FORM
27
Rev 6/99

State of Colorado
Oil and Gas Conservation Commission

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

FOR OGCC USE ONLY

#7594

RECEIVED
2/12/2013

OGCC Employee:

[x] Spill [ ] Complaint
[ ] Inspection [ ] NOAV

Tracking No: 2231017

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.

CAUSE OF CONDITION BEING INVESTIGATED AND REMEDIATED

[X] Spill or Release [ ] Plug & Abandon [ ] Central Facility Closure [ ] Site/Facility Closure [ ] Other (describe):

GENERAL INFORMATION

OGCC Operator Number: 69175
Name of Operator: PDC Energy, Inc.
Address: 1775 Sherman Street, Suite 3000
City: Denver State: CO Zip: 80203

Contact Name and Telephone
Name: Brandon Bruns
No: (303) 831-3971
Fax: (303) 860-5838

API/Facility No: 320351
Facility Name: Sack 11, 12, 22, 23-6
Well Name: Sack 11, 12, 22, 23-6
Location (QtrQtr, Sec, Twp, Rng, Meridian): SENW S6 T1S R67W

County: Weld
Facility Number: 320351
Well Number: Sack 11, 12, 22, 23-6
Latitude: 39.996072 Longitude: -104.933931

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate
Site Conditions: Is location within a sensitive area (according to Rule 901e)? [X] Y [ ] N If yes, attach evaluation.
Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Oil and gas production, Agriculture
Soil type, if not previously identified on Form 2A or Federal Surface Use Plan: Silty sand, silty clay, and medium to fine grained sand
Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located approximately 30' west of the Tank Battery, a residential building is approximately 105' northeast, a water well is approximately 950' northeast, and Depth to shallowest groundwater is approximately 5 ft bgs.

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

Impacted Media (check):	Extent of Impact:	How Determined:
[X] Soils	Refer to the attached Figure 2 and Table 1	Excavation, direct push drilling, and soil sampling
[ ] Vegetation		
[X] Groundwater	Refer to the attached Table 2	Groundwater sampling
[ ] Surface water		

REMEDIATION WORKPLAN

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

A Form 19 was submitted to the COGCC on October 31, 2012. To date, no spill number has been assigned by the COGCC. An aerial map of the site is included on Figure 1.

Describe how source is to be removed:

The source area was previously excavated and impacted material was transported and disposed of at a licensed facility as described in the Form 19.

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.:

On October 29, 2012, five temporary monitoring/remediation wells were installed at the locations illustrated on the attached Figure 2 using direct push drilling techniques. Soil samples, as noted in Table 1, were collected from each borehole location, using continuous sampling techniques, to determine the lateral and vertical extents of petroleum hydrocarbon impacts in soil. The sample cores and analytical soil samples were field screened for volatile organic compound (VOC) concentrations using a photoionization detector (PID). The analytical soil sample and PID results are summarized in the attached Table 1 and the laboratory analytical reports are included in Attachment A. On October 30, 2012, groundwater analytical samples were collected from the four of the temporary monitoring wells. Monitoring well BH01 was not sampled as the well completion for the flush mount well vault was not fully cured and the well could not be accessed. The groundwater analytical results are summarized in the attached Table 2 and the laboratory analytical report is included as Attachment A. Based on the soil sample and groundwater sample analytical results, PDC plans to conduct 8-hour vacuum enhanced fluid recovery (EFR) and air sparge (AS) events every two weeks at the site to address residual hydrocarbon impacts. Additionally, should petroleum hydrocarbon concentrations degrade substantially using EFR and AS remediation techniques, persulfate chemical oxidant injections may be implemented as a final "polishing" technique. Once groundwater hydrocarbon impacts meet COGCC Table 910-1 groundwater standards, PDC will conduct quarterly groundwater sampling events at the well locations until groundwater concentrations meet COGCC standards for four consecutive quarters. Should groundwater concentrations remain above COGCC standards subsequent to a six month remediation and monitoring period, additional remediation options will be evaluated.

Submit Page 2 with Page 1.

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REMEDIATION WORKPLAN (CONT.)

OGCC Employee:

Tracking Number:
Name of Operator: PDC Energy, Inc.
OGCC Operator No: 69175
Received Date:
Well Name & No: Sack 11, 12, 22, 23-6
Facility Name & No.: Sack 11, 12, 22, 23-6

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

Once COGCC Table 910-1 groundwater standards are met, PDC will conduct quarterly sampling on the five monitoring wells to assess the dissolved phase petroleum hydrocarbon impacts in groundwater using USEPA Method 8260. Groundwater sampling will continue until four consecutive quarters of groundwater monitoring data indicate that petroleum hydrocarbon concentrations are below the COGCC Table 910-1 standards.

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.

The area where the excavation is located is used as an equipment access area to the tank battery location and consists of road base. The excavation has been backfilled and compacted with clean material and the ground surface was contoured to match pre-existing conditions.

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? [X] Y [x] N If yes, describe:

PDC feels that no further Site investigation is required at this time. The excavation extent and soil and groundwater sample locations are illustrated on Figure 2. Soil analytical results are summarized in Table 1, groundwater analytical results are summarized in Table 2, and surface water analytical results are summarized on Table 3.

Ground water investigation/monitoring underway.

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

Waste was disposed of at the Waste Management Facility in Ault, CO.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began:	9/7/2012	Date Site Investigation Completed:	10/30/2012	Remediation Plan Submitted:	
Remediation Start Date:	9/7/2012	Anticipated Completion Date:	NA	Actual Completion Date:	TBD

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

Print Name: Brandon Bruns

Signed: Brandon Bruns Title: EHS Professional Date: 2/10/13

OGCC Approved: Robert H. Chesson Digitally signed by Robert H. Chesson DN: cn=Robert H. Chesson, o=COGCC, ou, email=robert.chesson@state.co.us, c=US Date: 2013.02.27 10:05:21 -07'00' Title: EPS Date: 2/27/2013