

State of Colorado
Oil and Gas Conservation Commission

1120 Lincoln Street, Suite 801, Denver, Colorado 80203 (303)894-2100 Fax:(303)894-2109



FOR OGCC USE ONLY

REM 10020
Document 2527559

SITE INVESTIGATION AND REMEDIATION WORKPLAN

This form shall be submitted to the Director for approval prior to the initiation of site investigation and remediation activities. Form 27 is intended to be used whenever possible. Additional documentation will be required when large volumes of soil and groundwater have been impacted or involve large facilities with multiple source areas. See Rule 910. Attach as many pages as needed to fully describe the proposed work.

OGCC Employee:

☐ Spill ☐ Complaint
☐ Inspection ☐ NOAV

Tracking No:

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

☐ Spill or Release ☐ Plug & Abandon ☐ Central Facility Closure ☐ Site/Facility Closure ☒ Other (describe): drill cuttings

OGCC Operator Number: 10091

Name of Operator: Berry Petroleum Company

Address: 1999 Broadway, Suite 3700

City: Denver State: CO Zip: 80202

Contact Name and Telephone:

Chris Freeman

No: 303-999-4400

Fax: 303-999-4402

API Number: 05-045-12871

County: Garfield

Facility Name: Chevron CD-29 596

Facility Number: 335965

Well Name: Chevron #29-11D

Well Number: 29-11D

Location: (QtrQtr, Sec, Twp, Rng, Meridian): NE1/4 NW1/4 Sec 29 T5S R96W Latitude: _____ Longitude: _____

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc): drill cuttings

Site Conditions: Is location within a sensitive area (according to Rule 901e)? ☒ Y ☐ N If yes, attach evaluation.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): rangeland and natural gas production

Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: _____

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Bear Creek 500 feet NW

Description of Impact (if previously provided, refer to that form or document):

Impacted Media (check):

- ☒ Soils
☐ Vegetation
☐ Groundwater
☐ Surface Water

Extent of Impact:

drill cuttings contained within soil berm

How Determined:

laboratory testing

REMEDIAL WORKPLAN

Describe initial action taken (if previously provided, refer to that form or document):

Drill cuttings were excavated and tested for Table 910-1 parameters. The most recent testing showed all parameters except arsenic below the standards. These cuttings are currently stockpiled on site. The water storage pit on site will be closed. Upon removal of water in the pit, a composite sample will be collected from the pit bottom materials to evaluate compliance with Table 910-1 standards for this material.

Describe how source is to be removed:

Drill cuttings were excavated from the drilling pit and stockpiled on the well pad and enclosed by a soil berm. The water storage pit bottom materials will be excavated and landfarmed on site if test results show concentrations above the Table 910-1 standards.

Describe how remediation of existing impacts is to be accomplished, including removal and disposal at an injection well or licensed facility, land treatment on site, removal of impacted groundwater, insitu bioremediation, burning of oily vegetation, etc.:

Drill cuttings were landfarmed on site within a bermed area. Background soil samples were also collected and analyzed for arsenic in the vicinity of the pit to characterize natural soil arsenic concentrations. Water storage pit bottom materials will be landfarmed on site if test results show concentrations above the Table 910-1 standards. Landfarming methods could include tilling, application of fertilizer, and the addition of native soil or sawdust.



Tracking Number: _____
Name of Operator: _____
OGCC Operator No: _____
Received Date: _____
Well Name & No: _____
Facility Name & No: _____

REMEDIATION WORKPLAN (Cont.)

OGCC Employee: _____

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):

There are no impacts to groundwater.

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. Use additional sheet for description if required.

After treatment is completed, and background levels of arsenic in the drill cuttings are demonstrated, drill cuttings and water storage pit bottom materials will be blended with non-contaminated on-site materials and buried in the pit and compacted. All cuttings with SAR greater than 12 will be buried at least three feet below the reclaimed ground surface. The remainder of the pit will be backfilled using native rock and soil, regraded to conform to the surrounding ground surface, and reseeded using an approved seed mix. Noxious weeds will be controlled as necessary using approved methods.

Attach samples and analytical results taken to verify remediation of impacts. Show locations of samples on an onsite schematic or drawing.

Is further site investigation required? ☐ Y ☒ N If yes, describe:

Samples of the water storage pit bottom materials have been collected and analyzed for the Table 910-1 parameters to evaluate the compliance with the standards and to determine when treatment has been completed.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):

The remediated drill cuttings and water storage pit bottom materials will be blended with on-site materials and buried in the pit as described above.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 9/23/2010	Date Site Investigation Completed: 7/2/2013	Date Remediation Plan Submitted: _____
Remediation Start Date: 9/23/2010	Anticipated Completion Date: 9/1/2013	Actual Completion Date: 7/2/2013

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

Print Name: Chris P. Freeman

Signed: _____

Title: Regional Manager, Environmental, Health, and Safety

Date: 7/2/2013

OGCC Approved: _____ Title: _____ Date: _____



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Mt. Juliet, TN 37122
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Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Dave Nicholson
Berry Petroleum Company - Denver, CO
1999 Broadway, Suite 3700
Denver, CO 80202

Report Summary

Friday June 21, 2013

Report Number: L641803

Samples Received: 06/18/13

Client Project:

Description: Pit Reclamation

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By:

Mark W. Beasley , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197,
FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016,
NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002,
SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612,
MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1,
TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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REPORT OF ANALYSIS

Dave Nicholson
Berry Petroleum Company - Denver, C
1999 Broadway, Suite 3700
Denver, CO 80202

June 21, 2013

Date Received : June 18, 2013
Description : Pit Reclamation
Sample ID : CD-29 PIT BOTTOM
Collected By :
Collection Date : 06/17/13 13:10

ESC Sample # : L641803-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Chromium, Hexavalent	BDL	2.0	mg/kg	3060A/7196A	06/19/13	1
ORP	33.		mV	2580 B-2011	06/19/13	1
pH	8.2		su	9045D	06/20/13	1
Sodium Adsorption Ratio	17.			Calc.	06/20/13	1
Specific Conductance	1600		umhos/cm	9050AMod	06/20/13	1
Mercury	0.031	0.020	mg/kg	7471	06/19/13	1
Arsenic	12.	1.0	mg/kg	6010B	06/20/13	1
Barium	410	0.25	mg/kg	6010B	06/20/13	1
Boron	12.	10.	mg/kg	6010B	06/21/13	1
Cadmium	BDL	0.25	mg/kg	6010B	06/20/13	1
Chromium	36.	0.50	mg/kg	6010B	06/20/13	1
Copper	18.	1.0	mg/kg	6010B	06/20/13	1
Lead	14.	0.25	mg/kg	6010B	06/20/13	1
Nickel	16.	1.0	mg/kg	6010B	06/21/13	1
Selenium	BDL	1.0	mg/kg	6010B	06/20/13	1
Silver	BDL	0.50	mg/kg	6010B	06/20/13	1
Zinc	50.	1.5	mg/kg	6010B	06/20/13	1
Benzene	BDL	0.0025	mg/kg	8021/8015	06/21/13	5
Toluene	BDL	0.025	mg/kg	8021/8015	06/21/13	5
Ethylbenzene	BDL	0.0025	mg/kg	8021/8015	06/21/13	5
Total Xylene	BDL	0.0075	mg/kg	8021/8015	06/21/13	5
TPH (GC/FID) Low Fraction	BDL	0.50	mg/kg	GRO	06/20/13	5
Surrogate Recovery-%						
a,a,a-Trifluorotoluene (FID)	94.3		% Rec.	8021/8015	06/20/13	5
a,a,a-Trifluorotoluene (PID)	95.9		% Rec.	8021/8015	06/21/13	5
TPH (GC/FID) High Fraction	470	200	mg/kg	3546/DRO	06/19/13	50
Surrogate recovery(%)						
o-Terphenyl	679.		% Rec.	3546/DRO	06/19/13	50
Polynuclear Aromatic Hydrocarbons						
Anthracene	BDL	0.0060	mg/kg	8270C-SIM	06/20/13	1
Acenaphthene	0.029	0.0060	mg/kg	8270C-SIM	06/20/13	1
Acenaphthylene	BDL	0.0060	mg/kg	8270C-SIM	06/20/13	1
Benzo(a)anthracene	0.019	0.0060	mg/kg	8270C-SIM	06/20/13	1
Benzo(a)pyrene	0.016	0.0060	mg/kg	8270C-SIM	06/20/13	1
Benzo(b)fluoranthene	0.035	0.0060	mg/kg	8270C-SIM	06/20/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit (PQL)
L641803-02 (PH) - 8.2@22.4c



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Collected By :
Collection Date : 06/17/13 13:10

ESC Sample # : L641803-02

Site ID :

Project # :

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzo (g,h,i) perylene	0.019	0.0060	mg/kg	8270C-SIM	06/20/13	1
Benzo (k) fluoranthene	0.0078	0.0060	mg/kg	8270C-SIM	06/20/13	1
Chrysene	0.031	0.0060	mg/kg	8270C-SIM	06/20/13	1
Dibenz (a,h) anthracene	BDL	0.0060	mg/kg	8270C-SIM	06/20/13	1
Fluoranthene	0.020	0.0060	mg/kg	8270C-SIM	06/20/13	1
Fluorene	0.13	0.0060	mg/kg	8270C-SIM	06/20/13	1
Indeno (1,2,3-cd) pyrene	0.013	0.0060	mg/kg	8270C-SIM	06/20/13	1
Naphthalene	0.18	0.020	mg/kg	8270C-SIM	06/20/13	1
Phenanthrene	0.16	0.0060	mg/kg	8270C-SIM	06/20/13	1
Pyrene	0.091	0.0060	mg/kg	8270C-SIM	06/20/13	1
1-Methylnaphthalene	0.30	0.020	mg/kg	8270C-SIM	06/20/13	1
2-Methylnaphthalene	0.65	0.020	mg/kg	8270C-SIM	06/20/13	1
2-Chloronaphthalene	BDL	0.020	mg/kg	8270C-SIM	06/20/13	1
Surrogate Recovery						
Nitrobenzene-d5	93.2		% Rec.	8270C-SIM	06/20/13	1
2-Fluorobiphenyl	70.4		% Rec.	8270C-SIM	06/20/13	1
p-Terphenyl-d14	96.0		% Rec.	8270C-SIM	06/20/13	1

BDL - Below Detection Limit

Det. Limit - Practical Quantitation Limit (PQL)

Note:

The reported analytical results relate only to the sample submitted.

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Reported: 06/21/13 16:33 Printed: 06/21/13 16:34
L641803-02 (PH) - 8.2@22.4c