

State of Colorado  
Oil and Gas Conservation Commission

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Document Number:  
402229293

Receive Date:  
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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: KERR MCGEE OIL & GAS ONSHORE LP	Operator No: 47120	Phone Numbers Phone: (970) 336-3500 Mobile: (970) 515-1161
Address: P O BOX 173779		
City: DENVER	State: CO Zip: 80217-3779	
Contact Person: Phillip Hamlin	Email: Phil_Hamlin@oxy.com	

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 10048 Initial Form 27 Document #: 401177410

**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 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: SPILL OR RELEASE	Facility ID: 448259	API #: _____	County Name: WELD
Facility Name: SPILL/RELEASE POINT		Latitude: 40.231807	Longitude: -104.801408
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NENW	Sec: 17	Twp: 3N	Range: 66W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

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

Is domestic water well within 1/4 mile? No 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**

A building is located approximately 115 feet southwest of the release location.

# 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 sampling and laboratory analysis
Yes	SOILS	100' (N-S) x 87' (E-W) x 10' bgs	Excavation, soil boring, soil sampling, and laboratory analysis

## 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 November 1, 2016, historical impacts were discovered during abandonment activities at the Tuttle L 63N66W/17SEW production facility, and excavation activities were initiated. Groundwater was encountered in the excavation area at approximately 10 feet below ground surface (bgs). Between February 15 and March 21, 2019, additional excavation activities were completed, to address remaining soil impacts to the north of the 2016 excavation area, and to mitigate deep saturated zone soil impacts within the 2016 excavation footprint, as described herein. The COGCC has issued Spill/Release Point ID 448259 for this release.

## 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 samples were collected from the initial 2016 excavation area, and from ten (10) exploratory soil borings (BH01 - BH10), as described in the Initial Form 27. Additional soil samples were collected from the sidewalls and base of the 2019 excavation area at depths ranging from approximately 9 to 16 feet bgs and submitted for laboratory analysis of BTEX, TPH-GRO by USEPA Method 8260C, and TPH-DRO and ORO by USEPA Method 8015. Analytical results indicate that constituent concentrations in the soil samples collected from the final lateral extent of the 2019 excavation area were in full compliance with COGCC standards. Analytical results for the 2019 excavation soil samples are presented in Table 1, and the 2019 excavation compliance soil sample locations are illustrated on Figure 1. The laboratory analytical reports for the 2019 excavation soil samples are provided in Attachment A.

### Proposed Groundwater Sampling

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

Between November 21, 2016 and June 11, 2019, a total of seventeen (17) temporary monitoring wells (BH01, BH02, BH04, BH08 - BH14, BH01R, BH01R2, BH02R, BH04R, BH08R, BH09R, BH11R) were installed to further assess the extent of groundwater impacts. Quarterly groundwater sampling was initiated on November 23, 2016, and is ongoing at the 10 temporary monitoring wells remaining at the site. Wells BH01 and BH02 were destroyed and replaced by BH01R and BH02R, respectively. Wells BH01R, BH04, BH08, BH09, and BH11 were abandoned during the 2019 excavation activities and replaced by BH01R2, BH04R, BH08R, BH09R, and BH11R, respectively. Groundwater samples are collected from the temporary monitoring wells on a quarterly basis and analyzed for BTEX. Groundwater analytical data is presented in Table 2, and the groundwater sample locations are illustrated on Figure 2. Laboratory analytical reports for the previous three quarters of groundwater monitoring are provided in Attachment A.

### 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 106  
Number of soil samples exceeding 910-1 18  
Was the areal and vertical extent of soil contamination delineated? No  
Approximate areal extent (square feet) 5660

### NA / ND

--          Highest concentration of TPH (mg/kg) 1752  
NA          Highest concentration of SAR           
         BTEX > 910-1 Yes  
         Vertical Extent > 910-1 (in feet) 16

### Groundwater

Number of groundwater samples collected 95  
Was extent of groundwater contaminated delineated? Yes  
Depth to groundwater (below ground surface, in feet) 10'  
Number of groundwater monitoring wells installed 17  
Number of groundwater samples exceeding 910-1 38

--          Highest concentration of Benzene (µg/l) 14000  
--          Highest concentration of Toluene (µg/l) 1400  
--          Highest concentration of Ethylbenzene (µg/l) 618  
--          Highest concentration of Xylene (µg/l) 8040  
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?

Soil impacted above COGCC standards historically extended laterally beyond the lease boundary. This soil was removed during the 2019 excavation activities, as described herein. Impacted groundwater has been detected in off-site temporary groundwater monitoring wells BH04, BH04R, BH09, BH09R, and BH13.

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?

Hydrocarbon impacted groundwater remains at the site. The 10 existing temporary groundwater monitoring wells (BH01R2, BH02R, BH04R, BH08R, BH09R, BH10 - BH14) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with COGCC standards for four consecutive quarters.

# REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes \_\_\_\_\_

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Between November 1 and 22, 2016, approximately 1,920 cubic yards of impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado and the Buffalo Ridge landfill in Keenesburg, Colorado. Approximately 40 barrels of impacted groundwater were removed from the 2016 excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado. Between February 15 and March 21, 2019, approximately 1,220 cubic yards of additional impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility and the Buffalo Ridge landfill. Approximately 780 barrels of impacted groundwater and hydro-excavation slurry were removed from the 2019 excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility.

## 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.

Laboratory data indicate that impacted soils in the 2016 and 2019 excavation areas have been remediated to be in full compliance with COGCC standards. Prior to backfilling, approximately 605 pounds of activated carbon were added to the groundwater within the 2016 excavation area, and approximately 165 pounds of activated carbon were added to the groundwater within the 2019 excavation area, to mitigate remaining hydrocarbon impacts in groundwater. Additional remedial activities may be evaluated, as necessary, to address remaining hydrocarbon impacts in groundwater. Quarterly groundwater monitoring is ongoing, and will be continued until concentrations remain in full compliance with COGCC standards for four consecutive quarters. Estimated time to attain NFA is TBD based on the groundwater concentrations, the extent of impacted groundwater, and the efficacy of selected remedial technologies.

## Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation ( or enhanced bioremediation )	Yes	Excavate and offsite disposal
_____ Chemical oxidation		If Yes: Estimated Volume (Cubic Yards) _____ 3140
_____ Air sparge / Soil vapor extraction		Name of Licensed Disposal Facility or COGCC Facility ID # _____ 149007
_____ Natural Attenuation	No	Excavate and onsite remediation
_____ Other _____	No	Land Treatment
	No	Bioremediation (or enhanced bioremediation)
	No	Chemical oxidation
	No	Other _____

## Groundwater Remediation Summary

\_\_\_\_\_ No Bioremediation ( or enhanced bioremediation )

\_\_\_\_\_ No Chemical oxidation

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

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

\_\_\_\_\_ Yes Other Groundwater removal, activated carbon adsorption \_\_\_\_\_

## 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.

Between November 21, 2016 and June 11, 2019, a total of 17 temporary groundwater monitoring wells (BH01, BH02, BH04, BH08 - BH14, BH01R, BH01R2, BH02R, BH04R, BH08R, BH09R, BH11R) were installed at the site to further assess the extent of groundwater impacts. The 10 existing temporary groundwater monitoring wells (BH01R2, BH02R, BH04R, BH08R, BH09R, BH10 - BH14) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with COGCC standards for four consecutive quarters. Groundwater analytical results for the Second Quarter 2019 sampling event indicated that the benzene concentration in well BH13 was out of compliance with the COGCC standard for the first time in this well. However, as this sampling event was conducted immediately following 2019 hydro-excavation activities, and given that BH13 is located along the same utility corridor as these activities, this well was re-sampled on August 8, 2019, to determine whether benzene impacts above standards remained in this well. Groundwater analytical results for both the August 8, 2019 re-sampling event and the Third Quarter 2019 site-wide sampling event in September 2019 indicated that BTEX concentrations in well BH13 were in full compliance with COGCC standards. As a result, Kerr-McGee believes that down-gradient POC at this location has been maintained. Groundwater sample locations are illustrated on Figure 2, and a potentiometric surface contour map for the Third Quarter 2019 is presented as Figure 3. Boring logs for the temporary monitoring wells and exploratory soil borings are provided as Attachment B.

# 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? Yes

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

NA

Volume of E&P Waste (solid) in cubic yards 3140

E&P waste (solid) description Hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: 149007

Non-COGCC Disposal Facility: Buffalo Ridge Landfill - Keenesburg, Colorado

Volume of E&P Waste (liquid) in barrels 820

E&P waste (liquid) description Hydrocarbon impacted groundwater and hydro-excavation slurry

COGCC Disposal Facility ID #, if applicable: 434766

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.

The site has been restored to its pre-release grade. Kerr-McGee will conduct reclamation activities 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. 11/03/2016

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

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 11/01/2016

Date of commencement of Site Investigation. 11/01/2016

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

### REMEDIAL ACTION DATES

Date of commencement of Remediation. 11/01/2016

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: Phillip Hamlin

Title: Senior HSE Representative

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

Email: Phil\_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: \_\_\_\_\_

Date: \_\_\_\_\_

Remediation Project Number: 10048

### COA Type

### Description

<u>COA Type</u>	<u>Description</u>

### 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.

<u>Att Doc Num</u>	<u>Name</u>
402229388	LOGS
402229400	ANALYTICAL RESULTS
402229402	ANALYTICAL RESULTS
402251459	SOIL SAMPLE LOCATION MAP
402251462	GROUND WATER SAMPLE LOCATION
402251482	GROUND WATER ELEVATION MAP
402251484	ANALYTICAL RESULTS
402251485	ANALYTICAL RESULTS

Total Attach: 8 Files

### General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)