U.S. ENVIRONMENTAL PROTECTION AGENCY
POLLUTION/SITUATION REPORT
PDC Energy Oil Spill - Removal Polrep

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**Region V**

**Subject:** **POLREP #7**
**Progress**
**PDC Energy Oil Spill**
**Z5NH**
**Beverly, OH**
**Latitude: 39.6159881 Longitude: -81.6669809**

**To:**
**From:** Betsy Nightingale, On-Scene Coordinator
**Date:** 5/21/2014
**Reporting Period:** 5/17/14-5/21/14

## 1. Introduction

### 1.1 Background

| | | | |
|---|---|---|---|
| **Site Number:** | Z5NH | **Contract Number:** | |
| **D.O. Number:** | | **Action Memo Date:** | |
| **Response Authority:** | OPA | **Response Type:** | Emergency |
| **Response Lead:** | PRP | **Incident Category:** | Removal Action |
| **NPL Status:** | Non NPL | **Operable Unit:** | |
| **Mobilization Date:** | 5/4/2014 | **Start Date:** | 5/4/2014 |
| **Demob Date:** | 5/22/2014 | **Completion Date:** | |
| **CERCLIS ID:** | | **RCRIS ID:** | |
| **ERNS No.:** | | **State Notification:** | |
| **FPN#:** | E14519 | **Reimbursable Account #:** | |

#### 1.1.1 Incident Category

Emergency Response - OPA

#### 1.1.2 Site Description

The site is a wet gas/natural gas oil production well (Well Site Palmer 44-20) north of Beverly, Ohio. Wet gas is a mix of crude oil and condensate.

On Sunday May 4, 2014, PDC Energy reported a 100 barrel spill of drilling mud (75% synthetic oil blend) into an unnamed creek near Beverly, OH. On May 9, PDC provided a revised figure of 366 barrels (15372 gallons) of hydrocarbons are estimated to have been released. In addition to the drilling mud, an unknown amount of wet gas was also released. The spill is believed to have been a result of a mechanical failure of a well head during a horizontal drilling operation intended for hydraulic fracturing in the Utica Shale formation to extract wet gas and natural gas. Upon discovery of the discharge, drilling operations were stopped and PDC Energy implemented their emergency response plan. The incident management specialist contractor, Wild Well Control (WWC), was notified of the situation and mobilized to the discharge site. WWC arrived on site within six hours of mobilization.

The oil production well pad is situated on a man-made earthen platform, with steep embankments to the north, east, and south. (Photos of well pad engineering design plans are available in the website documents section.) As a result of the well head failure, drilling fluid discharged out of the well boring and onto the surface of the drilling pad and down gradient into storm-water control and naturally occurring drainage features adjacent to the north, east, & south perimeters of the well pad and to an unnamed creek downstream of the ditches. The unnamed creek flows for ¾ mile before leading to Cow Run Creek, and Cow Run Creek flows for a mile before leading to Olive Creek. Olive Creek then flows for a mile before meeting with the Muskingum River a tributary of the Ohio River.

Ohio Department of Natural Resources and PDC are investigating the cause of the failure of the well head and release. In addition to the drilling mud and wet gas, natural gas was released causing an explosive atmosphere leading to dangerous working conditions and the evacuation of 7 residents from 3 homes adjacent to the site. The release was stopped and the evacuation was subsequently lifted. PDC does not anticipate any further releases.

##### 1.1.2.1 Location

1010 Center Bend Rd
Beverly, Morgan County, Ohio

**1.1.2.2 Description of Threat**

Oil has been released into an unnamed creek that is a tributary to the Muskingum River, a navigable waterway.

**1.1.3 Preliminary Removal Assessment/Removal Site Inspection Results**

## 2. Current Activities

### 2.1 Operations Section

**2.1.1 Narrative**

Please see earlier POLREPs for information prior to this reporting period. This report addresses May 17-21, 2014.

Incident Command Structure (ICS) Forms 202, 207 and 214 continue to be utilized each operational period (currently 24 hour operational period).

**General Notes**

Accessibility and topography have impeded response operations.

As the bulk of the free product released to the surface waters appears to have been collected, EPA has formally transitioned oversight the the response to the Ohio EPA. OSC Nightingale and the USCG Strike team personnel demobed from the site on May 19, and START demobed from the site May 21.

At EPA's request, PDC developed and revised a continuing operations plan, that details actions that are being taken to prevent, monitor for and address further releases after EPAs departure from the site. This plan is available in the documents section of the website.

At this time, the vast majority of product that was released to surface waters appears to have been collected. Very little product is being observed in the tributaries, and sheen is diminishing daily. Additional collection and maintenance activities are being conducted and will continue. Product does not appear to have made it as far as (former) Containment Dam 2 as a result of this release. Several subsurface seeps that are releasing small amount of product have been discovered along the riverine channels, indicating that some oil has migrated subsurface. The extent of this is currently being evaluated. Discharge from these seeps is contained.

**1. Weather**

Minimal rain was received over the reporting period, with the exception of on May 21.

**2. Report by Geographic Division.** For organizational purposes, the site has been divided geographically as detailed below, and shown in the well pad and waterway maps located in the documents section of the website. These maps are being revised to add updated nomenclature.

During May 17-21, further work was done to develop and implement strategies to address these areas:

**Well**- Fishing work to retrieve pipe from the well was conducted. Normal well operations are under way.

**Drilling Pad**- Free product remains present on pad and in the pad's stormwater drainage system. Seeps of product downgradient of the pad into the lateral channels also indicate that product has migrated subsurface through the gravel base of the pad. According to PDC's consultant the a shale layer is about about 7 feet below ground surface, and 2 feet of gravel was installed just below the surface. Geologists are on site, test pits have been dug and investigations are ongoing to determine the extent of contamination.

Four catch basins are located on the pad. Some surface flow also drains to catch basins, while in other areas, surface flow drains through swales to the sedimentation basins. Catch basins have been plugged, and are being kept pumped down 24 hours a day to reduce discharges from the pad to the sedimentation basins. The pad is drained by a subsurface french drain system that drains to the catch basins.

Due to the extensive nature of contamination in the pad, the challenges associated with cleaning it while the rig is in place, and the therefore high potential for additional release from the pad, the pad has been hydraulically isolated from the surrounding environment, until the pad is fully remediated. It is anticipated that the rig will be removed within about 1 month. Further investigation of contamination is planned for that time.

**East swale (stormwater drainage feature of pad)**- Area drains to ST#2. Area was impacted by spray and overland flow of oil. Because this swale drains to a sediment trap that has been plugged and should not readily discharge, flushing of this swale was designated as a secondary priority.

**East Sediment Trap (ST2)** - Pond/trap receives storm water from pad. Basin is continually pumped out so water/product that accumulates will not discharge. Pumping effectively prevented overflow for the majority of this reporting period. Absorbents were installed and maintained. Additional sediment removal using the super sucker is planned.

**Sediment Trap #2 Outfall channel (tributary to east lateral)** - Vegetation was cleared from the area affected by overland flow on May 19th. On May 20th, crews washed this area in an effort to flush oil. The wash produced oil and sheen which was collected at Dam B. Continual flushing with sprinklers is planned to liberate further product. Flow from this drainage feature drains to Containment Dam B and then eventually

to Containment Dam 1.

**East lateral channel (tributary to unnamed creek)** - This tributary drains to Containment Dam 1. Small seeps containing product were observed on the drill pad side of the East Lateral channel. A bentonite lined sandbag underflow dam (**Containment Dam B**) was installed on May 18th, downstream of all seeps that are knowingly carrying product to the East Lateral. This dam was monitored over this reporting period, and absorbents were used to retrieve accumulated product.

**West Sediment Trap (ST1)** - Pond/trap receives storm water from pad. Basin is continually pumped out so water/product that accumulates will not discharge. Pumping effectively prevented overflow for the majority of this reporting period. Absorbents were installed and maintained. Additional sediment removal using the super sucker is planned.

**West Hillside** - This is the west side of the drainage pad, where oil staining is present in two large areas and overland flow of oil occurred during the release. This area drains to ST1. Test pits were dug over this reporting period, and showed that oil appeared to have penetrated about 6 inches into the soil. This area was washed on May 20. The washing successfully mobilized some product and sheen that was collected in ST1. Continual flushing with sprinklers is planned to liberate further product.

**West swale (stormwater drainage feature of pad)**- Area drains to ST1. Because this swale drains to a sediment trap that has been plugged and should not readily discharge, flushing of this swale was designated as a secondary priority.

**Sediment Trap #1 Outfall channel (tributary to unnamed creek)** - Area was manually scraped with hoes, shovels and rakes and the washed on May 19. An oil collection area set up at the base of the hill downstream in the unnamed tributary. This work effectively mobilized some free product. Flow from this drainage feature drains to Containment Dam 1.

**West lateral (tributary to unnamed creek)** - The seep at the headwaters from the drill pad (described above) is likely the seep of highest concern on site due to its flow rate and amount of product that it is carrying. The output from the seep is currently contained by a plastic structure that is being kept full of fresh absorbents. A bentonite lined sandbag underflow dam (**Containment Dam A**) was installed on May 18th, downstream of all seeps that are knowingly carrying product to the West Lateral. This dam was monitored over this reporting period, and absorbents were used to retrieve accumulated product.

**Unnamed tributary (Area between confluence with west lateral and dam 1)**- Further flushing of this segment is planned. On May 21st, another sandbag containment dam (**Containment Dam 3**), was installed just upstream of Containment Dam 1. The purpose of this dam is collect oil that flows downstream before it reaches Containment Dam 1, so that the contaminated sediment behind Containment Dam 1 can be dried out and removed.

**Containment Dam 1**- The majority of free product that had collected behind this dam so far was removed on May 13 with the rope skimmer. Some of the oil that is accumulating at this dam appears to be submerged, but floats to the surface with agitation. Agitation and collection via pumping are currently the primary methods being used to recover oil at this point. Over the next few days, the contaminated sediment that has accumulated behind this dam will be removed and disposed of.

PDC plans to continue to collect and treat all water/fluid that accumulates behind this dam. Large pumps are staged to assist with this effort. A pump management company was hired to ensure that all pumps function effectively. This dam is being manned 24 hours a day to ensure that water levels are kept at a manageable level.

**Downstream of Dam 1 to Dam 2 on Cow Run** - Some absorbents remain in place in this section. A large piece of bedrock was lifted over this reporting period in an attempt to flush out any trapped product that may be contributing to sheening. The rock lifting did appear to liberate some oil. The area is being monitored to evaluate the source of this product.

Additionally, on May 10, a seep was discovered on the downstream side of the dam that was carrying product into the dam sump. This sump is being continually pumped out to prevent discharge downstream. The source of this product is currently be investigated. Three test pits were installed on May 19th to delineate the source. Two of these were found to contain or accumulate product. These two are being kept open to serve as recovery trenches and are being pumped out continuously and monitored 24 hours a day. Geologists are monitoring the area and assessing options.

**Containment Dam 2**- Two containment booms are in place as contingencies at this former dam location and are not accumulating product. This area is being monitored 24 hours a day currently.

**3. EPA Air Monitoring**

Benzene concentrations remained low on the pad and in the work areas during this reporting period. Offsite perimeter monitoring for benzene is also conducted daily. There were no on or off site detections during this reporting period. A summary of recent benzene monitoring results and a map of monitoring locations are available in the documents section of the website.

VOCs were generally lower this operational period. Ambient VOCs ranged up to 0.650 ppm near Containment Dam 1. High levels of VOCs were detected in freshly dug subsurface contamination investigation test pits.

Gamma radiation has remained at background levels during this reporting period.

**4. EPA Water Sampling Water**
Sampling results that have been received back to date do not show detections above levels of concern downstream of Containment Dam 2 for any parameters.

**5. PDC Shoreline Cleanup Assessment Technique (SCAT)**
PDC completed SCAT surveys of riverine waterbodies before and after flushing/ high pressure low volume rinsing when possible.

**6. PDC Air Monitoring**
PDC is conducting roving air monitoring throughout the site making one rotation every 30 minutes, and working with an industrial hygenist, has established the following action levels:

VOCs- at 70 ppm upgrade to Level C PPE; at 700 ppm upgrade to Level B PPE

Benzene - at 2.5 ppm upgrade to Level C PPE

LEL - at 10% evacuate area

H2S - evacuate area if detected

**7. Waste Generation/Storage/Treatment**
A large amount of waste management is ongoing on site. EPA and USCG are doing periodic passes by waste storage areas to check for leaks or other concerns.

PDC is working to generate an updated total fluid recovered to date. Available data is included in the table below. Total fluids recovered through May 20 are estimated to be 16,673 barrels (700,266 gallons). The fluid total includes oil, drilling fluids, water, and does include water that was introduced into the system naturally and through flushing/washing activities.

PDC set up a multiphase wastewater treatment system on May 15, and began discharging treated water to surface waters under NPDES permit. The system subsequently failed over this reporting period, and discharged a small amount of product to a dry swale. This area was immediately excavated, and no impacts were observed downstream. Use of the full wastewater treatment system has been discontinued. The first phase of the system (settling and filtering) is being maintained in the event that water is needed to flush or wash the already impacted areas upstream of containment dam 1. A detailed description of the treatment processes that were utilized included in the documents section of the website.

**2.1.2 Response Actions to Date**

EPA is on site overseeing the response by the responsible party. Numerous measures are being taken to keep oil contained, as detailed in prior POLREPs and above.

**2.1.3 Enforcement Activities, Identity of Potentially Responsible Parties (PRPs)**

A Notice of Federal Interest was issued to PDC Energy on 5/5/2014.

**2.1.4 Progress Metrics**

| Date | Waste Stream | Medium | Amount | Units | Disposal | Treatment |
|---|---|---|---|---|---|---|
| 5/7/2014 | bagged oily waste | Solid | 68 | bags | x | |
| 5/8/2014 | bagged oily waste | Solid | 128 | bags | x | |
| 5/9/2014 | bagged oily waste | Solid | 112 | bags | x | |
| 5/10/2014 | bagged oily waste | Solid | 506 | bags | x | |
| 5/11/2014 | bagged oily waste | Solid | 203 | bags | x | |
| 5/12/2014 | bagged oily waste | Solid | 234 | bags | x | |
| 5/13/2014 | bagged oily waste | Solid | 226 | bags | x | |
| 5/14/2014 | bagged oily waste | Solid | 114 | bags | x | |
| 5/15/2014 | bagged oily waste | Solid | 155 | bags | x | |
| 5/16/2014 | bagged oily waste | Solid | 75 | bags | x | |
| 5/17/2014 | bagged oily waste | Solid | 25 | bags | x | |
| 5/18/2014 | bagged oily waste | Solid | 208 | bags | x | |
| 5/19/2014 | bagged oily waste | Solid | 80 | bags | x | |
| 5/20/2014 | bagged oily waste | Solid | 134 | bags | x | |
| 5/8/2014 | oil/fluid/water mixture | Liquid | 3125 | barrels | x | |
| 5/9/2014 | oil/fluid/water mixture | Liquid | 1350 | barrels | x | |
| 5/10/2014 | oil/fluid/water mixture | Liquid | 1600 | barrels | x | |
| 5/11/2014 | oil/fluid/water mixture | Liquid | 312 | barrels | x | |
| 5/12/2014 | oil/fluid/water mixture | Liquid | 1852 | barrels | x | |
| 5/13/2014 | oil/fluid/water mixture | Liquid | 3808 | barrels | x | |
| 5/14/2014 | oil/fluid/water mixture | Liquid | 1401 | barrels | x | |
| 5/17/2014 | oil/fluid/water mixture | Liquid | 355 | barrels | x | |
| 5/20/2014 | oil/fluid/water mixture | Liquid | 2870 | barrels | x | |
| 5/7/2014 | contaminated soil | Solid | 6 | yards | x | |
| 5/8/2014 | contaminated soil | Solid | 16 | yards | x | |
| 5/17/2014 | contaminated soil | Solid | 1 | yards | x | |
| 5/18/2014 | contaminated soil | Solid | 20 | yards | x | |
| 5/19/2014 | contaminated soil | Solid | 15 | yards | x | |

| | | | |
|---|---|---|---|
| **Totals** | **bagged oily waste** | **2268bags** | |
| | **oil/fluid/water mixture** | **16673bbls** | **700266gallons** |
| | **contaminated soil** | **58yards** | |

**2.2 Planning Section**

**2.2.1 Anticipated Activities**

Implement activities detailed in PDC continuing operations plan; continue work to permanently prevent further releases of product from the drill pad; continue oil recovery in creek, sediment ponds and drainage ditches; and conduct other activities that are necessary to complete cleanup under the oversight of Ohio EPA.

**2.2.1.1 Planned Response Activities**

An after action review is tentatively planned for response participants.

**2.2.1.2 Next Steps**

**2.2.2 Issues**

**2.3 Logistics Section**

Logistics are being managed by PDC.

**2.4 Finance Section**

No information available at this time.

**2.5 Other Command Staff**

No information available at this time.

**3. Participating Entities**

**3.1 Unified Command**

EPA, Ohio EPA, PDC Energy

**3.2 Cooperating Agencies**

Ohio Department of Natural Resources

US Coast Guard (2 members of the USCG Strike Teams arrived on site on May 12 to assist with clean up oversight, and remained onsite through May 19th.)

National Weather Service (Since May 12th, NWS has been providing detailed forecasts, quantities of rainfall predicted and received, and river flow information every 8 hours or more often if necessary via email. NWS also provides radio alerts of incoming severe weather.)

US Fish & Wildlife Service

**4. Personnel On Site**

5/17/14
1 - EPA OSC
2 - Tetra Tech START
1 - Ohio EPA
1 - USCG Atlantic Strike Team
1 - USCG Gulf Strike Team
approx. 50-75 - PDC Energy and contractors

5/18/14
1 - EPA OSC
2 - Tetra Tech START
1 - Ohio EPA
1 - USCG Atlantic Strike Team
1 - USCG Gulf Strike Team
approx. 50-75 - PDC Energy and contractors

5/19/14
1 - EPA OSC
2 - Tetra Tech START
1 - Ohio EPA
1 - USCG Atlantic Strike Team
1 - USCG Gulf Strike Team
approx. 50 - PDC Energy and contractors

5/20/14
0 - EPA OSC
2 - Tetra Tech START
1 - Ohio EPA
0 - USCG Atlantic Strike Team
0 - USCG Gulf Strike Team
approx. 50 - PDC Energy and contractors

5/21/14
0 - EPA OSC
2 - Tetra Tech START
1 - Ohio EPA
0 - USCG Atlantic Strike Team
0- USCG Gulf Strike Team
approx. 50 - PDC Energy and contractors

**5. Definition of Terms**

| | |
|---|---|
| ATSDR | Agency for Toxic Substances and Disease Registry |
| BZ | Breathing Zone |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CERCLIS | Comprehensive Environmental Response, Compensation, and Liability Information System |
| DNR | Department of Natural Resources |
| EPA | Environmental Protection Agency |
| ERNS | Emergency Response Notification System |
| ERRS | Emergency and Rapid Response Service |
| NG/M^3 | nanograms per cubic meter |
| NCP | National Oil and Hazardous Substance Pollution Contingency Plan |
| NOAA | National Oceanic and Atmospheric Administration |
| NPL | National Priorities List |
| NRC | National Response Center |
| OEPA | Ohio Environmental Protection Agency |
| ODH | Ohio Department of Health |
| OSC | On Scene Coordinator |
| PPE | Personal Protective Equipment |
| PPM | Parts per million |
| RCRIS | Resource Conservation and Recovery Act Information System |
| RP | Responsible Party |
| RRT | Regional Response Team |
| START | Superfund Technical Assessment and Response Team |
| US FWS | United States Fish and Wildlife Service |
| USCG | United States Coast Guard |

**6. Additional sources of information**

**6.1 Internet location of additional information/report**

www.epaosc.org/PDCEnergyBeverly

**6.2 Reporting Schedule**

This is the last regularly scheduled report that will be issued, as cleanup is now being conducted under the oversight of Ohio EPA. Further reports will be issued periodically, as major cleanup milestones are achieved.

**7. Situational Reference Materials**

No information available at this time.