

State of Colorado
Oil and Gas Conservation 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. Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATION

Name of Operator: CAERUS PICEANCE LLC	Operator No: 10456	Phone Numbers
Address: 1001 17TH STREET #1600		Phone: (970) 778-2314
City: DENVER State: CO Zip: 80202		Mobile: (970) 778-2314
Contact Person: Jake Janicek	Email: jjanicek@caerusoilandgas.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 15878 Initial Form 27 Document #: 402433873

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 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 checked="" 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 checked="" type="checkbox"/> Other Cuttings Remediation

SITE INFORMATION N Multiple Facilities (in accordance with Rule 909.c.)

Facility Type: LOCATION	Facility ID: 335928	API #: _____	County Name: GARFIELD
Facility Name: SG E34 496	Latitude: 39.660280	Longitude: -108.160547	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWNW	Sec: 34	Twp: 4S	Range: 96W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications CL Most Sensitive Adjacent Land Use 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

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 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 checked="" 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	SOILS	4263 cubic yards	Laboratory Analytical

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 5/20/2020, composite soil samples (20200520-E34-496 (CUTW), 20200520-E34-496 (CUTWMID), and 20200520-E34-496 (CUTE)) were collected from the stockpile of drill cuttings produced during the drilling of natural gas wells from 11/18/2018 to 5/10/2019 on the E34-496 pad location. All samples were submitted for laboratory analysis of all analytes listed in COGCC Table 910-1. Laboratory analytical results indicate that all samples were compliant with COGCC Table 910-1 Concentration Levels (except for the Concentration Levels listed for benzene, EC, SAR, and/or pH) or were below background concentrations for arsenic. Table 1 summarizes analytical results and reports are attached. Figure 1 depicts sampling locations. Appendix 1 details sampling efforts associated with the background sampling mentioned above. Background samples were collected from the M34-496 pad location (COGCC Location ID 335927).

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):

Composite soil samples will be collected from the cuttings that have been processed through the soil shredder at a rate of one sample per approximately 1000-2000 cubic yards of cuttings. Caerus requests a reduced analyte suite for all future soil samples. This reduced analyte suite would include all hydrocarbon analytes (benzene) that soil samples collected on 5/20/2020 exhibited exceedances for. Please see the "Remediation Summary" section of this form for details on how Caerus plans to address inorganic exceedances.

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 3

Number of soil samples exceeding 910-1 3

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

Approximate areal extent (square feet) 20000

NA / ND

-- Highest concentration of TPH (mg/kg) 220

-- Highest concentration of SAR 18

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 0

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 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?

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.

No source removal is necessary.

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.

All drill cuttings will be remediated via mechanical soil shredding until soil samples confirm compliance with the benzene Concentration Level listed in COGCC Table 910-1. Remediation success will be verified via the sampling plan provided in the "Proposed Soil Sampling" section of this form.

In order to prepare the cuttings for processing through the shredder, they will be laid out in a landfarm format. This will allow them to dry completely. While they are in a landfarm format, composite samples will be collected from them. All samples will be submitted for laboratory analysis of the sampling suite proposed in the "Proposed Soil Sampling" section of this form.

In order to address the arsenic exceedances exhibited in the soil samples, Caerus is requesting consideration for the COGCC Table 910-1 Concentration Level for arsenic under guidelines set forth under FAQ 31. Caerus believes the request for FAQ 31 consideration is acceptable as arsenic results for all three samples were below background concentrations of samples collected at the nearby M34-496 pad location (COGCC Location ID 335927). Appendix 1 details information on these background samples.

In order to address EC, SAR, and pH exceedances exhibited in samples collected on 5/20/2020, Caerus is requesting consideration for COGCC Table 910-1 Concentration Levels for EC, SAR, and pH under guidelines set forth under FAQ 32 as all cuttings will be buried (Pending COGCC approval) under three feet of native soil. Caerus believes the request for FAQ 32 consideration is acceptable as there are minimal potential receptors in the area and environmental impacts to these receptors are unlikely. The nearest surface water is 1200 feet to the west and groundwater at the site is estimated to be greater than 200 feet below the pad surface based on topography.

Soil Remediation Summary

In Situ

_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Air sparge / Soil vapor extraction
_____ Natural Attenuation
_____ Other _____

Ex Situ

No _____ Excavate and offsite disposal
If Yes: Estimated Volume (Cubic Yards) _____
Name of Licensed Disposal Facility or COGCC Facility ID # _____
Yes _____ Excavate and onsite remediation
Yes _____ Land Treatment
No _____ Bioremediation (or enhanced bioremediation)
No _____ Chemical oxidation
Yes _____ Other _____ Soil Shredding _____

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 _____

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 _____

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.

Once an NFA status has been granted for this project, a Cuttings Beneficial Reuse Plan will be submitted via a Form 4 which will include contour drawings and include specifics of the interim reclaim plan including the burial of drill cuttings. In general, all disturbed areas will be reclaimed except for the working pad surface which includes the areas near the wellheads, separators, tank batteries, and areas reasonably needed for production and/or subsequent drilling operations. Per FAQ 32, which addresses materials with elevated pH, SAR, and EC, the cuttings will be positioned in the cut slope of the auxiliary pad to the southwest of the main pad under three feet of clean material, segregated soil horizons replaced to their original relative positions, fill and cut slopes recontoured to achieve erosion control/long-term stability, and top soil tilled adequately to establish a proper seedbed. A seed mix approved by the landowner will be used to re-seed all disturbed non-working surface areas during the next favorable season. Bare ground and noxious weed spraying will be utilized for weed prevention.

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? Yes _____

If NO, does the seed mix comply with local soil conservation district recommendations? Yes _____

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). 05/20/2020

Date of commencement of Site Investigation. 05/20/2020

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 05/20/2020

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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: 07/10/2020

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: 08/25/2020

Remediation Project Number: 15878

COA Type

Description

	Provide correct latitude and longitude that correspond with land treatment unit location via Supplemental eForm 27.
	Any accumulation of fluid in treatment area shall be removed upon detection. Treatment area shall monitored after any significant precipitation event.
	Prior to 3-years of operations and if materials have not met the Table 910-1 Standards, the Operator shall have submitted and received approval of a Form 28 Centralized Exploration and Production (CE&P) Facility meeting all of the requirements, including financial assurance. If the land treatment unit is not permitted as a Form 28 at that time, then prior to the 3-year anniversary, ALL impacted land treatment material shall be removed and disposed at an approved facility. No time extensions to the land treatment unit will be granted.
	Operator's request for a reduced analyte suite (benzene only) cannot be approved at this time based on the sampling frequency (1 sample per 1,091 to 1,891 cubic yards). In addition to benzene, operator shall continue to analyze representative samples for TPH-DRO and TPH-GRO.

	<p>Under Remediation Summary, Operator includes a request for addressing arsenic exceedances under guidelines set forth in FAQ 31 and addressing exceedances of EC, SAR, and pH under guidelines set forth in FAQ 32. Approval of the Operator's eForm 27 does not constitute approval to address inorganics under FAQs 31 and 32 at this time.</p> <p>Approval of this Form 27 does not constitute COGCC approval of operator's proposed beneficial reuse of cuttings. Operator shall submit Form 4 Beneficial Reuse Sundry with figures of the SG E34 496 Location (ID No. 335928) showing the existing, post interim and final reclamation contours to COGCC EPS and Reclamation Specialist for approval prior to reuse of cuttings. The operator's Form 4 Beneficial Reuse Sundry shall also address Table 910-1 exceedances for arsenic, SAR, pH, and EC.</p>
	<p>Under Proposed Soil Sampling, Operator states that soil samples will be collected at a rate of "one sample per approximately 1,000-2,000 cubic yards of cuttings."</p> <p>Operator shall collect soil samples at a minimum rate of one sample per 1,000 cubic yards of cuttings.</p>

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.

<u>Att Doc Num</u>	<u>Name</u>
402433873	FORM 27-INITIAL-SUBMITTED
402433878	MAP
402433881	ANALYTICAL RESULTS
402433883	ANALYTICAL RESULTS
402433888	ANALYTICAL RESULTS

Total Attach: 5 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	Approval of the eForm 27 is not an endorsement of the reclamation plan that has been included on this form; Location will need to meet 1000 series reclamation requirements in order to pass interim and final reclamation. A field inspection will be conducted at a future date to evaluate compliance with reclamation standards.	08/17/2020

Total: 1 comment(s)