

**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	Phone Numbers
Address: P O BOX 173779		Phone: (720) 929-4306
City: DENVER	State: CO	Zip: 80217-3779
Contact Person: Erik Mickelson	Email: DJRemediation_Forms@oxy.com	Mobile: ()

PROJECT, PURPOSE & SITE INFORMATION**PROJECT INFORMATION**

Remediation Project #: 30632 Initial Form 27 Document #: 403453113

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: LOCATION	Facility ID: 457921	API #: _____	County Name: WELD
Facility Name: PSC-63N67W 10NWSE		Latitude: 40.238599	Longitude: -104.876651
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSE	Sec: 10	Twp: 3N	Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE	Facility ID: 485465	API #: _____	County Name: WELD
Facility Name: PSC 15-10FSV, 24A&4 O SA Facility		Latitude: 40.238921	Longitude: -104.876676
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSE	Sec: 10	Twp: 3N	Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM

Most Sensitive Adjacent Land Use Surface Water

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? No

Other Potential Receptors within 1/4 mile

County Road 70 feet (ft) west. Water well 980 ft northeast. Beeman ditch 930 ft northeast. Groundwater approximately 22 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 Samples/Laboratory Analytical Results
Yes	SOILS	TBD	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 9, 2001, a separator malfunction at the Fort St. Vrain-4 facility resulted in an oil dump valve malfunction.

On February 4, 2005, historical petroleum hydrocarbon impacts to soil and groundwater were encountered during excavation activities.

On April 25, 2008, a release was discovered while pressure testing the flowlines and dumlplines, and one or more lines did not hold pressure.

Decommissioning activities were completed at the PSC 15-10FSV, 24A&4 O SA Facility on October 23, 2023. Groundwater was not encountered during excavation activities. Visual inspection and field screening of soil at two aboveground storage tanks (ASTs), one produced water vessel (PWV), one emission control device (ECD), two meter houses, one pothole location, and one separator were conducted following removal activities, and soil samples (AST01@0.5', AST02@0.5', FL01@4', PWV-B01@5', and PWV-W01@2.5') were submitted for analysis of full list Table 915-1 constituents due to the presence of impacts. Soil samples (SEP01-INLET@4' and SEP01-OUTLET@4') were submitted for analysis of reduced list Table 915-1 constituents, as approved in the Form 27 Initial dated July 10, 2023 (Document No. 403453113), to determine if a release occurred. Laboratory analytical results indicated that TPH, BTEX, TMBs, naphthalene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, pH, SAR, and/or boron impacts outside of the ECMC Table 915-1 allowable levels and/or site-specific background levels were present at the AST01, AST02, FL01, and PWV locations. As such, a Form 19 Initial/Supplemental Spill/Release Report (Document No. 403571300) was submitted on October 26, 2023 and the ECMC issued Spill/Release Point ID 485465. The facility soil sample locations are depicted on Figure 1. The PID readings and soil sample results are summarized in Tables 1 and 2, respectively.

Excavation activities are ongoing and will be summarized in a subsequent Form 27 Supplemental report.

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):

Between October 1, 2001 and May 28, 2008, 35 soil samples were collected from the 2001, 2005, and 2008 excavations for laboratory analysis. Please refer to the Form 27 Supplemental dated February 2, 2024 (Remediation No. 723; Document No. 403669679) for more details.

Between October 23, 2023 and August 1, 2024, confirmation soil samples were collected from the base and sidewalls for the excavation extents at depths ranging from 2 ft bgs to 20 ft bgs. The confirmation soil samples were submitted for analysis of the excavation-specific waste profile using ECMC-approved methods. Analytical results indicate that levels of TMBs, TPH, polycyclic aromatic hydrocarbons (PAHs), arsenic, barium, cadmium, lead, and selenium exceeding the ECMC Table 915-1 allowable levels and site-specific background levels remain in the excavations. Excavation activities are ongoing. The laboratory reports are attached.

Proposed Groundwater Sampling

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

Quarterly groundwater monitoring was conducted at the site between October 2001 and February 2021. Quarterly groundwater monitoring was discontinued following approval of the ECMC (Remediation No. 723; Document No. 402663472).

Proposed Surface Water Sampling

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

On September 7, 2001, two surface water samples (DSS-01 and DSS-02) were collected from the drainage ditch and submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Please refer to the Form 27 Supplemental dated February 2, 2024 (Remediation No. 723; Document No. 403669679) for more details.

Additional Investigative Actions

☐ Additional alternative investigative actions described in attached Site Investigation Plan (summary):

On October 23, 2022, visual inspections and field screening of soils was conducted at the loadout, hatch, and/or the base for each AST, three sidewalls of the PWV excavation, the inlets of two meter houses, and the ECD footprint. Based on the inspection and screening results, hydrocarbon-impacted soils were not observed at the soil screening locations. As a result, no soil samples were submitted for laboratory analysis from these areas in accordance with the ECMC Operator Guidance for Oil & Gas Facility Closure document. The PID readings and soil sample results are summarized in Table 1 and Table 2, respectively. The soil sample locations are depicted on Figure 1. A photographic log is attached.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 162

Number of soil samples exceeding 915-1 131

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

Approximate areal extent (square feet) 7875

NA / ND

-- Highest concentration of TPH (mg/kg) 9068

-- Highest concentration of SAR 28.5

BTEX > 915-1 Yes

Vertical Extent > 915-1 (in feet) 20

Groundwater

Number of groundwater samples collected 526

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 22

Number of groundwater monitoring wells installed 31

Number of groundwater samples exceeding 915-1 138

-- Highest concentration of Benzene (µg/l) 1600

-- Highest concentration of Toluene (µg/l) 48

-- Highest concentration of Ethylbenzene (µg/l) 970

-- Highest concentration of Xylene (µg/l) 14700

NA 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?

One tank battery background soil sample (TB-BG01@0.5') was collected from the soil used to construct the tank battery for comparison to shallow soil samples collected within the fill material. Twenty-one native background soil samples (Native-BG01@3', Native-BG01@6', Native-BG02@3', Native-BG02@6', Native-BG03@5' through Native-BG05@5', Native-BG03@10' through Native-BG05@10', Native-BG06@13' through Native-BG10@13', Native-BG11@15' through Native-BG13@15', and Native-BG11@18' through Native-BG13@18') were collected from the native material outside of the facility excavations for laboratory analysis of pH, EC, SAR, boron, and Table 915-1 metals, using ECMC-approved methods. Laboratory analytical results indicate that pH, arsenic, and selenium are naturally high in the soil used to construct the tank battery and in the native soil around the facility. The background soil sample analytical results are summarized in Table 2. The background soil sample locations are depicted on Figure 1.

☐ 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?

Excavation activities are ongoing and will be summarized in a subsequent Form 27 Supplemental report.

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.

In 2001, approximately 750 cubic yards of petroleum hydrocarbon impacted soil were removed from the excavation and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling. In 2005, approximately 1,272 cubic yards of petroleum hydrocarbon impacted soil were removed from the excavation and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado, for recycling. In 2008, approximately 650 cubic yards of petroleum hydrocarbon impacted soil were removed from the excavation and transported to the Front Range Landfill in Erie, Colorado, for disposal. The 2001, 2005, and 2008 excavation extents are depicted on the Site Map attached as Figure 2.

The 3-point composite base soil sample collected from the 2001 excavation exceeded the ECMC sensitive area allowable level of 1,000 mg/kg. The soil sample was collected at the water table, so no further excavation was conducted at the time.

Additional impacted soil will be removed and transported to a licensed disposal facility. Final disposal information will be provided upon completion of excavation activities. Disposal records will be kept on file and available upon request. The excavation areas will be backfilled and contoured to match pre-existing conditions.

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.

Please refer to the Form 27 Supplemental dated February 2, 2024 (Rem No. 723; Document No. 403669679) for more details.

Laboratory data indicate that impacts exceeding the ECMC Table 915-1 allowable levels and site-specific background levels for TMBs, TPH, PAHs, arsenic, barium, cadmium, lead, and selenium remain in the excavations. Groundwater was not encountered during facility decommissioning activities. Excavation activities are ongoing and will be summarized in a subsequent Form 27 Supplemental report.

Soil Remediation Summary

☒ In Situ

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Air sparge / Soil vapor extraction

Yes Natural Attenuation

Other

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 2672

Name of Licensed Disposal Facility or ECMC Facility ID # 149007

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

Yes Other Groundwater and Free Product 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.

Between October 2001 and August 2018, eighteen groundwater monitoring wells (MW01 through MW18), six assessment wells (AW01 through AW06), and ten replacement monitoring wells (MW01R, MW01R2, MW02R, MW04R, MW04R2, MW05R, MW05R2, MW05R3, MW07R, and MW14R) were installed at the site. Groundwater monitoring continued on a quarterly basis. The monitoring well locations are depicted on Figure 2.

In November 2013, monitoring wells MW01R2, MW04R, MW05R2, MW07R through MW18, and AW01 through AW06 were surveyed to obtain the relative groundwater and top-of-casing well elevation data. The survey data indicated the groundwater flow direction at the site is to the northwest. In September 2018 and August 2019, replacement monitoring wells MW04R2 and MW05R3 were tied into the survey data. The survey data indicated the groundwater flow direction at the site is to the northwest. Relative groundwater elevations are provided in Table 3.

As of the February 2021 quarterly monitoring event, BTEX concentrations in monitoring wells AW01, AW04, MW01R2, MW04R2, MW05R3, MW07R, MW09, MW10, MW14R, MW15, and MW16 were in full compliance with ECMC allowable levels at the time of sampling for four consecutive quarterly monitoring events. As such, quarterly groundwater monitoring was discontinued following approval of the ECMC (Form 27 Supplemental Document No. 402663472).

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 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: \$ 14500

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? _____

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

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

E&P waste (solid) description _____

ECMC Disposal Facility ID #, if applicable: _____

Non-ECMC Disposal Facility: _____

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

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? _____

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 will be reclaimed in accordance with ECMC 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 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. 10/24/2023

Actual Spill or Release date, or date of discovery. 10/24/2023

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/23/2023

Proposed site investigation commencement. 10/23/2023

Proposed completion of site investigation. 06/23/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 10/23/2023

Proposed date of completion of Remediation. 06/23/2025

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

No additional work has been done since the previous Form 27 and, as such, none of the previous attachments have been included with this form. The implementation schedule has been updated.

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

Signed: Erik Mickelson

Title: Environmental Lead

Submit Date:

Email: DJRemediation_Forms@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: 30632

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

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Total Attach: 0 Files

General Comments

User Group

Comment

Comment Date

		Stamp Upon Approval
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Total: 0 comment(s)