

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>(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>Phillip_Hamlin@oxy.com</u>	Mobile: <u>()</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 13888 Initial Form 27 Document #: 402115667

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

Facility Type: <u>TANK BATTERY</u>	Facility ID: <u>451655</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>Hopper 43-15. 23-15 & 24-15 battery</u>	Latitude: <u>40.137266</u>	Longitude: <u>-104.989016</u>	
	** correct Lat/Long if needed: Latitude: <u>40.137409</u>	Longitude: <u>-104.989096</u>	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>467861</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HOPPER 43-15A</u>	Latitude: <u>40.137270</u>	Longitude: <u>-104.989066</u>	
	** correct Lat/Long if needed: Latitude: _____	Longitude: _____	
QtrQtr: <u>NWSE</u>	Sec: <u>15</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

SITE CONDITIONS

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use Idle Field

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

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 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	To be determined	Soil Samples/Laboratory Analytical Results
No	SOILS	No impacts	Soil Samples/Laboratory Analytical Results

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, 2019, historical groundwater impacts were discovered during site decommissioning activities associated with the closure of two partially buried produce water vessels at the Hopper 43-15A production facility. Based on the groundwater analytical results from sample GW01, a release was reported to the COGCC, and a Form 19 Initial with Supplemental (402184111) was submitted on September 23, 2019. A Topographic Site Location Map showing the geographic setting of the release is provided as Figure 1. The general site layout, excavation area, and sample locations are depicted on the Excavation Site Map provided as Figure 2. The excavation soil sample analytical results are summarized in Table 1, the groundwater analytical results are summarized in Table 2, and the laboratory analytical reports are provided as Attachment A.

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, 2019, following removal of the two PWVs, soil samples were collected from the sidewalls and bases of the excavations. The soil samples were field screened for volatile organic compounds using a photoionization detector (PID). All soil samples were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX), total petroleum hydrocarbons (TPH), and naphthalene. The base soil samples were also analyzed for pH, specific conductance (EC), and sodium adsorption ratio (SAR). Laboratory analytical results for all soil samples indicate that BTEX, TPH, SAR and EC concentrations and levels were in full compliance with COGCC Table 910-1 allowable levels. The base sample collected from the northern PWV excavation (N-B01@2.5') exceeded allowable levels for pH. This area was excavated and confirmation sample, B02@3.5', was collected. The soil sample analytical results are summarized in Table 1, and the laboratory analytical report is attached.

Proposed Groundwater Sampling

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

On September 19, 2019, 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 laboratory results indicated that the benzene concentration was 43.3 ug/L. On September 20, 2019 grab groundwater sample GW02 was collected from the excavation and also submitted to Origins Laboratory in Denver, CO for analysis of BTEX by USEPA 8260. The groundwater results indicated that the benzene concentration was 307 ug/L.

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 12
Number of soil samples exceeding 910-1 1
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 224

NA / ND

-- Highest concentration of TPH (mg/kg) 334.1
-- Highest concentration of SAR 1.22
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 2

Groundwater

Number of groundwater samples collected 2
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 4'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 2

-- Highest concentration of Benzene (µg/l) 307
ND Highest concentration of Toluene (µg/l)
-- Highest concentration of Ethylbenzene (µg/l) 89.9
-- Highest concentration of Xylene (µg/l) 875
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 analyzed for pH and sodium adsorption ratio (SAR).

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?

Groundwater monitoring wells will be installed to delineate the dissolved-phase hydrocarbon plume. Quarterly groundwater monitoring will be conducted to determine the extent and magnitude of the dissolved-phase hydrocarbon impacts. The need for future remediation activities will be based on the results from the groundwater assessment activities.

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 40 cubic yards of soil were taken to the Front Range Regional Landfill in Erie, Colorado. Additionally, 60 barrels of groundwater were removed from the excavation and taken to the Kerr-McGee Aggregate Recycling Facility.

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 remaining dissolved-phase impacts, 50 pounds of COGAC was applied to the groundwater prior to backfilling the excavation. The safety data sheet for COGAC is provided as Attachment B. In order to determine the extent and magnitude of the dissolved-phase hydrocarbon impacts, a minimum of four groundwater monitoring wells will be installed in the source area, cross-gradient, and downgradient of the excavation footprint. Groundwater monitoring will be conducted on a quarterly basis and will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters. Based on the results of groundwater sample GW02, it is estimated that NFA status can be obtained after four consecutive quarters of monitoring.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____ 40

_____ Air sparge / Soil vapor extraction

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

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ 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 Chemically Oxygenated
Granular Activated Carbon
(COGAC) and groundwater
removal

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.

To determine the extent and magnitude of impacts, a minimum of four groundwater monitoring wells will be installed in the source area, cross-gradient, and downgradient of the excavation footprint. Groundwater monitoring will be conducted on a quarterly basis. Collected groundwater samples will be submitted for laboratory analysis of BTEX by USEPA Method 8260. Quarterly groundwater monitoring at the location will continue until BTEX concentrations remain below COGCC Table 910-1 groundwater standards for four consecutive quarters.

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? _____

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? 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 will be reclaimed in accordance with COGCC 1000 Series Reclamation Rules.

Is the described reclamation complete? _____

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. 09/20/2019

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/22/2019

Date of commencement of Site Investigation. 09/19/2019

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 09/19/2019

Date of completion of Remediation. _____

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: Phil Hamlin

Title: Senior Environmental Rep.

Submit Date: 11/20/2019

Email: Phillip_Hamlin@oxy.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: 12/04/2019

Remediation Project Number: 13888

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.

<u>Att Doc Num</u>	<u>Name</u>
402224281	FORM 27-SUPPLEMENTAL-SUBMITTED
402225417	MAP
402225420	SITE MAP
402225422	ANALYTICAL RESULTS
402225424	ANALYTICAL RESULTS
402225426	ANALYTICAL RESULTS
402244794	OTHER

Total Attach: 7 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
		Stamp Upon Approval

Total: 0 comment(s)