

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

Report taken by:

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: KERR MCGEE OIL & GAS ONSHORE LP		Operator No: 47120	Phone Numbers Phone: (970) 336-3500 Mobile: ()
Address: P O BOX 173779			
City: DENVER	State: CO	Zip: 80217-3779	
Contact Person: Phil Hamlin		Email: Phil_Hamlin@oxy.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 12943

Initial Form 27 Document #: 401983039

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: PIT	Facility ID: 118126	API #:	County Name: WELD
Facility Name: ARISTOCRAT		Latitude: 40.244728	Longitude: -104.660803
** correct Lat/Long if needed: Latitude:		Longitude:	
QtrQtr: NENE	Sec: 9	Twp: 3N	Range: 65W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SM

Most Sensitive Adjacent Land Use Surface Water and Rangeland

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

Water well approximately 1,280 feet (ft) south-southeast, surface water (Platte Valley Canal) approximately 700 ft northeast, and groundwater approximately 13 ft below ground surface (bgs).

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 Samples/Lab Analysis
Yes	SOILS	51' N-S x 43' E-W x 25' bgs	Soil Samples/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.

In April and May 2019, a subsurface assessment was conducted to determine if petroleum hydrocarbon impacts to the subsurface media exist from a former permitted earthen pit at the Aristocrat 41-9 1 site. The former pit was identified in a Colorado Oil and Gas Conservation Commission (COGCC) Field Inspection Form (Document No. 689500951). Laboratory analytical results from the initial soil borings indicated petroleum hydrocarbon impacts to the subsurface. The volume of the release is unknown. Based on the subsurface assessment, excavation of the petroleum hydrocarbon impacted soil was initiated in July 2019.

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 Soil Sampling Summary Attachment.

Proposed Groundwater Sampling

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

In May 2019, assessment soil borings SB03 through SB14 were completed as groundwater monitoring wells. The monitoring wells were sampled for laboratory analysis of benzene, toluene, ethylbenzene, and total xylenes (BTEX) in May 2019. Laboratory analytical results indicated benzene, ethylbenzene, and total xylenes exceedances to groundwater. The monitoring wells were abandoned prior to the July 2019 excavation activities. Soil boring logs with monitoring well completion diagrams are included as an attachment.

On July 17, 2019, one groundwater sample (GW01) was collected from the excavation for laboratory analysis of BTEX. The laboratory analytical results indicated that groundwater sample GW01 was in full compliance with COGCC Table 910-1 allowable levels for BTEX. The laboratory analytical results for the monitoring well and excavation groundwater samples are summarized in Table 2. The laboratory analytical report is attached.

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 25

Number of soil samples exceeding 910-1 11

Was the areal and vertical extent of soil contamination delineated? Yes

Approximate areal extent (square feet) 2193

NA / ND

-- Highest concentration of TPH (mg/kg) 15400

-- Highest concentration of SAR 25.27

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 25

Groundwater

Number of groundwater samples collected 24

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 13'

Number of groundwater monitoring wells installed 12

Number of groundwater samples exceeding 910-1 6

-- Highest concentration of Benzene (µg/l) 288

-- Highest concentration of Toluene (µg/l) 12.2

-- Highest concentration of Ethylbenzene (µg/l) 2410

-- Highest concentration of Xylene (µg/l) 29100

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?

Petroleum hydrocarbon impacts to soil and groundwater were encountered east and south of the former pit location.

☐ 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.

Approximately 2,930 cubic yards of petroleum hydrocarbon impacted soil were removed from the excavation and transported to Buffalo Ridge Landfill in Keenesburg, Colorado, for disposal. The impacted soil was excavated into the capillary and phreatic zones to address potential hydrocarbon impacts that may have been present below the groundwater table due to past seasonal fluctuations. The general site layout and excavation footprint are depicted on the Site Map attached as Figure 1.

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.

While backfilling the excavation, 200 pounds of COGAC®, a carbon-based bioremediation product designed to capture and degrade petroleum hydrocarbons via chemical oxidation and passive bio-stimulation, were applied to the clean backfill in a series of lifts in the capillary and phreatic horizons. The safety data sheet for COGAC® is included as an attachment.

Soil Remediation Summary

<input type="checkbox"/> In Situ	<input checked="" type="checkbox"/> Ex Situ
_____ Bioremediation (or enhanced bioremediation)	Yes _____ Excavate and offsite disposal
_____ Chemical oxidation	_____ If Yes: Estimated Volume (Cubic Yards) _____ 2930
_____ 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

Yes _____	Bioremediation (or enhanced bioremediation)
Yes _____	Chemical oxidation
No _____	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 May 2019, assessment soil borings SB03 through SB14 were completed as groundwater monitoring wells. In July 2019, groundwater monitoring wells SB03 through SB14 were destroyed prior to excavation activities. In October 2019, following completion of the excavation activities, eleven groundwater monitoring wells MW01 through MW11 were installed at the site (destroyed wells SB03, SB04, SB06, SB08, and SB09 were replaced as wells MW01, MW03, MW05, MW02, and MW04, respectively). Soil boring logs with monitoring well completion diagrams are included as an attachment.

In October 2019, groundwater monitoring wells MW01 through MW11 were sampled and submitted for laboratory analysis for BTEX by United States Environmental Protection Agency Method 8260D. The monitoring well locations are depicted on Figure 1. A Groundwater Elevation Contour Map generated using fourth quarter 2019 survey data is provided as Figure 3. The groundwater analytical results are summarized in Table 2. The laboratory analytical reports for the May 2019 and October 2019 groundwater monitoring events are attached.

Groundwater monitoring will continue on a quarterly basis until a No Further Action status request is warranted.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☒ Annually ☐ Other _____

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

☒ Other Soil and Groundwater Assessment Update _____

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 2930

E&P waste (solid) description Petroleum hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Buffalo Ridge Landfill in Keenesburg, 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? No _____

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? 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 earthen pit was permanently removed from service and the permit was closed in 1999.

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. 05/06/2019

Actual Spill or Release date, if known. 05/06/2019

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/14/2019

Date of commencement of Site Investigation. 04/29/2019

Date of completion of Site Investigation. 10/25/2019

REMEDIAL ACTION DATES

Date of commencement of Remediation. 07/01/2019

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: ` Phil Hamlin

Title: Senior Environmental Rep.

Submit Date: `

Email: Phil_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: _____

Date: _____

Remediation Project Number: 12943

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**

402217510	OTHER
402229235	LOGS
402248995	GROUND WATER ELEVATION MAP
402249714	SITE MAP
402249715	SOIL SAMPLE LOCATION MAP
402249760	ANALYTICAL RESULTS
402263020	SITE INVESTIGATION REPORT
402266340	SITE MAP
402266341	SOIL SAMPLE LOCATION MAP
402266346	GROUND WATER ELEVATION MAP
402266467	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)