

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
CHRIS CANFIELD

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATON

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>(720) 929-4306</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80217-3779</u>
Contact Person: <u>Erik Mickelson</u>	Email: <u>Erik.Mickelson@anadarko.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 7733 Initial Form 27 Document #: 2232793

PURPOSE INFORMATION

<input type="checkbox"/> 901.e. Sensitive Area Determination	<input type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
<input type="checkbox"/> 909.c.(1), Rule 905: Pit or PW vessel closure	<input type="checkbox"/> Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
<input type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation	<input checked="" type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project
<input type="checkbox"/> 909.c.(3), Rule 907.e.: Land treatment of oily waste	<input type="checkbox"/> Rule 906.c.: Director request
<input type="checkbox"/> 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure	<input type="checkbox"/> Other _____

SITE INFORMATION N Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: <u>LOCATION</u>	Facility ID: <u>318083</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HALEY 41-13-61N68W 13NENE</u>	Latitude: <u>40.057210</u>	Longitude: <u>-104.945200</u>	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: <u>NENE</u>	Sec: <u>13</u>	Twp: <u>1N</u>	Range: <u>68W</u>
Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>		

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use Agriculture

Is domestic water well within 1/4 mile? Yes Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? Yes

Other Potential Receptors within 1/4 mile

Water well approximately 880 feet (ft) north-northwest, building approximately 760 ft north, and excavation groundwater approximately 10 ft below ground surface (bgs).

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste | <input type="checkbox"/> Other E&P Waste | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input type="checkbox"/> Condensate | <input type="checkbox"/> Pigging Waste | |
| <input type="checkbox"/> Drilling Fluids | <input type="checkbox"/> Rig Wash | |
| <input type="checkbox"/> Drill Cuttings | <input type="checkbox"/> Spent Filters | |
| | <input type="checkbox"/> Pit Bottoms | |
| | <input type="checkbox"/> Other (as described by EPA) | _____ |

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	See Attached Data	Groundwater Samples/Lab Analysis
Yes	SOILS	135ft N-S X 140ft E-W X 12ft bgs	Soil Samples/Lab 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.

While hydro-vacuuming to locate untraceable underground lines at the Haley 41-13 #1 tank battery facility, petroleum hydrocarbon impacted soil was encountered. A hole in the water dump line was discovered while excavating impacted soil. The volume of the release is unknown. The petroleum hydrocarbon impacted soil was excavated.

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 July 26 and August 8, 2012, 20 sidewall soil samples and 2 base soil samples were collected from the excavation and submitted for laboratory analysis of total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Laboratory analytical results indicated that TPH and BTEX concentrations were in full compliance with Colorado Oil and Gas Conservation Commission (COGCC) Table 910-1 allowable levels at the extent of the excavation. The general site layout, excavation footprint, and soil sample locations are depicted on the Excavation Site Map provided as Figure 1. The soil sample analytical results are summarized in Table 1.

Proposed Groundwater Sampling

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

Groundwater was encountered in the southern portion of the excavation. On July 26 and 31, 2012, two groundwater samples (GW01 and GW02) were collected from the open excavation for laboratory analysis of BTEX. Laboratory analytical results indicated that benzene concentrations in samples GW01 and GW02 exceeded the COGCC Table 910-1 allowable level at concentrations of 5.5 micrograms per liter (µg/L) and 320 µg/L, respectively. The excavation groundwater sample locations are depicted on Figure 1. The groundwater sample analytical results are summarized in Table 2.

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

Number of soil samples collected 22
Number of soil samples exceeding 910-1 4
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 9300

NA / ND

-- Highest concentration of TPH (mg/kg) 4160
NA Highest concentration of SAR
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 10

Groundwater

Number of groundwater samples collected 160
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 3'
Number of groundwater monitoring wells installed 12
Number of groundwater samples exceeding 910-1 15

-- Highest concentration of Benzene (µg/l) 828
-- Highest concentration of Toluene (µg/l) 2.7
-- Highest concentration of Ethylbenzene (µg/l) 100
-- Highest concentration of Xylene (µg/l) 37
NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected
 Number of surface water samples exceeding 910-1
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?

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.

Approximately 5,233 cubic yards of petroleum hydrocarbon impacted soil were removed from the excavation and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado. The impacted soil was excavated into the capillary and phreatic zones to address potential hydrocarbon impacts that may have been present below the groundwater table due to past seasonal fluctuations. The general site layout and excavation footprint are depicted on the Excavation Site Map provided as Figure 1.

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.

Prior to backfilling the excavation, ten gallons of MicroBlaze®, a concentrated solution of facultative microbes, nutrients, and surfactants designed to bioremediate petroleum hydrocarbons, were applied to the groundwater in each excavation.

Soil Remediation Summary

In Situ

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

Ex Situ

Yes _____ Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) _____ 5233

Name of Licensed Disposal Facility or COGCC Facility ID # _____ 149007

No _____ Excavate and onsite remediation

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

Yes _____ Bioremediation (or enhanced bioremediation)

No _____ Chemical oxidation

No _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

No _____ 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.

Monitoring wells MW01 through MW09 were installed at the site between January 2013 and August 2015. Replacement monitoring wells MW03R through MW05R were installed in May 2017 and May 2018. Groundwater monitoring continued on a quarterly basis. The monitoring well locations are depicted on Figure 2. Boring logs with monitoring well completion diagrams are attached.

On October 23, 2013, monitoring wells MW01 through MW05 were surveyed to obtain the relative groundwater and top-of casing well elevation data. The survey data indicated the groundwater flow direction at the site is to the southwest. On August 31, 2016, monitoring wells MW03R through MW05R and MW06 through MW09 were tied into the survey data. The survey data indicated the groundwater flow direction at the site ranges from the southwest to south-southeast. Relative groundwater elevations are provided in Table 2. Groundwater Elevation Contour Maps for the fourth quarter 2017 through third quarter 2018 monitoring events are provided as Figures 3A through 3D, respectively.

As of the August 2018 quarterly monitoring event, BTEX concentrations in monitoring wells MW01, MW02, MW03R through MW05R, and MW07 through MW09 were in full compliance with COGCC Table 910-1 allowable levels for four consecutive quarterly monitoring events. The groundwater analytical results are summarized in Table 2. The analytical reports for the four compliant groundwater monitoring events are attached.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other Final Report
Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other NFA Status Request

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 5,233 cubic yards of petroleum hydrocarbon impacted soil were transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado.

Volume of E&P Waste (solid) in cubic yards 5233

E&P waste (solid) description Petroleum hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: 149007

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? Yes

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface?

Does Groundwater meet Table 910-1 standards? Yes

Is additional groundwater monitoring to be conducted? No

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 was restored to its pre-release grade. The Kerr-McGee tank battery remains on-site.

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 approve the seed mix?

If NO, does the seed mix comply with local soil conservation district recommendations?

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. _____

Actual Spill or Release date, if known. 07/27/2012

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/26/2012

Date of commencement of Site Investigation. 07/26/2012

Date of completion of Site Investigation. 11/13/2017

REMEDIAL ACTION DATES

Date of commencement of Remediation. 07/26/2012

Date of completion of Remediation. 08/21/2018

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

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: Erik Mickelson _____

Title: Senior HSE Representative _____

Submit Date: 10/03/2018 _____

Email: Erik.Mickelson@anadarko.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: CHRIS CANFIELD _____

Date: 10/23/2018 _____

Remediation Project Number: 7733 _____

COA Type**Description**

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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**

401743953	FORM 27-SUPPLEMENTAL-SUBMITTED
401755732	LOGS
401755735	ANALYTICAL RESULTS
401764536	SITE MAP
401764540	GROUND WATER ELEVATION MAP
401764595	SOIL SAMPLE LOCATION MAP

Total Attach: 6 Files

General Comments**User Group****Comment****Comment Date**

Environmental	The Colorado Oil & Gas Conservation Commission (COGCC) has reviewed and hereby approves your 10/03/2018 request for a determination of No Further Action at the above-referenced location. However, should future conditions indicate that contaminant concentrations in soils exceed COGCC standards, or if ground water is found to be impacted, further investigation and/or remediation activities could be required. Remediation Project 7733 will be closed in the COGIS database. Note that surface reclamation must meet the COGCC 1004 series rules.	10/23/2018
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Total: 1 comment(s)