

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
CHRIS CANFIELD

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 11639 Initial Form 27 Document #: 401643628

PURPOSE INFORMATION

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure	<input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
<input checked="" type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation	<input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project
<input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste	<input type="checkbox"/> Rule 906.c.: Director request
<input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure	<input type="checkbox"/> Other _____

SITE INFORMATION N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: <u>LOCATION</u>	Facility ID: <u>317642</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>WALSH-62N68W 24NWSW</u>	Latitude: <u>40.120527</u>	Longitude: <u>-104.956445</u>	
	** correct Lat/Long if needed: Latitude: <u>40.120710</u>	Longitude: <u>-104.955600</u>	
QtrQtr: <u>NWSW</u>	Sec: <u>24</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Residential

Is domestic water well within 1/4 mile? Yes 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

Residences are located within 75 feet of the tank battery. Groundwater is estimated at 30 feet below ground surface (bgs) based on Colorado Division of Water Resources (DWR) data for nearby permitted wells.

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 type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input 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
Yes	SOILS	Refer to Figure 2 and Table 1	Site investigation and 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 April 27, 2018, historic petroleum hydrocarbon impacts were discovered during the plug and abandonment of the Walsh 1 tank battery. A topographic map is included as Figure 1. Initial excavation activities were conducted on April 27, 2018. Approximately 220 cubic yards of impacted material were excavated and transported off-site for disposal.

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 April 27, 2018, one soil sample (SS01) was collected at 9 feet below ground surface (bgs) from a test pit located west of the tank battery. The sample was submitted to Summit Scientific Laboratories (Summit) for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH) – gasoline range organics (GRO) by USEPA Method 8260B and TPH – diesel range organics (DRO) by USEPA Method 8015. Analytical results indicated constituent concentrations were below COGCC Table 910-1 standards. The sample location is illustrated on Figure 1 and soil analytical data is summarized in Table 1.

Proposed Groundwater Sampling

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

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):

One water well is permitted by the Colorado Division of Water Resources (DWR) on the property south of the former tank battery. The well is permitted for stock use under Permit # 7071. On June 28, 2018, a water sample (ResWell) was collected from the well to confirm water quality. The sample was collected from the existing pump hose and submitted to Summit Scientific Laboratories for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX) by USEPA Method 8260B. Analytical results indicated BTEX concentrations were below COGCC Table 910-1 standards (Table 2).

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 55
Number of soil samples exceeding 910-1 18
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 11970
0

NA / ND

-- Highest concentration of TPH (mg/kg) 6380
NA Highest concentration of SAR
 BTEX > 910-1 Yes
 Vertical Extent > 910-1 (in feet) 17

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 910-1

 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 910-1
If surface water is impacted, other agency notification may be required.

OTHER INVESTIGATION INFORMATION

Were impacts to adjacent property or offsite impacts identified?

Site investigation activities were conducted between May 7 and July 19, 2018, using mechanical excavation and hollow stem auger drilling methods. Results of the investigation indicated that petroleum hydrocarbon impacts in exceedance of COGCC standards were detected in areas outside of the former PDC tank battery. Test pit and soil boring locations are illustrated on Figure 1. Soil analytical data is summarized in Table 1.

Were background samples collected as part of this site investigation?

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

Volume of solid waste (cubic yards) 220 Volume of liquid waste (barrels) 0

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.

On April 27, 2018, approximately 220 cubic yards of impacted material were removed during initial excavation activities and transported to the Front Range Regional Landfill for disposal under PDC waste manifests. Between January 3 and June 27, 2019, approximately 32,578 cubic yards of impacted material were excavated and chemically treated on-site using hydrogen peroxide.

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.

Between January 3 and June 27, 2019, excavation and ex-situ chemical oxidation activities were conducted to address remaining petroleum hydrocarbon soil impacts on Site. Approximately 32,578 CY of impacted material were excavated between 1.5 feet and 18 feet below ground surface (bgs) and chemically treated using hydrogen peroxide. A total of 237 soil samples (S01 – S237) were collected from the sidewalls and base of the excavation extent at depth ranging between 9 feet and 18 feet bgs. During the chemical treatment process, 4-point confirmation soil samples were collected from every 100 CY of soil treated to confirm hydrocarbon concentrations were reduced below COGCC Table 910-1 standards and material could be used for backfilling. Groundwater was not encountered in the excavation area during remediation activities.

Soil Remediation Summary

In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

_____ Other _____

Ex Situ

Yes _____ Excavate and offsite disposal

_____ If Yes: Estimated Volume (Cubic Yards) _____ 220

_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____

Yes _____ Excavate and onsite remediation

No _____ Land Treatment

No _____ Bioremediation (or enhanced bioremediation)

Yes _____ Chemical oxidation

No _____ 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.

On August 2, 2019, a limited groundwater assessment was conducted within the former excavation and treatment area to determine if shallow groundwater was present. Three temporary monitoring wells (MW01 – MW03) were installed using hollow stem auger drilling methods to a depth of 20 feet below ground surface (bgs). On August 7, 2019, the three monitoring wells were gauged to determine if measurable groundwater was present. Groundwater was detected in two monitoring wells (MW02 and MW03), therefore samples were collected and submitted for laboratory analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX). In addition, on October 18, 2019, area water well sampling was conducted at a nearby Colorado Division of Water Resources (DWR) Well (Permit # 7071). One water sample (Res Well) was collected from the stock well and submitted for laboratory analysis of the COGCC 609 analyte list. Consistent with the pre-treatment water sampling results from this well, BTEX concentrations were below COGCC Table 910-1 standards. Analytical data for these sampling events are provided in the attached summary report.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other _____
Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other Remediation Progress Report _____

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:

Approximately 220 cubic yards of impacted material were removed in April 2018 and transported to the Front Range Regional Landfill for disposal under PDC waste manifests. Between January 3 and June 27, 2019, approximately 32,578 cubic yards of impacted material were excavated and chemically treated on-site using hydrogen peroxide. The material was backfilled following treatment and confirmation sampling.

Volume of E&P Waste (solid) in cubic yards _____ 32798
E&P waste (solid) description _____ E&P non-hazardous waste
COGCC Disposal Facility ID #, if applicable: _____
Non-COGCC Disposal Facility: _____ Front Range Regional Landfill
Volume of E&P Waste (liquid) in barrels _____ 0
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? Yes _____
Do all soils meet Table 910-1 standards? Yes _____
Does the previous reply indicate consideration of background concentrations? No _____
Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? _____
Does Groundwater meet Table 910-1 standards? Yes _____
Is additional groundwater monitoring to be conducted? _____

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.

The tank battery was decommissioned and will not be reconstructed. Final reclamation is on-going and will be completed in accordance with the COGCC 1000 Series and Town of Frederick requirements.

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 approve the seed mix? _____
If NO, does the seed mix comply with local soil conservation district recommendations? _____

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 04/27/2018

Actual Spill or Release date, if known. 04/27/2018

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/27/2018

Date of commencement of Site Investigation. 04/27/2018

Date of completion of Site Investigation. 10/18/2019

REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/27/2018

Date of completion of Remediation. 06/27/2019

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

PDC has conducted extensive remedial actions and has reduced hydrocarbon concentrations below COGCC table 910-1 standards at two of the three effected properties. The third property owner has not permitted access to PDC to conduct any remediation activity on their property, therefore PDC is requesting a closure for this remediation project. Supporting documentation for these efforts is attached.

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: ` 11/06/2019 _____

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: CHRIS CANFIELD _____

Date: 12/04/2019 _____

Remediation Project Number: 11639 _____

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**

402227357	FORM 27-SUPPLEMENTAL-SUBMITTED
402227422	SITE INVESTIGATION REPORT
402232037	CORRESPONDENCE

Total Attach: 3 Files

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

Environmental	<p>Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.</p> <p>For locations with active ongoing oil and gas operations, comply with Rule 1003 interim reclamation requirements and for locations that will no longer have active oil and gas operations, comply with Rule 1004 Final Reclamation requirements.</p>	12/04/2019
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Total: 1 comment(s)