

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 INFORMATION

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>(970) 336-3500</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80217-3779</u>
Contact Person: <u>Phillip Hamlin</u>	Email: <u>Phil.Hamlin@anadarko.com</u>	Mobile: <u>(970) 515-1161</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9549Initial Form 27 Document #: 200439143

PURPOSE INFORMATION

- | | |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination | <input checked="" 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 checked="" 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 type="checkbox"/> Other _____ |

SITE INFORMATION

N Multiple Facilities (in accordance with Rule 909.c.)

Facility Type: <u>PIT</u>	Facility ID: <u>103144</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HELGOTH HEIRS 1 1</u>		Latitude: <u>40.118312</u>	Longitude: <u>-104.732594</u>
		** correct Lat/Long if needed: Latitude: <u>40.117610</u>	Longitude: <u>-104.732555</u>
QtrQtr: <u>SWSW</u>	Sec: <u>24</u>	Twp: <u>2N</u>	Range: <u>66W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications CLMost Sensitive Adjacent Land Use CROP LANDIs domestic water well within 1/4 mile? YesIs surface water within 1/4 mile? NoIs groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

An occupied building is located approximately 900 feet northwest of the release location.

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 checked="" 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 sampling and laboratory analysis
Yes	SOILS	42' (E-W) x 128' (N-S) x 25' bgs	Excavation, soil boring, soil sampling, and laboratory 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.

Between March 13 and April 8, 2013, a Limited Phase II Site Assessment was conducted at the Helgoth Heirs Unit #1 production facility. Historical hydrocarbon impacts to soil and groundwater were discovered during this investigation. The facility was subsequently abandoned, associated infrastructure removed, and excavation activities were initiated. The COGCC has issued Spill/Release Point ID 2232617 for this release.

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):

Soil samples were collected during the Limited Phase II Site Assessment and subsequent excavation activities, as described in the Initial Form 27 (COGCC Document No. 2525951) and the associated Supplemental Remedial Report (COGCC Document No. 2525953). Based on the data presented, impacted soils remain at the site, both to the north of the previously excavated area and below approximately 19 feet below ground surface (bgs).

Proposed Groundwater Sampling

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

Between March 13, 2013 and January 9, 2014, twenty-six (26) temporary monitoring wells (SB01 - SB26) were installed to assess the extent of groundwater impacts. Quarterly groundwater sampling was initiated on January 13, 2014 and is ongoing at the fifteen (15) temporary monitoring wells remaining at the site (SB07, SB08, SB10, SB11, SB13, SB17 - SB26). Wells SB01 - SB06, SB09, SB12, and SB14 - SB16 were removed during excavation activities. Groundwater samples are collected from the temporary monitoring wells on a quarterly basis and analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater analytical data is presented in Table 1, and the groundwater sample locations are illustrated on Figure 1. Laboratory analytical reports are included as Attachment A.

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):

A Supplemental Remedial Report was submitted to the COGCC with the Initial Form 27 on July 31, 2014, to detail the results of assessment and remediation activities conducted at the site. Additional details regarding the Limited Phase II Site Assessment, impacted soil excavation, temporary groundwater monitoring well installation, and initiation of LNAPL recovery activities can be found in that report, as well as the Phase II Subsurface Site Assessment Report, dated April 25, 2013. A partially-buried produced water vessel was removed during excavation activities.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 47

Number of soil samples exceeding 910-1 10

Was the areal and vertical extent of soil contamination delineated? No

Approximate areal extent (square feet) 5069

NA / ND

-- Highest concentration of TPH (mg/kg) 6700

NA Highest concentration of SAR

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 25

Groundwater

Number of groundwater samples collected 141

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 24'

Number of groundwater monitoring wells installed 26

Number of groundwater samples exceeding 910-1 78

-- Highest concentration of Benzene (µg/l) 3340

-- Highest concentration of Toluene (µg/l) 5420

-- Highest concentration of Ethylbenzene (µg/l) 1980

-- Highest concentration of Xylene (µg/l) 23800

NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

0 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?

Hydrocarbon impacted soil and groundwater remain at the site. The 15 temporary groundwater monitoring wells remaining at the site will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with State standards for four consecutive quarters. Additional temporary monitoring wells will be installed as necessary to maintain point of compliance (POC).

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.

Between July 29 and December 20, 2013, approximately 2,760 cubic yards of impacted material were excavated and transported to the Kerr-McGee Land Treatment Facility in Weld County, Colorado.

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.

As described in the Supplemental Remedial Report, impacted soil and groundwater remain at the Site. A solar-powered light non-aqueous phase liquid (LNAPL) recovery system (Spill Buster) was installed in temporary monitoring well SB23, and LNAPL recovery activities were initiated on February 14, 2014. On March 4, 2014, passive LNAPL bailers were installed in wells SB21 and SB22, and bi-weekly LNAPL gauging and recovery events were initiated to supplement Spill Buster LNAPL recovery activities. The Spill Buster and passive LNAPL bailers have been redeployed to various wells based on field observations and to optimize LNAPL removal. To date, a total of approximately 56.77 gallons of LNAPL had been removed via Spill Buster operation and LNAPL bailing. The Spill Buster is currently undergoing maintenance, but manual LNAPL gauging and recovery activities are ongoing. Quarterly groundwater monitoring is ongoing and will be continued until concentrations remain in full compliance with State standards for four consecutive quarters. Additional remediation measures, including in-situ chemical oxidation (chemox) soil mixing, enhanced fluid recovery, and air sparging, are currently under evaluation to address remaining soil and groundwater impacts. Estimated time to attain NFA is TBD based on the review of groundwater concentrations, the extent of impacted groundwater, and the efficacy of selected remedial technologies.

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) _____ 2760
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

No _____ Bioremediation (or enhanced bioremediation)
No _____ Chemical oxidation
No _____ Air sparge / Soil vapor extraction
Yes _____ Natural Attenuation
Yes _____ Other _____ LNAPL 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 March 13, 2013 and January 9, 2014, a total of 26 temporary monitoring wells (SB01 - SB26) were installed to assess the extent of groundwater impacts. Wells SB01 - SB06, SB09, SB12, and SB14 - SB16 were subsequently removed during excavation activities. The 15 temporary groundwater monitoring wells remaining at the site (SB07, SB08, SB10, SB11, SB13, SB17 - SB26) will continue to be sampled on a quarterly basis and submitted for laboratory analysis of BTEX until concentrations remain in full compliance with State standards for four consecutive quarters. Additional temporary monitoring wells will be installed as necessary to maintain POC. Groundwater sample locations are illustrated on Figure 1, and a potentiometric surface contour map for the First Quarter 2018 is presented as Figure 2. Well completion logs for the temporary monitoring wells are included as Attachment B.

REMEDATION 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:

NA

Volume of E&P Waste (solid) in cubic yards 2760

E&P waste (solid) description 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: _____

REMEDATION COMPLETION REPORT

REMEDATION COMPLETION SUMMARY

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

Do all soils meet Table 910-1 standards? _____

Does the previous reply indicate consideration of background concentrations? _____

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? _____

Is additional groundwater monitoring to be conducted? _____

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 has been restored to its pre-release grade. Kerr-McGee will consult with the surface owner to determine reclamation specifics to properly conduct reclamation activities in accordance with COGCC 1000 Series Rules.

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. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). _____ 03/13/2013

Date of commencement of Site Investigation. _____ 03/13/2013

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____ 07/29/2013

Date of completion of Remediation. _____

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: ` Phillip Hamlin

Title: Senior HSE Representative

Submit Date: ` 05/01/2018

Email: Phil.Hamlin@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: 05/01/2018

Remediation Project Number: 9549

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. In the next annual report include documentation of how points of compliance have been or will be added. At present no points of compliance have been established downgradient of SB 25 and SB 17 and other monitoring points from groundwater elevation contour map provided
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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**

401558460	FORM 27-SUPPLEMENTAL-SUBMITTED
401558921	ANALYTICAL RESULTS
401573365	GROUND WATER SAMPLE LOCATION
401573486	GROUND WATER ELEVATION MAP
401573489	ANALYTICAL RESULTS
401573681	LOGS

Total Attach: 6 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)