

State of Colorado  
Oil and Gas Conservation Commission

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RICK ALLISON

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>	<b>Phone Numbers</b>
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 #: 10763 Initial Form 27 Document #: 401440234

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>331521</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>FOE-66N64W 20NWSE</u>	Latitude: <u>40.469140</u>	Longitude: <u>-104.571440</u>	
	** correct Lat/Long if needed: Latitude: <u>40.468490</u>	Longitude: <u>-104.564910</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>20</u>	Twp: <u>6N</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 Residential  
 Is domestic water well within 1/4 mile? Yes Is surface water within 1/4 mile? No  
 Is groundwater less than 20 feet below ground surface? Yes

**Other Potential Receptors within 1/4 mile**

FWS Wetlands are located approximately 718 feet south of the location. Occupied buildings are located approximately 115 feet south the location. There are no CPW Sensitive Wildlife Habitats identified within a 1/4-mile radius.

# 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 type="checkbox"/> Oil                       | <input type="checkbox"/> Tank Bottoms                |  |
| <input 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 1-4 and Figures 1-3	Excavation and sampling activities.

## 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 October 13, 2016, approximately 14 barrels of produced water were released within secondary containment at the Foe 33-20 tank battery. Upon discovery, the produced water dump line was shut in and spill response measures were completed. Between August 30 and September 7, 2017, approximately 1,360 cubic yards (CY) of impacted material were removed and transported to the North Weld Waste Management Facility for disposal under PDC waste manifests. Nine (9) soil samples (SS01-SS09) were collected from the sidewalls of the excavation at depths ranging between 12.5 and 13 feet bgs. Analytical results indicated that organic compounds were observed in exceedance of applicable COGCC Table 910-1 standards on the south sidewall of the excavation extent; however, excavation activities could not be continued as third-party infrastructure were still in place. Groundwater was encountered within the excavation at approximately 14.5 feet bgs. Approximately 134 barrels of groundwater was removed via vacuum trucks and transported to a licensed disposal facility. Analytical results from groundwater sample GW01 and subsequent groundwater samples collected from monitoring well BH01 indicated BTEX concentrations were below the applicable COGCC Table 910-1 groundwater standards.

## 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 August 23 and September 9, 2021, approximately 4,214 cubic yards of impacted material were removed and transported to the North Weld Waste Management Facility in Ault, Colorado for disposal under PDC waste manifests. One hundred three (103) soil samples (SS10 - SS90 and SS92 - SS113) were collected from the base and sidewalls of the final excavation extent at depths ranging between 12.5 and 19 feet bgs. Samples were submitted for laboratory analysis of the COGCC Table 915-1 Organic Compounds in Soils and TPH (C6-C36). Final analytical results received for the final excavation extent indicated that organic compound concentrations were in exceedance of the applicable COGCC Table 915-1 regulatory standards in soil samples SS65, SS69, and SS73. In addition, one soil sample (SS91) was collected at a depth of approximately 2.5 feet bgs and submitted for laboratory analysis of soil suitability for reclamation.

### 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 ):

Per correspondence with the COGCC, overburden material was stock piled on the surface in 500 cubic yard piles and subsequently sampled using a five point composite sampling method. Between August 26, and September 3, 2021, seven (7) composite samples (CS01 - CS07) were collected from the overburden material and submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, pH, electrical conductivity (EC), sodium adsorption ratio (SAR), and boron. Analytical results indicated that organic compound concentrations were in compliance with the applicable COGCC Table 915-1 regulatory standards; however, pH was observed in exceedance of the applicable regulatory standard in five composite samples.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 103

Number of soil samples exceeding 915-1 9

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 11180

### NA / ND

-- Highest concentration of TPH (mg/kg) 1114

-- Highest concentration of SAR 0.0266

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 17

### 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

0 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 September 7, 2021, one background soil sample (BKG01) was collected from native material on site and submitted for laboratory analysis of pH. Analytical results indicated that pH was in compliance of the applicable COGCC Table 915-1 standard in native material.

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

Volume of solid waste (cubic yards) 4214

Volume of liquid waste (barrels) 0

Is further site investigation required?

Five (5) soil borings will be advanced via direct push drilling methods to the south of the excavation extent in order to delineate hydrocarbon impacted material in the vicinity of the residential structure on site. Soil samples will be collected from each soil boring at the interval exhibiting the highest volatile organic compound (VOC) reading utilizing a photoionization detector (PID) reading and at the terminus of each soil boring. Samples will be submitted for laboratory analysis Table 915-1 Organic Compounds in Soil, TPH (C6-C36).

Two (2) soil borings will be advanced topographically upgradient of the flowline in order to evaluate inorganic parameters in native material.

## 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 August 23 and September 9, 2021, approximately 4,214 cubic yards of impacted material were removed and transported to the North Weld Waste Management Facility in Ault, Colorado 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.

A remediation strategy will be developed to address the remaining hydrocarbon impacts located under the residential structure 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) \_\_\_\_\_ 4214

\_\_\_\_\_ 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 2021 excavation activities.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

Quarterly     Semi-Annually     Annually     Other    Supplemental Source Mass Removal Summary and Background Investigation Proposal

### 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    Supplemental Source Mass Removal Summary and Background Investigation Proposal

## 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    5574

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    136

E&P waste (liquid) description    Hydrocarbon impacted groundwater

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.

Due to pH exceedances observed in composite sampling of backfill material, further investigation is required to confirm pH levels in native soils on site. The proposed soil boring locations are illustrated on Figure 3. The excavation was backfilled and re-contoured to match pre-existing conditions and the third party underground infrastructure has been removed. The location will be reclaimed in accordance with the COGCC 1000 series.

Is the described reclamation complete?  Yes  No

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. 10/13/2016

Proposed date of completion of Reclamation. 01/05/2027

## 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. 11/04/2016

Actual Spill or Release date, or date of discovery. 10/13/2016

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/13/2016

Proposed site investigation commencement. 11/14/2016

Proposed completion of site investigation. 01/27/2022

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/30/2017

Proposed date of completion of Remediation. 01/05/2027

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**

Based on final analytical results from the final excavation extent and the close proximity of residential infrastructure, PDC will conduct a supplemental site investigation at the former Foe 33-20 tank battery to delineate remaining hydrocarbon impacted material and to evaluate soil suitability for reclamation in native material. This site investigation will be completed by the end of the first quarter 2022.

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: 01/06/2022

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: RICK ALLISON

Date: 01/25/2022

Remediation Project Number: 10763

**Condition of Approval****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**

402887737	FORM 27-SUPPLEMENTAL-SUBMITTED
402888035	PHOTO DOCUMENTATION
402896947	SOIL SAMPLE LOCATION MAP
402896950	SOIL SAMPLE LOCATION MAP
402896951	SITE INVESTIGATION PLAN
402917861	ANALYTICAL RESULTS

Total Attach: 6 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)