

September 25, 2024

Noble Energy Inc. – HSR Fischer 6-23

Groundwater Monitoring Report

NWNE Sec 23, T4N, R65W

40.305000, -104.630639

Weld County, Colorado

Fremont Project No. C024-016

Facility # 309888, Remediation #34710

Site Overview – Site History

Historical soil and groundwater impacts were identified at the site of the former Noble HSR Fischer 6-23 tank battery (HSR Fischer) on January 19, 2024 while potholing for the RBU Madison pipeline. On January 29, 2024, a site investigation was conducted to delineate the extent of soil and groundwater impacts at the HSR Fischer site. Fourteen monitoring wells were installed during the initial site investigation.

On March 5, 2024, the pipeline installation crews installed a 20-inch diameter pipeline through the former HSR Fischer tank battery location. The scope of work included removal and offsite disposal of clean and impacted soil while trenching through the former location. The excavation was intended to accommodate the installation of the pipeline rather than removing all of the impacted soil. Approximately 380 cubic yards of clean and impacted soil were excavated and transported to Waste Management's Buffalo Ridge landfill. During the March 5, 2024 pipeline installation project and subsequent reclamation work, 12 of the 14 monitoring wells were destroyed or damaged. The 14 monitoring well network was re-installed on March 2, 2024 and groundwater samples were collected on March 3, 2024.

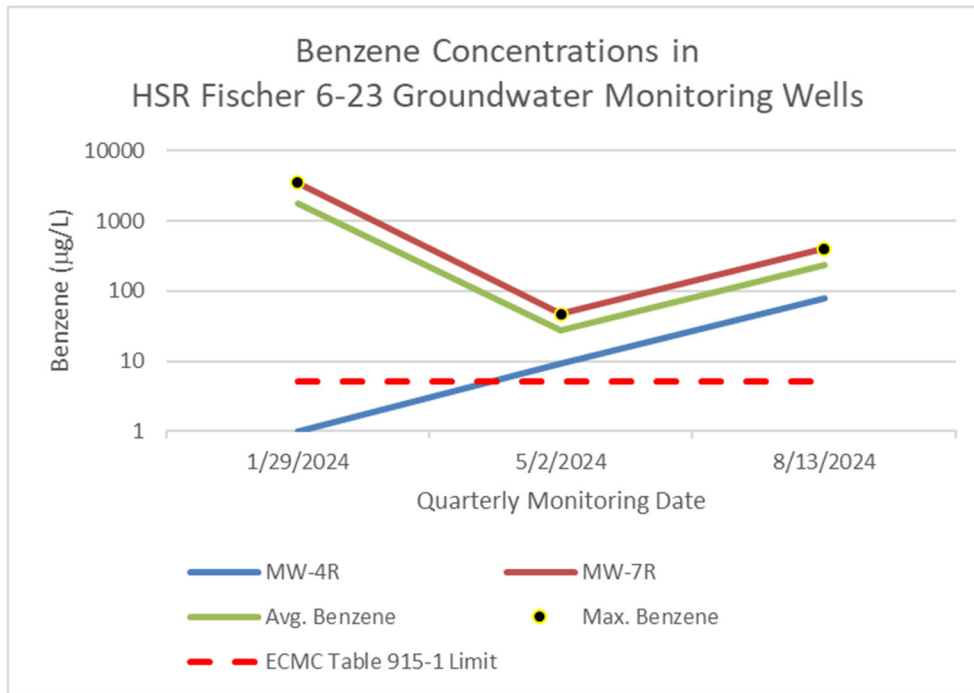
Conceptual Site Model*

*Data presented represents the most recent sampling event

- **Land Use** – Rangeland
- **Soil Type (USCS)** – SP
- **Potential Receptors within ¼ mile** – Surface water within 1000 ft
- **Inferred Groundwater Gradient (Ft/Ft) and Flow Direction** – 0.008 ft/ft North
- **Impacted Media and Extent** – Groundwater, soil
- **LNAPL Present** – no
- **Points of Compliance** – Yes, in all cardinal and ordinal directions
- **Number of Consecutive ECMC Compliant Quarters** – zero
- **Remediation Type** – MNA
- **Remediation System Operation Date(s)** – NA

Contaminants of Concern (COC)

The laboratory data indicate that the dissolved phase organic constituents were below their respective ECMC Table 915-1 standards in 12 of 14 wells sampled during the August 2024 quarterly monitoring event. Two monitoring wells exceeded the ECMC Table 915-1 standards of 5 µg/L for benzene. 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 are 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. The Q3 2024 sampling event marks zero consecutive quarters of ECMC-compliant groundwater at the site. A solar-powered air sparge (AS) remediation system is being proposed to address residual hydrocarbon impacts in the soil and groundwater pending landowner approval and installation availability. The proposed remediation system layout can be found in attached Figure 5.

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 (970) 213-7488 if you require any additional information.

Fremont appreciates the opportunity to provide this service.

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



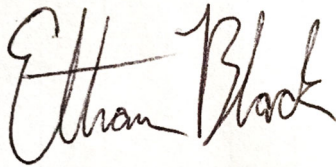
10/24/2024

Date _____

Chris Lattes

Consultant

Reviewed by:



10/24/2024

Date _____

Ethan D. Black, PG
Geologist

Attachments:

Tables

Figures

Laboratory Report

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA AND ORGANIC CHEMISTRY DATA
NOBLE ENERGY INC.
HSR FISCHER 6-23, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C024-016

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 (ft)	Groundwater Elevation (ft)	LNAPL Thickness (ft)
ECMC Table 915-1 Limits		5.0	560	700	1400	140	67	67				
MW-1	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	96.78	3.24	93.54	NP
MW-1R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.97	2.95	97.02	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.00	95.97	NP
MW-2	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	96.45	2.86	93.59	NP
MW-2R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.59	2.54	97.05	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.00	95.59	NP
MW-3	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	96.58	2.97	93.61	NP
MW-3R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.67	2.55	97.12	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.05	95.62	NP
MW-4	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	96.47	2.91	93.56	NP
MW-4R	5/2/2024	9.21	<1.00	7.32	81.4	<2.00	18.3	10.3	99.73	2.70	97.03	NP
	8/13/2024	77.2	<1.00	8.73	133	4.28	43.6	27.4		4.18	95.55	NP
MW-5	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.66	5.96	93.70	NP
MW-5R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.88	3.86	96.02	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.14	95.74	NP
MW-6	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.34	5.80	93.54	NP
MW-6R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	2.41	<2.00	99.76	2.77	96.99	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.31	95.45	NP
MW-7	1/29/2024	3500	<1.0	550	5600	94	790	430	99.69	6.14	93.55	NP
MW-7R	5/2/2024	46.7	<1.00	13.7	175	<2.00	28.4	18.8	99.65	2.62	97.03	NP
	8/13/2024	399	<1.00	13.0	94.7	2.48	46.7	10.9		4.14	95.51	NP
MW-8	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.21	5.77	93.44	NP
MW-8R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.74	2.90	96.84	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.37	95.37	NP
MW-9	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.78	6.46	93.32	NP
MW-9R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	NF	3.17	NM	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.75	NM	NP

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 (ft)	Groundwater Elevation (ft)	LNAPL Thickness (ft)
ECMC Table 915-1 Limits		5.0	560	700	1400	140	67	67				
MW-10	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.82	6.52	93.30	NP
MW-10R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	100.00	3.25	96.75	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.77	95.23	NP
MW-11	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	98.87	5.39	93.48	NP
MW-11R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.39	2.45	96.94	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.02	95.37	NP
MW-12	1/29/2024	<1.0	<1.0	<1.0	10	<1.0	<1.0	<1.0	96.61	3.03	93.58	NP
MW-12R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.81	2.75	97.06	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.23	95.58	NP
MW-13	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.11	5.64	93.47	NP
MW-13R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.46	2.57	96.89	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.05	95.41	NP
MW-14	1/29/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	100.00	6.52	93.48	NP
MW-14R	5/2/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00	99.54	2.56	96.98	NP
	8/13/2024	<1.00	<1.00	<1.00	<1.00	<2.00	<2.00	<2.00		4.12	95.42	NP

Bold face values exceed the ECMC limits

Red highlighted 915-1 Limits indicate the referenced groundwater screening level

NP - No measurable LNAPL

NA - Not Analyzed

TABLE 2
SUMMARY OF INORGANIC GROUNDWATER CHEMISTRY DATA
NOBLE ENERGY INC.
HSR FISCHER 6-23, WELD COUNTY, COLORADO
FREMONT PROJECT NO. C024-106

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
Site Specific Background (MW-3R)		4025	616	1438
MW-1	1/29/2024	2570	435	942
MW-1R	5/2/2024	2410	468	1100
	8/13/2024	2490	413	833
MW-2	1/29/2024	2400	411	929
MW-2R	5/2/2024	2260	434	998
	8/13/2024	2430	389	810
MW-3	1/29/2024	3310	554	1390
MW-3R	5/2/2024	3190	542	1440
	8/13/2024	3220	493	1150
MW-4	1/29/2024	2270	406	830
MW-4R	5/2/2024	2380	443	1100
	8/13/2024	2120	380	713
MW-5	1/29/2024	2180	393	775
MW-5R	5/2/2024	1840	362	838
	8/13/2024	2510	403	823
MW-6	1/29/2024	2450	451	928
MW-6R	5/2/2024	2520	494	1150
	8/13/2024	2370	444	574
MW-7	1/29/2024	2170	409	409
MW-7R	5/2/2024	2360	467	948
	8/13/2024	2220	430	391

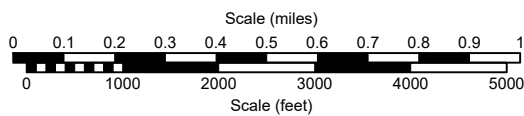
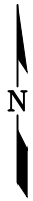
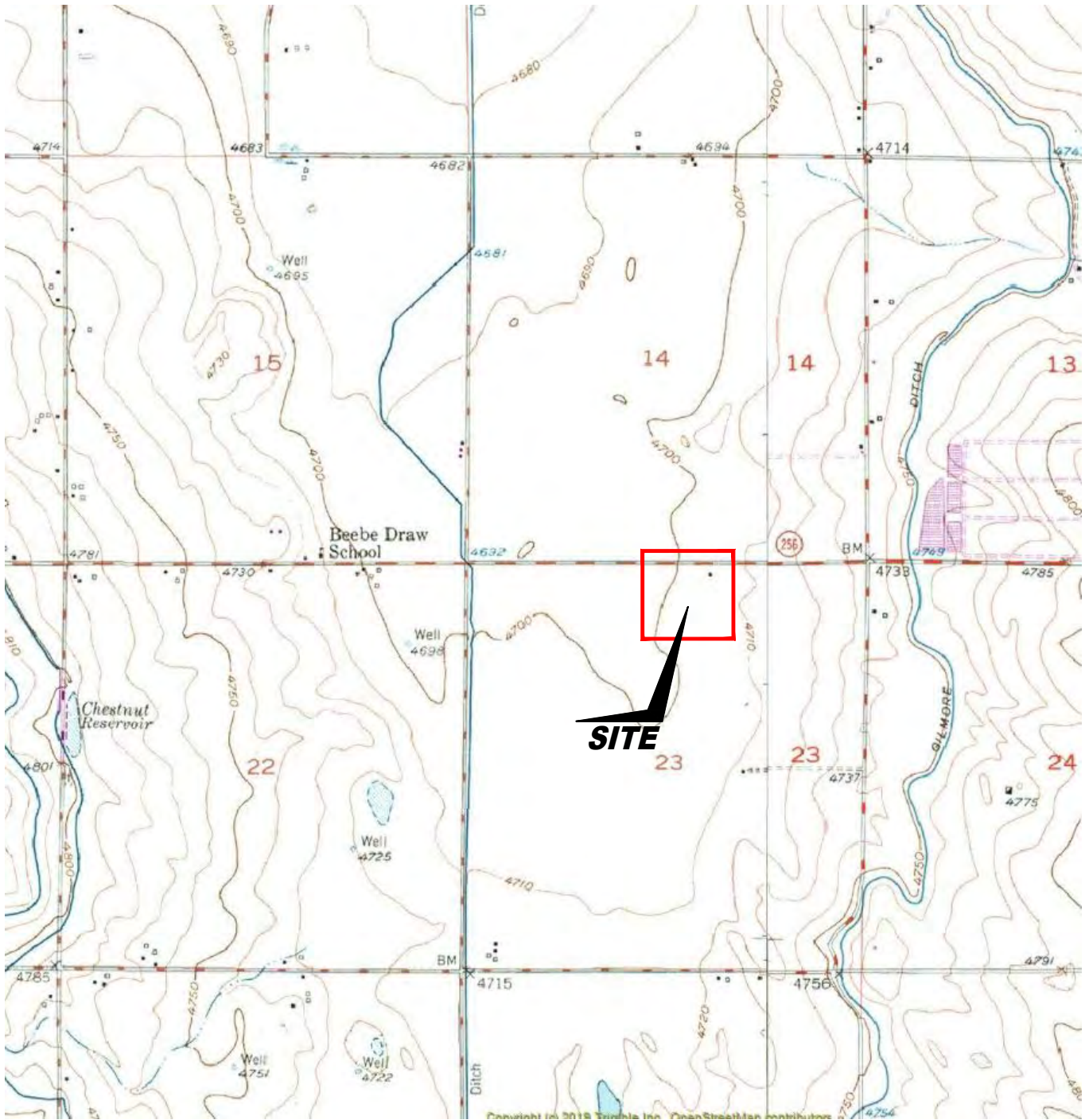
Sample ID	Sample Date	Total Dissolved Solids (mg/L)	Chloride Ion (mg/L)	Sulfate Ion (mg/L)
ECMC Table 915-1 Limits		<1.25 x local background	250 or <1.25 x local background	250 or <1.25 x local background
Site Specific Background (MW-3R)		4025	616	1438
MW-8	1/29/2024	2110	394	838
MW-8R	5/2/2024	2260	432	1050
	8/13/2024	2270	380	785
MW-9	1/29/2024	1930	340	701
MW-9R	5/2/2024	1940	392	800
	8/13/2024	1980	337	610
MW-10	1/29/2024	2160	367	694
MW-10R	5/2/2024	2120	386	814
	8/13/2024	2060	356	635
MW-11	1/29/2024	2380	430	462
MW-11R	5/2/2024	2610	584	890
	8/13/2024	2280	420	430
MW-12	1/29/2024	2230	411	840
MW-12R	5/2/2024	2240	421	995
	8/13/2024	2430	379	827
MW-13	1/29/2024	2910	517	1090
MW-13R	5/2/2024	2640	474	1170
	8/13/2024	3030	475	1000
MW-14	1/29/2024	2140	400	778
MW-14R	5/2/2024	2220	448	1070
	8/13/2024	2270	385	756

Bold face values exceed the ECMC limits

Assume MW-3R is the upgradient/cross gradient well

Yellow highlighted 915-1 Limits indicate the referenced groundwater screening level

DES - Destroyed



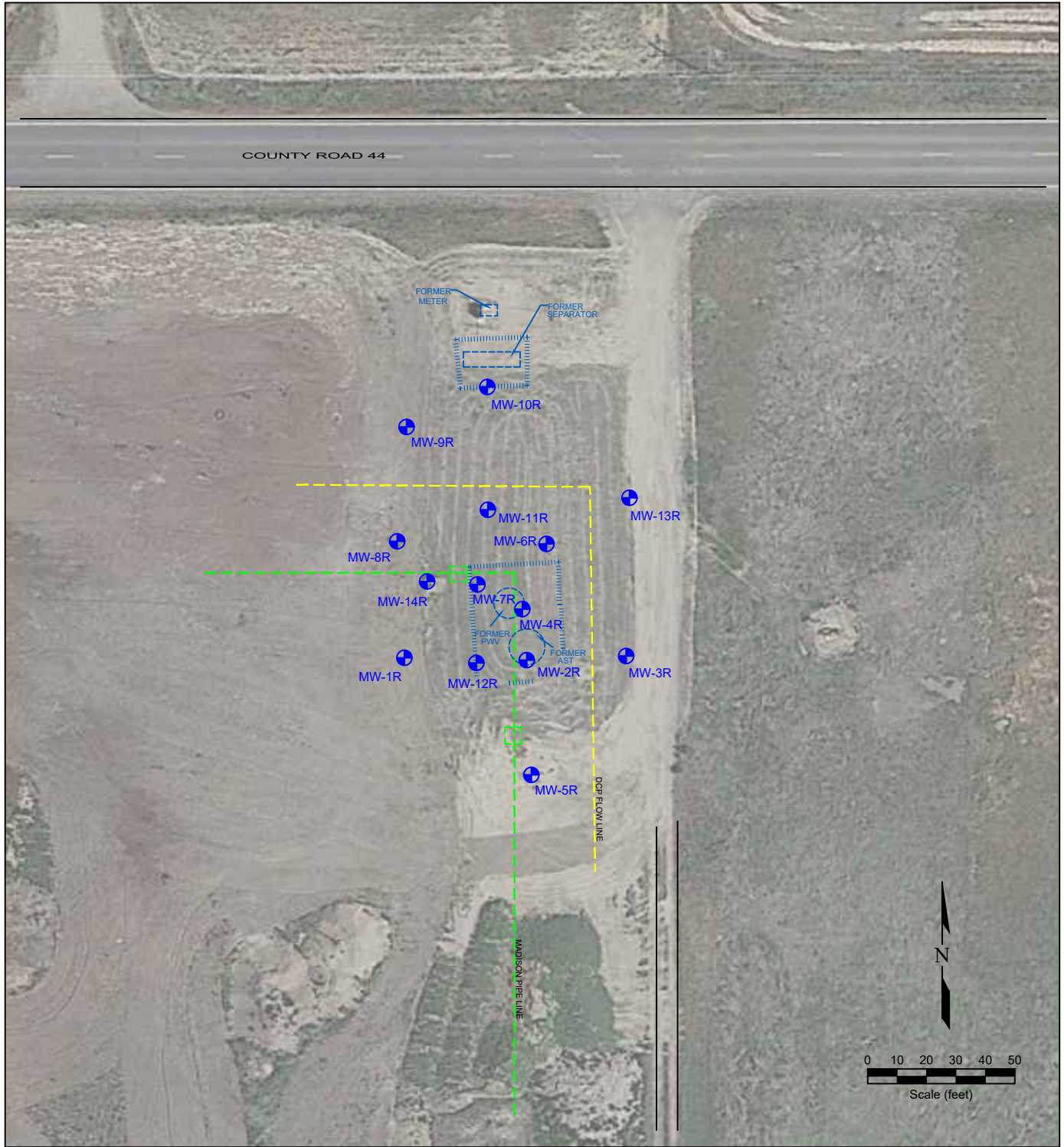
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1
SITE LOCATION MAP

Noble Energy, Inc. ~ HSR Fischer 6-23
 NWNE, Sec 23, T4N, R65W, 6th P.M.
 Weld County, Colorado
 40.30500 ° -104.630639 °

Project No. CO24-016	API #	Facility # 309888
Date 10/22/24	Remediation # 34710	Filename 24016T





LEGEND

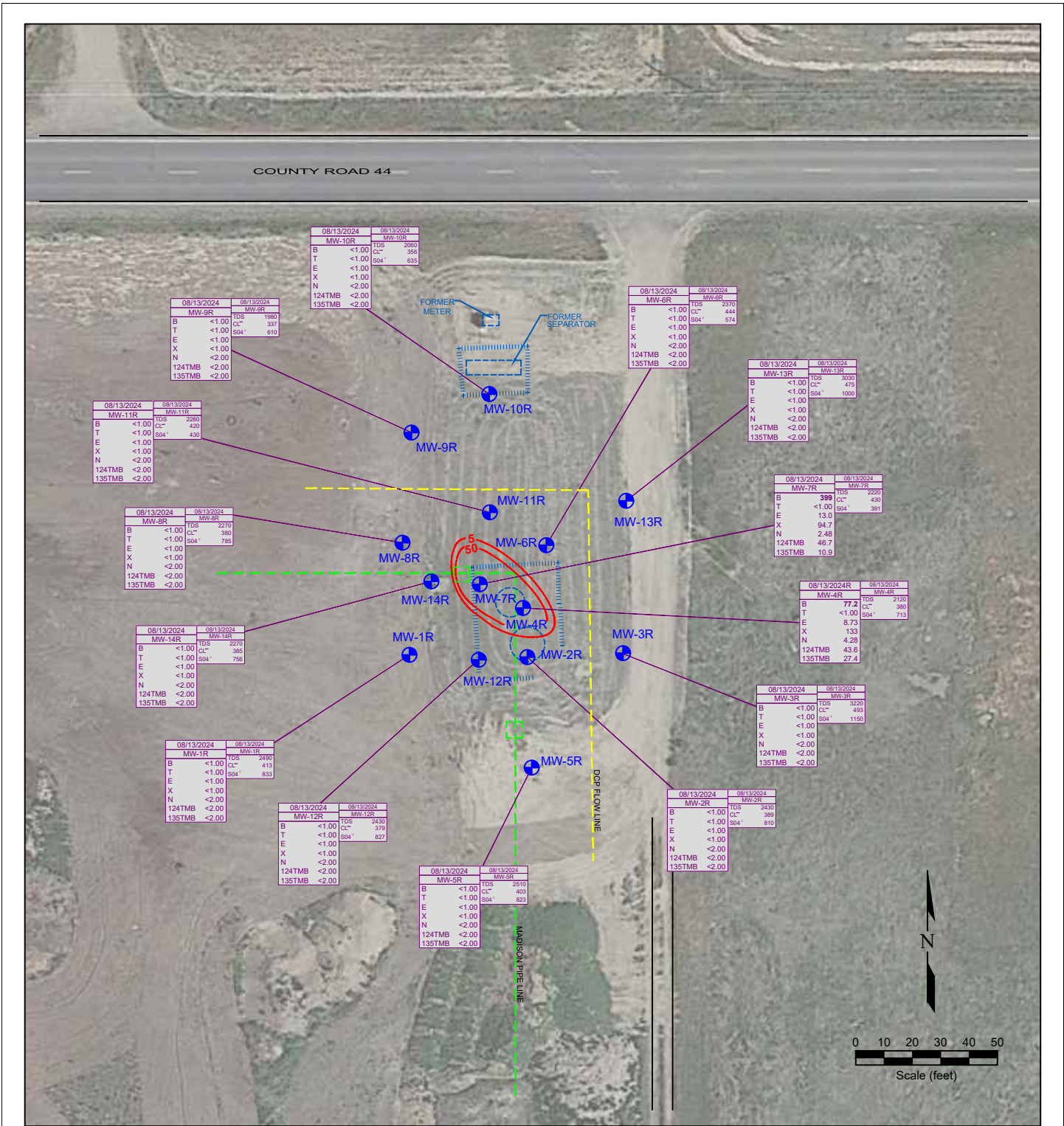
- + MONITORING WELL
- AST ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- DCP FLOW LINE
- MADISON PIPE LINE
- FENCE LINE
- SOLAR POWERED AS SYSTEM TRAILER
- CONTAINMENT BERM
- CONTAINMENT WALL

**Figure 2
SITE MAP**

Noble Energy, Inc. ~ HSR Fischer 6-23
 NWNE, Sec 23, T4N, R65W, 6th P.M.
 Weld County, Colorado
 40.30500 ° -104.630639 °

Project No. CO24-016	API #	Facility # 309888
Date 10/22/24	Remediation # 34710	Filename 24016Q





LEGEND

- MONITORING WELL
- AS1 ABOVE GROUND STORAGE TANK
- FORMER FORMER FACILITY
- DCP FLOW LINE
- MADISON PIPE LINE
- FENCE LINE
- SOLAR POWERED AS SYSTEM TRAILER
- CONTAINMENT BERM
- CONTAINMENT WALL

~ BENZENE ISOCONCENTRATION (ug/L)

08/13/2024	DATE SAMPLED	08/13/2024	DATE SAMPLED
MW-1	SAMPLE ID	MW-1	SAMPLE ID
B	<1.0	TDS	2510
T	<1.0	CL ⁻	403
E	<1.0	SO4 ⁻	829
X	<1.0		
N	<2.0		
124TMB	<1.0		
135TMB	<1.0		

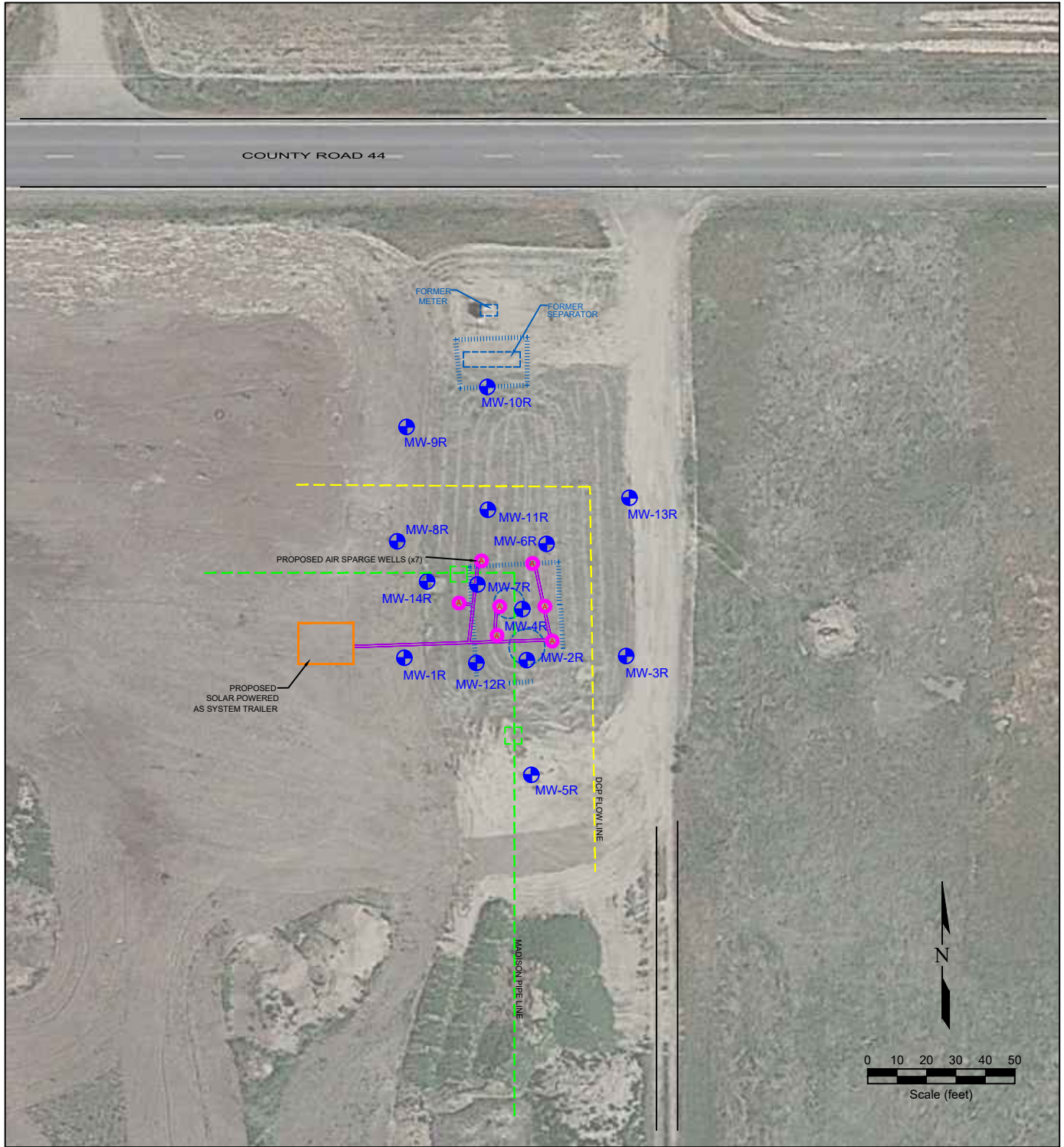
08/13/2024	DATE SAMPLED	08/13/2024	DATE SAMPLED
MW-1	SAMPLE ID	MW-1	SAMPLE ID
TDS	2510	TOTAL DISSOLVED SOLIDS (mg/L)	
CL ⁻	403	CHLORIDE ION (mg/L)	
SO4 ⁻	829	SULFATE ION (mg/L)	

Figure 4
GROUNDWATER CHEMISTRY MAP
August 13, 2024

Noble Energy, Inc. ~ HSR Fischer 6-23
NWNE, Sec 23, T4N, R65W, 6th P.M.
Weld County, Colorado
40.30500 ° -104.630639 °

Project No. CO24-016	API #	Facility # 309888
Date 10/22/24	Remediation # 34710	Filename 24016Q





LEGEND

- MONITORING WELL
- ⊕ ABOVE GROUND STORAGE TANK
- ⊕ PROPOSED AIR SPARGE WELL
- FORMER FACILITY
- SOLAR POWERED AS SYSTEM TRAILER
- DCP FLOW LINE
- MADISON PIPE LINE
- FENCE LINE
- CONTAINMENT BERM
- CONTAINMENT WALL
- PROPOSED SYSTEM TRENCH

**Figure 5
PROPOSED AS SYSTEM LAYOUT MAP**

Noble Energy, Inc. ~ HSR Fischer 6-23
 NWNE, Sec 23, T4N, R65W, 6th P.M.
 Weld County, Colorado
 40.30500 ° -104.630639 °

Project No. CO24-016	API #	Facility # 309888
Date 10/22/24	Remediation # 34710	Filename 24016Q

