

State of Colorado  
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
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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: PDC ENERGY INC	Operator No: 69175	Phone Numbers Phone: (970) 313-5582 Mobile: ( )
Address: 1099 18TH STREET SUITE 1500		
City: DENVER	State: CO Zip: 80202	
Contact Person: Jason Davidson		
Email: ENspillremediationcontractor@pdce.com		

## PROJECT, PURPOSE &amp; SITE INFORMATION

## PROJECT INFORMATION

Remediation Project #: 30534 Initial Form 27 Document #: 403449064

## 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: WELL	Facility ID: _____	API #: 123-29164	County Name: WELD
Facility Name: MEYER 4	Latitude: 40.389926	Longitude: -104.792679	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNW	Sec: 21	Twp: 5N	Range: 66W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION	Facility ID: 332800	API #: _____	County Name: WELD
Facility Name: MEYER-65N66W 21NWNW	Latitude: 40.389930	Longitude: -104.792660	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNW	Sec: 21	Twp: 5N	Range: 66W Meridian: 6 Sensitive Area? Yes

## **SITE CONDITIONS**

General soil type - USCS Classifications SC

Most Sensitive Adjacent Land Use Residential

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**

Closest Domestic Well – 1560' SW

Nearest Surface Water – Loveland and Greeley canal and Boomerang Ditch – 35' E

Nearest Occupied Building – Hospital 220' NE

Additional Occupied Buildings – Residential buildings 420' S

No other potential receptors are located within ¼ mile of the Site

Above distances are approximations

# 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
No	GROUNDWATER	Not impacted	Not encountered
Yes	SOILS	Refer to Figure 3 and Tables 2-4	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.

In accordance with COGCC Rule 911, this form serves as notification for the decommissioning and abandonment of the Meyer 4 production facility, Meyer 4 wellhead, and removal of the associated flowlines. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. In addition, on-site dump lines located between the separator and tank battery will be removed by pulling from either end during decommissioning activities. Field observations and photo documentation will be recorded in a field inspection form for submittal to the COGCC.

## 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 ):

Soil samples will be collected from the surface in cardinal directions of the wellhead and grab soil samples will be collected below and/or adjacent to applicable facility equipment, as defined in the Rule 911.a.(4) guidance document (9/20/21), for field screening purposes. Discrete soil samples will be collected for laboratory analysis either in any area of observed hydrocarbon impacts, or in the sample locations designated by the COGCC. Soil samples will be collected adjacent to applicable facility equipment, the wellhead(s), and flowline riser(s) from native material and submitted for laboratory analysis BTEXN, TMB's, PAH, TPH (C6-C36), pH, EC, SAR, and boron by COGCC approved methods, with the exception of the sample(s) collected below the AST(s) which will be analyzed for BTEXN, TMB's, PAH's, and TPH (C6-C36). See the attached Figure 1 for an illustration of the facility layout and proposed soil sample locations.

### Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning and/or abandonment activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260.

### 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 ):

The produced water vessels were removed in 2017 under Remediation Project Number 12485, and granted closure on April 26, 2019, Form 27 Document Number 402020856. Assessments will be conducted during the removal of the on-location flowline (~90 feet in length). The flowline and adjacent sub-surface will be inspected for visual and olfactory indicators of potential failure and hydrocarbon impacts. Soils will be field screened below the flowline and if suspected impacts are observed, a soil sample will be collected and submitted for analysis of BTEXN, TMB's, PAH's, and TPH (C6-C36). If analytical results indicate the presence of organic compound concentrations, the sample will be analyzed for the full Table 915-1 suite.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 24  
Number of soil samples exceeding 915-1 3  
Was the areal and vertical extent of soil contamination delineated? No  
Approximate areal extent (square feet) 1669

### NA / ND

-- Highest concentration of TPH (mg/kg) 391  
-- Highest concentration of SAR 2.41  
BTEX > 915-1 Yes  
Vertical Extent > 915-1 (in feet) 8

### 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?

Six background samples were collected from 3 background soil borings (BKG01 - BKG03) from approximately 3 ft-bgs and 6 ft-bgs in areas away from oil and gas infrastructure and were submitted for analysis of arsenic, barium, cadmium, lead, selenium, pH, EC, SAR, and boron.

☐ 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?

## 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.

During facility closure activities, hydrocarbon impacted soils were discovered at the former separator dump line riser. The historic release was reported in Form 19 document number 403577077. A total of approximately 440 cubic yards of impacted soil was removed and hauled to Waste Management's North Weld Landfill in Ault, CO in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request.

## 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.

As described above, impacted soil has been removed leaving only residual concentrations of barium reported above ECMC Table 915-1 standards to be resolved.

Please refer to the Operator Comments section of this Form 27 for additional discussion.

## Soil Remediation Summary

☐ In Situ

☒ Ex Situ

☐ Bioremediation ( or enhanced bioremediation )  
☐ Chemical oxidation  
☐ Air sparge / Soil vapor extraction  
☐ Natural Attenuation  
☐ Other \_\_\_\_\_

☐ Yes    Excavate and offsite disposal  
☐ If Yes: Estimated Volume (Cubic Yards)    440  
☐ Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_  
☐ Excavate and onsite remediation  
☐ 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 site investigation and facility decommissioning 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 Remediation Progress Report

### 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 has been completed.

- PDC is requesting a reduced analyte list for additional soil sampling activities at the facility to include only barium.

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: \$ 45000

### 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 440

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Waste Management's North Weld  
Landfill in Ault, CO

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.

Reclamation will be conducted in accordance with ECOM 1004 Series Rules.

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. 10/31/2024

Proposed date of completion of Reclamation. 10/31/2026

## 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. 05/25/2023

Actual Spill or Release date, or date of discovery. 10/26/2023

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/25/2023

Proposed site investigation commencement. 10/25/2023

Proposed completion of site investigation. 05/31/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 10/25/2023

Proposed date of completion of Remediation. 05/31/2024

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 Form 27 serves as a reduced analyte request for excavation occurring at the former separator dump line riser at the Meyer 4 production facility. Two of the excavation confirmation soil samples (EX07@4 and EX16@4) collected from approximately 4 ft-bgs from the southwest and south sidewalls, respectively, reported barium concentrations above 1.25x the average background for barium (57.35 mg/kg).

Six background samples were collected from 3 background soil borings (BKG01 - BKG03) from approximately 3 ft-bgs and 6 ft-bgs from areas away from oil and gas infrastructure and were submitted for analysis of arsenic, barium, cadmium, lead, selenium, pH, EC, SAR, and boron by ECMC approved methods. Apart from excavation confirmation soil samples EX07@4 and EX16@4, analytical results for all facility closure confirmation samples submitted for analysis are compliant with Table 915-1 GWSSLs, below the highest background pH value (8.62), or below 1.25x the average background for arsenic (14.67 mg/kg), barium (57.35 mg/kg), lead (16.87 mg/kg), and selenium (0.77 mg/kg).

Lead and barium levels for Site samples and background samples were compared using the Wilcoxon Rank Sum Test, EPA Background Test Form2, with a null hypothesis that the lead and barium levels in Site samples are substantially higher than lead and barium levels in background samples. The test rejected the null hypothesis with 95% confidence ( $\alpha=0.5$ ) for lead concentrations, which supports the alternative hypothesis that the Site is not impacted. The test supports the null hypothesis for barium, which suggests that barium concentrations in the Site samples are greater than barium concentrations in the background samples.

Therefore, PDC respectfully requests a reduced analyte list for additional soil sampling activities at the facility to include only barium.

The details of the Wilcoxon Rank Sum Tests are presented in detail in the attached Lead Statistical Evaluation Summary and Barium Statistical Evaluation Summary.

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

Signed: Jason Davidson

Title: Senior Env. Specialist

Submit Date: 01/22/2024

Email: ENspillremediationcontractor@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: 02/01/2024

Remediation Project Number: 30534

## COA Type

## Description

	ECMC agrees to the Operator's request of a reduced analyte list for additional soil sampling activities at the facility to include only barium.
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

403658044	FORM 27-SUPPLEMENTAL-SUBMITTED
403658240	ANALYTICAL RESULTS
403658241	ANALYTICAL RESULTS
403658242	ANALYTICAL RESULTS
403658243	ANALYTICAL RESULTS
403658244	SITE MAP
403658245	SOIL SAMPLE LOCATION MAP
403658246	ANALYTICAL RESULTS
403658247	ANALYTICAL RESULTS
403658248	ANALYTICAL RESULTS

Total Attach: 10 Files

## General Comments



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

Total: 0 comment(s)