

State of Colorado  
Energy & Carbon Management Commission

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



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Report taken by:  
John Heil

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 ECOM 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.

Closure request is not available for an Initial Site Investigation and Remediation Workplan.

OPERATOR INFORMATION

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	<b>Phone Numbers</b>
Address: 1001 17TH STREET #1600		Phone: (970) 640-6919
City: DENVER State: CO Zip: 80202		Mobile: (970) 640-6919
Contact Person: Blair Rollins	Email: brollins@caerusoilandgas.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 31518 Initial Form 27 Document #: 403479868

PURPOSE INFORMATION

- Rule 913.c.(1): Pit or Cuttings Trench closure.
- Rule 913.c.(2): Buried or partially buried vessel closure, which will be by removal.
- Rule 913.c.(3): Remediation of Spill and Releases pursuant to Rule 912.
- Rule 913.c.(4): Land treatment of Oily Waste pursuant to Rule 905.e.
- Rule 913.c.(5): Closure of Centralized E&P Waste Management Facilities pursuant to Rule 907.h.
- Rule 913.c.(6): Remediation of impacted Groundwater pursuant to Rule 915.e.(3).D, and the contaminant concentrations in Table 915-1.
- Rule 913.c.(7): Investigation and remediation of natural gas in soil or Groundwater.
- Rule 913.c.(8): When requested by the Director due to any potential risk to soil, Groundwater, or surface water.
- Rule 913.c.(9): Decommissioning of Oil and Gas Facilities.
- Rule 913.g: Changes of Operator.
- Rule 915.b: Request to leave elevated inorganics in situ.
- Other: \_\_\_\_\_

SITE INFORMATION

No Multiple Facilities

Facility Type: SPILL OR RELEASE	Facility ID: 484391	API #: _____	County Name: RIO BLANCO
Facility Name: LOVE RANCH 8 Off-Location Flowline	Latitude: 39.891270	Longitude: -108.292690	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWNW	Sec: 9	Twtp: 2S	Range: 97W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GC Most Sensitive Adjacent Land Use Cropland  
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**

All wells within the area are associated with this remediation project or are registered water wells associated with oil and gas development activities.

**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	To be determined	Laboratory analysis
Yes	SOILS	To be determined	Laboratory analysis
Yes	SURFACE WATER	To be determined	Laboratory 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.

Initial response activities can be found on COGCC Form 19 documents 403391282 and 403398312. Additional initial investigation activities can be found within the attached report of work completed included in this submittal document.

**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 ):

Vertical and horizontal extent of contamination and confirmation soil samples will be collected in support of this project.

**Proposed Groundwater Sampling**

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

Groundwater monitoring will be included in the site investigation, but specific points for groundwater monitoring have yet to be established.

**Proposed Surface Water Sampling**

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

Continued surface water samples will be collected from the previously established points outlined in the attached report of work completed.

**Additional Investigative Actions**

Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

Additional investigation activities will be conducted as surface water elevation recedes allowing for additional access to the point of release. Additional investigation will include soil and water samples to determine the extent of contamination associated with the project.

**SITE INVESTIGATION REPORT**

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 0  
Number of soil samples exceeding 915-1 \_\_\_\_\_  
Was the areal and vertical extent of soil contamination delineated? \_\_\_\_\_  
Approximate areal extent (square feet) \_\_\_\_\_

### NA / ND

-- Highest concentration of TPH (mg/kg) \_\_\_\_\_  
-- Highest concentration of SAR \_\_\_\_\_  
BTEX > 915-1 \_\_\_\_\_  
Vertical Extent > 915-1 (in feet) \_\_\_\_\_

### Groundwater

Number of groundwater samples collected 0  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) \_\_\_\_\_  
Number of groundwater monitoring wells installed \_\_\_\_\_  
Number of groundwater samples exceeding 915-1 \_\_\_\_\_

\_\_\_\_ Highest concentration of Benzene (µg/l) \_\_\_\_\_  
\_\_\_\_ Highest concentration of Toluene (µg/l) \_\_\_\_\_  
\_\_\_\_ Highest concentration of Ethylbenzene (µg/l) \_\_\_\_\_  
\_\_\_\_ Highest concentration of Xylene (µg/l) \_\_\_\_\_  
NA Highest concentration of Methane (mg/l) \_\_\_\_\_

### Surface Water

0 Number of surface water samples collected  
\_\_\_\_ Number of surface water samples exceeding 915-1  
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?

Caerus plans to continue to determine the extent of soil, groundwater, and surface water impacts associated with the project through laboratory analysis and will report findings to the CECMC on Supplemental Form 27s.

## REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes

### SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Caerus is in the process of determining the extent of contamination associated with the project. Once the extent of contamination is determined, Caerus will provide a remediation strategy to the CECMC to allow for source removal.

### 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.

Caerus is in the process of determining the extent of contamination associated with the project. Once the extent of contamination is determined, Caerus will provide a remediation strategy to the CECMC to allow for source removal.

### Soil Remediation Summary

In Situ

Ex Situ

\_\_\_\_ Bioremediation ( or enhanced bioremediation )

\_\_\_\_ Excavate and offsite disposal

\_\_\_\_\_ Chemical oxidation  
\_\_\_\_\_ Air sparge / Soil vapor extraction  
\_\_\_\_\_ Natural Attenuation  
\_\_\_\_\_ Other \_\_\_\_\_

If Yes: Estimated Volume (Cubic Yards) \_\_\_\_\_  
Name of Licensed Disposal Facility or ECMC 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.

Caerus continues to conduct surface water monitoring and boom deployment to ensure impacts to surface water are contained. Caerus will continue to conduct surface water monitoring at the outlined monitoring stations found on the attached report of work completed, and will report these results to the CECMC on a quarterly basis. Groundwater monitoring will be included in the site investigation, but specific points for groundwater monitoring have yet to be established.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

Quarterly     Semi-Annually     Annually     Other

### Request Alternative Reporting Schedule:

Semi-Annually     Annually     Other

Rule 913.e:

After initial approval of a Form 27, the Operator will provide quarterly update reports in a Supplemental Form 27 to document progress of site investigation and remediation, unless an alternative reporting schedule has been requested by the Operator and approved by the Director. The Director may request a more frequent reporting schedule based on site-specific conditions.

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

Other Q2 2024 REM update

## Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Per Rule 705.b, and in line with guidance laid out in the SBAP, Caerus has general liability insurance in the amount of \$1M, and Caerus has umbrella insurance, which sits over the general liability insurance in the amount of \$75M. The umbrella and general liability insurance covers property damage, bodily injury to third parties, and sudden or accidental pollution under a combined \$76M.

Operator anticipates the remaining cost for this project to be: \$ 100000

## 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

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

Volume of E&P Waste (liquid) in barrels

E&P waste (liquid) description

ECMC Disposal Facility ID #, if applicable:

Non-ECMC Disposal Facility:

# REMEDIATION COMPLETION REPORT

## REMEDIATION COMPLETION SUMMARY

Is this a Final Closure Request for this Remediation Project? No

If YES:

Compliant with Rule 913.h.(1).

Compliant with Rule 913.h.(2).

Compliant with Rule 913.h.(3).

Do all soils meet Table 915-1 standards?

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards?

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

Operator shall comply with the ECMC 1000-Series Reclamation Requirements for all impacted and disturbed areas.

## 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.

Caerus will reclaim all impacted areas in accordance with the COGCC 1000 series regulations

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 provide the seed mix? \_\_\_\_\_

If YES, does the seed mix comply with local soil conservation district recommendations? \_\_\_\_\_

Did the local soil conservation district provide the seed mix? \_\_\_\_\_

### SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. \_\_\_\_\_

Proposed date of completion of Reclamation. \_\_\_\_\_

## IMPLEMENTATION SCHEDULE

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

### PRIOR DATES

Date of Surface Owner notification/consultation, if required. \_\_\_\_\_

Actual Spill or Release date, or date of discovery. \_\_\_\_\_

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 05/02/2023

Proposed site investigation commencement. 05/02/2023

Proposed completion of site investigation. 07/31/2023

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/30/2023

Proposed date of completion of Remediation. 08/30/2024

Per Rule 913.d.(2): Any change from the approved implementation schedule will be requested at least 14 days in advance, and the Operator may not make the change without the Director's approval.

Change from approved implementation schedule per Rule 913.d.(2).

Basis for change in implementation schedule:

\_\_\_\_\_

## OPERATOR COMMENT

This document presents the Work Plan to install a permeable reactive barrier (PRB) trench, and to conduct a high-resolution site characterization (HRSC) investigation of soil and groundwater conditions at the Site. Additionally, the results of this investigation will be used to site in additional monitoring well locations and to design the future site remediation in-situ injection program.

A permeable reactive barrier interceptor trench will be installed between (or above) the point of release (POR) and the west bank of Piceance Creek where a hydrocarbon sheen has continually been intermittently identified since the release occurred. Hydrocarbon impacted soils will be removed and replaced with a slurry mixture of BOS 200® and clean soil. This phase of the project will take 2 days to complete, and it is anticipated that approximately 250 pounds of BOS 200® and 250 pounds of supplemental gypsum (electron donor) will be added to the base and sidewalls of the PRB trench prior to backfill. The PRB trench will be approximately 3-feet wide, 6-feet deep and 50-feet in length, completed in 10 feet long sections.

Additional HRSC will be used to evaluate the extent of the petroleum hydrocarbon impacts across the plume, identify preferential hydraulic pathways, and provide data to assist in the evaluation of remediation options at the Site. To accomplish this, Entrada and Caerus have subcontracted Vista Geoscience, of Golden, Colorado (Vista) to perform the investigation at the Site. Vista is proposing to use a Geoprobe 7000 series direct-push rig (or equivalent) to advance its membrane interface and hydraulic profiling tool (MiHPT) at the site to map the free Phase and dissolved phase plume at and downgradient of the Site. Approximately 24 boring locations will be advanced within the expanded HRSC and remediation design characterization area to accomplish each of these tasks.

I hereby certify all statements made in this form are to the best of my knowledge true, correct, and complete.

Signed: Blair Rollins

Title: EHS Specialist

Submit Date: 05/16/2024

Email: brollins@caerusoilandgas.com

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: John Heil

Date: 05/17/2024

Remediation Project Number: 31518

## COA Type

## Description

<u>COA Type</u>	<u>Description</u>
1 COA	Per Rule 908.a, submit a Form 15 for review and approval prior to construction of the proposed permeable reactive barrier interceptor trench (i.e., Special Purpose Pit).

## ATTACHMENT 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

<u>Att Doc Num</u>	<u>Name</u>
403788875	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
403788919	OTHER
403795247	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 3 Files

## General Comments

### User Group

### Comment

### Comment Date

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Comply with outstanding COAs.	05/17/2024

Total: 1 comment(s)