

State of Colorado  
Energy & Carbon Management Commission

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Document Number:

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Receive Date:

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: (970) 515-1110
City: DENVER	State: CO	Zip: 80217-3779
Contact Person: Macy Kiel	Email: DJRemediation_Forms@oxy.com	Mobile: ( )

## PROJECT, PURPOSE &amp; SITE INFORMATION

## PROJECT INFORMATION

Remediation Project #: 24758 Initial Form 27 Document #: 403137797

## 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: WELL	Facility ID: _____	API #: 123-07404	County Name: WELD
Facility Name: STRONG P 28-2	Latitude: 40.200392	Longitude: -104.891293	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNE	Sec: 28	Twp: 3N	Range: 67W
Meridian: 6	Sensitive Area? Yes		

Facility Type: SPILL OR RELEASE	Facility ID: 482916	API #: _____	County Name: WELD
Facility Name: Strong P 28-2 Wellhead	Latitude: 40.200392	Longitude: -104.891293	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: NWNE	Sec: 28	Twp: 3N	Range: 67W
Meridian: 6	Sensitive Area? Yes		

## SITE CONDITIONS

General soil type - USCS Classifications SC

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

Domestic water well: approximately 1300' N  
Surface water: approximately 1010' W and 670' E  
Wetlands: areas with wetland characteristics located approximately 1000' W and 640' E  
Springs: none  
Livestock: none  
Occupied Building: none  
High Priority Habitats: none

## SITE INVESTIGATION PLAN

### TYPE OF WASTE:

- ☒ E&P Waste ☐ Other E&P Waste ☒ Non-E&P Waste
- ☒ Produced Water ☐ Workover Fluids Non-Impacted Groundwater
- ☒ 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
No	GROUNDWATER	No hydrocarbon impacts observed	groundwater samples/laboratory analytical results
Yes	SOILS	19' (N-S) x 20' (E-W) x 11' 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.

Wellhead cut and cap operations and flowline removal activities were completed at the Strong P 28-2 wellhead on September 7 through 15, 2022. Groundwater was encountered in the wellhead cut and cap excavation area at approximately 10' below ground surface (bgs). Visual inspection and field screening of soils around the well, associated pumping equipment, and flowline removal potholes was conducted following wellhead cut and cap operations and flowline removal activities and soil samples (InitialWasteCharacterization@4', WH-B01@6', WHS-W01@3", FL-B01@2', FL-B02@3', and DL-B01@5') were submitted for laboratory analysis to determine if a release occurred. Laboratory analytical results indicated that the naphthalene, 1,2,4-trimethylbenzene (TMB), 1,3,5-TMB, total petroleum hydrocarbons (TPH), 1-methylnaphthalene, 2-methylnaphthalene, boron, pH, arsenic, barium, cadmium, lead, nickel, and/or selenium concentrations in soil samples InitialWasteCharacterization@4', WH-B01@6', and WHS-W01@3" exceeded the applicable ECMC Table 915-1 standards and background limits. As such, a Form 19-Initial/Supplemental Spill/Release Report (ECMC Document No. 403158098) was submitted on September 9, 2022, and the ECMC issued Spill/Release Point ID 482916. A topographic Site Location Map showing the geographic setting of the site location is provided as Figure 1. Soil sample location and field screening data are presented in Table 1. The soil sample and field screening locations are illustrated on Figures 2 through 5. The laboratory analytical reports are provided as Attachment A. The field notes and a photographic log are provided as Attachment B.

### 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 ):

From September 7 through June 6, 2024, soil samples were collected from the base and sidewalls of the current wellhead excavation extent ranging in depths of approximately 1 to 11 feet bgs. Based on waste characterization results (InitialWasteCharacterization@4', WH-B01@6', WHS-W01@3"), confirmation soil samples were submitted for laboratory analysis of naphthalene, TMBs, TPH, boron, pH, PAHs, arsenic, barium, cadmium, copper, lead, nickel, and selenium using ECMC approved methods. Analytical results indicate that barium, cadmium, pH, and boron impacts remain in the excavation area. However, the remaining impacts will be left in place due to the presence of groundwater within the excavation and will be addressed through quarterly groundwater monitoring. Soil analytical results are summarized in Tables 2 through 5.

#### Proposed Groundwater Sampling

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

Groundwater was encountered in the wellhead cut and cap excavation area at approximately 10' bgs. On November 1, 2022, a groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-TMB, 1,3,5-TMB, by USEPA Method 8260D, as approved in the Form 27-Initial (Document No. 403137797). Analytical results indicate that the constituent concentrations in groundwater sample GW-01 were in compliance with ECMC Table 915-1 standards as summarized in Table 6. The groundwater sample location is illustrated in Figure 3. Monitoring wells will be installed at the site and sampled for four consecutive quarters to monitor for groundwater compliance. Future groundwater samples will be submitted for the full ECMC Table 915-1 groundwater analytical suite, as well as dissolved barium and dissolved cadmium.

### 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 ):

On September 8 through 15, 2022, visual inspection and field screening of soils was conducted at four (4) sidewall locations within the wellhead excavation area, three (3) locations at the ground surface adjacent to the excavation, and two flowline removal potholes. Based on the inspection and screening results, no soil samples were submitted from these areas in accordance with ECMC Operator Guidance. Following cut and cap operations, a soil gas survey was conducted at three (3) soil vapor points (SVP-03 - SVP-05) that were installed adjacent to the former wellhead. Soil vapor points SVP-01 and SVP-02 were able to be screened due to the presence of groundwater. GEM 5000 readings were non-detect for methane at all three (3) points. The SVP locations are illustrated on Figure 2 and SVP screening results are summarized in Table 7.

## SITE INVESTIGATION REPORT

### SAMPLE SUMMARY

#### Soil

Number of soil samples collected 22

Number of soil samples exceeding 915-1 22

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

Approximate areal extent (square feet) 380

#### NA / ND

-- Highest concentration of TPH (mg/kg) 1538

-- Highest concentration of SAR 2.17

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 11

#### Groundwater

Number of groundwater samples collected 1

Was extent of groundwater contaminated delineated? Yes

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

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 915-1 0

ND Highest concentration of Benzene (µg/l)

-- Highest concentration of Toluene (µg/l) 2.17

ND Highest concentration of Ethylbenzene (µg/l)

-- Highest concentration of Xylene (µg/l) 5.17

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?

Background soil samples WH-BG01 - WH-BG011 were collected from native material adjacent to the wellhead cut and cap excavation area at depths ranging from 3' to 10' bgs. The background soil samples were submitted for laboratory analysis of the Soil Suitability for Reclamation Parameters and/or Table 915-1 Metals using standard methods appropriate for detecting target analytes in Table 915-1. Analytical results for the background soil samples are presented in Tables 3 and 5. Background sample locations are illustrated in Figures 2 through 4.

☐ 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?

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts. A background groundwater sample will be collected and submitted for laboratory analysis of TDS, sulfate ions, and chloride ions to establish background levels. Based on the remaining soil impacts in the former wellhead excavation area, groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the full ECMC Table 915-1 groundwater analytical suite, as well as dissolved barium and dissolved cadmium.

## 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.

Between September 7 through June 6, 2024, approximately 140 cubic yards of impacted material were excavated and transported to the Front Range Landfill in Erie, Colorado for disposal; and approximately 90 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Approximately 70 cubic yards of impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling. Laboratory analytical results indicate that barium, cadmium, pH, and boron impacts remain in the excavation area. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation and will be addressed through quarterly groundwater monitoring. 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.

Laboratory analytical results indicate that barium, cadmium, pH, and boron impacts remain in the excavation area. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation and will be addressed through quarterly groundwater monitoring. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining groundwater impacts. Based on the remaining impacts in the former wellhead excavation area, the groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the full ECMC Table 915-1 groundwater analytical suite, as well as dissolved barium and dissolved cadmium. Estimated time to attain NFA is TBD based on the groundwater concentrations, the extent of impacted groundwater, and the efficacy of the 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) 300

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

\_\_\_\_\_ Name of Licensed Disposal Facility or ECMC Facility ID # 149007

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

\_\_\_\_\_ 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.

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts. Based on the remaining inorganic impacts in the former wellhead excavation area, groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the ECMC Table 915-1 groundwater analytical suite, as well as dissolved barium and dissolved cadmium. A groundwater monitoring location figure illustrating the locations of the surveyed monitoring wells will be provided in a Form 27-Supplemental update.

## 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 ECMC. 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: \$ 9500

### 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 70 cubic yards of impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado for recycling.

Volume of E&P Waste (solid) in cubic yards 300

E&P waste (solid) description impacted soil

ECMC Disposal Facility ID #, if applicable: 149007

Non-ECMC Disposal Facility: Front Range Landfill and Buffalo Ridge Landfill

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?

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards? \_\_\_\_\_

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. 08/15/2022

Actual Spill or Release date, or date of discovery. 09/07/2022

### **SITE INVESTIGATION DATES**

Date of Initial Actions described in Site Investigation Plan (start date). 09/07/2022

Proposed site investigation commencement. 09/07/2022

Proposed completion of site investigation. 01/31/2026

### **REMEDIAL ACTION DATES**

Proposed start date of Remediation. 09/07/2022

Proposed date of completion of Remediation. 01/31/2026

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**

Per the COA on the approved Form 27-Site Investigation and Remediation Workplan Supplemental (Document No. 403380921), laboratory analytical results indicate that barium, cadmium, pH, and boron impacts remain in the excavation area. However, the remaining impacts will be left in-place due to the presence of groundwater within the excavation and will be addressed through quarterly groundwater monitoring. Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the remaining soil impacts. A background groundwater sample will be collected and submitted for laboratory analysis of TDS, sulfate ions, and chloride ions to establish background levels. Based on the remaining soil impacts in the former wellhead excavation area, groundwater monitoring wells will be sampled on a quarterly basis and submitted for laboratory analysis of the full ECMC Table 915-1 groundwater analytical suite, as well as dissolved barium and dissolved cadmium.

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

Signed: Macy Kiel

Title: HSE Advisor

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: 24758

**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**

403806001	SITE MAP
403928447	SOIL SAMPLE LOCATION MAP
403928454	SOIL SAMPLE LOCATION MAP
403928455	SOIL SAMPLE LOCATION MAP
403928457	SOIL SAMPLE LOCATION MAP
403928461	PHOTO DOCUMENTATION
403928462	ANALYTICAL RESULTS
403928464	ANALYTICAL RESULTS

Total Attach: 8 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)