FORM 27 Rev 3/16

State of Colorado
Oil and Gas Conservation Commission

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Report taken by: Jim Hughes

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: BERRY PETROLEUM COMPANY LLC Operator No: 10091
Address: 5201 TRUXTUN AVENUE #100
City: BAKERSFIELD State: CA Zip: 90339
Contact Person: Tom Hogelin Email: THogelin@bry.com

Phone Numbers
Phone: (970) 2855207
Mobile: (970) 9482785

PROJECT, PURPOSE & SITE INFORMATION

PROJECT INFORMATION

Remediation Project #: 10052 Initial Form 27 Document #: 401204071

PURPOSE INFORMATION

- [ ] 901.e. Sensitive Area Determination
- [ ] 909.c.(1), Rule 905: Pit or PW vessel closure
- [ ] 909.c.(2), Rule 906: Spill/Release Remediation
- [ ] 909.c.(3), Rule 907.e.: Land treatment of oily waste
- [ ] 909.c.(4), Rule 908.g.: Centralized E&P Waste Management Facility closure
- [ ] 909.c.(5), Rule 910.b.(4): Remediation of impacted ground water
- [ ] Rule 909.e.(2)A.: Notice completion of remediation in accordance with Rule 909.b.
- [ ] Rule 909.e.(2)B.: Closure of remediation project
- [ ] Rule 906.c.: Director request
- [x] Other Submitting landfarming progress report - lab analysis attached

SITE INFORMATION

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

Facility Type: LAND APPLICATION SITE Facility ID: 443362 API #: County Name: GARFIELD
Facility Name: Chevron F06 696 Latitude: 39.557060 Longitude: -108.152849
** correct Lat/Long if needed: Latitude: Longitude:
QtrQtr: SENW Sec: 6 Twp: 6S Range: 96W Meridian: 6 Sensitive Area? Yes

SITE CONDITIONS

General soil type - USCS Classifications ML
Most Sensitive Adjacent Land Use Grazing
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:

- [x] **E&P Waste**
  - [ ] Produced Water
  - [ ] Oil
  - [ ] Condensate
  - [ ] Drilling Fluids
  - [x] Drill Cuttings
- [x] **Other E&P Waste**
  - [ ] Workover Fluids
  - [ ] Tank Bottoms
  - [ ] Pigging Waste
  - [ ] Rig Wash
  - [ ] Spent Filters
  - [x] Pit Bottoms
  - [ ] Other (as described by EPA) _____
- [ ] **Non-E&P Waste** _____

DESCRIPTION OF IMPACT

Impacted?	Impacted Media	Extent of Impact	How Determined
No	SOILS	Confined to bermed treatment area	Visual inspection

INITIAL ACTION SUMMARY

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

Spoil material that is being treated on site by land farming is from drilling, completions and from the bottom of the pit that has been previously closed. The well pad has previously had a partial interim reclamation performed with an allowance for approximately 4,626 cubic yards of material. This material fails COGCC Table 910-1 for benzo(a)pyrene. Landfarming began in the summer of 2012. The lowest level of benzo(a)pyrene from soil samples taken annually since 2012 is 0.027; the highest is 0.052; the latest sample taken on Oct. 9, 2016 was 0.0325. Discrete sampling in 2015 reported that TPH met COGCC Table 910-1 standards in 2014. This material was spread out on the well pad and was treated three times in 2016 (May 5, July 25, & Sept. 13).

PROPOSED SAMPLING PLAN

Proposed Soil Sampling

- [x] Will soil samples be collected as part of this investigation? (Number, type (grab/composite), analyses, and locations of samples):

Samples will be taken semi-annually (twice a year) in the summer and fall.
• Phase I - Composite sample will be taken from 8 locations on the spoil pile in early summer and analyzed.
o If composite sample passes, discrete samples will be taken to confirm the composite samples.
o If discrete samples pass, spoil will be buried per COGCC rules and interim reclamation of the pad will take place.
o If discrete samples fail, landfarming will continue.
o If composite sample fails, landfarming will continue.
• Phase II - Composite sample will be taken from 8 locations on the spoil pile in late fall and analyzed.
o Procedure will be the same as Phase I

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: 1

Number of soil samples exceeeding 910-1: 0

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

Approximate areal extent (square feet): 11250

NA / ND

NA — Highest concentration of TPH (mg/kg):

NA — Highest concentration of SAR:

BTEX > 910-1: No

Vertical Extent > 910-1 (in feet): 2

Groundwater

Number of groundwater samples collected: 0

Was extent of groundwater contaminated delineated? No

Depth to groundwater (below ground surface, in feet): `

Number of groundwater monitoring wells installed:

Number of groundwater samples exceeding 910-1:

— Highest concentration of Benzene (µg/l):

— Highest concentration of Toluene (µg/l):

— Highest concentration of Ethylbenzene (µg/l):

— Highest concentration of Xylene (µg/l):

— 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?

☐ 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?

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.

In 2017, the landfarmed material was spread out even more to an approximate average depth of 18". The material has been tilled three times adding only fulvic acid to each treatment.

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.

Spoil will be turned over by an excavator and/or a Kubota farm tractor pulling a chisel point plow 8 to 10 times (depending on weather and snow conditions) during the warm months in 2017. The soil will be turned over with the frequency established in the plan as a minimum or with a higher frequency if possible. The soil has been spread out to increase exposure to the atmosphere and sunlight as much as possible on the production pad.

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
  - Yes Land Treatment
  - No Bioremediation (or enhanced bioremediation)
  - No Chemical oxidation
  - No Other ____

Groundwater Remediation Summary

- No Bioremediation (or enhanced bioremediation)
- No Chemical oxidation
- No Air sparge / Soil vapor extraction
- No Natural Attenuation
- No 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.

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? 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.

This well pad has previously had a partial interim reclamation performed with an allowance for approximately 4,626 cubic yards of material. This material fails COGCC Table 910-1. This material will be landfarmed on site until 910-1 is met and then will be buried with a minimum of 3' of cover. Surface roughening shall be utilized on all areas receiving revegetation. Topsoil will be spread over all areas to be revegtated. Seed applied by drill will be covered by weed-free straw, mulched and crimped. Seed applied by hydroseeding will be tackified. Monthly inspections for physical signs of compaction alleviation will be conducted by a qualified inspector while conducting stormwater inspections except when the location is in winter exclusion status. The location will be inspected during the growing season by a qualified contractor capable of identifying noxious weeds and selecting and applying the appropriate chemical to eradicate those noxious weeds.

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? Yes

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. 06/22/2012

Actual Spill or Release date, if known. _____

SITE INVESTIGATION DATES

Date of Initial Actions described in Site Investigation Plan (start date). 07/13/2012

Date of commencement of Site Investigation. _____

Date of completion of Site Investigation. _____

REMEDIAL ACTION DATES

Date of commencement of Remediation. 08/08/2012

Date of completion of Remediation. _____

SITE RECLAMATION DATES

Date of commencement of Reclamation. _____

Date of completion of Reclamation. _____

OPERATOR COMMENT

Submitting landfarming lab analysis for F06 696. One composite sample consisting of 16 subsamples was taken. Benzo(a)pyrene was reported at 0.0172 mg/kg. TPH previously met 910-1 standards. A final sample will be taken on 9/26/17 and if it passes 910-1, the material will be used to close the pit on location.

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

Signed:` Tom Hogelin Title: Construction Foreman

Submit Date:` 09/25/2017 Email: THogelin@bry.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: Jim Hughes Date: 12/08/2017

Remediation Project Number: 10052

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
401412541	FORM 27-SUPPLEMENTAL-SUBMITTED
401412551	REMEDIATION PROGRESS REPORT

Total Attach: 2 Files

General Comments

User Group	Comment	Comment Date
Environmental	Provide monthly Supplemental F27s describing activities performed as it relates to this remediation.	12/08/2017
Environmental	Provide a table with the sample Location IDs and latitude/longitude of each sample that was composited.	12/08/2017
Environmental	Provide a map illustrating locations of where samples were collected.	12/08/2017
Environmental	This Supplemental Form 27 is conditionally approved; however, additional information or activities may be required, including financial assurance, during the course of remediation.	12/08/2017

Total: 4 comment(s)