FORM 27 Rev 5/22

State of Colorado
Oil and Gas Conservation Commission

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Report taken by: Kari Brown

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 COGCC 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: Phillip Hamlin Email: Phillip_Hamlin@oxy.com

Phone Numbers
Phone: (970) 336-3500
Mobile: ( )

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 23466 Initial Form 27 Document #: 403056997

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.
- [X] 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.
- [X] 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.
- [X] Other: Proposed groundwater monitoring plan

SITE INFORMATION

Yes Multiple Facilities

Facility Type: TANK BATTERY Facility ID: 446417 API #: County Name: WELD
Facility Name: HOWARD 4N-29HZ Latitude: 40.007922 Longitude: -104.922433
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: SWNW Sec: 32 Twp: 1N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 481695 API #: County Name: WELD
Facility Name: Howard 28N-29HZ Produced Water Latitude: 40.007831 Longitude: -104.922047
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: SWNW Sec: 32 Twp: 1N Range: 67W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GW

Most Sensitive Adjacent Land Use Crop Land

Is domestic water well within 1/4 mile? No

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 650 feet northwest of the facility location.
A wetland is located approximately 700 feet northwest of the facility location.

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
Yes	GROUNDWATER	See attached data	Groundwater sampling / laboratory analyis
Yes	SOILS	23' (E-W) x 23' (N-S) x 11' bgs	Excavation / soil sampling / 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 March 3, 2022, a release of an unknown volume of produced water was discovered during a routine inspection at the Howard 28N-29HZ separator location, and hydro-excavation activities were initiated. Groundwater was encountered within the hydro-excavation area at approximately 7 feet below ground surface (bgs). The COGCC issued Spill/Release Point 481464 for this release.

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):

Soil samples were collected from the final hydro-excavation extent, as described in a previous Form 27-Supplemental update (COGCC Document No. 403152763). Based on the data presented, impacted soils in the hydro-excavation area were remediated to be in compliance with the applicable COGCC Table 915-1 standards and/or within the range of site-specific background results and acceptable soil variability for inorganic constituents.

Proposed Groundwater Sampling

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

On November 16, 2022, six (6) temporary groundwater monitoring wells (BH01 - BH06) were installed to further assess the extent of the potentially remaining groundwater impacts. Quarterly groundwater monitoring was initiated on December 2, 2022, and is ongoing. Groundwater analytical data is presented in Table 1, and the groundwater sample locations are illustrated on Figure 1. The laboratory analytical report for the initial Fourth Quarter 2022 groundwater monitoring event is provided as Attachment A.

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):

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil **NA / ND**

Number of soil samples collected 20 -- Highest concentration of TPH (mg/kg) 44.44

Number of soil samples exceeeding 915-1: 11 | -- | Highest concentration of SAR: 35.7

Was the areal and vertical extent of soil contamination delineated? Yes | BTEX > 915-1: Yes

Approximate areal extent (square feet): 475 | Vertical Extent > 915-1 (in feet): 11

Groundwater

Number of groundwater samples collected: 7 | -- | Highest concentration of Benzene (µg/l): 11.2

Was extent of groundwater contaminated delineated? Yes | -- | Highest concentration of Toluene (µg/l): 9.61

Depth to groundwater (below ground surface, in feet): 6 | ND | Highest concentration of Ethylbenzene (µg/l):

Number of groundwater monitoring wells installed: 6 | -- | Highest concentration of Xylene (µg/l): 6.61

Number of groundwater samples exceeding 915-1: 1 | 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 BG01@2' - BG04@2', BG01@4' - BG04@4', BG06@6' - BG08@6', and BG06@10' - BG08@10' were collected, as described in a previous Form 27-Supplemental update (COGCC Document No. 403152763).

☐ 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?

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 March 14 and July 29, 2022, approximately 196 cubic yards of impacted hydro-excavation soil slurry with groundwater were removed from the excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County, Colorado for recycling. The hydro-excavation area was subsequently backfilled and contoured to match pre-existing conditions, and the affected facility infrastructure was replaced.

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 impacted soils in the hydro-excavation area were remediated to be in compliance with the applicable COGCC Table 915-1 standards and/or within the range of site-specific background results and acceptable soil variability for inorganic constituents. On July 14, 2022, approximately 55 pounds of OxPure® activated carbon were added to the groundwater within the hydro-excavation area, to mitigate remaining hydrocarbon impacts in groundwater. Additional remedial activities may be evaluated, as needed, to address potential remaining groundwater impacts. 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**

Bioremediation (or enhanced bioremediation)

Chemical oxidation

☒ **Ex Situ**

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards): 196

Air sparge / Soil vapor extraction

Natural Attenuation

Other

Name of Licensed Disposal Facility or COGCC Facility ID # 434766

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

No Air sparge / Soil vapor extraction

Yes Natural Attenuation

Yes Other OxPure® activated carbon application

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.

On November 16, 2022, 6 temporary groundwater monitoring wells (BH01 - BH06) were installed to further assess the extent of the potentially remaining groundwater impacts. Cross-gradient dedicated background monitoring well BH05 was selected from the Fourth Quarter 2022 monitoring event as a background location for comparison to inorganic groundwater standards in Table 915-1. Based on a comparison to site-specific background concentrations, inorganic constituents in all 5 of the assessment monitoring wells (BH01 - BH04, BH06) were in compliance with the Table 915-1 standards during the Fourth Quarter 2022 monitoring event. As such, Kerr-McGee is requesting the removal of Table 915-1 inorganic constituents (chloride, sulfate, and total dissolved solids) from the ongoing quarterly groundwater monitoring program at this location. Based on these results, Kerr-McGee is also requesting the removal of dedicated background temporary monitoring well BH05 from the groundwater monitoring program. The 5 assessment temporary groundwater monitoring wells (BH01 - BH04, BH06) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of the remaining Table 915-1 constituents (BTEX, naphthalene, 1,2,4-and 1,3,5-TMB). Background monitoring well BH05 will continue to be gauged during ongoing quarterly monitoring events, but groundwater assessment samples will not be collected from this monitoring well location. The temporary monitoring well locations are illustrated on Figure 1, and a potentiometric surface contour map for the Fourth Quarter 2022 is presented as Figure 2. Well completion logs for the temporary monitoring wells are provided in Attachment B.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Approved Reporting Schedule:

[X] Quarterly [ ] Semi-Annually [ ] Annually [ ] Other

[X] **Request Alternative Reporting Schedule:**

[ ] Semi-Annually [X] 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: [X] Groundwater Monitoring [ ] Land Treatment Progress Report [ ] O&M Report

[X] Other Proposed groundwater monitoring plan

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 Oil and Gas Conservation 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: $ 25000

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 196 cubic yards of impacted hydro-excavation slurry were removed from the excavation area via vacuum truck and transported to the Kerr-McGee Aggregate Recycle Facility in Weld County Colorado for recycling.

Volume of E&P Waste (solid) in cubic yards 196

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

COGCC Disposal Facility ID #, if applicable: 434766

Non-COGCC Disposal Facility:

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

E&P waste (liquid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC 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 COGCC 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.

Following the completion of excavation and assessment activities, the site will be restored to its pre-release grade and Kerr-McGee's production infrastructure will be replaced.

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. 03/03/2022

Actual Spill or Release date, or date of discovery. 03/03/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/03/2022

Proposed site investigation commencement. 03/14/2022

Proposed completion of site investigation. 11/16/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 03/14/2022

Proposed date of completion of Remediation. 09/30/2023

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

Based on the Fourth Quarter 2022 groundwater analytical results, Kerr-McGee is requesting the removal of dedicated background temporary monitoring well BH05 from the ongoing groundwater sampling program. Additionally, Kerr-McGee is seeking the Director's approval to remove the inorganic constituents in Table 915-1 (chloride, sulfate, and total dissolved solids) from the ongoing quarterly groundwater monitoring program. The remaining 5 assessment monitoring wells (BH01 - BH04, BH06) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of the remaining Table 915-1 constituents (BTEX, naphthalene, 1,2,4- and 1,3,5-TMB). Based on the Fourth Quarter 2022 groundwater monitoring results presented herein, Kerr-McGee will continue to provide annual Form 27-Supplemental updates for this site. The Project Implementation Summary is provided as Attachment C.

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

Signed: Phillip Hamlin Title: Senior Environmental Rep

Submit Date: 12/21/2022 Email: Phillip_Hamlin@oxy.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with COGCC Rules and applicable orders and is hereby approved.

COGCC Approved: Kari Brown Date: 03/16/2023

Remediation Project Number: 23466

COA Type	Description
	COGCC does not approve of Operator's request to remove the dedicated background temporary monitoring well from the ongoing groundwater sampling plan nor does COGCC approve of Operator's request to remove inorganic constituents (chloride, sulfate, TDS) from the ongoing quarterly groundwater monitoring plan. Operator shall analyze groundwater samples from all monitoring wells for all Table 915-1 groundwater constituents (BTEX, naphthalene, 1,2,4- and 1,3,5-TMB, total dissolved solids, chloride, sulfate) for a minimum of four quarterly monitoring events.
1 COA	

Attachment Check 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
403263952	FORM 27-SUPPLEMENTAL-SUBMITTED
403263974	LOGS
403263975	GROUND WATER SAMPLE LOCATION
403263976	GROUND WATER ELEVATION MAP
403263978	ANALYTICAL RESULTS
403263980	IMPLEMENTATION SCHEDULE
403263981	ANALYTICAL RESULTS

Total Attach: 7 Files

General Comments

User Group	Comment	Comment Date
		Stamp Upon Approval

Total: 0 comment(s)