

**United States Environmental Protection Agency**  
**Region VIII**  
**POLLUTION REPORT**

**Date:** Thursday, January 1, 2009

**From:** Kerry Guy

**Subject:** Remvoal Assessent/Removal Planning  
Billings PCE  
715 Central Avenue (origin), Billings, MT  
Latitude: 45.7700000  
Longitude: -108.5333000

<b>POLREP No.:</b>	3	<b>Site #:</b>	08-ME
<b>Reporting Period:</b>	5/28/08 to 1/1/2009	<b>D.O. #:</b>	
<b>Start Date:</b>	10/12/2007	<b>Response Authority:</b>	CERCLA
<b>Mob Date:</b>	10/2/2007	<b>Response Type:</b>	Time-Critical
<b>Demob Date:</b>		<b>NPL Status:</b>	Non NPL
<b>Completion Date:</b>		<b>Incident Category:</b>	Removal Action
<b>CERCLIS ID #:</b>		<b>Contract #</b>	
<b>RCRIS ID #:</b>			

#### **Current Activities**

The site is located in Billings, Montana, in Sections 3, 4, and 5, T. 1 S., R. 26 E. The site encompasses residential, commercial, and light industrial use neighborhoods.

The EPA groundwater investigation has determined that the Billings PCE groundwater contaminant plume is approximately 8,500 feet long (within the 100 ug/L concentration contour) with a maximum width of 3,320 feet. PCE vapors from the contaminated groundwater has impacted homes and other structures above the PCE groundwater plume. There are approximately 298 residential, 8 condominium and 179 commercial properties within the study area. The 10-4 risk-based action level (RAL) for PCE of 41ug/m3 was exceeded in six of the 74 residential properties sampled. The respective 10-5 and 10-6 target screening levels were exceeded at 38 and 58 of the 74 properties sampled respectively.

The PCE contamination originated from Big Sky Linen (BSL), which had a dry cleaning operation from approximately 1967 through 1992. The area addressed in the removal action (source area) was between the BSL property at 715 Central Avenue and the intersection of Central Avenue and 7th Street West. The source area had highly contaminated soil and groundwater, including free-phase PCE. The PCE leaked from the pipelines connected to BSL floor drains and the from the adjoining storm sewer line. PCE contaminated soil was observed under approximately 380 linear feet of combined pipeline and storm sewer line.

Although dry cleaning and PCE use was discontinued at BSL in approximately 1992, the groundwater plume was persistent (and possibly growing) due to the nature of source area contamination. The PCE contamination was trapped and held by the fine grained soils under the pipelines. This fine-grained soil was a continuous source of contamination to the underling gravel aquifer.

#### **COMMUNITY INVOLVEMENT ACTIVITIES**

The following describes the community involvement activities that EPA in conjunction with other agencies has conduct during the course of the site investigation and cleanup. These activities are designed to provide information to community members and provide opportunities for them to be involved in the process.

Chronology of community involvement:

- May 2006: EPA announces that it will investigate the effects of PCE- contaminated groundwater beneath a southwest Billings neighborhood.
- July 2006: EPA notifies public about collecting air samples and drilling wells to test groundwater around the suspected source of the contamination.
- September 2006: EPA notifies public about taking groundwater samples and testing indoor and sub-slab (the air just below the foundation) air of about 20 houses.

- October 4, 2006: Public Meeting
- December 2006: EPA notifies public about sampling more groundwater wells.
- June, 2007: Fact Sheet on Vapor Intrusion
- December 13, 2007: Public Meeting
- February 2007: EPA continues placing air-sampling devices in homes in the area of the groundwater plume that have volunteered for sampling.
- July 2007: EPA samples more homes
- October 2007: Information Repository (IR) set up at the Billings Library
- November 19, 2007: Public Notice in Billings Gazette notifying people about the IR
- February 7-9, 2008: EPA installs radon mitigation units on 3 homes
- June 11, 2008 – Public Meeting for occupants of the 711 Central Building
- June 2008, Fact Sheet on Health and Safety issues for the 711 Bldg. July 2008:

#### Removal Planning

A comprehensive evaluation of remediation alternatives was conducted prior to initiation of the removal. The nature of contamination, site geology, hydrogeology, logistical considerations (buildings, utilities, etc) and potential impact on residents were the factored into the evaluation. The evaluation included many technologies that were initially ranked based on potential effectiveness, feasibility, and cost. The top ranked technologies were considered for further investigation and testing. The testing included;

- A pilot test of BOS 100, an iron impregnated granular carbon product was conducted by injecting it into the aquifer. There was not a satisfactory reduction of PCE concentrations, and the technology was not further pursued. However, the test results were consistent with other observations and provided valuable information that resulted in the elimination of technologies involving the injection of solids or disturbance of the gravel aquifer.
- A bioremediation bench test was conducted with soil and groundwater collected from the site. The effectiveness of bioremediation was found to vary depending on the combination of nutrient and bacteria amendments. Although complete breakdown of PCE was achieved in the test, potential challenges and risks were also revealed by the test and bioremediation was not selected for this phase of the removal action.
- A soil oxidant demand (SOD) test conducted on soil collected from the site revealed favorable conditions for treatment using potassium permanganate..

Extensive preliminary work was required prior to initiating the physical removal. This included;

- The installation of an HVAC bypass system in the building adjacent to the BSL alley/driveway,
- Closure of Central Avenue and rerouting of traffic around the planned removal area,
- Bypassing or rerouting the water, sanitary sewer, storm sewer, electrical and natural gas lines, around the planned removal area,
- The installation of a concrete wall adjacent to the BSL building to allow deep excavation close to the shallow footings.

Based on the testing and evaluation, the selected removal/remediation technologies were:

- In situ soil treatment with Modified Fenton's Oxidant,
- Targeted soil excavation, and
- A sheet piling enclosure.

Because the thickness and characteristics of the fine-grained material (and corresponding depth of the gravel aquifer) differed in the source area, different removal/remediation technologies were used in different parts of the source area.

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