

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:
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>	Phone Numbers Phone: <u>(303) 860-5800</u> Mobile: <u>()</u>
Address: <u>1775 SHERMAN STREET - STE 3000</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>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 21104 Initial Form 27 Document #: 402875512

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: <u>WELL</u>	Facility ID: _____	API #: <u>123-11701</u>	County Name: <u>WELD</u>
Facility Name: <u>DANLEY 1</u>	Latitude: <u>40.463000</u>	Longitude: <u>-104.561390</u>	
	** correct Lat/Long if needed: Latitude: <u>40.463033</u>	Longitude: <u>-104.561378</u>	
QtrQtr: <u>NWNW</u>	Sec: <u>28</u>	Twp: <u>6N</u>	Range: <u>64W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>322593</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>DANLEY-66N64W 28NWNW</u>	Latitude: <u>40.463000</u>	Longitude: <u>-104.561390</u>	
	** correct Lat/Long if needed: Latitude: <u>40.463322</u>	Longitude: <u>-104.561547</u>	
QtrQtr: <u>NWNW</u>	Sec: <u>28</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 Livestock /
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

Tank Battery: Nearest Well: Domestic- 510 feet NNE, Surface Water: Greeley No. 2 Canal - 426 feet N, Occupied Buildings: 700 feet SE and 700 feet NE, Livestock: 0 feet (within pasture), FWS Wetlands: Greeley No 2. Canal, Riverine (R4SBCx) - 426 feet N.

Wellhead: Nearest Well: Domestic- 598 feet NNE, Surface Water: Greeley No. 2 Canal - 532 feet N, Occupied Building: 600 feet SE, Livestock: 0 feet (within pasture), FWS Wetlands: Greeley No 2. Canal, Riverine (R4SBCx) - 532 feet N and Forested/Shrub Riparian (Rp1FO) 593 feet SW.

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
UNDETERMINED	SOILS	Refer to Tables 1-7 and Figs. 1-3	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 Danley 1 production facility, wellhead, and removal of the associated flowline. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning and abandonment 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):

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. GPS data will be collected for all soil sample locations. Soil samples collected will be submitted for laboratory for analysis of BTEX, naphthalene, TPH (C6-C36), 1,2,4-TMB, and 1,3,5-TMB by EPA Methods 8260B & 8015. Additionally, soil sample(s) will be collected in the area most likely to be impacted by produced water and will be submitted for laboratory analysis of EC, pH, SAR, and boron by saturated paste and hot water soluble extraction methods. Refer to the Proposed Sample Location Map.

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, and 1,3,5-trimethylbenzene 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):

If a produced water vessel is present, discrete soil samples will be collected from the base of the excavation and excavation sidewall in areas most likely to be impacted and exhibiting the highest field screened VOC concentration. The soil samples will be submitted for additional laboratory analysis of EC, pH, SAR, & boron by saturated paste and hot water soluble extraction methods. Assessments will be conducted during the removal of this off-location flowline (estimated to be 110 feet in length) and soil samples will be collected below the flowline risers. The flowline and adjacent sub-surface will be inspected for any 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 for an initial assessment. Samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36) by EPA Methods 8260B and 8105.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 9
Number of soil samples exceeding 915-1 3
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 100

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 6.46
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

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?

On March 3, 2022, three background samples (BKG01) were collected from native material topographically up-gradient of the wellhead location and submitted for analysis of pH and SAR. Analytical results indicated that pH and SAR were in compliance of the applicable Table 915-1 standard in native material.
On March 3, 2022, three background samples (BKG01) were collected from native material topographically up-gradient of the tank battery location and submitted for analysis of pH. Analytical results indicated that pH was in exceedance of the applicable Table 915-1 standard in native material.

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?

Based on the analytical results collected during wellhead decommissioning activities, a supplemental site investigation is required to delineate pH and SAR concentrations recorded at the former wellhead. Proposed soil boring locations are illustrated on Figure 4.

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.

No soil was removed from the locations during tank battery decommissioning, wellhead closure activities and the removal of the associated flowline.

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.

Soil encountered adjacent to and surrounding the wellhead, below the flowline riser and production equipment was visually inspected and field screened for VOC concentrations using a PID. In addition, soil samples were collected, and inspections conducted along the flowline at each sig. direction change. Per the approved proposed soil sampling plan, two soil samples were collected at approximately 4 feet and 6 feet bgs from undisturbed areas most likely to be impacted by oil and gas operations located adjacent to and below production infrastructure. Samples were also collected below and/or adjacent to the AST, SEP-FL and SEP-DL, and PWV. In addition, the excavation base sample and sidewall sample which exhibited the highest PID reading collected adjacent to the PWV were submitted for laboratory analysis of pH, EC, SAR and boron. Soil samples WH01 and FLR01 were submitted for laboratory analysis of the COGCC Table 915-1 Organic Compounds in Soil, TPH (C6-C36), pH, EC, SAR, and boron. Soil samples FL01-01 and FL01-02 were submitted for lab analysis of BTEXN, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36) by EPA Methods 8260B and 8015. Analytical results indicated that organic compounds and soil suitability constituents were in compliance with the applicable COGCC Table 915-1 Protection of Groundwater SSLs, except for pH and SAR in sample WH01 and for pH in FLR01 and PWV01. Background analytical indicated that pH was in exceedance of the regulatory standards in native material. Analytical results are summarized in Tables 1-5, and GPS coordinates and field screened VOC concentrations are summarized in Tables 6 and 7. Field screening and laboratory sample locations collected at the wellhead, flowline and tank battery are illustrated on Figures 1-3. The laboratory reports are included as Attachment A and the wellhead, flowline and tank battery decommissioning field notes and photo logs are included as Attachment B.

Soil Remediation Summary

In Situ

Ex Situ

- _____ Bioremediation (or enhanced bioremediation)
- _____ Chemical oxidation
- _____ Air sparge / Soil vapor extraction
- _____ Natural Attenuation
- _____ Other _____

- _____ Excavate and offsite disposal
- _____ If Yes: Estimated Volume (Cubic Yards) _____
- _____ 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.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

Quarterly Semi-Annually Annually Other Confirmation Sampling Summary, Site Investigation Plan

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, Site Investigation Plan

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? 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

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? No

Does the previous reply indicate consideration of background concentrations? _____

Does Groundwater meet Table 915-1 standards? Yes

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 tank battery, wellhead and flowline abandonment 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. 03/03/2022

Proposed date of completion of Reclamation. 03/03/2023

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. 09/22/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 12/20/2021

Proposed site investigation commencement. 03/03/2022

Proposed completion of site investigation. 09/20/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/03/2022

Proposed date of completion of Remediation. _____

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 the analytical results collected during wellhead decommissioning activities at the Danley 1 wellhead, additional site investigation activities are required at the location of the former wellhead to delineate pH and SAR levels recorded during decommissioning activities. PDC will conduct the supplemental site investigation by the end of 3Q2022.

Analytical results indicated that constituent concentrations in samples collected adjacent to and below the produced water vessel were in compliance with COGCC Table 915-1 standards, with exception to the pH value. Based on the absence of other indicators that a spill or release occurred, such as hydrocarbon detections or elevated EC and SAR in soil, the pH results at this location is not associated with E&P activities. Additionally, pH was determined to be present in the native background samples. As such, PDC requests that pH not be considered a Table 915-1 contaminant of concern at this location and is requesting a No Further Action (NFA) determination for the Danley 1 Tank Battery.

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: 05/03/2022

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: 05/23/2022

Remediation Project Number: 21104

Condition of Approval**COA Type****Description**

	Analyze additional confirmation soil samples at the well for all Table 915-1 Soil Suitability for Reclamation parameters (pH, EC, SAR, boron).
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**

403034104	FORM 27-SUPPLEMENTAL-SUBMITTED
403034286	SOIL SAMPLE LOCATION MAP
403034288	SOIL SAMPLE LOCATION MAP
403034293	SOIL SAMPLE LOCATION MAP
403034299	PHOTO DOCUMENTATION
403036464	ANALYTICAL RESULTS
403036491	SITE INVESTIGATION PLAN

Total Attach: 7 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)