FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

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Report taken by: Candice (Nikki) Graber

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 INFORMATON

Name of Operator: KERR MCGEE OIL & GAS ONSHORE LP Operator No: 47120
Address: P O BOX 173779
City: DENVER State: CO Zip: 80217-3779
Contact Person: Erik Mickelson Email: DJRemediation_Forms@oxy.com

Phone Numbers
Phone: (720) 929-4306
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 21228 Initial Form 27 Document #: 402901726

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.
- [X] 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 #: 123-16299 County Name: WELD
Facility Name: ARNDT 28-4P Latitude: 40.113498 Longitude: -104.673815
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NWNW Sec: 28 Twp: 2N Range: 65W Meridian: 6 Sensitive Area? Yes

Facility Type: FLOWLINE Facility ID: 480679 API #: County Name: WELD
Facility Name: Roland X 28-3 & 28-4 battery Latitude: 40.116506 Longitude: -104.675791
** correct Lat/Long if needed: Latitude: 40.116563 Longitude: -104.675552
QtrQtr: NWNW Sec: 28 Twp: 2N Range: 65W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications: SP

Most Sensitive Adjacent Land Use: 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

The nearest domestic water well is located approximately 30 feet east of the wellhead.

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [X] **E&P Waste**
  - [X] Produced Water
  - [X] Oil
  - [X] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA)
- [ ] **Non-E&P Waste**

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
UNDETERMINED	GROUNDWATER	TBD	Inspection/soil samples/laboratory analytical results
UNDETERMINED	SOILS	TBD	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 were completed at the Arndt 28-4P wellhead on January 25, 2022. Groundwater was not encountered in the wellhead cut and cap excavation area. Visual inspection and field screening of soils around the well and associated pumping equipment was conducted following wellhead cut and cap operations, and soil sample (WH-B01@6') was submitted for laboratory analysis to determine if a release occurred. Laboratory analytical results indicated that constituent concentrations in the soil samples were compliant with Table 915-1 and/or within background limits, with the exception to the pH value in soil sample (WH-B01@6'). At the time of initial sampling, the pH exceedance in (WH-B01@6') was believed to be within the acceptable range of analytical variability. Per the COA received on a previous Form 27-Supplemental (Doc. No 403035900) denying the application of analytical variability of the pH exceedance in (WH-B01@6'), a verification soil sample (B01V@6) was collected to verify the exceedance and submitted for laboratory analysis of pH. Laboratory analytical results indicated that the verification soil sample (B01V@6) exceeded Table 915-1 and background limits. Additional background samples sufficiently away from potential oil & gas activity have been collected to address the pH exceedance and laboratory analytical results are pending. The flowline associated with this wellhead was removed on January 25 - February 7, 2022. Soil samples were collected from the locations where the flowline risers were disconnected at the wellhead (FL-B01@4') and separator (FL-B05@3') and submitted for laboratory analysis to determine if a release occurred. Soil sample location and field screening data are presented in Table 1. The wellhead soil sample and field screening locations are illustrated on Figure 2. The flowline soil sample and field screening locations are illustrated on Figure 3.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

From January 25, 2022 - July 25, 2024 soil samples were collected from the base of the cut and cap excavation area (WH-B01@6', B01V@6) and from locations where the flowline risers were disconnected at the wellhead (FL-B01@4') and separator (FL-B05@3'). Samples were submitted for laboratory analysis of BTEX, naphthalene, and TPH using standard methods (approved Doc. 402901726). Additionally, sample WH-B01@6' was submitted for laboratory analysis of pH, EC, SAR, and boron using ECMC-approved methods. Analytical results indicated that constituent concentrations in the soil samples were compliant with Table 915-1, with exception to the pH value in WH-B01@6'. At the time of initial sampling, the pH value in (WHB01@6') was believed to be within the acceptable range of analytical variability. Verification sample (B01V@6) was submitted for laboratory analysis to verify the exceedance. Analytical results indicated verification sample (B01V@6) exceeded Table 915-1 and background limits.

Proposed Groundwater Sampling

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

Groundwater was not encountered during wellhead cut and cap or flowline removal operations.

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 January 25 - February 7, 2022, visual inspection and field screening of soils was conducted at 4 sidewall locations in the cut and cap excavation, 4 locations at the ground surface adjacent to the excavation, and 24 locations during flowline removal activities. Based on the inspection and screening results, hydrocarbon-impacted soil was not observed, and no soil samples were submitted for laboratory analysis in accordance with ECMC Operator Guidance. On January 31, 2022, a soil gas survey was conducted at 5 soil vapor points (SVP01 - SVP05) installed adjacent to the former wellhead location following cut and cap operations. GEM 5000 field readings were non-detect for methane at all 5 soil vapor points. Soil analytical results are summarized in Tables 2 - 3. The SVP locations are illustrated on Figure 2. SVP screening results are summarized in Table 4. The laboratory analytical report is provided as Attachment A. The photographic log is provided as Attachment B.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected: 4
Number of soil samples exceeeding 915-1: 1
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet): 0

NA / ND

ND — Highest concentration of TPH (mg/kg):
-- — Highest concentration of SAR: 3.47
BTEX > 915-1: No
Vertical Extent > 915-1 (in feet): 6

Groundwater

Number of groundwater samples collected: 0
Was extent of groundwater contaminated delineated? No
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?

Background soil samples WH-BG01@3' - WH-BG04@3', WH-BG01@6' - WH-BG04@6', BG05@3-BG08@3, BG05@6-BG08@6, BG05@12-BG08@12 were collected from native material with comparable depths, lithology, and land use adjacent to the wellhead cut and cap excavation. Background soil samples WH-BG01@3' - WH-BG04@3', WH-BG01@6' - WH-BG04@6' were submitted for laboratory analysis of the Soil Suitability for Reclamation Parameters using standard methods appropriate for detecting the target analytes in Table 915-1. Background soil samples BG05@3-BG08@3, BG05@6-BG08@6, BG05@12-BG08@12 were submitted for laboratory analysis of Soil Suitability for Reclamation Parameters and Table 915-1 Metals. Analytical results for the background soil samples are presented in Tables 2 and 3.

☐ 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?

Additional background samples sufficiently away from potential oil & gas activity have been collected to address the pH exceedance in soil samples (WH-B01@6', B01V@6) and laboratory analytical results are pending. Assessment activities are ongoing and will be detailed in a forthcoming Form 27-Supplemental.

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.

Additional background samples sufficiently away from potential oil & gas activity have been collected to address the pH exceedance in soil samples (WH-B01@6', B01V@6) and laboratory analytical results are pending. Assessment activities are ongoing and will be detailed in a forthcoming Form 27-Supplemental.

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.

Additional background samples sufficiently away from potential oil & gas activity have been collected to address the pH exceedance in soil samples (WH-B01@6', B01V@6) and laboratory analytical results are pending. Assessment activities are ongoing and will be detailed in a forthcoming Form 27-Supplemental.

Soil Remediation Summary

☐ **In Situ**

- ____ Bioremediation (or enhanced bioremediation)
- ____ Chemical oxidation
- ____ Air sparge / Soil vapor extraction
- ____ Natural Attenuation
- ____ Other ____

☐ **Ex Situ**

- ____ Excavate and offsite disposal
  - If Yes: Estimated Volume (Cubic Yards) ____
  - Name of Licensed Disposal Facility or ECMC Facility ID # ____
- ____ Excavate and onsite remediation
  - ____ 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:

[X] 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

[X] Other Progress Report

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: $ 5000

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? _____

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. 09/22/2021

Actual Spill or Release date, or date of discovery. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 01/25/2022

Proposed site investigation commencement. 01/25/2022

Proposed completion of site investigation. 07/25/2024

REMEDIAL ACTION DATES

Proposed start date of Remediation. _____

Proposed date of completion of Remediation. _____

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: Erik Mickelson Title: Environmental Lead

Submit Date: 08/30/2024 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: Candice (Nikki) Graber Date: 10/29/2024

Remediation Project Number: 21228

COA Type	Description
	All previous COAs apply.
	On the next Form 27 Operator shall provide a table showing all analytical collected at the site to date.
2 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
403903900	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
403904533	SOIL SAMPLE LOCATION MAP
403904534	SITE MAP
403904535	SOIL SAMPLE LOCATION MAP
403904537	ANALYTICAL RESULTS
403904539	PHOTO DOCUMENTATION
403904542	ANALYTICAL RESULTS
403904544	ANALYTICAL RESULTS
403973496	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 9 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)