

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

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 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	Phone Numbers Phone: (720) 595-2132 Mobile: ()
Address: 1001 17TH STREET #2000		
City: DENVER	State: CO Zip: 80202	
Contact Person: Jason Davidson	Email: jdavidson@gwp.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 17902 Initial Form 27 Document #: 402674196

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: TANK BATTERY	Facility ID: 463941	API #: _____	County Name: WELD
Facility Name: Kielian 2-2 battery	Latitude: 40.335184	Longitude: -104.850155	
** correct Lat/Long if needed: Latitude: 40.335184		Longitude: -104.850155	
QtrQtr: SESE	Sec: 2	Twp: 4N	Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GM Most Sensitive Adjacent Land Use Residential

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

The Kielian 2-2 battery is surrounded by private ranching and agricultural mixed-use properties in all directions. There are residential properties ~400' west and ~300' southeast. The wellhead is located ~250' northwest of the battery. A small pond is in place ~60' west of the battery and a gravel pit is in place ~600' east. The Thompson and Platte Ditch is in place ~1,180' south of the battery. There is 1 groundwater well mapped within a ¼ mile of the battery. Groundwater depth is unknown but is expected to be encountered at <20' bgs. The 100-year floodplain of the Big Thompson River drainage is mapped ~260' north of the battery. The battery is located within a Mule Deer Severe Winter Range Buffer and an Aquatic Native Species Conservation Waters buffer is mapped ~1,050' northwest of the battery.

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
UNDETERMINED	GROUNDWATER	Area surrounding MW-1	Site Investigation Activities
Yes	SOILS	50' E/W x 65' N/S x 7' deep	Site Investigation Activities

INITIAL ACTION SUMMARY

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

During facility closure activities, soil and potential groundwater impacts were observed in test pits advanced to groundwater below the partially buried produced water tank and below the horizontal separator on May 5, 2021. The historic release was reported under Form 19 document number 402681821. Please refer to the Site Characterization Workplan submitted with the COGCC approved Supplemental Form 27 Document Number 402708417 and to the Geoprobe Investigation Workplan submitted with the COGCC approved Supplemental Form 27 Document Number 402756750 for a summary of the initial actions conducted at the Site.

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):

Please refer to the Operator Comments under the Submit tab of this Form 27 for a summary of the proposed soil sampling activities at the Site.

Proposed Groundwater Sampling

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

Please refer to the Groundwater Monitoring section under the Remedial Action Plan tab of this Form 27 for a summary of the groundwater sampling activities at the Site.

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 12

-- Highest concentration of TPH (mg/kg) 63.4

Number of soil samples exceeding 915-1 5

NA Highest concentration of SAR

Was the areal and vertical extent of soil contamination delineated? Yes

BTEX > 915-1 Yes

Approximate areal extent (square feet) 3250

Vertical Extent > 915-1 (in feet) 7

Groundwater

Number of groundwater samples collected 6

ND Highest concentration of Benzene (µg/l)

Was extent of groundwater contaminated delineated? Yes

ND Highest concentration of Toluene (µg/l)

Depth to groundwater (below ground surface, in feet) 5'

ND Highest concentration of Ethylbenzene (µg/l)

Number of groundwater monitoring wells installed 6

ND Highest concentration of Xylene (µg/l)

Number of groundwater samples exceeding 915-1 0

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?

Please refer to the Site Characterization Workplan submitted with the COGCC approved Supplemental Form 27 Document Number 402708417 and to the Geoprobe Investigation Workplan submitted with the COGCC approved Supplemental Form 27 Document Number 402756750 for a discussion of the background sampling activities conducted at the Site.

☐ 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.

Great Western will either dig and haul impacted soils to a commercial landfill or treat impacted soils above COGCC Table 915-1 concentration levels onsite.

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.

A remediation or closure plan will be developed based on the analytical results from four quarters of groundwater sampling from the six existing wells and the three proposed wells summarized in the Operator Comments section under the Submit tab of this Form 27.

Soil Remediation Summary

☐ In Situ

☐ Ex Situ

Bioremediation (or enhanced bioremediation)

Excavate and offsite disposal

Chemical oxidation

If Yes: Estimated Volume (Cubic Yards)

Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC 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.

On November 24, 2021, groundwater monitoring was conducted in monitoring wells MW01 through MW06. Prior to purging, depth to water measurements were collected in each monitoring well using an oil water interface probe to determine relative groundwater elevations and calculate well specific target purge volumes. No free product was observed in any of the monitoring wells. After purging at least three casing volumes from each monitoring well using a peristaltic pump, groundwater samples were collected into laboratory provided containers, placed on ice, and delivered with a completed chain-of-custody form to Origins Laboratory in Denver, Colorado, for analysis of BTEX, 1,2,4-TMB, 1,3,5-TMB, and naphthalene by EPA Method 8260D.

During the November 2021 groundwater monitoring event, depth to groundwater ranged from approximately 4.25 feet below ground surface (ft bgs) in monitoring well MW04 to 8.35 ft-bgs in monitoring well MW01. Groundwater was calculated to flow north-northeast with an average hydraulic gradient of 0.0042 feet of vertical rise per foot of horizontal run as measured from well MW01 to well MW02.

All groundwater analytical results were below the laboratory reporting limit and compliant with applicable COGCC Table 915-1 groundwater standards. The groundwater analytical results and relative groundwater elevations are summarized in Table 1 and displayed on Figure 2, which are included as attachments. The laboratory analytical report is also attached.

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.

If necessary, the site will be reclaimed in accordance with COGCC 1000-Series Rules.

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. 04/13/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 04/30/2021

Proposed site investigation commencement. 08/16/2021

Proposed completion of site investigation. 08/17/2021

REMEDIAL ACTION DATES

Proposed start date of Remediation. 02/07/2022

Proposed date of completion of Remediation. 02/11/2022

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

Based on the analytical results from the November 24, 2021 quarter groundwater monitoring event, Great Western proposes the installation of three additional monitoring wells to better understand the extent of dissolved hydrocarbon concentrations in groundwater at the Site. Great Western proposes to install the wells using a Geoprobe rig in January 2022. Following installation, the wells will be included in quarterly groundwater monitoring activities. Two of the monitoring wells will be installed in the area where soil concentrations were identified above Table 915-1 Protection of Groundwater Soil Screening Levels (PGWSSL) and one will be installed to the northeast as a point of compliance. During monitoring well installation, one soil sample will be collected from the northeastern proposed well location. Based on field observations, a soil sample may or may not be collected during the installation of the proposed well surrounded by prior samples SB03-5, SB04-5, and SS11-6. No soil samples will be collected from the southern proposed monitoring well located at prior soil sample SB02-6. The soil samples will be collected from the vertical interval within the vadose zone exhibiting the greatest field evidence of impact or if no field evidence of impact is observed, from directly above water saturation. All soil samples collected will be submitted for laboratory analysis of BTEXN, TMBs, TPH (C6-36), acenaphthene, anthracene, chrysene, and pyrene. The proposed monitoring well locations are presented on the attached Figure 3.

Great Western will conduct field screening and confirmation sampling activities in accordance with COGCC 900 Series Rules. Discrete soil samples will be collected and analyzed pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2).

The next quarterly groundwater sampling event is scheduled for late-February 2022.

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:

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:

Date:

Remediation Project Number: 17902

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**

402903334	ANALYTICAL RESULTS
402903335	GROUND WATER ELEVATION MAP
402903336	MAP
402903337	ANALYTICAL RESULTS

Total Attach: 4 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)