

State of Colorado Oil and Gas Conservation Commission

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08/30/2018

Report taken by:

RICK ALLISON

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.

Refer to Rules 340, 905, 906, 907, 908, 909, and 910

OPERATOR INFORMATION

Name of Operator: SRC ENERGY INC	Operator No: 10311	Phone Numbers Phone: (970) 4755220 Mobile: ()
Address: 1675 BROADWAY SUITE 2600		
City: DENVER	State: CO Zip: 80202	
Contact Person: Dave Castro	Email: dcastro@srcenergy.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10672

Initial Form 27 Document #: 401452818

PURPOSE INFORMATION

- | | |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination | <input checked="" type="checkbox"/> 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water |
| <input checked="" 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 checked="" type="checkbox"/> 909.c.(2), Rule 906: Spill/Release Remediation | <input type="checkbox"/> Rule 909.e.(2)B.: Closure of remediation project |
| <input 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 type="checkbox"/> Other |

SITE INFORMATION

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

Facility Type: SPILL OR RELEASE	Facility ID: 451116	API #:	County Name: WELD
Facility Name: Eldridge 4-23		Latitude: 40.475524	Longitude: -104.736213
		** correct Lat/Long if needed: Latitude: 40.475525	Longitude: -104.736236
QtrQtr: SENE	Sec: 23	Twp: 6N	Range: 66W Meridian: 6 Sensitive Area? No

SITE CONDITIONS

General soil type - USCS Classifications SC

Most Sensitive Adjacent Land Use agriculture

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? Yes

Other Potential Receptors within 1/4 mile

Seeley Lake, various

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	190' x 80'	Analyzed groundwater from MWs
Yes	SOILS	90' x 85'	Analyzed soils from MW 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.

Historical release found from removal of concrete water vault. Upon removal water vault, excavation activities were started to remove impacted soils near release point. Groundwater amendment was applied to the excavation prior to backfilling activities. Based on excavation and soil/groundwater samples collected it was determined that further site delineation was needed.

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 impacts are defined at the site. A total of 42 soil grab samples have been collected from excavation sidewalls, monitoring/pilot test wells, and soil borings. During proposed excavation activities (source removal), an additional 9-14 sidewall grab soil samples will be collected. The samples will be analyzed for BTEX, TPH-GRO, and TPH-DRO.

Proposed Groundwater Sampling

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

Groundwater impacts are defined at the site. Currently 21 monitoring wells (MW-1 through MW-21) exist onsite. Monitoring wells MW-1 through MW-21 will be sampled on a quarterly basis. The groundwater samples will be analyzed for BTEX.

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 42

Number of soil samples exceeding 910-1 13

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

Approximate areal extent (square feet) 7650

NA / ND

-- Highest concentration of TPH (mg/kg) 11293
.7

-- Highest concentration of SAR 2.04

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 4

Groundwater

Number of groundwater samples collected 61

Was extent of groundwater contaminated delineated? Yes

Depth to groundwater (below ground surface, in feet) 4'

Number of groundwater monitoring wells installed 21

Number of groundwater samples exceeding 910-1 25

-- Highest concentration of Benzene (µg/l) 37200

-- Highest concentration of Toluene (µg/l) 15400

-- Highest concentration of Ethylbenzene (µg/l) 17000

-- Highest concentration of Xylene (µg/l) 46400

NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected

0 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?

Groundwater impacts offsite, to the southwest of the pad, have been defined. MW-18 is the only offsite monitoring well with groundwater impacts exceeding 910-1.

☒ Were background samples collected as part of this site investigation?

Soil sample SS-01 was analyzed for inorganics (EC, SAR, pH).

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

Volume of solid waste (cubic yards) 900

Volume of liquid waste (barrels) 0

☐ Is further site investigation required?

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.

Initial source removal was completed via excavation in June 2017. Additional 900 cubic yards of impacted soil are proposed to be excavated to finish source removal activities. The proposed excavation would be advanced to a total depth of approximately 6 feet below ground surface (bgs) and application of groundwater amendment will be utilized on the southwest corner of the pad. Three days of excavation activities are anticipated.

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.

Following additional source removal activities via excavation (remediation of remaining impacted soil), a proposed mobile air sparge/soil vapor extraction (AS/SVE) remedial will be installed onsite (remediation of impacted groundwater onsite). Based on AS/SVE pilot testing activities completed at the Site in April 2018, AS/SVE technology is a feasible remedial method to address the petroleum hydrocarbon impacted groundwater remaining at the site. The AS/SVE remedial system will consist of ten, 2-inch vertical AS wells and four, 2-inch horizontal SVE wells. Each AS/SVE remedial well will be connected to an individual conveyance line (1-inch polyvinyl chloride (PVC) for AS and 2-inch PVC for SVE) that will tie into the equipment housed within the mobile trailer. The AS/SVE mobile trailer will be powered by a generator fueled by a 1,000-gallon propane aboveground storage tank (AST). Installation of the AS/SVE system is anticipated to take 4 days to complete. Proposed operation of the AS/SVE remedial system for 12 months to remediate groundwater impacts to below 910-1 limits. Estimated time to attain NFA status is approximately 2 years.

Soil Remediation Summary

☒ In Situ

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

☒ Ex Situ

Yes Excavate and offsite disposal
_____ If Yes: Estimated Volume (Cubic Yards) 900
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)
Yes Chemical oxidation
Yes 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.

Quarterly sampling of MW-1 through MW-21 (21 wells) analyzed for BTEX. As groundwater impacts decrease monitoring wells may be removed from the sampling plan as long as point of compliance is maintained.

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? Yes _____

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

impacted soil

Volume of E&P Waste (solid) in cubic yards _____ 900

E&P waste (solid) description _____ hydrocarbon impacted soils

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: North Weld Landfill _____

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 _____

Do all soils meet Table 910-1 standards? No _____

Does the previous reply indicate consideration of background concentrations? _____

Are the only residual soil impacts pH, SAR, or EC at depths greater than 3 feet below ground surface? Yes _____

Does Groundwater meet Table 910-1 standards? No _____

Is additional groundwater monitoring to be conducted? Yes _____

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 will follow COGCC guidelines and regulations.

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? _____

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

IMPLEMENTATION SCHEDULE

PRIOR DATES

Date of Surface Owner notification/consultation, if required. 06/14/2017

Actual Spill or Release date, if known. 06/14/2017

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/14/2017

Date of commencement of Site Investigation. 06/14/2017

Date of completion of Site Investigation. 03/01/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. 06/14/2017

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

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

Signed: ` Dave Castro

Title: Sr. Env. Specialist

Submit Date: ` 08/30/2018

Email: dcastro@srcenergy.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: RICK ALLISON

Date: 09/10/2018

Remediation Project Number: 10672

COA Type**Description**

	Submit Quaterly Remediation Progress Reports. Including laboratory analytical reports for all samples collected during quartlery reporting period.
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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**

401747895	FORM 27-SUPPLEMENTAL-SUBMITTED
401747968	LOGS
401747974	REMEDIAL ACTION PLAN
401747976	REMEDIAL ACTION PLAN
401747978	ANALYTICAL RESULTS
401747980	GROUND WATER SAMPLE LOCATION
401747985	GROUND WATER ELEVATION MAP
401747990	REMEDIAL ACTION PLAN

Total Attach: 8 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)