

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:

403136365

Receive Date:

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.

Report taken by:

OPERATOR INFORMATION

Name of Operator: <u>PDC ENERGY INC</u>	Operator No: <u>69175</u>	<b>Phone Numbers</b>
Address: <u>1775 SHERMAN STREET - STE 3000</u>		Phone: <u>(303) 860-5800</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80203</u>		Mobile: <u>( )</u>
Contact Person: <u>Karen Olson</u>	Email: <u>COGCCSPILLREMEDICATION@PDCE.COM</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9951 Initial Form 27 Document #: 200440746

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: <u>PIT</u>	Facility ID: <u>113418</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>TOEDTLI</u>	Latitude: <u>40.851038</u>	Longitude: <u>-103.739836</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NESW</u>	Sec: <u>10</u>	Twp: <u>10N</u>	Range: <u>57W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use RANGELAND  
 Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? Yes  
 Is groundwater less than 20 feet below ground surface? No

**Other Potential Receptors within 1/4 mile**

Intermittent tributary to Spring Creek approximately 1,115 feet to the south.

# 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 type="checkbox"/> Oil                       | <input type="checkbox"/> Tank Bottoms                |  |
| <input 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 1-2 and Figure 1	Site investigation soil samples

## **INITIAL ACTION SUMMARY**

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

On October 28, 2016, site investigation activities were conducted to assess the potential presence of hydrocarbon impact associated with one of the historical produced water overflow evaporation pits at the Toedtli 1-10 Pit. Please refer to the LTE Site Investigation and Closure Request, dated December 7, 2016 for additional details. A total of 15 locations were sampled during site investigation activities. On October 28, 2016, five soil samples ranging from 0.75 feet bgs to 4 feet bgs were collected from within the pit and analyzed for BTEX and TPH to assess potential petroleum hydrocarbon impacts in the produced water pit. One of the soil samples was also analyzed for pH, EC, and SAR to assess the potential presence of inorganic impacts near the surface within the typical vegetative root zone. On January 13, 2017, four soil samples surrounding the pit and two background soil samples were collected from 1 foot bgs and analyzed for pH, EC, and SAR. On February 3, 2017, six additional locations were sampled, and four discrete soil samples were collected from each location, at depths of 1 foot, 3, feet, 5 feet, and 10 feet bgs. The samples were analyzed for pH, EC, and SAR.

## **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 September 14, 2021, two (2) soil borings were advanced beneath the former skim pit location to confirm the absence of hydrocarbon impacts. Six (6) soil samples (BH04 & BH05) were collected at approximately 7 feet, 8 feet, and 9 feet bgs and were submitted for laboratory analysis of BTEX, 1,2,4-TMB, 1,3,5-TMB, naphthalene, and TPH(C6-C36). Analytical results indicate all organic compound concentrations were below the COGCC Table 915-1 Protection of Groundwater SSLs. Additionally on September 14, 2021, thirteen (13) soil borings (BH01-BH03 and BH07-BH16) were advanced across the former location to evaluate soil sustainability for reclamation. Twenty-six (26) soil samples were collected at approximately 1 foot and 3 feet bgs and were submitted for laboratory analysis of pH, EC, and SAR. Analytical results indicate pH, and EC were observed in exceedance of the applicable Table 915-1 standards across soil borings BH02-BH03, BH07-BH12, BH14, and BH16.

### **Proposed Groundwater Sampling**

Will groundwater samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

### **Proposed Surface Water Sampling**

Will surface water samples be collected as part of this investigation? ( Number, analyses, and locations of samples ):

### **Additional Investigative Actions**

Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

# SITE INVESTIGATION REPORT

## **SAMPLE SUMMARY**

### **Soil**

Number of soil samples collected 32

Number of soil samples exceeding 915-1 16

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

Approximate areal extent (square feet) 52000

### **NA / ND**

-- Highest concentration of TPH (mg/kg) 197

-- Highest concentration of SAR 4.98

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 3

### **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 0

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 September 14, 2022, two (2) background soil samples (BKG01) were collected at 1 foot & 3 feet bgs from native material adjacent to the former facility. All background soil samples were submitted for analysis of the pH, EC, and SAR. Analytical results indicated that pH was 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)         

Volume of liquid waste (barrels)         

Is further site investigation required?

Up to fifteen (15) soil borings will be advanced at the former location to horizontally and vertically delineate pH and EC exceedances remaining at this location. Volatile organic compound (VOC) concentrations using a photoionization detector (PID) and lithologic descriptions will be recorded for each borehole. Soil samples will be collected from necessary intervals to obtain horizontal or vertical delineation, to a maximum of 10 feet bgs and will be submitted for laboratory analysis of pH and/or EC.

Additionally, up to three (3) background soil borings will be advanced to approximately 10 feet bgs in native material adjacent to the former location to evaluate pH and EC in native conditions.

## **REMEDIAL ACTION PLAN**

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

### **SOURCE REMOVAL SUMMARY**

Describe how source is to be removed.

The Toedtli 1-10 pit has been abandoned.

### **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.

Per the Condition of Approvals (COAs) issued by the State (Document # 401219644), additional site investigation and confirmation sampling activities were conducted to delineate inorganic impacts down-gradient of soil boring SB-09 and confirm the current remediation status of this location. In addition, because the skim pit has been decommissioned, confirmation soil samples were collected adjacent to and below the former pit location to confirm the absence of hydrocarbon impacts. Based on analytical results, additional supplemental site investigation activities will be conducted to vertically and horizontally delineate pH and EC constituents. Confirmation samples will be submitted for laboratory analysis in accordance with the 900 Series and Table 915-1. A summary of the analytical results and a photo log documenting on-going site investigation activities will be provided in a forth-coming Supplemental Form 27.

**Soil Remediation Summary**

In Situ

Ex Situ

- \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )
- \_\_\_\_\_ Chemical oxidation
- \_\_\_\_\_ Air sparge / Soil vapor extraction
- \_\_\_\_\_ Natural Attenuation
- \_\_\_\_\_ Other \_\_\_\_\_

- \_\_\_\_\_ Excavate and offsite disposal
- \_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_
- \_\_\_\_\_ Name of Licensed Disposal Facility or COGCC Facility ID # \_\_\_\_\_
- \_\_\_\_\_ Excavate and onsite remediation
- \_\_\_\_\_ 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 has not been encountered during site investigation activities at this facility.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

Quarterly     Semi-Annually     Annually     Other    Remediation Timeline Update, 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    Remediation Timeline Update, 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 COGCC 1000 Series.
- Investigation and delineation has been completed for organics in soil. Further soil investigation/delineation of inorganics and native material assessment of inorganics is required at the former Toedtli 1-10 facility.

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? No

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 0

E&P waste (solid) description \_\_\_\_\_

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal 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.

Upon closure of the pit, this location was backfilled to the pre-existing grade or to match the surrounding topography as much as practical. Due to inorganic exceedances observed during the September 14, 2021 site investigation, additional delineation activities will be conducted at this location. Following the completion of investigation and delineation activities, a site-specific reclamation plan will be developed in accordance with the COGCC 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. \_\_\_\_\_

Proposed date of completion of Reclamation. 08/16/2027

## 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. \_\_\_\_\_

Actual Spill or Release date, or date of discovery. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/28/2016

Proposed site investigation commencement. 09/01/2022

Proposed completion of site investigation. 12/31/2022

### REMEDIAL ACTION DATES

Proposed start date of Remediation. \_\_\_\_\_

Proposed date of completion of Remediation. \_\_\_\_\_

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 timeline and progress update for the Toedtli 1-10 pit. In accordance with the May 14, 2017 COGCC issued COA (Form # 401219644), following the closure of the former pit, soil samples were collected to assess organic constituents. Soil analytical results indicate organic compound concentrations are below applicable COGCC Table 915-1 Protection of Groundwater SSLs in the vicinity of the former pit.

Additionally, in accordance with a second COA issued on Form # 401219644, inorganic concentrations were evaluated across the former production facility down to approximately 3 feet bgs. Analytical results indicated that pH levels and EC concentrations were in exceedance of the COGCC Table 915-1 soil suitability for reclamation standards for pH and EC.

Following the approval of this form and landowner approval, PDC will conduct a supplemental site investigation to delineate vertically and horizontally inorganic pH and EC constituents at the Toedtli 1-10 pit. Additionally, a native material assessment will be conducted to further evaluate soil suitability for reclamation conditions in native material.

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: COGCCSPILLREMEDATION@PDCE.CO  
M

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: 9951

**COA Type**

**Description**

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**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**

403153074	SOIL SAMPLE LOCATION MAP
403153075	ANALYTICAL RESULTS
403153076	LOGS
403153100	SITE INVESTIGATION PLAN

Total Attach: 4 Files

**General Comments**

**User Group**

**Comment**

**Comment Date**

		Stamp Upon Approval
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Total: 0 comment(s)