FACT SHEET: PFAS AND DRINKING WATER

OCTOBER 2024

About PFAS

PFAS (per and polyfluoroalkyl substances) are a group of human-made chemicals that have been widely used in industrial and consumer products since the mid-1900s. Due to the unique physical and chemical properties of PFAS to resist heat, stains, grease, and water, they have been used in:

- firefighting foams
- textiles and leather products
- metal plating
- food packaging
- shampoos
- cosmetics
- sunscreens
- air and dust
- denture cleaner
- coatings and coating additives
- photographic and lithographic processes
- medical devices
- hydraulic fluids
- carpets
- waterproof clothing
- non-stick cookware
- pesticides
- fertilisers
- floor polishes

PFAS are of concern because they can persist for a long time in humans and in the environment, and have now been associated with adverse environmental and human health outcomes. These substances are now commonly detected at very low, or trace levels, in groundwater, surface water and soils in urban areas worldwide.

PFAS is not manufactured in Australia, but it is imported for use in industrial and chemical manufacturing, and within many domestic consumer products. While many essential uses of PFAS are still permitted, as a precautionary measure there are now efforts, both nationally and internationally, to restrict non-essential uses and reduce or ban the use of the most hazardous PFAS chemicals. From 1 July 2025, the Australian Government is banning the manufacture, importation, exportation or use of PFOS, PFOA, and PFHxS or any products containing them.

PFAS and health

Some content in this section is from the Environmental Health Standing Committee (enHealth)'s factsheet on PFAS.

For most people, the level of exposure to PFAS is likely to be small. No public health and safety issues with PFAS have been identified from the overall dietary exposure for the general Australian population.

In locations where PFAS have been used as an active ingredient in firefighting foams, there may be higher PFAS levels in the local environment. In these communities, people may have increased exposure to certain PFAS, including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS), and have elevated blood concentrations above the general population of these PFAS.

In Australia, enHealth describes various health effects associated with PFAS exposure, but also notes that to date, a causative relationship between health effects and PFAS exposure has not been established. The science and understanding of these issues will continue to evolve. As a precaution, enHealth continues to recommend exposure to PFAS be minimised wherever possible. More information about potential health effects of PFAS are available from enHealth.

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The NHMRC stated that the evidence to date on health effects of PFAS has been uncertain, and can be interpreted in different ways depending on the health outcomes, methodologies, assumptions and other factors used. PFAS has been associated with mildly elevated cholesterol levels, effects on kidney function and the levels of some hormones. However, these effects are small and largely within ranges seen in the general population.

Some studies have found associations with immune system function, though there are limitations on these studies. NHMRC's current PFAS review concluded that the most critical health effects include potential ability to cause cancer for PFOA, potential bone marrow effects for PFOS and potential thyroid effects for PFHxS and PFBS based on animal studies. They recommend that human exposure is minimised as a precaution.

PFAS and drinking water

To ensure the safety of drinking water and provide a basis for determining the quality of water supplied to consumers in all parts of Australia, the National Health and Medical Research Council (NHMRC) has developed the Australian Drinking Water Guidelines.

The guidelines set health-protective values for how much of a substance a person can consume over their lifetime, without any increased risk to their health. The values are very conservative, and include a range of uncertainty factors, which always err on the side of caution, to ensure public health. They include a wide safety margin.

The Guidelines undergo rolling revisions to ensure they represent the latest scientific evidence on safe drinking water. The Guidelines are underpinned by scientific evidence and are used by state and territory health departments, drinking water regulators, local health authorities and water utilities.

The current Guidelines include maximum health-based guideline values for PFOA and PFOS + PFHxS in drinking water. These were published in 2018 and were derived using Tolerable Daily Intake values recommended by the Department of Health and Aged Care. The current values are already extremely low. These miniscule, trace amounts of PFAS are so low they are barely detectable.

These Guidelines for PFAS have been under review by the NHMRC since 2022. The independent review has considered recent guidance and reviews from international and local jurisdictions to determine whether they are suitable to adopt or adapt for Australia.

On 21 October 2024, the NHMRC released draft updated Guideline values for PFAS for consultation. Anyone can make submissions on the draft updated Guidelines by here. The consultation will be open for at least 30 days.

The proposed NHMRC advise and health-based guideline values are draft only, and will not be considered final until they are published in the Australian Drinking Water Guidelines.

Chemical	Existing ADWG level	Draft updated level
PFOS	**70** ng/L or 70 parts per trillion (Less than 0.07 micrograms per litre of PFOS and PFHxS combined)	**4** ng/L (Less than 0.004 micrograms per litre)
PFHxS		**30** ng/L (Less than 0.03 micrograms per litre)
PFOA	**560** ng/L, or 560 parts per trillion (Less than 0.56 micrograms per litre)	**200** ng/L (Less than 0.2 micrograms per litre)
PFBS	-	**1000** ng/L (Less than 1.0 micrograms per litre)

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The NHMRC note that exposure to PFAS can occur through many pathways including drinking tap water, consumer products, food packaging, air and dust. The guidelines assume that 10% of a person's exposure is due to drinking water. Up to 90% of PFAS exposure is estimated to come from sources other than drinking water.

The NHMRC indicated that the risk from PFAS in drinking water is low for most Australians. While the proposed guideline values are lower than those currently in place, that does not mean there is an immediate risk to your health if you continue to drink tap water.

The information available shows that most water supplies are already below the lower, proposed guideline values, and these values are based on minimising risk over a lifetime's worth of exposure. The NHMRC use conservative assumptions in setting these values, ensuring that even very small potential risks are addressed. Drinking water is only one of many sources of possible PFAS exposure.

Thus, higher values in drinking water for short periods is unlikely to increase health risks. Notably, even the US EPA, which has set very low levels for the US, has given water producers a five-year period (until 2029) to meet their limits.

How water authorities implement the Australian Drinking Water Guidelines

Water utilities routinely conduct a range of tests to ensure drinking water quality complies with the Guidelines. As with other risks to water safety, the risks of PFAS will vary across different areas, so PFAS testing will vary across water utilities and locations.

In consultation with drinking water regulators, water utilities apply a preventative risk-based approach - meaning that we test more often in identified higher risk areas. These areas are identified with support from Environmental Protection Agencies and can include areas where firefighting foams have been used, at airports and at industrial facilities, or landfill areas where PFAS may have leached out.

When testing, water authorities must follow a set of strict protocols to ensure there is no contamination during the collection, storage and analysis for PFAS compounds. For example, the specialists collecting the samples cannot wash their hair or wear makeup, perfume, insect repellent or sunscreen for a defined period, to ensure they do not contaminate the samples. Specific types of containers and clothing must also be used to ensure no contamination. Testing is carried out at specialised, accredited laboratories using extremely sophisticated methods, by combining liquid chromatography with tandem mass spectrometry (LC-MS-MS).

Addressing PFAS at the source

Import and manufacture bans on PFAS, and appropriate controls on products containing PFAS, are key to limiting human exposure to PFAS in the environment, including our drinking water catchments.

The most effective way to limit PFAS in drinking water is to prevent contamination of catchments, and where legacy contamination exists, assessments should be undertaken to identify effective control measures (which could include site remediation, water treatment measures and/or source selection and blending). Governments and industry need to continue to work together to look at ways to identify and control PFAS at their source.

In Australia, the Federal Government has banned the production or importation of some PFAS substances by July next year, including everyday products that contain PFAS.

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The Waste Management & Resource Recovery Association's media release, *Federal Government needs to turn the PFAS tap off now (18.9.24),* states that 'PFAS is everywhere…. Simply head to the supermarket and you can buy materials off the shelf that contain PFAS at far higher levels than being found in water at present."

The article refers to a University of Queensland study which found that dental floss contains 15 parts per billion of PFAS, microwave popcorn bags have 18,200 parts per billion and cosmetics up to 10,500 parts per billion.

"Australia is yet to sign the Stockholm Convention on persistent organic pollutants or so-called 'forever chemicals', which Europe did over a decade ago…. The waste and resource recovery industry has been calling on the Federal Government for years for much tighter restrictions on what can be placed on market containing PFAS and how it is managed, including labelling and registration schemes… In 2025 the Federal Government is proposing to ban less than five of the more than 4,000 types of PFAS in existence…. There needs to be urgent action on this…. This material needs to be prevented from circulating in the environment in the first place," said Gayle Sloan, CEO.

PFAS treatment

Controlling PFAS at the source (ie controlling if it is used in firefighting foams and everyday products), and preventing it entering raw water sources, is generally lower cost, less energy intensive and more effective than implementing treatment technology to remove PFAS from drinking water.

The removal of PFAS by existing conventional water treatment processes is challenging because of PFAS' small size and very strong chemical structure. There are known water treatment technologies that can remove PFAS (for example reverse osmosis, granular activated carbon, ion exchange), however these can be high cost and energy intensive, and produce contaminated waste that needs to be managed.

Water utilities continue to participate in research and explore treatment options for managing PFAS in Australia and with other utilities around the world.

Using a home filter is not necessary for health reasons in most parts of Australia, because drinking water is already sufficiently treated at a water treatment plant. The NHMRC said that households with a reticulated drinking water supply with PFAS levels below the health-based guideline values do not need additional home water treatment. (A reticulated drinking water supply means customers whose drinking water is piped in from a water utility, which is most Australians.) There are many home water filters on the market, but not all filters address PFAS, or are effective at removing all PFAS. Available filters display varying levels of effectiveness at removing PFAS.

If you choose to use a filter, make sure that the device has been proven to remove PFAS by independent testing. It is vital that the filter is independently certified to remove PFAS and maintained as per the manufacturer's instructions for effective functioning to ensure it continues to function as designed. Home filters can reduce beneficial aspects of tap water such as chlorine and fluoride, which are in water to protect public health. The US EPA have a fact sheet on home filters.

Raw vs treated water

It is important to distinguish between results for raw water and treated water. Raw water is water taken from rivers, dams and aquifers that hasn't been through water treatment processes.

This water does not need to comply with drinking water guidelines as it will be treated.

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Nonetheless, water authorities may still test this water as part of processes to manage risks. It is important to understand the quality of raw water as part of managing water quality in the entire system. A detection of PFAS in raw water does not necessarily mean PFAS will be detected in the treated water.

Treated water is water that has been through water treatment processes and is supplied to customers at their homes and businesses. The Australian Drinking Water Guidelines apply to this water. Water authorities test this water to check if it meets drinking water quality requirements.

Water sector response

The water sector (water utilities are generally part of government) has proactively recognised the evidence-based risks associated with PFAS. The Water Services Association of Australia is working on behalf of the sector to understand national and international changes and assist our members in working with Australian, state and territory governments on policy, legislation, guidelines and management approaches for PFAS.

The water sector invests in research projects and initiatives which provide the evidence base that helps inform monitoring, treatment, and policy decisions. The outputs of such research include more effective and cost-efficient processes and technologies to treat and remove PFAS. This research also enhances our understanding of the specific human health and environment risks associated with PFAS.

Research organisations, such as Water Research Australia, play an important role in coordinating these activities and ensuring water sector collaboration to deliver these research outcomes.

The water sector is committed to ensuring the provision of safe and secure drinking water to customers and communities.

Water Services Association of Australia (WSAA) is the peak body representing the water sector. Our members provide water and wastewater services to over 24 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

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