41 8/19/2024		

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank	FILL	Fill from excavation/reclamation				0.0
			GW	Well sorted gravel from old road base		80%		0.0
			SW	Sand, brown, fine to coarse grain size, well sorted, increasing saturation				0.0
5								0.1
								0.4
								0.3
				Sand, brown, fine to coarse grain size, well sorted, wet		80%		0.3
								0.1
			GP	Poorly graded gravel from excavation 1/4 inch diameter				0.1
10	#10-20 Silica Sand	1" Screen	CH	Fat clay, high plasticity, wet, light tan		70%		0.1
								19.6
			NR	No recovery				2.3
				Unable to sample past 12' due to fat expanding clays, clogging sampler		0%		NA
15								NA
								NA
								NA
20								NA

BORING/WELL CONSTRUCTION LOG



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Boring/Well No. MW-5		Total Depth 16'	Location Noble Energy, Inc. WPF III T6N-R64W-S18 L01 SWSW Sec. 18, T6N, R64W, 6th PM Weld County, Colorado		
Project No./Name C023-007 / Noble WPF III T6N-R64W-S18 L01			Approved By		
Drilling Contractor/Driller DrillPro			Geologist/Office Aaron Otilar / Fremont Environmental, Inc.		
Drilling Equipment/Method Geoprobe		Size/Type of Bit 2.5" direct push	Sampling Method direct push	Start/Finish Date 8/19/2024	
Well Installed? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Casing Mtrl./Dia. PVC/1"	Screen: Type Slotted Mtrl. PVC Length 10' Dia. 1" Slot Size 0.010"			
Elevation of: (ft. above datum)	Ground Surface 105.40	Top of Well Casing 5.61	Top of Screen .	Bottom of Screen .	Ground Water Surface/Date Measured 6.53 8/19/2024

DEPTH (feet)	WELL CONSTRUCTION		LITHOLOGY		Penetration Rate (blows/6")	Recovery (%)	Sample Interval (feet)	PID Values (ppm)
			GRAPHIC LOG	VISUAL DESCRIPTION				
	Bentonite	1" Blank	FILL	Fill from excavation/reclamation				0.1
			GW	Well sorted gravel from old road base		80%		0.1
			SW	Sand, brown, fine to coarse grain size, well sorted, increasing saturation				0.0
5								0.0
								0.3
								0.2
			GW/GP	Sand, brown, fine to coarse grain size, well sorted, wet		80%		0.1
								0.1
10	#10-20 Silica Sand	1" Screen	CL	Poorly graded gravel from excavation 1/4 inch diameter				0.9
			GW/GP	Fat clay, high plasticity, wet, light tan		60%		2.8
								0.8
			GW/GP	No recovery				0.6
				Unable to sample past 12' due to fat expanding clays, clogging sampler		80%		0.1
								0.0
15			CH					0.0
				TD 16'				0.0
20								