

State of Colorado
Oil and Gas Conservation Commission

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FOR OGCC USE ONLY

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Project 9317
Document 200437837
Spill 437366

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

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: 318973 Facility Name: Berry Well Name: Berry		County: Weld Facility Number: 63N67W8SENE Well Number: 1	
Location (QtrQtr, Sec, Twp, Rng, Meridian): SENE S8 T3N R67W		Latitude: 40.243690 Longitude: -104.90860	

TECHNICAL CONDITIONS

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

Site Conditions: Is location within a sensitive area (according to Rule 901e)? 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: Silty Sand

Potential receptors (water wells within 1/4 mi, surface waters, etc.): The nearest surface water is located approximately 700' southwest of the site.

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	15' (E-W) x 20' (N-S) x 5' bgs	Excavation, soil sampling, and laboratory analysis
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	See attached data	Groundwater sampling and laboratory analysis
<input type="checkbox"/> Surface water	_____	_____

REMEDIATION WORKPLAN

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

On May 22, 2014, historical hydrocarbon impacts were discovered during removal of the produced water sump at the Berry 63N67W8SENE production facility. The volume of released material is unknown. The well was shut in, associated underground infrastructure removed, and excavation activities commenced. Groundwater was encountered in the excavation at approximately 5 feet below ground surface (bgs). An Initial Form 19 was submitted to the COGCC on May 23, 2014, and a Supplemental Form 19 was submitted on May 29, 2014. The COGCC has issued Spill Tracking number 437366 for this release.

Describe how source is to be removed:

On May 22, 2014, excavation activities commenced and approximately 20 cubic yards of impacted material were excavated and transported to the Front Range Regional Landfill in Erie, 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 4 feet bgs. Soil samples were submitted to eAnalytics Laboratory in Loveland, 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. Laboratory results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below the applicable COGCC Table 910-1 standards. Soil was 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 5 feet bgs. A groundwater sample (GW01) was collected and submitted for laboratory analysis of BTEX. Analytical results received on May 22, 2014, indicated that the benzene concentration in sample GW01 was above the applicable COGCC Table 910-1 groundwater standard. Approximately 40 barrels of impacted groundwater were removed via vacuum truck and transported to a licensed injection facility for disposal. A second groundwater sample (GW02) was subsequently collected from the excavation area and submitted for laboratory analysis of BTEX. Analytical results received on May 23, 2014, indicated that the BTEX concentration in sample GW02 was below the applicable COGCC Table 910-1 groundwater standard. Soil analytical results are summarized in Table 1 and groundwater analytical results are summarized in Table 2. 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 excavated and transported to the Front Range Regional Landfill in Erie, Colorado. Impacted groundwater was removed via a vacuum truck and transported to a licensed injection facility for disposal. 100 pounds of activated carbon were added to the groundwater in the excavation prior to backfilling. Additional groundwater monitoring measures are described on the following page. The produced water sump was replaced during assessment and remediation activities.



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

REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.): On June 3, 2015, three temporary groundwater monitoring/remediation wells were installed at the site to further assess the extent of groundwater impacts. Groundwater samples were collected from the temporary monitoring wells on June 17, 2015. Samples were submitted to Origins Laboratory in Denver, Colorado for analysis of BTEX by USEPA Method 8260C. Temporary monitoring/remediation well locations and groundwater analytical results are illustrated on Figure 2, and a groundwater contour map is presented on Figure 3. Groundwater analytical results are summarized in Table 2 and the groundwater laboratory analytical reports and well completion diagrams are included as Attachments A and B, respectively. As presented in Table 2, BTEX concentrations were below the applicable COGCC groundwater standards. Based on these data, Kerr-McGee is requesting a no further action (NFA) determination from the COGCC for this release.

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 remains at the site. 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? [] Y [X] N If yes, describe: Data indicate that impacted soil has been delineated and removed from the site. Temporary monitoring/remediation wells have been installed to further assess groundwater impacts; groundwater points of compliance have been achieved in all directions. Soil and groundwater analytical results are summarized in Tables 1 and 2, respectively. The analytical laboratory reports are included as Attachment A. Based on the soil and groundwater analytical results, Kerr-McGee is requesting an NFA determination for this release.

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 Front Range Regional Landfill in Erie, Colorado for disposal. Impacted groundwater was transported to a licensed injection facility for disposal.

IMPLEMENTATION SCHEDULE

Table with 4 columns: Date Site Investigation Began (5/22/2014), Date Site Investigation Completed (6/3/2015), Remediation Plan Submitted, Remediation Start Date (5/22/2014), Anticipated Completion Date, Actual Completion Date (6/17/15)

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: [Signature] Title: Senior HSE Representative Date: 10/23/15

OGCC Approved: Title: Date:

At a minimum, two more rounds of sampling and analysis of at least one groundwater monitoring point within the outline of the original excavation (2014). Groundwater sampling and analysis for benzene, toluene ethylbenzene and xylene isomers with data submission to COGCC are required before a request for closure will be considered. Sampling events should be no closer than 90 days apart.