

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
RICK ALLISON

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 ECOM 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>(970) 313-5582</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>Jason Davidson</u>	Email: <u>ENspillremediationcontractor@pdce.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 29396 Initial Form 27 Document #: 403407130

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>123-11844</u>	County Name: <u>WELD</u>
Facility Name: <u>LOWELL-PAUL DAIRY 1-33</u>	Latitude: <u>40.450480</u>	Longitude: <u>-104.775430</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NENE</u>	Sec: <u>33</u>	Twp: <u>6N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>LOCATION</u>	Facility ID: <u>322671</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>LOWELL-PAUL DAIRY-66N66W 33NENE</u>	Latitude: <u>40.450480</u>	Longitude: <u>-104.775430</u>	
** correct Lat/Long if needed: Latitude: <u>40.450479</u>		Longitude: <u>-104.775225</u>	
QtrQtr: <u>NENE</u>	Sec: <u>33</u>	Twp: <u>6N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications GW

Most Sensitive Adjacent Land Use Rangeland

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

Closest Domestic Well – 1150' NW
Additional Domestic Wells - None
Nearest Surface Water - Cache La Poudre River - 800' SW
Site is located within 100-Year Effective Floodplain
Nearest Occupied Building – 540' NE
Additional Occupied Buildings – 820' NE, 880' W
Freshwater Forested/ Shrub Wetland – 1150' S
Aquatic Native Species Conservation Waters Buffer – 350' S

No other potential receptors are located within ¼ mile of the Site
Above distances are approximations from Site center

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
No	GROUNDWATER	Refer to Table 5	Grab Groundwater Sampling
No	SOILS	Refer to Tables 2-4 & Figure 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 ECMC Rule 911, this form serves as notification for the decommissioning and abandonment of the Lowell-Paul Dairy 1-33 production facility, Lowell-Paul Dairy 1-33 wellhead, and removal of the associated flowlines. The ground and sub-surfaces will be visually inspected for hydrocarbon impacts during equipment decommissioning. In addition, on-site dump lines located between the separator and tank battery will be removed by pulling from either end during decommissioning activities. 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 and 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. Soil samples collected at the tank battery and adjacent to the wellheads and wellhead flowline riser from native material and will be submitted for laboratory analysis of BTEXN, TMB's, PAH, TPH (C6-C36), pH, EC, SAR, and boron by ECMC approved methods, with the exception of the sample(s) collected below the AST (s) which will be analyzed for BTEXN, TMB's, PAH's, and TPH (C6-36).

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 (TMB), and 1,3,5-TMB 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 from the base of the excavation and excavation sidewall in areas most likely to be impacted and exhibiting the highest field screened VOC concentration and submitted for laboratory analysis of BTEXN, TMB's, PAH's, TPH (C6-C36), pH, EC, SAR, and boron. Assessments will be conducted during the removal of the on-location flowline (~70 feet in length) and soil samples will be collected below the flowline risers. The flowlines and adjacent sub-surface will be inspected for 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 and submitted for analysis of BTEXN, TMB's, PAH's, and TPH (C6-C36).

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 15
Number of soil samples exceeding 915-1 1
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 300

NA / ND

-- Highest concentration of TPH (mg/kg) 0.96
-- Highest concentration of SAR 2.95
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 6

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 5
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l) _____
ND Highest concentration of Toluene (µg/l) _____
-- Highest concentration of Ethylbenzene (µg/l) 1.7
-- Highest concentration of Xylene (µg/l) 3.6
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?

Six site-specific background samples were collected from four background soil borings (BKG01-BKG04) from approximately 3 ft., 4 ft., and 5 ft-bgs in areas away from oil and gas infrastructure. Soil samples BKG01@4 and BKG02@4 were submitted for analysis of arsenic and lead and soil samples BKG03 through BKG04 were submitted for analysis of EC, pH, SAR, boron, arsenic, barium, lead, and selenium by ECMC approved methods.

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?

One groundwater monitoring well will be installed and sampled at least once to verify that groundwater has not been impacted at the Lowell Paul Dairy 1-33 wellhead.

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 October 24, 2023, excavation was conducted to remove the impacted soil at the wellhead. Four excavation confirmation soil samples (EX02-EX05) were collected from the sidewalls of the excavation from approximately 3 ft-bgs and one excavation confirmation soil sample (EX01@5.5) from the floor of the excavation from approximately 5.5 ft-bgs. The final extent of excavation was approximately 20 feet by 15 feet to a total depth of 5.5 ft-bgs. In total, approximately 60 cubic yards of presumably impacted soil were removed and hauled to Waste Management's North Weld Landfill in Ault, CO in accordance with ECMC Rules 905 and 906. Copies of the waste manifests are available upon request.

A summary of initial facility closure and excavation activities was provided in the Facility Closure Investigation and Excavation Environmental Report was provided with Supplemental Form 27 Document Number 403713718.

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.

As described above, hydrocarbon impacted soil has been removed leaving only an elevated concentration of lead reported its respective ECMC Table 915-1 standard to be resolved (Excavation floor sample EX01@5.5). Please refer to the Source Removal Summary section above.

Please refer to the Operator Comments for information on additional excavation conducted at the Site.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 60

_____ 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 encountered in the wellhead excavation at approximately 5.5 ft-bgs. One grab groundwater sample was collected and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB by EPA Method 8260. All results were reported below their respective ECMC Table 915-1 regulatory standards. Refer to the attached Table 5 for a summary of the analytical results.

Please refer to the Facility Closure Investigation and Excavation Environmental Report for a summary of groundwater activities at the Site. The report was provided with Supplemental Form 27 Document Number 403713718.

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 Site Investigation and Remediation Progress Report

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.

- Source mass removal is complete.
- Facility closure activities and confirmation soil sampling were conducted at the Lowell-Paul Dairy 1-33 wellhead and production facility on October 19 and October 24, 2024.
- One groundwater monitoring well will be installed and sampled at least once to verify organics concentrations in groundwater at the Lowell Paul Dairy 1-33 wellhead.

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 60

E&P waste (solid) description Hydrocarbon impacted soil

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: Waste Management's North Weld Landfill in Ault, CO

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? Yes

Does the previous reply indicate consideration of background concentrations? Yes

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 facility closure 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? No

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. 10/31/2024

Proposed date of completion of Reclamation. 10/31/2026

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. 04/13/2023

Actual Spill or Release date, or date of discovery. 10/19/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/19/2023

Proposed site investigation commencement. 10/19/2023

Proposed completion of site investigation. 05/17/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 10/24/2023

Proposed date of completion of Remediation. 10/24/2023

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

Hydrocarbon impacted soils were identified at the wellhead during facility closure activities. Excavation was conducted and the identified impacted soil was removed and transported offsite for disposal at a properly permitted waste facility. All analytical results reported for excavation confirmation soil samples collected from the final extent of the excavation were compliant with their applicable Table 915-1 GWSSLs, or less than 1.25x average background concentrations for arsenic, barium, and selenium. Lead was reported above 1.25x average background concentration for excavation floor sample EX01 @5.5. All groundwater analytical results reported for the grab groundwater sample were reported as compliant with their respective Table 915-1 groundwater standards.

A reduced analyte list (lead only) for subsequent confirmation samples was requested and approved by the ECMC in Form 27 Supplemental Document Number 403627558 on December 18, 2023. On May 17, 2024, EX01 @5.5 was removed and the material was hauled to a licensed disposal facility. Four sidewall samples and one floor soil sample (EX06-EX10) were collected and submitted for analysis of lead. All results were compliant with their respective GWSSLs.

Due to detections of organics in the groundwater sample collected from the wellhead excavation, PDC proposes to install one groundwater monitoring well adjacent to the former wellhead, in the hydrologically down-gradient direction from the wellhead based on regional drainage and Site topography. One groundwater sample will be collected from the well and submitted for analysis of BTEXN and TMBs to confirm the presence or absence of organic concentrations exceeding Table 915-1 groundwater standards. If compliant, PDC will request closure of Remediation Project #29396. If the sample is non-compliant, four additional groundwater monitoring wells will be installed to further characterize impacts at the Site. This method was selected following the approval of the same method on a similar Site, Remediation Project #27934, Document #403883899 (attached to this Form 27 as a Related Form).

A general location map is provided as Figure 1. Sample location information is provided in Table 1. Soil sample and field screening locations are presented in Figure 2, and analytical results are summarized in Table 2, Table 3, Table 4 and Table 5. The proposed groundwater well location is displayed on Figure 3.

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

Signed: Jason Davidson

Title: Remediation Advisor

Submit Date: 09/30/2024

Email: ENspillremediationcontractor@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: RICK ALLISON

Date: 11/01/2024

Remediation Project Number: 29396

COA Type	Description
0 COA	

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
403939587	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403939730	MAP
403939735	SOIL SAMPLE LOCATION MAP
403939738	MAP
403939741	ANALYTICAL RESULTS
403979265	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 6 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)