

State of Colorado Oil and Gas Conservation Commission

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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.

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

OPERATOR INFORMATION

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 12383Initial Form 27 Document #: 401898095

PURPOSE INFORMATION

- | | |
|--|---|
| <input type="checkbox"/> 901.e. Sensitive Area Determination | <input 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 checked="" 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 checked="" type="checkbox"/> Other <u>Update - Limited Subsurface Investigation and Quarterly Groundwater Monitoring</u> |

SITE INFORMATION

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

Facility Type: <u>LOCATION</u>	Facility ID: <u>335863</u>	API #: <u></u>	County Name: <u>ADAMS</u>
Facility Name: <u>Sauvage 12-7</u>		Latitude: <u>39.984260</u>	Longitude: <u>-104.937470</u>
		** correct Lat/Long if needed: Latitude: <u>39.985795</u>	Longitude: <u>-104.932459</u>
QtrQtr: <u>NWNW</u>	Sec: <u>7</u>	Twp: <u>1S</u>	Range: <u>67W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications CL

Most Sensitive Adjacent Land Use Agricultural, Unnamed tributary to Big Dry Creek

Is domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? YesIs groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Residential property 600 feet to the north, German Reservoir No. 1 in place 970 feet to the north/northwest, Unnamed Reservoir in place 1,330 feet to the north/northeast

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	Unknown	Subsurface Investigation
Yes	SOILS	Unknown	Subsurface 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.

On May 28, 2019, a soil boring investigation was conducted to further define vertical and horizontal extent of potentially impacted soil and groundwater at the Site. Eight soil borings were advanced to 14 feet below ground surface (bgs) surrounding the source area. Soil staining was observed from approximately 6 feet to 11 feet bgs. One characterization soil sample from each boring was submitted to Origins Laboratory (Origins) for analysis based on the highest field screening readings using a photoionization detector (PID). Origins analyzed the samples for total petroleum hydrocarbons (TPH)-gasoline range organics (GRO) and TPH- diesel range organics (DRO). Concentrations of TPH-GRO and TPH-DRO were added to calculate TPH. TPH concentrations were reported below the COGCC Table 910-1 concentration level of 500 milligrams per kilogram (mg/kg) in soil samples from soil borings SB-1, SB-2, and SB-4 through SB-9. TPH concentrations were reported at 598.5 mg/kg in the soil sample from 10' bgs in boring SB-3, which is above the Table 910-1 concentration level. Two of the eight borings were converted into groundwater monitoring wells. Monitoring well MW-1 was installed to the west of the source area and MW-2 was installed to the south of the source area. The analytical results from the soil boring investigation are summarized on the attached Table 1 and illustrated on Figure 3. Copies of the boring logs for MW-1 and MW-2 and the laboratory report are also attached.

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):

Great Western proposes to conduct an additional subsurface investigation to further delineate the vertical and horizontal extent of the hydrocarbon impacted soil in the source area. Seven soil borings are proposed to be advanced using a Geoprobe. Discrete characterization soil samples will be collected and analyzed for TPH-GRO and TPH-DRO based on the highest field screening measurements using a PID and visual and olfactory observations. Soil borings will be advanced to approximately 15 feet bgs. The proposed soil boring locations are depicted on the attached Figure 4 but are subject to change based on field observations during the investigation. Soil boring activities are scheduled for late-April/early-May 2020.

Proposed Groundwater Sampling

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

Great Western proposes to install up to three additional groundwater monitoring wells during the proposed subsurface investigation. Following development, the wells will be sampled, along with MW-1 and MW-2, on a quarterly schedule and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Monitoring will continue until four consecutive quarters of analytical results below Table 910-1 concentration levels for BTEX are obtained. The estimated proposed well locations are depicted on the attached Figure 4 but are subject to change based on field observations during the investigation. Monitoring wells will remain in place until project closure, at which time they will be abandoned in accordance with State standards.

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 8

Number of soil samples exceeding 910-1 1

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

Approximate areal extent (square feet) 3300

NA / ND

-- Highest concentration of TPH (mg/kg) 598

NA Highest concentration of SAR

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 11

Groundwater

Number of groundwater samples collected 6

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 7'

Number of groundwater monitoring wells installed 2

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

0 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?

Please refer to the Proposed Soil Sampling and Proposed Groundwater Sampling sections in the Site Investigation Plan tab of this Form 27.

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.

Operator will either dig and haul or treat any soils onsite that exceed Table 910-1 concentration levels.

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.

If necessary, a remediation or closure plan will be developed based on the results of the proposed subsurface investigation scheduled for late-April/early-May 2020. Groundwater is addressed in the Proposed Groundwater Sampling plan section under the Site Investigation Plan tab of this Form 27 and in the Groundwater Monitoring section below.

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
☐ _____ 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 from monitoring wells MW-1 and MW-2 has been sampled for BTEX analysis on a quarterly schedule since June 4, 2019. BTEX concentrations have not been detected at or above laboratory reporting limits in any of the samples that have been collected from the wells. Groundwater flow direction at the Site will be determined based on survey elevation data and groundwater depth measurements collected during upcoming quarterly sampling events. Groundwater analytical results are summarized on the attached Table 2 and illustrated on the attached Figure 5.

REMEDIATION 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: _____

REMEDIATION COMPLETION REPORT

REMEDIATION 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.

If necessary, the site will be reclaimed in accordance with COGCC 1000 series rules.

Is the described reclamation complete? No _____

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). 07/13/2015

Date of commencement of Site Investigation. 05/28/2019

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

Soil boring SB-6 was skipped during the numbering process and was not advanced.

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: 02/13/2020

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: 02/14/2020

Remediation Project Number: 12383

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**

402306428	FORM 27-SUPPLEMENTAL-SUBMITTED
402311979	GROUND WATER SAMPLE LOCATION
402311980	ANALYTICAL RESULTS
402311981	ANALYTICAL RESULTS
402311982	ANALYTICAL RESULTS
402311983	ANALYTICAL RESULTS
402311985	ANALYTICAL RESULTS
402311986	ANALYTICAL RESULTS
402312354	SOIL SAMPLE LOCATION MAP
402312357	SOIL SAMPLE LOCATION MAP
402312893	LOGS
402312894	LOGS

Total Attach: 12 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)