

**State of Colorado**  
**Energy & Carbon Management Commission**

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



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Report taken by:  
Abdul Elnajdi

**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 ECOM 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: <u>NOBLE ENERGY INC</u>	Operator No: <u>100322</u>	<b>Phone Numbers</b>
Address: <u>1099 18TH STREET SUITE 1500</u>		Phone: <u>(970) 730-7281</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80202</u>		Mobile: <u>( )</u>
Contact Person: <u>Dan Peterson</u>	Email: <u>cvxreform@eagle-enviro.com</u>	

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**

Remediation Project #: 12591 Initial Form 27 Document #: 401946514

**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**

Yes  Multiple Facilities

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>459573</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Edward Hemple Unit 1</u>	Latitude: <u>40.302039</u>	Longitude: <u>-104.692251</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWNW</u>	Sec: <u>20</u>	Twp: <u>4N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>479280</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Edward Hemple 1</u>	Latitude: <u>40.302293</u>	Longitude: <u>-104.692823</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWNW</u>	Sec: <u>20</u>	Twp: <u>4N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

General soil type - USCS Classifications OL

Most Sensitive Adjacent Land Use Crop Land

Is domestic water well within 1/4 mile? Yes

Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? Yes

**Other Potential Receptors within 1/4 mile**

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste      | <input type="checkbox"/> Other E&P Waste             | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids             | _____                                  |
| <input checked="" type="checkbox"/> Oil            | <input type="checkbox"/> Tank Bottoms                |  |
| <input checked="" type="checkbox"/> Condensate     | <input type="checkbox"/> Pigging Waste               |  |
| <input type="checkbox"/> Drilling Fluids           | <input type="checkbox"/> Rig Wash                    |  |
| <input type="checkbox"/> Drill Cuttings            | <input type="checkbox"/> Spent Filters               |  |
|  | <input type="checkbox"/> Pit Bottoms                 |  |
|  | <input type="checkbox"/> Other (as described by EPA) | _____                                  |

## DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	150' X 150'	Laboratory Analysis
Yes	SOILS	150' X 150' X 7' bgs	Laboratory 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.

The extent of impacts will be determined through excavation of impacted soil above COGCC Table 910-1 standards. A third party environmental consultant will collect confirmation soil samples and transport them to a certified laboratory under proper chain of custody procedures for analysis of TPH-DRO, TPH-GRO, BTEX, and Naphthalene.

## 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 ):

Five soil samples were collected during site investigation activities by AECOM and submitted them to Summit Scientific for analysis of TPH-DRO, TPH-GRO, BTEX, and Naphthalene by EPA Methods

### Proposed Groundwater Sampling

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

One grab groundwater sample was collected from the base of the excavation by Eagle Environmental and submitted to Origins Laboratory for analysis of BTEX by EPA Method 8260c.

### 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 ):

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

Soil	NA / ND
Number of soil samples collected <u>347</u>	-- Highest concentration of TPH (mg/kg) <u>5829</u>
Number of soil samples exceeeding 915-1 <u>121</u>	-- Highest concentration of SAR <u>6.17</u>

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

BTEX > 915-1 Yes

Approximate areal extent (square feet) 22500

Vertical Extent > 915-1 (in feet) 7

**Groundwater**

Number of groundwater samples collected 1179

-- Highest concentration of Benzene (µg/l) 19800

Was extent of groundwater contaminated delineated? Yes

-- Highest concentration of Toluene (µg/l) 22900

Depth to groundwater (below ground surface, in feet) 7

-- Highest concentration of Ethylbenzene (µg/l) 903

Number of groundwater monitoring wells installed 96

-- Highest concentration of Xylene (µg/l) 15700

Number of groundwater samples exceeding 915-1 520

NA Highest concentration of Methane (mg/l)

**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.

**OTHER INVESTIGATION INFORMATION**

Were impacts to adjacent property or offsite impacts identified?

Were background samples collected as part of this site investigation?

Five (5) background samples were collected during source excavation activities from similar lithologic soil of comparable depths for arsenic and barium analysis. Five (5) additional background samples were collected during reclamation activities from similar lithologic soil of comparable depths to compare residual boron, pH, EC, SAR, and ECMC Table 915-1 metals. Additional backgrounds will be proposed on a supplemental Form 27, as needed.

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?

Wells destroyed during excavation activities are scheduled for replacement in July 2024. During monitoring well replacement activities, soil borings will be logged and a soil sample will be collected from the capillary fringe or interval of most probable impact of each boring for full ECMC Table 915-1 analysis. Additionally, soil samples will be collected adjacent to the remaining monitoring wells at the site for full ECMC Table 915-1 analysis.

**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.

Limited source removal was completed from December 14, 2018 to June 10, 2019. Grab confirmation soil samples were collected above the phreatic zone to determine the lateral and vertical extent of impacts. Additionally, 30 cubic yards of impacted material was removed in January 2021 during lease road reclamation. Surficial grab confirmation soil samples were collected from former pad during reclamation activities in May 2024, and will be included in the scope of remediation at the site.

Additional source removal began at the site in February 2023 to remove residual impacts at the site and concluded in January 2024. Per the approved workplan (Form 27 Doc. # 403298775), confirmation soil samples were collected for compliance with ECMC Table 915-1 GSSLs for TPH (C6-C36), ECMC Table 915-1 organics, arsenic, and barium during source removal activities.

During monitoring well replacement activities, soil borings will be logged and a soil sample will be collected from the capillary fringe of each boring for full ECMC Table 915-1 analysis.

**REMEDICATION 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.

Ninety-six (96) monitoring wells were installed during groundwater investigation activities. Wells will be sampled on a quarterly basis to monitor for natural attenuation (see sampling plan proposal below). Source excavation activities resumed in February 2023 and concluded in January 2024. Monitoring wells destroyed during excavation activities will be replaced, as needed.

Based on the results of source removal and dissolved plume confirmation, as well as a review of the lithology at the site, AS/SVE remedial technology appears feasible and will be utilized to address any residual soil and groundwater impacts at the site. A pilot test will be completed to further evaluate AS/SVE remedial technology. Further remediation will be proposed on a supplemental Form 27.

NFA will be considered when soil and groundwater are in compliance with ECMC Table 915-1 regulatory limits. An estimated no further action request may be submitted in November 2027.

### Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation ( or enhanced bioremediation )	Yes Excavate and offsite disposal
_____ Chemical oxidation	If Yes: Estimated Volume (Cubic Yards) _____ 24320
_____ Air sparge / Soil vapor extraction	Name of Licensed Disposal Facility or ECMC Facility ID # _____
_____ Natural Attenuation	No Excavate and onsite remediation
_____ Other _____	_____ Land Treatment
	_____ Bioremediation (or enhanced bioremediation)
	_____ Chemical oxidation
	_____ Other _____

### Groundwater Remediation Summary

No \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

No \_\_\_\_\_ Chemical oxidation

No \_\_\_\_\_ Air sparge / Soil vapor extraction

Yes \_\_\_\_\_ Natural Attenuation

Yes \_\_\_\_\_ Other A groundwater amendment was placed at the base of the excavation to aid in groundwater remediation

### 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.

Per the approved monitoring plan (Form 27 Doc. # 403298775), MW-01, MW-02, MW-03R, MW-04 through MW-08, MW-09R, MW-10, MW-13, MW-14, MW-16, MW-20 through MW-24, MW-25R, MW-26, MW-27, MW-28, MW-32, MW-33, MW-35, MW-38 through MW-46, MW-47R, MW-48 through MW-55, MW-57, MW-58, MW-61, MW-62, MW-63R, MW-64 through MW-66, MW-68, MW-69, MW-71 through MW-74, MW-78 through MW-81, MW-83 through MW-87, RC-MW-01, RC-MW-02, and RC-MW-03 were sampled. These wells were sampled on a quarterly basis and submitted to Origins Laboratory for analysis of BTEX, naphthalene, 1,3,5-trimethylbenzene, and 1,2,4- trimethylbenzene.

During source excavation activities, monitoring activities were completed on "on-plan wells", where applicable.

Wells destroyed during excavation activities are scheduled for replacement in July 2024. Monitoring wells MW-01 through MW-93 and RC-MW-01 through RC-MW-03 will be replaced, as needed. Additionally, monitoring well MW-94 will be installed cross-gradient to the east of MW-02. All monitoring wells will be sampled on a quarterly basis with samples analyzed for BTEX, naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260, chloride and sulfate anions by EPA Method 300.0, and total dissolved solids (TDS) by Method SM 2540C.

# REMEDIATION 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 Quarterly Groundwater Monitoring Reports and Source Excavation Summary \_\_\_\_\_

## 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 ECMC rules. Records are available on the ECMC's website.

Operator anticipates the remaining cost for this project to be: \$ 650000

## WASTE DISPOSAL INFORMATION

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

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

No beneficial use

Volume of E&P Waste (solid) in cubic yards 24320

E&P waste (solid) description E&P solid waste derived from excavation activities.

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

Non-ECMC Disposal Facility: Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels 2870

E&P waste (liquid) description E&P liquid waste derived from excavation activities.

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

Non-ECMC Disposal Facility: Republic Landfill

# REMEDIATION COMPLETION REPORT

## REMEDIATION 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? No

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

Does Groundwater meet Table 915-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

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 ECMC 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. 12/19/2018

Proposed date of completion of Reclamation. 10/31/2030

## 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. 01/29/2021

Actual Spill or Release date, or date of discovery. 12/05/2018

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/04/2018

Proposed site investigation commencement. 12/04/2018

Proposed completion of site investigation. 07/31/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/19/2018

Proposed date of completion of Remediation. 11/30/2027

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:

Estimated completion of remediation date extended to account for AS/SVE system operation and post-remediation monitoring.

**OPERATOR COMMENT**

Per conversations between ECMC and Operator, please route review to EPS Krystal Heibel.

Grading and seeding activities were completed at the site in 2Q24. Therefore, quarterly groundwater monitoring was not completed at that time due to health and safety concerns and limited site access.

Wells destroyed during excavation activities are scheduled for replacement in July 2024. During monitoring well replacement activities, soil borings will be logged and a soil sample will be collected from the capillary fringe or interval of most probable impact of each boring for full ECMC Table 915-1 analysis. Additionally, soil samples will be collected adjacent to the remaining monitoring wells at the site for full ECMC Table 915-1 analysis.

All monitoring wells at the site will be sampled on a quarterly basis with samples analyzed for BTEX, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, chloride and sulfate anions, and total dissolved solids.

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

Signed: Grace Congdon

Title: Environmental Consultant

Submit Date: 07/10/2024

Email: cvxeform@eagle-enviro.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: Abdul Elnajdi

Date: 08/05/2024

Remediation Project Number: 12591

**COA Type****Description**

COA Type	Description
0 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**

403848761	FORM 27-SUPPLEMENTAL-SUBMITTED
403848803	MONITORING REPORT
403848804	MONITORING REPORT
403848805	MONITORING REPORT
403849436	REMEDATION PROGRESS REPORT
403849438	SITE INVESTIGATION REPORT
403849439	SITE INVESTIGATION PLAN

Total Attach: 7 Files

**General Comments****User Group****Comment****Comment Date**

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)