Investigating PFCs in Minnesota: Current Status (March 2009)

c-pfc1-01 • March 2009

PFCs Lateral Team

Perfluorinated chemicals (PFCs) were first found to have contaminated drinking water supplies in parts of the eastern Twin Cities in 2004. The MPCA and Minnesota Department of Health (MDH) identified contaminated wells and the MPCA provided clean drinking water. Most of the contamination was traced to four dumps or landfills. The known drinking-water problems are under control and cleanup plans for three of the four waste sites have been approved. The MPCA's focus on PFCs is shifting to investigating use of PFC-containing foams at firefighting training sites and PFCs in the ambient environment.

This fact sheet is the second general update on current status of the MPCA's work on PFCs. Previous history of the agency's response to this complex problem is available on the MPCA's Web site at www.pca.state.mn.us/cleanup/pfc/index.html.

Background

PFCs are a family of synthetic chemicals, initially developed by the 3M Company, that have been used for decades to make products that resist heat, oil, stains, grease, and water. 3M has phased out manufacture of some PFCs, but there are currently other manufacturers of PFCs around the world.

From the 1950s through the early 70s, 3M disposed of wastes from PFC manufacturing primarily in four places: dump sites in Oakdale and Woodbury, the 3M manufacturing facility in Cottage Grove, and the Washington County Landfill. In late 2003, the MPCA discovered PFCs in ground water at and near some of these sites.

In 2004, MPCA began sampling monitoring wells at the disposal sites and nearby private wells, and the MDH sampled city wells in Washington County to identify drinking-water supplies with PFCs. Sampling soon expanded to a wider area of the east Metro.

More than 1,600 private wells were sampled, along with more than 50 community wells. Both private and community wells were affected, including a number of private wells in Lake Elmo, Cottage Grove, Grey Cloud Island Township, and several of the city of Oakdale's wells. Based on PFC levels found in some wells, MDH advised 83 households not to drink their water due to PFCs.

Coincident with these activities, staff in the MPCA's Superfund Program and Closed Landfill Programs conducted and ordered investigations for PFCs related to the four waste sites. The sites had all been previously investigated for other contaminants, so a great deal was known about their subsurface geology, ground water, and past disposal practices.

Current status

Waste disposal sites

In May, 2007, the MPCA Citizens' Board approved a Settlement Agreement and

Consent Order negotiated between MPCA staff and 3M. The CO is a legally binding document that lays out timetables, deliverables and other requirements, including funding, for investigating and cleaning up PFCs at the three 3M sites. Because the Washington County site is in the MPCA's Closed Landfill Program, 3M has no legal liability for the site but did agree under the CO to provide up to $8 million to help fund the state's cleanup of the site. MPCA staff and management provide quarterly progress reports to the Citizens' Board on implementation of the CO.

As of February 2009, the MPCA Commissioner had approved cleanup plans for the Washington County Landfill and the 3M Oakdale, and 3M Woodbury sites. A proposed cleanup plan for the 3M Cottage Grove site will go out for public comment later this spring. Construction of the selected remedies at all four sites should start in spring/summer 2009.

Cleanup plans for the three 3M sites share basic similarities of 1) institutional controls, 2) excavation of remaining source areas, 3) continued and/or enhanced ground-water extraction and treatment, and 4) long-term monitoring. Excavated wastes from these sites will be placed in a specially built long-term containment cell at the SKB Industrial Landfill in Rosemount, Minn. The Washington County Landfill will be re-excavated and the wastes placed into newly constructed, triple-lined cells on-site.

Plans for all four sites have gone or will go through the MPCA's public participation process used in Superfund cleanups. Public participation is not required in the Closed Landfill Program but because all four sites are in similar situations, MPCA management chose to apply the Superfund public participation process to the Washington County site as well. All work performed at the 3M sites and MPCA expenses under the Superfund program are funded by 3M under the CO's cost recovery provisions.

Information on cleanup of the four sites is on the MPCA Web site at www.pca.state.mn.us/cleanup/pfc/pfcsites.html.

Drinking water

All of the households or communities with PFCs above MDH health standards have been provided with bottled water, carbon filtration, or municipal water hookups. 3M provided the city of Oakdale with large carbon filtration units which filter water from two of the city's affected wells at the treatment plant. 3M also provided funding for the city of Lake Elmo to extend clean city water to over 200 homes in the area affected by the contamination.

In March 2008 MDH published a Health Based Value (HBV) of 7 parts per billion for PFBA (one of the PFCs of concern). Previously, MDH had provided a temporary drinking-water guidance of 1 ppb for PFBA, and issued advisories for wells near the Washington County and Oakdale disposal sites. The new limit means about 50 wells that received advisories are now below the HBV. Advisories will remain in place until MDH rescinds them. The agencies are developing a joint monitoring plan for the future to ensure safe drinking water.

The 2007 Legislature directed MDH to study the effectiveness of point-of-use treatment systems for individual households. A number of water-treatment systems were found to be effective at removing PFCs. Final results of the study are on the MDH Web site at www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html.

East Metro PFC Biomonitoring Study

MDH's East Metro PFC Biomonitoring Study is measuring exposure to PFCs in adults living in selected areas of Washington County where the drinking water is contaminated with PFCs. Although public health actions to prevent or reduce people's exposure to PFCs are now in place, some PFCs stay in the body for years and can likely still be measured. A report on the result of the study will be released later in 2009.

PFCs in the ambient environment

Over the last 10 years or so, scientists have found trace levels of PFCs nearly everywhere in the environment; low levels are found in people and animals around the globe. In Minnesota, it has been apparent since 2006 that PFCs may be present at concentrations of potential concern in areas that are not related to the waste disposal sites. Using funding provided by 3M under the CO, the MPCA has made a number of important discoveries regarding PFCs in Minnesota's ambient environment. For example:

- Fish from several lakes in the Twin Cities and portions of the Mississippi River have elevated concentrations of PFOS (one of the PFCs of concern) in fish tissue, which has prompted MDH to issue fish-consumption advisories.

- Trace levels of PFCs are found in some shallow ambient ground water statewide, although levels are well within HBVs.
- The chemicals have been found in the effluent of a number of wastewater treatment plants sampled by the MPCA.
- PFCs were detected at permitted landfills, as well as in ground water up- and down-gradient of some facilities (also at levels within health-based limits).
- The MPCA is beginning an investigation into whether PFCs used in firefighting foam may have entered soil and ground water at firefighter training sites.

The MPCA is conducting more than a dozen ambient research projects, summarized in a report titled "PFCs in the Ambient Environment: 2008 Progress Report" (available on the Web at http://www.pca.state.mn.us/publications/c-pfc1-02.pdf). These investigations will continue in 2009.

PFCs are still widely used around the world even though 3M ceased production of PFOA and PFOS in 2002. Other American manufacturers have phased out or will phase out production of some PFCs as well. Manufacturers in other countries continue to produce PFOA and PFOS for use in products that are legally exported and used for beneficial purposes here and around the globe. Research by the MPCA and others suggests that past and present PFC manufacture or end-usage provides pathways for release into the environment that cannot be directly attributed to 3M, which developed the original PFC chemistry.

What does it all mean?

MPCA investigations have shown that while PFCs are relatively widespread in Minnesota, concentrations are typically not present at levels triggering health concerns, except at a few small locations. The areas where concentrations of the three PFCs of concern, alone or in combination, exceed MDH limits are being addressed by treating city water (Oakdale) or providing bottled water or treatment systems to individual households (Lake Elmo, Cottage Grove, and Grey Cloud Island Township). MDH also prohibits construction of new wells in some aquifers that are contaminated with PFCs in portions of Oakdale and Lake Elmo. Cleanups of the four PFC disposal sites beginning this year will ensure that any residual PFC contamination at the sites is removed or contained.

Sampling results indicate the ground-water plumes for PFCs related to the waste sites are stable, i.e. the areas of contamination are not expanding and the concentrations are not increasing. The chemicals may have left the Oakdale, Woodbury and Lake Elmo waste sites years ago, before existing ground-water pump-out systems had been installed at those sites. Long-term sampling of city and private wells is planned to assure that if the ground-water contamination changes, actions will be taken to protect public health. While some uncertainties remain, public health risks appear to be low. (For more information on PFCs and health, see www.health.state.mn.us/divs/eh/hazardous/topics/pfcshealth.html.)

It is important to remember that these chemicals are critical components of many products on which human health and safety depend, for example hydraulic fluids in aircraft and firefighting foams. Eliminating their use could in some cases create unacceptable risk tradeoffs. While Minnesota has been in the forefront of investigating PFCs, scientists in other states and nations have begun conducting their own research as well. As with other emerging contaminants, we will continue to work to gain a better understanding of the potential health and environmental effects of PFCs.

For more information

MPCA: Ralph Pribble, 651-757-2657 or ralph.pribble@pca.state.mn.us

MDH: Tannie Eshenaur, 651-201-4783 or tannie.eshenaur@health.state.mn.us

MPCA Web: www.pca.state.mn.us/cleanup/pfc/index.html

MDH Web: www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html