FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Report taken by: BOB CHESSON

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 INFORMATON

Name of Operator: AXIS EXPLORATION LLC Operator No: 10646
Address: 370 17TH ST SUITE 5300
City: DENVER State: CO Zip: 80202
Contact Person: Josh Carlisle

Phone Numbers
Phone: (303) 618-0003
Mobile: ( )
Email: jcarlisle@extractionog.com

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 14354 Initial Form 27 Document #: 402195017

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [x] 909.c.(1), Rule 905: Pit or PW vessel closure
- [x] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [ ] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [ ] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [x] Other Facility decommissioning in support of final reclamation.

SITE INFORMATION

Y Multiple Facilites (in accordance with Rule 909.c.)

Facility Type: TANK BATTERY Facility ID: 441605 API #: County Name: ARAPAHOE
Facility Name: Reeves 32-21 Tank Battery 441605 Latitude: 39.689660 Longitude: -104.324925
** correct Lat/Long if needed: Latitude: 39.689609 Longitude: -104.324943
QtrQtr: SWNE Sec: 21 Twp: 4S Range: 62W Meridian: 6 Sensitive Area? No

Facility Type: SPILL OR RELEASE Facility ID: 469323 API #: County Name: ARAPAHOE
Facility Name: REEVES 32-21 Latitude: 39.689630 Longitude: -104.325047
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: SWNE Sec: 21 Twp: 4S Range: 62W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications SC
Most Sensitive Adjacent Land Use Idle Field
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? No

Other Potential Receptors within 1/4 mile

Residential area

SITE INVESTIGATION PLAN

TYPE OF WASTE:

- [x] **E&P Waste**
  - [x] Produced Water
  - [ ] Oil
  - [ ] 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	30' x 40' x 32' bgs	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.

This form has been prepared to support removal of two partially-buried produced-water vessels associated with this location. In accordance with COGCC Rule 905.b, soil samples, and groundwater samples if present, will be collected during closure of the buried or partially-buried produced water vessels to assure compliance with COGCC Table 910-1 allowable limits. The initial investigation will be conducted using excavation equipment. Field screening of disturbed soils will be conducted during equipment removal and samples will be collected for laboratory analysis if any indications of impacts are identified. Identified impacts will be reported as required for each discovery, and a Form 19 will be submitted.

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):

If no suspected release is identified, one discrete grab soil sample will be collected from directly beneath each produced-water vessel upon removal and submitted for laboratory analysis of organic constituents (TPH and BTEX) and inorganic constituents (SAR, EC, and pH). Additionally, one discrete grab soil sample will be collected from each sidewall of the excavations and submitted for laboratory analysis of organics (TPH and BTEX). If a release is discovered and confirmed through soil screening and/or laboratory analysis, additional excavations may be conducted to further delineate horizontally and vertically. If the extent of impacts is reached and/or remaining impact analytical results are needed for future remediation activities, additional discrete soil samples will be collected from the sidewalls and base and analyzed for organic (TPH and BTEX) and inorganic (SAR, EC and pH) constituents.

Proposed Groundwater Sampling

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

If groundwater is encountered during excavation activities, one sample will be collected and 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: 63

Number of soil samples exceeeding 910-1: 21

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

Approximate areal extent (square feet): 1200

NA / ND

-- Highest concentration of TPH (mg/kg): 15200

-- Highest concentration of SAR: 3.14

BTEX > 910-1: Yes

Vertical Extent > 910-1 (in feet): 27

Groundwater

Number of groundwater samples collected: 0

Was extent of groundwater contaminated delineated? Yes

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

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.

On November 14, 2019, an Apex Field Coordinator was dispatched to the location to collect soil samples in support of the removal of two partially-buried produced-water vessels (PWVs). Soil samples were collected from the base and sidewalls of the produced-water vessel excavations and submitted for analysis at a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory for the approved constituents of concern, including total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and total xylenes (BTEX). The base samples were also submitted for analysis of inorganic constituents (SAR, EC, and pH). All samples fell within COGCC Table 910-1 allowable limits all constituents of concern, indicating that no further remediation investigation would be needed pertaining to the PWV removals. At that time, potential soil impacts were noted along a dumpline associated with the western PWV. Additional samples were collected from the dumpline excavation on November 18, 2019 indicating that further remediation investigation would be needed. The Remediation Project was then turned over to Remington Technologies (Remington) for onsite remediation. Impacted soil was treated onsite (see Remediation Summary below), therefore no soil was removed from location.

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.

Between March 9 and 10, 2020, Remington installed ten borings across the facility to estimate the extent of lateral and horizontal impacts. From April 20th to May 7th, 2020, Remington completed excavation and onsite treatment of petroleum impacted soil. A total of 1,800 cubic yards of soil were excavated. Approximately 700 cubic yards of the excavated soil, exhibiting no petroleum hydrocarbon staining and/or having low PID field screening levels, were segregated and stockpiled as clean fill material/overburden. Approximately 1,100 cubic yards of soil exhibiting petroleum hydrocarbon impacts were treated onsite. The soil treatment process included laying out impacted soil approximately 8-inch thick in the treatment area. A proprietary chemical treatment solution was applied and mixed into the soil. Soil samples were collected and analyzed for BTEX and TPH. Once laboratory analytical results from the soil treatment confirmation samples were below COGCC Table 910-1 limits for BTEX and TPH, the treated soil was stockpiled and used for excavation backfill. Prior to backfilling, confirmation soil samples were collected from the base and sidewalls of the excavation at varying depths and submitted for laboratory analyses of TPH and BTEX. Once the excavation and the stockpiled material were both cleared with laboratory data, the excavation was backfilled utilizing the overburden and treated soil. The excavation was wheel rolled compacted to match existing grade.

Soil Remediation Summary

☒ **In Situ**

- Bioremediation (or enhanced bioremediation)
- Yes 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

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Final Report

Report Type: ☐ Groundwater Monitoring ☐ Land Treatment Progress Report ☐ O&M Report

☒ Other No further action status request

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? Yes

Do all soils meet Table 910-1 standards? Yes

Does the previous reply indicate consideration of background concentrations? No

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

Does Groundwater meet Table 910-1 standards? Yes

Is additional groundwater monitoring to be conducted? No

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? 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. 11/19/2019

Actual Spill or Release date, if known.

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/01/2019

Date of commencement of Site Investigation. 11/14/2019

Date of completion of Site Investigation. 05/07/2020

REMEDIAL ACTION DATES

Date of commencement of Remediation. 04/20/2020

Date of completion of Remediation. 05/07/2020

SITE RECLAMATION DATES

Date of commencement of Reclamation.

Date of completion of Reclamation.

OPERATOR COMMENT

This form has been prepared to document successful closure of the two PWVs at this location, as well as to document the remediation of impacted soil associated with a release originating at a dumpline associated with the western PWV. Please find attached a Topographic Map, a Site Diagram and Lab Results Summary Table from Apex's site investigation, a Site Diagram and Lab Results Summary Table from Remington's site investigation, and laboratory results.

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

Signed:` Maggie Graham Title: Senior Project Manager

Submit Date:` 07/31/2020 Email: Maggie.Graham@apexcos.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: BOB CHESSON Date: 08/03/2020

Remediation Project Number: 14354

COA Type	Description

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
402447484	FORM 27-SUPPLEMENTAL-SUBMITTED
402450677	OTHER
402457534	CORRESPONDENCE

Total Attach: 3 Files

General Comments

User Group	Comment	Comment Date
Environmental	Based on the information presented no further action is necessary at this time and the COGCC approves the closure request. However, should future conditions at the site indicate contaminant concentrations in soils exceeding COGCC standards or if groundwater is found to be impacted, then further investigation and/or remediation activities may be required. The surface area disturbed by the remediation activity shall be reclaimed in accordance with the 1000 Series Reclamation Rules. For locations with active ongoing oil and gas operations, comply with Rule 1003 interim reclamation requirements and for locations that will no longer have active oil and gas operations, comply with Rule 1004 Final Reclamation requirements.	08/03/2020

Total: 1 comment(s)