

# State of Colorado Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203  
Phone: (303) 894-2100 Fax: (303) 894-2109



Document Number:

402669575

Receive Date:

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 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: FOUNDATION ENERGY MANAGEMENT LLC	Operator No: 10112	<b>Phone Numbers</b>
Address: 5057 KELLER SPRINGS RD STE 650		
City: ADDISON	State: TX Zip: 75001	
Contact Person: Alyssa Beard	Email: abeard@foundationenergy.com	
		Phone: (303) 244-8114
		Mobile: (720) 257-2302

### PROJECT, PURPOSE & SITE INFORMATION

#### PROJECT INFORMATION

Remediation Project #: 17342

Initial Form 27 Document #: 402565168

#### 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 checked="" type="checkbox"/> Other Remediation Workplan   |

#### SITE INFORMATION

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

Facility Type: LOCATION	Facility ID: 324639	API #:	County Name: JACKSON
Facility Name: ALLARD-610N79W 30SENE		Latitude: 40.812241	Longitude: -106.301789
		** correct Lat/Long if needed: Latitude:	Longitude:
QtrQtr: SENE	Sec: 30	Twp: 10N	Range: 79W Meridian: 6 Sensitive Area? Yes

#### SITE CONDITIONS

General soil type - USCS Classifications GW

Most Sensitive Adjacent Land Use Non-Crop Land - Silver Spur Land and Cattle

Is domestic water well within 1/4 mile? Yes

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

The Allard location was constructed in alluvial material associated with the Michigan River.

### 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	Unknown	Laboratory analysis
Yes	SOILS	150 square feet	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.

Initial actions and completed remedial measures have previously been submitted to the COGCC in the Form 19I (Document #402528181), in the Form 19S (Document #402545454), and in the Form 27I (Document #402565168). The COGCC assigned spill tracking facility ID #324639 and remediation number #17342 for the Site. The impacts were initially discovered in late September 2020 and believed from a historical spill of unknown origins. The Allard well was plugged and decommissioned in November 2020, and impacted material was discovered in two separate areas of the Site at the former wellhead and near the treater. Following the well plugging activities, initial delineation activities were completed on December 1, 2020 and included test pitting and sampling activities. Impacted material was hauled offsite, and clean backfill material was used to fill the test pits until further delineation and a remediation workplan could be prepared. Lab results confirmed groundwater was above COGCC standards for benzene, and that further groundwater investigation was required. Following delineation of the soils, the excavation was backfilled to existing grade and further remedial activities are proposed within this Form 27S workplan.

Foundation mobilized to the location on 12/1/20 once the well had been plugged and excavation in the vicinity was possible. Foundation's environmental consultant, Tasman Geosciences, collected six groundwater samples and seven soil samples from the former treater and battery area, and five groundwater and four soil samples from the former wellhead area. The investigative samples were delivered to the lab on 12/2/20 for analysis to Summit Scientific laboratory, and the results were presented in Form 27 Initial (Document #402565168), and approved with conditions of approval (COA). Based on the results of that investigation, further remediation and delineation activities are necessary, and a proposed investigation/remediation workplan is provided herein.

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 ):

In December 2020, 4 soil samples were collected from the former well pumpjack area (WJA) on the north side of the Site and 7 soil samples were collected from the former battery and treater area (FBTA) on the south side of the Site. Soil samples were analyzed for BTEX and TPH, and the results were presented in the F27I(#402565168). Three excavations, one at the WJA (Figure 3) and 2 at the FBTA (Figure 4), are proposed to remove contaminated soil. Field screening and confirmation samples as shown on Figures 2 to 4 will be collected from the base and sidewalls of each excavation area to determine the horizontal and vertical extents of the impacted soil. FEM proposes to collect base and sidewall samples from the excavation extents and representative of the locations with the highest PID detections. Additionally, soil samples will be collected at each of the proposed soil borings that will be converted to a groundwater monitoring well and analyzed for Table 915-1 constituents per the F27I.

Proposed Groundwater Sampling

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

Delineation activities were performed on 12/1/20 after the Allard well had been plugged and abandoned. Groundwater was observed to be impacted at the groundwater interface of the test pits and above the COGCC standards at two test pit locations. The soil-groundwater interface ranged from about 5 to 7 feet below ground surface (bgs) across the Site from north to south. Based on the results presented in the approved F27I and illustrated on Figures 2 to 4, FEM proposed to install up to eight additional groundwater monitoring wells at the site to delineate the horizontal extents (four in the north and four in the south areas of the Site shown on Figure 2). The wells will be set while using heavy equipment from the excavation activities to depths 9-10 feet bgs. Groundwater samples will be run for Table 915-1 analytes, and a potentially reduced analyte list will be developed for future groundwater monitoring events based on the results of this investigation.

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 0

Number of soil samples exceeding 910-1 0

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

Approximate areal extent (square feet) 250

### NA / ND

NA Highest concentration of TPH (mg/kg)         

NA Highest concentration of SAR         

BTEX > 910-1 Yes

Vertical Extent > 910-1 (in feet) 6

### Groundwater

Number of groundwater samples collected 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet) 6'

Number of groundwater monitoring wells installed 0

Number of groundwater samples exceeding 910-1 0

NA Highest concentration of Benzene (µg/l)         

NA Highest concentration of Toluene (µg/l)         

NA Highest concentration of Ethylbenzene (µg/l)         

NA Highest concentration of Xylene (µg/l)         

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)          Volume of liquid waste (barrels)         

☒ Is further site investigation required?

A determination of additional site investigation will be made based on the results of the proposed remediation and investigation activities proposed within this F27S document. If warranted, FEM proposes to conduct quarterly groundwater monitoring until a period of four quarters of groundwater monitoring results are below the COGCC standards and a no further action (NFA) and Site Closure is approved by the COGCC. In addition, FEM would consider evaluating further investigation and alternative remediation approach applicable to the Site with landowner and COGCC approval, which may include, but not limited to the potential use of chemox or other treatment methods to mitigate the impacted area beneath the surface. Updates and a workplan will be discussed and provided to COGCC in a subsequent Form 27S progress report.

# 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.

As previously reported in the Form 19 Supplemental (#402545454) and the Form 27 Initial (#402565168), initial source delineation efforts were performed in November and December 2020, which included the plugging and decommissioning of Allard Well and off-location flowline. During test pitting activities, groundwater was observed to infiltrate the test pits at 5-7 feet bgs. Groundwater was above COGCC standards at two locations. Upon acceptance of this workplan, source material from the excavation areas shown on Figures 3 and 4 will be removed until the horizontal extents have been delineated and confirmed with confirmation soil samples. The excavated soil will be transported to an off-site disposal facility. If warranted, FEM would consider evaluating further investigation and additional remediation approaches applicable to the Site with landowner and COGCC approval, which may include, but not limited to the potential use of chemox or other treatment methods.

## 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 the proposed excavation of impacted soil associated with the Site and COGCC approval, monitoring wells will be installed to delineate the extent of groundwater contamination. A remediation workplan will be presented to COGCC for approval in a subsequent form 27 progress report. Groundwater monitoring will be performed at the Site until a period of four consecutive monitoring events have demonstrated that groundwater impacts are below COGCC Table 915-1 standards. At that time, a no further action (NFA) determination for the Site will be requested from the COGCC. Based on initial and subsequent investigation results, a reduced list of Table 915-1 analytes may be proposed for future monitoring events.

## Soil Remediation Summary

### ☐ In Situ

\_\_\_\_\_ Bioremediation ( or enhanced bioremediation )  
\_\_\_\_\_ 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.

Groundwater samples were collected on December 1, 2020 from eleven open test pit locations via a grab sample using a bailer from the open excavation and were submitted to Summit Scientific (Summit) for BTEX analysis using USEPA method 8260B. Groundwater was observed to be at the bottom of each test pit around 5-7 feet below ground surface. Based on the results during the initial delineation activities, two samples were above the COGCC standards and were located in the vicinity of the former well jack (WJPIT-01) on the northern side (Figure 3) and at the test pit location (TP-08) located near the treater area on the south side of the Site (Figure 4). The December 2020 laboratory analytical data were reported in the Form 27 Initial (Document #402565168). FEM proposes to complete additional groundwater wells at the Site illustrated on Figure 2. Per the COGCC conditions of approval, Table 915-1 analytes will be analyzed, and a potentially reduced analyte list will be developed for future groundwater monitoring events based on the results of this investigation. Future Site-wide groundwater gauging and sampling data will be used to evaluate hydraulic characteristics and provide information regarding seasonal fluctuations at the Site. This information will be presented to the COGCC in subsequent F27S submittals.

## REMEDIATION PROGRESS UPDATE

### PERIODIC REPORTING

**Frequency:** ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Not Applicable at this time.

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

☒ Other Field Activities and delineation summary update report.

### 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 \_\_\_\_\_

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.

The excavation will be backfilled and compacted to existing grade upon completion of impacted material removal. The former wellhead area and the former battery will be reclaimed at the earliest opportunity following the conclusion of remediation activities.

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. \_\_\_\_\_

Actual Spill or Release date, if known. \_\_\_\_\_

### **SITE INVESTIGATION DATES**

Date of Initial Actions described in Site Investigation Plan (start date). 12/01/2020

Date of commencement of Site Investigation. 05/11/2021

Date of completion of Site Investigation. \_\_\_\_\_

### **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 05/11/2021

Date of completion of Remediation. \_\_\_\_\_

### **SITE RECLAMATION DATES**

Date of commencement of Reclamation. \_\_\_\_\_

Date of completion of Reclamation. \_\_\_\_\_

### **OPERATOR COMMENT**

This Supplemental Form 27 has been prepared in response to the conditions of approval provided in the Initial Form 27 (#402565168) that requested an updated workplan for further remediation and groundwater delineation by April 30th, 2021.

As presented within this F27S document and based on the information provided in previous approved COGCC documents, FEM proposes to complete the proposed remediation and groundwater delineation activities presented upon landowner and COGCC approval in May, 2021. FEM will provide COGCC with updates of the investigative results in subsequent Form 27S reports.

Information within this Supplemental Form 27 is associated the historical release that was discovered during well plugging/off-location flowline abandonment of the Allard 30-8-5 well in 2020 (REM# 17342). Attached to this Supplemental Form 27 are proposed excavation areas, as well as the proposed sample locations for soil and groundwater.

Impacted soil will be excavated and transported to an off-site disposal facility, and monitoring wells will be installed using the heavy equipment on-site for the excavation to a depth of 9-10 feet below ground surface.

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

Signed: Alyssa Beard

Title: EHSR Manager

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

Email: regulatory@foundationenergy.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: \_\_\_\_\_

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

Remediation Project Number: 17342

### **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**

402674670	REMEDIAL ACTION PLAN
-----------	----------------------

Total Attach: 1 Files

## **General Comments**

### **User Group**

### **Comment**

### **Comment Date**

		Stamp Upon Approval
--	--	---------------------

Total: 0 comment(s)