

State of Colorado  
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



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401868363  
Receive Date:  
02/20/2019

Report taken by:  
CHRIS CANFIELD

Site Investigation and Remediation Workplan (Initial 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 &amp; GAS ONSHORE LP</u>	Operator No: <u>47120</u>	<b>Phone Numbers</b>
Address: <u>P O BOX 173779</u>		Phone: <u>(970) 515-1698</u>
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80217-3779</u>
Contact Person: <u>Greg Hamilton</u>	Email: <u>gregory.hamilton@anadrarko.com</u>	Mobile: <u>( )</u>

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 12743 Initial Form 27 Document #: 401868363

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 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>LOCATION</u>	Facility ID: <u>302753</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>HORNUNG-64N68W 28NENE</u>	Latitude: <u>40.288810</u>	Longitude: <u>-105.003000</u>	
** correct Lat/Long if needed: Latitude: <u>40.283296</u>		Longitude: <u>-104.999141</u>	
QtrQtr: <u>NENE</u>	Sec: <u>28</u>	Twp: <u>4N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>No</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>319025</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>NEWTON-62N68W 13NENE</u>	Latitude: <u>40.143967</u>	Longitude: <u>-104.944039</u>	
** correct Lat/Long if needed: Latitude: <u>40.144331</u>		Longitude: <u>-104.944440</u>	
QtrQtr: <u>NENE</u>	Sec: <u>13</u>	Twp: <u>2N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>
Facility Type: <u>LOCATION</u>	Facility ID: <u>335564</u>	API #: _____	County Name: <u>WELD</u>
Facility Name: <u>CHAMPLIN #86 AMOCO G-61N68W 17SESE</u>	Latitude: <u>40.046753</u>	Longitude: <u>-105.022847</u>	
** correct Lat/Long if needed: Latitude: <u>40.046063</u>		Longitude: <u>-105.022443</u>	
QtrQtr: <u>SESE</u>	Sec: <u>17</u>	Twp: <u>1N</u>	Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u>

Facility Type: LOCATION Facility ID: 336199 API #: \_\_\_\_\_ County Name: WELD  
Facility Name: ZEEK-63N68W 23NENW Latitude: 40.218250 Longitude: -104.972420  
\*\* correct Lat/Long if needed: Latitude: 40.218486 Longitude: -104.972350  
QtrQtr: NENW Sec: 23 Twp: 3N Range: 68W Meridian: 6 Sensitive Area? No

**SITE CONDITIONS**

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Rangeland, Non-cropland  
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**

Residential area located northeast, and reservoir located southwest of NEWTON-62N68W 13NENE. Livestock located north of ZEEK-63N68W 23NENW. Wetland located east, and residential area located west of CHAMPLIN #86 AMOCO G-61N68W 17SESE.

# 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
No	SOILS	No impacts	Sampling 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.

The objective of the soil sampling was to determine if the operation of produced water sumps at the sites resulted in petroleum hydrocarbon impacts to the subsurface media.

## 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 the operation of produced water sumps resulted in petroleum hydrocarbon impacts at the respective sites. For each sump closure site, a minimum of one base sample, four sidewall samples, and one background sample were field-screened using a photoionization detector. Based on the field-screening results, the base samples collected beneath each produced water sump were submitted for laboratory analysis of benzene, toluene, ethylbenzene, and total 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 8015C, electrical conductivity (EC), and pH. This included four base samples from the HORNUNG, one from the NEWTON, one from the CHAMPLIN, and one from the ZEEK. The soil sampling activities, laboratory analytical results, and conclusions will be summarized in the Form 27 Supplemental.

### Proposed Groundwater Sampling

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

### 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 7

Number of soil samples exceeding 910-1 0

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

Approximate areal extent (square feet) 0

### NA / ND

-- Highest concentration of TPH (mg/kg) 37.75  
4

NA Highest concentration of SAR         

BTEX > 910-1 No

Vertical Extent > 910-1 (in feet) 0

### Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet)         

Number of groundwater monitoring wells installed         

Number of groundwater samples exceeding 910-1         

         Highest concentration of Benzene (µg/l)         

         Highest concentration of Toluene (µg/l)         

         Highest concentration of Ethylbenzene (µg/l)         

         Highest concentration of Xylene (µg/l)         

         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?

Background samples were collected. Laboratory analytical results indicate that pH and EC levels were compliant or samples were collected below the designated root zone (>3 feet bgs) at the extent of the excavation; therefore, the background soil samples were not submitted for laboratory analysis.

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

## SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Soil samples were collected from the sump excavation for laboratory analysis of TPH, BTEX, pH, and EC. No impacted soil was encountered, therefore, no source removal was necessary.

## REMEDICATION 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.

A remediation summary for each sump closure site will be summarized in the Sump Closure Reports, submitted as part of the Form 27 Supplemental. No impacted soil or groundwater were encountered at any of the locations.

## 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 )
- \_\_\_\_\_ Chemical oxidation
- \_\_\_\_\_ Air sparge / Soil vapor extraction
- \_\_\_\_\_ Natural Attenuation
- \_\_\_\_\_ 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.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

**Frequency:**  Quarterly  Semi-Annually  Annually  Other \_\_\_\_\_

**Report Type:**  Groundwater Monitoring  Land Treatment Progress Report  O&M Report

Other Produced Water Sump Closure \_\_\_\_\_

## 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: \_\_\_\_\_

## 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). 09/24/2018

Date of commencement of Site Investigation. 09/24/2018

Date of completion of Site Investigation. 12/17/2018

### 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: ` Greg Hamilton \_\_\_\_\_

Title: Senior Staff HSE Rep \_\_\_\_\_

Submit Date: ` 02/20/2019 \_\_\_\_\_

Email: gregory.hamilton@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: 03/18/2019 \_\_\_\_\_

Remediation Project Number: 12743 \_\_\_\_\_

**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**

401868363	INVESTIGATION/REMEDATION WORKPLAN (INITIAL)
401975600	FORM 27-INITIAL-SUBMITTED

Total Attach: 2 Files

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

Agency	The subject Form 27 (Initial Form) is being returned to draft status pending an opportunity to discuss COGCC review comments and questions with the operator.	02/26/2019
Environmental	1. Your submittal describes activities that have been completed at four locations, yet those activities are being reported by means of an initial Form 27. Please remember that closure of partially-buried produced water vessels requires prior approval of a Form 27 (Rule 905.b). Also, the Form 27 process requires a minimum of two transactions; prior approval of an Initial Form 27 and subsequent approval of a Supplemental Form 27 which includes a remediation completion report and request for a determination of no further action. Note that the remediation completion report tab does not appear on the Initial Form 27. Again, if I'm reading your submittal correctly, it's describes work that did not take place under an approved work plan.	02/26/2019
Environmental	2. Some of the information provided is contradictory and confusing. For an example, if none of seven soil samples collected exceed Table 910-1 concentrations, then what's the basis for stating the aerial extent of contamination was 1386 square feet? And, why does the remediation summary section of the form describe source removal? Further, which of the four locations subject to your submittal do those statements apply to?	02/26/2019
Environmental	3. The sample summary section reports that 7 soil samples were collected. Do you mean 7 at each of the 4 locations subject to the form, or a total of 7 across all four of the subject locations?	02/26/2019
Environmental	4. No rationale is given for the number and locations of the soil samples. Rule 910 b.(3)B requires that the number and locations of the soil samples be adequate to evaluate the site both laterally and vertically.	02/26/2019
Environmental	5. The section of the form concerning background samples states that although background samples were collected, they were not submitted for laboratory analysis. Rule 910.b.(3)D requires collection and analysis of samples of nearby, non-impacted native soils for the purpose of establishing site-specific background conditions. Given that your background samples were not analyzed, what is the basis for saying that other soil samples, collected from areas likely to have been impacted, are "compliant".	02/26/2019

Environmental	6. Your response to the form's question on background samples includes the following statement, "or samples were collected below the root zone (>3 feet bgs) at the extent of the excavation". That statement is inconsistent with COGCC rules. Electrical Conductivity (EC), Sodium Adsorption Ratio (SAR), and pH are all listed on Table 910-1 as Contaminants of Concern. Further, Rule 910.b.(3)D. requires comparison of analytical results for those parameters with analytical results for samples collected from nearby non-impacted native soils. The purpose of that exercise is to determine whether or not a release of produced water occurred, and if so, the horizontal and vertical extent of resulting impacts as required by Rule 910.b.(3)B. I suspect that you are trying to apply a 2008 COGCC response to a post-rulemaking Frequently Asked Question (32. How will the COGCC apply the Table 910-1 concentration levels for pH, sodium adsorption ratio (SAR), and electrical conductivity (EC)?). That question and its response concern remediation of releases resulting in elevated pH, SAR, and EC, specifically that remediation targeting those parameters will generally apply to soils within three feet of the ground surface. It does not eliminate the need to comply with the above mentioned rules.	02/26/2019
Environmental	7. Under the section on Periodic Reporting, your response to the frequency of periodic reporting is "Produced water sump closure".	02/26/2019
Environmental	8. In the section on Reclamation Planning, you stated that the sites have been reclaimed. Again, an Initial Form 27 is not the correct way to report the completion of unauthorized work.	02/26/2019
Environmental	9. In the Implementation Schedule, you state that the subject work commenced on 09/24/2018. See comment number 1.	02/26/2019
Environmental	10. While multiple responses to questions in the subject form describe samples having been collected and analyzed. No reports of laboratory analysis were submitted. Likewise, no figures depicting the locations of soil sample sites and excavation limits were submitted.	02/26/2019

Total: 11 comment(s)