PFAS (Per- and Polyfluoroalkyl Substances)

There has been a lot of media attention lately about PFAS. PFAS are a group of manufactured chemicals that have been used in industry and consumer products since the 1940s because of their useful properties. There are thousands of different PFAS, some of which have been more widely used and studied than others.

Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS), for example, are two of the most widely used and studied chemicals in the PFAS group. PFOA and PFOS have been replaced in the United States with other PFAS in recent years.

One common characteristic of concern of PFAS is that many break down very slowly and can build up in people, animals, and the environment over time and are therefore called "forever chemicals".

PFAS Can Be Found in Many Places

PFAS can be present in our water, soil, air, and food as well as in materials found in our homes or workplaces, including:

- **Soil and water at or near waste sites** - at landfills, disposal sites, and hazardous waste sites such as those that fall under the federal Superfund and Resource Conservation and Recovery Act programs.
- **Fire extinguishing foam** - in aqueous film-forming foams (or AFFFs) used to extinguish flammable liquid-based fires. Such foams are used in training and emergency response events at airports, shipyards, military bases, firefighting training facilities, chemical plants, and refineries.
- **Manufacturing or chemical production facilities that produce or use PFAS** – for example at chrome plating, electronics, and certain textile and paper manufacturers.
- **Food** – for example in fish caught from water contaminated by PFAS and dairy products from livestock exposed to PFAS.
- **Food packaging** – for example in grease-resistant paper, fast food containers/wrappers, microwave popcorn bags, pizza boxes, and candy wrappers.
- **Household products and dust** – for example in stain and water-repellent used on carpets, upholstery, clothing, and other fabrics; cleaning products; non-stick cookware; paints, varnishes, and sealants.
- **Personal care products** – for example in certain shampoo, dental floss, and cosmetics.
- **Biosolids** – for example fertilizer from wastewater treatment plants that is used on agricultural lands can affect ground and surface water and animals that graze on the land.
- **Drinking water** – in public drinking water systems and private drinking water wells.

People Can Be Exposed to PFAS in a Variety of Ways

Due to their widespread production and use, as well as their ability to move and persist in the environment, surveys conducted by the Centers for Disease Control and Prevention (CDC) show that most people in the United States have been exposed to some PFAS. Most known exposures are relatively low, but some can be high, particularly when people are exposed to a concentrated source over long periods of time. Some PFAS chemicals can accumulate in the body over time.

Current research has shown that people can be exposed to PFAS by:

- Working in occupations such as firefighting or chemicals manufacturing and processing.
- Drinking water contaminated with PFAS.
- Eating certain foods that may contain PFAS, including fish.
- Swallowing contaminated soil or dust.
- Breathing air containing PFAS.
- Using products made with PFAS or that are packaged in materials containing PFAS.

What We Know about Health Effects

Current peer-reviewed scientific studies have shown that exposure to certain levels of PFAS may lead to:

- Reproductive effects such as decreased fertility or increased high blood pressure in pregnant women.
- Developmental effects or delays in children, including low birth weight, accelerated puberty, bone variations, or behavioral changes.
- Increased risk of some cancers, including prostate, kidney, and testicular cancers.
- Reduced ability of the body's immune system to fight infections, including reduced vaccine response.
- Interference with the body's natural hormones.
- Increased cholesterol levels and/or risk of obesity.

PFAS in Connecticut

The Connecticut Department of Public Health (DPH) set a Drinking Water Action Level in 2016 for PFAS that was the same as the EPA Health Advisory (70 parts per trillion) at that time and included three additional PFAS (PFNA, PFHxS, PFHpA) to the group. The sum of this group of five PFAS was to be below the target concentration of 70 parts per trillion.

On June 15, 2022, DPH announced new drinking water action levels for four individual PFAS compounds.

Analyte	CT Drinking Water Action Level (parts per trillion, ppt)
Perfluorooctane sulfonic acid (PFOS)	10
Perfluorononanoic acid (PFNA)	12
Perfluorooctanoic acid (PFOA)	16
Perfluorohexane sulfonic acid (PFHxS)	49

In June, 2023 the DPH added another six individual PFAS compounds for drinking water action levels.

According to DPH: Action Levels can be used as guidance by Local Health Departments and private well owners when evaluating the potability of well water. Action Levels are non-enforceable and are intended to be used as guidance by Local Health Departments and private well owners when evaluating the potability of well water. There are currently no enforceable federal drinking water standards for chemicals in the PFAS family.

Jewett City Water Company and PFAS

The Jewett City Water Company sampled for PFAS in its treated drinking water in 2023. The levels that were detected at the Jewett City Water Company distribution entry points along with the current Connecticut drinking water action levels can be found in the following table:

	Current CT Action Levels (ng/L) - ppt	Proposed EPA MCL's (ng/L) - ppt	Proposed EPA Hazard Index (HI) (Unitless)	Jewett City Water Company 2023 PFAS Levels (ng/L) - ppt
Perfluorooctane Sulfonic Acid (PFOS)	10	4.0	-	Not Detected
Perfluorononanoic Acid (PFNA)	12	-	1.0	Not Detected
Perfluorooctanoic Acid (PFOA)	16	4.0	-	Not Detected
Perfluorohexane Sulfonic Acid (PFHxS)	49	-	1.0	Not Detected
Perfluorobutanesulfonic Acid (PFBS)	760	-	1.0	Not Detected
Perfluorohexanoic Acid (PFHxA)	240	-	-	Not Detected
Perfluorobutanoic Acid (PFBA)	1800	-	-	Not Detected - 12
6:2 Chloropolyfluoroether Sulfonic Acid (6:2 Cl-PFESA, 9Cl-PF3ONS, F-53B major)	2	-	-	Not Detected
8:2 Chloropolyfluoroether Sulfonic Acid (8:2 Cl-PFESA, 11CL-PF3OUdS, F-53B minor)	5	-	-	Not Detected
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA, GenX)	19	-	1.0	Not Detected