

Frequently Asked Questions (FAQs)

PFAS General

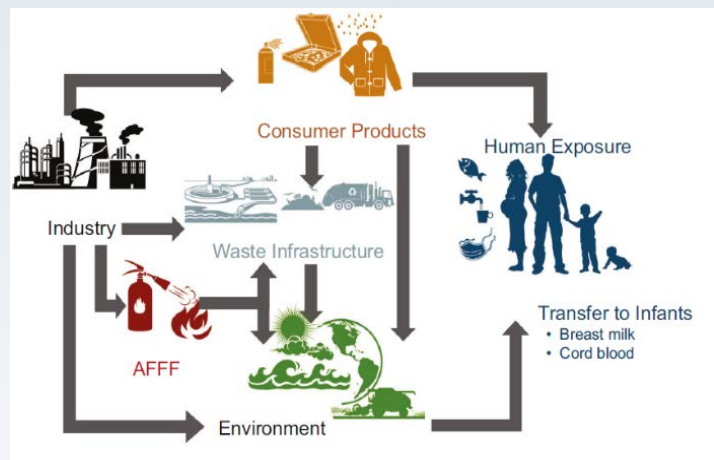
What are per- and polyfluoroalkyl substances (PFAS)?

Per- and polyfluoroalkyl substances (PFAS) are a large group of human-made substances that do not occur naturally in the environment and are resistant to heat, water, and oil. PFAS have been used extensively in surface coating and protectant formulations due to their unique ability to reduce the surface tension of liquids [1]. Perfluorooctane sulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two types of PFAS that are no longer manufactured or imported into the United States [2]; however, there could be some imported goods containing trace amounts of these substances[3]. Other PFAS goods and materials are still produced and used in the United States [4].

PFAS are persistent in the environment, can accumulate within the human body over time, and are toxic at relatively low concentrations [5]. Exposure to unsafe levels of PFOA/PFOS may result in adverse health effects including developmental effects to fetuses during pregnancy, cancer, liver effects, immune effects, thyroid effects, and other effects (such as cholesterol changes)[6]. PFOA and PFOS were found in the blood of nearly all people tested in several national surveys[7], [8]. According to the Center for Disease Control (CDC), blood levels of both PFOS and PFOA have steadily decreased in U.S. residents since 1999-2000[9].

How are people exposed to PFOA, PFOS and other PFAS?

PFAS can be introduced into the body by eating or drinking contaminated food or liquid (including water), breathing in or touching products treated with PFAS, such as carpets or clothing [10]. Contaminated drinking water has led to high levels of exposure to PFOA, PFOS, and other PFAS for some populations residing near manufacturing facilities[11]. Infants may be exposed to PFAS through breastfeeding[12]. Workers in facilities that make or use PFAS can be exposed to higher amounts of these chemicals and have higher levels in their blood[13].



Major exposure pathways of PFAS to humans. Figure from Sunderland et. al. (2019)

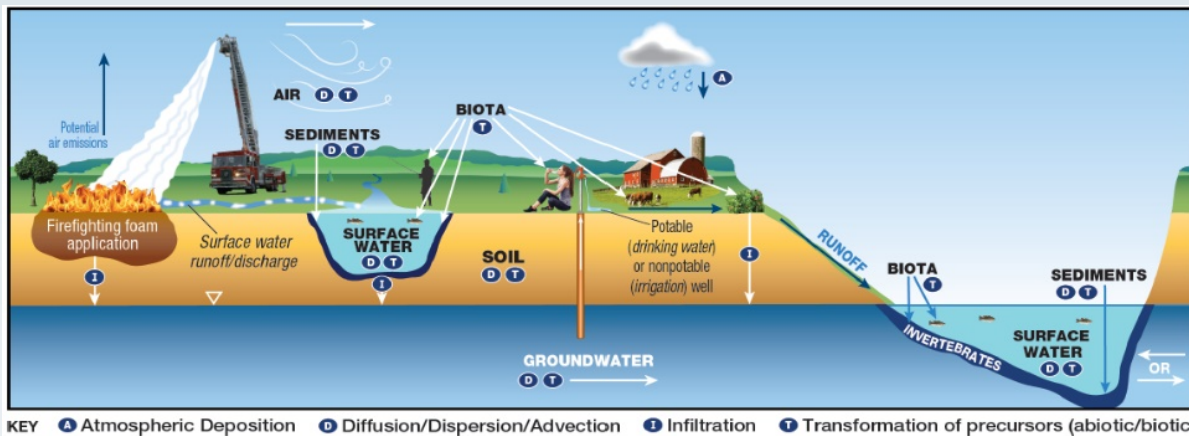
Where are PFOA, PFOS and other PFAS found in the environment?

PFAS, especially PFOS and PFOA, have been detected in air, water, and soil in and around manufacturing facilities; however, these releases have been declining since companies began phasing out the production and use of several PFAS in the early 2000s[14]. Due to their chemical structure, PFAS are very stable in the environment and are resistant to breaking down.

Some PFAS are volatile and can be carried long distances through the air, which may lead to contamination of soils and groundwater far from the source of the PFAS emission [15]. PFAS have been detected in many parts of the world, including oceans and the Arctic, indicating that long-range transport is possible[16].

How does PFAS get into drinking water?

The four major sources of PFAS are: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids[10]. PFAS can get into drinking water when products containing them are used or spilled onto the ground or into lakes and rivers[17]. Once in groundwater, PFAS are easily transported large distances and can contaminate drinking wells [10]. Substances containing PFAS can be spilled into lakes or rivers used as sources of drinking water[10]. PFAS in the air can also end up in rivers and lakes used for drinking water[10].



Mechanisms of transport of PFAS from firefighting foam application to environmental media[18].

Are (PFAS) still being produced in the United States?

PFAS have been used extensively in surface coating and protectant formulations due to their unique ability to repel oil, grease and water. Major applications have included protectants for paper and cardboard packaging products, carpets, leather products, and textiles that enhance water, grease, and soil repellency, and in firefighting foams[19]. PFAS have also been used as processing aids in the manufacture of nonstick coatings on cookware[19].

Under the PFOA Stewardship Program with the U.S. Environmental Protection Agency (US EPA), eight major PFAS producers have phased out PFOA and other PFSA substances from emissions and products[2].

To complement the PFOA Stewardship Program, US EPA has issued regulations, known as Significant New Use Rules (SNURs), requiring manufacturers and processors of these chemicals to notify EPA of new uses of these chemicals before they are commercialized[20]. Specifically, the regulations require that anyone who intends to manufacture (including import) or process any chemicals for uses contained in the SNUR must submit a notification to EPA at least 90 days before beginning the activity[20]. This provides EPA with an opportunity to review and, if necessary, place limits on manufacturers or processors who intend to reintroduce or import products with these chemicals.

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