

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10646 Initial Form 27 Document #: 401421323

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

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

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>446193</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Erickson Birkle P 25-4JI batterr</u>		Latitude: <u>40.201321</u>	Longitude: <u>-104.847981</u>
		** correct Lat/Long if needed: Latitude: <u>40.201320</u>	Longitude: <u>-104.847968</u>
QtrQtr: <u>NWNW</u>	Sec: <u>25</u>	Twp: <u>3N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>
Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>452278</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>SPILL/RELEASE POINT</u>		Latitude: <u>40.201320</u>	Longitude: <u>-104.847968</u>
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: <u>NWNW</u>	Sec: <u>25</u>	Twp: <u>3N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Flood plain

Is domestic water well within 1/4 mile? No 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

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- ☒ E&P Waste ☐ Other E&P Waste ☐ Non-E&P Waste
- ☒ Produced Water ☐ Workover Fluids
- ☒ Oil ☐ Tank Bottoms
- ☐ Condensate ☐ Pigging Waste
- ☐ Drilling Fluids ☐ Rig Wash
- ☐ Drill Cuttings ☐ Spent Filters
- ☐ Pit Bottoms
- ☐ Other (as described by EPA)

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	GROUNDWATER	See attached data	Sample of GW within the excavation
No	SOILS	No impacts	Sample of soils during excavation

INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

On September 19, 2017, soil and groundwater sampling activities were conducted in association with a produced water sump closure at the Erickson Birkle P25-4JI Tank Battery location. On September 21, 2017 an Initial Form 19 was submitted to the COGCC, followed by a Supplemental Form 19 on September 28, 2017. No soil was removed from the excavation due to the fact that no soil impacts were identified. Shallow groundwater was encountered at two feet below ground surface in the sump's excavation. Prior to backfilling the excavation, 50 pounds of Chemically Oxygenated Granular Activated Carbon (COGAC) were applied to the groundwater. A regional topographic facility location map is provided as Figure 1, and a facility layout and sample locations map is attached as Figure 2.

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):

On September 19, 2017, soil grab samples were collected from each wall of the sump excavation (N01@1.5', E01@1.5', S01@1.5', W01@1.5'). All soil samples were submitted to Origins Laboratory in Denver, Colorado, for analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260C, TPH - diesel range organics and residual range organics (DRO and RRO, respectively) by USEPA Method 8015, electrical conductivity (EC), and pH. Soil sample analytical results are summarized in Table 1, and the laboratory reports are provided.

Proposed Groundwater Sampling

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

On September 19, 2017, grab groundwater sample GW01 was collected from the excavation and submitted to Origins Laboratory in Denver, Colorado, for analysis of BTEX by USEPA 8260. The groundwater results indicated that the benzene concentration was 5.92 ug/L (exceeding Table 910-1 allowable groundwater concentrations). Groundwater sample analytical results are summarized in Table 2, and the laboratory reports are provided.

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):

Based on the analytical results from groundwater sample GW01, a subsurface assessment was conducted at the facility to determine the extent of shallow groundwater impacts. Five (5) groundwater monitoring wells were installed at the location. Groundwater monitoring was conducted on a quarterly basis. Collected groundwater samples were submitted for laboratory analysis of BTEX by USEPA Method 8260. Quarterly groundwater monitoring continued until BTEX concentrations remained below COGCC Table 910-1 groundwater standards for four consecutive quarters. Quarterly groundwater elevation contour maps are provided as Figures 3 - 6. Groundwater monitoring analytical results are summarized in Table 2, and the laboratory reports are provided.

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) 154

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 20
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 2'
Number of groundwater monitoring wells installed 5
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 5.92
-- Highest concentration of Toluene (µg/l) 28.1
-- Highest concentration of Ethylbenzene (µg/l) 440
-- Highest concentration of Xylene (µg/l) 591
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?

A background sample was collected and placed on hold with the laboratory pending the results of the sidewall samples. The background sample was not analyzed due to the analytical results of the confirmation sidewall soil samples not exceeding COGCC Table 910-1 allowable concentrations. Both EC and pH concentrations detected in the soil samples were within the allowable limits.

☐ 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.

On September 19, 2017, a produced water sump was permanently removed from this location. Environmental testing was conducted during the sump removal activities. Laboratory analysis from the soil samples collected from the excavation's extent were either not detected or below COGCC Table 910-1 allowable concentrations. No soil or groundwater has been removed from this location.

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.

To support the hydrocarbon natural attenuation process for the limited remaining dissolved-phase impacts, 50 pounds of Chemically Oxygenated Granular Activated Carbon (COGAC) were applied to the groundwater prior to backfilling the excavation. In order to determine the extent and magnitude of dissolved-phase hydrocarbon impacts, five (5) groundwater monitoring wells were installed in the source area, upgradient, cross-gradient and downgradient of the excavation footprint in November of 2017. Groundwater monitoring was conducted on a quarterly basis and continued until BTEX concentrations remained below COGCC Table 910-1 groundwater standards for four consecutive quarters. Based on quarterly groundwater analytical results, as discussed in the Groundwater Monitoring section, no further action is required.

Soil Remediation Summary

☐ In Situ

_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Air sparge / Soil vapor extraction
_____ Natural Attenuation
_____ Other _____

☐ Ex Situ

_____ Excavate and offsite disposal
_____ If Yes: Estimated Volume (Cubic Yards) _____
_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____
_____ Excavate and onsite remediation
_____ Land Treatment
_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Other _____

Groundwater Remediation Summary

☐ Bioremediation (or enhanced bioremediation)
Yes _____ Chemical oxidation
☐ Air sparge / Soil vapor extraction
Yes _____ Natural Attenuation
Yes _____ Other _____ COGAC Application _____

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.

In November of 2017, five groundwater monitoring wells were installed. One well was installed within the source area (MW02), one well was installed upgradient of the source area (MW01), two wells cross-gradient of the source (MW03 and MW05) and one well downgradient of the source (MW04). Groundwater monitoring was conducted on a quarterly basis, between December 5, 2017, and September 20, 2018, and all groundwater samples were submitted for laboratory analysis of BTEX by USEPA 8260. For all groundwater samples, laboratory analytical results indicated that all BTEX compounds were below laboratory detection limits, and thus below COGCC standards. On March 15, 2018, MW01 which is the upgradient well, was unable to be sampled due to a blockage within the pipe. During subsequent sampling events, water samples were collected, but were rejected during data validation due to concerns that the blockage had continued to prevent representative groundwater samples from being collected.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Closure of remediation project.

Report Type: ☒ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☒ Other Closure of remediation project.

WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? No

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

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

E&P waste (solid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

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 excavation was backfilled and graded to match the adjacent topography. Kerr-McGee's tank battery and associated components were permanently removed from the facility location. Future reclamation activities at the facility location will be compliant with COGCC regulations.

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. 09/20/2017

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 09/19/2017

Date of commencement of Site Investigation. 09/19/2017

Date of completion of Site Investigation. 09/20/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 09/19/2017

Date of completion of Remediation. 09/20/2018

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: ` Phil Hamlin

Title: Senior Environmental Rep.

Submit Date: ` 02/13/2019

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: 02/13/2019

Remediation Project Number: 10646

COA Type**Description**

	Based on the information presented, it appears that no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if ground water is found to be impacted, then further investigation and/or further remediation activities may be required. In addition, the surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules.
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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**

401886487	FORM 27-SUPPLEMENTAL-SUBMITTED
401938707	MAP
401938712	SITE MAP
401938714	GROUND WATER ELEVATION MAP
401938716	GROUND WATER ELEVATION MAP
401938719	GROUND WATER ELEVATION MAP
401938723	GROUND WATER ELEVATION MAP
401938726	ANALYTICAL RESULTS
401938727	ANALYTICAL RESULTS
401938792	ANALYTICAL RESULTS

Total Attach: 10 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)