

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
402333786  
Receive Date:  
03/24/2020  
Report taken by:  
Kari Oakman

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>KERR MCGEE OIL &amp; GAS ONSHORE LP</u>	Operator No: <u>47120</u>	<b>Phone Numbers</b>
Address: <u>P O BOX 173779</u>		Phone: <u>(970) 336-3500</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80217-3779</u>
Contact Person: <u>Phil Hamlin</u>	Email: <u>Phillip_Hamlin@oxy.com</u>	Mobile: <u>( )</u>

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 13888 Initial Form 27 Document #: 402115667

**PURPOSE INFORMATION**

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input checked="" 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** Y Multiple Facilities ( in accordance with Rule 909.c. )

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>451655</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Hopper 43-15. 23-15 &amp; 24-15 battery</u>	Latitude: <u>40.137266</u>	Longitude: <u>-104.989016</u>	
	** correct Lat/Long if needed: Latitude: <u>40.137409</u>	Longitude: <u>-104.989096</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>467861</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HOPPER 43-15A</u>	Latitude: <u>40.137270</u>	Longitude: <u>-104.989066</u>	
	** correct Lat/Long if needed: Latitude: _____	Longitude: _____	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

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

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**

# 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	See attached data	Groundwater Samples/Lab. Analytical Results
Yes	SOILS	14' N-S X 16' E-W x 2.5' bgs	Soil Samples/Laboratory Analytical Results

## 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 September 19, 2019, historical petroleum hydrocarbon impacts were discovered during site decommissioning activities associated with the closure of two partially-buried produced water vessels (PWVs) at the Hopper 43-15A production facility. Based on the groundwater analytical results from sample GW01, a release was reported to the COGCC, and a Form 19 Initial with Supplemental (COGCC Document No. 402184111) was submitted on September 23, 2019. Site diagrams indicating sample locations, and analytical reports, were previously provided as attachments in a Form 27 Supplemental (COGCC Document No. 402224281) on November 20, 2019.

## 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 ):

On September 19, 2019, following removal of the two PWVs, soil samples were collected from the sidewalls and bases of the excavations. The soil samples were field screened for volatile organic compounds using a photoionization detector (PID). All soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH), and naphthalene. The base soil samples were also analyzed for pH, specific conductance (EC), and sodium adsorption ratio (SAR). Laboratory analytical results for all soil samples indicate that BTEX, TPH, SAR and EC concentrations and levels are in full compliance with COGCC Table 910-1 allowable levels. The base sample collected from the northern PWV excavation (N-B01@2.5') exceeded allowable levels for pH. This area was excavated and confirmation sample, B02@3.5', was collected; this sample is in compliance with COGCC Table 910-1 allowable levels for pH.

### Proposed Groundwater Sampling

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

On September 19, 2019, one groundwater sample (GW01) was collected from the excavation and submitted to Origins Laboratory in Denver, Colorado, for analysis of BTEX by USEPA 8260. The laboratory analytical results indicate that sample GW01 exceeded the COGCC Table 910-1 allowable levels for benzene at 43.3 ug/L. On September 20, 2019, following the removal of impacted groundwater, an additional groundwater sample (GW02) was collected from the excavation and submitted to Origins Laboratory in Denver, CO for analysis of BTEX by USEPA 8260. The laboratory analytical results indicate that sample GW02 exceeded the COGCC Table 910-1 allowable levels for benzene at 307 ug/L.

### 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 12  
Number of soil samples exceeding 910-1 1  
Was the areal and vertical extent of soil contamination delineated? Yes  
Approximate areal extent (square feet) 224

### NA / ND

-- Highest concentration of TPH (mg/kg) 334.1  
-- Highest concentration of SAR 1.22  
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 2

### Groundwater

Number of groundwater samples collected 7  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 3'  
Number of groundwater monitoring wells installed 5  
Number of groundwater samples exceeding 910-1 3

-- Highest concentration of Benzene (µg/l) 307  
-- Highest concentration of Toluene (µg/l) 7.36  
-- Highest concentration of Ethylbenzene (µg/l) 366  
-- Highest concentration of Xylene (µg/l) 3400  
NA Highest concentration of Methane (mg/l)

### Surface Water

0 Number of surface water samples collected  
 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?

A background sample was collected and analyzed for pH and sodium adsorption ratio (SAR).

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?

Five groundwater monitoring wells (MW01 - MW05) were installed on January 16, 2020. The extent of groundwater contamination has not yet been delineated. Additional monitoring wells will be installed to establish points of compliance.

# 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.

Approximately 40 cubic yards of soil were taken to the Front Range Regional Landfill in Erie, Colorado. Approximately 60 barrels of groundwater were removed from the excavation and taken to the Kerr-McGee Aggregate Recycling Facility in Weld County, Colorado.

## 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.

While backfilling the excavation, 50 pounds of COGAC™, a carbon-based groundwater remediation product, was applied to the clean backfill to mitigate remaining hydrocarbon impacts in groundwater. The safety data sheet for COGAC™ is provided in Attachment C.

## Soil Remediation Summary

In Situ

Ex Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

Yes \_\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 40

\_\_\_\_\_ 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

Yes \_\_\_\_\_ Bioremediation ( or enhanced bioremediation )

Yes \_\_\_\_\_ Chemical oxidation

No \_\_\_\_\_ Air sparge / Soil vapor extraction

Yes \_\_\_\_\_ Natural Attenuation

Yes \_\_\_\_\_ Other Chemically Oxygenated  
Granular Activated Carbon  
(COGAC™) application and  
groundwater removal

## 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.

To delineate the extent and magnitude of impacts, additional groundwater monitoring wells will be installed downgradient from well MW02. Groundwater monitoring will be conducted on a quarterly basis. Collected groundwater samples will be submitted for laboratory analysis of BTEX by USEPA Method 8260. Quarterly groundwater monitoring at the location will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters. A groundwater elevation map from the January 22, 2020 sampling event is provided as Figure 1. Groundwater sample analytical results are summarized in Table 1, the laboratory analytical report is provided in Attachment A, and drilling logs are provided in Attachment B.

# 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? Yes \_\_\_\_\_

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Approximately 60 barrels of petroleum hydrocarbon impacted groundwater was transported to the Aggregate Recycle Facility in Weld County, Colorado, for recycling.

Volume of E&P Waste (solid) in cubic yards \_\_\_\_\_ 40

E&P waste (solid) description Petroleum hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-COGCC Disposal Facility: Front Range Regional Landfill, Erie, Colorado

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_ 60

E&P waste (liquid) description Petroleum hydrocarbon impacted groundwater

COGCC Disposal Facility ID #, if applicable: \_\_\_\_\_ 434766

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? Yes \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? No \_\_\_\_\_

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? No \_\_\_\_\_

Is additional groundwater monitoring to be conducted? Yes \_\_\_\_\_

## 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.

The site will be reclaimed in accordance with COGCC 1000 Series Reclamation 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 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. 09/20/2019

Actual Spill or Release date, if known. \_\_\_\_\_

## **SITE INVESTIGATION DATES**

Date of Initial Actions described in Site Investigation Plan (start date). 09/19/2019

Date of commencement of Site Investigation. 09/19/2019

Date of completion of Site Investigation. \_\_\_\_\_

## **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 09/19/2019

Date of completion of Remediation. \_\_\_\_\_

## **SITE RECLAMATION DATES**

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

**OPERATOR COMMENT**

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I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Phil Hamlin \_\_\_\_\_

Title: Sr. Staff Env. Rep. \_\_\_\_\_

Submit Date: 03/24/2020 \_\_\_\_\_

Email: Phillip\_Hamlin@oxy.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: Kari Oakman \_\_\_\_\_

Date: 03/26/2020 \_\_\_\_\_

Remediation Project Number: 13888 \_\_\_\_\_

**COA Type****Description**

	Operator shall field log soil borings during new monitoring well installation and provide boring logs/well construction diagrams.
	The presence of staining, hydrocarbon odor, and elevated PID levels in the boring log for MW02 indicates that soil impacts may be present outside of the original excavation extent. Operator shall collect soil samples from the area surrounding MW02 to confirm soils meet Table 910-1 standards.

**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**

402333786	FORM 27-SUPPLEMENTAL-SUBMITTED
402337101	ANALYTICAL RESULTS
402337109	ANALYTICAL RESULTS
402337124	GROUND WATER ELEVATION MAP
402351316	LOGS
402351317	OTHER

Total Attach: 6 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)