



# East Metro Perfluorochemical Biomonitoring Pilot Project Report to the Community

July 2009

## **What is the East Metro Perfluorochemical Biomonitoring Project?**

This study is a biomonitoring pilot project. Biomonitoring means directly measuring the amount of a chemical in someone's body. This study was done to measure perfluorochemicals (PFCs) in the blood of people who had PFCs in their drinking water. We want to see what the average levels of PFCs are, and how much the levels vary across everyone who was tested as part of the study. We want to know whether levels in the groups we studied are different from levels found in other studies.

Because this is a small pilot study and not a health study, this project was not designed to provide information on the health effects of being exposed to PFCs. It also was not designed to find out all of the ways that people might be exposed to PFCs. This pilot study will help the Minnesota Department of Health (MDH) learn more about how to do biomonitoring in the future.

## **Why was this pilot project done in the East Metro?**

Residents in communities located east of the Minneapolis-St. Paul metropolitan area of Minnesota (East Metro) are concerned about exposure to perfluorochemicals in drinking water. Disposal of PFC-containing wastes in the past led to PFCs moving into the groundwater in these communities. In 2007 the Minnesota Legislature directed MDH to conduct a pilot biomonitoring project to measure perfluorochemicals in two communities that were exposed to PFCs in drinking water.

## **What are perfluorochemicals?**

Perfluorochemicals (PFCs) are a family of manmade chemicals that have been used for decades to make products that resist heat, oil, stains, grease and water. Common uses include nonstick cookware, stain-resistant carpets and fabrics, as components of fire-fighting foam, and other industrial applications.

## **How were people chosen for the study?**

Scientists at MDH chose two communities in the East Metro area based on their past exposure to PFCs in drinking water:

- 100 residents of Oakdale who get their drinking water from city wells; and,
- 100 residents of Lake Elmo and Cottage Grove who got their drinking water from a private well that had at least 0.1 parts per billion (ppb) of either PFOA or PFOS in the water.

Participants had to be age 20 or older and have lived in their current home since January 1, 2005. For Oakdale, 500 households were randomly selected from the city utility billing records and asked to complete a survey. For the Lake Elmo/Cottage Grove group, all households that had used a private well with the minimum levels of PFCs were contacted and asked to complete a survey. From each group, 100 people were randomly chosen and invited to participate.

### How did the pilot project work?

Each person who agreed to participate was asked to sign and return a consent form. They were then asked to go to a local clinic and give a small amount of blood. They also answered a series of questions in a telephone interview. Ninety-eight people from each group completed all of these steps, for a total of 196 people in the study. There were 88 men and 108 women, who participated. They ranged in age from 20-86 years, with an average age of 53. Most had lived in their homes for over 10 years; the average was 18 years.

### How were the PFCs measured?

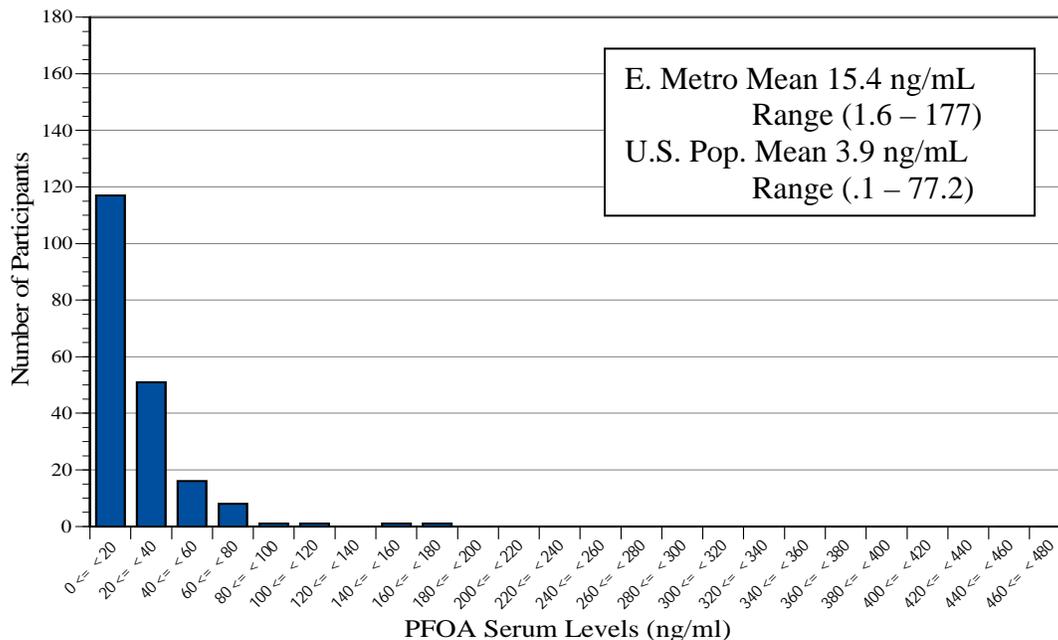
The blood samples were taken from the clinic to the MDH Public Health Laboratory and analyzed to measure the amount seven PFC chemicals:

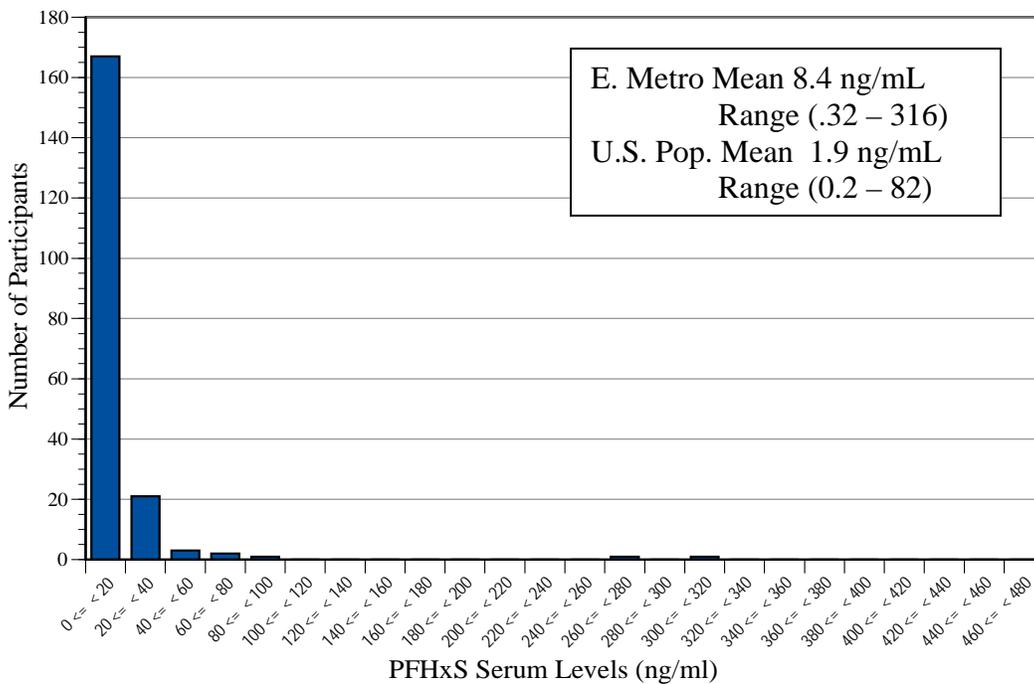
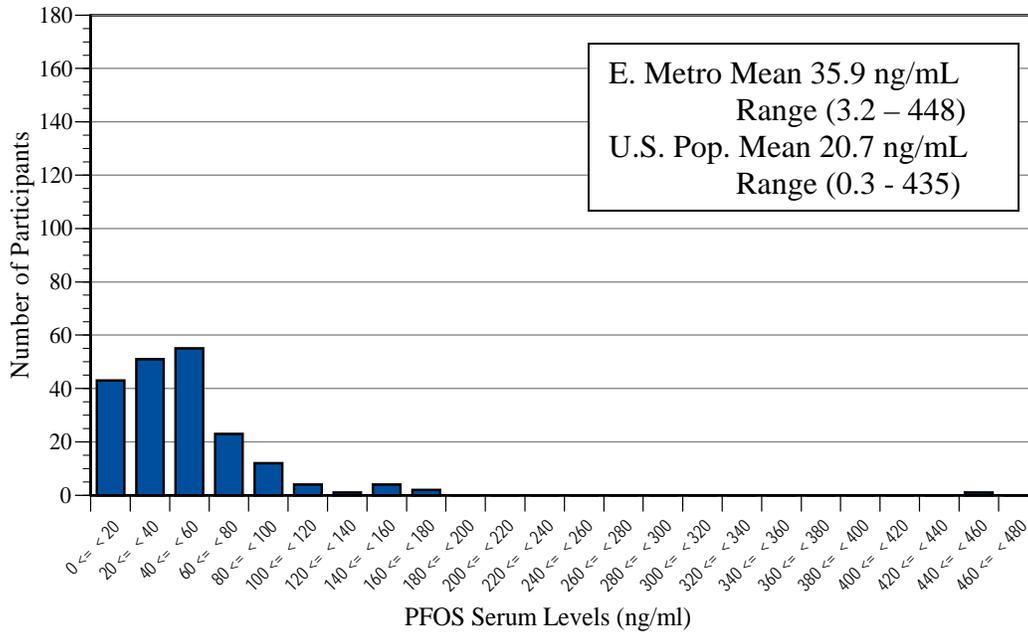
- perfluorooctanoic acid (PFOA)
- perfluorooctane sulfonate (PFOS)
- perfluorobutanoic acid (PFBA)
- perfluorobutane sulfonate (PFBS)
- perfluorohexane sulfonate (PFHxS)
- perfluorohexanoic acid (PFHxA)
- perfluoropentanoic acid (PFPeA)

### What are the results of the pilot project?

Three chemicals, PFOA, PFOS and PFHxS, were found in the blood of every person in the study. PFBA was found in blood from 55 of the 196 people (28%). PFBS was found in blood from five people. PFPeA and PFHxA were not found in any blood samples.

The graphs below show how much PFOA, PFOS, and PFHxS were found for all participants in the project. They also show how the average and range (low to high) compare with levels found in the US population.





Each PFC chemical stays in people’s bodies for a different length of time. The amount of time it takes for our bodies to get rid of half of the amount of PFOA in our bodies is about 4 years; for PFBA it only takes several days. So, the amount of a PFC found in people’s blood is affected by how much they take in and by how long it takes for the human body to get rid of it. The amount of each PFC in drinking water varies throughout the East Metro. PFBA is the most widespread. Some of the PFCs measured in the study are being phased out of most commercial uses. Others, like PFBS, are thought to be less toxic and are now being used more widely.

Studies of the general population tell us that most people in the US have small amounts of PFCs in their blood. MDH compared the average (or geometric mean) amount of PFCs found in the study communities to the average amount found in a sample of the US population. We found that the average levels of PFCs in both groups of people tested in this project were somewhat higher than the general US population.

PFC levels in blood were a little higher in men, and levels increased with age. The amount of some PFCs seems to increase the longer a person lived in a home with PFCs in the drinking water. The average amounts of PFCs found in people drinking Oakdale city water were not different from people drinking private well water in Lake Elmo or Cottage Grove.

### **How do these results compare with other community studies?**

There are two other reports of communities that were exposed to PFCs through drinking water. In the Ohio River Valley, residents of the Little Hocking Water District drank water with much higher levels of PFOA than the East Metro residents. Their blood sample results are also much higher than the East Metro results. The second group in Arnsberg, Germany drank water with levels of PFOA that are similar to the East Metro levels and their blood results are also similar.

Blood test results found in studies of 3M employees who were exposed through their work with PFCs had results much higher than any of the community studies.

### **What did we learn and what will happen next?**

This pilot project helped MDH learn ways to work with communities to conduct biomonitoring and for measuring PFCs in human blood. The lessons learned will be helpful for possible future investigations of the ways people are exposed to PFCs and ways to prevent exposures. Community members are invited to give input on what will happen next.

Studies have found that levels of PFCs in the US general population are decreasing. An advisory panel for this project has recommended to MDH that there be another study in these communities in the future to see whether exposure levels are changing over time. Actions taken since the PFCs were found in the groundwater have reduced people's exposure from drinking water. We expect that the levels of PFCs in people's bodies will decrease over time to levels that are similar to those found in the general population.

### **Where can I get more information?**

For more information about this study or about this pilot biomonitoring program, or if you wish to obtain a copy of the complete technical report, please contact the Minnesota Department of Health, Environmental Public Health Tracking and Biomonitoring Program, at 651-201-5902 or visit our website at:

<http://www.health.state.mn.us/tracking> .

For information about PFCs, please visit MDH's Web site at:

<http://www.health.state.mn.us/divs/eh/hazardous/topics/pfcs/index.html> .