

# **FREMONT ENVIRONMENTAL INC.**

May 14, 2024

Mr. Daniel Peterson  
Noble Energy Inc.  
2115 117<sup>th</sup> Avenue  
Greeley, CO 80634

Subject:           **Flowline Closure Data Submittal**  
                  Kehn USX AA01-16  
                  API # 05-123-271989  
                  SESE Sec. 1, T6N, R63W  
                  Weld County, Colorado  
                  Fremont Project No. C023-300  
                  Remediation # 30992

Dear Mr. Peterson:

As you requested, Fremont Environmental Inc. (Fremont) personnel conducted flowline closure activities for the Noble Energy Inc. (Noble) Kehn USX AA01-16. Impacted soil was encountered during abandonment activities. Details of the Kehn USX AA01-16 closure activities are documented in the attached Closure Report. Groundwater was not encountered during flowline abandonment activities.

Please contact me at (303) 261-6246 if you require any additional information. Fremont appreciates the opportunity to provide this service.

Sincerely,

**FREMONT ENVIRONMENTAL INC.**



Stanley Gilbert  
Environmental Scientist

Attachments:

- Facility Closure Checklist
- Tables
- Figures
- Photos
- Laboratory Report

# Flowline Closure Checklist

## COGCC Rule 911.a.(4) Environmental Site Closure Assessment Field Form

<i>Additional Attachments:</i>		Tank Battery Closure		Wellhead Closure		Pit Closure		Partially Buried Vault Closure
<i>Site Name &amp; COGCC Facility Number:</i> KEHN USX AA 01-16 (API: 05-123-27198)		<i>Date:</i> 02/07/2024				<i>Remediation Project #:</i> 30992		
<i>Associated Wells:</i>		<i>Age of Site:</i> 2008				<i>Number of Photos Attached:</i> See Attached		

*Starting point: (GPS coordinates and descriptions)*  
40.510219, -104.377190 (wellhead)

*End point: (GPS coordinates and descriptions)*  
40.512020, -104.380172 (Separator)

*USCS Soil Type:* SP *Estimated Depth to Groundwater:* >25'

*Hydrocarbon Impacted Soils / Spills: (Note estimated size and if impact appears to be surficial or extends to an unknown depth)*  
**Impacts discovered at sample location FL05 3'**

*Salt Crusted Soils or Impacted Vegetation: (Note estimated size and if impact appears to be surficial or extends to an unknown depth)*  
**None observed**

Flowlines								
<i>Flowline type</i>	OIL/Water/Gas							
<i>Depth</i>	3'							
<i>Age</i>	2008							
<i>Length</i>	1109'							
<i>Construction Material</i>	Steel							
<i>Were flowlines pulled?</i>	Yes							
<i>Visual Integrity of lines</i>	Good							
<i>Visual impacts if trenched</i>	N/A							
<i>PID Readings if trenched</i>	N/A							
<i>Sample taken? Location/Sample ID#</i>	Yes, See Attached							
<i>Photo Number(s)</i>	See Attached							

*Other observations regarding on location flowlines:*

### Summary

*Was impacted soil identified?*  
 No     Yes - less than 10 cubic yards     Yes - more than 10 cubic yards

*Total number of samples field screened:* 6    *Total number of samples collected:* 6

*Highest PID Reading: High @ 0.7ppm (FL05 3')*    *Total number of samples submitted to lab for analysis:* 3

*If more than 10 cubic yards of impacted soil were observed:*

*Vertical extent:* Unknown    *Estimated spill volume:* Unknown

*Lateral extent:* Unknown    *Volume of soil removed:* Impacts left in place

*Is additional investigation required?*  
**Yes, additional investigation required**

*Was groundwater encountered during the investigation?*  
 No     Yes - not impacted or in contact with impacted soils     Yes - groundwater impacted and/or in contact with impacted soils

*Measured depth to groundwater:*    *Was remedial groundwater removal conducted?* Yes  No

*Date Groundwater was encountered:*    *Commencement date of removal:*

*Sheen on groundwater?*  Yes  No    *Volume of groundwater removed prior to sampling:*

*Free product observed?*  Yes  No    *Volume of groundwater removed post sampling:*

*Total number of samples collected:*    *Total Volume of groundwater removed:*

*Total number of samples submitted to lab for analysis:*

**TABLE 1**  
**FIELD DATA SUMMARY TABLE**  
**NOBLE 100322**  
**KEHN USX AA 01-16, WELD COUNTY, COLORADO**  
**REM # 30992**

Sample ID	Sample Date	Depth (ft)	GPS Data Latitude/Longitude		PDOP Value	VOC Concentration (ppm)
FL01 3'	11/20/2023	3.0ft	40.5102184	-104.3772016	-	0.0
FL02 3'	11/20/2023	3.0ft	40.5104465	-104.3775374	-	0.1
FL04 3'	11/20/2023	3.0ft	40.5114205	-104.3788847	-	0.2
FL05 3'	11/20/2023	3.0ft	40.5121019	-104.3798335	-	0.7
FL06 3'	11/20/2023	3.0ft	40.5120194	-104.3801738	-	0.4
FL03 4'	11/23/2023	4.0ft	40.5109023	-104.3781575	-	0.5
BKG 3'	11/20/2023	3.0ft	40.5099151	-104.3773115	-	0.0

1. Global Positioning System (GPS) data is provided in decimal degrees using North American Datum (NAD) 83 UTMZone 13 North.

2. Volatile organic compound (VOC) concentrations are measured in the field using a photoionization detector (PID).

PDOP = Position Dilution of Precision

ppm = Parts per million

in. = Inches

ft. = Feet

bgs = Below ground surface

TABLE 2  
SUMMARY OF VOLATILE ORGANIC SOIL CHEMISTRY DATA  
NOBLE 100322  
KEHN USX AA 01-16, WELD COUNTY, COLORADO  
REM # 30992

Sample ID	Sample Date	Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-Benzene (mg/kg)	Xylenes (mg/kg)	1,2,4-Trimethyl-Benzene (mg/kg)	1,3,5-Trimethyl-Benzene (mg/kg)	Naphthalene (mg/kg)	TPH (mg/kg)	TPH GRO (mg/kg)	TPH DRO (mg/kg)	TPH ORO (mg/kg)
ECMC Table 915-1 Limits (Residential SSL)			1.2	490	5.8	58	30	27	2	500	500**		
ECMC Table 915-1 Limits (Protection of Groundwater SSL)			0.0026	0.69	0.78	9.9	0.0081	0.0087	0.0038	500	500**		
FL01 3'	11/20/2023	3.0Ft	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.0050	<0.0038	<500	<0.50	<50	<50
FL05 3'	11/20/2023	3.0Ft	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<b>0.0182</b>	<0.0038	<500	<0.50	<50	<50
FL06 3'	11/20/2023	3.0Ft	<0.0020	<0.0050	<0.0050	<0.010	<0.0050	<0.00500	<0.0038	<500	<0.50	<50	<50

1. Bold values exceed the ECMC Table 915-1 limit(s)
2. Red & blue highlighted soil analytical values indicate an exceedance of the referenced soil screening level (SSL)
3. \* Indicates laboratory minimum detection limit in excess of SSL
4. \*\* Summation of GRO+DRO+ORO must be less than 500 mg/kg

(<) = Analytical result is less than the indicated laboratory reporting limit.

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

TPH-ORO = Total petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

ft. = Feet

bgs = Below ground surface

NA - Not analyzed

Source material characterization sample, excavated and transported off site for disposal.

Material excavated and transported off site for disposal.

TABLE 3  
SUMMARY OF POLYCYCLIC AROMATIC HYDROCARBON SOIL CHEMISTRY DATA  
NOBLE 100322  
KEHN USX AA 01-16, WELD COUNTY, COLORADO  
REM # 30992

Sample ID	Sample Date	Depth (ft)	Acenaphthene (mg/kg)	Anthracene (mg/kg)	Benzo (a) Anthracene (mg/kg)	Benzo (a) Pyrene (mg/kg)	Benzo (b) Fluoranthene (mg/kg)	Benzo (k) Fluoranthene (mg/kg)	Chrysene (mg/kg)	Dibenzo (a,h) Anthracene (mg/kg)	Fluoranthene (mg/kg)	Fluorene (mg/kg)	Indeno (1,2,3-cd) Pyrene (mg/kg)	Pyrene (mg/kg)	1-Methyl - Naphthalene (mg/kg)	2-Methyl- Naphthalene (mg/kg)
ECMC Table 915-1 Limits (Residential SSL)			360	1800	1.1	0.11	1.1	11	110	0.11	240	240	1.1	180	18	24
ECMC Table 915-1 Limits (Protection of Groundwater SSL)			0.55	5.8	0.011	0.24	0.3	2.9	9	0.096	8.9	0.54	0.98	1.3	0.006	0.019
FL01 3'	11/20/2023	3.0ft	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
FL05 3'	11/20/2023	3.0ft	0.0117	0.365	<b>0.367</b>	0.022	<b>0.322</b>	0.0121	0.328	<0.00500	0.0918	0.0158	0.01	0.074	<0.00500	<0.00500
FL06 3'	11/20/2023	3.0ft	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500

1. Bold values exceed the ECMC Table 915-1 limit(s)

2. Red & blue highlighted soil analytical values indicate an exceedance of the referenced soil screening level (SSL)

3. \* Indicates laboratory minimum detection limit in excess of SSL

4. \*\* Summation of GRO+DRO+ORO must be less than 500 mg/kg

(<) = Analytical result is less than the indicated laboratory reporting limit.

TPH-GRO = Total petroleum hydrocarbons - gasoline range organics

TPH-DRO = Total petroleum hydrocarbons - diesel range organics

TPH-ORO = Total petroleum hydrocarbons - oil range organics

mg/kg = Milligrams per kilogram

ft. = Feet

**TABLE 4**  
**SUMMARY OF SOIL SUITABILITY FOR RECLAMATION**  
**NOBLE 100322**  
**KEHN USX AA 01-16, WELD COUNTY, COLORADO**  
**REM # 30992**

Sample ID	Sample Date	Depth (ft)	pH (Standard Units)	EC (mmhos/cm)	SAR (Standard Units)	Boron (mg/L)
ECMC Table 915-1 Soil Suitability Limits			6 - 8.3	4	6	2
FL01 3'	11/20/2023	3.0Ft	<b>8.40</b>	0.228	0.411	<2.00
FL05 3'	11/20/2023	3.0Ft	<b>8.50</b>	0.252	0.466	<2.00
FL06 3'	11/20/2023	3.0Ft	<b>9.02</b>	0.0796	0.0109	<2.00
BKG 3'	11/20/2023	3.0Ft	7.14	0.0686	0.0186	<2.00
Maximum Background Concentration		3.0Ft	7.14	0.0686	0.0186	<2.00

1. **Bold** faced values exceed the ECMC Table 915-1 limit(s), but are within background concentrations.

2. **Bold** faced values exceed the ECMC Table 915-1 limit(s) and native background concentrations.

3. Brown highlighted soil analytical values indicate a regulatory exceedance.

NA - Not analyzed/Not applicable

TABLE 5  
SUMMARY OF METALS IN SOIL CHEMISTRY DATA  
NOBLE 100322  
KEHN USX AA 01-16, WELD COUNTY, COLORADO  
REM # 30992

Sample ID	Sample Date	Depth (ft)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (VI) (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)
ECMC Table 915-1 Limits (Residential SSL)			0.68	15000	71	0.3	3100	400	1500	390	390	23000
ECMC Table 915-1 Limits (Protection of Groundwater SSL)			0.29	82	0.38	0.00067	46	14	26	0.26	0.8	370
FL01 3'	11/20/2023	3.0Ft	<b>1.08</b>	80.6	0.270	<0.30	3.88	13.3	2.61	<b>0.443</b>	0.0354	13.6
FL05 3'	11/20/2023	3.0Ft	<b>0.685</b>	<b>96.0</b>	<0.200	<0.30	1.50	4.77	1.75	<0.260	0.0231	6.67
FL06 3'	11/20/2023	3.0Ft	<b>0.992</b>	57.7	<0.200	<0.30	1.04	3.58	1.22	<0.260	<0.0200	4.67
BKG 3'	11/20/2023	3.0Ft	<b>0.913</b>	26.6	<0.200	<0.30	1.47	3.39	1.43	<0.260	<0.0200	5.93
1.25x Maximum Background Concentration		3.0Ft	1.41	33.3	<0.200	<0.30	1.84	4.24	1.79	<0.260	<0.0200	7.41

1. **Bold** faced values exceed the ECMC Table 915-1 limit(s), but are within 1.25x background concentrations.
2. **Bold** faced values exceed the ECMC Table 915-1 limit(s) and native background concentrations.
3. Red & blue highlighted soil analytical values indicate an exceedance of the referenced soil screening level (SSL).
4. Non-detect background results accounted for in the highest background concentration by using the reporting limit.

ECMC = Energy & Carbon Management Commission

(<) = Analytical result is less than the indicated laboratory reporting limit.

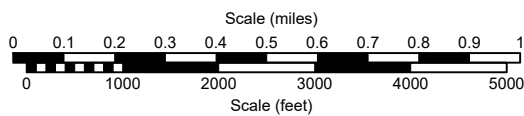
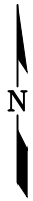
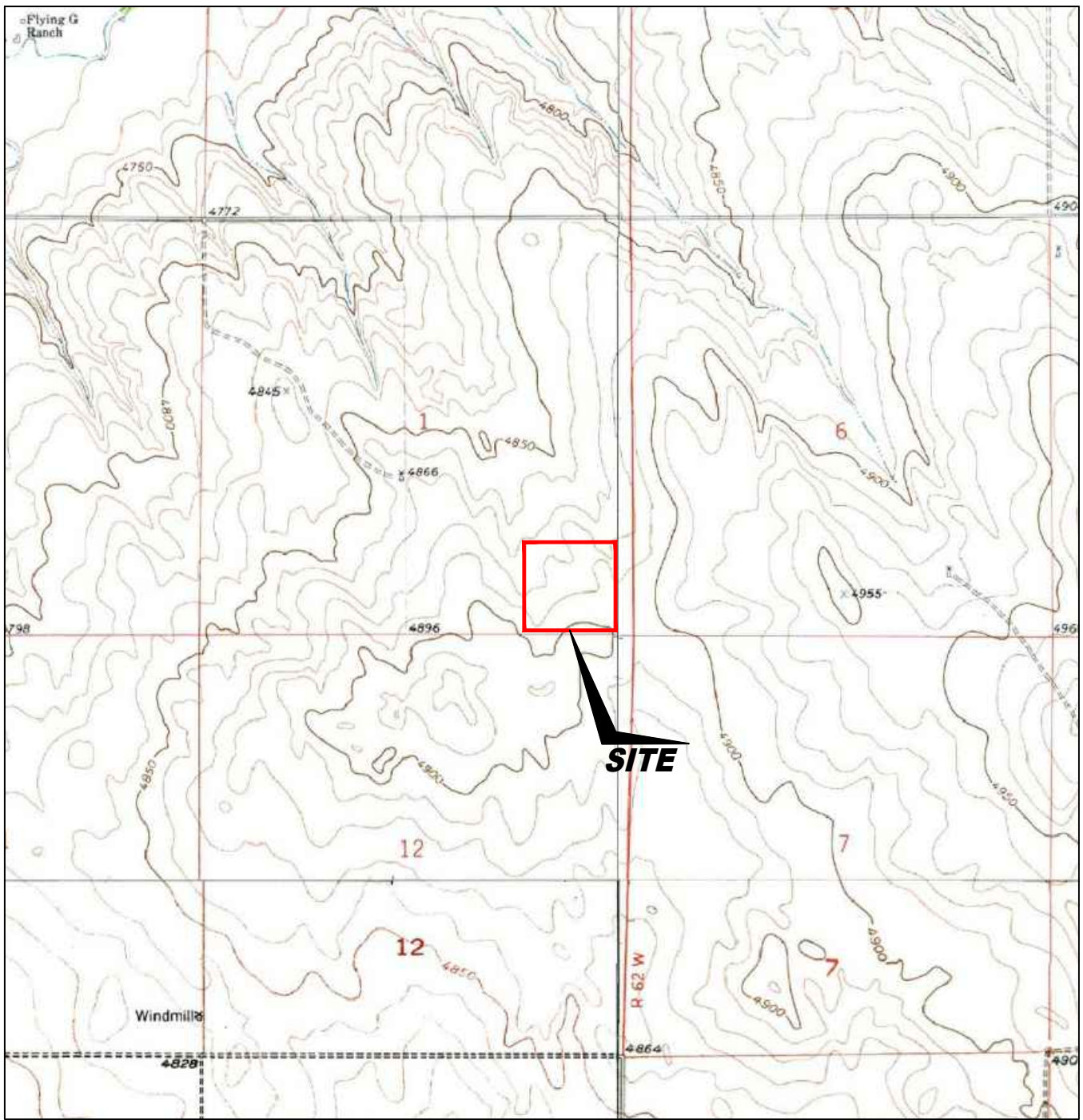
mg/kg = Milligrams per kilogram

ft. = Feet

bgs = Below ground surface

\* Indicates laboratory minimum detection limit in excess of SSL

NA - Not analyzed/Not applicable



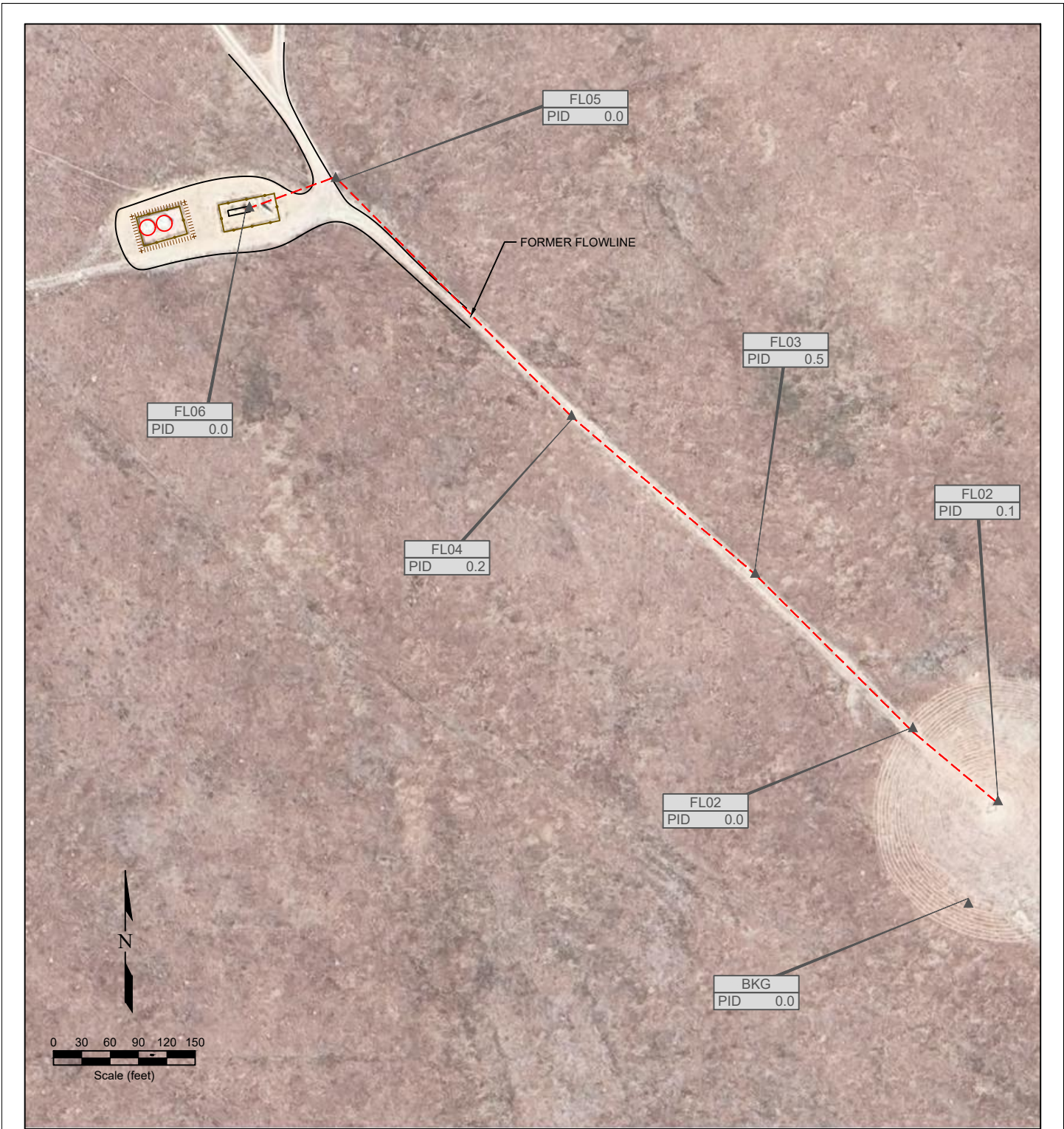
USGS 7.5 MINUTE SERIES (TOPOGRAPHIC)

Figure 1  
**SITE LOCATION MAP**  
**NOBLE ENERGY INC ~ KEHN USX AA 01 -16**

SESE Sec. 1, T6N, R63W, 6th PM  
 Weld County, Colorado  
 40.510216°, -104.377220°

Project # <b>C023-299</b>	API # <b>05-123-27198</b>	Facility #
Date <b>6/2/24</b>	Remediation # <b>30992</b>	Filename <b>23299T</b>



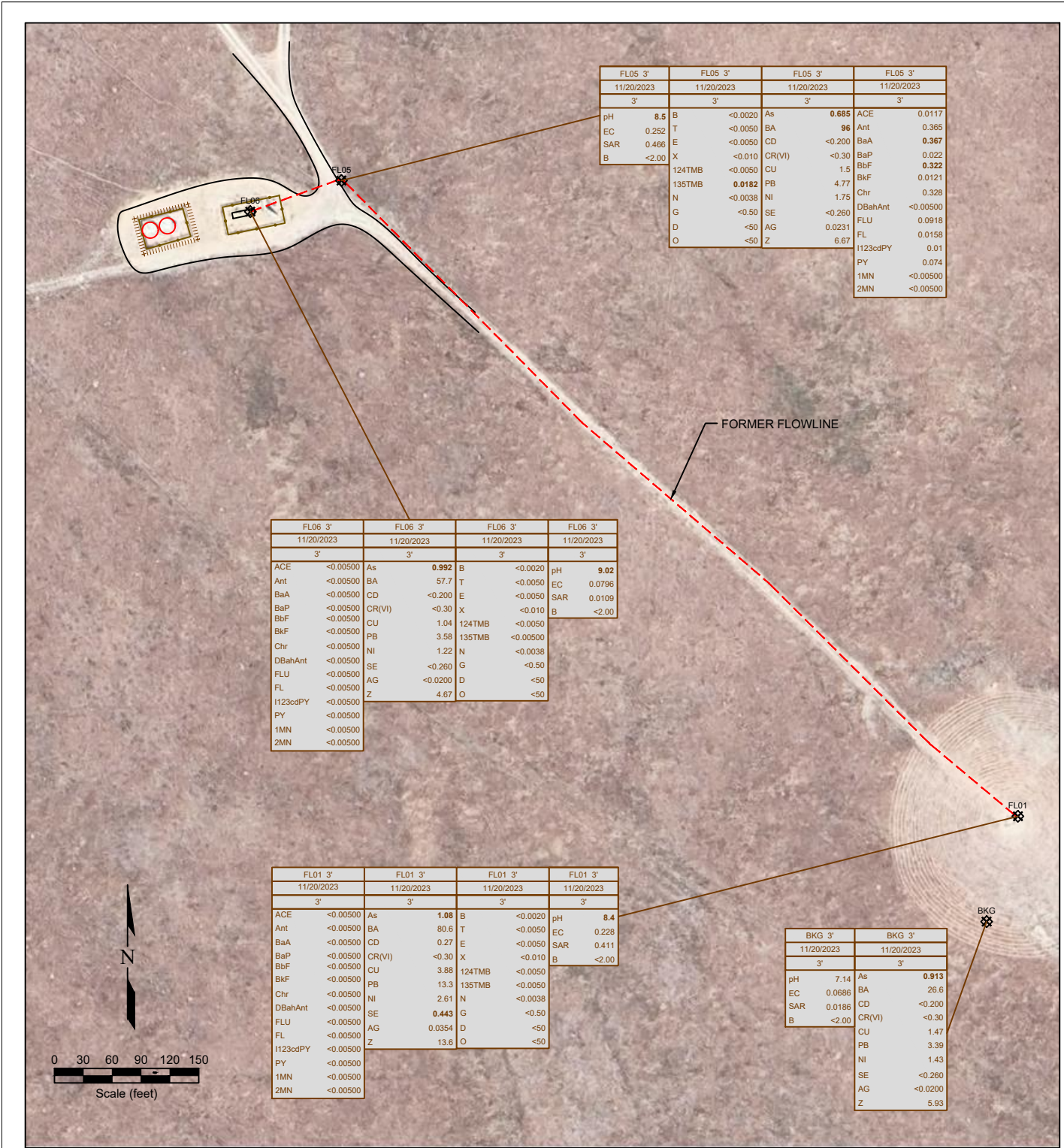


LEGEND	
▲ PID READING LOCATION	▲ AST ABOVE GROUND STORAGE TANK
■ BUILDING	■ BUILDING
--- FORMER FLOWLINE	--- FENCE LINE
CONTAINMENT BERM	--- CONTAINMENT WALL

**Figure 2**  
**SITE MAP**  
**NOBLE ENERGY INC ~ KEHN USX AA 01 -16**

SESE Sec. 1, T6N, R63W, 6th PM  
Weld County, Colorado  
40.510216°, -104.377220°

Project No. <b>C023-299</b>	API # <b>05-123-27198</b>	Facility #
Date <b>6/2/24</b>	Remediation # <b>30992</b>	Filename <b>23299Q</b>



**LEGEND**

- SOIL SAMPLE LOCATION (AST)
- ABOVE GROUND STORAGE TANK
- BUILDING
- FORMER FLOWLINE
- FENCE LINE
- CONTAINMENT BERM
- CONTAINMENT WALL
- NOT ANALYZED

SAMPLE ID	SAMPLE ID	SAMPLE ID	SAMPLE ID
ACE	ACENAPHTHENE (mg/kg)	As	ARSENIC (mg/kg)
Ant	ANTHRACENE (mg/kg)	BA	BARIUM (mg/kg)
BaA	BENZO (A) ANTHRACENE (mg/kg)	CD	CADMIUM (mg/kg)
BaP	BENZO (B) FLUORANTHENE (mg/kg)	CR(VI)	CHROMIUM (mg/kg)
BbF	BENZO (K) FLUORANTHENE (mg/kg)	CU	COPPER (mg/kg)
Chr	CHRYSENE (mg/kg)	EC	EC (mmho/cm)
DBahAnt	DIBENZ (A,H) ANTHRACENE (mg/kg)	EC	EC (pH units)
FLU	FLUORANTHENE (mg/kg)	EC	EC (mmho/cm)
I123cdPY	INSENE (1,2,3-CD) PYRENE (mg/kg)	EC	EC (pH units)
PY	PYRENE (mg/kg)	EC	EC (mmho/cm)
1MN	1-METHYLNAPHTHALENE (mg/kg)	EC	EC (pH units)
2MN	2-METHYLNAPHTHALENE (mg/kg)	EC	EC (mmho/cm)

**Figure 3**  
**SOIL CHEMISTRY MAP**  
**NOBLE ENERGY INC ~ KEHN USX AA 01 -16**  
 SESE Sec. 1, T6N, R63W, 6th PM  
 Weld County, Colorado  
 40.510216°, -104.377220°

Project No. <b>C023-299</b>	API # <b>05-123-27198</b>	Facility #
Date <b>6/2/24</b>	Remediation # <b>30992</b>	Filename <b>23299Q</b>

# Photo Log



*Description:*

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# Photo Log



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***Description:***

# Photo Log



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