FORM 27 Rev 5/22

State of Colorado
Energy & Carbon Management Commission

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Report taken by: Steven Arauza

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

OPERATOR INFORMATON

Name of Operator: CAERUS PICEANCE LLC Operator No: 10456
Address: 1001 17TH STREET #1600
City: DENVER State: CO Zip: 80202
Contact Person: Jake Janicek Email: jjanicek@caerusoilandgas.com

Phone Numbers
Phone: (970) 778-2314
Mobile: (970) 778-2314

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 31686 Initial Form 27 Document #: 403475735

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.
- [X] 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.
- [X] Other: Initial Status Update

SITE INFORMATION

No Multiple Facilities

Facility Type: SPILL OR RELEASE Facility ID: 484573 API #: County Name: GARFIELD
Facility Name: H7 Dumpline Latitude: 39.462858 Longitude: -107.701938
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: NENE Sec: 7 Twp: 7S Range: 92W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications ML
Most Sensitive Adjacent Land Use Rangeland
Is domestic water well within 1/4 mile? Yes
Is surface water within 1/4 mile? No
Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [X] **E&P Waste**
  - [X] Produced Water
  - [ ] Oil
  - [X] Condensate
  - [ ] Drilling Fluids
  - [ ] Drill Cuttings
- [ ] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [ ] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
Yes	SOILS	60x60x25	Soil sampling/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.

Please reference Initial Form 19 Spill Report under Document Number (DN) 40327356 and Spill/Release Point ID 484573 for initial spill and reporting details.

An initial investigative assessment was conducted on June 21 and 22, 2023, to delineate the impacts discovered while completing facility modifications at the location. Using a hydro-vacuum truck, four potholes were advanced in each cardinal direction immediately outside of the metal containment and two potholes within the metal containment adjacent to each tank. Potholes were advanced to total depths of 15 feet below ground surface (bgs) or refusal and field screening samples were collected via hand auger in 2 foot to 3 foot intervals. All collected soils were field screened for the presence or absence of hydrocarbon odors or staining via visual and olfactory senses as well as using a photoionization detector (PID). The most impacted soil samples and the terminus soil samples were submitted from each pothole.

Based on the potholing analytical results, a supplemental assessment was conducted on July 3 and 5, 2023, using a environmental drill rig to further delineate the observed historic impacts. One soil boring was advanced within the metal containment and four soil borings were advanced in each cardinal direction outside of the metal containment. Total depths ranged from 31.5 feet bgs to 32 feet bgs. Soil borings were screened in 5-foot intervals and characterized as described above, and confirmation samples were collected at every 10-foot interval and terminus.

Please reference the attached report of work completed (ROWC) for additional details on all investigative assessment activities conducted at the Site during Q2 2023.

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

[X] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

Caerus is currently in the process of determining the next steps to remediate the defined hydrocarbon plume located beneath the former tank battery containment and north of the tank containment within the dumpline corridor. Once a plan is in place, the plan will be presented to the Colorado Oil and Gas Conservation Commission (COGCC). Prior to any further investigative work Caerus requests a reduced analyte suite of total petroleum hydrocarbons (TPH), total xylenes, and naphthalene.

Please see the attached ROWC for further investigative details.

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):

Please see the "Proposed Soil Sampling" and "Remediation Summary" for additional investigative details.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected: 27

Number of soil samples exceeeding 915-1: 27

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

Approximate areal extent (square feet): 3600

NA / ND

-- Highest concentration of TPH (mg/kg): 2663.58

-- Highest concentration of SAR: 6.54

BTEX > 915-1: Yes

Vertical Extent > 915-1 (in feet): 22

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):

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?

[X] Were background samples collected as part of this site investigation?

Please reference DN 403104348 to reference previous site-specific background sampling summary/results.

[ ] Was investigation derived waste (IDW) generated as part of this investigation?

Volume of solid waste (cubic yards):

Volume of liquid waste (barrels):

[X] Is further site investigation required?

Please see the "Proposed Soil Sampling" and Remediation Summary" for additional investigative details.

REMEDIAL ACTION PLAN

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

The source is historic and cannot be determined.

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.

Caerus is currently in the process of evaluating various remediation approaches to address the defined hydrocarbon plume located beneath the former tank battery containment and north of the tank containment where the dumpline corridor turns into the former containment. The estimated volume of impacted soil beneath the former tank battery is 3,206.27 cubic yards (conservative estimate based on soil boring locations with respect to identified impacts).

Per COGCC Rule 915.e.(2).C Caerus requests relief of arsenic as a contaminant of concern (COC). The arsenic concentrations in all confirmation soil samples ranged from 4.02 milligrams per kilogram (mg/kg) to 12.1 mg/kg which is within site-specific background sample 20220613-H7(BG-01)@10-12' which had a reported concentration of 19.3 mg/kg.

Per COGCC Rule 915.e.(2).C Caerus requests relief of pH as a COC per site-specific waste characterization and process knowledge. The produced water pH value collected from the nearby produced water storage tank (Tank 80136) at the KRK-67S92W /7NESW (Location ID:334852) (K7) location is below all investigative confirmation soil sample values collected at the Site with a value of 7.57 standard unit (SU). Values of pH for all confirmation samples collected range from 7.67 SU to 9.24 SU. The K7 and H7 locations produce from the same geologic formation (Rollins Formation). Therefore, their produced water signatures should be identical and representative of the each location. Since the pH of the produced fluids is lower than the assessment samples, Caerus believes that a release of these fluids would not contribute to the elevated pH results exhibited in the assessment samples. A geographic location map is included in the attached ROWC as Figure 6.

Please see "Operator Comments" section for additional information.

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

Approved Reporting Schedule:

☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Initial Status Update

☐ **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

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: $ 80000

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:

None

Volume of E&P Waste (solid) in cubic yards 0

E&P waste (solid) description

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility:

Volume of E&P Waste (liquid) in barrels 150

E&P waste (liquid) description impacted soil mixed with hydrovac rinseate

COGCC Disposal Facility ID #, if applicable:

Non-COGCC Disposal Facility: Greenleaf Environmental Services

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.

There is currently nothing to reclaim associated with project.

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 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). 06/07/2023

Proposed site investigation commencement. 06/21/2023

Proposed completion of site investigation. 07/05/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation.

Proposed date of completion of Remediation.

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

Carry over from "Remediation Summary" section.
Per COGCC Table 915-1 Footnote 1, Caerus requests relief of sodium adsorption ratio (SAR) as a COC. The concentrations of all confirmation soil samples collected during the investigative assessments range from 6.16 to 6.54 and were all less than the range of site-specific background SAR concentrations except for site-specific background 20220613-H7(BG-02)@25-27' with a concentration of 6.05. All other site-specific concentrations range from 6.56 to 10.8 which were collected from two site-specific background soil borings advanced north and southwest of the pad location. The site-specific background boring locations with respect to the pad location can be referenced in Figure 5 of the attached ROWC.

In order to address a COA concerning assessing potential pathways to groundwater, a discussion of Caerus' assessment of potential pathways to groundwater is detailed below. Caerus believes that a pathway to groundwater from soil identified beneath the dumpline and tank containment [point of release (POR)] location does not exist due to the following reasons:
1) The vertical distance between the POR location and the anticipated static water table depth. The static water table depth is estimated to be 154 feet below pad surface based on documents associated with a domestic water well approximately 535 feet to the north and identified by DWR Permit # 64199-. The vertical distance between the assumed static water level and the POR location is approximately 147 feet associated with this remediation project.
2) No groundwater was/has been observed infiltrating the soil borings during drilling site investigation activities.
3) The nearest sensitive receptor (200 feet northwest) is an unnamed tributary to Mamm Creek which the United States Geological Survey (USGS) map symbol detailed on the topo map provided on COGCC GISOnline indicates it is an intermittent stream. However, based on local knowledge and field observations, this tributary is better characterized as ephemeral, as it rarely flows except in extreme weather events, exceptional groundwater elevation increases manifested through natural springs, and/or rain/snow melt events. There is no observable standing water within the immediate area and any resulting appreciable groundwater elevation increase would have been observed in the unnamed drainage or the boreholes associated with this remediation project.

Given these observations and facts concerning groundwater in the immediate vicinity of the project site, per COGCC Table 915-1 Footnote 7, Caerus' requests that the Director make a determination to continue evaluating remediation success of this project using Residential Soil Screening Level Concentrations listed in Table 915-1.

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

Signed: Jake Janicek Title: EHS Specialist

Submit Date: 08/15/2023 Email: jjanicek@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: 09/22/2023

Remediation Project Number: 31686

COA Type	Description
	Comply with COGCC Rule 1105 flowline abandonment requirements, including notification and verification requirements.
	Submit Supplemental eForm 19 to request closure of Spill/Release ID #484573. Supplemental report shall comply with outstanding COAs, indicate that work is proceeding under an approved eForm 27 and shall reference the Remediation Project number assigned upon approval of this report.
	Comply with Rule 912 for any historical impacts that are discovered.
	Operator shall collect soil samples from areas most likely to be impacted and shall collect an appropriate number of representative soil samples to delineate the horizontal and vertical extents of contamination, per Rule 915.e.(2).B.
	Per Rule 913.b.(2), the Operator will conduct sampling and analysis of soil, and groundwater--if encountered, to determine the horizontal and vertical extent of any contamination in excess of the cleanup concentrations in Table 915-1 for soil and groundwater. The Operator shall analyze samples for the approved analyte list and shall compare analytical results for site investigation samples to the Table 915-1 Residential Soil Screening Level Concentrations.
	Based on the information provided (doc #403496634), the Operator's request for a reduced analyte suite of TPH, total xylenes, and napthalene is approved per Rule 915.e.(2).C with the following condition: In addition to the requested analyte list, Operator will continue to analyze soil samples for ethylbenzene, 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene.
6 COAs	

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
403475735	INVESTIGATION/REMEDIATION WORKPLAN (INITIAL)
403496634	SITE INVESTIGATION REPORT
403538296	FORM 27-INITIAL-SUBMITTED

Total Attach: 3 Files

General Comments

User Group	Comment	Comment Date
Environmental	Based on the assessment of potential pathways to groundwater provided under Operator Comment, the Operator's request to utilize the Table 915-1 Residential Soil Screening Level concentrations is conditionally approved.	09/22/2023
Environmental	Based on the information provided for background soil samples (doc #403496634), the Operator's request for relief from SAR as a contaminant of concern is conditionally approved per Table 915-1 Footnote 1.	09/22/2023
Environmental	Based on the information provided for the site-specific characterization and process knowledge provided under Operator Comment, the Operator's request for relief from pH as a contaminant of concern is conditionally approved per Rule 915.e.(2).C.	09/22/2023
Environmental	Based on the information provided for background soil samples (doc #403496634), the Operator's request for relief from arsenic as a contaminant of concern is conditionally approved per Table 915-1, Footnote 1.	09/22/2023

Total: 4 comment(s)