

State of Colorado  
Energy & Carbon Management Commission

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Document Number:  
404192262

Receive Date:

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Report taken by:

**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 ECMC 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>CM PRODUCTION LLC</u>	Operator No: <u>10352</u>	<b>Phone Numbers</b>
Address: <u>390 UNION BLVD SUITE 620</u>		Phone: <u>(303) 894-2100</u>
City: <u>LAKEWOOD</u> State: <u>CO</u> Zip: <u>80228</u>		Mobile: <u>(303) 905-5341</u>
Contact Person: <u>James Hix - East OWP EPS</u>	Email: <u>james.hix@state.co.us</u>	

**PROJECT, PURPOSE & SITE INFORMATION**

**PROJECT INFORMATION**

Remediation Project #: 17912 Initial Form 27 Document #: 402673506

**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: Rule 911: Closure of Oil and Gas Facilities

**SITE INFORMATION**

Yes  Multiple Facilities

Facility Type: LOCATION Facility ID: 324634 API #: \_\_\_\_\_ County Name: JACKSON

Facility Name: MARGARET SPAULDING-69N81W 28SWSE Latitude: 40.717432 Longitude: -106.499019

\*\* correct Lat/Long if needed: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

QtrQtr: SWSE Sec: 28 Twp: 9N Range: 81W Meridian: 6 Sensitive Area?  Yes

Facility Type: TANK BATTERY Facility ID: 427281 API #: \_\_\_\_\_ County Name: JACKSON

Facility Name: M. SPAULDING CENTRALIZED TANK BATT 1 Latitude: 40.718009 Longitude: -106.498498

\*\* correct Lat/Long if needed: Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

QtrQtr: SWSE Sec: 28 Twp: 9N Range: 81W Meridian: 6 Sensitive Area?  Yes

## SITE CONDITIONS

General soil type - USCS Classifications SW \_\_\_\_\_

Most Sensitive Adjacent Land Use Grazing Land

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**

Wolfer Ditch less than 50 feet to the east and Spring Gulch Ditch approximately 385 feet to the west. Groundwater ranges from 11 feet below ground surface (bgs) to 30 feet bgs.

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> <b>E&amp;P Waste</b> | <input checked="" type="checkbox"/> <b>Other E&amp;P Waste</b> | <input checked="" type="checkbox"/> <b>Non-E&amp;P Waste</b> |
| <input checked="" type="checkbox"/> Produced Water       | <input type="checkbox"/> Workover Fluids                       | Potential petroleum oils and lubes (POLs)                    |
| <input checked="" type="checkbox"/> Oil                  | <input checked="" 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	LNAPL	Visual, Field Screening, and Analytical
Yes	SOILS	Surface to 30 ft bgs	Field Screening and 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.

The Colorado ECMC Orphan Well Program (OWP) decommissioned the Margaret Spaulding Centralized Tank Battery facility during the summer of 2021. Soil samples were collected in accordance with the Initial Form 27 for the project and ECMC Rule 915.e(2)B. Twenty soil samples, including one project background sample, were collected from the site; ten were collected from flowline excavations, one was collected from the the flowline manifold excavation, six were collected from the former tank batteries, one was collected from under the former horizontal separator, one from the former surface discharge area, and one (background) was collected from nearby, non-impacted native soil. A direct-push subsurface investigation was performed in October 2022 to delineate the lateral and vertical extent of impacts. A total of 58 soil borings were advanced in a grid across the site. In October 2024 a subsurface investigation to install five groundwater monitoring wells around the perimeter and downgradient of the former tank battery was performed. All samples were submitted for laboratory analysis of Table 915-1 constituents.

## 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 ):

All areas suspected of having potential impacts, including around wellheads, associated flowline(s) (if present), and production equipment (if present), were visually inspected and field screen with a photoionization detector (PID). Using these observations and field screening results, soil samples were collected from areas most likely to be impacted. Ten discrete soil samples were collected from the various flowline excavation, one discrete soil sample was collected from the flowline manifold excavation, six discrete soil samples were collected from the former tank batteries, one discrete soil sample was collected from under the former horizontal separator, and one discrete soil sample was collected from the former surface discharge area. All samples were submitted for laboratory analysis of Table 915-1 constituents. The attached project map provides the location of all samples.

### Proposed Groundwater Sampling

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

Groundwater monitoring wells were installed around the former Margaret Spaulding Central Tank Battery in August 2024. Groundwater samples will be collected and submitted to an accredited environmental laboratory for analysis of Table 915-1 groundwater parameters including, benzene, toluene, ethylbenzene, xylenes (BTEX); 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene; naphthalene, total dissolved solids (TDS), chloride ion, and sulfate ion.

### Proposed Surface Water Sampling

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

No surface water was discovered in the vicinity of the wellsite during the plugging and decommissioning activities. As such, no surface water samples were collected for this project; however, future surface water samples may be collected from Spring Gulch and Wolfer Ditch to compare with groundwater results.

## Additional Investigative Actions

Additional alternative investigative actions described in attached Site Investigation Plan ( summary ):

The footprint and locations of the tanks and tank battery and the foot print and locations of equipment Production Facility was surveyed (GPS). All of the former production equipment and aboveground storage tanks (AST) have been removed. A Phase II Subsurface Site Investigation was performed in two stages in October 2022 and October 2023 to delineate the horizontal and vertical extent of impact across the Location. Groundwater Monitoring Wells were installed.

# SITE INVESTIGATION REPORT

## SAMPLE SUMMARY

### Soil

Number of soil samples collected 72

Number of soil samples exceeding 915-1 21

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) 32100

-- Highest concentration of SAR 1.99

BTEX > 915-1 No

Vertical Extent > 915-1 (in feet) 9

### Groundwater

Number of groundwater samples collected 23

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 10

Number of groundwater monitoring wells installed 12

Number of groundwater samples exceeding 915-1 7

-- Highest concentration of Benzene (µg/l) 5.86

-- Highest concentration of Toluene (µg/l) 34

-- Highest concentration of Ethylbenzene (µg/l) 138

-- Highest concentration of Xylene (µg/l) 225

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?

An area of light non-aqueous phase liquids (LNAPL) was observed on groundwater beneath the former Central Tank Battery and extending off-location to the northwest.

Were background samples collected as part of this site investigation?

Background soil samples were collected from nearby, undisturbed native soil. Laboratory results indicate the pH value was outside of the ECOMC Table 915-1 soil reclamation suitability standard. Additionally, arsenic concentrations exceeded the CECMC standard, but may be attributed to natural background levels.

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

Volume of solid waste (cubic yards) 60

Volume of liquid waste (barrels) 2

Is further site investigation required?

Soil sample results indicate E&P Waste impacts above Table 915-1 cleanup concentrations. Additional site investigation and remediation activities are warranted to address impacted soils beneath the former Margaret Spaulding Centralized Tank Battery and former Lone Pine Treatment Pits, including installation of additional groundwater monitoring wells to define the lateral extent of impact.

## 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.

The M Spaulding Centralized Tank Battery facility was decommissioned during the summer of 2021, and a subsurface investigation was conducted in the fall of 2022. Soil samples were collected in accordance with the Initial Form 27 for the project. Additional remediation is needed in the vicinity of the former tank battery and production facility. A second level subsurface investigation to install groundwater monitoring wells was performed in October 2024. A remediation pilot test to construct a biopile will be used to test impacted soils starting with the treated stockpile on location. A groundwater remediation plan to remove LNAPL and dissolved phase hydrocarbons will be prepared and approved prior to undertaking any remediation activities due to the scale of impacts at the site.

### 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.

This supplemental Form 27 presents the results of the 2024 subsurface investigation and groundwater monitoring events. Monitoring wells installed around the perimeter and downgradient of the former tank battery/production facility show E&P Waste impacts. Following review of the site data, remediation technologies to be evaluated include using a soil vapor extraction (SVE) bubbler to remove LNAPL and volatiles in the wells, and absorbent socks or skimmers. Due to the scale of E&P Waste impacts at the site additional remediation technologies may be evaluated. The OWP proposes using biopiles to treat TPH and organic compound impacted soils at the former Margaret Spaulding Centralized Tank Battery, Lone Pine Treatment Pits, and Lone Pine field well pads to meet Table 915-1. A pilot test will be performed to evaluate biopile feasibility. Use of biopiles will reduce truck traffic, off-site disposal, hauling clean fill back to the location, and reduce the amount of diesel fuel consumed in the process as compared to excavation and off-site disposal over mountain roads and passes. An evaluation of groundwater data will need to be performed to determine appropriate remediation technologies needed to address free-phase LNAPL and dissolved phase hydrocarbons potentially present at the location.

**Soil Remediation Summary**

In Situ

Ex Situ

Yes          Bioremediation ( or enhanced bioremediation )

No          Excavate and offsite disposal

         Chemical oxidation

If Yes: Estimated Volume (Cubic Yards)                         

Yes          Air sparge / Soil vapor extraction

Name of Licensed Disposal Facility or ECMC Facility ID #   

Yes          Natural Attenuation

Yes          Excavate and onsite remediation

Yes          Other The OWP proposes using Biopiles to remediate TPH and organic compound impacted soils.   

Yes          Land Treatment

Yes          Bioremediation (or enhanced bioremediation)

No          Chemical oxidation

Yes          Other Biopiles are proposed to treat TPH and organic compounds in soils.   

**Groundwater Remediation Summary**

Yes          Bioremediation ( or enhanced bioremediation )

         Chemical oxidation

Yes          Air sparge / Soil vapor extraction

         Natural Attenuation

Yes          Other Groundwater data evaluation will be performed to determine appropriate groundwater treatment.   

**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.

Historic groundwater analytical data from the existing monitoring wells around the produced water treatment pits has not shown significant groundwater impacts. An evaluation of appropriate groundwater remediation treatment technologies will be performed following installation of additional groundwater monitoring wells, soil boring logs and analytical data, fluid level measurements, and groundwater analytical results.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

### Approved Reporting Schedule:

Quarterly  Semi-Annually  Annually  Other

Groundwater Monitoring and Phase II Subsurface Investigation results will be evaluated.

### Request Alternative Reporting Schedule:

Semi-Annually  Annually  Other

Remediation technology evaluation.

### 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.

The CM PRODUCTION LLC - SPAULDING, MARGARET-69N81W 28SWSE and SPAULDING, MARGARET CENTRAL TANK BATTERY are in the ECMC OWP. The former Operator's bond and other funding will be used to investigate, remediate, and reclaim the location.

Operator anticipates the remaining cost for this project to be: \$ 500000

## WASTE DISPOSAL INFORMATION

Was E&P waste generated as part of this remediation? No

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 \_\_\_\_\_

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC Disposal Facility: \_\_\_\_\_

Volume of E&P Waste (liquid) in barrels \_\_\_\_\_

E&P waste (liquid) description \_\_\_\_\_

ECMC Disposal Facility ID #, if applicable: \_\_\_\_\_

Non-ECMC 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? \_\_\_\_\_

Is additional groundwater monitoring to be conducted? \_\_\_\_\_

Operator shall comply with the ECMC 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 will be in accordance with 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? \_\_\_\_\_

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. 06/11/2019

Actual Spill or Release date, or date of discovery. 09/30/2012

### SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 06/01/2021

Proposed site investigation commencement. 09/05/2023

Proposed completion of site investigation. 09/29/2026

### REMEDIAL ACTION DATES

Proposed start date of Remediation. 05/01/2026

Proposed date of completion of Remediation. 12/31/2030

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:

Based on the volume and extent of E&P Waste impacted soils at the site remediation is expected to require at least five years. Discovery of LNAPL and changes to Federal funding requirements are expected to extend the site investigation and remediation schedule.

**OPERATOR COMMENT**

The former CM PRODUCTION LLC - 10352 MARGARET SPAULDING-69N81W #28SWSE (Location ID #324634) M SPAULDING CENTRALIZED TANK BATTERY (Facility ID #427281) is in the ECMC Orphaned Well Program ("OWP"). Soil sampling was performed in August 2021 following tank battery and production facility decommissioning and a direct-push subsurface investigation was performed in October 2022 to assess the lateral and vertical extent of soil impacts at the tank battery. Analytical results for groundwater samples collected from monitoring wells previously installed around the former produced water treatment pits generally were consistent with previous results and were below Table 915-1 groundwater levels (see Remediation Project #7058). This Form 27 Supplemental presents the 2024 Subsurface Investigation and 2024 Groundwater Monitoring Report. In May 2024 five soil borings completed as groundwater monitoring wells were installed around the perimeter of the former Margaret Spaulding Centralized Tank Battery to assess groundwater impacts. Soil and groundwater impacts were not detected in samples from monitoring well MW-7. Petroleum hydrocarbon impacts were encountered in each soil sample collected while advancing MW-10 identified as the primary source area. Analytical results for soil samples collected from the other monitoring well borings on May 14 and May 15, 2024 indicated the presence of total petroleum hydrocarbons (TPH) above the Table 915-1 Cleanup Concentration of 500 mg/kg. Naphthalene was detected in two soil samples above the Table 915-1 residential soil screening level (SSL) and ethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene were reported above their respective Table 915-1 protection of groundwater SSL. The presence of light non-aqueous phase liquids (LNAPL) was encountered in monitoring wells MW-8, MW-9, MW-11, and MW-E during the May 2024 sampling event. LNAPL was not detected in monitoring well MW-9 or MW-E during the October 2024 sampling event. The LNAPL thickness is difficult to measure due to its viscosity. Benzene was detected in MW-10 at 1.09 ug/L in May and 5.86 ug/L in October 2024; however, LNAPL was not detected in MW-10. Results for 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene were reported in the 2024 groundwater samples above Table 915-1 concentrations for organics in groundwater. Inorganic parameter results in groundwater met Table 915-1 concentrations. Further site investigation and ongoing groundwater monitoring of the monitoring well network will proceed under Remediation Project #17912.

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

Signed: James Hix \_\_\_\_\_

Title: East OWP EPS \_\_\_\_\_

Submit Date: \_\_\_\_\_

Email: james.hix@state.co.us \_\_\_\_\_

Based on the information provided herein, this Application for Site Investigation and Remediation Workplan complies with ECMC Rules and applicable orders and is hereby approved.

ECMC Approved: \_\_\_\_\_

Date: \_\_\_\_\_

Remediation Project Number: 17912

**COA Type**

**Description**

0 COA	
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**ATTACHMENT 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**

404192332	SITE INVESTIGATION REPORT
404192335	ANALYTICAL RESULTS
404192336	ANALYTICAL RESULTS
404192338	ANALYTICAL RESULTS
404192339	ANALYTICAL RESULTS

Total Attach: 5 Files

**General Comments**

**User Group**

**Comment**

**Comment Date**

		Stamp Upon Approval
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Total: 0 comment(s)