What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a large group of synthetic fluorinated organic chemicals that include perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).

The unique characteristics of PFAS make them exceptional for consumer and industrial products, with more than ten thousand of these chemicals registered globally. However, these properties also make PFAS highly soluble, mobile, and recalcitrant to chemical and biological treatment processes. As a result, PFAS have been detected ubiquitoulsy in the environment.

National Primary Drinking Water Regulation Revision for PFOA and PFOS

On May 14, 2025, the USEPA announced it will keep the current National Primary Drinking Water Regulations (NPDWR) for PFOA and PFOS while providing regulatory flexibility for water utilities.

The Maximum Contaminant Levels (MCL) will remain in place for PFOA and PFOS at 4.0 ng/L, while compliance date will be extended from April 2029 to 2031 to provide additional compliance time for water systems.

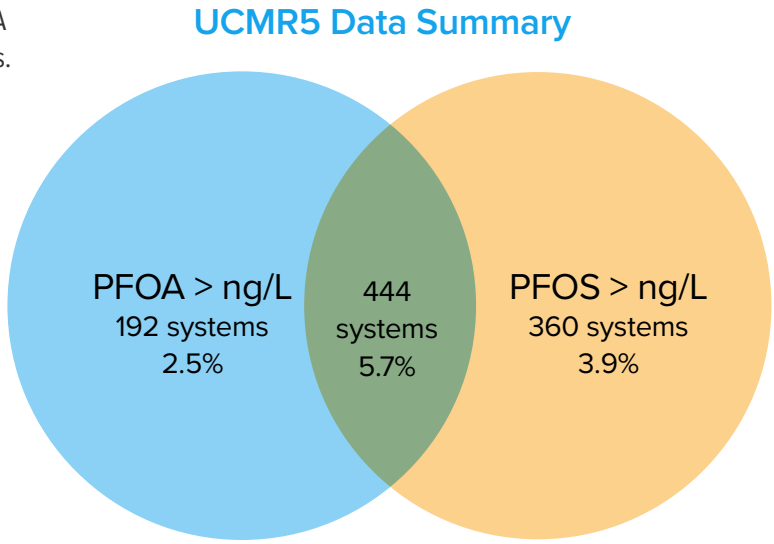
The USEPA also proposed to reconsider regulations for PFHxS, PFNA, HFPO-DA (GenX), and the Hazard Index (HI) mixture of these three PFAS plus PFBS.

As of January 2025, a total of 7,726 public water systems (PWS) have sampled for PFAS under UCMR5 and over 1.3 million monitoring data points have been reported.

936 out of 7,726 systems (12.1%) exceeded PFOA or PFOS MCL of 4.0 ng/L.

This compares to 941 systems if MCLs for PFHxS, PFNA, HFPO-DA, and HI are still in place.

Among the 936 systems, 636 PWSs exceeded PFOA MCL, 744 systems exceeded PFOS MCL, and 444 systems exceeded both MCLs.



A total of 7,726 systems sampled for PFAS in UCMR5

EPA-Designated Best Available Technologies

EPA has identified reverse osmosis (RO), nanofiltration (NF), granular activated carbon (GAC), and anion exchange resin (IX) as best available technologies (BAT) for PFAS treatment in drinking water. Each technology has its own advantages and disadvantages and its suitability for implementation depends on site-specific water quality and operational conditions.

Expanding the PFAS Treatment Toolbox

Although not BATs, alternative technologies including novel adsorbent Fluoro-Sorb, powdered activated carbon (PAC), and suspended ion exchange (SIX) have been applied at full-scale for drinking water PFAS treatment.

Fluoro-Sorb and SIX are advantageous to GAC and IX in treating PFAS in complex water matrices, particularly when competing foulants, such as TOC, is present at high concentrations.

PAC can be an effective and economical adsorptive treatment approach, addressing low levels of PFOA and PFOS. Although PAC results in higher carbon use rate than GAC and PAC application generates large volumes of solids residuals, the low capital investment and the flexibility to apply PAC on an as-needed basis makes it an economic alternative adsorption process.

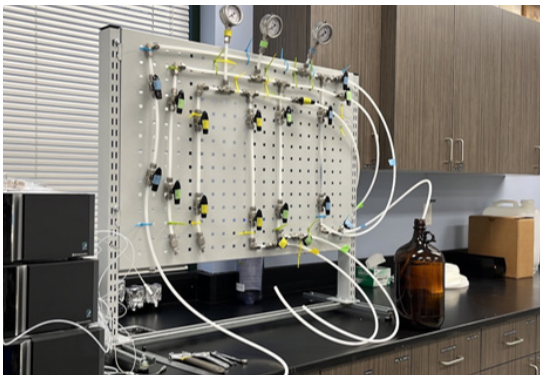
Both SIX and PAC are highly scalable and are most commonly applied for large-scale surface water treatment (>10 mgd), whereas Fluoro-Sorb is typically utilized as an alternative adsorbent to IX resin in pressure vessels and is more suitable for wellhead or low-flow applications.

Testing and Decision Making

PFAS treatment technology and product selection requires careful evaluation to reflect site-specific water quality and operational conditions. Carollo can help you navigate the complex decision of selecting the most suitable approach to meet your PFAS treatment needs.

Our Water Applied Research Center (Water ARC®) conducts rapid small-scale column tests (RSSCTs) and state-of-the-art bench testing for rapid technology screening, while our experienced team designs and fabricates custom pilot equipment when field-scale validation is required.

GAC/IX pilot testing at a surface water treatment plant. Pilot skid designed by Carollo.



RSSCT testing at Water ARC®

SIX bench testing at Water ARC®

For additional information, contact Carollo's National PFAS Lead
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