

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

Report taken by:

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>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillRemediation@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 18114 Initial Form 27 Document #: 402688392

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>WELL</u>	Facility ID: _____	API #: <u>123-17813</u>	County Name: <u>WELD</u>
Facility Name: <u>DINNER 14-B-1</u>		Latitude: <u>40.306339</u>	Longitude: <u>-104.747187</u>
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: <u>SESW</u>	Sec: <u>14</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 Agriculture

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

Nearest Well: Monitoring - 905 feet SE, Surface Water: Unnamed Irrigation Pond - 278 feet N, Occupied Building - 260 feet SW, Livestock - 1,180 feet W, FWS Wetlands - 278 feet N

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	GROUNDWATER	Refer to Table 4 & Figure 2	Confirmation Groundwater Sampling
Yes	SOILS	Refer to Tables 1-4 & Figure 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 July 15, 2021, field screening and confirmation soil sampling was conducted in accordance with the COGCC Rule 911 during the decommissioning and closure of the Dinner 14 B-1 Wellhead (Figure 1). During decommissioning activities, historic hydrocarbon impacts were discovered at the wellhead. Following the discovery, mitigation activities were initiated to delineate and remove remaining hydrocarbon impacts. Groundwater was encountered in the excavation at approximately 11 feet below ground surface (bgs). A total of 3,189.5 cubic yards (cy) of impacted material were excavated and transported to the North Weld Waste Management Facility for disposal under PDC waste 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):

On July 15, 2021, one soil sample (SS01) was collected from the impacted source material at approximately 10 feet bgs and was submitted for laboratory analysis of the full COGCC Table 915-1 analytical suite. Between July 30 and August 9, 2021, forty-five (45) soil samples (SS02-SS42 and SS44-SS47) were collected from sidewalls and base of the excavation at depths ranging from 5' to 20' bgs and were submitted for laboratory analysis of BTEX, 1,2,4-trimethylbenzene(TMB), 1,3,5-TMB, naphthalene(N), total petroleum hydrocarbons(TPH), fluorene, pyrene, 1-methylnaphthalene(M), and 2-M. In addition, one soil sample (SS43) was collected at approximately 2.5 feet bgs from the sidewall of the final excavation extent and submitted for laboratory analysis of pH, EC, SAR and boron. Analytical results indicated that constituent concentrations were below the applicable COGCC Table 915-1 Protection of Groundwater SSLs in all samples collected from the final excavation extent.

Proposed Groundwater Sampling

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

On July 19, 2021, one groundwater sample (GW01) was collected from the excavation and submitted for laboratory analysis of BTEX, N, 1,2,4-TMB, and 1,3,5-TMB. Analytical results indicated that benzene, 1,2,4-TMB and 1,3,5-TMB exceeded COGCC Table 915-1 standards. The groundwater sample location is illustrated on Figure 2 and the analytical results are summarized on Table 5.

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 July 15, 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 as well as between ground surface and 6 inches in the four cardinal directions surrounding the wellhead. Also, three field screened soil samples were collected adjacent to/below the flowline. In addition, three field screening sample locations were collected adjacent to/below the flowline. Sample locations collected during the initial decommissioning activities are illustrated on Figure 1.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 47
Number of soil samples exceeding 915-1 2
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 5640

NA / ND

-- Highest concentration of TPH (mg/kg) 1052
-- Highest concentration of SAR 2.27
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 20

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 11'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 915-1 1

-- Highest concentration of Benzene (µg/l) 12
ND Highest concentration of Toluene (µg/l)
-- Highest concentration of Ethylbenzene (µg/l) 34
-- Highest concentration of Xylene (µg/l) 280
NA 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 July 15, 2021, one background soil sample (BKG01) was collected at approximately 2.5 feet bgs and on August 9, 2021 three (3) background soil samples (BKG02) were collected from depths of 5 feet, 10 feet, and 18 feet bgs, respectively. All background soil samples were collected from native material topographically up-gradient of the wellhead and submitted for analysis of COGCC Table 915-1 metals. Analytical results indicated that arsenic and selenium were 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) 3190 Volume of liquid waste (barrels) 9685

☒ Is further site investigation required?

On October 18, 2021, eight (8) groundwater monitoring wells were installed via direct-push drilling methods to confirm the absence of dissolved-phase hydrocarbon impacts within and surrounding the former excavation extent. Lithologic descriptions and volatile organic compound (VOC) concentrations using a photoionization detector (PID) were recorded for each borehole. Per the Condition of Approval (COA) issued by the COGCC on October 7, 2021, one sample was collected from each borehole at depths ranging between 17 feet and 23 feet below ground surface (bgs). Additionally, due to elevated PID readings in borehole BH04, one sample was collected from the interval exhibiting the highest VOC concentration at 22-23 feet bgs, as well as, the terminus of the borehole at 29-30 feet bgs. Nine (9) soil samples were submitted to Summit Scientific Laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, total petroleum hydrocarbons (TPH)[C6-C36], fluorene, pyrene, 1-methylnaphthalene (M), 2-M, pH, electrical conductivity (EC), sodium adsorption ratio (SAR), and boron. Analytical results received for the samples collected during monitoring well installation activities indicated that constituent concentrations were in compliance with the applicable COGCC Table 915-1 regulatory standards.

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 July 15 and August 9, 2021, approximately 3,189.5 CY of impacted solids were removed from the excavation and transported to North Weld Waste Management Facility in Ault, Colorado for disposal under PDC waste manifests. Additionally, groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 9,685 barrels of groundwater were removed from the excavation and transported to the NGL C6 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.

Analytical results received from soil samples collected during monitoring well installation activities indicated that constituent concentrations were in compliance with the applicable COGCC Table 915-1 regulatory standards in all soil samples collected from boreholes BH01-BH08. Based on these results, monitored natural attenuation was selected as the remediation strategy during the fourth quarter 2021 and will remain the selected remediation strategy through the first quarter 2022.

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) 3190

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

Yes

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.

Based on the analytical data collected during source mass removal activities, PDC will conduct quarterly groundwater monitoring at the 8 site monitoring wells (BH01 - BH08) until closure criteria are met. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB by EPA Method 8260B in accordance with Table 915-1. Based on analytical results received from the fourth quarter 2021 groundwater monitoring event, total dissolved solids (TDS), and chloride and sulfate anions are in compliance with the applicable COGCC Table 915-1 groundwater standards.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

☒ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Confirmation Sampling Summary

☐ 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 Sampling Summary

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 3190

E&P waste (solid) description Non-Regulated Solids - E&P
Contaminated Soil

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: North Weld Waste Management
Facility

Volume of E&P Waste (liquid) in barrels 9685

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.

Following excavation 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. 07/15/2021

Proposed date of completion of Reclamation. 07/15/2026

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. 10/27/2020

Actual Spill or Release date, or date of discovery. 07/16/2021

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/03/2021

Proposed site investigation commencement. 07/15/2021

Proposed completion of site investigation. 10/18/2021

REMEDIAL ACTION DATES

Proposed start date of Remediation. 07/15/2021

Proposed date of completion of Remediation. 07/15/2026

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 Supplemental Form 27 was submitted to summarize quarterly groundwater monitoring activities and analytical results collected during the fourth quarter 2021 at the former Dinner 14 B-1 wellhead location. Based on fourth quarter 2021 analytical results, PDC is requesting that total dissolved solids (TDS) and chloride and sulfate anion analysis are removed from the quarterly sampling plan

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:

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:

Date:

Remediation Project Number: 18114

COA Type**Description**

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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**

402915064	MONITORING REPORT
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Total Attach: 1 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)