

State of Colorado Oil and Gas Conservation Commission

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Report taken by:

PETER GINTAUTAS

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATION

Name of Operator: <u>PDC ENERGY INC</u>	Operator No: <u>69175</u>	Phone Numbers
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>
Contact Person: <u>Karen Olson</u>	Email: <u>Karen.Olson@pdce.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 4468 Initial Form 27 Document #: 1943616

PURPOSE INFORMATION

- | | |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination | <input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water |
| <input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure | <input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b. |
| <input type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation | <input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project |
| <input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste | <input type="checkbox"/> Rule 906.c.: Director request |
| <input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure | <input type="checkbox"/> Other _____ |

SITE INFORMATION

N Multiple Facilities (in accordance with Rule 909.c.)

Facility Type: <u>LOCATION</u>	Facility ID: <u>323638</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>KIELIAN-64N67W 2NESE</u>		Latitude: <u>40.339060</u>	Longitude: <u>-104.851000</u>
		** correct Lat/Long if needed: Latitude: <u>40.335285</u>	Longitude: <u>-104.850160</u>
QtrQtr: <u>NESE</u>	Sec: <u>2</u>	Twp: <u>4N</u>	Range: <u>67W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use CROP LAND

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

SURFACE WATER APPROXIMATELY 80' SOUTHEAST OF SITE

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	GROUNDWATER	SEE ATTACHED DATA	GROUNDWATER SAMPLES/LAB ANALYSIS
Yes	SOILS	15' E- W X 22' N-S X 8' BGS	SAMPLES/SCREENING/ANALYSIS

INITIAL ACTION SUMMARY

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

FORM 19 WAS PRODUCED ON 04/30/08.

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):

Proposed Groundwater Sampling

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

Quarterly monitoring of MW conducted as approved in initial site investigation plan submitted prior to Eforms

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 0
Number of soil samples exceeding 910-1
Was the areal and vertical extent of soil contamination delineated?
Approximate areal extent (square feet)

NA / ND

 Highest concentration of TPH (mg/kg)
 Highest concentration of SAR
 BTEX > 910-1
 Vertical Extent > 910-1 (in feet)

Groundwater

Number of groundwater samples collected 11
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 8'
Number of groundwater monitoring wells installed 12
Number of groundwater samples exceeding 910-1 0

ND Highest concentration of Benzene (µg/l)
ND Highest concentration of Toluene (µg/l)
ND Highest concentration of Ethylbenzene (µg/l)
ND Highest concentration of Xylene (µg/l)
NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected
 Number of surface water samples exceeding 910-1
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?

☐ 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?

NO. DOWNGRADE MONITORING WELL MW08 IS A POC WELL. THEREFORE NO ADDITIONAL WELLS ARE NEEDED TO DEFINE THE EXTENT OF GROUNDWATER IMPACTS. GROUNDWATER MONITORING WELLS WILL CONTINUE TO BE SAMPLED UNTIL FOUR CONSECUTIVE QUARTERS OF ANALYTICAL LABORATORY RESULTS ARE BELOW THE BASIC STANDARDS FOR GROUNDWATER.

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.

DURING A ROUTINE TANK BATTERY UPGRADE ACTIVITIES, A LEAK IN DUMPLINE FROM THE SEPARATOR WAS OBSERVED TO HAVE RELEASED AN UNKNOWN VOLUME OF PRODUCED WATER AND CONDENSATE TO THE SUBSURFACE. APPROXIMATELY 98 CUBIC YARDS OF PETROLEUM HYDROCARBON IMPACTED ABOVE THE COLORADO OIL AND GAS COMMISSION (COGCC) SENSITIVE AREA ALLOWABLE LEVEL WAS REMOVED FROM THE EXCAVATION ALONG THE DUMP LINES. SOIL SAMPLES WERE COLLECTED FROM THE BASE AND SIDEWALLS OF THE EXCAVATION AND SUBMITTED FOR ANALYSIS BY OF TOTAL PETROLEUM HYDROCARBON BY EPA MODIFIED METHOD 8015. LABORATORY RESULTS INDICATED TPH CONCENTRATIONS (C6-C36) AT THE EXTENT OF EXCAVATION WERE BELOW THE COGCC 1000 MG/KG SENSITIVE AREA ALLOWABLE LEVEL. GROUNDWATER ENTERING THE EXCAVATION WAS ANALYZED FOR BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES (BTEX) BY EPA METHOD 8260. LABORATORY RESULTS INDICATED BENZENE CONCENTRATIONS EXCEEDED THE COLORADO PUBLIC HEALTH AND ENVIRONMENTAL (CDPHE) WATER QUALITY CONTROL COMMISSION, REGULATION 41- THE BASIC STANDARDS FOR GROUNDWATER OF 5 MICROGRAMS PER LITER (UG/L). A TOPOGRAPHIC MAP OF THE AREA IS SHOWN ON FIGURE 1. SOIL AND GROUNDWATER SAMPLE LOCATIONS ARE SHOWN IN FIGURE 2, SITE MAP PROVIDED . SOIL ANALYTICAL AND GROUNDWATER ANALYTICAL RESULTS ARE PROVIDED IN TABLES 1 AND 2 RESPECTIVELY.

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.

Due to a divestiture of the property, no further remediation strategies or groundwater sampling will be implemented by PDC Energy at this time.

Soil Remediation Summary

☐ In Situ

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

☐ Ex Situ

- _____ 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
- No ☐ 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.

THREE MONITORING WELLS (MW01 THROUGH MW03) WERE INSTALLED AT THE SITE ON JUNE 20, 2008. EACH OF THE WELLS WERE DEVELOPED AND PURGED FOLLOWING INSTALLATION. GROUNDWATER SAMPLES WERE COLELCTED FROM EACH OF THE WELLS AND SUBMITTED FOR LABORATORY ANALYSIS OF BTEX ON JUNE 26 2008. LABORATORY ANALYTICAL RESULTS INDICATED BENZENE LEVELS IN (MW01 THROUGH MW03) EXCEEDED THE BASIC STANDARDS FOR GROUNDWATER OF 5 UG/L . ADDITIONAL POINT OF COMPLIANCE (POC) WELLS (MW04 THROUGH MW07) WERE INSTALLED AT THE SITE ON AUGUST 12, 2008. GROUNDWATER SAMPLES WERE COLLECTED FROM EACH OF THE WELLS AND SUBMITTED FOR ANALYSIS OF BTEX ON AUGUST 26, 2008. LABORATORY RESULTS INDICATE BENZENE LEVELS IN MW04 AND MW05 EXCEED THE BASIC STANDARDS FOR GROUNDWATER OF 5 UG/L. MW08 WAS INSTALLED AT THE SITE ON DEC 31 2008. GROUNDWATER SAMPLES WERE COLLECTED FROM WELL MW08 AND SUBMITTED FOR ANALYSIS OF BTEX ON JANUARY 05, 2008. LABORATORY RESULTS INDICATED BENZENE LEVELS IN MW08 WERE BELOW THE BASIC STANDARDS FOR GROUNDWATER OF 5 UG/L. GORUNDWATER ANALYTICAL RESULTS ARE PROVIDED IN TABLE 2.

REMEDATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☒ Quarterly ☐ Semi-Annually ☐ Annually ☐ Other _____

Report Type: ☒ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☐ Other _____

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 _____

E&P waste (solid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

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

E&P waste (liquid) description _____

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____

REMEDATION COMPLETION REPORT

REMEDATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No _____

Do all soils meet Table 910-1 standards? _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? _____

Does Groundwater meet Table 910-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

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.

THE SITE WAS RESTORED TO ITS PRE RELEASE GRADE. PDC'S PRODUCTION FACILITY REMAINS AT THE SITE.

Is the described reclamation complete? _____

Does the reclamation described herein constitute interim or final reclamation of the Oil and Gas Location?

☐ Interim? ☐ Final?

Did the Surface Owner approve the seed mix? _____

If NO, does the seed mix comply with local soil conservation district recommendations? _____

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). _____

Date of commencement of Site Investigation. 09/04/2008

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 09/04/2008

Date of completion of Remediation. 12/04/2009

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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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 EHS Manager

Submit Date: 10/31/2017

Email: Karen.Olson@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: PETER GINTAUTAS

Date: 10/31/2017

Remediation Project Number: 4468

COA Type

Description

	Submit reports of site investigation and progress of remediation including results of sampling and analysis on an annual basis or more often until remediation is closed.
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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

401445951	FORM 27-SUPPLEMENTAL-SUBMITTED
401445954	MONITORING REPORT

Total Attach: 2 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)