

State of Colorado  
Energy & Carbon Management Commission

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403656955  
Receive Date:  
05/07/2024

Report taken by:  
Laurel Anderson

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 ECOM 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: <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>		
City: <u>DENVER</u>	State: <u>CO</u>	Phone: <u>(970) 336-3500</u>
	Zip: <u>80217-3779</u>	Mobile: <u>(970) 515-1698</u>
Contact Person: <u>Gregory Hamilton</u>	Email: <u>Gregory_Hamilton@oxy.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 32663 Initial Form 27 Document #: 403567026

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

Yes  Multiple Facilities

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>318488</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>GREENLEAF 15N-15HZ</u>	Latitude: <u>40.145300</u>	Longitude: <u>-104.648910</u>	
	** correct Lat/Long if needed: Latitude: <u>40.086524</u>	Longitude: <u>-104.696747</u>	
QtrQtr: <u>NWNE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>485213</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Greenleaf 16N-15HZ TB PW Recent Rel</u>	Latitude: <u>40.145469</u>	Longitude: <u>-104.649567</u>	
	** correct Lat/Long if needed: Latitude: _____	Longitude: _____	
QtrQtr: <u>NWNE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

**SITE CONDITIONS**

General soil type - USCS Classifications GW

Most Sensitive Adjacent Land Use Crop land

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**

Surface water is located approximately 200 feet west of the facility.  
The nearest domestic water well is located approximately 350 feet northeast of the facility. Additional domestic water wells are located approximately 600 feet northwest and 900 feet southwest of the facility.  
Multiple livestock holding pens are located approximately 750 feet northwest of the facility.  
The nearest occupied building is located approximately 300 feet west of the facility. Additional buildings are located approximately 450 feet northwest, 550 feet northwest, 775 feet northwest, and 1,200 feet southwest of the facility.

# 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	SOILS	26' (N-S) x 6' (E-W) x 6' bgs	Inspection/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 24, 2023, a release of an unknown volume was discovered at the Greenleaf 16N-15HZ O SA Production Facility location, due to produced water observed daylighting from the subsurface within the separator cabinet. On September 25, 2023, a preliminary waste characterization soil sample (B01@3") was collected from the area most likely to be impacted within the release area, based on field observations, and submitted for laboratory analysis of the full Table 915-1 analytical suite, using standard ECMC-approved methods appropriate for detecting the target analytes. Analytical results indicated that soil impacts were present in the release area due to the total petroleum hydrocarbons (TPH), trimethylbenzene (TMB), polycyclic aromatic hydrocarbons (PAH), electrical conductivity (EC), and sodium adsorption ratio (SAR) results above ECMC Table 915-1 standards and/or site-specific background levels. As such, a Form 19-Initial Spill/Release Report (Document No. 403539749) was submitted on September 26, 2023, and the ECMC issued Spill/Release Point ID 485213. Excavation and site assessment activities to address remaining soil impacts in the release area are currently ongoing and will be summarized in a forthcoming Form 27-Supplemental update. Soil sample location and field screening data are presented in Table 1. Soil analytical results are summarized in Tables 2 through 5. The current excavation extent and associated soil sample locations are illustrated on Figure 1.

## 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 December 28, 2023, hydro-excavation activities were initiated to address remaining soil impacts in the release area. Soil samples have been collected from the sidewalls and base of the current excavation extent, at depths of approximately 4 and 6 feet below ground surface (bgs), respectively. The soil samples were submitted for laboratory analysis of the full Table 915-1 analytical suite, to develop a waste profile for the remaining soil impacts. Analytical results indicate that impacted soil remains in the excavation area due to TMB, PAH, SAR, and pH results above Table 915-1 standards and/or background levels. Excavation and site assessment activities are ongoing, and will be summarized in a forthcoming Form 27-Supplemental update. Future confirmation soil samples from the excavation area will be submitted for laboratory analysis of BTEX, TPH, TMB, PAHs, EC, SAR, pH, and select Table 915-1 metals (As, Ba, Cd, Cu, Pb, Ni, Se, Zn), based on the analytical results presented herein.

### Proposed Groundwater Sampling

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

Groundwater has not been encountered during the hydro-excavation activities completed to date. If groundwater is encountered during ongoing excavation or site assessment activities, a minimum of one grab sample will be collected as soon as practical. Groundwater samples will be submitted to an accredited laboratory for analysis of BTEX, naphthalene, 1,2,4- and 1,3,5-trimethylbenzene (TMB), using standard methods appropriate for detecting the target analytes in ECMC Table 915-1.

### 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 ):

Excavation and site assessment activities to address remaining soil impacts are currently ongoing, and will be summarized in a forthcoming Form 27-Supplemental update. Soil sample location and field screening data are presented in Table 1. Soil analytical results are summarized in Tables 2 through 5. The current excavation extent and associated soil sample locations are illustrated on Figure 1. The laboratory analytical reports are provided as Attachment A. The field notes and a photographic log are provided as Attachment B.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 9

Number of soil samples exceeding 915-1 6

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 156

### NA / ND

-- Highest concentration of TPH (mg/kg) 534.9

-- Highest concentration of SAR 19.1

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 6

### Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) \_\_\_\_\_

Number of groundwater monitoring wells installed \_\_\_\_\_

Number of groundwater samples exceeding 915-1 \_\_\_\_\_

\_\_\_\_\_ Highest concentration of Benzene (µg/l) \_\_\_\_\_

\_\_\_\_\_ Highest concentration of Toluene (µg/l) \_\_\_\_\_

\_\_\_\_\_ Highest concentration of Ethylbenzene (µg/l) \_\_\_\_\_

\_\_\_\_\_ Highest concentration of Xylene (µg/l) \_\_\_\_\_

\_\_\_\_\_ Highest concentration of Methane (mg/l) \_\_\_\_\_

### Surface Water

0 Number of surface water samples collected

\_\_\_\_\_ 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?

Were background samples collected as part of this site investigation?

Four (4) background soil samples were collected from undisturbed native material adjacent to the production facility, at comparable depth and soil composition to the waste characterization soil sample. The background soil samples were submitted for laboratory analysis of the Soil Suitability for Reclamation Parameters and Table 915-1 metals using standard ECMC-approved methods appropriate for detecting the target analytes in Table 915-1. Analytical results for the background soil samples are presented in Table 4 and 5. Additional background soil sampling is planned to be conducted during ongoing excavation activities, and results will be presented in a forthcoming Form 27-Supplemental update.

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?

Impacted soil remains in the excavation area, as described herein. Excavation and site assessment activities to address remaining soil impacts are currently ongoing and will be summarized in a forthcoming Form 27-Supplemental update.

## 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.

To date, approximately 45 cubic yards of impacted hydro-excavation soil slurry have been removed and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. Excavation and site assessment activities to address remaining soil impacts are currently ongoing, and will be summarized in a forthcoming Form 27-Supplemental update.

### 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.

Impacted soil remains in the excavation area, as described herein. Excavation and site assessment activities to address remaining soil impacts are currently ongoing and will be summarized in a forthcoming Form 27-Supplemental update. Estimated time to attain NFA is TBD based on the extent of remaining soil impacts.

## Soil Remediation Summary

In Situ

Ex Situ

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

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

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

\_\_\_\_\_ If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_ 45

\_\_\_\_\_ Air sparge / Soil vapor extraction

\_\_\_\_\_ Name of Licensed Disposal Facility or ECMC Facility ID # \_\_\_\_\_ 434766

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

No \_\_\_\_\_ Excavate and onsite remediation

\_\_\_\_\_ Other \_\_\_\_\_

\_\_\_\_\_ 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.

# 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 Remediation progress update

## 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 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: \$ 10000

## 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 45 cubic yards of impacted hydro-excavation soil slurry have been removed and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling.

Volume of E&P Waste (solid) in cubic yards 45

E&P waste (solid) description Impacted hydro-excavation soil slurry

ECMC Disposal Facility ID #, if applicable: 434766

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

Volume of E&P Waste (liquid) in barrels 0

E&P waste (liquid) description \_\_\_\_\_

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

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? Yes

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

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 affected infrastructure will be replaced and the remaining production facility infrastructure will remain in place at this time. The site will be reclaimed in accordance with ECMC 1000 Series Reclamation Rules following future facility decommissioning activities.

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 provide the seed mix? Yes

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

Did the local soil conservation district provide the seed mix? No

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 06/30/2024

Proposed date of completion of Reclamation. 07/31/2024

## 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. 09/26/2023

Actual Spill or Release date, or date of discovery. 09/24/2023

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/25/2023

Proposed site investigation commencement. 09/25/2023

Proposed completion of site investigation. 03/31/2024

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 12/28/2023

Proposed date of completion of Remediation. 03/31/2024

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**

Excavation and site assessment activities to address remaining soil impacts are currently ongoing and will be summarized in a forthcoming Form 27-Supplemental update. Future confirmation soil samples from the excavation area will be submitted for laboratory analysis of BTEX, TPH, TMB, PAHs, EC, SAR, pH, and select Table 915-1 metals (As, Ba, Cd, Cu, Pb, Ni, Se, Zn), based on the analytical results presented herein. Form 27-Supplemental updates will continue to be submitted to the ECMC on a quarterly basis.

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

Signed: Gregory Hamilton

Title: Environmental Consultant

Submit Date: 05/07/2024

Email: Gregory\_Hamilton@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: Laurel Anderson

Date: 08/19/2024

Remediation Project Number: 32663

**COA Type****Description**

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**

403656955	FORM 27-SUPPLEMENTAL-SUBMITTED
403657131	ANALYTICAL RESULTS
403782339	ANALYTICAL RESULTS
403782346	SOIL SAMPLE LOCATION MAP
403782352	PHOTO DOCUMENTATION

Total Attach: 5 Files

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

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)