

State of Colorado  
Oil and Gas Conservation Commission

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Report taken by:  
KRIS NEIDEL

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> Phone: (303) 2448114 Mobile: ( )
Address: 5057 KELLER SPRINGS RD STE 650		
City: ADDISON	State: TX Zip: 75001	
Contact Person: Alyssa Beard	Email: abeard@foundationenergy.com	

PROJECT, PURPOSE & SITE INFORMATION

**PROJECT INFORMATION**  
Remediation Project #: 15761 Initial Form 27 Document #: 402417844

**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 checked="" 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 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 Investigation and Remedial Workplan

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

Facility Type: PIT	Facility ID: 111692	API #: _____	County Name: JACKSON
Facility Name: TITANIUM 26-10-7		Latitude: 40.547189	Longitude: -106.449038
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: NWSE	Sec: 26	Twp: 7N	Range: 81W Meridian: 6 Sensitive Area? Yes

**SITE CONDITIONS**

General soil type - USCS Classifications OL Most Sensitive Adjacent Land Use Non-crop federal 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? Yes

**Other Potential Receptors within 1/4 mile**

There is a pond approximately 0.11 miles from the pit.

# SITE INVESTIGATION PLAN

## TYPE OF WASTE:

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> E&P Waste      | <input type="checkbox"/> Other E&P Waste             | <input type="checkbox"/> Non-E&P Waste |
| <input checked="" type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids             |  |
| <input type="checkbox"/> Oil                       | <input 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	SOILS	See Figure 2	Field screening and Lab 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 19 Initial and Supplemental documents and in the Form 27 Initial (Document# 402417844). The COGCC assigned spill tracking facility ID #111692 and remediation number #15761 for the Site. Initial investigative activities were completed on December 2, 2020 and details were provided to COGCC in the March 30, 2021 approved Form 27S document #402565459. Soil samples were collected from five locations within the former produced water vessel and pit area. A shale layer approximately 1-foot thick was encountered during the excavation test pit activities around nine feet below ground surface and competent bedrock was encountered below the shale. Lab results confirmed soil was above COGCC standards for TPH in two locations. Groundwater was not encountered during excavation activities and during the initial December 2020 investigation and the test pit was backfilled to existing grade. This Form 27S workplan is being submitted to the COGCC for approval and details the proposed 2Q21 remediation and soil investigative activities for 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 ):

During the 12/2/20 pit closure investigation, soil samples were collected from the bases and extents of the test pits around the former produced water vessel and pit area (Figure 2). Based on the results of the 12/2/20 investigation presented in the approved F27S (#402565459), further excavation and delineation activities are warranted at the Site to address impacted material. With COGCC approval, FEM proposes to complete additional excavation of the remaining material and backfill will clean material. The horizontal and vertical extents of the excavation will be delineated to confirm that impacted material has been removed by field screening the excavation sidewall and base locations illustrated on Figure 2 for each area and the highest PID reading will be submitted for laboratory analysis of the constituents that were above the COGCC 910 standards during the 12/2/20 investigation including the full carbon range for TPH (C6-36) per Table 915.

### Proposed Groundwater Sampling

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

Groundwater was not encountered at the Site and sampling is not anticipated at this time.

### 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 ):

Based on the 12/2/20 investigation results for the inorganic parameters (Arsenic and SAR), FEM plans to collect a soil sample from the base of the excavation for SAR and one background sample during the upcoming investigation and excavation activities. The arsenic concentrations appear to indicative of natural conditions and within the range for backgrounds soils in Colorado range and agricultural lands. FEM does not anticipate further investigation activities once the impacted material has been removed following the proposed activities herein. Per Rule 915.f, if the remediation project is not completed by January 15, 2022, then the Operator will comply with the current version of Table 915-1.

# 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) 2550

### NA / ND

NA Highest concentration of TPH (mg/kg) \_\_\_\_\_  
NA Highest concentration of SAR \_\_\_\_\_  
BTEX > 910-1 No  
Vertical Extent > 910-1 (in feet) 9

### Groundwater

Number of groundwater samples collected 0  
Was extent of groundwater contaminated delineated? No  
Depth to groundwater (below ground surface, in feet) 0'  
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?

Two samples were collected and analyzed for inorganic and metals as part of the Table 910-1 parameters from the presumed depth of the former produced water vessel during the 12/2/21 investigation. An additional background sample will be collected from an undisturbed area off the well pad and analyzed for inorganics and metals during subsequent investigation activities.

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?

Further delineation and remedial activities may be needed to address the extent of impacts at the Site if the proposed dig and haul activities presented within this F27S document are unsuccessful. Following data evaluation and discussion with COGCC, a workplan will be presented to the COGCC for approval if needed. Based on field the observations, FEM would consider further investigation or evaluating an alternative remediation approach if applicable to the Site with COGCC approval, which may include, but not limited to the potential use of in-situ or other treatment methods to mitigate the impacted area beneath the surface.

# 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.

Impacted soils exceeding COGCC standards at the Site and require remediation, will be excavated with a trackhoe until analytical results show that the impacted material has been removed or treated. With approval of this remediation workplan, FEM proposes to begin these activities in May 2021 and once the equipment is coordinated, as much remaining source material will be removed from the Site and transported to an off-site disposal facility and backfilled to match pre-existing conditions once laboratory results confirm impacts have been removed. Impacted soils will be transported to the Pawnee Waste Landfill in Grover, CO. Confirmation soil samples will be collected to ensure the removal of any impacted material.

## 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 completion of the approved remediation efforts and/or treatment of impacted soils associated with the Site, source material will be removed from the Site and soil samples will be collected from the sidewalls and the base during the excavation activities to confirm the horizontal and vertical extents are below the COGCC soil standards.

## 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 was not encountered at the site during soil delineation activities and monitoring is not anticipated at this time. If site conditions change, a monitoring program may be warranted.

# REMEDIATION PROGRESS UPDATE

## PERIODIC REPORTING

**Frequency:**  Quarterly  Semi-Annually  Annually  Other Proposed 2Q21 remedial activities

**Report Type:**  Groundwater Monitoring  Land Treatment Progress Report  O&M Report  
 Other Soil investigative workplan

## 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 well was plugged in Fall 2020 and all equipment has been removed from the location. Full reclamation will be completed at the earliest opportunity after the final pit excavation and investigation activities are completed. The pit will be reclaimed to the approximate original contour of the landscape consistent with the 1000-series rule in accordance with final reclamation of the location.

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). \_\_\_\_\_

Date of commencement of Site Investigation. 07/27/2020

Date of completion of Site Investigation. 12/02/2020

## **REMEDIAL ACTION DATES**

Date of commencement of Remediation. 05/03/2021

Date of completion of Remediation. 05/14/2021

## **SITE RECLAMATION DATES**

Date of commencement of Reclamation. 09/06/2021

Date of completion of Reclamation. 09/20/2021

**OPERATOR COMMENT**

Information within this Form 27 is being submitted in association with REM# 15761 in conjunction with the closure of the Titanium 26-10-7 pit (Facility ID 111692) and per the conditions of approval in Forms 27S (#402565459). Impacted soil was discovered within the pit at the base depth of approximately 9 feet. Competent bedrock was encountered below a shale layer at the base of the test pit excavation within the former pit area and acting as a natural barrier for potential migration. Impacted material above the bedrock will be removed and transported to a disposal facility. Attached to this supplemental Form 27 is a Figure showing the proposed soil confirmation and sample locations for the upcoming activities that includes the approximate extents of the excavation areas. Based on the initial investigative results in December 2020, laboratory analysis for this proposed investigation will include BTEX, TPH, and site-specific inorganic parameters as described above with COGCC approval. Following the proposed activities confirming that impacted material has been removed, FEM will request a no further action (NFA) and Site closure of this remediation project. Per Rule 915.f, if the remediation project is not completed by January 15, 2022, then the Operator will comply with the current version of Table 915-1. Field activities for the Titanium pit are scheduled to begin May 4, 2021.

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: 04/23/2021 \_\_\_\_\_

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: KRIS NEIDEL \_\_\_\_\_

Date: 05/21/2021 \_\_\_\_\_

Remediation Project Number: 15761 \_\_\_\_\_

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

	This Site Investigation and Remediation Workplan (Form 27) is conditionally approved; however, additional information or activities may be required during the course of remediation.
	Samples location selection should be guided by rule 915.e.(2)B.
	It is understood that this project is Remediation by excavation, the impacted area is not yet delineated. Careful field notes and documentation should be taken and submitted with the supplemental Form 27.
3 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.

**Att Doc Num****Name**

402668015	FORM 27-SUPPLEMENTAL-SUBMITTED
402668805	SITE INVESTIGATION PLAN

Total Attach: 2 Files

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

		Stamp Upon Approval
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Total: 0 comment(s)