

State of Colorado
Energy & Carbon Management Commission

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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 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: PDC ENERGY INC	Operator No: 69175	Phone Numbers Phone: (303) 860-5800 Mobile: ()
Address: 1099 18TH STREET SUITE 1500		
City: DENVER	State: CO	Zip: 80202
Contact Person: Karen Olson	Email: taspillremediationcontractor@pdce.com	

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

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:

- 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	SOILS	Refer to Tables 1-5 & Figures 1-4	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 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 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 will be 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 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 ECMC. GPS data will be collected for all soil sample locations. Soil samples collected at the tank battery 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 and 8015. Soil samples will be 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 will be conducted during the removal of the on-location flowline (estimated to be 160 feet in length), 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 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 will be 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 12
Number of soil samples exceeding 915-1 3
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
_____ 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 from the soil boring at depths ranging from 2.5 feet to 8 feet bgs and submitted for laboratory analysis of ECMC Table 915-1 metals. Analytical results indicated that arsenic was in exceedance of the applicable Table 915-1 regulatory standards in native soil.

Additionally, on October 10, 2023, four (4) 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 feet to 10 feet bgs and were submitted for laboratory analysis of arsenic. Analytical results indicated that arsenic concentrations were in exceedance of the applicable standards in background soil borings BKG02, BKG03, BKG04, and BKG05.

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 horizontally delineate the arsenic exceedance observed in soil boring SB03 collected adjacent to the wellhead excavation extent. The soil borings will be advanced via direct push methodologies to approximately 10 feet bgs due to lithologic refusal encountered on site during the previous supplemental site investigation. Soil samples will be collected from native material adjacent to soil boring SB03 at depths ranging between 5 feet and 10 feet bgs and will be submitted for laboratory analysis of arsenic.

In addition, three (3) background soil borings will be advanced surrounding the former wellhead to approximately 10 feet bgs and will be submitted to the laboratory for analysis of arsenic. Volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded for each soil boring. Supplemental site investigation activities are proposed to be conducted by the end of the second quarter 2024, pending approval of this form and landowner approval. 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.

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.

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'. Analytical results are summarized in Tables 1 through 4, and GPS coordinates and field screened VOC concentrations are summarized in Table 5. The soil sample locations are illustrated on Figure 1 and Figure 2 and the soil boring locations are illustrated on Figure 3. The laboratory reports are included as Attachment A and the soil boring logs are included as Attachment B.

Soil Remediation Summary

In Situ

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 COGCC 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 Confirmation Sample Summary & Supplemental Site Investigation Proposal

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 Sample Summary & Supplemental Site Investigation Proposal

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 and delineation 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: \$ 15000

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:

No beneficial use.

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

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Waste Management Facility

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? 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 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 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. 01/11/2025

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. 01/01/2024

Proposed completion of site investigation. 03/31/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/15/2023

Proposed date of completion of Remediation. 01/11/2025

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, the proposed date of site investigation commencement and the proposed date of the completion of site investigation is proposed to span through the first 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 October 10, 2023, at the former Howard 14-18 Wellhead location.

Soil analytical results received for soil samples (SB01, SB02, SB04 and SB05) collected during supplemental site investigation and delineation activities indicated that arsenic concentrations were delineated to within ECMC Table 915-1 Protection of Groundwater SSLs and are indicative of native material concentrations.

Additionally, due to the similarities in lithologic conditions exhibited during supplemental site investigation activities, it was determined that the geology 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. It was determined that soil samples collected during site investigation activities are within 1.25x background concentrations for this location with the exception to soil boring SB03.

Following approval of this form and landowner approval, PDC proposes an additional supplemental site investigation via direct push methodologies to provide horizontal delineation in soil boring SB03. In addition, a native material evaluation will be conducted to determine if the exceedances observed are indicative of native material conditions at the former Howard 14-18 Wellhead. 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: Senior Program Manager

Submit Date: _____

Email: taspillremediationcontractor@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: _____

Date: _____

Remediation Project Number: 23602

COA Type

Description

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
403631567	LOGS
403631583	SOIL SAMPLE LOCATION MAP
403631586	SOIL SAMPLE LOCATION MAP
403631588	SOIL SAMPLE LOCATION MAP
403651717	ANALYTICAL RESULTS
403651725	SITE INVESTIGATION PLAN

Total Attach: 6 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)