

State of Colorado
Energy & Carbon Management Commission

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403810143
Receive Date:
06/25/2024

Report taken by:
Chris Sanchez

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 ECMC 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>1099 18TH STREET SUITE 1500</u>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80202</u>
Contact Person: <u>Karen Olson</u>	Email: <u>taspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9423 Initial Form 27 Document #: 200438567

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>327161</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>PESCHEL-64N65W 20SWSW</u>	Latitude: <u>40.291816</u>	Longitude: <u>-104.693308</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSW</u>	Sec: <u>20</u>	Twp: <u>4N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>443029</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>SPILL/RELEASE POINT</u>	Latitude: <u>40.291900</u>	Longitude: <u>-104.693210</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSW</u>	Sec: <u>20</u>	Twp: <u>4N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: SPILL OR RELEASE Facility ID: 481764 API #: _____ County Name: WELD
Facility Name: Peschel 20 Sec. HZ Latitude: 40.291601 Longitude: -104.693349
** correct Lat/Long if needed: Latitude: _____ Longitude: _____
QtrQtr: SESW Sec: 20 Twp: 4N Range: 65W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use CROP LAND

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/Sampling – 298' NE; Surface Water: Freshwater Pond - 235 ESE; Occupied Building: 514 WSW; Livestock: 1,078' SSW; FWS Wetlands: 240' SSE Riverine (R4SBAx).

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 3 and Table 2	Drilling and water sampling
Yes	SOILS	Refer to Figure 2 and Table 2	Excavation and 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 August 21, 2015, a historic hydrocarbon release was discovered at the former tank battery during tank battery expansion activities. Following the discovery, mitigation activities were initiated and approximately 1,610 cubic yards of impacted material were removed from the former excavation. During excavation activities, groundwater was encountered in the excavation at approximately 3 feet below ground surface (bgs). Groundwater vacuum recovery was conducted concurrent with excavation activities and approximately 1,385 barrels (bbls) of groundwater was removed from site.

On March 15, 2022, a release of approximately four bbls of produced water was discovered at the Peschel 20 Sec Hz facility. Following the discovery, mitigation efforts were initiated, and approximately 8 cubic yards of impacted material were removed from site. Following mitigation activities, confirmation sampling activities were completed between March 17, and March 18, 2022. Analytical results received for samples collected during confirmation sampling activities indicated that organic compound concentrations were in exceedance of the applicable ECOM Table 915-1 Protection of Groundwater SSLs in soil sample SS01.

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):

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):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 0
Number of soil samples exceeding 915-1 _____
Was the areal and vertical extent of soil contamination delineated? _____
Approximate areal extent (square feet) _____

NA / ND

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

Groundwater

Number of groundwater samples collected 12
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 3
Number of groundwater monitoring wells installed 14
Number of groundwater samples exceeding 915-1 2

-- _____ Highest concentration of Benzene (µg/l) 11
ND _____ Highest concentration of Toluene (µg/l) _____
-- _____ Highest concentration of Ethylbenzene (µg/l) 12
-- _____ Highest concentration of Xylene (µg/l) 130
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 June 21, 2022, five background soil borings (BKG01 - BKG05) were advanced in native soil to a depth of approximately 4 feet below ground surface (bgs). Three soil samples were collected from each background soil boring at depths ranging from 1 foot to 4 feet bgs and were submitted to Summit Scientific Laboratory (Summit) for analysis of the Table 915-1 Metals Suite.

Background soil analytical results indicated that arsenic, barium, cadmium, lead, and selenium concentrations were in exceedance of the applicable Table 915-1 Protection of Groundwater SSLs in native soil on site. Additionally, the arsenic, barium, and selenium concentrations recorded in soil sample SS06, are below or within 1.25x the concentrations of background samples collected at the corresponding depth in all five background locations, and are indicative of native soil conditions.

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?

On November 16, 2015, six monitoring wells (BH01 – BH06) were installed to confirm the absence of dissolved-phase hydrocarbon impacts within and adjacent to the former excavation extent. On February 12, 2016, four replacement monitoring wells (BH02R, BH04R – BH06R) were installed to replace monitoring wells previously destroyed. Per landowner request, monitoring well BH06R was subsequently abandoned, and a temporary well is installed via hand auger each quarter. On December 27, 2016, five remediation wells (EFR01-EFR05) were installed to delineate the light non-aqueous phase liquid (LNAPL) extent within the subsurface. Due to the persisting measurable free phase hydrocarbons, additional site investigation activities were conducted adjacent to BH01 to delineate the lateral extent of LNAPL within the sub-surface. Between February 7, and February 28, 2017, five remediation wells (RW01 – RW05) and one replacement monitoring well (BH01R) were installed for monitoring and remediation purposes. On August 19, 2021, two additional monitoring wells (BH07 and BH08) were installed to establish point of compliance (POC) down-gradient from the existing well network.

On June 21, 2022, four monitoring wells (BH09 – BH12) were installed to confirm the absence of dissolved-phase hydrocarbon impacts within and adjacent to the former excavation extent following the release on March 15, 2022, at a separator southeast of the existing well network. Lithologic descriptions and volatile organic compound (VOC) concentrations were measured using a photoionization detector (PID) were collected and recorded for each boring.

PDC is proposing to install one monitoring well in the vicinity of destroyed monitoring well BH07 to establish sufficient POC downgradient of monitoring well RW03. The proposed monitoring well location is illustrated on Figure 3.

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 August 21, 2015, a historic hydrocarbon release was discovered at the former tank battery during tank battery expansion activities. Following the discovery, mitigation activities were initiated and approximately 1,610 cubic yards of impacted material were removed from the former excavation.

On March 15, 2022, approximately eight cubic yards (cy) of impacted material was removed from the excavation at the Peschel 20 Sec Hz facility and transported to the North Weld Waste Management 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.

Monitored natural attenuation (MNA) was initiated as the remedial strategy during the fourth quarter 2015 and continued through the first quarter 2016. During the fourth quarter 2016, measurable LNAPL was detected in monitoring well BH01. Therefore, enhanced fluid recovery (EFR) was initiated and continued through the first quarter 2017.

On March 10, 2017, a Spill Buster was installed at monitoring well BH01R to address persisting LNAPL. Between March and October 2017, the Spill Buster was operational at three wells (EFR03, BH01R, and RW02) and removed a total of 136 ounces of LNAPL.

Due to site-wide decreases in LNAPL levels, the Spill Buster was removed from location during the fourth quarter 2018 and hand bailing was initiated. In February 2019, a passive LNAPL collection bailer was deployed in monitoring well BH01R. Due to the decrease of LNAPL in monitoring well BH01R, the passive LNAPL collection bailer was removed from location during third quarter 2021. To date, a total of 8.90 gallons of LNAPL have been removed by the passive bailer and hand bailing.

LNAPL monitoring and MNA will remain the selected remediation strategies for this location through the third quarter 2024.

Per the Condition of Approval (COA) issued under the ECMC Document No. 403032552, a remediation strategy was developed to address the remaining hydrocarbon impacts identified in soil sample SS01. Based on the minor concentration exceedances of 1,3,5-TMB and naphthalene recorded in SS01 at the Peschel 20 Sec Hz release location, MNA was selected as the remediation strategy. Prior to site closure, confirmation samples will be collected from native material at the former soil sample location SS01 and submitted for laboratory analysis of the full Table 915-1 analytical suite.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ Air sparge / Soil vapor extraction

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

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

No _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other LNAPL Recovery via Hand Bailing _____

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.

Groundwater will continue to be monitored at the ten site monitoring wells (BH01R, BH03, BH04R, BH05R, BH07 - BH12) and four remediation wells (RW01, RW03, RW05, and EFR04) until closure criteria are achieved. 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. Per the approved Supplemental Form 27 (Document No. 403455312), monitoring well BH02R was removed from the monitoring well network and total dissolved solids (TDS), chlorides, and sulfates were removed from the sampling and analysis plan following the second quarter 2023. Additionally, per the approved Supplemental Form 27 (Document No. 403620401), monitoring well BH06R was removed from the monitoring well network and remediation well EFR04 was added to the monitoring well network following the fourth quarter 2023.

During the second quarter 2024, monitoring wells BH05R and BH07 were found destroyed on arrival and consequently, were not sampled. Second quarter 2024 analytical results indicated that organic compound concentrations were in exceedance of the applicable ECMC Table 915-1 groundwater standards in monitoring well BH01R and remediation well RW03. Organic compound concentrations were in compliance with the applicable regulatory standards in the remaining 10 sampled monitoring well locations.

Based on at least four consecutive quarters of organic compound concentrations in compliance with the applicable regulatory standards and sufficient POC for the remaining dissolved-phase hydrocarbon impacts on site, PDC is requesting to remove BH05R from the monitoring well network. One monitoring well will be installed in the vicinity of destroyed monitoring well BH07 to establish sufficient POC downgradient of monitoring well RW03. The proposed monitoring well location is illustrated on Figure 3.

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 partially completed in groundwater.
- Source mass removal has been partially completed, monitoring wells were installed, and groundwater will continue to be monitored for natural attenuation.
- One additional monitoring well will be installed in the vicinity of destroyed monitoring well BH07 to establish sufficient POC downgradient of monitoring well RW03.
- Facility and infrastructure remain operational and the location will be reclaimed in accordance with the COGCC 1000 Series following decommissioning activities.

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: \$ 20000 _____

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 _____

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: _____

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

E&P waste (liquid) description _____

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC 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? _____

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 ECMC 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.

The excavation has been backfilled, compacted, and re-contoured to match pre-existing conditions. This site remains on an active facility. Following the decommissioning of this facility, this location will be reclaimed in accordance with the ECMC 1000 Series.

Is the described reclamation complete? _____

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. 08/21/2015

Actual Spill or Release date, or date of discovery. 08/21/2015

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). _____

Proposed site investigation commencement. 09/30/2024

Proposed completion of site investigation. 12/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/18/2015

Proposed date of completion of Remediation. 12/21/2026

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:

PDC is proposing to install one monitoring well in the vicinity of destroyed monitoring well BH07 to establish sufficient POC downgradient of monitoring well RW03. The proposed monitoring well location is illustrated on Figure 3.

OPERATOR COMMENT

This Supplemental Form 27 was submitted to summarize quarterly groundwater monitoring and analytical results collected during the second quarter 2024 at the Peschel 5, 14-20 and Peschel 20 SEC HZ locations.

During the second quarter 2024, monitoring wells BH05R and BH07 were found destroyed on arrival and consequently, were not sampled. Second quarter 2024 analytical results indicated that organic compound concentrations were in exceedance of the applicable ECMC Table 915-1 groundwater standards in monitoring well BH01R and remediation well RW03. Organic compound concentrations were in compliance with the applicable regulatory standards in the remaining 10 sampled locations.

Based on at least four consecutive quarters of organic compound concentrations in compliance with the applicable regulatory standards and sufficient POC for the remaining dissolved-phase hydrocarbon impacts on site, PDC is requesting to remove BH05R from the monitoring well network. One monitoring well will be installed in the vicinity of destroyed monitoring well BH07 to establish sufficient POC downgradient of monitoring well RW03. The proposed monitoring well location is illustrated on Figure 3.

Per the condition of approval (COA) issued in the approved Supplemental Form 27 (Document No. 403719777), the site investigation report tab has been updated to account for the most recent groundwater analytical results received for the second quarter 2024.

In addition, per the above referenced COA, the second quarter 2023 groundwater monitoring report and approved Supplemental Form 27 (Document No. 403455312) have been attached to this form. During the second quarter 2023, inorganic parameter concentration trends were examined over time and compared to historic background concentrations and groundwater flow direction. Based on the data, TDS and sulfate anion concentrations were within the 125% threshold of the maximum historic background concentration in all monitoring well locations for nine consecutive quarters. In addition, the chloride anion concentration in monitoring well BH06R was in exceedance of the applicable ECMC Table 915-1 groundwater standard and greater than 1.25x the maximum historic background concentration during the second quarter 2023, exclusively. However, when comparing inorganic concentrations to groundwater elevation, there was a direct correlation between elevated inorganic concentrations in BH06R and seasonal fluctuations in groundwater elevation. Based on the location of BH06R, as the only monitoring well in the agricultural field to the northeast, the elevated chloride concentration recorded during the second quarter 2023 may be a result of agricultural operations and not associated with oil and gas operations. The graphs illustrating the data are included in Attachment A of the second quarter 2023 groundwater monitoring report.

Based on this data, the ECMC approved PDC's request to remove TDS, chloride, and sulfate from the quarterly sampling and analysis plan following the second quarter 2023.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Karen Olson

Title: Remediation Advisor

Submit Date: 06/25/2024

Email: taspillremediationcontractor@pdce.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: Chris Sanchez

Date: 08/21/2024

Remediation Project Number: 9423

COA Type

Description

<u>COA Type</u>	<u>Description</u>
1 COA	Operator shall continue quarterly groundwater monitoring for the duration of the remediation project.

ATTACHMENT 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.

<u>Att Doc Num</u>	<u>Name</u>
403810143	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403832603	MONITORING REPORT
403832606	MONITORING REPORT

Total Attach: 4 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)