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

received 10/03/2016
Project 9871
Spill 445916
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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.

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV
Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

[x] 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: 1099 18th Street, Suite 1800
City: Denver State: CO Zip: 80202

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

API/Facility No: 445916
Facility Name: HSR-Hall
Well Name: HSR-Hall
Location (QtrQtr, Sec, Twp, Rng, Meridian): NWSW S31 T4N R66W

County: Weld
Facility Number: 64N66W31NWSW
Well Number: 12-31
Latitude: 40.26676 Longitude: -104.82673

TECHNICAL CONDITIONS

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

Site Conditions: Is location within a sensitive area (according to Rule 901e)? [X] Y ☐ N If yes, attach evaluation.

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

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

Potential receptors (water wells within 1/4 mi, surface waters, etc.): There is no surface water within 1/4 mile of the site. The nearest water well is approximately 900' west of the release area.

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

Impacted Media (check):	Extent of Impact:	How Determined:
[x] Soils	32' (E-W) x 41' (N-S) x 11' bgs	Excavation, soil sampling, and laboratory analysis
☐ Vegetation		
[x] Groundwater	See attached data	Groundwater sampling and laboratory analysis
☐ Surface water		

REMEDIATION WORKPLAN

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

On May 25, 2016, historical hydrocarbon impacts were discovered beneath the produced water sump during construction activities at the HSR-Hall 64N66W31NWSW production facility. The volume of released material is unknown. The facility was shut in, associated infrastructure removed, and excavation activities commenced. Groundwater was encountered in the excavation at approximately 11 feet below ground surface (bgs). An Initial Form 19 was submitted to the COGCC on May 27, 2016 (Document # 401055055) and a Supplemental Form 19 was submitted to the COGCC on June 3, 2016 (Document # 401056830). The COGCC has issued Spill Tracking #445916 for this release.

Describe how source is to be removed:

On May 25, 2016, excavation activities commenced and approximately 220 cubic yards of impacted material were excavated and transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Excavation activities were guided in the field using a photoionization detector (PID) to measure volatile organic compound (VOC) concentrations in soil. Soil samples were collected from the sidewalls of the final extent of the excavation area at approximately 10 feet bgs. Soil samples were submitted to Origins Laboratory in Denver, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260, TPH – diesel range organics and oil range organics (DRO and ORO) by USEPA Method 8015, electrical conductivity (EC), and pH. Laboratory results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below applicable COGCC Table 910-1 standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations. Groundwater was encountered in the excavation at approximately 11 feet bgs. A groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX. Analytical results received on May 27, 2016, indicated that the benzene, toluene, and total xylenes concentrations in sample GW01 were above the applicable COGCC Table 910-1 groundwater standards. Approximately 80 barrels of groundwater were removed from the excavation area via vacuum truck and transported to a licensed injection facility for disposal. A second groundwater sample (GW02) was subsequently collected from the excavation and submitted for laboratory analysis of BTEX. Analytical results received on June 1, 2016, indicated that the benzene, toluene, and total xylenes concentrations in sample GW02 remained above the applicable COGCC Table 910-1 groundwater standards. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. Soil and excavation groundwater sample locations are illustrated on Figure 1 and laboratory analytical reports are included as Attachment A.

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.:

Impacted soil was transported to the Buffalo Ridge Landfill in Keenesburg, Colorado. Impacted groundwater was transported to a licensed injection facility for disposal. Prior to backfilling the excavation, approximately 220 pounds of activated carbon were introduced to the groundwater table to mitigate remaining aqueous phase hydrocarbon impacts. Additional groundwater monitoring measures are described on the following page. The produced water sump was removed and will not be replaced; a sump closure report is included as Attachment B.

Submit Page 2 with Page 1.

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REMEDIATION WORKPLAN (CONT.)

OGCC Empbyeee:

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.):

Temporary groundwater monitoring wells will be installed at the site to further assess the extent of groundwater impacts. These wells will be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain below COGCC groundwater standards for four consecutive quarters.

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 excavation has been backfilled with clean soil and graded to match the adjacent topography. Kerr-McGee's tank battery was removed and will not be rebuilt. Reclamation activities at the site will be compliant with COGCC regulations.

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:

Laboratory data indicate that impacted soils in the excavation have been remediated to below COGCC Table 910-1 standards. Temporary monitoring wells will be installed to further assess groundwater impacts. Groundwater samples will be collected from the temporary monitoring wells until BTEX concentrations remain below the applicable COGCC standards for four consecutive quarters. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A.

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

Impacted soil was transported to the Buffalo Ridge Landfill in Keenesburg, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	5/25/2016	Date Site Investigation Completed:	TBD	Remediation Plan Submitted:	
Remediation Start Date:	5/25/2016	Anticipated Completion Date:	12/15/2017	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: 9/29/16

OGCC Approved: _____ Title: _____ Date: _____

Submit reports of site investigation and progress of remediation including results of sampling and analysis on an annual basis or more often until remediation is closed.