

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
BOB CHESSON

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 #: 11774 Initial Form 27 Document #: 401749307

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: 320793	API #: _____	County Name: ARAPAHOE
Facility Name: GREAT WESTERN KRAUS-ALBIN 22-20	Latitude: 39.602846	Longitude: -104.467196	
	** correct Lat/Long if needed: Latitude: 39.602613	Longitude: -104.467776	
QtrQtr: SENW	Sec: 20	Twp: 5S	Range: 63W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

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

Intermittent drainage in place approximately 200 feet northwest.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste | <input type="checkbox"/> Other E&P Waste | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | |
| <input checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input checked="" 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 type="checkbox"/> 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.

The Initial Form 27 (Document number 401749307) provides details for the initial subsurface investigation and delineation of impacted soil and groundwater at the Site. In summary, soil impacts were discovered on 1/23/18, during plugging and abandonment activities. A subsurface investigation was conducted on 3/8/18 and three monitoring wells were installed. To further delineate the source area, seven soil borings were advanced to depths ranging from 19.5 feet to 28 feet below ground surface (bgs) during a subsequent subsurface investigation conducted at the Site on 3/6/19. Two of the seven borings were converted into groundwater monitoring wells. Monitoring well MW-4 was installed downgradient of the source area and MW-5 was installed upgradient of the source area. Quarterly groundwater monitoring has been conducted at the site since April 2018.

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 delineate the horizontal and vertical extent of petroleum hydrocarbon impacted soil to the east and northeast of the area of impact around the former separator. Two soil borings are proposed to be advanced using a Geoprobe to approximately 25 feet bgs. The proposed soil boring locations are shown on Figure 4 but are subject to change based on field observations during soil boring activities. Please refer to the Additional Investigative Actions section below for a description of the proposed confirmation soil sample analysis.

Proposed Groundwater Sampling

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

Great Western proposes to install two monitoring wells in the soil borings to determine if and to what extent groundwater is impacted. Following well development activities, one groundwater sample will be collected from each new monitoring well and the five existing wells in accordance with COGCC Rule 915.e.(3). The samples will be analyzed for BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB by EPA Method 8260, for total dissolved solids (TDS) by EPA Method 2540C, and for chloride and sulfate by EPA Method 300.0. Soil boring and monitoring well installation activities are scheduled for early-June 2021.

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):

If needed, discreet soil samples will be analyzed for BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB and Total Petroleum Hydrocarbons (TPH)- Gasoline Range Organics (GRO) [C6-C10] by EPA Method 8260 and for TPH- Diesel Range Organics (DRO) [C10-C28] and TPH- Residual Range Organics (RRO) [C28-C40] by EPA Method 8015. Analytical results for TPH-GRO, TPH-DRO, and TPH-RRO will be added together to calculate TPH.

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? No
Approximate areal extent (square feet) _____

NA / ND

NA Highest concentration of TPH (mg/kg) _____
NA Highest concentration of SAR _____
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) _____

Groundwater

Number of groundwater samples collected 4
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 23'
Number of groundwater monitoring wells installed 5
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?

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.

Source removal activities will be determined following free product removal at monitoring well MW-1 and will be addressed in a subsequent Form 27.

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.

To address the free product consistently encountered in monitoring well MW-1, on 9/5/19, Great Western installed a solar-powered SVE/bubbler unit at the well. The unit will continue to operate on a 24/7 basis until free product thickness has been reduced to less than 0.02 feet in the well. Table 2 (attached) provides a summary of the total emissions since the SVE unit was activated. A total of 1.00 ton of hydrocarbons have been removed with the SVE unit since September 2019. A copy of the laboratory report is attached. A remedial action plan will be determined following free product removal and will be addressed in a subsequent Form 27. Figure 6 (attached) illustrates the remediation system layout.

Soil Remediation Summary

In Situ

Ex Situ

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

_____ 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
Yes _____ 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.

Quarterly groundwater monitoring was conducted at the Site on 4/1/2021. Groundwater analytical results are illustrated on Figure 4 and summarized in Table 1 (attached). Based on survey elevation data and groundwater levels measured on 4/1/2021, groundwater at the Site flows to the northwest. Figure 3 (attached) illustrates the potentiometric surface during the 4/1/2021 quarterly sampling event. Monitoring well MW-1 was not sampled due to approximately 2.89 feet of free product measured in the well. Prior to installation of the solar-powered SVE/bubbler unit, free product was typically measured at a thickness of 0.30 feet in monitoring well MW-1. The increase in free product thickness can be attributed to residual liquid hydrocarbons desorbing from the pore spaces in the surrounding soils and being actively pulled via vacuum into the well. BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB concentrations were not reported at or above laboratory detection limits in the groundwater samples collected from monitoring wells MW-2, MW-3, MW-4, and MW-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? _____

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. 01/24/2018

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/23/2018

Date of commencement of Site Investigation. 03/08/2018

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 09/03/2019

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

Great Western proposes to collect groundwater samples from the seven monitoring wells (2 new and 5 existing) on a quarterly basis. The samples will be analyzed for BTEX, naphthalene, 1,2,4-TMB, and 1,3,5-TMB by EPA Method 8260. The next quarterly groundwater sampling event is scheduled for early-July 2021.

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: 06/01/2021

Email: j davidson@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: BOB CHESSON

Date: 06/05/2021

Remediation Project Number: 11774

Condition of Approval

COA Type

Description

0 COA

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

402705251	FORM 27-SUPPLEMENTAL-SUBMITTED
402705274	REMEDATION PROGRESS REPORT
402705276	MAP

Total Attach: 3 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)