

State of Colorado
Oil and Gas Conservation Commission

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403113734
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Report taken by:
Jason Kosola

Site Investigation and Remediation Workplan (Initial 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.

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

OPERATOR INFORMATION

Name of Operator: <u>PDC ENERGY INC</u>	Operator No: <u>69175</u>	Phone Numbers
Address: <u>1775 SHERMAN STREET - STE 3000</u>		Phone: <u>(303) 860-5800</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80203</u>		Mobile: <u>()</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillRemediation@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 24352 Initial Form 27 Document #: 403113734

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: LOCATION Facility ID: 478974 API #: _____ County Name: WELD

Facility Name: Bost Farm 9N-8C-L Latitude: 40.414642 Longitude: -104.827929

** correct Lat/Long if needed: Latitude: 40.414710 Longitude: -104.827990

QtrQtr: Lot2 Sec: 7 Twp: 5N Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 482131 API #: _____ County Name: WELD

Facility Name: Bost Farms Latitude: 40.414710 Longitude: -104.827990

** correct Lat/Long if needed: Latitude: _____ Longitude: _____

QtrQtr: SWNW Sec: 7 Twp: 5N Range: 66W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM

Most Sensitive Adjacent Land Use Agricultural

Is domestic water well within 1/4 mile? No

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

Surface Water: Boomerang Ditch - 1,070 feet NW; Occupied Building: 1,470' E; Livestock: 1,412' WSW; FWS Wetlands: 915' SW Freshwater Emergent Wetland (PEM1F); HPH Sensitive Wildlife Habitat: Rule 1202.c: 1,331' SE - Aquatic Native Species Conservation Area.

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 type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input type="checkbox"/> Condensate | <input type="checkbox"/> Pigging Waste | |
| <input checked="" 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	SOILS	Refer to Tables 1-4, Figures 1-2	Confirmation Soil Sampling

INITIAL ACTION SUMMARY

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

On May 4, 2022, a release was discovered at the Bost Farms Drill Pad. A vibrating mud line leak resulted in the release of approximately ten (10) BBLS of drilling fluid outside of secondary containment. Following the discovery, mitigation activities were immediately initiated and five (5) BBLS of drilling fluid were recovered. Additionally, 8 cubic yards (CY) of drilling fluid impacted soil was scraped and transported to the North Weld Waste Management facility with other drilling waste material under PDC waste manifest documentation.

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):

On June 9, 2022, one soil sample (SB06) was collected from the impacted source material between ground surface and 6 inches bgs and was submitted for laboratory analysis of the full COGCC Table 915-1 analytical suite. Analytical results indicated TPH compound concentrations were observed above the Protection of Groundwater SSL. Additionally, ten (10) soil samples (SB01-SB05 & SB07-SB11) were collected from the release area between 0-6 inches bgs to confirm the absence of petroleum hydrocarbon impacts. The confirmation soil samples were submitted for preliminary analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36). Analytical results indicated that organic compounds were observed below the applicable Table 915-1 protection of groundwater SSLs with the exception of soil samples SB05 & SB06 both collected at 6 inches bgs.

Proposed Groundwater Sampling

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

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):

Soil analytical results are summarized in Table 1-4. GPS coordinates and PID readings for the soil samples collected during confirmation sampling activities are summarized in Table 5. Soil sample locations are illustrated on Figure 1 and Figure 2. Proposed soil boring locations are illustrated on Figure 3. The laboratory analytical reports are included in Attachment A. Field notes & photo log are included in Attachment B

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil	NA / ND
Number of soil samples collected 11	-- Highest concentration of TPH (mg/kg) 26430

Number of soil samples exceeding 915-1 2 -- Highest concentration of SAR 0.181

Was the areal and vertical extent of soil contamination delineated? No BTEX > 915-1 No

Approximate areal extent (square feet) 1610 Vertical Extent > 915-1 (in feet) 1

Groundwater

Number of groundwater samples collected 0 Highest concentration of Benzene (µg/l) _____

Was extent of groundwater contaminated delineated? No Highest concentration of Toluene (µg/l) _____

Depth to groundwater (below ground surface, in feet) _____ Highest concentration of Ethylbenzene (µg/l) _____

Number of groundwater monitoring wells installed _____ Highest concentration of Xylene (µg/l) _____

Number of groundwater samples exceeding 915-1 _____ 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?

On July 28, 2022, three (3) background soil samples (BKG01, BKG02, BKG03) were collected from native material adjacent to the release location. Soil samples were collected between ground surface and 6 inches bgs and were submitted for laboratory analysis of pH, arsenic and selenium. Laboratory analytical results are currently pending. Native Material soil sample locations are illustrated on Figure 2

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?

Up to seven (7) soil borings will be advanced to vertically and horizontally delineate impacts within and adjacent to the release extent to evaluate COC concentrations in native soil. Confirmation sampling will be completed by the end of the fourth quarter 2022. The proposed soil boring locations are illustrated on Figure 3.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Following the release, five (5) BBLs of drilling fluid were recovered. Additionally, 8 cubic yards (CY) of drilling fluid impacted soil was scraped and transported to the North Weld Waste Management facility with other drilling waste material under PDC waste manifest documentation.

REMEDATION 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.

A remediation strategy will be selected following the evaluation of soil analytical results.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ Air sparge / Soil vapor extraction

_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ 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.

Groundwater was not encountered during mitigation or delineation activities conducted between May 4 and June 9, 2022, at the Bost Farms Drill Pad.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other Release Response, Confirmation Sample Summary, & Supplemental Site Investigation Plan

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 Release Response, Confirmation Sample Summary, & Supplemental Site Investigation 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.

Operator does not have site-specific financial assurance for this project; however, Operator has inactive well, blanket, and surface bonding including Surety IDs 106077122, 106473808, and 106473820, as well as commercial general liability and/or umbrella/excess insurance meeting the requirements of Rule 705.b. Operator does not anticipate making an insurance claim for this project.

- Source mass removal activities have been completed
- Investigation and delineation is ongoing for organics and inorganics in soil.

Costs included herein are estimates only and may change over time based on numerous factors. Accordingly, Operator makes no guarantees as to the accuracy of such cost estimates, thus providing an estimate for the next year below.

Operator anticipates the remaining cost for this project to be: \$ 15000

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 8

E&P waste (solid) description Drilling fluid impacted soils

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Waste Management Facility

Volume of E&P Waste (liquid) in barrels 5

E&P waste (liquid) description Drilling fluid

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Waste Management Facility

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.

The Bost Farms Drill Pad is an active facility and there are no current plans for decommissioning or reclamation activities.

Is the described reclamation complete? _____

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. _____

Proposed date of completion of Reclamation. _____

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. _____

Actual Spill or Release date, or date of discovery. 05/04/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/04/2022

Proposed site investigation commencement. 10/01/2022

Proposed completion of site investigation. 12/31/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/04/2022

Proposed date of completion of Remediation. 07/22/2027

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:

OPERATOR COMMENT

Following the approval of this form and designation of a Form 27 Remediation Project Number, a Supplemental Form 19 Closure Request will be submitted indicating work will be proceeding under an approved Form 27 (Rule 912.c). Subsequently, PDC will conduct a supplemental site investigation at the Bost Farms Drill Pad to vertically and horizontally delineate remaining petroleum hydrocarbon impacts observed in the confirmation soil samples SB05 and SB06 collected at 0-6 inches bgs. Confirmation sampling activities will be summarized in a forthcoming Supplemental Form 27. Additionally, laboratory analysis of soil samples collected from native material is pending. Following the receipt of the remaining Table 915-1 laboratory results, PDC will be submitting an analyte reduction request for the director approval based on the constituents identified in the sample collected from the source material.

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

Signed: Karen Olson

Title: Senior Program Manager

Submit Date: 08/02/2022

Email: COGCCSpillRemediation@pdce.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: Jason Kosola

Date: 08/03/2022

Remediation Project Number: 24352

Condition of Approval**COA Type****Description**

	<p>913.e.(3) Reporting Schedule In accordance with Rule 913.e.(3), Operator will adopt a quarterly reporting schedule. COGCC selected Quarterly under Remediation Progress Update.</p>
1 COA	

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**

403113734	FORM 27-INITIAL-SUBMITTED
403122959	SOIL SAMPLE LOCATION MAP
403122960	SOIL SAMPLE LOCATION MAP
403122961	SITE INVESTIGATION PLAN
403122962	ANALYTICAL RESULTS
403122963	PHOTO DOCUMENTATION

Total Attach: 6 Files

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

Environmental	Added Spill 482131 to facility list.	08/03/2022
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Total: 1 comment(s)