

State of Colorado  
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
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Document Number:

403933625

Receive Date:

09/25/2024

Report taken by:

Krystal Heibel

## Site Investigation and Remediation Workplan (Supplemental Form)

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. However, this shall not preclude the Operator from taking immediate action to protect public health or safety, the environment, wildlife, or livestock.

This Form 27 describes site conditions as currently understood by the Operator; approval of this Form 27 by ECMC is based on the site conditions accurately described herein; any changes in site conditions identified during or subsequent to the performance of the approved workplan may necessitate additional investigation or remediation which shall be described on a supplemental Form 27. This Form 27 is intended to provide basic information regarding the proposed site investigation and remediation actions, but the workplan may be more fully described in attached documentation.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

## OPERATOR INFORMATION

Name of Operator: NOBLE ENERGY INC	Operator No: 100322	Phone Numbers
Address: 1099 18TH STREET SUITE 1500		Phone: (970) 730-7281
City: DENVER	State: CO	Zip: 80202
Contact Person: Dan Peterson	Email: rbueuf27@chevron.com	Mobile: ( )

## PROJECT, PURPOSE &amp; SITE INFORMATION

## PROJECT INFORMATION

Remediation Project #: 25074 Initial Form 27 Document #: 403152303

## PURPOSE INFORMATION

- ☐ Rule 913.c.(1): Pit or Cuttings Trench closure.
- ☐ Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- ☒ Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- ☐ Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- ☐ Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- ☐ Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- ☐ Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- ☐ Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- ☐ Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- ☐ Rule 913.g: Changes of Operator.
- ☐ Rule 915.b: Request to leave elevated inorganics in situ.
- ☐ Other: \_\_\_\_\_

## SITE INFORMATION

No Multiple Facilities

Facility Type: SPILL OR RELEASE	Facility ID: 482023	API #: _____	County Name: WELD
Facility Name: Lilli Unit 14-5	Latitude: 40.685929	Longitude: -103.888174	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SESW	Sec: 5	Twp: 8N	Range: 58W
Meridian: 6	Sensitive Area? Yes		

## SITE CONDITIONS

General soil type - USCS Classifications SC

Most Sensitive Adjacent Land Use Range land

Is domestic water well within 1/4 mile? No

Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? No

Structures 0.03mi NNW

## SITE INVESTIGATION PLAN

### TYPE OF WASTE:

☒ **E&P Waste**
☐ **Other E&P Waste**
☐ **Non-E&P Waste**
☒ Produced Water
☐ Workover Fluids

☒ Oil
☐ Tank Bottoms

☒ Condensate
☐ Pigging Waste

☐ Drilling Fluids
☐ Rig Wash

☐ Drill Cuttings
☐ Spent Filters

☐ Pit Bottoms

☐ Other (as described by EPA)

### DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	Refer to tables and figures	Lab analysis

### INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

During tank battery decommissioning activities on, 04/01/2022, one soil sample collected from beneath a separator dumpline exceeded COGCC standards for TPH at 890 mg/kg. A site investigation was conducted to delineate the extent of impacts at the site on, 05/24/2022. Five soil borings were advanced and impacts were observed up to 24' bgs.

### PROPOSED SAMPLING PLAN

#### Proposed Soil Sampling

☒ Will soil samples be collected as part of this investigation? ( Number, type (grab/composite), analyses, and locations of samples ):

Additional soil boring are necessary to define the horizontal and vertical extent of impacts. Soil samples will be analyzed by a certified laboratory for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil per COGCC Table 915-1, and EC, SAR, pH, and boron. All samples collected will be analyzed by a certified laboratory using approved COGCC laboratory analysis methods.

#### Proposed Groundwater Sampling

☒ Will groundwater samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

If groundwater is encountered a grab sample will be collected and analyzed for all organic and inorganic compounds per COGCC Table 915-1.

#### Proposed Surface Water Sampling

☐ Will surface water samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

### Additional Investigative Actions

☐ Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

A Site Assessment was conducted between 5/24/2022 and 10/26/2022 to delineate impacted media. Eleven soil borings were advanced in the area of impacts. Soil samples were collected and analyzed for TPH (total volatile [C6-C10] and extractable [C10-C36] hydrocarbons), organic compounds in soil, metals in soil per COGCC Table 915-1, and EC, SAR, pH, and boron. Groundwater was not encountered during this assessment.

## SITE INVESTIGATION REPORT

### SAMPLE SUMMARY

**Soil**

Number of soil samples collected 41

Number of soil samples exceeding 915-1 34

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 4600

**Groundwater**

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet)

Number of groundwater monitoring wells installed

Number of groundwater samples exceeding 915-1

**Surface Water**

0 Number of surface water samples collected

Number of surface water samples exceeding 915-1

If surface water is impacted, other agency notification may be required.

**NA / ND**

-- Highest concentration of TPH (mg/kg) 21300

-- Highest concentration of SAR 5.47

BTEX &gt; 915-1 Yes

Vertical Extent &gt; 915-1 (in feet) 32

Highest concentration of Benzene (µg/l)

Highest concentration of Toluene (µg/l)

Highest concentration of Ethylbenzene (µg/l)

Highest concentration of Xylene (µg/l)

Highest concentration of Methane (mg/l)

**OTHER INVESTIGATION INFORMATION**☐ Were impacts to adjacent property or offsite impacts identified?☒ Were background samples collected as part of this site investigation?

One background soil sample was collected adjacent to the Lilli Unit N-5 Tank Battery on 3/31/2022, and 23 background soil samples were collected adjacent to the Lilli Unit O-5 (Location ID 323665, Rem #20862) between 5/3/2022 and 2/28/2024. All soil samples were collected from within lean clay. The highest background concentrations for arsenic, barium, cadmium, lead, and selenium with a 1.25x multiplier applied were calculated to be 18.4 mg/kg, 698 mg/kg, 1.23 mg/kg, 31.8 mg/kg, and 5.08 mg/kg, respectively. The background levels for arsenic, barium, cadmium, lead, and selenium exceed all soil boring concentrations, with the exception of one arsenic concentration at BH09 (33.4 mg/kg). As such, barium, cadmium, lead, and selenium should not be considered contaminants of concern. Additional justification to eliminate arsenic as a contaminant of concern using the nonparametric Mann-Whitney-Wilcoxon rank-sum test is presented in the Operator Comments section of this Form 27.

☐ Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards)

Volume of liquid waste (barrels)

☐ Is further site investigation required?**REMEDIAL ACTION PLAN**

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? No

**SOURCE REMOVAL SUMMARY**

Describe how source is to be removed.

The source was delineated through an environmental site assessment between 5/24/2022 and 10/27/2022 and will be removed through remedial excavation. The results of the 5/24/2022 and 10/27/2022 site assessments are attached to this Form 27. Based on the justification to eliminate metals as contaminants of concern presented in the Site Investigation Report and Operator Comments sections of this Form 27, and the absence of detected concentrations of EC, SAR, and boron above ECOM Table 915-1, Noble proposes to limit excavation confirmatory soil sampling to the analysis of Organic Compounds in Soil per ECOM Table 915-1, TPH, and pH.

**REMEDIAL ACTION SUMMARY**

Describe how remediation of existing impacts to soil and groundwater is to be accomplished (i.e. summarize remedial action plan). Provide a brief narrative description including: technical justification, schedule for implementation, estimated time to attain NFA status, plus plans and specifications for the selected remedial action technology.

The soil samples impacted with organic compounds in soil exceeding ECMC Table 915-1 standards (SEP01-DL02@4', BH01, BH04, BH05, BH06, and BH07) will be removed through a remedial excavation. The final excavation extent will be determined through confirmatory soil sampling, in accordance with the proposed sampling plan in the Source Removal Summary section, above.

It is currently anticipated that clean excavation overburden soil will be set aside for later use as backfill material. If stockpiled clean overburden soil is determined to be free of impacts through field screening (i.e., low PID readings, absence of staining/odors), that soil will be used as clean backfill within the excavation. All soil that is impacted based on historical or future confirmatory soil sampling, elevated PID readings, and/or staining/odors, that soil will be transported off-site for disposal at an appropriately permitted facility.

### **Soil Remediation Summary**

☐ In Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Air sparge / Soil vapor extraction  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

☐ Ex Situ

\_\_\_\_\_ Excavate and offsite disposal  
\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_  
\_\_\_\_\_ Name of Licensed Disposal Facility or ECMC Facility ID # \_\_\_\_\_  
\_\_\_\_\_ Excavate and onsite remediation  
\_\_\_\_\_ Land Treatment  
\_\_\_\_\_ Bioremediation (or enhanced bioremediation)  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Other \_\_\_\_\_

### **Groundwater Remediation Summary**

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Air sparge / Soil vapor extraction  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

### **GROUNDWATER MONITORING**

If groundwater has been impacted, describe proposed monitoring plan, including # of wells or sample points, monitoring schedule, analytical methods, points of compliance. Attach a groundwater monitoring location diagram.

## REMEDATION PROGRESS UPDATE

### PERIODIC REPORTING

#### Approved Reporting Schedule:

☒ Quarterly☐ Semi-Annually☐ Annually☐ Other

#### ☐ Request Alternative Reporting Schedule:

☐ Semi-Annually☐ Annually☐ Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

#### Report Type:

☐ Groundwater Monitoring☐ Land Treatment Progress Report☐ O&M Report☒ Other Site Assessment Report and Proposed Remedial Excavation Plan

### Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Noble intends to directly address the costs of remediation at the locations as part of our asset retirement obligation process and operations. Noble has general liability insurance (policy MWZZ 316714) and financial assurance in compliance with COGCC rules. Records are available on the COGCC's website. The cost for remediation is an estimate only, costs may change upwards or downward based on site-specific information. Noble makes no representation or guarantees as to the accuracy of the estimate.

Operator anticipates the remaining cost for this project to be: \$ 50000

### WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? \_\_\_\_\_

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_

E&P waste (solid) description \_\_\_\_\_

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC Disposal Facility: \_\_\_\_\_

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_

E&P waste (liquid) description \_\_\_\_\_

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC Disposal Facility: \_\_\_\_\_

## REMEDATION COMPLETION REPORT

### REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No \_\_\_\_\_

If YES:

☐ Compliant with Rule 913.h.(1).☐ Compliant with Rule 913.h.(2).☐ Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

Does Groundwater meet Table 915-1 standards? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

## RECLAMATION PLAN

### RECLAMATION PLANNING

Describe reclamation plan. Discuss existing and new grade recontouring; method and testing of compaction alleviation; and reseeding program, including location of new seed, seed mix and noxious weed prevention. Attach diagram or drawing.

Reclamation will be in accordance with COGCC 1000 Series Rules.

Is the described reclamation complete? No \_\_\_\_\_

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim

☐ Final

Did the Surface Owner provide the seed mix? \_\_\_\_\_

If YES, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 01/09/2023

Proposed date of completion of Reclamation. 01/12/2026

## IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. 04/15/2022

Actual Spill or Release date, or date of discovery. 04/15/2022

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/01/2022

Proposed site investigation commencement. 08/11/2023

Proposed completion of site investigation. 07/12/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/25/2024

Proposed date of completion of Remediation. 03/25/2025

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

☒ Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

The implementation schedule has been updated to reflect the need to complete a remedial excavation at the former Lilli Unit N-5 Tank Battery. The proposed remedial excavation will be completed following the approval of this form, landowner negotiations, and crew availability.

## OPERATOR COMMENT

This form 27 is being submitted to supplement previously approved Form 27 Document #403715446, and to provide further justification to support the analyte reduction request for remedial excavation confirmatory soil samples.

Noble acknowledges that the "Is groundwater less than 20 feet below ground surface?" box was selected "Yes" on previous Form 27 Supplementals. However, this was selected in error, and groundwater has not been encountered at depths less than 20-ft bgs. Soil borings were advanced at this location to total depths of 31-ft bgs, and groundwater was not encountered. Soil boring logs from all historical drilling events are attached to this Form 27. Additionally, Figure 4 "Water Well Investigation Location Map" was removed from the attached report since it does not indicate groundwater levels locally at the site.

The following response is in reference to the Environmental Comment associated with Form 27 Document #403715446: "Due to barium, lead, and selenium Table 915-1 Protection of Groundwater SSL exceedances, ECMC does not approve the Operator's reduced analyte suite of removing Table 915-1 metals."

While Noble recognizes that site concentrations of arsenic, barium, cadmium, lead, and selenium exceed Table 915-1 Protection of Groundwater Soil Screening Levels (GSSLs), Noble is not requesting the application of ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) at this time. Based on the extensive background sampling performed at the adjacent Lilli Unit O-5 site, located approximately 1,200-ft east of the Lilli Unit N-5 site, arsenic, barium, cadmium, lead, and selenium are naturally elevated in native soils at concentrations above all decommissioning and soil boring concentrations observed at the Lilli Unit N-5 site, as well as above ECMC Table 915-1 GSSLs. The previously submitted background comparison is provided below:

One background soil sample was collected adjacent to the Lilli Unit N-5 Tank Battery on 3/31/2022, and 23 background soil samples were collected adjacent to the Lilli Unit O-5 (Location ID 323665, Rem #20862) between 5/3/2022 and 2/28/2024. All soil samples were collected from within lean clay. The highest background concentrations for arsenic, barium, cadmium, lead, and selenium with a 1.25x multiplier applied were calculated to be 18.4 mg/kg, 698 mg/kg, 1.23 mg/kg, 31.8 mg/kg, and 5.08 mg/kg, respectively. The background levels for arsenic, barium, cadmium, lead, and selenium exceed all soil boring concentrations, with the exception of one arsenic concentration at BH09 (33.4 mg/kg). As such, barium, cadmium, lead, and selenium should not be considered contaminants of concern. Following receipt of analytical results, background and site data for arsenic in soil was compared using the nonparametric Mann-Whitney-Wilcoxon rank-sum test to assess if site concentrations were substantially higher than background concentrations. The results of the metals evaluation indicated that concentrations for all metals of concern recorded in the site data are not substantially different from background concentrations and consequently, are indicative of native soil conditions. Based on this discussion, no further metals delineation activities are required at this location and Noble is requesting to eliminate ECMC Table 915-1 metals from the sampling plan for this remediation project. The metals assessment is attached to this Form 27.

If the ECMC approves the elimination of metals from the sampling plan, Noble proposes to limit excavation confirmatory soil sampling to the analysis of ECMC Table 915-1 Organic Compounds in Soil, TPH, and pH.

Quarterly reporting will continue until closure criteria are achieved for the remediation project. The results of the remedial excavation will be submitted on a subsequent Form 27.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Allan Engelhardt

Title: Environmental Consultant

Submit Date: 09/25/2024

Email: chevroneform@tasman-geo.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Krystal Heibel

Date: 12/23/2024

Remediation Project Number: 25074

## COA Type

## Description

	If a spill/release of produced fluids or E&P waste causes an impact to soil, the operator should perform sampling and analysis to fully delineate the lateral and vertical extent of those impacts.
1 COA	

## ATTACHMENT LIST

Upon approval, the approved Form 27 and all listed attachments will be indexed to the Remediation Project file. Only the approved Form 27 will also be indexed to the related Facilities.

## Att Doc Num

## Name

403933625	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
403933629	ANALYTICAL RESULTS
403933690	SITE INVESTIGATION REPORT
404038100	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 4 Files

## General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	"While Noble recognizes that site concentrations of arsenic, barium, cadmium, lead, and selenium exceed Table 915-1 Protection of Groundwater Soil Screening Levels (GSSLs), Noble is not requesting the application of ECMC Table 915-1 Residential Soil Screening Levels (RSSLs) at this time."	12/23/2024
Environmental	Based on the Operator's assessment of background conditions at the subject location, arsenic, barium, cadmium, lead, and selenium results for confirmation soil samples appear to be representative of background as opposed to E&P activities. Therefore, the Operator's demonstration of background will be accepted as an alternative to the default standard in ECMC's Table 915-1.	12/23/2024
Environmental	ECMC approves the reduced analyte suite of ECMC Table 915-1 Organic Compounds in Soil, TPH, and pH.	12/23/2024
Environmental	Per Doc # 403715446, Based on the Operator's assessment of background conditions at the subject location, arsenic results for confirmation soil samples appear to be representative of background as opposed to E&P activities. Therefore, the Operator's demonstration of background will be accepted as an alternative to the default standard in ECMC's Table 915-1.	12/23/2024

Total: 4 comment(s)