

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:

401436717

Receive Date:

10/23/2017

Report taken by:

Stan Spencer

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

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 9864 Initial Form 27 Document #: 2526999

PURPOSE INFORMATION

- | | |
|--|--|
| <input type="checkbox"/> 901.e. Sensitive Area Determination | <input checked="" 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 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 type="checkbox"/> Other _____ |

SITE INFORMATION

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

Facility Type: <u>PIT</u>	Facility ID: <u>119496</u>	API #: _____	County Name: <u>GARFIELD</u>
Facility Name: <u>FEDERAL 3-11</u>		Latitude: <u>39.380805</u>	Longitude: <u>-108.954361</u>
		** correct Lat/Long if needed: Latitude: _____	Longitude: _____
QtrQtr: <u>NWSE</u>	Sec: <u>11</u>	Twp: <u>8S</u>	Range: <u>104W</u>
		Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

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? Yes

Other Potential Receptors within 1/4 mile

No additional receptors have been identified within 1/4-mile of the subject facility.

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 checked="" type="checkbox"/> Oil | <input type="checkbox"/> Tank Bottoms | |
| <input checked="" 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	See attached data	Groundwater sampling and laboratory analysis
Yes	SOILS	16' (N-S) x 16' (E-W) x 17' bgs	Excavation, soil sampling, and 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.

In September 2016, Foundation Energy Management, LLC (Foundation) completed the transfer of multiple assets from National Fuel Corporation to Foundation. This asset transfer included ten locations with inactive pits, which were determined to serve no current or future purpose related to the operation of the associated wells. The subject pit Facility IDs, associated wells and associated well API numbers were provided in Exhibit E of the Form 10.

Site inspections were conducted by the COGCC in June 2016. Foundation conducted pit assessment activities in December 2016 and selected six of the pits for remediation and closure (Figure 1). Two of the pits can be closed with no further activities, and two require additional assessment activities. Proposed remediation activities are described in the following sections.

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):

Soil samples were collected from the final lateral extent of the excavation area at approximately 15 feet bgs. The soil samples were submitted to Summit Scientific for analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), and total petroleum hydrocarbons (TPH) - gasoline range organics (GRO) by USEPA Method 8260C, TPH - diesel range organics (DRO) by USEPA Method 8015, electrical conductivity (EC), and pH. Laboratory analytical results indicated that constituent concentrations in the soil samples collected from the final lateral extent of the excavation area were below the applicable COGCC Table 910-1 soil standards. Soils were excavated into the phreatic zone to address potential hydrocarbon impacts that may have been present below the current groundwater table due to seasonal fluctuations. Soil sample analytical data is presented in Table 1, and the soil sample locations are illustrated on Figure 2. Laboratory analytical reports were previously submitted.

Proposed Groundwater Sampling

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

Groundwater was unexpectedly encountered in the excavation at approximately 18' bgs, and subsequently infiltrated to approximately 17' bgs. A groundwater sample (GW01) was collected on July 19, 2017, and submitted for analysis of BTEX. Laboratory analytical results indicated that the benzene concentration in sample GW01 was above the applicable COGCC Table 910-1 groundwater standard. Subsequent to leaving the excavation open for 48 hours, a second groundwater sample (GW02) was collected on July 21, 2017. Laboratory analytical results indicated that BTEX concentrations in sample GW02 were below the applicable COGCC Table 910-1 groundwater standards. Groundwater sample analytical data is presented in Table 2, and the groundwater sample locations are illustrated on Figure 2. Laboratory analytical reports were previously submitted.

Proposed Surface Water Sampling

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

The arroyo located southeast of the former pit location was dry during initial assessment activities in December 2016. During the July 2017 remediation activities, there was no flowing water in the arroyo, only several stagnant puddles. As such, no samples were collected from this apparently intermittent surface water feature.

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 9
Number of soil samples exceeding 910-1 3
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 256

NA / ND

-- Highest concentration of TPH (mg/kg) 10100
-- Highest concentration of SAR 26.6
BTEX > 910-1 Yes
Vertical Extent > 910-1 (in feet) 17

Groundwater

Number of groundwater samples collected 2
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 17'
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 160
-- Highest concentration of Toluene (µg/l) 1.4
-- Highest concentration of Ethylbenzene (µg/l) 5.7
-- Highest concentration of Xylene (µg/l) 46
NA Highest concentration of Methane (mg/l)

Surface Water

0 Number of surface water samples collected
 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?

Three composite samples were collected and analyzed for arsenic during the December 2016 site assessment activities. The background arsenic sample results ranged from 5.60 milligrams per kilogram (mg/kg) to 9.58 mg/kg.

☐ 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?

Hydrocarbon impacted groundwater may potentially remain at the site. Temporary groundwater monitoring wells will be installed at the site to further assess the potential extent of groundwater impacts. The temporary groundwater monitoring wells will be sampled and submitted for laboratory analysis of BTEX to verify that groundwater impacts have been mitigated. Should groundwater impacts remain, the temporary monitoring wells will be sampled and submitted for laboratory analysis of BTEX on a quarterly basis until concentrations remain below COGCC groundwater standards for four consecutive quarters.

REMEDIAL ACTION PLAN

Does this Supplemental Form 27A include changes to a previously approved Remedial Action Plan? Yes _____

SOURCE REMOVAL SUMMARY

Describe how source is to be removed.

Impacted soil was remediated as described in the following section. Potential groundwater impacts will be addressed as described below.

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.

Approximately 170 cubic yards in impacted soil were excavated and treated on-site with a dilute solution of hydrogen peroxide to mitigate hydrocarbon impacts. Laboratory analysis of excavation sidewall samples verified that soil impacts were fully addressed. Post-remediation soil confirmation composite samples were collected from the treated material at a frequency of 1 per 50 yards of treated material. Laboratory analysis of the treated soil confirmation samples indicated that hydrocarbon impacts were successfully mitigated. Confirmed successfully treated material was backfilled within the excavation area; soil above pH and/or EC standards was placed greater than 3' bgs and will be covered with imported soil as part of final site reclamation activities. Temporary monitoring wells will be installed to further assess the potential extent of groundwater impacts and/or for remediation purposes. Temporary groundwater monitoring wells will be sampled and submitted for laboratory analysis of BTEX to verify that groundwater impacts have been mitigated. Should groundwater impacts remain, the temporary monitoring wells will be sampled and submitted for laboratory analysis of BTEX on a quarterly basis until concentrations remain below COGCC groundwater standards for four consecutive quarters. Installation of temporary groundwater monitoring wells will be initiated following approval of the remediation plan by the COGCC. Estimated time to attain NFA is TBD based on the review of groundwater concentrations, the extent of impacted groundwater, and the efficacy of selected remedial technologies, if needed.

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 # _____

Yes _____ Excavate and onsite remediation

No _____ Land Treatment

No _____ Bioremediation (or enhanced bioremediation)

Yes _____ Chemical oxidation

No _____ Other _____

Groundwater Remediation Summary

No _____ Bioremediation (or enhanced bioremediation)

No _____ Chemical oxidation

No _____ Air sparge / Soil vapor extraction

Yes _____ Natural Attenuation

Yes _____ Other _____ Under evaluation

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.

Temporary groundwater monitoring wells will be installed to further assess the extent of groundwater impacts and/or for remediation purposes. The temporary groundwater monitoring wells will be sampled and submitted for laboratory analysis of BTEX on a quarterly basis to verify that groundwater impacts have been mitigated. Should groundwater impacts remain, the temporary monitoring wells will be sampled and submitted for laboratory analysis of BTEX until concentrations remain below COGCC groundwater standards for four consecutive quarters. Point of compliance will be monitored through an analytical data review and the evaluation of potentiometric flow direction. A groundwater monitoring location figure illustrating the proposed locations of the temporary monitoring wells is provided as Figure 3.

REMEDIATION PROGRESS UPDATE

PERIODIC REPORTING

Frequency: ☐ Quarterly ☐ Semi-Annually ☐ Annually ☒ Other Proposed GW monitoring well location figure. _____

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? 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 _____

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 former pit excavation area was backfilled to approximately 3' bgs. Future post-remediation reclamation activities at the site will be compliant with applicable COGCC and BLM regulations.

Is the described reclamation complete? Yes

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). _____ 12/01/2016

Date of commencement of Site Investigation. _____ 12/01/2016

Date of completion of Site Investigation. _____ 12/03/2016

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____ 07/17/2017

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

--

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 & Reg. Specialist

Submit Date: 10/23/2017

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: Stan Spencer

Date: 10/24/2017

Remediation Project Number: 9864

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**

401436717	FORM 27-SUPPLEMENTAL-SUBMITTED
401436737	SITE MAP
401436739	SOIL SAMPLE LOCATION MAP
401436742	ANALYTICAL RESULTS
401436744	ANALYTICAL RESULTS
401436782	GROUND WATER SAMPLE LOCATION

Total Attach: 6 Files

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

Environmental	Assuming that groundwater flow direction is congruent with topography (southeast), install two additional temporary groundwater wells to the south and east of the spill location in order to intercept potential pathways. If groundwater is impacted above Table 910-1 concentrations, propose a remediation plan. Closure will be approved when it is demonstrated either that there is no impact to groundwater or following remediation, four consecutive 1/4s of monitoring comply with Table 910-1.	10/24/2017
---------------	--	------------

Total: 1 comment(s)