

State of Colorado
Energy & Carbon Management Commission

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Document Number:
403471242
Receive Date:
08/23/2023
Report taken by:
Steven Arauza

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.

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

OPERATOR INFORMATION

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	Phone Numbers
Address: 1001 17TH STREET #1600		Phone: (970) 285-2925
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 #: 24488 Initial Form 27 Document #: 403106734

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: 481814	API #: _____	County Name: GARFIELD
Facility Name: Garden Gulch 8 inch to Latham	Latitude: 39.566968	Longitude: -108.183634	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWSE	Sec: 32	Twps: 5S	Range: 96W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SC Most Sensitive Adjacent Land Use Non-cropland rangeland
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? No

Other Potential Receptors within 1/4 mile

House Log Gulch is located approximately 250 feet east.

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	Water sampling and laboratory analysis
Yes	SOILS	To be determined	Soil sampling and laboratory analysis
No	SURFACE WATER	None	Water sampling and 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.

On March 22, 2022, produced water was observed surfacing at the adjacent Lantham Laydown yard. It is estimated that approximately 30 barrels of produced water were released due to the flowline failure. The failed portion of flowline was exposed and standing fluids were recovered. The release was reported via COGCC Form 19 Document 402993777. Subsequently, COGCC Form 27 Document 403106734 was submitted and Remediation Project 24488 was issued.

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 samples will be collected as necessary to delineate the vertical and horizontal extent of soil impacts. Additional investigation is scheduled for summer 2023. Soil samples will be analyzed for the approved reduced analyte list of total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes (BTEX), 1,2,4 trimethylbenzene, 1,3,5 trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, electrical conductivity (EC), sodium adsorption ratio (SAR), pH, boron, arsenic, barium, cadmium, copper, lead, nickel, selenium, and hexavalent chromium.

Proposed Groundwater Sampling

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

Caerus will continue quarterly groundwater monitoring of the four installed groundwater monitoring wells to maintain delineation of groundwater impacts at the Location. Groundwater samples will be analyzed for COGCC Table 915-1 water constituents of concern.

Proposed Surface Water Sampling

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

Caerus will continue to monitor House Log Gulch located south of the point of release (POR) on a quarterly basis. Surface water samples will be analyzed for COGCC Table 915-1 water constituents of concern.

Additional Investigative Actions

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

See Remedial Action Plan.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil		NA / ND	
Number of soil samples collected	37	--	Highest concentration of TPH (mg/kg) 2909
Number of soil samples exceeding 915-1	37	--	Highest concentration of SAR 39.3
Was the areal and vertical extent of soil contamination delineated?	No		BTEX > 915-1 Yes
Approximate areal extent (square feet)	2500		Vertical Extent > 915-1 (in feet) 20
Groundwater			
Number of groundwater samples collected	27	--	Highest concentration of Benzene (µg/l) 185
Was extent of groundwater contaminated delineated?	Yes	--	Highest concentration of Toluene (µg/l) 0.46
Depth to groundwater (below ground surface, in feet)	27	--	Highest concentration of Ethylbenzene (µg/l) 1.38
Number of groundwater monitoring wells installed	4	--	Highest concentration of Xylene (µg/l) 8.22
Number of groundwater samples exceeding 915-1	14	NA	Highest concentration of Methane (mg/l)

Surface Water

19 Number of surface water samples collected
0 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?

Benzene impacts have been observed in two monitoring wells (MW02 & MW03) on either side of the pipeline corridor.

Were background samples collected as part of this site investigation?

Background soil samples were collected in support of this project, and are outlined in the report of work completed (ROWC) associated with Document 403315942.

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 is in the process of delineating soil impacts vertically and horizontally.

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.

Caerus proposes to install injection wells and inject a slurry of powdered carbon product and an alternative electron acceptor at the POR to enhance biodegradation and demobilize hydrocarbon impacts. Following treatment of the POR, additional wells will be installed downgradient of the POR along the east and west sides of the access road to facilitate additional remedial injections aiming to prevent downgradient mobilization of impacts. See the attached ROWC for details.

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.

See the attached ROWC for details on remediation summary of this project.

Soil Remediation Summary

In Situ

Ex Situ

Yes Bioremediation (or enhanced bioremediation)

_____ Chemical oxidation

_____ Air sparge / Soil vapor extraction

_____ Natural Attenuation

_____ Other _____

_____ 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

Yes 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 will continue monitoring the four groundwater monitoring wells, spring, and two surface water sample locations on a quarterly basis to maintain delineation of groundwater impacts. To date, benzene exceedances have been observed within MW02 & MW03. All water samples collected will be compared to COGCC Allowable Concentration (915-Groundwater) Standards for the project and reported to the COGCC on Supplemental Form 27 documentation.

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 2023 REM update and remediation plan proposal

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? Yes

Describe beneficial use, if any, of E&P Waste derived from this remediation project:

Volume of E&P Waste (solid) in cubic yards 40

E&P waste (solid) description Hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Greenleaf Environmental Services, DeBeque, 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

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 COGCC 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 return the spill area to the active working surface of the roadway for continued operation.

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. 03/22/2022

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 03/23/2022

Proposed site investigation commencement. 03/23/2022

Proposed completion of site investigation. _____

REMEDIAL ACTION DATES

Proposed start date of Remediation. 09/22/2022

Proposed date of completion of Remediation. 03/22/2024

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

Caerus proposes to install injection wells and inject a slurry of powdered carbon product and an alternative electron acceptor at the POR to enhance biodegradation and demobilize hydrocarbon impacts. Following treatment of the POR, additional monitoring points will be installed downgradient of the POR using a hydrovac to monitor success of product injection into the right of way and spill path. These wells could also be used to facilitate additional remedial injections aiming to prevent downgradient mobilization of impacts. The attached groundwater flow direction map indicates that the direction of flow leads from the point of release east-northeast toward MW01, which is therefore the downgradient point of compliance well for the Remediation project. Caerus proposes to conduct weekly sampling during the injection, and four weekly sampling events after the injection to monitor the effectiveness of the injection and prevention of impacts being pushed downgradient of MW01. The proposed sampling frequency assumes weather conditions are favorable for access during Q3 and Q4, but will be discussed with COGCC EPS Steven Arauza as the proposed injection is conducted. These sampling events will include locations MW01, MW02, MW03, MW04, spring, upstream, and downstream of the site as indicated in the attached report of work completed (ROWC), and will include COGCC Table 915-1 groundwater standards.

See the attached ROWC for site details.

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

Signed: Blair Rolins

Title: Environmental Specialist

Submit Date: 08/23/2023

Email: brollins@caerusoilandgas.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: Steven Arauza

Date: 09/07/2023

Remediation Project Number: 24488

COA Type

Description

<u>COA Type</u>	<u>Description</u>
0 COA	

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

403471242	INVESTIGATION/REMEDATION WORKPLAN (SUPPLEMENTAL)
403485386	REMEDATION PROGRESS REPORT
403507027	GROUND WATER ELEVATION MAP
403522737	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 4 Files

General Comments

User Group

Comment

Comment Date

Environmental	Comply with outstanding COAs.	09/07/2023
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Total: 1 comment(s)