

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
PETER GINTAUTAS

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>		
City: <u>DENVER</u>	State: <u>CO</u>	Phone: <u>(720) 929-6726</u>
	Zip: <u>80217-3779</u>	Mobile: <u>()</u>
Contact Person: <u>Paul Schneider</u>	Email: <u>Paul.Schneider@Anadarko.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 3952 Initial Form 27 Document #: 2057613

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 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 checked="" type="checkbox"/> Other <u>Remediation Update and Monitoring Well Reduction Request</u>

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

Facility Type: <u>LOCATION</u>	Facility ID: <u>328545</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>FRITZLER-64N66W 31NWNE</u>	Latitude: <u>40.273020</u>	Longitude: <u>-104.818150</u>	
	** correct Lat/Long if needed: Latitude: <u>40.272573</u>	Longitude: <u>-104.820136</u>	
QtrQtr: <u>NWNE</u>	Sec: <u>31</u>	Twp: <u>4N</u>	Range: <u>66W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use IRRIGATED

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

GROUNDWATER AT 18 FT BGS, SURFACE WATER 750' SE OF SITE AND WATER WELL 200' W OF SITE.

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 SAMPLE LAB ANALYSIS
Yes	SOILS	31' N-S X 41' E-W X 20' DEEP	SOIL SAMPLE 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.

A CORROSION HOLE IN THE WATER DUMP LINE LEAD TO THE DISCOVERY OF HISTORICAL IMPACT AROUND THE WATER SUMP. THE WELL WAS SHUT IN AND PETROLEUM HYDROCARBON IMPACTED SOIL AND GROUNDWATER WERE REMOVED. THE STEEL WATER SUMP WAS REPLACED WITH A NEW FIBERGLASS UNIT.

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):

Please refer to the Form 27 submitted to the COGCC on June 28, 2007.

Proposed Groundwater Sampling

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

Quarterly groundwater monitoring has been performed at the site since May 2007.

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 4
Number of soil samples exceeding 910-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 1271

NA / ND

ND Highest concentration of TPH (mg/kg) _____
NA Highest concentration of SAR _____
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

Groundwater

Number of groundwater samples collected 649
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 14'
Number of groundwater monitoring wells installed 24
Number of groundwater samples exceeding 910-1 154

-- Highest concentration of Benzene (µg/l) 35000
-- Highest concentration of Toluene (µg/l) 35000
-- Highest concentration of Ethylbenzene (µg/l) 30000
-- Highest concentration of Xylene (µg/l) 19000
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?

Groundwater impacts were detected in the adjoining agricultural field north of the tank battery.

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?

YES. BTEX CONSTITUENTS WERE DETECTED ABOVE COGCC TABLE 910-1 ALLOWABLE LEVELS IN THE THREE MONITORING WELLS (MW01 THROUGH MW03) DURING THE MAY 2007 MONITORING EVENT. BASED ON THE GROUNDWATER LABORATORY RESULTS IT APPEARS THAT THE EXTENT OF GROUNDWATER IMPACT HAS NOT BEEN DETERMINED AT THIS SITE. ADDITIONAL MONITORING WELLS WILL BE INSTALLED NORTH OF THE TANK BATTERY (DOWNGRAIENT OF WELLS MW01 THROUGH MW03) IN ORDER TO ESTABLISH POC. GROUNDWATER MONITORING WILL CONTINUE ON A QUARTERLY BASIS.

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.

AN ESTIMATED 1,188 CUBIC YARDS OF PETROLEUM HYDROCARBON IMPACTED SOIL WERE REMOVED FROM THE EXCAVATION. APPROXIMATELY 9 BARRELS OF PETROLEUM HYDROCARBON IMPACTED GROUNDWATER WERE REMOVED FROM THE EXCAVATION USING A VACUUM TRUCK. LABORATORY RESULTS INDICATE THAT TPH CONCENTRATIONS ARE BELOW THE COGCC ALLOWABLE LEVELS AT THE EXTENT OF THE EXCAVATION. 10 GALLONS OF MICROBLAZE WAS APPLIED TO THE GROUNDWATER AND EXPOSED SMEAR ZONE SOILS IN THE OPEN EXCAVATION.

Soil was excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to past seasonal fluctuations.

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.

Remediation details are provided in the Remediation Summary Attachment.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 1188

_____ Air sparge / Soil vapor extraction

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

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ Land Treatment

_____ Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Other _____

Groundwater Remediation Summary

Yes _____ Bioremediation (or enhanced bioremediation)

No _____ Chemical oxidation

Yes _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other _____ Groundwater Recovery

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.

Between May 2007 and May 2012, twenty-one monitoring wells (MW01 through MW21) and one recovery culvert (RW01) were installed to assess the extent and magnitude of the residual dissolved-phase groundwater impacts and establish points of compliance (POC) at the site.

Monitoring well MW20 was destroyed as of the November 2011 monitoring event. Replacement well MW20R was installed in April 2012. With COGCC approval, monitoring wells MW04, MW06, MW13, MW18, and MW21 were removed from the monitoring program in August 2013 based on twelve or more consecutive quarters of compliant groundwater analytical results. Monitoring well MW08 was destroyed as of the November 2014 monitoring event. On March 1, 2013, replacement monitoring well MW08R was installed. In August 2016, monitoring well MW10 was abandoned and replaced with well MW10R. The monitoring well locations are depicted on the Site Map provided as Figure 1. Soil boring logs with monitoring well completion diagrams are attached. The laboratory analytical report for the most recent (February 2017) quarterly groundwater monitoring event, which was fully compliant, is attached.

On December 10, 2013, wells MW01 through MW21 were surveyed to obtain relative groundwater and top-of-casing well elevation data. The survey data indicated the groundwater flow direction at the site is to the north. A Groundwater Elevation Contour Map generated using the February 2017 groundwater elevation data is provided as Figure 3. The relative groundwater elevations are provided in Table 1.

Based on the groundwater analytical data to date, Kerr-McGee requests a reduction in the number of monitoring wells included in the groundwater monitoring program. BTEX concentrations have been compliant with COGCC Table 910-1 allowable levels for nine or more consecutive quarterly groundwater monitoring events in monitoring wells MW17, MW19, and MW20R. Additionally, none of these wells currently serve or are needed as a POC.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other _____
Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other _____

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:

The impacted soil was excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado.

Volume of E&P Waste (solid) in cubic yards _____ 1188

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 _____ 9

E&P waste (liquid) description Petroleum Hydrocarbon Impacted
Groundwater _____

COGCC Disposal Facility ID #, if applicable: _____ 159443

Non-COGCC Disposal Facility: _____

REMEDIATION COMPLETION REPORT

REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No _____

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? No _____

Is additional groundwater monitoring to be conducted? Yes _____

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. KERR-MCGEE'S PRODUCTION FACILITY REMAINS AT THIS SITE. Interim reclamation was completed to 1,000 Series Rules post-excavation.

Is the described reclamation complete? Yes _____

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. 10/06/2006

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/30/2006

Date of commencement of Site Investigation. 10/06/2006

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 10/06/2006

Date of completion of Remediation. 12/31/2008

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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

Signed: Paul Schneider

Title: HSE Manager

Submit Date: 07/17/2017

Email: Paul.Schneider@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: PETER GINTAUTAS

Date: 07/18/2017

Remediation Project Number: 3952

COA Type

Description

	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.
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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.

<u>Att Doc Num</u>	<u>Name</u>
401179153	FORM 27-SUPPLEMENTAL-SUBMITTED
401193482	LOGS
401249560	ANALYTICAL RESULTS
401249569	MAP
401249577	GROUND WATER ELEVATION MAP
401249581	SITE MAP
401266896	CORRESPONDENCE
401270050	REMEDATION PROGRESS REPORT

Total Attach: 8 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Reduction of monitoring wells proposed in this document is justified and approved.	07/18/2017

Total: 1 comment(s)