

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS)

EPA Research Summary

PFAS in the Environment

Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been in use since the 1940s. PFAS are found in a wide array of consumer and industrial products. PFAS manufacturing and processing facilities, facilities using PFAS in production of other products, airports, and military installations are some of the contributors of PFAS releases into the air, soil, and water. Due to their widespread use and persistence in the environment, most people in the United States have been exposed to PFAS. There is evidence that continued exposure above specific levels to certain PFAS may lead to adverse health effects.

EPA is supporting states, tribes, and local communities in addressing human health concerns related to PFAS. In response to requests for support on PFAS, EPA researchers are developing analytical chemistry methods to detect and quantify PFAS in environmental media; gathering and assessing data on chemical toxicity and environmental exposures for PFAS of highest concern; and summarizing data and conducting studies to determine the effectiveness and the cost of different technologies for treating or removing PFAS in drinking water and contaminated sites.

Developing and Validating Analytical Methods

EPA researchers are developing and validating laboratory methods to detect and quantify selected PFAS in air, water, and soil. EPA recently released a revised version of [EPA Method 537.1](#) for additional PFAS (e.g. Hexafluoropropylene oxide dimer acid (HFPO-DA), a GenX chemical) in drinking water.

Currently, EPA researchers are working on:



- Validating methods under [EPA's SW-846 Compendium](#) to measure certain PFAS in groundwater, surface water, wastewater, and solids (e.g., soils, sediments, and sewage).
- Developing and testing sampling and analytical methods for identifying and quantifying PFAS in air and stack emissions.
- Extending the use of non-targeted chemical analysis for air emissions and solids.

Tested and validated methods are important for ensuring that government and private laboratories can accurately and consistently identify and measure PFAS in the environment, which is critical for estimating exposure and risk. These methods can be used by federal agencies, states, tribes, and local communities.

Assessing PFAS Toxicity

EPA researchers are developing standard human health toxicity reference values for specific PFAS where sufficient scientific data exist. These values will enable risk assessors in states, tribes, and local communities, in conjunction with knowledge on exposure, to assess the risks and make decisions

about managing PFAS to protect human health and the environment. EPA researchers are also applying computational and high throughput toxicology tools for PFAS toxicity testing on a larger scale to enable faster understanding of potential toxicity for the universe of thousands of PFAS, most of which have little or no published toxicity data.

Researching PFAS Exposure

EPA researchers are measuring PFAS in air, drinking water, soils, etc., to understand how and to what degree people might be exposed to PFAS. This research includes modeling human population exposures to better understand the relative contributions of different sources and pathways for PFAS. This will help states, tribes, and local communities to assess potential risks and, as necessary choose the most effective methods for protecting public health.

Testing Drinking Water Treatment Methods

EPA researchers continue to evaluate different drinking water treatment technologies that can remove certain PFAS from drinking water systems. They are evaluating systems across the nation currently treating PFAS and gathering data on cost and performance. Researchers are also testing modifications needed to improve treatment. This research is being conducted in cooperation with drinking water utilities and with other federal agencies.

Researchers will generate performance and cost data with collaborators to develop models and provide tools to enable local communities to determine optimal treatment choices based on their specific needs and circumstances.

Cleaning Up Contaminated Sites

EPA researchers are developing methods for characterizing PFAS releases and movement in soil, water, and sediments at contaminated sites, so that site managers can understand the scope and magnitude of such contamination in order to decide how best to respond. Researchers are also developing and testing methods for treating, removing, or immobilizing PFAS at such sites, to provide site managers with tools for site remediation. Some of this work is being done in collaboration with the Department of Defense on current and former military bases.

Managing PFAS Containing Materials and Waste

EPA researchers are characterizing how end-of-life disposal approaches, such as landfills, incinerators, and recycling might contribute to PFAS in the environment.

They are also evaluating waste management technologies such as thermal treatment and composting, that may be useful and cost-effective to manage consumer and industrial products at end-of-life disposal.

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For more information:

<https://www.epa.gov/pfas/epa-pfas-data-and-tools>