

State of Colorado
Energy & Carbon Management Commission1120 Lincoln Street, Suite 801, Denver, Colorado 80203
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Report taken by:

Grace Rollins

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	Phone Numbers
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 #: 9675 Initial Form 27 Document #: 200439575

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: TANK BATTERY	Facility ID: 440852	API #: _____	County Name: WELD
Facility Name: SPILL/RELEASE POINT	Latitude: 40.268799	Longitude: -104.723004	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNE	Sec: 36	Twp: 4N	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? Yes 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 livestock pasture is located approximately 100 feet southwest of the release location. The nearest domestic water well is located approximately 600 feet northwest of the release location. Multiple industrial-use buildings are located within 1/4 mile of the release location. Groundwater at approximately 13 ft below ground surface (bgs).

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 80' (E-W) x 19' bgs	Soil boring, excavation, 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 February 9, 2015, historical hydrocarbon impacts were discovered during abandonment activities at the HSR-Corvi 2-36 production facility, and excavation activities were initiated. Groundwater was not encountered during excavation activities. The ECMC issued Spill/Release Point ID 440852 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 as described in the Initial Form 27 (ECMC Document No. 200439575). Due to the presence of multiple active subsurface lines, impacted soil was left in-place in the vicinity of excavation soil samples N01@15', S01@15', W01@15', and B01@18'. Between March 5 and 10, 2015, multiple soil borings were advanced around the excavation area, in order to complete the delineation of soil impacts. These borings were advanced to the limit of the soil impacts observed during drilling; soil samples collected from borings W-BH02 and NW-BH06 exhibited constituent concentrations out of compliance with ECMC soil standards.

Proposed Groundwater Sampling

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

The soil borings advanced between March 5 and 10, 2015 yielded groundwater, and as such borings S-BH01, W-BH02, N-BH03, N-BH04, W-BH05, and NW-BH06 were converted to groundwater monitoring wells BH01 - BH06. Samples collected from these locations indicated that groundwater impacts were present at the site. Between August 17 and 25, 2015, 5 additional monitoring wells (BH07 - BH11) were installed to further assess the extent of groundwater impacts. Quarterly groundwater monitoring was initiated on March 11, 2015, and is ongoing at the ten (10) temporary monitoring wells remaining at the site (BH01 - BH07, BH09 - BH11); BH08 was removed from the monitoring program under an approved reduction request (ECMC Document No. 402943641). Groundwater analytical data is presented in Table 3.

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):

Groundwater samples have been intermittently collected from select site remediation wells, as needed, for remediation system monitoring and optimization purposes. Groundwater analytical results for the remediation wells are included in Table 3.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 32

Number of soil samples exceeding 915-1 25

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

Approximate areal extent (square feet) 11700

NA / ND

-- Highest concentration of TPH (mg/kg) 2650

NA Highest concentration of SAR

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 25

Groundwater

Number of groundwater samples collected 418

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 15

Number of groundwater monitoring wells installed 30

Number of groundwater samples exceeding 915-1 129

-- Highest concentration of Benzene (µg/l) 13900

-- Highest concentration of Toluene (µg/l) 20500

-- Highest concentration of Ethylbenzene (µg/l) 760

-- Highest concentration of Xylene (µg/l) 22000

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?

Groundwater impacts out of compliance with the ECMC standards were historically detected in off-Site temporary monitoring well BH01.

☐ 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?

Impacted soil and groundwater remain at the site. Additional soil assessment activities will be conducted following the completion of groundwater remediation.

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.

On February 9, 2015, approximately 150 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Remaining hydrocarbon-impacted soil that was left in place is being addressed as described below.

REMEDATION 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.

Kerr-McGee selected air sparge (AS) and soil vapor extraction (SVE) as remedial technologies to address remaining hydrocarbon impacts to soil and groundwater at the site. Between November 29, 2017 and February 26, 2018, nine AS remediation wells (AS-01 through AS-09) and ten SVE remediation wells (SVE-01 through SVE-10) were installed for use with an on-site remediation system. Remediation system construction, permitting, and start-up activities were described in a previous Form 27-Supplemental Update (ECMC Doc Nos. 401903958, 401903958, and 401618615). The as-built locations of the remediation system wells are illustrated on Figure 2.

Between May 28 and May 30, 2024, a soil assessment was conducted to evaluate the remaining 915 soil exceedances at the site and 14 soil borings (BH01 through BH05 and S-BH01 through S-BH09) were advanced to a maximum depth of 30 ft bgs. Based on the results of the assessment, soil impacts remain laterally undelineated to the southwest and south and vertically undelineated at BH01, BH02, BH05, S-BH01, and S-BH06. The existing AS/SVE system will be adjusted as necessary to focus remedial efforts on the locations where organic soil exceedances remain at the site. The soil assessment PID readings and laboratory analytical results are summarized in Tables 1 and 2. The soil boring locations are depicted on Figure 1 and the boring logs are attached.

Soil Remediation Summary

☒ In Situ

No Bioremediation (or enhanced bioremediation)

No Chemical oxidation

Yes Air sparge / Soil vapor extraction

Yes Natural Attenuation

No Other

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 150

Name of Licensed Disposal Facility or ECMC Facility ID #

No Excavate and onsite remediation

Land Treatment

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Other

Groundwater Remediation Summary

No Bioremediation (or enhanced bioremediation)

No Chemical oxidation

Yes Air sparge / Soil vapor extraction

Yes Natural Attenuation

No 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.

Groundwater monitoring is conducted quarterly at wells BH01 through BH07 and BH09 through BH11 for Table 915-1 organic constituents in groundwater. The ECMC approved the removal of well BH08 from the quarterly monitoring program in the Form 27 Document No. 402943641. The ECMC approved the removal of Table 915-1 inorganic constituents from the quarterly monitoring program in the Form 27 Document No. 402646251. All monitoring wells that were able to be sampled were in compliance with Table 915-1 allowable levels during the fourth quarter of 2024 and first quarter of 2025 groundwater monitoring events. The monitoring well locations are depicted on Figure 2. The Groundwater Elevation Contour Map for the January 2025 monitoring event is provided as Figure 3.

Groundwater monitoring will continue on a quarterly basis until no further action (NFA) is warranted.

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: \$ 175000

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 150

E&P waste (solid) description Impacted soil

ECMC Disposal Facility ID #, if applicable:

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

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 site has been restored to its pre-release grade. Kerr-McGee will conduct reclamation activities in accordance with ECMC 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 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. 02/10/2015

Actual Spill or Release date, or date of discovery. 02/09/2015

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/09/2015

Proposed site investigation commencement. 02/09/2015

Proposed completion of site investigation. 12/31/2028

REMEDIAL ACTION DATES

Proposed start date of Remediation. 02/09/2015

Proposed date of completion of Remediation. 12/31/2028

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

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: 02/26/2025

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: Grace Rollins

Date: 03/10/2025

Remediation Project Number: 9675

COA Type**Description**

	ECMC does not approve Operator's proposal to conduct additional soil assessment following the completion groundwater monitoring. Operator shall define the vertical and horizontal extent of impacts to soil and submit the results of the investigation on the subsequent Supplemental Form 27.
	The soil samples collected in 2024 referred to as "Background Samples" in the attached analytical summary tables were collected from areas on-location and are not representative of background conditions near the spill/release. These samples shall be omitted from future background determination calculations.
	If Operator proposes background soil sampling, Operator shall obtain background samples from a minimum of five (5) separate locations as an initial characterization. Background sampling locations should be sufficiently away from the impacted area to reflect conditions not impacted by oil and gas activity, and should be obtained from similar depths and soil horizons or lithologic materials for comparison to confirmation soil samples.
	Operator indicates that the SVE/AS system will be updated to address remaining impacts to soil. However, the blue shading of the analytical summary tables (Doc. # 404097086) indicates data collected throughout 2024 was no longer included in the "Active remediation implementation period". Operator shall clarify when SVE/AS system operations have commenced and concluded and include all SVE/AS data in the subsequent Supplemental Form 27.

4 COAs

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**

404096606	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
404096626	ANALYTICAL RESULTS
404096627	ANALYTICAL RESULTS
404096628	ANALYTICAL RESULTS
404096629	ANALYTICAL RESULTS
404096630	ANALYTICAL RESULTS
404096632	ANALYTICAL RESULTS
404096633	ANALYTICAL RESULTS
404096634	ANALYTICAL RESULTS
404096635	SITE MAP
404096636	GROUND WATER ELEVATION MAP
404097081	SOIL SAMPLE LOCATION MAP

404097086	ANALYTICAL RESULTS
404103604	LOGS
404121702	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 15 Files

General Comments

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

Total: 0 comment(s)