

State of Colorado
Oil and Gas Conservation Commission

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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
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>taspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 20180 Initial Form 27 Document #: 402805525

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>WELL</u>	Facility ID: _____	API #: <u>123-27303</u>	County Name: <u>WELD</u>
Facility Name: <u>DUKE J 4-33</u>	Latitude: <u>40.425720</u>	Longitude: <u>-104.792730</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSW</u>	Sec: <u>4</u>	Twp: <u>5N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>LOCATION</u>	Facility ID: <u>332974</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>DUKE USX J-65N66W 4NWSW</u>	Latitude: <u>40.425710</u>	Longitude: <u>-104.792690</u>	
** correct Lat/Long if needed: Latitude: <u>40.425914</u>		Longitude: <u>-104.792047</u>	
QtrQtr: <u>NWSW</u>	Sec: <u>4</u>	Twp: <u>5N</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 School / Commercial

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

Tank Battery: Surface Water: Freshwater Pond - 129 feet NNW, Occupied Buildings: 450 feet SE, FWS Wetlands: Freshwater Pond (PUBFx) - 129 feet NNW

Wellhead: Nearest Well: Domestic - 1,405 feet SW, Surface Water: Freshwater Pond - 184 feet NNE, Occupied Buildings: 252 feet S / 584 feet SE, FWS Wetlands: Freshwater Pond (PUBFx) - 184 feet NNE

Conflict unlikely, but facility, wellhead, and flowline are all located < 500 feet from commercial storage structure and school (West Ridge Academy Charter)

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 1-4 & Figures 1-5	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 December 3, 2021, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the former Duke J 4-33 wellhead, associated flowline, and tank battery. During decommissioning activities, historic hydrocarbon impacts were discovered at the wellhead.

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 December 3, 2021, two soil samples (WH01 and FLR01) were collected adjacent to the cut and capped well casing and below the flowline riser at approximately 6 feet and 4 feet below ground surface (bgs), respectively. The samples were submitted for the Table 915-1 Organic Compounds in soil, TPH (C6-C36), and soil suitability for reclamation. Analytical results indicated that contaminants of concern (COC) include: TPH (C6-C36), COGCC Table 915-1 Organic Compounds, pH and SAR. Following the discovery of the release, soil sample FLR01 was additionally submitted for analysis of Table 915-1 metals. In addition, one soil sample (FLR01-01) was collected at approximately 6' bgs below the flowline at the halfway point and submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX) naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, and TPH (C6-C36).

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 closure activities conducted on December 3, 2021, soil encountered on-site and below production equipment was visually inspected and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). Per the approved proposed soil sampling plan, samples were collected adjacent to the cut and capped wellhead, between ground surface and 6 inches in the four cardinal directions surrounding the wellhead, below and/or adjacent to the separator flowline and in the cardinal directions of the dump line (SEP01-FL, SEP01-DL-[direction]), below the AST (AST01-AST06), and adjacent to the meter house (MH01). Nine (9) samples (SEP01-DL-B, SEP01-DL-N, SEP01-FL, and AST01-AST06) were submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36). In addition, the samples collected adjacent to the separator dumphline were submitted for laboratory analysis of pH, EC, SAR, and boron.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

NA / ND

Number of soil samples collected 27 -- Highest concentration of TPH (mg/kg) 700
 Number of soil samples exceeding 915-1 3 -- Highest concentration of SAR 6.79
 Was the areal and vertical extent of soil contamination delineated? Yes BTEX > 915-1 No
 Approximate areal extent (square feet) 315 Vertical Extent > 915-1 (in feet) 6

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 December 3, 2021, two background soil samples (BKG01) were collected up gradient from the wellhead at approximately 4 feet & 6 feet bgs, respectively, and submitted for analysis of pH, EC, SAR & the COGCC Table 915 -1 metals. Analytical results indicate arsenic, barium, & selenium were in exceedance of the applicable regulatory standards.
 Between October 3 & December 2, 2022, three soil borings (BKG02-BKG04) were advanced in native material topographically upgradient of the wellhead. Three soil samples collected at approximately 2.5 feet, 4 feet, and 8 feet bgs from BKG02. Three soil samples were collected at approximately 4 feet, 5 feet, and 8 feet bgs from BKG03. Four soil samples were collected at approximately 2.5 feet, 4 feet, 5 feet, and 6 feet bgs from BKG04. BKG02-BKG04 samples were submitted for analysis of Table 915-1 metals. Analytical results indicated that arsenic, barium, and selenium were observed in exceedance of the applicable regulatory standards in native soil.

Was investigation derived waste (IDW) generated as part of this investigation?
 Volume of solid waste (cubic yards) 55 Volume of liquid waste (barrels) 0

Is further site investigation required?

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 October 3 and 21, 2022, fifty-five (55) cubic yards of soil were removed from the location and transported to the North Weld Waste Management Facility for disposal under PDC waste manifests.

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.

Between October 3 and 21, 2022, seven (7) confirmation soil samples (SS01-SS05, SS10, and SS11) were collected from the base and sidewalls of the Duke J 4-33 wellhead excavation. Per the COA issued for Supplemental Form 27 (Document #402954637), all confirmation soil samples were submitted for the full COGCC Table 915-1 analytical suite. In addition, one soil sample (SS08) was collected from approximately 2.5 feet bgs and submitted for pH, EC, SAR, and boron analysis. Analytical results indicated that constituent concentrations were below the applicable COGCC Table 915-1 Protection of Groundwater SSLs in the soil samples collected from the final wellhead excavation extent with the exception of barium in soil sample SS05.

In addition, on December 2, 2022, four soil borings (SB01-SB04) were advanced adjacent to the wellhead excavation soil sample SS05 @ 4' in native material surrounding the former excavation extent via hand auger to vertically and horizontally delineate the barium exceedance recorded during excavation activities. All five soil borings were advanced to approximately 8 feet bgs. Lithologic descriptions and field screened VOC concentrations were collected using a PID in 1 foot intervals. Seven (7) soil samples were collected from soil borings SB01 through SB04 between 4 feet and 8 feet bgs. All soil samples were submitted for laboratory analysis of barium. Analytical results indicated barium were in compliance with Table 915-1 standards or indicative of native material conditions for all soil samples collected.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 55

_____ 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 decommissioning and 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

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.

- The project has been completed and no further assessment or remediation is required at this time.

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: \$ 1000

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 55

E&P waste (solid) description Hydrocarbon 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 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? Yes

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

Does Groundwater meet Table 915-1 standards? Yes

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 wellhead and flowline abandonment, tank battery decommissioning, and supplemental source mass removal 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. 12/03/2021

Proposed date of completion of Reclamation. 12/06/2023

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. 08/06/2021

Actual Spill or Release date, or date of discovery. 12/03/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/30/2021

Proposed site investigation commencement. 09/30/2021

Proposed completion of site investigation. 12/02/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/03/2021

Proposed date of completion of Remediation. 12/02/2022

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

Between October 3 and 21, 2022, supplemental source mass removal and confirmation sampling activities were conducted at the Duke J 4-33 wellhead to remove hydrocarbon impacted material and delineate impacts in accordance with the COGCC Table 915-1 standards. On December 2, 2022 a supplemental site investigation was conducted adjacent to the wellhead excavation to vertically and horizontally delineate the barium exceedance recorded during excavation activities. Additionally, between October 3 and December 2, 2022, soil borings were advanced in native material adjacent to the former Duke J 4-33 wellhead excavation extent to evaluate arsenic, barium and selenium concentrations in native material. Based on the results described herein, soil samples collected from the final excavation extent are below the applicable COGCC Table 915-1 Protection of Groundwater SSL, or are indicative of native material conditions as referenced in Footnote 11 of the Table 915-1. Therefore, PDC is requesting a No Further Action (NFA) determination for the Duke J 4-33 wellhead and associated flowline.

Additionally, analytical results indicated that constituent concentrations in all soil samples collected from the Duke J 4-33 tank battery were in compliance with COGCC Table 915-1 standards. As such PDC is requesting a No Further Action (NFA) determination for the Duke J 4-33 tank battery.

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: 12/06/2022

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: Taylor Robinson

Date: 12/14/2022

Remediation Project Number: 20180

COA Type

Description

	<p>Based on the information presented, it appears that no further remedial action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required.</p> <p>This no further action determination is limited to environmental remediation. Operator is required to comply with COGCC 1100 Series Rules for Flowline Regulations for all Flowline Abandonment activities and COGCC 400 Series Rules for Wellhead Plugging and Abandonment.</p> <p>The surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules. For locations with active ongoing oil and gas operations, comply with Rule 1003 interim reclamation requirements and for locations that will no longer have active oil and gas operations, comply with Rule 1004 Final Reclamation requirements.</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

403251233	FORM 27-SUPPLEMENTAL-SUBMITTED
403251414	SOIL SAMPLE LOCATION MAP
403251416	SOIL SAMPLE LOCATION MAP
403251421	PHOTO DOCUMENTATION
403251424	PHOTO DOCUMENTATION
403251793	SOIL SAMPLE LOCATION MAP
403251796	SOIL SAMPLE LOCATION MAP

403251797	SOIL SAMPLE LOCATION MAP
403251821	LOGS
403251935	ANALYTICAL RESULTS
403251938	ANALYTICAL RESULTS

Total Attach: 11 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)