

# 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:

401992807

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<br>Phone: (720) 595-2078<br>Mobile: ( ) |
| Address: 1001 17TH STREET #2000                       |                            |   |
| City: DENVER  | State: CO Zip: 80202       |   |
| Contact Person: Ben Huggins                           | Email: bhuggins@gwogco.com |   |

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 12383

Initial 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 Limited subsurface investigation                                 |

#### SITE INFORMATION

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

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

#### 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? 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

German Reservoir No. 1 - 970 feet north/northwest  
Unnamed Reservoir - 1,330 feet 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.

During due diligence in July 2015, fourteen direct push soil borings were advanced surrounding the tank battery to assess potential soil and groundwater petroleum hydrocarbon impacts. Analytical soil sample results from one source area borehole indicated that soils exceeded Table 910-1 concentration levels for Total Petroleum Hydrocarbons (TPH). Analytical results from the remaining boreholes were either below Table 910-1 concentration levels or were not detected. Groundwater was encountered at 4' to 8' below ground surface (bgs). Analytical sample results from four source area boreholes indicated that groundwater exceeded Table 910-1 standards for benzene. Ethylbenzene concentrations exceeded Table 910-1 standards in three of the four source area boreholes. Benzene was reported at a concentration below its Table 910-1 standard in one additional groundwater sample. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were not detected in the remaining groundwater samples. Please refer to the attached Figure 1 for borehole/sample locations and laboratory analytical results from the July 2015 due diligence investigation. Laboratory analytical reports are attached and summarized on the attached Table 1. The tank battery and all associated equipment and utilities were decommissioned in mid-2018, allowing access to the location for further investigation. On January 29, 2019 a test excavation investigation was conducted at the locations of SB-9, SB-10, and SB-11 (advanced in July 2015). Test excavations were dug from 7' to 12.5' bgs. Hydrocarbon staining and odor were observed in soil from all three test pits and PID readings ranged from 186 ppm to 9,644 ppm. Groundwater was not encountered. Please refer to the attached Figure 2 for an illustration of the test pit locations and field screening results. It was determined that a geoprobe investigation would be conducted instead of additional test excavations to better delineate the extent of impacts.

## 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 ):

Soil borings are proposed to be advanced during a limited subsurface investigation scheduled for late-May / early-June 2019. Discrete confirmation soil samples are proposed to be collected utilizing a geoprobe and analyzed for TPH- Gasoline Range Organics (GRO) and TPH- Diesel Range Organics (DRO). The proposed soil boring locations are depicted on the attached Figure 2, but are subject to change based on field observations during the limited subsurface investigation.

### Proposed Groundwater Sampling

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

The operator proposes to install up to four groundwater monitoring wells during the limited subsurface investigation to monitor quarterly 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 2, but are subject to change based on field observations during the limited subsurface 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 15  
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) 866  
NA Highest concentration of SAR           
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 8

### Groundwater

Number of groundwater samples collected 12  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 6'  
Number of groundwater monitoring wells installed 0  
Number of groundwater samples exceeding 910-1 4

-- Highest concentration of Benzene (µg/l) 2470  
-- Highest concentration of Toluene (µg/l) 0  
-- Highest concentration of Ethylbenzene (µg/l) 1760  
-- Highest concentration of Xylene (µg/l) 6590  
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 limited subsurface investigation scheduled for May 28, 2019. Groundwater is addressed in the Proposed Groundwater Sampling plan under the Site Investigation Plan tab of this Form 27.

## 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.

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

## 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**

|  |
|--|
|  |
|--|

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 Geologist \_\_\_\_\_

Submit Date: ` \_\_\_\_\_

Email: jdavidson@olsson.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: 12383 \_\_\_\_\_

**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**

|           |                          |
|-----------|--------------------------|
| 402046052 | ANALYTICAL RESULTS       |
| 402046053 | ANALYTICAL RESULTS       |
| 402046054 | ANALYTICAL RESULTS       |
| 402046056 | ANALYTICAL RESULTS       |
| 402046057 | ANALYTICAL RESULTS       |
| 402046058 | ANALYTICAL RESULTS       |
| 402048853 | SOIL SAMPLE LOCATION MAP |
| 402048855 | SITE MAP                 |
| 402048858 | SOIL SAMPLE LOCATION MAP |

Total Attach: 9 Files

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

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

Total: 0 comment(s)