

State of Colorado
Energy & Carbon Management Commission

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 30170 Initial Form 27 Document #: 403428170

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

No Multiple Facilities

Facility Type: LOCATION	Facility ID: 424967	API #: _____	County Name: WELD
Facility Name: Ikenouye F 28-65HN TANK	Latitude: 40.368300	Longitude: -104.678280	
	** correct Lat/Long if needed: Latitude: 40.369020	Longitude: -104.678555	
QtrQtr: NESE	Sec: 29	Twp: 5N	Range: 65W 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

Nearest Well: Irrigation - 890' ESE; Surface Water: Irrigation Ditch - 156' E; Occupied Building: 1,370' NE; Livestock: 983' NE; FWS Wetlands: 156' E 156' E - Riverine (R4SBCx); HPH Sensitive Wildlife Habitat: Rule 1202.c: 606' WNW - Aquatic Native Species Conservation Area; Rule 1202.d: Tank Battery Within Mule Deer Severe Winter Range; 1202.d: Tank Battery Within Mule Deer Winter Concentration Area; Tank Battery Within 100-Year Floodplain.

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 Document No. 403555576	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.

Between August 8 and 9, 2023, field screening and confirmation soil sampling activities were conducted in accordance with the ECMC Rule 911 during the decommissioning of the Ikenouye F 28-65HN Tank Battery. Following the removal of greater than 10 cubic yards (CY) of potentially impacted material, it was determined that a historic release was discovered below the separator dump-line. Additionally, based on initial analytical results from the waste characterization soil samples (AST02-B & AST02-W), it was determined that a second historic release was discovered below the westernmost above ground storage tank (AST). On August 8, 2023, mitigation activities were conducted at the separator dump-line and to date approximately 20 CY of impacted material were removed from the separator dump-line source area. Mitigation activities continued on August 9 & 16, 2023, at AST02, to date, approximately 23 cubic yards of impacted material were removed from the AST02 location. Additionally, mitigation activities continued at the the produced water vessel (PWV01) and AST03, to date, approximately 1 cubic yard of impacted material was removed from PWV01 and approximately 5 cubic yards of impacted material were removed from AST03. In total, approximately 49 cubic yards of impacted material were removed from the Ikenouye F 28-65HN Tank Battery and transported to the North Weld Waste Management Landfill for disposal under PDC waste manifests.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

- ☒ Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

On August 8 & 9, 2023, three (3) waste characterization soil samples (WC01, AST02-B, & AST02-W) were collected from the separator dump-line and AST02 source areas at approximately 2.5 feet, 1 foot, and 6 inches below ground surface (bgs), respectively. The samples were submitted for laboratory analysis of the full ECMC Table 915-1 analytical suite. Analytical results indicated that site specific COCs for the separator dump-line release include: benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH[C6-C36]), 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, and barium. Analytical results indicated that site specific COCs for the AST02 release include: benzene, toluene, ethylbenzene, and total xylenes (BTEX), naphthalene, total petroleum hydrocarbons (TPH[C6-C36]), 1,2,4-trimethylbenzene (TMB), and 1,3,5-TMB.

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):

During closure activities conducted between August 8 & 16, 2023, soil encountered on-site and below production equipment was visually inspected and field screened for VOC concentrations using a PID. Per the approved proposed sampling plan, samples were collected below and/or adjacent to the above ground storage tank (AST01), separator flowlines & dump-lines (SEP01-FL, SEP02-FL, & SEP02-DL), & submitted for analysis of Organic Compounds in Soil and TPH (C6-C36). Soil samples (SEP01-FL, SEP02-FL, & SEP02-DL) were submitted for additional analysis of pH, EC, SAR, & boron. Additionally, soil samples (PWV01-B, PWV01-W, AST03-B, & AST03-S) were collected from the base and sidewall exhibiting the highest field screened PID response and submitted for analysis of the Table 915-1 analytical suite. Analytical results indicated that the soil samples were in compliance with the applicable standards with the exception of barium exceedances observed in soil samples PWV01-W & AST03.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 22

Number of soil samples exceeding 915-1 5

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 615

NA / ND

-- Highest concentration of TPH (mg/kg) 160

-- Highest concentration of SAR 2.17

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 4

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 August 9, 2023, two background soil borings (BKG01 & BKG02) were advanced via hand auger in native material adjacent to the tank battery location. Five soil samples were collected from each background soil boring at approximately 6 inches, 1 foot, 1.5 feet, 2.5 feet, and 3.5 feet bgs and the 10 soil samples were submitted for laboratory analysis of ECOM Table 915-1 metals. Analytical results indicated that arsenic, barium, cadmium, lead, and selenium concentrations were in exceedance of the applicable regulatory standards in native soil.

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

Volume of solid waste (cubic yards) 49

Volume of liquid waste (barrels) 0

☒ Is further site investigation required?

Based on final analytical results from decommissioning and mitigation activities on the Ikenouye F 28-65HN tank battery, supplemental site investigation activities are needed to vertically and horizontally delineate barium exceedances observed in soil samples SEP01-DL-N @ 2.5' and PWV01-W @ 1.5'. As such, up to seven (7) soil borings will be advanced via hand auger drilling methods to vertically and horizontally delineate the barium exceedances observed in the previously mentioned samples.

Up to three (3) additional background soil boring will be advanced via hand auger drilling methods adjacent to the former tank battery in order to evaluate barium in native material. The proposed soil boring location map was included on the previously submitted Supplemental Form 27 Document No. 40355576.

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.

Between August 8 & 16, 2023, approximately 49 cubic yards of impacted material were removed from the Ikenouye F 28-65HN Tank Battery and transported to the North Weld Waste Management Landfill for disposal under PDC waste manifests.

REMEDIAL 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.

Following mitigation activities, five confirmation soil samples (SS01-SS05) were collected from the base and sidewalls of the AST02 excavation at depths ranging between 6 in and 3 ft bgs and submitted for laboratory analysis of BTEX, naphthalene, TMBs, and TPH (C6-C36). In addition, one soil sample (SS06) was collected from the sidewall of the final excavation extent and submitted for analysis of pH, EC, SAR, & boron. Analytical results indicated that all constituents were in compliance with the applicable Table 915-1 standards.

Five (5) confirmation soil samples (SEP01-DL-B, SEP01-DL-N, SEP01-DL-E, SEP01-DL-S, & SEP01-DL-W) were collected from the base and sidewalls of the separator dump-line final excavation extent at depths ranging between 2.5 ft and 3.5 ft bgs and submitted for laboratory analysis of Table 915-1 Organic Compounds in Soil, TPH (C6-C36), pH, EC, SAR, boron, and barium. Analytical results indicated that constituents were in compliance with the applicable standards, with the exception of barium in SEP01-DL-N.

During decommissioning activities high PID readings were recorded under PWV01 and AST03. Subsequently, excavation activities were initiated with approximately 1 cubic yard of impacted material removed from PWV01 and approximately 5 cubic yards of impacted material removed from AST03. Soil samples (PWV01-B, PWV01-W, AST03-B, & AST03-S) were collected at the AST03 and PWV01 excavation locations, the base and sidewall which exhibited the highest PID reading was submitted for laboratory analysis of the full ECMC Table 915-1 analytical suite. Analytical results indicated that constituents were in compliance with the applicable standards, except for barium exceedances observed in soil samples PWV01-W and AST03-S.

Supporting documentation was included on the previously submitted Supplemental Form 27 Document No. 403555576.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 49

_____ 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 decommissioning or mitigation activities conducted at the Ikenouye F 28-65HN 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

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 has been completed.
- Investigation and delineation is complete for organic compounds in soil.
- Further soil investigation/activities are required at the former tank battery location to delineate elevated barium concentrations
- Facility and infrastructure were decommissioned and the location will be reclaimed in accordance with the ECMC 1000 Series.

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: \$

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

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.

Following tank battery decommissioning and mitigation activities, the location was backfilled, compacted, and re-contoured to match pre-existing conditions. The locations 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. 08/08/2023

Proposed date of completion of Reclamation. 08/16/2028

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. 05/09/2023

Actual Spill or Release date, or date of discovery. 08/08/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/29/2023

Proposed site investigation commencement. 05/01/2024

Proposed completion of site investigation. 09/30/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/08/2023

Proposed date of completion of Remediation. 08/16/2028

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

This form is being submitted as a second quarter 2024 timeline update for the Ikenouye F 28-65HN Tank Battery. Per ECMC request, tables and figures previously submitted have not been included with this form submittal. Please refer to ECMC document no. 403555576 for previously submitted tables and figures.

Following landowner approval and crew availability, supplemental site investigation activities will be conducted to vertically and horizontally delineate barium concentrations at the separator dump-line (SEP01-DL-N @ 2.5') location and the produced water vessel (PWV01-W @ 1.5') location. Additionally, an assessment of barium concentrations in native material will be conducted. 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: 30170

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

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Total Attach: 0 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)