

State of Colorado
Oil and Gas Conservation Commission

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Document Number:
401637779
Receive Date:
05/15/2018

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 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>(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 #: 11340 Initial Form 27 Document #: 401627324

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 checked="" 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>LOCATION</u>	Facility ID: <u>318102</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>GERALD PICKERING GU-61N65W 29SWNE</u>	Latitude: <u>40.025147</u>	Longitude: <u>-104.683686</u>	
** correct Lat/Long if needed: Latitude: <u>40.025671</u>		Longitude: <u>-104.683271</u>	
QtrQtr: <u>SWNE</u>	Sec: <u>29</u>	Twp: <u>1N</u>	Range: <u>65W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>318890</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>ELLANORA M ACKERSON GAS UNIT-61N67W 2SWSE</u>	Latitude: <u>40.075906</u>	Longitude: <u>-104.853925</u>	
** correct Lat/Long if needed: Latitude: <u>40.075401</u>		Longitude: <u>-104.854375</u>	
QtrQtr: <u>SWSE</u>	Sec: <u>2</u>	Twp: <u>1N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>319311</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>TROUDT-USX VV-61N67W 7NWSE</u>	Latitude: <u>40.062442</u>	Longitude: <u>-104.929240</u>	
** correct Lat/Long if needed: Latitude: <u>40.058861</u>		Longitude: <u>-104.933168</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>7</u>	Twp: <u>1N</u>	Range: <u>67W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: LOCATION Facility ID: 326790 API #: County Name: WELD
Facility Name: UPRR 43 PAN AM GAS UNIT J-61N67W 19NESE Latitude: 40.033889 Longitude: -104.927331
** correct Lat/Long if needed: Latitude: 40.033735 Longitude: -104.926228
QtrQtr: NESE Sec: 19 Twp: 1N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION Facility ID: 327382 API #: County Name: WELD
Facility Name: WALSH GAS UNIT-62N68W 24NWSE Latitude: 40.121404 Longitude: -104.949951
** correct Lat/Long if needed: Latitude: 40.119027 Longitude: -104.948746
QtrQtr: NWSE Sec: 24 Twp: 2N Range: 68W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION Facility ID: 328082 API #: County Name: WELD
Facility Name: PEAKS 35-2 Latitude: 40.076700 Longitude: -104.974100
** correct Lat/Long if needed: Latitude: 40.076965 Longitude: -104.974030
QtrQtr: SESW Sec: 2 Twp: 1N Range: 68W Meridian: 6 Sensitive Area? Yes

Facility Type: LOCATION Facility ID: 331441 API #: County Name: WELD
Facility Name: ROBBINS-61N67W 24NWNW Latitude: 40.041808 Longitude: -104.845822
** correct Lat/Long if needed: Latitude: 40.038851 Longitude: -104.842046
QtrQtr: NWNW Sec: 24 Twp: 1N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: TANK BATTERY Facility ID: 446225 API #: County Name: ADAMS
Facility Name: BOX ELDER G-61S65W 26SESW Latitude: 39.930914 Longitude: -104.635165
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: SESW Sec: 26 Twp: 1S Range: 65W Meridian: 6 Sensitive Area? Yes

Facility Type: TANK BATTERY Facility ID: 451745 API #: County Name: WELD
Facility Name: Borgmann SE 1 2N68W battery Latitude: Longitude:
** correct Lat/Long if needed: Latitude: 40.162001 Longitude: -104.946282
QtrQtr: Sec: Twp: Range: Meridian: Sensitive Area? Yes

Facility Type: TANK BATTERY Facility ID: 451746 API #: County Name: WELD
Facility Name: Borgman U 1-10JI battery Latitude: Longitude:
** correct Lat/Long if needed: Latitude: 40.164498 Longitude: -104.950615
QtrQtr: Sec: Twp: Range: Meridian: Sensitive Area? Yes

SITE CONDITIONS
General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Residential and Agriculture
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
NA

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
No	GROUNDWATER	See Sump Closure Reports	Groundwater sample results provided, if applicable
Yes	SOILS	See Sump Closure Reports	Soil sample results provided

INITIAL ACTION SUMMARY

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

The objective of the soil and groundwater (if present) sampling was to determine if petroleum hydrocarbon impacts to the subsurface media resulted from operating a produced water sump at the site.

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 sampling was conducted to determine if petroleum hydrocarbon impacts to subsurface soil resulted from operating a produced water sump at the respective sites. For each sump closure site, one or more soil samples were collected for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH), pH, and specific conductivity (EC). The soil sampling activities, laboratory analytical results, and conclusions are summarized in the attached Sump Closure Reports.

Proposed Groundwater Sampling

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

If groundwater was encountered in the sump excavation, a groundwater sample was collected and submitted for laboratory analysis of BTEX. The groundwater sampling activities are summarized in the attached Sump Closure Reports, as applicable.

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 13
Number of soil samples exceeding 910-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 240

NA / ND

-- Highest concentration of TPH (mg/kg) 117.9
NA Highest concentration of SAR
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

Groundwater

Number of groundwater samples collected 2
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 4'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 0

ND Highest concentration of Benzene (µg/l)
-- Highest concentration of Toluene (µg/l) 4.88
ND Highest concentration of Ethylbenzene (µg/l)
ND Highest concentration of Xylene (µg/l)
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.

Soil samples were collected from the sump excavations for laboratory analysis of TPH, BTEX, pH, and EC. Impacted soil, if encountered, was transported to Front Range Landfill in Erie, Colorado. The Sump Closure Reports are attached.

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.

Source removal, as applicable, has been completed at the sump closure sites as summarized in the attached Sump Closure Reports. Groundwater impacts were not encountered. No further action is required for these sites.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

If Yes: Estimated Volume (Cubic Yards) _____ 70

_____ Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or COGCC Facility ID # _____

_____ Natural Attenuation

No _____ Excavate and onsite remediation

_____ Other _____

_____ 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

No _____ 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.

NA

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: Quarterly Semi-Annually Annually Other Final Report; Produced water vessel closure

Report Type: Groundwater Monitoring Land Treatment Progress Report O&M Report
 Other Produced water vessel closure

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 70

E&P waste (solid) description Petroleum hydrocarbon impacted soil (Ackerson Ellanora M GU #2)

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Front Range Landfill in Erie, Colorado

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? No

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? Yes

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.

Sump closure sites have been reclaimed (interim) or are in the process of being reclaimed (final) in accordance with COGCC 1000 Series Reclamation 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). 08/24/2017

Date of commencement of Site Investigation. 08/24/2017

Date of completion of Site Investigation. 01/30/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

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: Erik Mickelson _____

Title: Senior HSE Representative _____

Submit Date: 05/15/2018 _____

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: 05/16/2018 _____

Remediation Project Number: 11340 _____

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**

401637779	FORM 27-SUPPLEMENTAL-SUBMITTED
401637812	SITE INVESTIGATION REPORT
401637815	SITE INVESTIGATION REPORT
401637819	SITE INVESTIGATION REPORT
401637820	SITE INVESTIGATION REPORT
401637821	SITE INVESTIGATION REPORT
401637822	SITE INVESTIGATION REPORT
401637824	SITE INVESTIGATION REPORT
401637825	SITE INVESTIGATION REPORT
401637826	SITE INVESTIGATION REPORT
401637827	SITE INVESTIGATION REPORT

Total Attach: 11 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)