

State of Colorado
Oil and Gas Conservation Commission

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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 #: 4082 Initial Form 27 Document #: 1881429

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: <u>WELL</u> | Facility ID: _____ | API #: <u>123-18575</u> | County Name: <u>WELD</u> |
| Facility Name: <u>BROWN C UNIT 2</u> | Latitude: <u>40.085008</u> | Longitude: <u>-105.033419</u> | |
| ** correct Lat/Long if needed: Latitude: _____ Longitude: _____ | | | |
| QtrQtr: <u>NWNW</u> | Sec: <u>5</u> | Twp: <u>1N</u> | Range: <u>68W</u> Meridian: <u>6</u> Sensitive Area? <u>Yes</u> |

SITE CONDITIONS

General soil type - USCS Classifications SW Most Sensitive Adjacent Land Use Pasture

Is domestic water well within 1/4 mile? Yes 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

Lower Boulder Ditch

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 checked="" 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 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 | GROUNDWATER | No impacts remaining as of Q2 2021 | Monitoring Wells |
| Yes | SOILS | 76' x 50' x 15.5' bgs | Excavation |

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 November 1, 2007, EnCana Oil & Gas identified integrity issues associated with the partially buried produced water vessel and a connecting flowline which released an and an unknown volume of comingled fluids. A Form 19 (doc #1881428) was submitted to report the release to the state. The first of two limited excavations was completed in November 2007 to remove accessible impacted soil. Final excavation extents measured 30 feet x 70 feet x 18 feet bgs. Neither vertical nor horizontal delineation were achieved due to integrity concerns associated with the Boulder Ditch and an active gas line which ran through the excavation. The second limited excavation effort was completed December 2011 to remove additional soil impacts left in place by the 2007 excavation. Final extents of the excavation efforts measured 28 feet x 48 feet x 10 feet bgs. Vertical delineation was not achieved as impacts past the vadose zone were not characterized. A final, comprehensive excavation was completed in February and March 2021 wherein soil impacts were delineated horizontally and vertically in accordance with Table 910-1 allowable limits. The final excavation extents measured 76 feet x 50 feet x 15.5 feet bgs. More impacted soil was removed and disposed at the Front Range Landfill. Lesser impacted soil was stockpiled on site and treated with oxidizers. Composite samples were collected from all treated soil and from within the footprint of contaminated and treatment stockpiles to verify compliance with Table 910-1 standards for TPH and BTEX. Contaminated groundwater was encountered in each excavation at approximately 10' bgs and has been treated several times with COGAC and oxidizers via subsurface injections and exposed surface application. There are currently 12 monitoring wells installed at the site to facilitate quarterly groundwater quality monitoring.

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):

No additional soil sampling is proposed.

Proposed Groundwater Sampling

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

Based on dissolved phase petroleum hydrocarbon impacts beneath the site, groundwater monitoring will continue to be conducted on a quarterly basis. Collected groundwater samples will be analyzed for Table 915-1 organic and inorganic constituents of concern until results are within allowable limits for four consecutive quarters. Reduced analyte lists may be requested in future submittals based on laboratory results. One or more groundwater samples may be collected to establish native concentrations of inorganic constituents.

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 | NA / ND |
|--|--|
| Number of soil samples collected <u>65</u> | -- Highest concentration of TPH (mg/kg) <u>6050</u> |
| Number of soil samples exceeding 915-1 <u>5</u> | NA Highest concentration of SAR _____ |
| Was the areal and vertical extent of soil contamination delineated? <u>Yes</u> | BTEX > 915-1 <u>No</u> |
| Approximate areal extent (square feet) <u>3800</u> | Vertical Extent > 915-1 (in feet) <u>15</u> |
| Groundwater | |
| Number of groundwater samples collected <u>374</u> | -- Highest concentration of Benzene (µg/l) <u>4050</u> |
| Was extent of groundwater contaminated delineated? <u>Yes</u> | -- Highest concentration of Toluene (µg/l) <u>480</u> |
| Depth to groundwater (below ground surface, in feet) <u>10</u> | -- Highest concentration of Ethylbenzene (µg/l) <u>340</u> |
| Number of groundwater monitoring wells installed <u>12</u> | -- Highest concentration of Xylene (µg/l) <u>2410</u> |
| Number of groundwater samples exceeding 915-1 <u>81</u> | 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?

Crestone proposes to use AGW-06 as a background sample to determine native concentrations of TDS, chloride, and sulfate in groundwater as it is crossgradient of the source and has never exceeded for any constituents of concern.

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?

Based on dissolved phase petroleum hydrocarbon impacts beneath the site, groundwater monitoring will continue to be conducted on a quarterly basis. Collected groundwater samples will be analyzed for Table 915-1 organic and inorganic constituents of concern until results are within 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.

From February 10 to March 5, 2021, excavation activities were conducted at the site to remove impacted soil identified during the December 2020 site assessment near monitoring well MW-01. The excavation extended to a depth of approximately 15.5 feet. The footprint of the excavation was approximately 76 by 50 feet. Groundwater was encountered at approximately 10 feet bgs. Excavation activities continued until laboratory results of soil samples collected from the base and sidewalls demonstrated compliance with Table 910-1 allowable limits for TPH and BTEX. Approximately 1,096 tons or 777 cubic yards of impacted soil were excavated and disposed of at the Front Range Landfill in Erie, CO. Approximately 1,405 cubic yards of impacted soil was excavated and stockpiled onsite. Stockpiled soil was mechanically mixed to allow for natural volatilization of petroleum hydrocarbons from the soil. Once the soil was adequately treated, composite soil samples were collected from all treated stockpiled soil to verify compliance with COGCC Table 910-1 standards for TPH and BTEX prior to using the soil to backfill the excavation.

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 Initial Action Summary for a review of remediation project initiation and progress.
 3rd quarter 2021 groundwater data was collected September 8, 2021. Given consideration of monitoring well AGW-6 to establish background levels of TDS, chlorides, and sulfate, all Table 915-1 constituents of concern were within allowable limits. It should be noted that inorganic constituent values are highest in the areas where COGAC and oxidizers were applied, suggesting that the source of these elevated values is the approved remedial treatment (persulfate oxidizers) rather than the hydrocarbon material release. It is estimated that NFA status will be achieved by 1st quarter 2022.

Soil Remediation Summary

| | |
|---|---|
| <input type="checkbox"/> In Situ | <input checked="" type="checkbox"/> Ex Situ |
| _____ Bioremediation (or enhanced bioremediation) | Yes Excavate and offsite disposal |
| _____ Chemical oxidation | _____ If Yes: Estimated Volume (Cubic Yards) _____ 777 |
| _____ Air sparge / Soil vapor extraction | Name of Licensed Disposal Facility or COGCC Facility ID # _____ |
| _____ Natural Attenuation | Yes Excavate and onsite remediation |
| _____ Other _____ | No Land Treatment |
| | No Bioremediation (or enhanced bioremediation) |
| | Yes Chemical oxidation |
| | No Other _____ |

Groundwater Remediation Summary

No _____ Bioremediation (or enhanced bioremediation)

Yes _____ Chemical oxidation

No _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other COGAC _____

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.

Based on dissolved phase petroleum hydrocarbon impacts beneath the site, groundwater monitoring will continue to be conducted on a quarterly basis. Collected groundwater samples will be analyzed for Table 915-1 organic and inorganic constituents of concern until results are within COGCC 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.

Reclamation activities will be completed in accordance with 1000 Series Rules, in collaboration with the landowner, and reported in a Form 4 (Sundry Notice) with proper documentation to demonstrate compliance with requirements for final reclamation.

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). 11/01/2007

Proposed site investigation commencement. 11/05/2007

Proposed completion of site investigation. 03/05/2022

REMEDIAL ACTION DATES

Proposed start date of Remediation. 11/01/2007

Proposed date of completion of Remediation. 03/05/2021

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:

