

State of Colorado
Energy & Carbon Management Commission

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Document Number:
403850840

Receive Date:

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 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 #: 23602 Initial Form 27 Document #: 403065592

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>123-20240</u>	County Name: <u>WELD</u>
Facility Name: <u>HOWARD 14-18</u>	Latitude: <u>40.393500</u>	Longitude: <u>-104.600110</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSW</u>	Sec: <u>18</u>	Twp: <u>5N</u>	Range: <u>64W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>331157</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HOWARD-65N64W 18SWSW</u>	Latitude: <u>40.393535</u>	Longitude: <u>-104.600136</u>	
** correct Lat/Long if needed: Latitude: <u>40.393492</u>		Longitude: <u>-104.600577</u>	
QtrQtr: <u>SWSW</u>	Sec: <u>18</u>	Twp: <u>5N</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 Agricultural

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: Irrigation - 390' SSW; Surface Water: Irrigation Ditch - 85' SSE; Occupied Building: 180' SSE; Livestock: 390' S; FWS Wetlands: 820' NNW
Freshwater Pond (PUBFx).

Wellhead (Howard 14-18): Irrigation - 490' SW; Surface Water: Irrigation Ditch - 35' SSE; Occupied Building: 185' SSW; Livestock: 420' SSW; FWS Wetlands:
892' NW Freshwater Pond (PUBFx).

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
Yes	SOILS	Refer to Tables 1-4 & Figures 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 ECMC Rule 911, this form serves as notification for the decommissioning and abandonment of the Howard 14-18 production facility, Howard 14-18 wellhead, and removal of the associated flowline. The ground and sub-surfaces was visually inspected for hydrocarbon impacts during equipment decommissioning. Field observations and photo documentation were recorded in a field inspection form for submittal to the ECMC.

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):

Soil samples were collected from the surface in cardinal directions of the wellhead, as defined in the Rule 911.a.(4) guidance document (9/20/21), for field screening purposes. Grab soil samples were 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 were collected for laboratory analysis either in any area of observed hydrocarbon impacts, or in the sample locations designated by the ECMC. GPS data was collected for all soil sample locations. Soil samples collected at the tank battery were submitted for laboratory for analysis of BTEX, naphthalene, TPH (C6-C36), 1,2,4-TMB, and 1,3,5-TMB by EPA Methods 8260B and 8015. Soil samples were collected adjacent to the wellhead from native material and submitted for laboratory analysis of Organic Compounds in Soil, soil suitability, and TPH (C6-C36).

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):

Assessments were conducted during the removal of the on-location flowline (estimated to be 160 feet in length), soil samples were collected below the flowline risers. The flowline and adjacent sub-surface were inspected for any visual and olfactory indicators of potential failure and hydrocarbon impacts. Soils were field screened below the flowline and if suspected impacts were observed, a soil sample was collected for an initial assessment and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, and TPH (C6-C36). If analytical results indicate the presence of organic compound concentrations, the sample was analyzed for the full Table 915-1 suite. GPS data and photo documentation will be recorded for each inspection/sample location.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 18
Number of soil samples exceeding 915-1 2
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 333

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 1.12
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 8

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
0 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 15, 2023, one background soil boring (BKG01) was advanced in native material topographically upgradient of the tank battery and wellhead. Background soil samples were collected at depths ranging from 2.5 ft to 8 ft bgs and submitted for laboratory analysis of ECMC Table 915-1 metals.

On October 10, 2023, four background soil borings (BKG02 - BKG05) were advanced in native material surrounding the former wellhead location. Soil samples were collected from the background soil borings at depths ranging from 2.5 ft to 10 ft bgs and were submitted for laboratory analysis of arsenic.

On April 16, 2024, three background soil borings (BKG06-BKG08) were advanced in native material surrounding the former wellhead location. Soil samples were collected from the background soil borings at depths ranging from 5 ft to 10 ft bgs and were submitted for laboratory analysis of arsenic. Analytical results indicated that arsenic was in exceedance of the applicable standards in native material.

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

Volume of solid waste (cubic yards) 4 Volume of liquid waste (barrels) 0

Is further site investigation required?

Up to three (3) soil borings will be advanced to confirm the arsenic exceedances observed in the WH01-N & WH01-S soil sample locations and soil boring SB03 (per the COA issued on ECMC Document No. 403617517). Soil samples will be submitted for laboratory analysis of arsenic. The 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.

On March 15, 2023 approximately 4 cubic yards of impacted material were excavated adjacent to the wellhead and transported to the North Weld Waste Management Facility in Ault, CO for disposal under a PDC waste manifest.

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.

On October 10, 2023, five (5) soil borings (SB01-SB05) were advanced via hand auger to delineate the vertical and horizontal extents of the arsenic exceedance observed in soil sample WH01-B, WH01-N and WH01-S. One (1) soil sample was collected from the source soil boring SB01 at approximately 8.5 feet bgs, from soil adjacent to WH01-B and was submitted for analysis of arsenic. Additionally, three (3) soil samples were collected from the four (4) cardinal direction borings (SB02-SB05) at depths ranging from 5 feet and 9 feet bgs and were submitted for analysis of arsenic. Sample collection and soil boring total depths varied due to lithologic refusal encountered during site investigation activities. Analytical results indicated that arsenic concentrations were within the applicable ECMC Table 915-1 Protection of Groundwater SSLs in the confirmation soil samples collected from soil borings SB01 @ 8.5', SB02 @ 7' and SB04 @ 8'. Analytical results indicated that arsenic concentrations were above the applicable ECMC Table 915-1 Protection of Groundwater SSLs in the confirmation soil samples collected from soil borings SB02 @ 5', SB02 @ 6', SB03, SB04 @ 5', SB04 @ 6', and SB05 @ 5'. On April 16, 2024, three soil borings (SB06-SB08) were advanced to horizontally delineate arsenic exceedances remaining in the vicinity of the former wellhead and soil samples were collected from each soil boring at depths of approximately 5 feet to 6 feet bgs. Additionally, three background soil borings (BKG06-BKG08) were advanced in native material to assess arsenic concentrations. Soil samples were collected from native material at depths ranging between approximately 5 feet and 10 feet bgs. Analytical results indicated that all soil samples were below 1.25x the peak 2.5 ft to 9 ft bgs background arsenic concentrations, based on similar lithologies, except for soil samples WH01-N and WH01-S collected from the final excavation extent. Soil boring locations are illustrated on Figure 3.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation (or enhanced bioremediation)	Yes _____ Excavate and offsite disposal
_____ Chemical oxidation	If Yes: Estimated Volume (Cubic Yards) _____ 4
_____ 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

_____ 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.

Groundwater was not encountered during initial decommissioning activities or during supplemental site investigation activities at the former Howard 14-18 Wellhead and Tank Battery.

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 CSS, SSIP, & Third Quarter 2024 - Timeline Update

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.

- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 1000 Series.
- Investigation and delineation is complete for organics in soil.
- Investigation of arsenic is ongoing.

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: \$ 10000

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:

Volume of E&P Waste (solid) in cubic yards 4

E&P waste (solid) description Hydrocarbon impacted soils

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: North Weld Waste Management Facility

Volume of E&P Waste (liquid) in barrels 0

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.

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 ECMC 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. 03/15/2023

Proposed date of completion of Reclamation. 04/30/2025

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. 04/28/2022

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

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/23/2022

Proposed site investigation commencement. 07/11/2024

Proposed completion of site investigation. 12/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/15/2023

Proposed date of completion of Remediation. 04/30/2025

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:

Based on the evaluation of the soil analytical results and the need for supplemental site investigation activities to confirm arsenic exceedances in soil samples WH01-N, WH01-S, and soil boring SB03 (Due to the COA issued on ECMC Document No. 403617517), the proposed date of site investigation commencement and the proposed date of the completion of site investigation is proposed to span through the fourth quarter of 2024 pending approval of this form and landowner negotiations.

OPERATOR COMMENT

This Supplemental Form 27 was submitted to summarize supplemental site investigation activities and analytical results collected on April 15, 2024, at the former Howard 14-18 Wellhead location.

Soil analytical results received for soil samples (SB06-SB08) collected during supplemental site investigation and delineation indicated that soil samples were below 1.25x the highest background concentrations from 2.5 feet to 9 feet bgs. The use of the highest background concentration from the previous mentioned depths is due to the similarities in lithologic conditions exhibited during supplemental site investigation activities, it was determined that the lithology at the former Howard 14-18 Wellhead is uniform between 2.5 feet bgs and 9 feet bgs and consists of poorly sorted sand and under the United States Department of Agriculture (USDA) web soil survey the entire site is classified as Ascalon loam. Given this information and the invariable lithology, the highest background concentration observed per lithologic unit was used to determine if site conditions were indicative of native material conditions. This approach remains consistent to previously presented analytical results since this remediation project was opened in 2022. It was determined that arsenic concentrations observed in soil samples collected during the multiple site investigation activities are within 1.25x background concentrations for this location with the exception to soil samples WH01-N and WH01-S. These two remaining arsenic exceedances are vertically and horizontally delineated to below 1.25x site background concentrations.

Following approval of this form and landowner approval, PDC proposes an additional supplemental site investigation to confirm the arsenic concentrations in soil samples WH01-N and WH01-S. In addition, a COA was issued on ECMC Document No. 403617517 requesting a resample of soil samples collected in soil boring SB03. As such, soil samples will be recollected in the location of soil boring SB03 to confirm the arsenic concentrations. Supplemental Form 27s will be prepared and submitted on a quarterly schedule to provide updates and progress of the remediation until closure criteria has been achieved.

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: _____

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: _____

Date: _____

Remediation Project Number: 23602

COA Type

Description

0 COA	
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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.

Att Doc Num	Name
403851178	MAP
403851179	SOIL SAMPLE LOCATION MAP
403851182	SOIL SAMPLE LOCATION MAP
403851183	SOIL SAMPLE LOCATION MAP
403851186	ANALYTICAL RESULTS
403851187	SITE INVESTIGATION PLAN
403851188	PHOTO DOCUMENTATION

Total Attach: 7 Files

General Comments

User Group

Comment

Comment Date

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

Total: 0 comment(s)