

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

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):

GENERAL INFORMATION

OGCC Operator Number: 69175 Name of Operator: <u>Petroleum Development Corporation (PDC)</u> Address: <u>1775 Sherman Street, Suite 3000</u> City: <u>Denver</u> State: <u>CO</u> Zip: <u>80203</u>		Contact Name and Telephone Name: <u>John Nussbaumer</u> No: <u>(303) 860-5800</u> Fax: <u>(303) 860-5838</u>	
API/Facility No: <u>05-123-20671</u> Facility Name: <u>Anderson 12-13</u> Well Name: <u>Anderson</u>		County: <u>Weld</u> Facility Number: _____ Well Number: <u>12-13</u>	
Location (QtrQtr, Sec, Twp, Rng, Meridian): <u>SWNW Sec 13 T6N R65W 6th Principal Meridian</u> Latitude: _____ Longitude: _____			

TECHNICAL CONDITIONS

Type of Waste Causing Impact (crude oil, condensate, produced water, etc.): Condensate and produced water

Site Conditions: Is location within a sensitive area (according to Rule 901e) Y N If yes, attach evaluation. Groundwater < 20 feet bgs.

Adjacent land use (cultivated, irrigated, dry land farming, industrial, residential, etc.): Irrigated cropland

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

Potential receptors (water wells within 1/4 mi, surface waters, etc.): Surface water is located 15' east of the site, a building is located 1.710' west of the site, a water well is located 2.232' north of the site, and depth to groundwater is 4' below ground surface (bgs).

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

Impacted Media (check):	Extent of Impact:	How Determined:
<input checked="" type="checkbox"/> Soils	<u>75' N-S x 4' E-W x 4' bgs</u>	<u>Soil samples for field screening and laboratory analysis</u>
<input type="checkbox"/> Vegetation	_____	_____
<input checked="" type="checkbox"/> Groundwater	<u>See attached data</u>	<u>Collected groundwater samples for laboratory analysis</u>
<input type="checkbox"/> Surface water	_____	_____

REMEDIATION WORKPLAN

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

Form 19 provided 9/8/08 (Spill# 1984346).

Describe how source is to be removed:

During routine tank battery upgrade activities a leak in the dump lines was observed to have released an unknown quantity of produced water and condensate to the subsurface. Once the dump lines were removed, impacted soil above the Colorado Oil and Gas Conservation Commission (COGCC) Allowable Concentrations and Levels (Table 910-1 prior to 4/1/09) was excavated during August and September 2008. Soil samples were collected from the base and sidewalls of the excavation and were submitted for analysis of Total Petroleum Hydrocarbons (TPH) by EPA Modified Method 8015. Laboratory results indicated TPH concentrations (C6-C36) at the extents of the excavation were below the COGCC sensitive area standard of 1,000 mg/kg. Two additional soil borings were hand augered on lease road. Soil samples were collected and submitted for TPH and laboratory results indicated TPH concentrations (C6-C36) were below the COGCC sensitive area allowable level. Groundwater entering the excavation was analyzed for benzene, toluene, ethyl benzene, and xylenes (BTEX) by EPA Method 8260B. Laboratory results indicated benzene concentrations exceeded the Colorado Department of Public Health and Environmental (CDPHE) Water Quality Control Commission (WQCC) Regulation 41- The Basic Standards for Groundwater of 5 micrograms per liter (µg/l). A surface water sample was collected from the adjacent irrigation pond and analyzed for BTEX. Analytical results indicated BTEX levels were below the laboratory reporting limit of 1 µg/l. Before backfilling the excavation, activated carbon was applied to the groundwater and exposed smear zone soils. A topographic map and site map are provided as Figures 1 and 2. Soil, groundwater and surface water analytical results are provided in Tables 1, 2 and 3.

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.:

Approximately 234 cubic yards of impacted soil above the COGCC allowable level was transported to the Waste Management landfill in Ault, CO for disposal.



REMEDIATION WORKPLAN (CONT.)

OGCC Employee: _____

Tracking Number: _____
Name of Operator: PDC
OGCC Operator No: 69175
Received Date: _____
Well Name & No: Anderson 12-13
Facility Name & No.: Anderson 12-13

If groundwater has been impacted, describe proposed monitoring plan (# of wells or sample points, sampling schedule, analytical methods, etc.):
Four monitoring wells (MW01-MW04) were installed at the site on 8/24/08. Two additional monitoring wells, MW05 and MW06, were installed at the site on 10/20/08 in order to define possible groundwater impacts to the south and southwest of the release location. Each of the wells were developed and purged following installation. Groundwater samples were collected and submitted for laboratory analysis of BTEX on 9/25/08, 11/11/08, 12/23/08, 3/19/09, and 6/17/09. Analytical results indicated BTEX levels in groundwater samples collected from monitoring wells MW01 through MW06 have been below The Basic Standards for Groundwater for four consecutive quarters.

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 site is currently in use as a PDC production facility.

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 [X] N If yes, describe:
Analytical results indicate BTEX levels in the groundwater samples collected from each of the wells have remained below the Basic Standards for Groundwater for four consecutive quarters. The groundwater data indicates the former source area impacts have been remediated. Based on the laboratory results, PDC is requesting No Further Action status for the site.

Final disposition of E&P waste (landtreated and disposed onsite, name of licensed disposal facility, recycling, reuse, etc.):
Approximately 243 cubic yards of impacted soil above the COGCC allowable level was transported to the Waste Management Landfill in Ault, CO for disposal.

IMPLEMENTATION SCHEDULE

Date Site Investigation Began: 9/3/08 Date Site Investigation Completed: 9/24/09 Remediation Plan Submitted: _____
Remediation Start Date: 9/3/08 Anticipated Completion Date: 10/3/09 Actual Completion Date: _____

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

Print Name: Randall Ferguson

Signed: [Signature] Title: Environmental Supervisor Date: 12/3/09

OGCC Approved: _____ Title: _____ Date: _____