FORM 27 Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303) 894-2100 Fax 894-2109

FOR OGCC USE ONLY

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Project 9500
Remediation 200439032
Spill 444185
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☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☒ Site/Facility Closure ☐ Other (describe) _____

GENERAL INFORMATION

OGCC Operator Number: 47120
Name of Operator: Kerr-McGee Oil and Gas Onshore LP
Address: P.O. Box 173779
City: Denver State: CO Zip: 80217-3779

Contact Name and Telephone
Name: Phillip Hamlin
No: (970) 336-3500
Fax: (970) 336-3656

API/Facility No: 318057
Facility Name: Lorenz-63N66W/30SWSW
Well Name:
Location (QtrQtr, Sec, Twp, Rng, Meridian): SWSW Sec 30-T3N-R66W

County: Weld
Facility Number:
Well Number:
Latitude: 40.191804 Longitude: -104.824718

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Oil, Produced Water, and Condensate

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☒ Y ☐ N If yes, attach evaluation. *Groundwater < 20 ft.*

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Rangeland

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Fine to coarse grained sand, sandy clay, and clay.

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water and wetlands approximately 260' southwest, water well approximately 800' southeast, livestock approximately 20' west, building approximately 750' east, and excavation groundwater approximately 1' below ground surface (bgs).

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):		Extent of Impact:	How Determined:
☒	Soils	14' N-S x 44' E-W x 4' bgs (maximum extent)	Collected soil samples for laboratory analysis
☐	Vegetation		
☒	Groundwater	See attached data	Collected groundwater samples for laboratory analysis
☐	Surface water		

REMEDIATION WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

During deconstruction activities at the Lorenz-63N66W/30SWSW tank battery, petroleum hydrocarbon impacted groundwater was encountered beneath the produced water sump. There were no indications that the dumplines or produced water sump were leaking. The volume of the release is unknown. The petroleum hydrocarbon impacted soil was excavated. Impacted groundwater was encountered in the excavation. A topographic Site Location Map depicting the general location of the release is provided as Figure 1.

Describe how source is to be removed:

Impacted soil was excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current water table due to past seasonal fluctuations. On November 25, 2015, four sidewall soil samples (N01@2.5', E01@2.5', S01@2.5', and W01@2.5') were collected from the excavation and submitted for laboratory analysis of total petroleum hydrocarbons (TPH) by United Stated Environmental Protection Agency (USEPA) Methods 8015C and 8260C, benzene, toluene, ethylbenzene, and total xylenes (BTEX) by USEPA Method 8260C, pH by USEPA Method 9045D, and specific conductivity (EC) by USEPA Method 9050D. Laboratory results indicated that the TPH concentration in soil sample W01@2.5' exceeded the COGCC Table 910-1 allowable level. An excavation groundwater sample (GW01) was collected for BTEX analysis. Laboratory analytical results for the GW01 groundwater sample indicated the benzene concentration exceeded the Colorado Groundwater Quality Standard (CGWQS) for benzene at a concentration of 96.8 micrograms per liter (µg/L).

On December 1, 2015, two additional excavation sidewall soil samples (N02@2.5' and S02@2.5') were collected following the removal of additional impacted soil. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC Table 910-1 allowable levels. Following the removal of additional impacted soil along the western sidewall of the excavation and the removal of approximately 180 barrels of impacted groundwater, the groundwater level in the excavation increased from 3 feet bgs to 1 foot bgs. On December 2, 2015, one additional excavation sidewall soil sample (W02@0.5') was collected at a depth of 0.5 feet bgs. Laboratory analytical results indicated that TPH, BTEX, pH, and EC levels were in compliance with COGCC Table 910-1 allowable levels at the excavation extent. A second groundwater sample (GW02) was collected from the excavation for BTEX analysis. Laboratory analytical results for sample GW02 indicated BTEX concentrations were in compliance with the CGWQS.

Approximately 220 cubic yards of impacted soil were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. Prior to backfilling, an additional 160 barrels of groundwater were removed from the excavation and transported to a licensed injection facility. In addition, 80 pounds of COGAC®, an activated carbon-based bioremediation product, was applied to the groundwater and clean backfill through a series of lifts to ensure distribution through the phreatic and smear zones. The general site layout, excavation dimensions, and soil and groundwater sample locations are depicted on the Excavation Site Map provided as Figure 2. The excavation soil and groundwater sample analytical results are summarized in Tables 1 and 2, respectively. The laboratory analytical reports are attached.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

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REMEDIATION WORKPLAN (CONT.)

OGCC Employeee:

Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No.: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

Groundwater monitoring wells will be installed at the site to fully define the extent and magnitude of the release. The monitoring wells will be surveyed to determine the groundwater flow direction. Groundwater monitoring activities will be conducted and samples will be submitted for laboratory analysis of BTEX. BTEX concentrations in the final excavation groundwater sample (GW02) were in compliance with the CGWQS. If BTEX concentrations in the monitoring well groundwater samples are in compliance with the CGWQS during the initial sampling event, Kerr-McGee will request a No Further Action status for this site. If impacts to groundwater are detected, groundwater monitoring activities will continue on a quarterly basis.

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. Use additional sheet for description if required.

The site was restored to its pre-release grade and the tank battery will be reconstructed.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? [X] Y [ ] N If yes, describe:

After installing the monitoring wells and establishing points of compliance, groundwater monitoring will be conducted.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The impacted soil was transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	11/25/2015	Date Site Investigation Completed:	Active	Remediation Plan Submitted:	
Remediation Start Date:	11/30/2015	Anticipated Completion Date:	TBD	Actual Completion Date:	

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

Print Name: Phillip Hamlin

Signed: _____ Title: Senior HSE Representative Date: 2/9/16

OGCC Approved: _____ Title: _____ Date: _____

Peter Gintautas

Digitally signed by Peter Gintautas
DN: cn=Peter Gintautas, o=COGCC, ou=Environmental Protection Specialist, email=peter.gintautas@state.co.us, c=US
Date: 2016.02.16 13:41:10 -07'00'