

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:
402843541
Receive Date:
10/26/2021

Report taken by:
Candice (Nikki) Graber

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>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80203</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSpillRemediation@pdce.com</u>	
		Phone: <u>(303) 860-5800</u>
		Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 18830 Initial Form 27 Document #: 402704514

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>LOCATION</u>	Facility ID: <u>323335</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Purvis SE-10</u>	Latitude: <u>40.324690</u>	Longitude: <u>-104.874670</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSE</u>	Sec: <u>10</u>	Twp: <u>4N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>WELL</u>	Facility ID: _____	API #: <u>123-32473</u>	County Name: <u>WELD</u>
Facility Name: <u>Purvis 10TD</u>	Latitude: <u>40.324720</u>	Longitude: <u>-104.874610</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NWSE</u>	Sec: <u>10</u>	Twp: <u>4N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: WELL Facility ID: API #: 123-32474 County Name: WELD
Facility Name: Purvis 10XD Latitude: 40.324800 Longitude: -104.874390
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWSE Sec: 10 Twp: 4N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL Facility ID: API #: 123-32475 County Name: WELD
Facility Name: Purvis 10DD Latitude: 40.324750 Longitude: -104.874530
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWSE Sec: 10 Twp: 4N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: WELL Facility ID: API #: 123-32476 County Name: WELD
Facility Name: Purvis 10WD Latitude: 40.324780 Longitude: -104.874440
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWSE Sec: 10 Twp: 4N Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Residential / 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: Irrigation - 1,225 feet E, Surface Water: Little Thompson Ditch - 155 feet SW, Occupied Buildings: 570 feet E, Livestock: 1,560 feet N, FWS Wetlands: Riverine Habitat, Little Thompson Ditch - 155 feet SW, HP Habitat: Aquatic Native Species Conservation - 572 feet SW and 1,275 feet NW.

Flowline conflicts possible as all four wellheads are located < 200 feet N/NE of Little Thompson Ditch and tank battery is located 278 feet NE of Little Thomson Ditch. Residential neighborhood is located 572 feet - 662 feet of facility.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste | <input type="checkbox"/> Other E&P Waste | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input checked="" type="checkbox"/> Condensate | <input type="checkbox"/> Pigging Waste | |
| <input type="checkbox"/> Drilling Fluids | <input type="checkbox"/> Rig Wash | |
| <input type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Spent Filters | |
| | <input type="checkbox"/> Pit Bottoms | |
| | <input type="checkbox"/> Other (as described by EPA) | _____ |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	SOILS	Refer to Tables 1-4 and Figures 1&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.

In accordance with COGCC Rule 911, this form serves as notification for decommissioning and abandonment of the Purvis 10DD, TD, WD, XD production facility and the abandonment of Purvis 10DD, Purvis 10TD, Purvis WD, and Purvis XD wellheads and removal of the off-location flowlines. 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 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 (1/4/21), 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 will be submitted for laboratory for analysis of BTEX, naphthalene, total petroleum hydrocarbons (TPH C6-C36), 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Methods 8260B and 8015. Additionally, soil sample(s) will be collected in the area most likely to be impacted by produced water to confirm soil suitability for reclamation. The sample(s) will be submitted for laboratory analysis of electrical conductivity (EC), pH, sodium adsorption ratio (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 for laboratory analysis from the base and excavation sidewall exhibiting the highest field screening measurement. The samples will be submitted for laboratory analysis of EC, pH, SAR, and boron by saturated paste and hot water soluble extraction methods. An assessment will be conducted during the removal of the adjacent flowlines (estimated 65-80 feet in length), with an emphasis in the areas where the flowline is in close proximity to sensitive areas, such as High Priority Habitats and FWS wetlands. 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 submitted for the same organic parameters as listed above in proposed soil sampling section.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 14
Number of soil samples exceeding 915-1 7
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 100

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 6.28
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 July 29, 2021, two background samples (BKG01@4' and BKG01@6') were collected from native material topographically up-gradient of the tank battery and wellhead locations and submitted for analysis of pH. Analytical results indicated that pH was in exceedance of the applicable Table 915-1 standard in native material. Additionally, BKG01@6' was submitted for analysis of SAR and analytical results indicated that SAR was in compliance with 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?

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 location during wellhead closure activities and the removal of the associated flowlines, or during tank battery decommissioning and closure activities.

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.

Soil encountered adjacent to and surrounding the wellheads, below the flowline risers, and below production equipment were visually inspected and field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). In addition, field screening samples were collected, and inspections conducted at each end of the flowline. Per the approved proposed soil sampling plan, soil samples were collected adjacent to each cut and capped wellhead at 6 feet below ground surface (bgs) and below each flowline riser at 4 ft. bgs. The samples were submitted for laboratory analysis of the Table 915-1 Organic Compounds in Soil, TPH, and soil suitability constituents. Production facility samples were collected below and/or adjacent to the ASTs, SEP-FL, SEP-DL, and PWV and were submitted for laboratory analysis of BTEX, naphthalene, 1, 2, 4-TMB, 1, 3, 5-TMB and TPH (C6-C36) and samples PWV01-B and PWV01-N were submitted for analysis of pH, EC, SAR, and boron. Analytical results indicated that pH was in exceedance of the applicable COGCC Table 915-1 standard in sample WH01-WH04 and SAR in PWV01-B. Consequently, two background soil samples (BKG01) were collected from native material and submitted for analysis of pH and SAR. Analytical results indicated that pH was in exceedance of the applicable standard in native material, and SAR was not in exceedance of the applicable standard. Analytical results are summarized in Tables 1,2 and 3, and GPS coordinates and field screened VOC concentrations are summarized in Table 4. Field screening and laboratory sample locations collected at the wellheads and along the flowlines are illustrated on Figures 1 and 2, and Figure 1 for the production facility. The laboratory reports are included as Attachment A and the wellheads and flowlines, and production facility 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

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

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.

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

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. _____

Proposed date of completion of Reclamation. _____

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. 05/12/2021

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

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/28/2021

Proposed site investigation commencement. 07/29/2021

Proposed completion of site investigation. 03/28/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/28/2022

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:

OPERATOR COMMENT

Based on the analytical results collected during tank battery decommissioning activities, additional site investigation is required below and adjacent to the location of the former produced water vessel to confirm the SAR level is in compliance with the COGCC Table 915-1 standards. PDC will conduct the supplemental site investigation by the end of 1Q2022.

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: 10/26/2021

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: Candice (Nikki) Graber

Date: 10/27/2021

Remediation Project Number: 18830

Condition of Approval**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**

402843541	FORM 27-SUPPLEMENTAL-SUBMITTED
402843726	ANALYTICAL RESULTS
402843729	PHOTO DOCUMENTATION
402843730	SOIL SAMPLE LOCATION MAP
402843741	SOIL SAMPLE LOCATION MAP
402843743	ANALYTICAL RESULTS
402843744	PHOTO DOCUMENTATION
402843747	SOIL SAMPLE LOCATION MAP
402843750	SOIL SAMPLE LOCATION MAP
402843751	ANALYTICAL RESULTS
402843753	PHOTO DOCUMENTATION
402843754	SOIL SAMPLE LOCATION MAP
402843755	SOIL SAMPLE LOCATION MAP
402843762	ANALYTICAL RESULTS
402843767	PHOTO DOCUMENTATION
402843768	SOIL SAMPLE LOCATION MAP
402843769	SOIL SAMPLE LOCATION MAP
402843771	ANALYTICAL RESULTS
402843772	PHOTO DOCUMENTATION
402843780	SOIL SAMPLE LOCATION MAP

Total Attach: 20 Files

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

		Stamp Upon Approval
--	--	---------------------

Total: 0 comment(s)