

State of Colorado
Oil and Gas Conservation Commission

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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 INFORMATON

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 11222 Initial Form 27 Document #: 401607069

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 type="checkbox"/> Other _____

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

Facility Type: PIT	Facility ID: 275725	API #: _____	County Name: WELD
Facility Name: HILL 31-15-8	Latitude: 40.611682	Longitude: -104.130966	
** correct Lat/Long if needed: Latitude: _____		Longitude: _____	
QtrQtr: SWSE	Sec: 31	Twp: 8N	Range: 60W 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? No

Is groundwater less than 20 feet below ground surface? No

Other Potential Receptors within 1/4 mile

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
UNDETERMINED	SOILS	NA	Soil sampling

INITIAL ACTION SUMMARY

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

Foundation is planning to collect soil samples at the Hill Central Tank Battery pit location from the proposed locations on the attached map, with a hand auger decontaminated between each sample location.

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):

Foundation proposes to collect 5 soil samples by hand auger for the pit closure investigation - 1 base sample due to the relatively small size of the pit - and 4 sidewall samples which in addition to GBTEX and TPH will be analyzed for pH, EC, and SAR to determine inorganic concentrations and potential reclamation success.

Proposed Groundwater Sampling

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

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 5
Number of soil samples exceeding 910-1 4
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 0

NA / ND

-- Highest concentration of TPH (mg/kg) 3790
-- Highest concentration of SAR 15.9
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 0

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

Highest concentration of Benzene (µg/l) 0
Highest concentration of Toluene (µg/l) 0
Highest concentration of Ethylbenzene (µg/l) 0
Highest concentration of Xylene (µg/l) 0
Highest concentration of Methane (mg/l) 0

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) 23 Volume of liquid waste (barrels) 0

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.

Soil samples will be collected from the locations proposed on the attached map, and analyzed for BTEX, TPH, EC, SAR, and pH (with the exception of the base soil sample, which will not be run for EC, SAR, and pH due to the sample depth). Based on the analytical results, soil will be removed as necessary.

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.

Since soil samples have not been collected yet, Foundation will require additional data in order to develop the remediation plan. However, should soil samples in the pit base and sidewalls exceed the Table 910-1 standard, soil will be removed from the pit and transported to a licensed landfill until the extent of impacts have been determined and removed.

**Update 1/31/19 - Soil samples were collected in April 2018 from the pit sidewalls and base using a hand auger. The results indicated that the north sidewall exceeded the Table 910-1 standard for DRO and EC. Foundation decided to use a dig and haul approach to remove the impacts. The excavation in conjunction with the pit closure occurred July 2, 2018. Initial soil sampling done in April 2018 on the pit base and sidewalls indicated DRO concentrations over the Table 910-1 standard on the North sidewall, as well as high EC and SAR on the east sidewall. Soil staining was not observed during the initial pit sampling. Foundation then contracted Tasman Geosciences to perform excavation on the impacted areas and excavation oversight. Twenty three tons of soil was removed from the Hill CTB pit in order to ensure that the Table 910-1 standard was met and reclamation would succeed. Tasman collected a confirmation sample from the north sidewall at 4' bgs on July 2, 2018 which met the Table 910-1 standard. In excavating the north sidewall, the pit footprint was enlarged to the north approximately 5 feet and to the east by 2 feet. Clean backfill was placed into the pit after the confirmation sample confirmed that the soil containing DRO had been removed. Samples were collected on 1/22/19 to confirm that soil on reclaimed area of the pit (at each corner) does not contain high inorganic constituents and can support reclamation.

Soil Remediation Summary

In Situ

Ex Situ

_____ Bioremediation (or enhanced bioremediation)

Yes _____ Excavate and offsite disposal

_____ Chemical oxidation

_____ If Yes: Estimated Volume (Cubic Yards) _____ 0

_____ Air sparge / Soil vapor extraction

_____ Name of Licensed Disposal Facility or COGCC Facility ID # _____

_____ Natural Attenuation

_____ Excavate and onsite remediation

_____ Other _____

_____ 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.

NA

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:

None

Volume of E&P Waste (solid) in cubic yards _____ 23

E&P waste (solid) description _____ Soil from former produced water pit

COGCC Disposal Facility ID #, if applicable: _____

Non-COGCC Disposal Facility: _____ Waste Management Ault CO

Volume of E&P Waste (liquid) in barrels _____ 0

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? Yes _____

Does the previous reply indicate consideration of background concentrations? Yes _____

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? Yes _____

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.

Once soil samples collected from the base and sidewalls of the pit show concentrations less than the Table 910-1 standard, the berms will be pushed into the base of the pit. Additional topsoil will be brought in and compacted to bring the pit area to surface and prepared for seeding with dryland pasture seed mix. If soil amendments are necessary to increase the chance of success at seeding, Foundation will add amendments based on inorganic soil results.

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? Yes _____

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). 04/18/2018

Date of commencement of Site Investigation. 04/18/2018

Date of completion of Site Investigation. 04/18/2018

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. 05/21/2018

Date of completion of Reclamation. 05/21/2018

OPERATOR COMMENT

The waste manifest shows 23 tons of material disposed. For the purposes of this form, Foundation has assumed a 1:1 ratio of cubics yards to tons.

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

Signed: Alyssa Beard _____

Title: EHS Manager _____

Submit Date: 01/31/2019 _____

Email: abeard@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: RICK ALLISON _____

Date: 03/21/2019 _____

Remediation Project Number: 11222 _____

COA Type**Description**

	<p>The following information is required to continue review of the pit closure and remediation project closure request:</p> <ol style="list-style-type: none"> 1. Laboratory report for the inorganic data collected at the Hill CTB pit January 2019. 2. No data have been supplied for soil sample analysis beneath the skim tank as requested in the Condition of Approval on the Form 27-Initial. Soil sample analysis shall include: BTEX, TPH-GRO and TPH-DRO. 3. No confirmation sample was taken for EC and SAR when the east wall of the pit was excavated. Supply data showing the excavation was successful in removing the lateral extent of the EC and SAR. <p>Operator is directed to submit the above data on a Form 27 Supplemental Report for further review.</p>
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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**

401844383	FORM 27-SUPPLEMENTAL-SUBMITTED
401846669	ANALYTICAL RESULTS
401846671	SOIL SAMPLE LOCATION MAP
401846672	SITE MAP
401846683	DISPOSAL MANIFESTS
401924466	ANALYTICAL RESULTS
401924467	ANALYTICAL RESULTS
401924474	SOIL SAMPLE LOCATION MAP

Total Attach: 8 Files

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

Environmental	Changed final closure request to No and passed form. Operator will submit Form 27 Supplemental with data required in COAs	03/21/2019
Environmental	<ol style="list-style-type: none"> 1. The original Form 27 was approved for 5 soil samples from the sidewalls and base of the excavation. In addition, an additional sample was required beneath the skim tank. Submit the required analytical data with a diagram of sample locations. 2. Soil sample SS-2 contained a SAR value and EC that exceed the Table 910-1 allowable levels. Provide additional data that demonstrates the top three feet of soil within the pit and berm foot print complies with the Table 910-1 levels for pH, EC and SAR. 	12/03/2018

Total: 2 comment(s)