

State of Colorado Energy & Carbon Management Commission

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Receive Date:

09/15/2023

Report taken by:

Krystal Heibel

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: WESTERN OPERATING COMPANY	Operator No: 95620	Phone Numbers Phone: (303) 726-8650 Mobile: ()
Address: 1165 DELAWARE STREET #200		
City: DENVER	State: CO Zip: 80204	
Contact Person: Steve James	Email: steve@westernoperating.com	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 24450 Initial Form 27 Document #: 403090399

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: WELL	Facility ID: _____	API #: 087-08147	County Name: MORGAN
Facility Name: GLENN STATE 4-36		Latitude: 40.099240	Longitude: -103.826710
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W Meridian: 6 Sensitive Area? No

Facility Type: LOCATION	Facility ID: 313967	API #: _____	County Name: MORGAN
Facility Name: GLENN STATE-62N58W 36NWNW		Latitude: 40.099240	Longitude: -103.826710
		** correct Lat/Long if needed: Latitude: 40.099736	Longitude: -103.826401
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W Meridian: 6 Sensitive Area? No

Facility Type: OFF-LOCATION FLOWLINE	Facility ID: 482360	API #:	County Name: MORGAN
Facility Name: Wellhead Line 36NWNW	Latitude: 40.099669	Longitude: -103.826748	
** correct Lat/Long if needed: Latitude:		Longitude:	
QtrQtr: NWNW	Sec: 36	Twp: 2N	Range: 58W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications	SM	Most Sensitive Adjacent Land Use	Rangeland
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?	No		

Other Potential Receptors within 1/4 mile

The Glenn State 4-36 wellhead is surrounded by vacant land in all directions. There are no residences within a quarter mile of the wellhead. There are no groundwater well permits mapped within a quarter mile of the wellhead. Groundwater depth is unknown, but groundwater permit 147107 approximately 0.36 miles northeast of the wellhead, reported a static water level of 38.5 feet below ground surface (ft-bgs) at the time of completion. There is an unnamed ephemeral drainage mapped approximately 0.16 miles north of the site. There are no additional sensitive areas or wildlife habitats identified within a quarter mile of the wellhead.

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
No	SOILS	No known impacts	Analytical Results

INITIAL ACTION SUMMARY

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

Western Operating proposes to plug and abandon (P&A) the Glenn State 4-36 well and remove the production facility equipment. Plugging and abandonment of the well will occur in Summer 2022. Cut and cap and production facility removal activities are planned to commence and be completed approximately 10 days after P&A activities are complete. Western Operating will conduct site investigation activities, field screening, and confirmation soil sampling activities during closure in accordance with COGCC 900 Series Rules. Discreet soil samples and, if necessary, one groundwater sample, will be collected and analyzed pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2) and Rule 915.e.(3). All waste generated during the closure activities will be managed and disposed of in accordance with Rules 905 and 906. See the attached Figure 1 for an illustration of the location of the Site.

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):

A minimum of 16 discreet soil samples will be collected for field screening. At least seven of the samples will be submitted to an accredited laboratory for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and Gasoline Range Organics (GRO) [C6-C10] by EPA Method 8260 and for Diesel Range Organics (DRO) [C10-C28] and Residual Range Organics (RRO) [C28-C40] by EPA Method 8015. Analytical results for GRO, DRO, and RRO will be added together to calculate Total Petroleum Hydrocarbons (TPH). One wellhead sidewall sample and one produced water tank floor sample will be analyzed for the Soil Suitability for Reclamation parameters; Electrical Conductivity (EC), Sodium Absorption Ratio (SAR), pH by Saturated Paste Method, and boron by Hot Water-Soluble Soil Extract Method. See the attached Figure 2 for an illustration of proposed discreet soil sample locations for field screening and for laboratory analysis.

Proposed Groundwater Sampling

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

If groundwater is encountered during decommissioning activities, a grab sample will be collected as soon as practical. If contaminated soil is in contact with groundwater or if free product/hydrocarbon sheen are observed, the release will be reported in accordance with Rule 912.b. Groundwater samples will be submitted for laboratory analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene by EPA Method 8260.

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):

Western Operating will remove the flowline by cutting it in 50' sections and pulling it from the subsurface. An estimated 1 discrete soil samples will be collected for field screening during flowline abandonment. If indications of soil impacts are present, the sample will be submitted to an accredited laboratory for analysis as discussed in the Proposed Soil Sampling section above. Samples collected from areas most likely to have been impacted during the operational life of the flowline, in accordance with COGCC Operator Guidance Rule 911.a.(4), will be submitted to an accredited laboratory for analysis of BTEX, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, TPH, EC, SAR, pH and boron.

SITE INVESTIGATION REPORT

SAMPLE SUMMARY

Soil

Number of soil samples collected 11
Number of soil samples exceeding 915-1 1
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 64

NA / ND

ND Highest concentration of TPH (mg/kg) _____
-- Highest concentration of SAR 1.27
BTEX > 915-1 No
Vertical Extent > 915-1 (in feet) 3

Groundwater

Number of groundwater samples collected 0
Was extent of groundwater contaminated delineated? No
Depth to groundwater (below ground surface, in feet) _____
Number of groundwater monitoring wells installed _____
Number of groundwater samples exceeding 915-1 _____

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 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?

Four background soil samples were collected from two sample locations undisturbed by oil and gas activities near the Glenn State 4-36 wellhead and production facility. Background analytical results demonstrate that SAR, pH, and arsenic concentrations exist naturally at this location above Table 915-1 allowable limits. Arsenic results were averaged for all background samples and multiplied by 1.25 to establish a baseline background concentration of 1.68 mg/kg. All confirmation samples collected from the final extents of excavation were below background levels for SAR, pH, and arsenic.

☐ 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.

No organic compounds were detected through field-screening or laboratory analysis during the investigation. Arsenic and selenium were reported above the Table 915-1 standard in soil sample SEP01@3 collected from underneath the separator flowline riser. Approximately 3 cubic yards of soil were removed from around this location by excavation and transported to Pawnee Waste.

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.

Based on site investigation activities and laboratory analytical results for confirmation soil samples collected from the Glenn State 4-36 wellhead and production facility, a remediation plan is not needed.

Soil Remediation Summary

☐ In Situ

☒ Ex Situ

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

Yes _____ Excavate and offsite disposal
_____ If Yes: Estimated Volume (Cubic Yards) _____ 3
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

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

Adequacy of Operator's General Liability Insurance and Financial Assurance

Describe the adequacy of the Operator's general liability insurance and Financial Assurance to fully address the anticipated costs of Remediation, including the estimated remaining cost for this project (below).

If this information has been provided on a Form 27 within the last 12 months, provide the Document Number of that form.

Western Operating has \$5,000,000 in liability insurance and is currently adequately bonded.

Operator anticipates the remaining cost for this project to be: \$ 10000

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? No ☐

Does the previous reply indicate consideration of background concentrations?

Does Groundwater meet Table 915-1 standards? Yes

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.

Following facility closure activities, the location will be backfilled, compacted, and re-contoured to match pre-existing conditions. The location was reclaimed in accordance with the COGCC 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? No

If YES, does the seed mix comply with local soil conservation district recommendations? _____

Did the local soil conservation district provide the seed mix? No

SITE RECLAMATION DATES

Proposed date of commencement of Reclamation. 10/01/2023

Proposed date of completion of Reclamation. 10/01/2024

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). 08/15/2022

Proposed site investigation commencement. 06/23/2023

Proposed completion of site investigation. 08/17/2023

REMEDIAL ACTION DATES

Proposed start date of Remediation. 08/17/2023

Proposed date of completion of Remediation. 09/01/2023

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

Facility closure activities and confirmation soil sampling at the Glenn State 4-36 wellhead and production facility occurred on June 23, and August 17, 2023. Four discrete soil samples were collected from the four sidewalls of the produced water vessel (PWV) and wellhead (WH01) excavations, and field screened using a photo-ionization detector (PID) calibrated with 100 parts per million (ppm) isobutylene gas. One discrete soil sample was field screened beneath the pumpjack motor (PJ01@0.5), and five soil samples were field screened from potholes to remove on-location flowlines and dumpline (FL01-FL05). All field screening PID readings were less than 4.1 ppm, and no visual or olfactory evidence of hydrocarbon impact was observed.

Soil sample AST01@3 was collected from underneath the flowline riser of the southern-most above ground storage tank (AST). Soil sample AST02@0.5 was collected beneath the access hatch of the northern-most AST. Soil samples SEP01@3 and SEP01@4.5 were collected from beneath former separator flowline risers. Soil samples were collected from the floor of the wellhead excavation (WH01@6), and sidewall adjacent to the former wellhead line riser (FLR01@3). Two soil samples, PWV01@5 and WDL01@3 were collected from the floor beneath the PWV, and sidewall beneath the former water dump line, respectively.

All facility closure confirmation soil samples were submitted to Summit Scientific (Summit) in Golden, Colorado for analysis of benzene, toluene, ethylbenzene, total xylenes, naphthalene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and gasoline range organics [C6-C10] by EPA Method 8260, and diesel range organics [C10-C28] and residual range organics [C28-C40] by EPA Method 8015. Soil samples PWV01@4, WDL01@3 and FLR01@3 were submitted for analysis of electrical conductivity (EC), sodium adsorption ratio (SAR), and pH by Saturated Paste Extraction Methods, and boron by Hot Water Soluble Soil Extraction Method. Soil samples WH01@6, FLR01@3, SEP01@3, PWV01@4, and WDL01@3 were submitted for analysis of Table 915-1 Metals in Soils.

All analytical results reported for confirmation soil samples were compliant with their respective Table 915-1 Protection of Groundwater Soil Screening Levels except for arsenic (3.51mg/kg) and selenium (0.29mg/kg) reported for soil sample SEP01@3. Supplemental excavation was conducted to remove approximately three cubic yards of soil from around this location and confirmation soil sample SEP01@4.5 was collected and submitted for analysis of the full Table 915-1 list of contaminants of concern in soil. Analytical results were compliant with Table 915-1 Protection of Groundwater Soil Screening Levels. Groundwater was not encountered during facility closure activities.

Please refer to the attached Closure Checklists for a detailed description of site investigation activities. Sample location information is provided in Table 1 and the analytical results are summarized in Table 2, Table 3 and Table 4. A general location map is provided on Figure 1. Soil sample, and field screening locations are presented on Figure 2. A photo log and the laboratory analytical reports are also attached.

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

Signed: Ryan Finley

Title: Senior Project Geologist

Submit Date: 09/15/2023

Email: rfinley@entradainc.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: Krystal Heibel

Date: 10/25/2023

Remediation Project Number: 24450

COA Type

Description

	It appears that impacted soil / a salt kill exists immediately to the east of the site. Operator shall collect and analyze soil samples from the disturbed soil location and submit a revised "Soil Sample Location Map" illustrating where the samples were collected.
	Background sample location "BKG01" at 3' and 6' appears to be impacted by oil and gas activity and within interim reclamation area. Because of this, "BKG01@3" and "BKG01@6" cannot be used for initial characterization. If a spill/release of produced fluids or E&P waste causes an impact from inorganic constituents to soil, the operator should perform sampling and analysis to fully delineate the lateral and vertical extent of those impacts. Background sampling locations should be sufficiently away from the impacted area to reflect conditions not impacted by oil and gas activity, and should be obtained from similar depths and soil horizons or lithologic materials for comparison to confirmation soil samples.
	Operator shall collect confirmation soil samples as described in the Rule 915.e.(2) Guidance Document. Operator will analyze soil samples for TPH (C6-C36), Table 915-1 Organic Compounds in Soil, Table 915-1 metals, and Table 915-1 Soil Suitability for Reclamation (Electrical conductivity, Sodium adsorption ratio, and pH by saturated paste method, boron (hot water soluble)).
	If groundwater is encountered, Operator will analyze groundwater samples for Table 915-1 Groundwater Inorganic Parameters (total dissolved solids, sulfate, chloride) and organic compounds in groundwater.

4 COAs

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.

<u>Att Doc Num</u>	<u>Name</u>
403532278	INVESTIGATION/REMEDIATION WORKPLAN (SUPPLEMENTAL)
403532311	OTHER
403532312	PHOTO DOCUMENTATION
403532320	ANALYTICAL RESULTS
403532322	ANALYTICAL RESULTS
403532398	MAP
403532399	SOIL SAMPLE LOCATION MAP
403572403	FORM 27-SUPPLEMENTAL-SUBMITTED

Total Attach: 8 Files

General Comments

<u>User Group</u>	<u>Comment</u>	<u>Comment Date</u>
Environmental	No further action request removed. Since Table 915-1 exceedances are observed at this location, Operator shall sample for full Table 915-1 at all soil sample locations.	10/23/2023

Total: 1 comment(s)