

State of Colorado  
Oil and Gas Conservation Commission

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Kari Brown

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: <u>CRESTONE PEAK RESOURCES OPERATING LLC</u>	Operator No: <u>10633</u>	Phone Numbers Phone: <u>(303) 7744017</u> Mobile: <u>(720) 9251820</u>
Address: <u>1801 CALIFORNIA STREET #2500</u>		
City: <u>DENVER</u>	State: <u>CO</u>	Zip: <u>80202</u>
Contact Person: <u>Schuyler Hamilton</u>	Email: <u>SHamilton@CiviResources.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 16598 Initial Form 27 Document #: 402591326

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

Yes  Multiple Facilities

Facility Type: SPILL OR RELEASE Facility ID: 479236 API #: \_\_\_\_\_ County Name: WELD

Facility Name: Sheley 1 separator Latitude: 40.163573 Longitude: -104.899443

\*\* correct Lat/Long if needed: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

QtrQtr: NESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: TANK BATTERY Facility ID: 479258 API #: \_\_\_\_\_ County Name: WELD

Facility Name: Sheley 1 battery Latitude: 40.163470 Longitude: -104.899489

\*\* correct Lat/Long if needed: Latitude: 40.163554 Longitude: -104.899792

QtrQtr: SESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 479403 API #: \_\_\_\_\_ County Name: WELD  
Facility Name: Sheley 1 Battery Latitude: 40.163659 Longitude: -104.899719  
\*\* correct Lat/Long if needed: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
QtrQtr: SESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

Facility Type: SPILL OR RELEASE Facility ID: 480273 API #: \_\_\_\_\_ County Name: WELD  
Facility Name: Sheley 1 Latitude: 40.163715 Longitude: -104.899720  
\*\* correct Lat/Long if needed: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_  
QtrQtr: SESW Sec: 4 Twp: 2N Range: 67W Meridian: 6 Sensitive Area? Yes

### **SITE CONDITIONS**

General soil type - USCS Classifications SM Most Sensitive Adjacent Land Use cropland

Is domestic water well within 1/4 mile? No Is surface water within 1/4 mile? No

Is groundwater less than 20 feet below ground surface? Yes

#### **Other Potential Receptors within 1/4 mile**

Occupied structures

# 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	Approximately 80' x 80'	Monitoring Wells
Yes	SOILS	160' x 120' (undefined vertically)	Soil Borings

## INITIAL ACTION SUMMARY

Description of initial action or emergency response measures take to abate, investigate, and/or remediate impacts associated with E&P Waste.

This remediation project was initiated to support removal of two partially buried produced water vessels which were previously removed from this production facility without the required soil sampling. In response to this compliance gap, multiple investigative soil borings were completed in and around the previous locations of the vessels. Soil and groundwater samples from the initial soil boring locations confirmed organic and inorganic impacts above Table 915-1 allowable limits and were reported as Spill/Release Point ID 479403. Two additional spills/releases have since been added to this Remediation Project: 480273 and 479236. 480273 was a release of produced water from a separate partially buried vessel discovered June 21, 2021. 479236 was a release of produced water from a separator leg discovered January 20, 2021. Additional soil borings were advanced to delineate the extent of soil impacts. Select soil borings were completed as monitoring wells to delineate the extent of groundwater impacts and to allow for quarterly monitoring of groundwater impacts. Based on analytical data from the abovementioned sampling efforts, soil and groundwater organic and inorganic constituents of concern have been horizontally delineated.

## 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 ):

Crestone does not propose additional soil sampling at this time.

### Proposed Groundwater Sampling

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

Groundwater samples will be collected and analyzed for Table 915-1 constituents of concern until results are within COGCC allowable limits for four consecutive quarters.

### 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 44  
 Number of soil samples exceeding 915-1 26  
 Was the areal and vertical extent of soil contamination delineated? No  
 Approximate areal extent (square feet) 40000

**NA / ND**

-- Highest concentration of TPH (mg/kg) 1381  
 NA Highest concentration of SAR           
 BTEX > 915-1 Yes  
 Vertical Extent > 915-1 (in feet) 16

**Groundwater**

Number of groundwater samples collected 53  
 Was extent of groundwater contaminated delineated? Yes  
 Depth to groundwater (below ground surface, in feet) 6  
 Number of groundwater monitoring wells installed 12  
 Number of groundwater samples exceeding 915-1 24

-- Highest concentration of Benzene (µg/l) 61  
 ND Highest concentration of Toluene (µg/l)           
 -- Highest concentration of Ethylbenzene (µg/l) 240  
 -- Highest concentration of Xylene (µg/l) 1900  
 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?

Several background soil samples were collected and submitted for inorganic constituents of concern to characterize native levels of inorganics. Analytical results of pH for BKG06@4 registered at 8.87, demonstrating elevated native pH at the site. One waste characterization sample (PW01) was also collected from the produced water on site and analyzed for Table 915-1 metals. Based on the results from PW01, the produced water at the site is not a significant source of arsenic (0.002974 mg/L), barium (8.92 mg/L), or selenium (<0.001 mg/L). Two background groundwater samples were collected to characterize native concentrations of total dissolved solids (TDS), chlorides, and sulfates. Based on analytical results, Crestone proposes the following alternative allowable limits for TDS and sulfate: 1850 mg/L and 577 mg/L respectively. Data for background samples and further background result considerations are attached.

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?

Groundwater samples will be collected from installed wells and submitted for analysis of Table 915-1 constituents on a quarterly basis until results are within Table 915-1 allowable limits for four consecutive quarters.

**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.

Soils and water may be removed and transported to a licensed disposal facility. Waste manifests will be available upon request.

**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 Site Investigation History for an overview of site investigation initiation and history. 4th quarter 2021 groundwater results indicate MW07 exceeded Table 915-1 allowable limits for benzene and 1,2,4 trimethylbenzene, and MW05 exceeded allowable limits for TDS and chlorides. All other samples were within Table 915-1 allowable limits. Given the number and spread of installed monitoring wells at the site, the location of soil impacts at the site, the demonstrated static nature of the impact plume, shallow groundwater, and varied soil lithologies, Crestone proposes to continue to monitor impacts at the site via quarterly groundwater sampling to ensure impacts remain delineated and do not migrate to other potential sources while Crestone evaluates viable remediation technologies. See the attached Groundwater Contour Map and Laboratory Results Summary Table for sample locations, groundwater flow direction, and analytical results.

## 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  
Yes \_\_\_\_\_ 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.

Twelve groundwater monitoring wells are currently installed at the site and are monitored on a quarterly basis. As of Q2 2021, organic exceedances are limited to MW07, and groundwater impacts are delineated. Groundwater samples will be collected and analyzed for Table 915-1 constituents of concern until results are within Table 915-1 allowable limits for four consecutive quarters.

# 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 \_\_\_\_\_

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

# 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.

This facility remains in production; reclamation is not scheduled at this time. When the facility is decommissioned at a later date, reclamation activities will be completed in accordance with 1000 Series 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 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. 02/04/2021

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

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 02/12/2021

Proposed site investigation commencement. 02/16/2021

Proposed completion of site investigation. \_\_\_\_\_

### 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**

This form has been submitted to provide 4th quarter 2021 groundwater monitoring data to the COGCC. Please find site investigation information attached including site map, groundwater contour map, lab results summary tables, and lab report.

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

Signed: Schuyler Hamilton

Title: Environmental Specialist

Submit Date: 04/08/2022

Email: SHamilton@CiviResources.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: Kari Brown

Date: 06/07/2022

Remediation Project Number: 16598

**Condition of Approval****COA Type****Description**

	Operator shall fully populate the implementation schedule in accordance with Rule 913.d on the next Form 27.
1 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**

402949860	FORM 27-SUPPLEMENTAL-SUBMITTED
403009350	MONITORING REPORT

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)