

State of Colorado
Energy & Carbon Management Commission

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Report taken by:
Alexander Ahmadian

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 ECOM 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: <u>KERR MCGEE OIL & GAS ONSHORE LP</u>	Operator No: <u>47120</u>	Phone Numbers
Address: <u>P O BOX 173779</u>		Phone: <u>(970) 515-1110</u>
City: <u>DENVER</u> State: <u>CO</u> Zip: <u>80217-3779</u>		Mobile: <u>()</u>
Contact Person: <u>Macy Kiel</u>	Email: <u>DJRemediation_Forms@oxy.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 36732 Initial Form 27 Document #: 403788401

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: <u>TANK BATTERY</u>	Facility ID: <u>487142</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HIGHUM/NORDEN/CLARK FACILITY TB</u>	Latitude: <u>40.045385</u>	Longitude: <u>-104.854014</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSE</u>	Sec: <u>14</u>	Twp: <u>1N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>487769</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Highum, Norden, Clark</u>	Latitude: <u>40.045444</u>	Longitude: <u>-104.854575</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>SWSE</u>	Sec: <u>14</u>	Twp: <u>1N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

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? Yes

Other Potential Receptors within 1/4 mile

Irrigation Ditch 280 feet (ft) southeast. Water well 580 ft south. Occupied buildings 910 ft south, 1,260 ft southwest, and 1,300 ft northeast. Livestock 1,100 ft southwest. County Road 610 ft south. Agriculture.

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
UNDETERMINED	GROUNDWATER	TBD	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.

Decommissioning activities were completed at the Highum, Norden, Clark Facility on 9/4/2024. Groundwater was encountered in the facility excavation at a depth of 10 ft bgs. Visual inspection and field screening of soil at one aboveground storage tank (AST), one produced water vessel (PWV), one separator, one emission control device (ECD), one meter house (MH), one scrub pot (SP), three dumphline locations, and one flowline location were conducted following removal activities. Soil samples [AST01@0.5', PWV-B01@0.5', PWV-N01@0.5', SEP-INLET(15-14A)@3', SEP-OUTLET(15-14A)@3', and FL01@6'] were submitted for analysis of full list Table 915-1 constituents to determine if a release occurred. Initial laboratory analytical results indicated that total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), pH, cadmium, lead, and selenium impacts exceeding the Table 915-1 allowable levels and background levels were present at the AST, PWV-B01, SEP-INLET(15-14A), and FL01 locations. As such, a Form 19 Initial/Supplemental Spill/Release Report (Document No. 403911503) was submitted on 9/6/2024 and the ECMC issued Spill/Release Point ID 487769. A verification sample was collected at the SEP-INLET location to confirm the initial results. Final SEP-INLET analytical results were within the ECMC Table 915-1 allowable levels or within background levels x1.25 for Table 915-1 metals. The facility is depicted on Figures 1A and 1B. The PID readings and soil sample results are summarized in Tables 1 and 2, respectively.

Assessment activities are ongoing and details will be provided 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 9/4/2024 and 1/15/2025, excavation activities were conducted to address remaining soil impacts at the facility and forty-five confirmation soil samples were collected from the base and sidewalls of the final excavation extents at depths of approximately 12 ft bgs and 5 to 8 ft bgs, respectively. The confirmation soil samples were submitted for laboratory analysis of the site specific waste profile, including TPH, benzene, toluene, ethylbenzene, total xylenes (BTEX), 1,2,4- and 1,3,5-trimethylbenzene (TMBs), PAHs, pH, boron, and select Table 915-1 metals using ECMC-approved methods. Final results for all combined facility excavation samples are pending. Once the final results have been received, they will be submitted in a subsequent Form 27 Supplemental report. The laboratory reports are attached.

Proposed Groundwater Sampling

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

On 12/13/2024, one groundwater sample (GW-FL01-B01@10') was collected from the FL01 excavation at a depth of 10 ft bgs. Groundwater was in contact with impacted soil. The groundwater sample was submitted for analysis of full list Table 915-1 constituents in groundwater. Laboratory analytical results indicate that groundwater is in compliance with Table 915-1 allowable levels for organic constituents, chloride, and sulfate. All organic constituents were below the lab reporting limits. Background groundwater samples are needed to assess compliance of Total Dissolved Solids (TDS). The groundwater sample location is depicted on Figure 1. The groundwater sample analytical results are summarized 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):

Between 9/4/2024, visual inspection and field screening of soil were conducted at the footprint and drain of the AST, three sidewall locations within the PWV excavation, one ECD, (ECD), one MH, one SP, and three dumpline potholes. Based on the inspection and screening results, hydrocarbon-impacted soil was not observed at the screening locations, and no soil samples were submitted for laboratory analysis from these areas, in accordance with the ECMC Operator Guidance. A photographic log is attached.

During excavation activities, unknown abandoned lines were discovered and removed. On 12/18/2024, soil samples (SS01@4' to SS05@4') were submitted for analysis of full list Table 915-1 constituents due to potential impact. Analytical results indicate that TPH, PAHs, BTEX, TMBs, SAR, cadmium, and/or lead impacts exceeding the Table 915-1 allowable levels and background levels were present at the SS01, SS02, SS03, and SS04 locations.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

NA / ND

Number of soil samples collected	<u>77</u>	--	Highest concentration of TPH (mg/kg)	<u>2856</u>
Number of soil samples exceeding 915-1	<u>60</u>	--	Highest concentration of SAR	<u>7.74</u>
Was the areal and vertical extent of soil contamination delineated?	<u>No</u>		BTEX > 915-1	<u>Yes</u>
Approximate areal extent (square feet)	<u>22012</u>		Vertical Extent > 915-1 (in feet)	<u>12</u>

Groundwater

Number of groundwater samples collected	<u>0</u>		Highest concentration of Benzene (µg/l)	<u> </u>
Was extent of groundwater contaminated delineated?	<u>No</u>		Highest concentration of Toluene (µg/l)	<u> </u>
Depth to groundwater (below ground surface, in feet)	<u> </u>		Highest concentration of Ethylbenzene (µg/l)	<u> </u>
Number of groundwater monitoring wells installed	<u> </u>		Highest concentration of Xylene (µg/l)	<u> </u>
Number of groundwater samples exceeding 915-1	<u> </u>		Highest concentration of Methane (mg/l)	<u> </u>

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?

The tank battery background sample and the native background samples collected from the native material outside of the facility have been removed, due to the excavation consuming the background sample locations. Twelve background samples were collected as part of the Norden 15-14A wellhead cut and cap activities (Remediation No. 35440), located approximately 350 ft west, from similar depths (3' and 6' bgs), and NCRS soil type (Clay Loam). Background soil samples were submitted for laboratory analysis of pH, electrical conductivity (EC), sodium adsorption ratio (SAR), boron and Table 915-1 metals using ECMC-approved methods. Analytical results indicate that EC, SAR, pH, arsenic, barium, and selenium are naturally high in the native soil. The background soil sample analytical results are summarized in Table 2. The background soil sample locations are illustrated on Figure 2.

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?

Assessment activities are ongoing and details will be provided 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.

Impacted soil from the facility excavation will be removed and transported to a licensed disposal facility. Final disposal information will be provided upon completion of assessment activities. Disposal records are kept on file and available upon request. The excavation area 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.

Final results for all combined facility excavation samples are pending. Once the final results have been received, they will be submitted in a subsequent Form 27 Supplemental report. Groundwater was encountered at approximately 10 ft bgs. Laboratory analytical results indicate that groundwater is in compliance with Table 915-1 allowable levels for organic constituents, chloride, and sulfate. All organic constituents were below the lab reporting limits. Background groundwater samples are needed to assess compliance of TDS. Assessment activities are ongoing and details will be provided in a subsequent Form 27 supplemental report.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____

_____ Air sparge / Soil vapor extraction

_____ Name of Licensed Disposal Facility or ECOM Facility ID # _____

_____ 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.

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. 09/06/2024

Actual Spill or Release date, or date of discovery. 09/05/2024

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/04/2024

Proposed site investigation commencement. 09/04/2024

Proposed completion of site investigation. 07/24/2025

REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/04/2024

Proposed date of completion of Remediation. 07/24/2026

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

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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: 02/07/2025

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: Alexander Ahmadian

Date: 04/25/2025

Remediation Project Number: 36732

COA Type**Description**

	<p>Based on the hoses visible in the attached photo log, it appears that groundwater was removed from the excavation on and after the date of groundwater sample collection. However, groundwater removal was not discussed in the subject Form. The Groundwater Remediation Summary of the next Supplemental Form 27 must be populated. Additionally, based on the visible extent of groundwater observed within the excavation, a single groundwater sample is not adequate to characterize potential impacts to groundwater.</p> <p>Due to the presence of impacted soil in contact with groundwater and limited site investigation Operator shall:</p> <ul style="list-style-type: none"> - Comply with Table 915-1 Protection of Groundwater Soil Screening Level Concentrations. - Install monitoring wells (within the spill/release area, cross-gradient, down-gradient, and up-gradient) to properly characterize groundwater pursuant to Rule 915 and determine hydraulic gradient, as required by Rule 915.e.(3)A.ii. All monitoring wells shall be constructed as permanent monitoring wells in accordance with the State Engineer's Water Well Construction and Permitting Rules - Analyze groundwater samples from all monitoring wells for Table 915-1 organic and inorganic parameters for a minimum of four quarterly monitoring events. <p>ECMC notes that a sheen is visible on groundwater observed within the excavation, as shown in the attached photo log.</p>
	<p>Off location background soil sample locations collected under Remediation No. 35440 are not approved by ECMC. Off location background samples were collected from areas on the original working surface of the well pad and are not representative of background conditions near the production facility/release. These samples shall be omitted from future background determination calculations.</p>
	<p>Per the COA on Form 27 Doc. #403930193: "Operator shall provide the Document numbers or attach the Form 42 associated for the on-location flowline abandonment on the next Form 27 Supplemental."</p> <p>This COA remains applicable and outstanding.</p> <p>On the subsequent Supplemental Form 27, Operator shall include under related forms all Form 42 and Form 44s associated with the Highum, Norden, Clark Facility. Operator shall also attach a map to the subsequent Supplemental Form 27 showing the location, status, and Facility ID of all associated flowlines.</p>

3 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
404052351	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
404066735	ANALYTICAL RESULTS
404066736	PHOTO DOCUMENTATION

404066738	ANALYTICAL RESULTS
404066739	ANALYTICAL RESULTS
404066741	ANALYTICAL RESULTS
404066742	ANALYTICAL RESULTS
404066743	ANALYTICAL RESULTS
404066744	ANALYTICAL RESULTS
404066869	SOIL SAMPLE LOCATION MAP
404066870	SOIL SAMPLE LOCATION MAP
404069679	SOIL SAMPLE LOCATION MAP
404179959	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 13 Files

General Comments

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

Total: 0 comment(s)