

State of Colorado Oil and Gas Conservation Commission

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Receive Date:

05/21/2021

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: WHITING OIL & GAS CORPORATION	Operator No: 96155	Phone Numbers
Address: 1700 LINCOLN STREET SUITE 4700		
City: DENVER	State: CO Zip: 80290	
Contact Person: Kyle Waggoner	Email: kyle.waggoner@whiting.com	
		Phone: (970) 4374113
		Mobile: (432) 6616647

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 15397

Initial Form 27 Document #: 402363826

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 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: LOCATION	Facility ID: 460754	API #: _____	County Name: WELD
Facility Name: Terrace Gas Plant		Latitude: 40.845550	Longitude: -103.908040
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NENW	Sec: 18	Twp: 10N	Range: 58W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications GM

Most Sensitive Adjacent Land Use Rangeland

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

None within 1/4 mile

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	Full extent unknown; known MW1	Monitor well
Yes	SOILS	~100'x100'	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.

A Form 19 (Release Point ID 468836) was previously submitted. Hydrocarbon impacted soils was discovered during decommissioning of the facility. The historical impacts were removed via mechanical excavation. Due to the depth of the impacts, soil borings were advanced to delineate the impacts.

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):

During the decommissioning of the facility soil impacts were discovered. A minimum of two bottom hole and four sidewall grab samples will be collected and analyzed for BTEX and TPH.

Proposed Groundwater Sampling

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

Quarterly groundwater monitoring will be conducted at this site to include gauging and sampling of all monitor wells that do not contain phase separated hydrocarbons (PSH). Groundwater 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 41
Number of soil samples exceeding 910-1 4
Was the areal and vertical extent of soil contamination delineated? No
Approximate areal extent (square feet) 10000

NA / ND

-- Highest concentration of TPH (mg/kg) 4300
NA Highest concentration of SAR
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 35

Groundwater

Number of groundwater samples collected 7
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) 49'
Number of groundwater monitoring wells installed 3
Number of groundwater samples exceeding 910-1 4

-- Highest concentration of Benzene (µg/l) 5500
-- Highest concentration of Toluene (µg/l) 8600
-- Highest concentration of Ethylbenzene (µg/l) 1500
-- Highest concentration of Xylene (µg/l) 4800
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?

☐ 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) 3 Volume of liquid waste (barrels) 1

☒ Is further site investigation required?

Further soil sampling and monitor wells may will be required to delineate the extent of impacts. Once and if the newly installed monitor wells contain water they will be sampled to determine the current extents.

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.

The impacted soils will be mechanically excavated to a depth that they can be safely removed. Several remedial options will be considered to remediate any remaining impacts that are located >20' BGS.

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.

In order to fully characterize the extent of groundwater impacts Whiting plans on advancing three monitor wells as indicated in Figure 4 of the Groundwater Monitoring Report First Quarter 2021 report. One of the delineation wells has been proposed to the south address any potential impacts related to the pipeline that enters from the south and the Nelson Ranches C-1 areas. The wells will be screened and advanced to a sufficient depth to allow for a ~10' water column. Upon completion of these wells in lieu of ORC socks a 5-day MDPE event will be conducted on the onsite monitor wells. The MDPE event is a more aggressive remediation technology that will both facilitate the remediation of the groundwater and the soils. These proposed activities are planned on being conducted prior to 10/15/21. If these proposed delineations wells are impacted additional wells will be installed to fully delineate the groundwater impacts.

As depicted in the attached 1st quarter groundwater monitoring report we included the analytes Naphthalene, 1,2,4-trimethylbenzene (1,2,4-TMB) 1,3,5-trimethylbenzene (1,3,5-TMB), chloride, sulfate, and TDS were analyzed to comply with COGCC Table 915-1 Clean-up Concentrations. Whiting will continue sampling for these analytes during future groundwater monitoring events.

The extents of the soil impacts in the excavation are depicted in the attached Fig_2_AE2_Soil_Concentration Map. There is only one location within the larger/southern excavation that exceeds TPH standards (SSW-2 @ 15'), however this was removed and five feet below concentrations are non-detect (SSW-2 @ 20'). The stockpile was sampled on 12/22/20 with each sample representing 100 cubic yards of the stockpile. Three of the samples were above thresholds representing 300 cubic yards of the 2,700 cubic yard stockpile. Whiting is proposing to utilize the portions of the stockpile that are below thresholds to backfill the excavation and dispose of the 300 cubic yards (SP.01,

Soil Remediation Summary

☒ In Situ

Yes Bioremediation (or enhanced bioremediation)

Yes Chemical oxidation

Yes Air sparge / Soil vapor extraction

Yes Natural Attenuation

No Other _____

☒ Ex Situ

Yes Excavate and offsite disposal

If Yes: Estimated Volume (Cubic Yards) 300

Name of Licensed Disposal Facility or COGCC Facility ID # _____

No Excavate and onsite remediation

Land Treatment

Bioremediation (or enhanced bioremediation)

Chemical oxidation

Other _____

Groundwater Remediation Summary

Yes Bioremediation (or enhanced bioremediation)

Yes Chemical oxidation

Yes Air sparge / Soil vapor extraction

Yes Natural Attenuation

No 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 groundwater monitoring to include gauging all wells and sampling and analysis (BTEx) of all wells that do not contain PSH.

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:

NA

Volume of E&P Waste (solid) in cubic yards 2700

E&P waste (solid) description Impacted Soil

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: Pawnee Waste

Volume of E&P Waste (liquid) in barrels 1

E&P waste (liquid) description Purge water

COGCC Disposal Facility ID #, if applicable: 440165

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? _____

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? _____

Does Groundwater meet Table 910-1 standards? _____

Is additional groundwater monitoring to be conducted? _____

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 at the site will be compliant with COGCC 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. 10/21/2019

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 10/21/2019

Date of commencement of Site Investigation. 10/21/2019

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 10/23/2019

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

The requested information has been included in the Remediation Summary section and has been attached.

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

Signed: Kyle Waggoner

Title: Reclamation Coordinator

Submit Date: 05/21/2021

Email: kyle.waggoner@whiting.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: 07/13/2021

Remediation Project Number: 15397

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

	Operator will install a monitoring well south of the excavation, approximately south of MW-1.
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**

402661424	FORM 27-SUPPLEMENTAL-SUBMITTED
402661437	MONITORING REPORT
402697366	MONITORING REPORT
402697372	ANALYTICAL RESULTS
402697374	SOIL SAMPLE LOCATION MAP
402697375	SOIL SAMPLE LOCATION MAP
402697377	SOIL SAMPLE LOCATION MAP
402697378	ANALYTICAL RESULTS
402697380	ANALYTICAL RESULTS
402697381	ANALYTICAL RESULTS

Total Attach: 10 Files

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

Environmental	Returning this Form 27 to Draft. Please address the following and resubmit: 1. Provide a plan for fully characterizing the extent of groundwater impacts, extent of soil impacts in the onsite excavations, and schedule for backfill of onsite excavations. 2. In the characterization plan, address extent of impacts potentially related to pipeline that enters the gas plant from the south, and the Nelson Ranches C-8 area. 3. Provide a reasoning and schedule for effectiveness of using ORC in a monitoring well to remediation groundwater impacts. 4. Revise the groundwater monitoring program to include the Table 915-1 Organics in Groundwater.	04/26/2021
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Total: 1 comment(s)