

State of Colorado
Oil and Gas Conservation Commission

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Report taken by:
Steven Arauza

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: <u>GRIZZLY OPERATING LLC</u>	Operator No: <u>10531</u>	Phone Numbers
Address: <u>5847 SAN FELIPE #3000</u>		Phone: <u>(970) 876-1959</u>
City: <u>HOUSTON</u> State: <u>TX</u> Zip: <u>77057</u>		Mobile: <u>()</u>
Contact Person: <u>Scott Ghan</u>	Email: <u>sghan@grizzlyenergyllc.com</u>	

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION
Remediation Project #: 14050 Initial Form 27 Document #: 402149004

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 type="checkbox"/> Other _____

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

Facility Type: <u>SPILL OR RELEASE</u>	Facility ID: <u>466240</u>	API #: _____	County Name: <u>GARFIELD</u>
Facility Name: <u>Gibson Gulch Unit-66S91W/29SWSW 323972</u>		Latitude: <u>39.492469</u>	Longitude: <u>-107.585501</u>
QtrQtr: <u>SWSW</u> Sec: <u>29</u> Twp: <u>6S</u>		Range: <u>91W</u> Meridian: <u>6</u>	Sensitive Area? <u>Yes</u>

** correct Lat/Long if needed: Latitude: _____ Longitude: _____

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? 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 type="checkbox"/> Produced Water | <input type="checkbox"/> Workover Fluids | _____ |
| <input 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	SOILS	30x30x26	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.

Prior to site assessment activities, the excavation was backfilled to approximately 10 feet below grade due to safety concerns and to access soil boring locations. The excavation was backfilled using clean overburden material generated during benching of the upgradient side of the excavation.

On 9/3/19, six soil borings were advanced to depths up to 32 feet bgs using direct push technology. As each soil boring was advanced a geologist inspected the soil for the presence of hydrocarbon impacts and field screened soil samples using a photoionization detector (PID). No hydrocarbon impacts were observed in any of the soil borings. During the advancement of soil borings, refusal was encountered within each soil borings at depths ranging from 24 feet bgs to 32 feet bgs. Soil samples were collected from each soil boring where field screening and observations indicated the highest potential for hydrocarbon impacts. As approved in COGCC Document Number 402149004, soil samples were submitted for laboratory analysis of TPH GRO/DRO and BTEX.

During assessment activities, water was only observed in soil boring SB-05. All other soil borings were advanced to refusal without the observation of water, indicating that the water observed in SB-05 does not represent characteristics of regional groundwater and appears to be restricted to the previous excavation area. One water sample was collected from soil boring SB-05 and submitted for laboratory analysis of constituents identified in COGCC Table 910-1. Soil boring logs are included as an attachment to this form. Soil boring locations are depicted on the attached Figure 2. Laboratory analytical reports are attached and summarized in Tables 1 and 2.

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):

One soil boring will be advanced in the norther portion of the excavation at the site using hollow stem drilling technology. The soil boring will be completed as a groundwater monitoring well. An additional soil boring will be advanced in the area of S. WALL W. SIDE @ 18' to obtain vertical delineation of the residual impacts the remain in this area. The soil borings will be logged by a geologist and soil samples will be field screened for volatile organic compounds. The proposed monitoring well will be installed in the location of soil boring SB-05 and soil sample E. Floor @ 26'. The proposed soil boring locations is depicted on Figure 2.

Proposed Groundwater Sampling

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

Following construction of the groundwater monitoring well, the well will be developed. The well will be purged until ten casing volumes of groundwater have been removed or until the well is purged dry. After well development, one groundwater sample will be collected from the monitoring well and submitted for laboratory analysis of constituents identified in COGCC Table 910-1. A continued water sampling frequency will be proposed following the results of this sampling event.

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 9
Number of soil samples exceeding 910-1 0
Was the areal and vertical extent of soil contamination delineated? Yes
Approximate areal extent (square feet) 900

NA / ND

ND Highest concentration of TPH (mg/kg) _____
NA Highest concentration of SAR _____
BTEX > 910-1 No
Vertical Extent > 910-1 (in feet) 26

Groundwater

Number of groundwater samples collected 1
Was extent of groundwater contaminated delineated? Yes
Depth to groundwater (below ground surface, in feet) 26
Number of groundwater monitoring wells installed 0
Number of groundwater samples exceeding 910-1 1

-- Highest concentration of Benzene (µg/l) 45
-- Highest concentration of Toluene (µg/l) 43
-- Highest concentration of Ethylbenzene (µg/l) 11
-- Highest concentration of Xylene (µg/l) 1100
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?

See COGCC Document Number 402149004 regarding background arsenic information.

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?

See details in Site Investigation Plan.

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.

Excavation activities removed approximately 440 cubic yards of hydrocarbon impacted soil. The soil was transported to Greenleaf Environmental Services in De Beque, Colorado for offsite disposal.

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.

The majority of the source material has been removed through excavation as previously stated. Vanguard mixed 400 lbs. of chemically oxidized granular activated carbon into the excavation at the water level prior to backfilling to remediate residual dissolved phase hydrocarbons in the area of soil sample E. FLOOR @ 26'.

Residual hydrocarbon impacts remain in the soil in the area of soil sample S. WALL W. SIDE @ 18'. Six soil borings were advanced to depths ranging from 26 feet bgs to 32 feet bgs at which point refusal was encountered, indicating a confining layer preventing further migration of hydrocarbons. Field screening and laboratory analytical data from these soil borings indicate that the identified hydrocarbon impacts in soil sample S. WALL W. SIDE @ 18' do not extend beyond these borings. The proposed boring in this area will further to define the vertical and lateral extents of these impacts.

Soil Remediation Summary

In Situ

_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Air sparge / Soil vapor extraction
_____ Natural Attenuation
_____ Other _____

Ex Situ

Yes Excavate and offsite disposal
_____ If Yes: Estimated Volume (Cubic Yards) 440
Name of Licensed Disposal Facility or COGCC Facility ID # 159998
_____ Excavate and onsite remediation
_____ Land Treatment
_____ Bioremediation (or enhanced bioremediation)
_____ Chemical oxidation
_____ Other _____

Groundwater Remediation Summary

Bioremediation (or enhanced bioremediation)
Yes _____ 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.

One groundwater sample will be collected and analyzed as described in the Site Investigation Plan section of this form.

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:

NA

Volume of E&P Waste (solid) in cubic yards _____ 440

E&P waste (solid) description hydrocarbon impacted soil

COGCC Disposal Facility ID #, if applicable: _____ 159998

Non-COGCC Disposal Facility: _____

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? _____

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.

All disturbances will be returned to preexisting conditions.

Is the described reclamation complete? _____

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. 07/22/2019

Actual Spill or Release date, if known. 07/22/2019

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/24/2019

Date of commencement of Site Investigation. 08/29/2019

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. _____

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

Based on data collected during site assessment activities, the majority of the source material was removed through excavation activities. If the COGCC agrees, Grizzly Operating plans to complete backfilling of the excavation with clean imported fill prior to the proposed soil boring groundwater monitoring well installation to safely access the proposed locations.

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

Signed: ` Chris McKisson _____

Title: Env. Scientist _____

Submit Date: ` 11/06/2019 _____

Email: cmckisson@ltenv.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: Steven Arauza _____

Date: 11/06/2019 _____

Remediation Project Number: 14050 _____

COA Type**Description**

	<p>Remediation Summary section of this report indicates that "residual hydrocarbon impacts remain in the soil in the area of soil sample S. WALL W. SIDE @ 18'," which the operator plans to further delineate by advancing an additional soil boring in this location. Remediation Summary section does not address residual hydrocarbon impacts to soil in the area of soil sample E. FLOOR @ 26'.</p> <p>Operator shall delineate and address residual hydrocarbon impacts at the location of soil samples S. WALL W. SIDE @ 18' and E. FLOOR @ 26'.</p>
	<p>In addition to complete soil sampling documentation, operator shall provide soil boring logs and monitor well construction logs for the proposed soil borings via a Supplemental eForm 27.</p>

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
402191075	FORM 27-SUPPLEMENTAL-SUBMITTED
402198456	ANALYTICAL RESULTS
402198490	MAP
402198499	ANALYTICAL RESULTS
402198500	ANALYTICAL RESULTS
402198774	ANALYTICAL RESULTS
402232230	LOGS
402232375	SITE MAP

Total Attach: 8 Files

General Comments

User Group	Comment	Comment Date
Environmental	Attached Groundwater Laboratory Results Summary Table (Table 2, doc #402198774) reports a sulfate concentration of 12,000 ug/L. Laboratory Report for the groundwater sample (doc #402198500) indicates a sulfate concentration of 21,000 ug/L.	11/06/2019
Environmental	Analytical Summary Table documents TPH exceedances in SW (S. WALL W. SIDE @ 18') and NE (E. FLOOR @ 26') corners of backfilled excavation area.	10/29/2019

Total: 2 comment(s)