

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203

Phone: (303) 894-2100 Fax: (303) 894-2109



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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.

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>
Contact Person: <u>Karen Olson</u>	Email: <u>tasfillremediationcontractor@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17686 Initial Form 27 Document #: 402645693

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: <u>LOCATION</u>	Facility ID: <u>327335</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>FLACK-64N64W 3NENW</u>		Latitude: <u>40.347386</u>	Longitude: <u>-104.537884</u>
		** correct Lat/Long if needed: Latitude: <u>40.347633</u>	Longitude: <u>-104.537850</u>
QtrQtr: <u>NENW</u>	Sec: <u>3</u>	Twp: <u>4N</u>	Range: <u>64W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Agriculture

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

Nearest Well: Domestic – 1,065 feet SE, Surface Water: Irrigation ditch – 321 feet N, Occupied Buildings: 153 feet NE, Livestock: 586 feet NE, FWS Wetlands: Riverine habitat – 321 feet N

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 1-5 & Figures 1-4	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 17, 2021, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the Flack 21-3 Tank Battery (Figure 1). Based on initial results, it was determined that a historic release was discovered below the former produced water vessel. Following the discovery, mitigation activities were initiated to delineate and remove remaining hydrocarbon impacts. Approximately 4,743.5 cubic yards (CY) of impacted material were removed and transported to the North Weld Waste Management Landfill and Buffalo Ridge Landfill for disposal under PDC manifests.

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 May 17, 2021, one soil sample (SS01) was collected from the source area at approximately 9 feet below ground surface (bgs) and submitted to Summit Scientific Laboratories for analysis of the full COGCC Table 915-1 analyte list. Preliminary analytical results indicate that contaminants of concern (COCs) include BTEX, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, naphthalene (N), TPH, anthracene, benzantracene, chrysene, fluorene, 1-methylnaphthalene (M), and 2-M. Between May 17 and June 15, 2021, sixty-one (61) soil samples (SS02-SS57, SS59-SS63) were collected from the sidewalls and base of the excavation at depths ranging from 9 to 16 feet bgs and were submitted for laboratory analysis of the above referenced organic COCs. In addition, one sample (SS58) was collected at 2.5 feet bgs and submitted for Table 915 soil suitability constituents. The excavation and sample locations are illustrated on Figure 2. Analytical results are summarized in tables 1 through 5, included in attachment A.

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):

On March 29, 2022, twelve background soil samples (BKG02-BKG04) were collected at approximately 2.5 feet, 5 feet, 9 feet, and the soil boring terminus, respectively, from native material adjacent to the former tank battery and were submitted for analysis of Table 915-1 Metals. Analytical results indicated that arsenic and selenium concentrations were in exceedance of the Table 915-1 Protection of Groundwater SSLs in native soils. Based on these results, the arsenic exceedances observed in soil sample SS01 is within 1.25x the background concentrations and indicative of native soil conditions, as referenced in footnote 11 of the Table 915-1. The barium and selenium concentrations observed in soil sample SS01 are in exceedance of the applicable regulatory standard. The soil boring locations are illustrated on Figure 3.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 65

Number of soil samples exceeding 915-1 1

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

Approximate areal extent (square feet) 8063

NA / ND

-- Highest concentration of TPH (mg/kg) 8940

-- Highest concentration of SAR 6.18

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 16

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

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)

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?

Between May 17, 2021 and June 15, 2021, two background soil samples (BKG01) were collected at approximately 2.5 feet and 9 feet bgs, respectively, and submitted for analysis of SAR and the COGCC Table 915-1 metals. Analytical results indicated that SAR, arsenic, and selenium were in exceedance of the applicable regulatory standards in native soil.

Additionally, on March 29, 2022, twelve background soil samples (BKG02-BKG04) were collected at approximately 2.5 feet, 5 feet, 9 feet, and the soil boring terminus, respectively, and were submitted for analysis of Table 915-1 Metals. Analytical results indicated that arsenic and selenium concentrations were in exceedance of the Table 915-1 Protection of Groundwater SSLs in native soils. Based on these results, the arsenic exceedances observed in soil sample SS01 is within 1.25x the background concentrations and indicative of native soil conditions, as referenced in footnote 11 of the Table 915-1.

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

Volume of solid waste (cubic yards) 4743

Volume of liquid waste (barrels) 15

☒ Is further site investigation required?

Fifteen (15) additional soil borings will be advanced to delineate the vertical and horizontal extent of the barium and selenium exceedances observed in excavation soil sample SS01 @ 9'. Volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded for each borehole. Soil samples from the seven soil borings within the former excavation extent will be collected at approximately 16-17' feet bgs. Soil samples from the eight soil borings surrounding the former excavation extent will be collected from each soil boring at 9 feet and 15 feet bgs. All soil samples collected will be submitted for laboratory analysis of barium and selenium. The proposed soil boring locations are illustrated on figure 4.

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.

Between May 17 and June 15, 2021, approximately 4,743.5 cubic yards of impacted material were excavated adjacent to the tank battery and transported to the Buffalo Ridge Landfill for disposal under PDC waste manifests.

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.

Based on the analytical results collected during supplemental site investigation activities conducted on March 29, 2022, additional supplemental site investigation activities are required to delineate the barium and selenium exceedances observed in SS01 @ 9'. A remediation strategy will be determined following the receipt of soil analytical results.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____ 4743

_____ 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.

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 Timeline Update

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.

- Investigation and delineation has been completed in soil for organic compounds.
- Source mass removal has been completed.
- Additional site investigation will be conducted to delineate barium and selenium exceedances.
- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the COGCC 1000 Series.

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 4743

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Buffalo Ridge Landfill and North Weld Waste Management Facility

Volume of E&P Waste (liquid) in barrels 15

E&P waste (liquid) description Surface water from irrigation activities

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: NGL C6

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? _____

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 COGCC 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.

Following tank battery decommissioning activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with the COGCC 1000 series

Is the described reclamation complete? Yes _____

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. 05/17/2021

Proposed date of completion of Reclamation. 10/31/2027

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. 01/11/2021

Actual Spill or Release date, or date of discovery. 05/18/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/15/2021

Proposed site investigation commencement. 11/14/2022

Proposed completion of site investigation. 11/15/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/17/2021

Proposed date of completion of Remediation. 10/31/2027

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

This document was prepared in order to satisfy the June 3, 2022 COGCC issued comment (document # 403039219) stating: Per Rule 913.d.(2) Operator shall submit a Supplemental Form 27 with an updated Implementation Schedule at least 14 days in advance of any schedule changes.

PDC will conduct a supplemental site investigation at the Flack 21-3 Tank Battery on November 14 and 15, 2022, to delineate the horizontal and vertical extents of the Table 915-1 barium and selenium exceedances observed in soil sample SS01 @ 9'. Supplemental form 27s will be prepared and submitted on a quarterly schedule to provide updates and progress of the remediation until closure criteria has been achieved.

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: 10/31/2022

Email: taspillremediationcontractor@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: BOB CHESSON

Date: 11/08/2022

Remediation Project Number: 17686

COA Type

Description

0 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

403212953	FORM 27-SUPPLEMENTAL-SUBMITTED
403212968	ANALYTICAL RESULTS
403212969	LOGS
403212971	SOIL SAMPLE LOCATION MAP

Total Attach: 4 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)