

Per- and Polyfluoroalkyl Substances (PFAS)

What are per- and polyfluoroalkyl substances?

Per- and polyfluoroalkyl substances (PFAS) are a large group of man-made chemicals that have been used worldwide in consumer products and in some industrial applications. They have been used in the United States since the 1940s. PFAS are used to make products that resist heat, oil, stains, grease, and water. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) were the two most commonly produced and most studied of the group. PFOA and PFOS are no longer manufactured in the United States. Chemicals in the PFAS class:

- do not occur naturally yet are widespread in the environment because of their broad uses
- are found in people, wildlife and fish world-wide
- are stable and do not break down easily in the environment (they are persistent)
- can build up in biological tissues (bioaccumulate) in people, wildlife, and fish over time if exposure continues

How can I be exposed to PFAS?

Because PFAS are man-made, they can be found near areas where they are manufactured; where used in industrial applications (ex: electroplating, textiles, pulp and paper); and/or, in some manufactured products. Although PFOA and PFOS are no longer manufactured in the U.S., some consumer and industrial products still contain PFAS. Common products where PFAS was used and may still be used in their production include:

- nonstick cookware
- food packaging (ex: microwave popcorn bags, fast food wrappers, sliced cheese wrappers, pizza boxes)
- stain-resistant carpets and fabrics and water-resistant clothing
- paints, varnishes and sealants
- cosmetics
- dental floss
- fire-fighting foams

Exposure to PFAS by contact with products using PFAS compounds through dermal absorption (by touching and passing through the skin) and inhalation during showering/bathing are lesser human health concerns at this time.

Ingestion (swallowing) of food or water containing PFAS is the exposure route of primary concern.

Are PFAS harmful?

Human health effects from exposure to all PFAS chemicals is not completely understood. The hazards of some PFAS chemicals are better understood than others. Studies have shown that exposure to some PFAS may affect developmental stages (growth, learning, behavior) of infants and older children; lower a woman's chance of getting pregnant; disrupt the body's hormones; increase cholesterol; and increase cancer risk (for PFOA). The U.S. Environmental Protection Agency (EPA) issued a drinking water Lifetime Health Advisory for PFOA and PFOS in 2016.

What is a Lifetime Health Advisory?

A Lifetime Health Advisory (LHA) is just that, an advisory. It is not an enforceable regulatory standard as is a primary drinking water standard (also called a Maximum Contaminant Level, or MCL) under the Safe Drinking Water Act. The LHA for PFOA and PFOS is 70 parts per trillion (ppt), individually or combined (PFOA plus PFOS). This LHA is protective of most typical water users, including the more sensitive categories of pregnant and nursing women, young children and the elderly.

EPA is currently working on a formal Regulatory Determination to conclude whether they will develop an enforceable Maximum Contaminant Level (MCL) for PFOA, PFOS or any other PFAS.

How do PFAS get into drinking water?

Exposure to PFAS by way of drinking water occurs if the source water supply has been contaminated by a PFAS source such as a PFAS manufacturer, some types of wastewater treatment facilities, landfills or firefighter training facilities.

How can I reduce my exposure to PFAS?

Because PFAS are present in so many different consumer products and throughout our environment, one cannot reasonably expect to prevent PFAS exposure altogether. However, some steps can be taken to reduce your exposure.

- If your drinking water contains PFOA or PFOS greater than the EPA LHA of 70 ppt, either individually or combined, consider using an alternative or treated water source for any activity in which you might swallow water. These activities include drinking, food preparation, brushing teeth or preparing infant formula.
- Water with a PFAS level greater than the LHA is not known to pose a risk for bathing, showering or washing clothes and cleaning.
- Activated carbon filtration or reverse osmosis membranes are effective in reducing PFAS in water supplies.
- Read consumer product labels and avoid using those with PFAS.

What is DHEC doing about PFAS?

From 2013 to 2015, as part of the EPA Unregulated Contaminant Monitoring Rule 3, SCDHEC conducted testing for six (6) PFAS chemicals, including PFOA and PFOS, at all public water systems that served greater than 10,000 persons and at some small systems randomly selected by EPA.

- Of 498 samples collected and analyzed, one (1) sample from one (1) utility returned detections of 12 ppt for PFHpA and 24 ppt for PFOA. The LHA of 70 ppt for PFOA/PFOS was not exceeded.
- Three (3) follow-up sample events were conducted at that system; all follow-up results did not contain detectable concentrations.

While awaiting national guidance from EPA regarding an MCL, SCDHEC has developed a strategy for assessing PFAS in drinking water and ambient surface water. That strategy has three phases:

1. Drinking Water Assessment
2. Ambient Surface Water Assessment
3. Private Well Assessment

The strategy for drinking water assessment focuses on community water systems because approximately 80% of the state's residents are served by such a system. The strategy for ambient surface water assessment focuses on lakes, rivers, and streams, including the assessment of PFAS chemicals in fish tissue to ensure safe fish consumption by our residents. The strategy for private well assessment focuses on private (i.e., individual) wells located in areas with higher vulnerability to potential PFAS sources. Please visit [DHEC's PFAS web page](#) to see the latest updates on each strategy.

Where can I find more information?

- U.S. Environmental Protection Agency: Basic Information about PFAS
 - <https://www.epa.gov/pfas>
- U.S. Environmental Protection Agency: Drinking Water PFOA and PFAS Lifetime Health Advisory
 - <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>
- U.S. Environmental Protection Agency: Technical Fact Sheet – PFOS and PFOA
 - https://www.epa.gov/sites/production/files/2017-12/documents/ffrrofactsheet_contaminants_pfos_pfoa_11-20-17_508_0.pdf
- U.S. Agency for Toxic Substances and Disease Registry: Frequently Asked Questions
 - <https://www.atsdr.cdc.gov/pfas/>