

State of Colorado  
Energy & Carbon Management Commission

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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 ECMC 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.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

**OPERATOR INFORMATION**

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

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**

Remediation Project #: 10048 Initial Form 27 Document #: 401177410

**PURPOSE INFORMATION**

- Rule 913.c.(1): Pit or Cuttings Trench closure.
- Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- Rule 913.g: Changes of Operator.
- Rule 915.b: Request to leave elevated inorganics in situ.
- Other: \_\_\_\_\_

**SITE INFORMATION**

No  Multiple Facilities

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:**

- 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	See attached data	Groundwater sampling and laboratory analysis
Yes	SOILS	100' (N-S) x 87' (E-W) x 16' 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 16-7 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 saturated zone soil impacts within the 2016 excavation footprint. The ECMC 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 (Document No. 401177410). Additional confirmation soil samples were collected from the sidewalls and base of the 2019 excavation area, as described in a previous Form 27-Supplemental Update (Document No. 402229293). 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 the ECMC allowable levels at the time of excavation.

**Proposed Groundwater Sampling**

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

During excavation activities, one groundwater sample (GW01) was collected for analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Analytical results indicated that benzene exceeding the ECMC allowable level at the time of sample collection was present in groundwater. Groundwater analytical data is presented in Table 1, and the groundwater sample location is illustrated on Figure 1.

**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 915-1 18

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

Approximate areal extent (square feet) 5660

### NA / ND

-- Highest concentration of TPH (mg/kg) 1752

NA Highest concentration of SAR           

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 16

### Groundwater

Number of groundwater samples collected 283

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 10

Number of groundwater monitoring wells installed 20

Number of groundwater samples exceeding 915-1 110

-- Highest concentration of Benzene (µg/l) 14000

-- Highest concentration of Toluene (µg/l) 4.93

-- Highest concentration of Ethylbenzene (µg/l) 369

-- Highest concentration of Xylene (µg/l) 6480

NA Highest concentration of Methane (mg/l)           

### Surface Water

0 Number of surface water samples collected

0 Number of surface water samples exceeding 915-1

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 the ECMC Table 910-1 standards extended laterally beyond the lease boundary. This soil was removed during the 2019 excavation activities, as described in a previous Form 27-Supplemental Update (Document No. 402229293). Impacted groundwater has historically been detected in off-site 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?

## 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 soil were removed from the site and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling, and the Buffalo Ridge landfill in Keenesburg, Colorado for disposal. Approximately 40 barrels of impacted groundwater were removed from the 2016 excavation via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. Between February 15 and March 21, 2019, approximately 1,220 cubic yards of impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility for recycling, and the Buffalo Ridge landfill for disposal. 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 for recycling.

### 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.

Laboratory data indicate that impacted soils in the 2016 and 2019 excavation areas have been remediated to be in full compliance with the ECMC Table 910-1 standards. Prior to backfilling, approximately 605 pounds of OxPure® activated carbon were added to the groundwater within the 2016 excavation area, and approximately 165 pounds of OxPure® 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 groundwater impacts.

During the third quarter of 2024, three additional monitoring wells (BH15, BH16, and BH17) were installed at the site to provide point of compliance (POC) for the exceedances present at monitoring well BH13. The boring logs are attached.

**Soil Remediation Summary**

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> 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 ECMC 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, OxPure®  
activated carbon application

**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 sampling of groundwater monitoring wells BH01R2, BH02R, BH04R, and BH08R through BH17 for full list Table 915-1 constituents is ongoing. Historically compliant monitoring well BH08R, located cross-gradient of the former excavation footprint and within the same land use as the source area, was used for determining inorganic compliance at the site. POC wells BH10 and BH14, exceeded background levels for Table 915-1 inorganic constituents in groundwater during the September 2024 sampling event. The monitoring well locations are depicted on Figure 1. The Groundwater Elevation Contour Map for the September 2024 monitoring event is provided as Figure 2. The laboratory analytical reports from the December 2023, March 2024, June 2024, and September 2024 sampling events are attached.

Although POC wells BH10 and BH14, located across Weld County Road 34 and in land use that differs from the source area, remain in exceedance of background levels for total dissolved solids and chloride ion, the exceedances are unlikely related to exploration and production activities. The levels of chloride ion at BH14 exceed those historically observed at source well BH11 and the consistent sulfate ion exceedances present at source well BH11 are not present at wells BH10 and BH14. Furthermore, Table 915-1 inorganic concentrations at well BH09, located between the source area and downgradient wells BH10 and BH14, have been compliant for the previous four quarters of monitoring. As such, KMOG does not recommend additional POC wells in the vicinity of wells BH10 and BH14.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

Quarterly  Semi-Annually  Annually  Other

### Request Alternative Reporting Schedule:

Semi-Annually  Annually  Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

Report Type:  Groundwater Monitoring  Land Treatment Progress Report  O&M Report  
 Other \_\_\_\_\_

## Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

KMOG has sufficient insurance and bonding to fully address the anticipated costs of Remediation, including the remaining estimated costs for this project. KMOG currently has over 40 million in bonds with the Colorado Energy and Carbon Management Commission. The cost for remediation is a preliminary estimate only, costs may change upwards or downward based on site-specific information. KMOG makes no representation or guarantees as to the accuracy of the preliminary estimate.

Operator anticipates the remaining cost for this project to be: \$ 45000 \_\_\_\_\_

## 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 1,360 cubic yards of hydrocarbon-impacted soil were transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling. Approximately 820 barrels of hydrocarbon-impacted groundwater and hydro-excavation slurry were transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling.

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

E&P waste (solid) description \_\_\_\_\_ Impacted soil

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_ 149007

Non-ECMC Disposal Facility: \_\_\_\_\_ Buffalo Ridge Landfill - Keenesburg, Colorado

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

E&P waste (liquid) description \_\_\_\_\_ Impacted groundwater and hydro-excavation slurry

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

Non-ECMC Disposal Facility: \_\_\_\_\_

## REMEDIATION COMPLETION REPORT

### REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No \_\_\_\_\_

If YES:

Compliant with Rule 913.h.(1).

Compliant with Rule 913.h.(2).

Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards? No \_\_\_\_\_

Does the previous reply indicate consideration of background concentrations? \_\_\_\_\_

Does Groundwater meet Table 915-1 standards? No \_\_\_\_\_

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

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

## 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 ECMC 1000 Series 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 provide the seed mix? \_\_\_\_\_

If YES, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. \_\_\_\_\_

Proposed date of completion of Reclamation. \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. 11/03/2016

Actual Spill or Release date, or date of discovery. 11/01/2016

### SITE INVESTIGATION DATES

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

Proposed site investigation commencement. 11/01/2016

Proposed completion of site investigation. 09/20/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/01/2016

Proposed date of completion of Remediation. 12/31/2025

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

\_\_\_\_\_

**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: Senior Environmental Rep.

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

Email: Phillip\_Hamlin@oxy.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: \_\_\_\_\_

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

Remediation Project Number: 10048

**COA Type****Description**

0 COA	

**ATTACHMENT 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**

403985161	ANALYTICAL RESULTS
403985163	ANALYTICAL RESULTS
403985164	ANALYTICAL RESULTS
403985169	ANALYTICAL RESULTS
403985171	ANALYTICAL RESULTS
403985174	SOIL SAMPLE LOCATION MAP
403988736	ANALYTICAL RESULTS
403988754	SITE MAP
403991996	LOGS

Total Attach: 9 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)