

State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:

402348824

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.

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

OPERATOR INFORMATION

Name of Operator: GREAT WESTERN OPERATING COMPANY LLC	Operator No: 10110	Phone Numbers
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 #: 15153

Initial Form 27 Document #: 402047090

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 type="checkbox"/> Other |

SITE INFORMATION

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

Facility Type: LOCATION	Facility ID: 320176	API #:	County Name: ADAMS
Facility Name: GREAT WESTERN GREIN 1		Latitude: 39.996989	Longitude: -104.795749
		** correct Lat/Long if needed: Latitude: 39.996675	Longitude: -104.792573
QtrQtr: NWNE	Sec: 5	Twp: 1S	Range: 66W
		Meridian: 6	Sensitive Area? Yes

SITE CONDITIONS

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

Is domestic water well within 1/4 mile? Yes Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Residence is located less than 200 feet east of tank battery. Unnamed surface water bodies in place approximately 700 feet and 1,130 feet to the southeast. Brighton lateral in place approximately 985 feet to the southeast.

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	Confined to Location	Quarterly Groundwater Sampling
Yes	SOILS	Confined to Location	Site Investigation Activities

INITIAL ACTION SUMMARY

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

Petroleum hydrocarbon impacted soil from a historical flowline release of unknown volume was discovered (Spill Release Point ID 463759) during the removal of a partially buried produced water vault on March 20, 2019. The produced water tank was removed and addressed under a separate Form 27 (Remediation Project # 13007). On March 29-30, 2019, a soil boring investigation was conducted to further define the horizontal and vertical extent of potentially impacted soil and groundwater at the Site. Seventeen borings were advanced in and surrounding the source area to depths ranging from 10 feet to 15.5 feet below ground surface (bgs). Soil staining was observed from approximately 3 feet to 10 feet bgs in the source area. Ten characterization soil samples were submitted to Origins Laboratory (Origins) for analysis, based visual and olfactory observations and field screening using a photoionization detector (PID). The samples were analyzed for total petroleum hydrocarbons (TPH)- gasoline range organics (GRO) and TPH- diesel range organics (DRO) to compare to the COGCC Table 910-1 concentration levels. Concentrations of TPH-GRO and TPH-DRO were added to calculate TPH. TPH concentrations were reported above the Table 910-1 concentration level of 500 milligrams per kilogram (mg/kg) in the soil samples from boring SB-1 at 6 feet bgs (1,630 mg/kg) and from SB-13 at 6 feet bgs (2,660 mg/kg). TPH concentrations in the remaining samples were reported either below laboratory reporting limits or below the Table 910-1 concentration level. The General Site Location is depicted on the attached Figure 1. The analytical results from the soil boring investigation are summarized on the attached Table 1 and illustrated on Figure 2. A copy of the laboratory report is 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):

Please refer to the Remediation Summary section of the Remedial Action Plan tab of this Form 27 for a description of proposed soil sampling activities.

Proposed Groundwater Sampling

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

During the March 29-30, 2019 soil boring investigation, 4 of the 8 borings were converted into groundwater monitoring wells. Monitoring well MW-1 was installed in the source area and MW-2, MW-3 and MW-4 surround the source area to the southeast, northwest, and north, respectively. Sometime between June 4 and September 30, 2019 monitoring wells MW-1 and MW-3 were destroyed. Immediately following remediation activities at the Site, Great Western proposes to re-install monitoring wells MW-1 and MW-3. Following development, all four groundwater monitoring wells will be sampled for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) on a quarterly schedule until four consecutive quarters of analytical results below Table 910-1 concentration levels for BTEX are obtained. Monitoring well MW-3 will be used as the point of compliance well. The well locations are depicted on the attached Figures 2 and 3. Copies of the boring logs for MW-1 - MW-4 are also included.

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 17

Number of soil samples exceeding 910-1 2

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

Approximate areal extent (square feet) 1400

NA / ND

-- Highest concentration of TPH (mg/kg) 2660

NA Highest concentration of SAR

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 10

Groundwater

Number of groundwater samples collected 8

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 8'

Number of groundwater monitoring wells installed 4

Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 368

ND Highest concentration of Toluene (µg/l)

-- Highest concentration of Ethylbenzene (µg/l) 393

-- Highest concentration of Xylene (µg/l) 4110

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?

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 proposes to excavate and treat any soils onsite that exceed Table 910-1 concentration levels.

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.

Great Western proposes to excavate approximately 500 cubic yards of hydrocarbon-impacted source area soil from approximately 3 feet to 10 feet bgs for onsite treatment with commonly used oxidizer mixtures. Prior to placement of impacted soil, up to 4 background soil samples will be collected from the soil treatment area located to the north and west of the source area. The samples will be analyzed for BTEX, TPH-GRO, and TPH-DRO. Source removal by excavation will be conducted, based on visual and olfactory observations, field soil screening, and laboratory analysis. Up to 4 confirmation soil samples will be collected from the sidewalls of the excavation and analyzed for BTEX, TPH-GRO, and TPH-DRO. To treat the dissolved phase contamination in groundwater exposed in the base of the excavation, Chemically Oxidized Granular Activated Carbon (COGAC™) will be used as a remedial backfill material applied as a slurry to the floor of the excavation and mixed with native material to improve distribution across the smear zone. Up to 10 confirmation samples will be collected from the treated soil and analyzed for BTEX, TPH-GRO, and TPH-DRO. Following receipt of laboratory analytical results below Table 910-1 concentration levels for BTEX, TPH-GRO, and TPH-DRO, the treated soil will be used to backfill the excavation. Figures 2 and 3, illustrate the estimated extent of impacted soil and groundwater based on data collected during the limited subsurface investigations at the Site. Great Western proposes to conduct the remediation activities during late-spring/early-summer 2020 and estimates a 2-year time frame to attain NFA status.

Soil Remediation Summary

☐ In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

☒ Ex Situ

No _____ Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) _____

Name of Licensed Disposal Facility or COGCC Facility ID # _____

Yes _____ Excavate and onsite remediation

Yes _____ Land Treatment

No _____ Bioremediation (or enhanced bioremediation)

Yes _____ Chemical oxidation

No _____ Other _____

Groundwater Remediation Summary

Yes _____ 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 through MW-4 were sampled for BTEX analysis on June 4, 2019. Concentrations of benzene (368 micrograms per liter (µg/L)) and total xylenes (4,110 µg/L) in the groundwater sample collected from MW-1 were reported above their respective Table 910-1 concentration levels of 5 µg/L and 1,400 µg/L. BTEX concentrations were not detected at or above laboratory reporting limits in the samples from MW-2, MW-3, and MW-4. As previously stated, sometime between June 4 and September 30, 2019 monitoring wells MW-1 and MW-3 were destroyed. Monitoring wells MW-2 and MW-4 have been sampled for BTEX analysis on a quarterly schedule since June 4, 2019. Concentrations of BTEX have not been detected at or above laboratory reporting limits in any of the samples during quarterly sampling activities. The analytical results are summarized in the attached Table 2 and well locations and analytical results are illustrated on the attached Figure 3. Copies of the laboratory analytical reports for the June 4, 2019, September 30, 2019, and December 18, 2019 sampling events are also attached.

Based on the Platte River in place 1.7 miles to the west and topography at the Site sloping to the west/northwest (see Figure 1), groundwater flow direction is presumed to be to the west/northwest. Following the re-installation of monitoring wells MW-1 and MW-3, groundwater flow direction will be determined based on survey elevation data and groundwater levels collected during quarterly sampling events.

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.

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. 03/21/2019

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/20/2019

Date of commencement of Site Investigation. 05/29/2019

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 05/04/2020

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

The COAs described in Form 27 Initial Document #402047090, approved by the COGCC on 2/26/20 are addressed as follows:

COA #1 - Great Western is requesting that the COGCC not require the sampling of the private water wells for the following reasons:

1. Monitoring well MW-2 is installed 15 feet up-gradient, making it representative of groundwater conditions in the immediate vicinity of the estimated area of impact.

2. Analytical results from MW-2 (sampled quarterly since installation) have been ND for BTEX every time.

COA #2-3 – Figure 3 (attached) has been updated to depict the proposed location of the requested 5th monitoring well to the southwest of the excavation and the legend has been corrected

COA #4 - Once all 5 monitoring wells are installed, Great Western will submit a groundwater elevation and potentiometric surface diagram. This figure was not included with the initial sampling round due to inaccurate measurements taken immediately following development activities. In addition, 2 of the 4 initially installed wells were destroyed by the farmer following the first round of sampling.

COA #5 - Form 19 Supplemental Closure Request Document #402325439, Approved by the COGCC on 2/28/20.

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: 15153 _____

COA Type**Description**

--	--

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**

402348829	GROUND WATER SAMPLE LOCATION
-----------	------------------------------

Total Attach: 1 Files

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

		Stamp Upon Approval
--	--	---------------------

Total: 0 comment(s)