FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Document Number: 401256705
Receive Date: 04/13/2017
Report taken by: BOB CHESSON

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 COGCC 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.
Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

Name of Operator: NOBLE ENERGY INC Operator No: 100322
Address: 1625 BROADWAY STE 2200
City: DENVER State: CO Zip: 80202
Contact Person: Jacob Evans Email: jacob.evans@nblenergy.com

Phone Numbers
Phone: (970) 3045329
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9870 Initial Form 27 Document #: 200440418

PURPOSE INFORMATION

- [x] 901.e. Sensitive Area Determination
- [ ] 909.c.(1), Rule 905: Pit or PW vessel closure
- [x] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [x] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [ ] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [ ] Other

SITE INFORMATION

N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: SPILL OR RELEASE Facility ID: 447161 API #: County Name: WELD
Facility Name: SPILL/RELEASE POINT Latitude: 40.295914 Longitude: -104.570827
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWSE Sec: 20 Twp: 4N Range: 64W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications: SW
Most Sensitive Adjacent Land Use: NON CROP LAND
Is domestic water well within 1/4 mile? Yes
Is surface water within 1/4 mile? Yes
Is groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Residence 0.2 miles NE

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [x] Produced Water
  - [x] Oil
  - [x] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	See Site Monitoring Data Report	Lab sample analysis
Yes	SOILS	See Site Monitoring Data Report	Lab sample 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 well was shut in, the flowline was repaired, and site assessment activities were conducted to determine the nature and extent of impacted material. Site assessment activites conducted on July 29, 2016 included soil and groundwater sampling in the area of the suspected flowliine release. Site assessment activities conducted on August 11, 2016 included soil sampling from soil borings and subsequent groundwater sampling from temporary monitoring wells. Refer to Spill/Release Report Document # 401088741 (Initial) and # 401092025 (Supplemental). COGCC issued spill tracking # 447161 for this release.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

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

Thirty six (36) soil samples were collected during site investigation and excavation activities and submitted under proper chain of custody to a certified laboratory for analysis of TPH-DRO, TPH-GRO, BTEX, and Naphthalene and analyzed by EPA Methods 8015 and 8260b.

Proposed Groundwater Sampling

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

Seventeen (17) groundwater samples were collected as part of site investigation and excavation activities and submitted to a certified laboratory under proper chain of custody and analyzed by EPA Method 8260b.

Proposed Surface Water Sampling

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

Additional Investigative Actions

- [x] Additional alternative investigative actions described in attached Site Investigation Plan (summary):

Quarterly groundwater monitoring will occur until four consecutive quarters of COGCC Table 910-1 compliant groundwater is achieved.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected: 36
Number of soil samples exceeeding 910-1: 13
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet): 5500

NA / ND

-- Highest concentration of TPH (mg/kg): 8200
NA Highest concentration of SAR:
BTEX > 910-1: Yes
Vertical Extent > 910-1 (in feet): 7

Groundwater

Number of groundwater samples collected: 17
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet): 7`
Number of groundwater monitoring wells installed: 16
Number of groundwater samples exceeding 910-1: 7

-- Highest concentration of Benzene (µg/l): 3500
-- Highest concentration of Toluene (µg/l): 1800
-- Highest concentration of Ethylbenzene (µg/l): 380
-- Highest concentration of Xylene (µg/l): 4400
NA Highest concentration of Methane (mg/l):

Surface Water

0 Number of surface water samples collected
0 Number of surface water samples exceeding 910-1
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?

☐ 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?

Subsequent to excavation activities, additional temporary monitoring wells will be installed to delineate dissolved phase impacts.

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.

Soil samples collected from borings BH01 through BH07 (Figure 3) indicated TPH concentrations are present in the vadose zone above COGCC Table 910-1 soil standards. Soil borings BH08 through BH16 indicate that soil impacts extend approximately 20 to 30 feet from the release location in all directions. Excavation of impacted soil above COGCC standards has been completed.

REMEDIATION 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.

1,160 cubic yards of impacted soil above COGCC Table 910-1 standards have been removed during excavation activities. 13 monitoring wells have been installed to delineate the dissolved BTEX plume. Currently the plume is stable and will be monitored on a quarterly basis to ensure concentrations of BTEX are decreasing.

Soil Remediation Summary

☐ **In Situ**

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

☒ **Ex Situ**

- Yes Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) 1160
  - Name of Licensed Disposal Facility or COGCC Facility ID # ____
- No 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.

Thirteen post excavation groundwater monitoring wells were installed and will be sampled for BTEX by EPA method 8260b on a quarterly basis. BH02R, BH03R, BH05R, BH07R, BH08R, BH09R, BH10R, BH11, BH12, BH13R, BH14, BH15, and BH16 are currently on the monitoring program and may be reduced contingent on lab analytical.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: [X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other

Report Type: [X] Groundwater Monitoring [ ] Land Treatment Progress Report [ ] O&M Report

[X] Other Site Investigation and Excavation Reports

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 reuse

Volume of E&P Waste (solid) in cubic yards 1160

E&P waste (solid) description Impacted soil above COGCC Table 910-1 standards.

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Buffalo Ridge Landfill

Volume of E&P Waste (liquid) in barrels 110

E&P waste (liquid) description Impacted groundwater above COGCC standards

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Republic Services Disposal Facility

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

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

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface?

Does Groundwater meet Table 910-1 standards? No

Is additional groundwater monitoring to be conducted? Yes

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.

After remediation and monitoring activities are completed, reclamation will be completed in compliance with COGCC Rule 1004. Monitoring wells wells will be properly plugged and abandoned once a NFA determination is achieved for the project.

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 approve the seed mix?

If NO, does the seed mix comply with local soil conservation district recommendations?

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required.

Actual Spill or Release date, if known. 08/02/2016

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date).

Date of commencement of Site Investigation. 07/29/2016

Date of completion of Site Investigation. 08/11/2016

REMEDIAL ACTION DATES

Date of commencement of Remediation. 01/24/2017

Date of completion of Remediation.

SITE RECLAMATION DATES

Date of commencement of Reclamation. 01/30/2017

Date of completion of Reclamation.

OPERATOR COMMENT

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

Signed:` Jacob Evans

Title: Environmental Coordinator

Submit Date:` 04/13/2017

Email: jacob.evans@nblenergy.com

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

COGCC Approved: BOB CHESSON

Date: 04/13/2017

Remediation Project Number: 9870

COA Type	Description

Attachment Check 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
401256705	FORM 27-SUPPLEMENTAL-SUBMITTED
401258917	SITE INVESTIGATION REPORT
401258919	OTHER
401258922	MONITORING REPORT

Total Attach: 4 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)