

February 18, 2025

Noble Energy Inc. – Branch 1-3

Groundwater Monitoring Report

API # 05-123-12513

NENE Sec 3, T4N, R64W

40.348483, -104.529653

Weld County, Colorado

Fremont Project No. C022-066

Facility # 323068, Remediation # 21830

Site Overview – Site History

In June 2022, a historical release was discovered within the produced water vault (PWV) excavation during decommissioning activities at the Branch facility. On June 29, 2022, a site investigation, utilizing a Geoprobe rig, advanced 10 soil borings delineating the magnitude and extent of soil impacts produced by the historical release. Excavation of impacted soil occurred in October 2022, and approximately 3,850 cubic yards of impacted soil were removed. Soil samples collected from the south sidewall, east sidewall, west sidewall, and floor of the excavation achieved the COGCC Table 915- 1 protection of groundwater soil screening levels (PGSSLs). However, approximately 60 feet of the northern sidewall failed for benzene, 1,2,3-trimeyhyllbenzene, naphthalene, 1- Methylnaphthalene, and 2-Methylnaphthalene. Further excavation efforts to remove these impacts were not possible due to the presence of an overhead power line as well as an underground telephone line in the borrow ditch along County Road 50. As a result, soil impacts were left in place. Additionally, a groundwater sample (GW01) collected during excavation was reported with a concentration of benzene exceeding Table 915-1 standards.

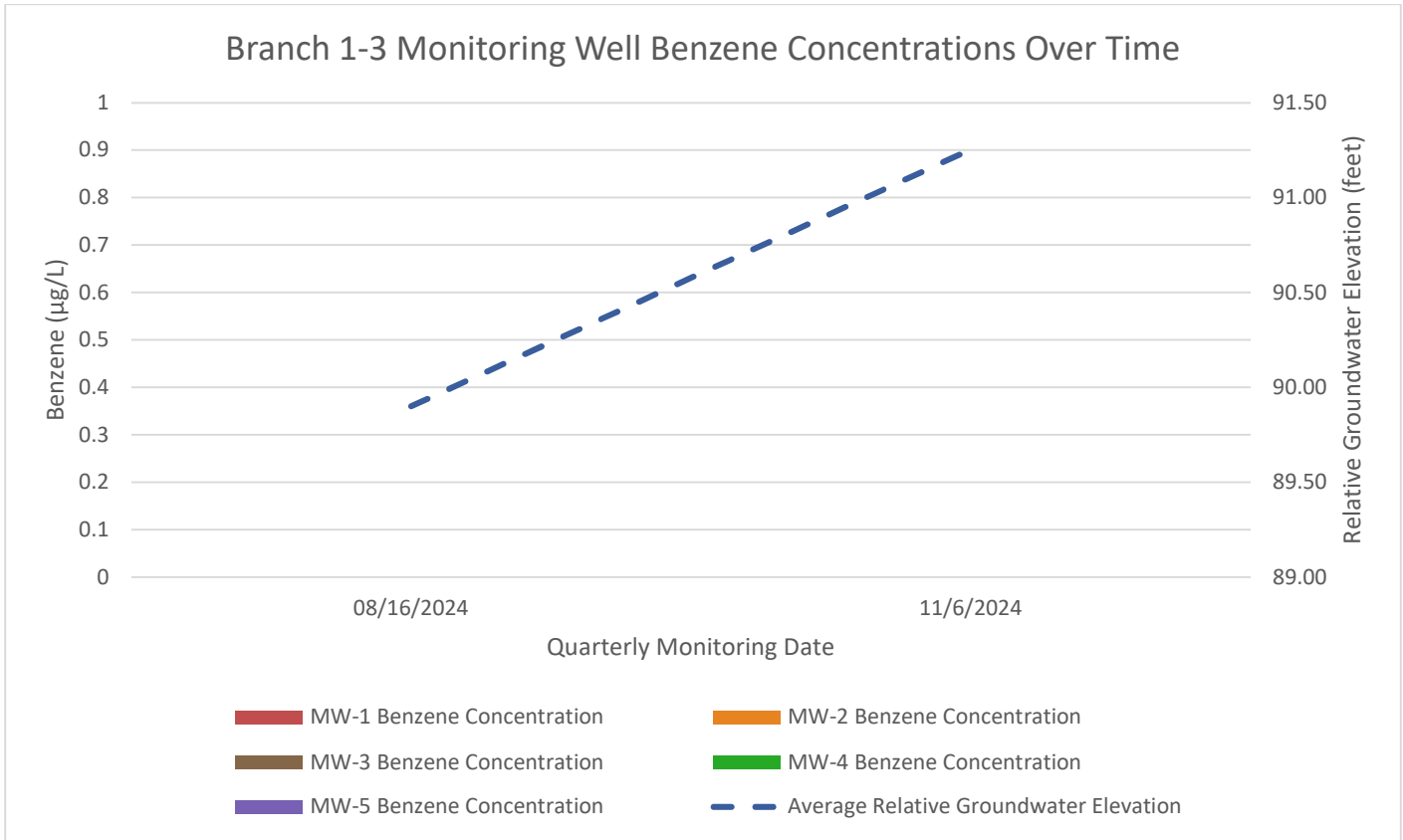
Conceptual Site Model*

*Data presented represents the most recent sampling event

- **Land Use** – Cropland
- **Soil Type (USCS)** – SW/SP and CL
- **Potential Receptors within ¼ mile** – Occupied residence 478 feet E, livestock 775 feet SSW, stock water well 942 feet E
- **Inferred Groundwater Gradient (Ft/Ft) and Flow Direction** – 0.18 (ft/ft) north northwest
- **Average Depth to Groundwater** – 8.40 feet (6 to 10 feet)
- **Impacted Media and Extent** – Soil and Groundwater
- **LNAPL Present** – No
- **Points of Compliance** – TBD
- **Number of Consecutive ECMC Compliant Quarters** – 2
- **Remediation Type** – Excavation and 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 wells sampled during the November 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 included separately.



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 Q4 2024 sampling event marks the second consecutive quarter of ECMC-compliant groundwater 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 (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.**



11/15/2024

Date _____

Chris Lattes

Consultant

Reviewed by:



11/15/2024

Date _____

Ethan D. Black, P.G.

Geologist

Attachments:

Tables

Figures

TABLE 1
SUMMARY OF GROUNDWATER ELEVATION DATA AND ORGANIC CHEMISTRY DATA
NOBLE 100322
BRANCH 1-3, WELD COUNTY, COLORADO
REM # 21830

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				
GW01	10/13/2022	28	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	NA	NA	NA	NA
MW 1	08/16/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	100.00	11.20	88.80	NP
	11/6/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0				6.12
MW 2	08/16/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	98.10	8.62	89.48	NP
	11/6/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0				10.06
MW 3	08/16/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	99.93	10.10	89.83	NP
	11/6/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0				8.34
MW 4	08/16/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	100.05	9.38	90.67	NP
	11/6/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0				7.26
MW 5	08/16/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0	100.17	9.45	90.72	NP
	11/6/2024	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	<1.0				10.20

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
BRANCH 1-3, WELD COUNTY, COLORADO
REM # 21830

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	08/16/2024	4780	1660	2040
	11/6/2024	7010	1740	2270
MW 2	08/16/2024	4770	1610	2050
	11/6/2024	7750	1880	2560
MW 3	08/16/2024	5570	1600	2740
	11/6/2024	7320	1480	2870
MW 4	08/16/2024	4630	1410	2030
	11/6/2024	7610	1890	2320
MW 5	08/16/2024	4400	1500	1450
	11/6/2024	6400	1530	2060
Background Concentration (Current)		9150.0	1850	3587.5

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

MW-3 used as cross-gradient background monitoring well



LEGEND

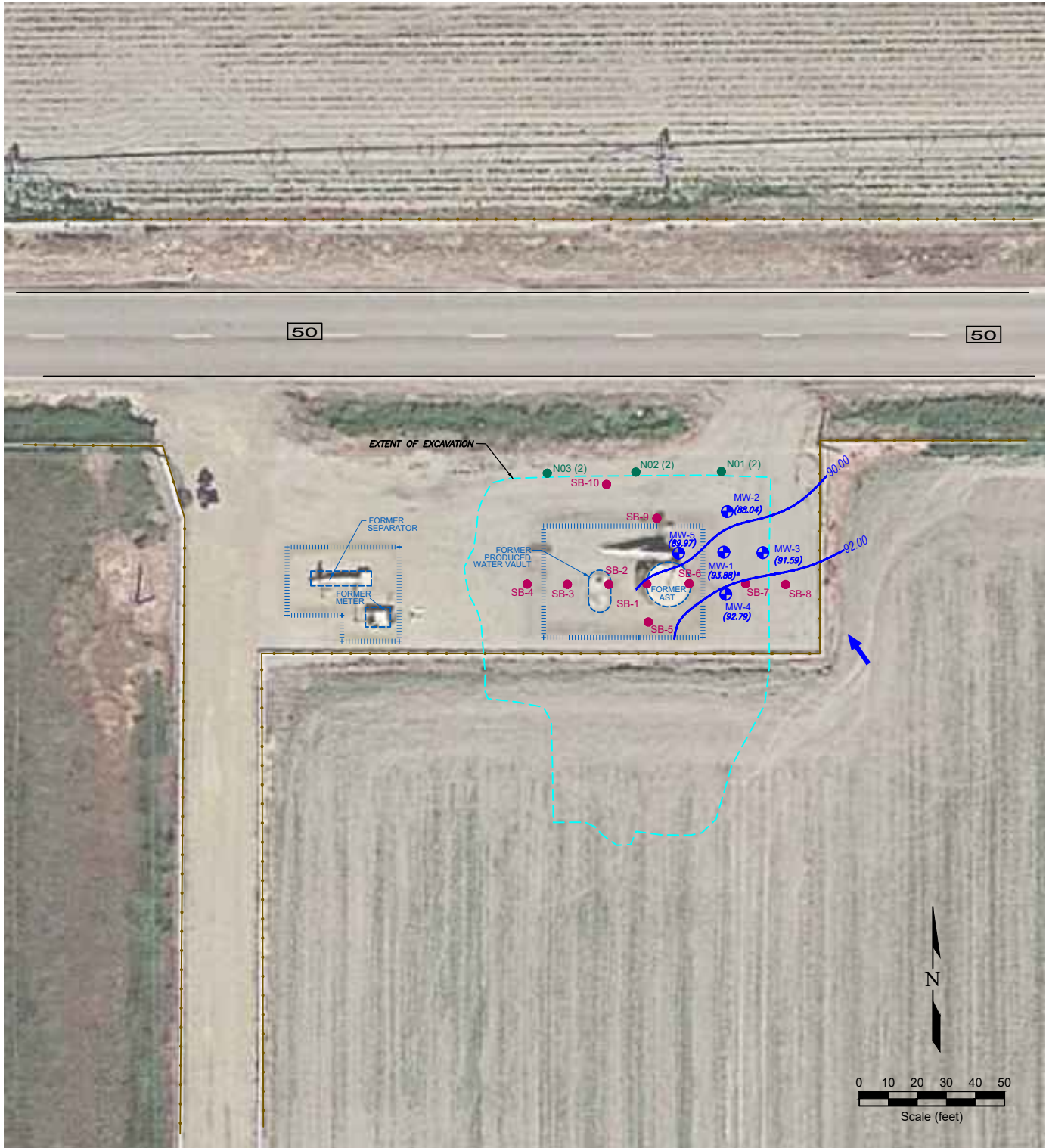
- 2022 SOIL BORING
- 2024 SOIL BORING
- MONITORING WELL
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- CONTAINMENT BERM
- FENCE LINE
- EXTENT OF EXCAVATION

**Figure 2
SITE MAP**

Noble Energy, Inc. ~ Branch 1-3
 NENE Sec. 3, T4N, R64W, 6th PM
 Weld County, Colorado
 40.348412°, -104.529767°

Project No. C022-066	API # 05-123-12513	Facility # 323068
Date 12/15/24	Remediation # 21830	Filename 22066Q2





LEGEND

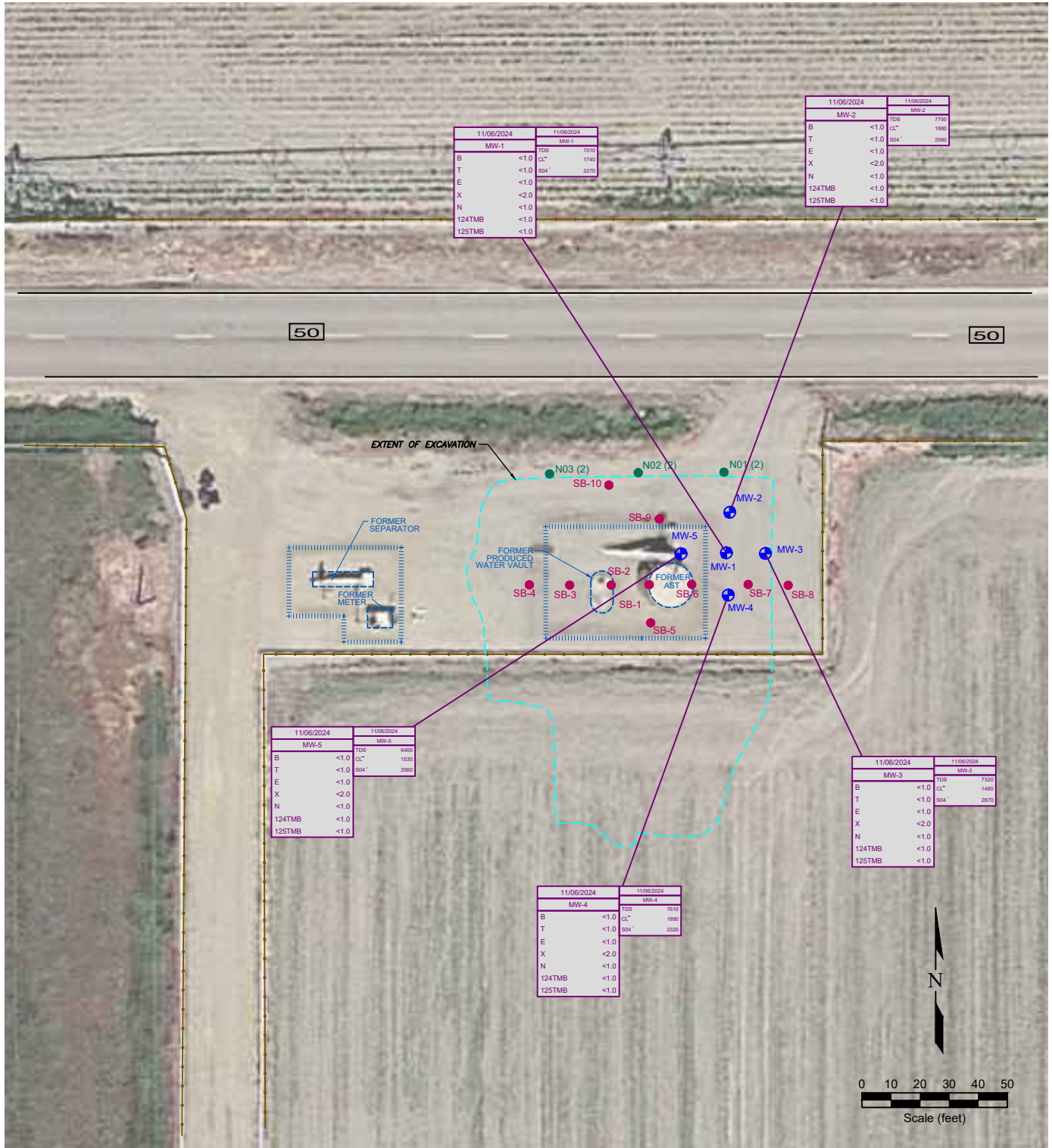
- 2022 SOIL BORING
- 2024 SOIL BORING
- MONITORING WELL
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- CONTAINMENT BERM
- FENCE LINE
- EXTENT OF EXCAVATION
- NOT USED FOR CONTOURING
- GROUND WATER ELEVATION (ft above arbitrary datum)
- WATER TABLE CONTOUR
- GROUND WATER FLOW DIRECTION

Figure 3
INFERRED GROUNDWATER CONTOUR MAP
 November 6, 2024

Noble Energy, Inc. ~ Branch 1-3
 NENE Sec. 3, T4N, R64W, 6th PM
 Weld County, Colorado
 40.348412°, -104.529767°

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LEGEND

- 2022 SOIL BORING
- 2024 SOIL BORING
- MONITORING WELL
- ABOVE GROUND STORAGE TANK
- FORMER FACILITY
- CONTAINMENT BERM
- FENCE LINE
- EXTENT OF EXCAVATION

11/06/2024	DATE SAMPLED	11/06/2024	DATE SAMPLED
MW-1	SAMPLE ID	MW-1	SAMPLE ID
B	BENZENE (ug/L)	TDS	TOTAL DISSOLVED SOLIDS (mg/L)
T	TOLUENE (ug/L)	CL ⁻	CHLORIDE ION (mg/L)
E	ETHYLBENZENE (ug/L)	SO4 ⁻²	SULFATE ION (mg/L)
X	TOTAL XYLENES (ug/L)		
N	1,2,4-TRIMETHYLBENZENE (ug/L)		
124TMB	1,3,5-TRIMETHYLBENZENE (ug/L)		
125TMB	NAPHTHALENE (ug/L)		

**Figure 4
GROUNDWATER CHEMISTRY MAP**

Noble Energy, Inc. ~ Branch 1-3
 NENE Sec. 3, T4N, R64W, 6th PM
 Weld County, Colorado
 40.348412°, -104.529767°

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