

State of Colorado
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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04/02/2024

Report taken by:

Krystal Heibel

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 ECMC 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
Address: 1099 18TH STREET SUITE 1500		Phone: (970) 313-5582
City: DENVER	State: CO	Zip: 80202
Contact Person: Jason Davidson	Email: ENspillremediationcontractor@pdce.com	Mobile: ()

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 31616 Initial Form 27 Document #: 403515500

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 #: 123-38694	County Name: WELD
Facility Name: Spaur Brothers EH 31-259HC	Latitude: 40.529522	Longitude: -104.471111	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NESE	Sec: 31	Twp: 7N	Range: 63W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL	Facility ID: _____	API #: 123-38696	County Name: WELD
Facility Name: Spaur Brothers EH 31-262HN	Latitude: 40.529439	Longitude: -104.471114	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NESE	Sec: 31	Twp: 7N	Range: 63W Meridian: 6 Sensitive Area? Yes

Facility Type: <u>SPILL OR RELEASE</u>		Facility ID: <u>485565</u>		API #: _____		County Name: <u>WELD</u>	
Facility Name: <u>Spaur Brothers EH 31-259HC</u>				Latitude: <u>40.529537</u>		Longitude: <u>-104.471116</u>	
** correct Lat/Long if needed: Latitude: _____ Longitude: _____							
QtrQtr: <u>NENE</u>	Sec: <u>31</u>	Twp: <u>7N</u>	Range: <u>63W</u>	Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

Facility Type: <u>SPILL OR RELEASE</u>		Facility ID: <u>485566</u>		API #: _____		County Name: <u>WELD</u>	
Facility Name: <u>Spaur Brothers EH 31-262HN</u>				Latitude: <u>40.529440</u>		Longitude: <u>-104.471119</u>	
** correct Lat/Long if needed: Latitude: _____ Longitude: _____							
QtrQtr: <u>NENE</u>	Sec: <u>31</u>	Twp: <u>7N</u>	Range: <u>63W</u>	Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

SITE CONDITIONS

General soil type - USCS Classifications <u>SM</u>	Most Sensitive Adjacent Land Use <u>Residential</u>
Is domestic water well within 1/4 mile? <u>Yes</u>	Is surface water within 1/4 mile? <u>No</u>
Is groundwater less than 20 feet below ground surface? <u>No</u>	

Other Potential Receptors within 1/4 mile

Wellhead:
Closest Domestic Well within quarter mile – 630' NNW
Additional Domestic Wells – 1195' SSE
Nearest Surface Water - None
Nearest Occupied Building – 735' SE
Additional Occupied Buildings – 580' NNW
Within Pronghorn Migration Corridors Buffer
Within Pronghorn Winter Concentration Buffer

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

Additional Flowline Receptors: None

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 Tables 2-4 & Figure 2-3	Excavation/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 ECMC Rule 911, this form serves as notification for the decommissioning and abandonment of the Spaur Brothers EH 31-259HC and 31-262HN Wellheads. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. Field observations and photo documentation will be recorded in a field inspection form for submittal to the ECMC.

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 wellheads, as defined in 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 adjacent to the cut and capped wellheads from native material and below the wellhead and separator flowline risers. Soil samples will be submitted for laboratory analysis of BTEXN, TMB's, PAH's, TPH (C6-C36), pH, EC, SAR, and boron by ECMC approved methods. See the attached Figure 1 for an illustration of the wellheads 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):

Assessments will be conducted during the in-place abandonment of the off-location flowlines (~230 feet in length) at significant direction changes, and in close proximity to sensitive habitats, such as wetlands, surface water crossings, and HPH boundaries. The subsurface adjacent to the abandoned flowlines will be field screened and inspected at the above referenced locations for any visual and olfactory indicators of potential failure and hydrocarbon impacts. If no apparent impacts are observed, samples will not be submitted for analysis. If suspected impacts are observed, a soil sample will be collected for an initial assessment and submitted for laboratory analysis of BTEXN, TMB's, PAH's, and TPH (C6-C36) by ECMC approved methods. If analytical results indicate the presence of organic compound concentrations, the sample will be analyzed for the full Table 915-1 suite. See the attached Figure 1 for an illustration of the flowline alignment and proposed soil sample locations.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 22

Number of soil samples exceeding 915-1 5

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

Approximate areal extent (square feet) 763

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

NA / ND

-- Highest concentration of TPH (mg/kg) 2230

-- Highest concentration of SAR 1.03

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 10

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?

Ten site-specific background samples were collected from 6 soil borings (BKG01-BKG06) from approximately 4 ft., 7 ft., and 9 ft-bgs in areas away from oil and gas infrastructure. Eight background soil samples (BKG01-BKG04) were submitted for analysis of EC, SAR, pH, arsenic, barium, cadmium, and selenium and background soil samples BKG05@9 and BKG06@9 were submitted for analysis of arsenic, barium, cadmium, and selenium by ECMC approved methods.

Please refer to the attached Facility Closure Investigation and Excavation Environmental Report for a summary of the background soil sampling activities conducted at the Site.

☐ 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?

PDC is currently in the process of evaluating barium and cadmium concentrations at the Site.

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.

On November 9, 2023, and January 23, 2024, excavation was conducted to remove the impacted soil at the former Spaur Brothers EH 31-262HN wellhead. Five confirmation soil samples (EX06 through EX10) were collected from approximately 7 ft-bgs and one confirmation soil sample (EX05@9.5) was collected from the floor of the excavation from approximately 9.5 ft-bgs. The final extent of the excavation was approximately 19 feet by 17 feet to a total depth of 9.5 ft-bgs. Approximately 110 cubic yards of presumably impacted soil were removed and hauled off site for disposal.

On November 9, 2023, and January 24, 2024, excavation was conducted to remove the impacted soil at the former Spaur Brothers EH 31-259HC wellhead. Five confirmation soil samples (2EX02 through 2EX04 and 2EX06 and 2EX07) were collected from the sidewalls of the excavation from approximately 7 ft-bgs and one confirmation soil sample (2EX05@10) was collected from the floor of the excavation from approximately 10 ft-bgs. The final extent of the excavation was approximately 22 feet by 20 feet to a total depth of 10 ft-bgs. Approximately 160 cubic yards of presumably impacted soil were removed and hauled off site for disposal.

In total, approximately 270 cubic yards of impacted soil was hauled offsite for disposal under PDC manifest to Waste Management's North Weld Landfill in Ault, Colorado in accordance with Rules 905 and 906. Copies of the waste manifests are available upon request.

Please refer to the attached Facility Closure Investigation and Excavation Environmental Report for a summary of the source removal activities conducted at the Site.

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.

Please refer to the Source Removal Summary section above and to the attached Facility Closure Investigation and Excavation Environmental Report for a summary of the source removal activities conducted at the Site.

Soil Remediation Summary

☐ In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

☒ Ex Situ

_____ Yes Excavate and offsite disposal

_____ If Yes: Estimated Volume (Cubic Yards) _____ 270

_____ Name of Licensed Disposal Facility or ECMC 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 excavation of the wellheads during cut and cap or excavation 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 Supplemental Site Investigation 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 is complete.
- Facility closure activities and confirmation soil sampling were conducted at the Spaur Brothers wellheads on November 9, and November 21, and December 11, 2023, and January 24, 2024, and excavation confirmation soil sampling activities were conducted on November 9, 2023, and January 23 and January 24, 2024.
- PDC is currently in the process of evaluating barium and cadmium concentrations at the Site.
- If additional excavation is necessary, PDC respectfully proposes a reduced analyte list to include only barium and cadmium.

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: \$ 10000

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 270

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable:

Non-ECMC 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

ECMC Disposal Facility ID #, if applicable:

Non-ECMC 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 ECMC 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 facility closure activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The location will be reclaimed in accordance with the ECMC 1000 series.

Is the described reclamation complete? 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. 10/31/2024

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. 08/02/2023

Actual Spill or Release date, or date of discovery. 11/14/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 11/09/2023

Proposed site investigation commencement. 11/09/2023

Proposed completion of site investigation. 09/30/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/09/2023

Proposed date of completion of Remediation. 11/09/2024

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:

Updated Proposed Completion of Site Investigation Date based on recently received laboratory data from background soil samples collected at the Site.

OPERATOR COMMENT

Hydrocarbon impacted soils were identified at each wellhead during facility closure activities. Excavation was conducted and the identified impacted soil was removed and transported offsite for disposal at a properly permitted waste disposal facility. All analytical results reported for excavation confirmation soil samples collected from the final extent of the excavations and initial facility closure confirmation soil samples were compliant with their applicable Table 915-1 GWSSLs, less than the highest pH background concentrations, or less than 1.25x highest background concentrations for metals except for barium in soil samples EX07@7, EX09@7, SS01@3, and SS02@1 and cadmium in soil sample EX05@9.5.

PDC is currently in the process of evaluating barium and cadmium concentrations at the Site. The results of the evaluation will be summarized in the next quarterly supplemental Form 27 submission. If additional excavation is necessary, PDC respectfully proposes a reduced analyte list to include only barium and cadmium.

Please refer to the attached Facility Closure Investigation and Excavation Environmental Report for a summary of initial facility closure and excavation activities conducted at the Site.

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

Signed: Jason Davidson

Title: Remediation Advisor

Submit Date: 04/02/2024

Email: ENspillremediationcontractor@pdce.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Krystal Heibel

Date: 06/12/2024

Remediation Project Number: 31616

COA Type

Description

0 COA	

ATTACHMENT 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

403734409	FORM 27-SUPPLEMENTAL-SUBMITTED
403734472	REMEDIATION PROGRESS REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

Environmental	"PDC is currently in the process of evaluating barium and cadmium concentrations at the Site. The results of the evaluation will be summarized in the next quarterly supplemental Form 27 submission. If additional excavation is necessary, PDC respectfully proposes a reduced analyte list to include only barium and cadmium."	06/12/2024
Environmental	ECMC agrees to the reduced analyte list to include only barium and cadmium.	06/12/2024

Total: 2 comment(s)