

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203

Phone: (303) 894-2100 Fax: (303) 894-2109



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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>(970) 313-5582</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Jason Davidson</u>	Email: <u>ENspillremediationcontractor@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 21791 Initial Form 27 Document #: 402935094

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>417318</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HEINZE TANK BATTERY 1</u>		Latitude: <u>40.524730</u>	Longitude: <u>-104.475220</u>
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSE</u>	Sec: <u>31</u>	Twp: <u>7N</u>	Range: <u>63W</u>
Meridian: <u>6</u>		Sensitive Area? <u>No</u>	

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Dairy farm and agriculture

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

The Heinze #1 tank battery is surrounded by a dairy farm and agricultural land in all directions. The nearest occupied structure is a residential home located approximately 0.3 miles to the east-southeast. The nearest surface water feature is an unnamed 2.2-acre pond located approximately 0.6 miles to the west. There are no DWR permitted groundwater wells within 0.25 miles of the Site. Depth to water is unknown but expected to be encountered at a depth greater than 20 feet below ground surface (ft-bgs) based on DWR records of the nearest permitted well (permit receipt #0302696A with reported DTW of 50 ft-bgs), 0.32 miles east southeast of the Site). The site is located within the CPW's high priority habitat "Pronghorn Winter Concentration" mapped extent. There are no additional sensitive areas or wildlife habitats identified within a quarter mile of the facility.

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 Figure 5 and Table 4	Grab Groundwater Sampling Activities
Yes	SOILS	Refer to Figs 2-4 & Tables 2-3&5-6	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.

Operator proposes to conduct closure of the Heinze #1 Tank battery. There is one partially buried water vessel, one above ground storage tank, two separators, and four emission combustion devices associated with the site. Tank battery closure activities are planned to commence on 2/7/22 and be completed by 3/31/22. Operator will conduct site investigation activities, field screening, and confirmation soil sampling activities during closure in accordance with COGCC 900 Series Rules. Discrete soil samples will be collected and analyzed pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2). All waste generated during the closure activities will be managed and disposed of at a licensed disposal facility in accordance with Rules 905 and 906.

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):

During tank battery closure, at least 13 discrete soil samples will be collected for field screening only and at least 7 discrete soil samples will be collected for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB and gasoline range organics (GRO) [C6-C10] by EPA Method 8260 and for diesel range organics (DRO) [C10-C28] and residual range organics (RRO) [C28-C40] by EPA Method 8015. Analytical results for GRO, DRO, and RRO will be added together to calculate total petroleum hydrocarbons (TPH). In addition, a soil sample will be collected from the base of the partially buried produced water vessel and analyzed for the Soil Suitability for Reclamation Parameters; Electrical Conductivity (EC), Sodium Absorption Ratio (SAR), and pH by Saturated Paste Method, and boron by Hot Water-Soluble Soil Extract Method.

Proposed Groundwater Sampling

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

Please refer to the Groundwater Monitoring and Operator Comments sections of this Form 27 for a summary of the monitoring well installation and groundwater sampling activities conducted at the Site.

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):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 21
Number of soil samples exceeding 915-1 4
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 1800

NA / ND

-- Highest concentration of TPH (mg/kg) 13250
Highest concentration of SAR
BTEX > 915-1 Yes
Vertical Extent > 915-1 (in feet) 13

Groundwater

Number of groundwater samples collected 5
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 6
Number of groundwater monitoring wells installed 5
Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l)
ND Highest concentration of Toluene (µg/l)
ND Highest concentration of Ethylbenzene (µg/l)
ND Highest concentration of Xylene (µg/l)
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?

Four background soil samples (BG1-1, BG1-3, BG2-1, and BG2-3) were collected from two locations at upgradient areas away from potential sources of impact related to the Site operations.

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

Volume of solid waste (cubic yards) 473 Volume of liquid waste (barrels) 524

☐ 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.

A total of approximately 473 cubic yards of hydrocarbon impacted soil, excavated from beneath the ASTs and separators, was hauled offsite for disposal under manifest to Waste Management's Buffalo Ridge Landfill in Keenesburg, Colorado and to Waste Management's North Weld Landfill in Ault, Colorado. In addition, a total of approximately 524 bbls of potentially impacted groundwater was removed from the base of the excavations and hauled offsite for disposal under manifest to Pawnee Waste Disposal in Grover, Colorado and to NGL Water Solutions C-7 injection well in Galeton, Colorado. All waste generated was managed and disposed of in accordance with Rules 905 and 906. To mitigate any potential residual dissolved phase hydrocarbons, 150 pounds of Trap & Treat BOS 200 activated carbon groundwater amendment was applied to the AST excavation and 100 pounds was applied to the separator excavation by placing it at the base of each excavation and mixing it into the clean backfill.

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 for a summary of the remediation activities conducted at the Site.

Soil Remediation Summary

☒ In Situ

☒ Ex Situ

<input type="checkbox"/> Bioremediation (or enhanced bioremediation)	<input type="checkbox"/> Yes	Excavate and offsite disposal	
<input type="checkbox"/> Yes	Chemical oxidation	If Yes: Estimated Volume (Cubic Yards)	473
<input type="checkbox"/>	Air sparge / Soil vapor extraction	Name of Licensed Disposal Facility or COGCC Facility ID #	
<input type="checkbox"/>	Natural Attenuation	Excavate and onsite remediation	
<input type="checkbox"/>	Other	Land Treatment	
		Bioremediation (or enhanced bioremediation)	
		Chemical oxidation	
		Other	

Groundwater Remediation Summary

<input type="checkbox"/>	Bioremediation (or enhanced bioremediation)
<input type="checkbox"/> Yes	Chemical oxidation
<input type="checkbox"/>	Air sparge / Soil vapor extraction
<input type="checkbox"/>	Natural Attenuation
<input type="checkbox"/>	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.

On August 29, 2022, monitoring wells MW01 through MW05 were developed by purging at least 10 casing volumes from each well. Prior to purging, depth to water measurements were collected in each monitoring well using an oil water interface probe to determine relative groundwater elevations and calculate well specific target purge volumes. No free product was observed in any of the monitoring wells. After purging each monitoring well using a dedicated bailer, groundwater samples were collected into laboratory provided containers, placed on ice, and delivered with a completed chain-of-custody form to Origins Laboratory in Denver, Colorado, for analysis of BTEX, 1,2,4-TMB, 1,3,5-TMB, and naphthalene by EPA Method 8260D.

During the August 2022 groundwater monitoring event, depth to groundwater ranged from approximately 7.70 feet below top of well casing (ft btoc) in monitoring well MW04 to 9.21 ft-btoc in monitoring well MW01. Groundwater was calculated to flow east-northeast with an average hydraulic gradient of 0.0053 feet of vertical rise per foot of horizontal run as measured from well MW04 to well MW02.

All groundwater analytical results were reported as non-detect and compliant with applicable COGCC Table 915-1 groundwater standards. The groundwater analytical results and relative groundwater elevations are summarized in Table 1 and displayed on Figure 1, which are included as attachments. The laboratory analytical report is also attached.

Groundwater monitoring will continue with the goal of achieving four consecutive quarterly sampling events in compliance with Table 915-1 standards.

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.

- Investigation and delineation has been completed in soil and groundwater.
- Source mass removal has been completed, monitoring wells installed, and groundwater will continue to be monitored for natural attenuation.
- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the COGCC 1000 Series.

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: \$

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? ☒ Yes ☐ No

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards

E&P waste (solid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

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 ☐ 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? _____

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 COGCC 1004 Series Rules.

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. 04/13/2022

Proposed date of completion of Reclamation. 04/13/2023

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. 12/20/2021

Actual Spill or Release date, or date of discovery. 02/28/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/07/2022

Proposed site investigation commencement. 02/24/2022

Proposed completion of site investigation. 08/24/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/11/2022

Proposed date of completion of Remediation. 03/28/2022

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:

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OPERATOR COMMENT

On August 23, 2022, five monitoring wells (MW01 through MW05) were installed at the site using a direct push drilling rig operated by Drillpro Services, Inc., with oversight by Entrada Consulting Group. At least 72-hours prior to well installation, a notice of intent to construct monitoring wells was submitted to the Colorado Division of Water Resources. At each soil boring, an Entrada geologist observed the recovered soil, recorded lithology descriptions, and noted any potential evidence of petroleum hydrocarbon impact such as staining, odor, and elevated PID readings. The monitoring wells were constructed of 1-inch PVC casing and installed to total depths ranging from 15 feet to 19 feet below ground surface (ft-bgs) with 10 feet to 15 feet of 0.010-inch slotted screen extending from total depth. On August 25 and 29, 2022, monitoring wells MW01 through MW05 were developed by purging at least 10 casing volumes from each well. The locations of the monitoring wells are shown on the attached Figure 1. The soil boring lithology logs and well construction diagrams are attached.

The next quarterly groundwater sampling event is scheduled for late-November 2022.

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: _____

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: _____

Date: _____

Remediation Project Number: 21791

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

403197637	GROUND WATER ELEVATION MAP
403197642	LOGS
403197644	ANALYTICAL RESULTS
403197645	ANALYTICAL RESULTS

Total Attach: 4 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)