
MCD special report

Investigation of Per- and Polyfluoroalkyl Substances (PFAS) in Groundwater

In a partnership with the U.S. Geological Survey (USGS), Miami Conservancy District (MCD) conducted a study to evaluate levels of per- and polyfluoroalkyl substances (PFAS) in the Great Miami River Buried Valley Aquifer across southwestern Ohio. The aquifer is the sole source of water supply for much of the region.



According to the USEPA, PFAS are a group of manufactured chemicals, including PFOA, PFOS, Gen X, and many others, that have been used in a variety of industries around the world since the 1940s. PFAS are very persistent in the environment and in the human body. They don't break down and can accumulate over time. There is evidence that exposure to PFAS can lead to adverse human health effects.

Study design

Conducted between 2019 and 2020, the study analyzed groundwater samples for 24 different PFAS in monitoring wells installed throughout the aquifer. The wells were selected because they were representative of the buried valley aquifer, and the approximate age of groundwater recharging the wells was known. No public water supply wells were sampled.



USGS staff sampling for PFAS using a hood. Sampling for PFAS requires specific protocols.

Findings

One or more PFAS compounds were detected in 11 of the 23 wells sampled. Most of the PFAS detected was in concentrations in the single parts per trillion range.

The PFAS compounds detected include: PFBS, PFHxS, PFPeS, PFOS, PFBA, PFPeA, PFOA, and PFOSA. The levels of two compounds, PFOA or PFOS, exceeded USEPA interim health advisories (HA) but did not exceed the proposed maximum contaminant levels (MCLs).

MCLs are regulatory standards set to protect human health. An HA is a non-enforceable and non-regulatory value below which exposure is not anticipated to lead to adverse human health effects. Other PFAS were either not detected in samples or were detected in concentrations less than Ohio action levels or federal health-risk-based guidance.

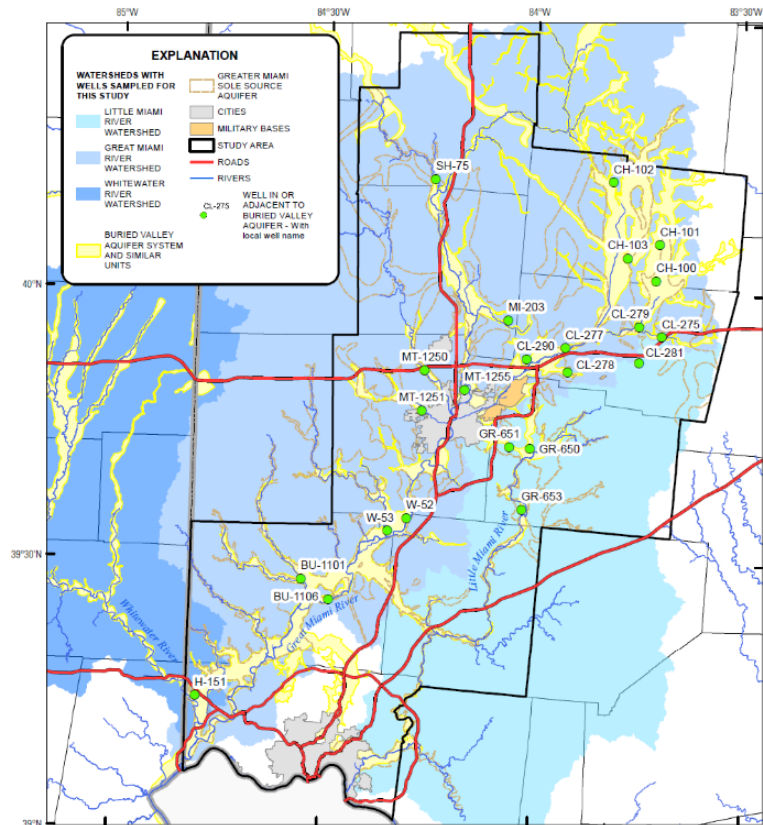
MCD AND WATER STEWARDSHIP

MCD works to help protect and improve water for people living and working within the Great Miami River Watershed – a 3,946 square mile area in southwest Ohio using data collected by our staff and partners, we work collaboratively with elected officials and community leaders, providing them with valued research and insight. This helps support the overall health and growth of our region. This work is funded through MCD's Aquifer Preservation Subdistrict.

Implications

The results of this study suggest that:

- Low concentrations of PFAS compounds are present in some areas of the buried valley aquifer system of the Great Miami River Watershed.
- The presence of PFAS in groundwater may be associated with urban land use. More PFAS was detected in wells that were located within, or near, urban land use areas.
- PFAS may be associated with younger groundwater that recharged the aquifer within the last 70 years.



Locations of the wells studied in this investigation.

What next?

MCD will begin periodic monitoring for PFAS compounds in its network of 13 monitoring wells. The results will help MCD to track changes in PFAS concentrations in regional groundwater sources. Tracking changes in PFAS levels will also help track the effectiveness of federal and state strategies to attempt to address PFAS contamination levels.

A report was published by the USGS in 2023 to summarize the findings. To view the report, use the QR code.



For more information or questions, please contact Mike Ekberg, Manager of Water Resources Monitoring and Analysis at mekberg@mcdwater.org.