

State of Colorado
Oil and Gas Conservation Commission

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



Document Number:
403062086
Receive Date:
07/11/2022

Report taken by:
Taylor Robinson

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 Phone: <u>(303) 860-5800</u> Mobile: <u>()</u>
Address: <u>1775 SHERMAN STREET - STE 3000</u>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillRemediation@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 21589 Initial Form 27 Document #: 402902806

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>329872</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>MCLEOD-64N66W 29NESE</u>	Latitude: <u>40.281146</u>	Longitude: <u>-104.794021</u>	
	** correct Lat/Long if needed: Latitude: <u>40.282597</u>	Longitude: <u>-104.795100</u>	
QtrQtr: <u>NESE</u>	Sec: <u>29</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Residential / Agricultural
 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? No

Other Potential Receptors within 1/4 mile

Nearest Well: Other - 920' WSW / Irrigation - 1,255' WNW; Surface Water: Irrigation Ditch - 920' E; Occupied Building: 750' E; FWS Wetlands: 1,130' SE
Freshwater Pond (PUBFx).

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	SOILS	Refer to Tables 1-5 & 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 March 21, 2022, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the McLeod 29-41 Tank Battery (Figure 1). Based on initial results, it was determined that a historic release was discovered below the former produced water vessel (PWV). Following the discovery, mitigation activities were initiated to delineate and remove remaining hydrocarbon impacts. Approximately 229 cubic yards (CY) of impacted material were removed and transported to the North Weld Waste Management Facility 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):

Between March 24 and April 11, 2022, three (3) soil samples (PWV01-W, SS01, and SS03) were collected from impacted source material adjacent to and below the PWV between approximately 5 feet and 21 feet bgs. The samples were submitted for laboratory analysis of the full COGCC Table 915-1 analyte suite. Laboratory analytical results from the PWV source area indicated COCs include BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36), fluorene, 1-M, and 2-M. Between March 24 and April 11, 2022, two (2) soil samples (SS02 & SS04) were collected from the base of the excavation at a depths of 16 and 25 feet bgs and submitted for laboratory analysis of BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, TPH (C6-C36). SS04 was submitted for additional analysis of fluorene, 1-M, & 2-M. Final analytical results for the soil sample collected from the base of the excavation indicate that organic concentrations are in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater SSLs in SS04.

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):

During initial decommissioning activities conducted on March 21, 2022, soil encountered on-site and below production equipment was visually inspected and field screened for VOC concentrations using a PID. Per the approved proposed soil sampling plan, one soil sample (SEP01-DL) was collected adjacent to the separator dumpline risers, one sample (SEP01-FL) was collected beneath beneath the flowline riser at the separator, and one sample (AST01) was collected adjacent to the above ground storage tank. Additionally, one grab soil sample (ECD01 @ 0-6") was collected adjacent to the ECD and field screened for VOCs using a PID. Soil samples SEP01-DL, SEP01-FL, and AST01 were submitted for lab analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36). Analytical results indicated that organic compounds were in compliance with the applicable COGCC Table 915-1 Protection of Groundwater SSLs in all three soil samples collected. The soil sample locations are illustrated on Figure 1.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 8
Number of soil samples exceeding 915-1 5
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 525

NA / ND

-- Highest concentration of TPH (mg/kg) 3220
-- Highest concentration of SAR 1.8
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 25

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?

On March 21, 2022, two (2) background soil samples (BKG01) were collected at approximately 2.5 feet and 5 feet bgs from native material topographically up-gradient of the tank battery. All background soil samples were submitted for analysis of COGCC Table 915-1 metals. Analytical results indicated that arsenic, barium, and selenium were in exceedance of the applicable regulatory standards in native soil. Based on these results, arsenic and selenium exceedances observed in soil sample PWV01-W, SS01, and SS03 are 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) 229 Volume of liquid waste (barrels) 0

Is further site investigation required?

During initial site investigative activities, deep soil impacts in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater Soil Screening Levels (SSLs) were discovered below 25 feet bgs. Due to the depth of the remaining impacts, source mass removal activities were discontinued.

At the end of 2022 agricultural season PDC will work with the landowner to identify preference for next steps of the investigation, which could either consist of installing borings for delineation or immediately advancing to supplemental excavation activities. Investigation / excavation area is in a active field. If borings are the landowners next step preference, up to twelve (12) additional soil borings will be advanced to approximately 30 feet bgs in order to delineate the vertical and horizontal extent of the remaining hydrocarbon impacts. If continued excavation is the next step preference, soils will be screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded. Should groundwater be encountered during the soil investigation activities groundwater samples will be collected and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB and 1,3,5-TMB by EPA method 8260B in accordance with the Table 915-1. Supplemental site investigation activities will be completed by the end of the first quarter 2023 pending landowner approval. The proposed soil boring locations are illustrated on Figure 3.

A remediation strategy will be determined following supplemental site investigation activities.

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 March 11 and April 11, 2022, approximately 229 cubic yards of impacted material were excavated below and adjacent to the former PWV and transported to the North Weld Waste Management Facility in Ault, CO for disposal under PDC waste manifests.

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.

During initial site investigative activities, deep soil impacts in exceedance of the applicable COGCC Table 915-1 Protection of Groundwater Soil Screening Levels (SSLs) were discovered below 25 feet bgs. Due to the depth of the remaining impacts, source mass removal activities were discontinued. Up to twelve (12) additional soil borings will be advanced to approximately 30 feet bgs in order to delineate the vertical and horizontal extent of the remaining hydrocarbon impacts.

Analytical results are summarized in Tables 1-5. GPS coordinates and field screened VOC concentrations are summarized in Table 6. Field screening and laboratory sample locations are illustrated on Figures 1 and 2. The proposed soil boring locations are illustrated on Figure 3. The laboratory reports are included as Attachment A and the wellhead and flowline decommissioning field notes and photo logs are included in Attachment B.

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 initial decommissioning or confirmation sampling activities.

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 Confirmation Sample Summary, Analyte Reduction Request and Supplemental Site Investigation Proposal

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.

- Further soil investigation/delineation is required at the former tank battery.
- Further source mass removal is required.
- Location is in active farm field and next steps required landowner approval

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: \$ 115000

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 229

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Waste Management

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

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 supplemental source mass removal activities at the former tank battery location, the location will be 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. 03/21/2022

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. 09/24/2021

Actual Spill or Release date, or date of discovery. 03/21/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/07/2022

Proposed site investigation commencement. 10/01/2022

Proposed completion of site investigation. 12/31/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/21/2022

Proposed date of completion of Remediation. 06/09/2027

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 landowner approval, PDC will conduct a supplemental site investigation/ excavation activities to define the vertical and horizontal extents of the remaining hydrocarbon impacts discovered during the March 2022 decommissioning and subsequent April 2022 confirmation sampling activities.

Based on analytical results received from the three waste characterization samples collected (PWV01-W, SS01, and SS03), PDC is requesting that the contaminants of concern (COCs) for this historic release at the McLeod 29-41 tank battery be reduced to the following: BTEX, naphthalene, TPH (C6-C36), 1,2,4-TMB, 1,3,5-TMB, fluorene, 1-M, and 2-M.

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: 07/11/2022

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: Taylor Robinson

Date: 02/13/2023

Remediation Project Number: 21589

COA Type

Description

	Operator did not provide analytical data for all Table 915-1 constituents therefore COGCC cannot approve the analyte reduction request.
	If analytes are detected in the characterization sample, even if they are at a concentration below the Table 915-1 SSLs, confirmation samples should still include those detected analytes.
	If impacts are found Operator shall analyze soil and groundwater (if applicable) samples for complete Table 915-1 Contaminants of Concern until Operator has submitted sufficient characterization data to request and receive Director Approval of reduced list of contaminants of concern.
	Background samples from similar depths as the soil samples exceeding Table 915-1 Protection of Groundwater Soil Screening Level Concentrations are required. Background samples collected to date are not from depths similar to the excavation soil samples.
4 COAs	

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

403062086	FORM 27-SUPPLEMENTAL-SUBMITTED
403062203	SOIL SAMPLE LOCATION MAP
403074288	ANALYTICAL RESULTS
403074289	SOIL SAMPLE LOCATION MAP

Total Attach: 4 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
--	--	---------------------

Total: 0 comment(s)