

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
402882448  
Receive Date:  
11/30/2021

Report taken by:  
CHRIS CANFIELD

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: GREAT WESTERN OPERATING COMPANY LLC	Operator No: 10110	<b>Phone Numbers</b>
Address: 1001 17TH STREET #2000		Phone: (720) 595-2132
City: DENVER	State: CO	Zip: 80202
Contact Person: Jason Davidson	Email: jdavidson@gwp.com	Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 15473 Initial Form 27 Document #: 402380471

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: Director Request

SITE INFORMATION

Yes Multiple Facilities

Facility Type: NONFACILITY	Facility ID: 475912	API #:	County Name: WELD
Facility Name: Morales Water Well	Latitude: 40.007119	Longitude: -104.798120	
** correct Lat/Long if needed: Latitude:		Longitude:	
QtrQtr: NWSE	Sec: 32	Twp: 1N	Range: 66W Meridian: Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Rural residential properties  
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

### SITE INVESTIGATION PLAN

**TYPE OF WASTE:**

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> E&P Waste       | <input checked="" type="checkbox"/> Other E&P Waste             | <input checked="" type="checkbox"/> Non-E&P Waste |
| <input type="checkbox"/> Produced Water  | <input type="checkbox"/> Workover Fluids                        | Not applicable                                    |
| <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 checked="" type="checkbox"/> Other (as described by EPA) | Methane   |

**DESCRIPTION OF IMPACT**

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	Unknown	Ongoing Site Investigation

**INITIAL ACTION SUMMARY**

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

Please refer to the Initial Form 27 Investigation/Workplan Document #402380471 and to the Supplemental Form 27 Investigation/Workplan Document #402444533 for a summary of the initial actions conducted.

**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 ):

Fourth quarter 2021 System sampling and maintenance will be conducted at the Division of Water Resources (DWR) Well Permit #137465 in November 2021 and at the DWR Well Permit #268360 in December 2021. Please refer to the Groundwater Monitoring section of the Remedial Action Plan tab of this Form 27 for additional discussion.

**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

NA / ND

Number of soil samples collected 0  
 Number of soil samples exceeding 915-1 \_\_\_\_\_  
 Was the areal and vertical extent of soil contamination delineated? \_\_\_\_\_  
 Approximate areal extent (square feet) \_\_\_\_\_

Highest concentration of TPH (mg/kg) \_\_\_\_\_  
 Highest concentration of SAR \_\_\_\_\_  
 BTEX > 915-1 \_\_\_\_\_  
 Vertical Extent > 915-1 (in feet) \_\_\_\_\_

**Groundwater**

Number of groundwater samples collected 1  
 Was extent of groundwater contaminated delineated? No  
 Depth to groundwater (below ground surface, in feet) 374'  
 Number of groundwater monitoring wells installed 0  
 Number of groundwater samples exceeding 915-1 1

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) \_\_\_\_\_  
 -- Highest concentration of Methane (mg/l) 26

**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?  
 \_\_\_\_\_
- 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?  
 \_\_\_\_\_

**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.  
 \_\_\_\_\_  
 Not applicable

**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.

Between July 10 and August 5, 2020, a methane mitigation system was installed at the property associated with the DWR Well Permit #137465. The system became operational on August 6, 2020.

Between August 6 and August 28, 2020, a methane mitigation system was installed at the property associated with the DWR Well Permit #268360. The system became operational on August 28, 2020.

**Soil Remediation Summary**

- In Situ**
  - \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )
  - \_\_\_\_\_ Chemical oxidation
- Ex Situ**
  - \_\_\_\_\_ Excavate and offsite disposal
  - \_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Natural Attenuation

\_\_\_\_\_ Other \_\_\_\_\_

\_\_\_\_\_ 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

Yes \_\_\_\_\_ Other \_\_\_\_\_ Methane mitigation system \_\_\_\_\_

**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.

Tasman Geosciences, under the direction of PDC Energy, Inc., collects water samples from the influent and effluent process streams of the methane mitigation systems installed on DWR Well Permit #137465 and #268360 on a quarterly basis and submits them to Summit Scientific Laboratories for analysis of dissolved gases by EPA Method RSK 175. In addition, the samples collected from the influent process streams are submitted to Dolan Integration Group (DIG) for hydrocarbon gas composition and stable isotopes analysis. Please refer to the attached 3Q21 Groundwater Monitoring Reports associated with DWR Well Permit #137465 and #268360 for a summary of the third quarter 2021 sampling event.

Fourth quarter 2021 System sampling and maintenance will be conducted at the DWR Well Permit #137465 in November 2021 and at the DWR Well Permit #268360 in December 2021.

# 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 \_\_\_\_\_

## 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: \_\_\_\_\_

# 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.

Not applicable

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 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. \_\_\_\_\_

## 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). 03/11/2020

Proposed site investigation commencement. 03/11/2020

Proposed completion of site investigation. 08/28/2020

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 07/10/2020

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**

Great Western is currently in the process of addressing the five COAs associated with the Supplemental Form 27 Investigation/Workplan Document #402444533.

COA #1 (Addressed): A structure contour map of the bottom of the Fox Hills Formation under and adjacent to the 0.75 mile radius study area around the Morales water well was submitted with the Form 27 Supplemental Document #402807224 approved by the COGCC on October 4, 2021.

COA #2 (Addressed/Ongoing): Quarterly sampling and analysis of DWR Well Permit #137465 and #268360, managed by PDC Energy, Inc., is ongoing.

COA #3 (Ongoing): Great Western is currently conducting further evaluation of possible sources of thermogenic gases present in the two water wells. An update will be provided in the next quarterly Supplemental Form 27 submittal.

COA #4 (Addressed): The Shoe Pressure Failure Calculation Worksheet and Soil Vapor Monitoring Report were submitted with the Form 27 Supplemental Document #402807224 approved by the COGCC on October 4, 2021.

COA #5 (Ongoing): Great Western is currently conducting research to gain a better understanding of local and formation variability in gas composition and isotopic ratios. An update will be provided in the next quarterly Supplemental Form 27 submittal.

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

Signed: Jason Davidson

Title: Senior EHS Specialist

Submit Date: 11/30/2021

Email: jdavidson@gwp.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: CHRIS CANFIELD

Date: 12/07/2021

Remediation Project Number: 15473

**Condition of Approval****COA Type****Description**

0 COA	
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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**

402882448	FORM 27-SUPPLEMENTAL-SUBMITTED
402882484	MONITORING REPORT
402882485	MONITORING REPORT

Total Attach: 3 Files

**General Comments****User Group****Comment****Comment Date**

		Stamp Upon Approval
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Total: 0 comment(s)