



Fact Sheet - Norfolk Island PFAS contamination

Overview

- Per- and polyfluoroalkyl substances (PFAS) were detected at three test sites on Norfolk Island in late 2019, when CSIRO was conducting water studies on the Island.
- The Department of Infrastructure, Transport, Regional Development and Communications (the department) hired environmental consultants, Senversa, to take more samples, to determine what the levels of PFAS are in soil and water across the Island and provide advice on any further action needed. This is what is referred to as a 'Preliminary Site Investigation'.
- The Preliminary Site Investigation found that use of PFAS-containing firefighting foams at the airport has led to PFAS contamination of the Airport Bore and the Mission Creek catchment.
- PFAS was detected at unacceptable levels in tap water and bore water tanks at the hospital, the works depot and the fire station. Alternative drinking water has been supplied at these locations.
- None of the privately-owned drinking water sampled had concentrations of PFAS above the adopted health guidelines.
- People should avoid drinking water from Mission Creek or Watermill Creek.
- Senversa will now conduct a Detailed Site Investigation and will return to Norfolk Island in mid-March 2021 for two weeks to collect additional samples.

Background

Results from the CSIRO's preliminary screening conducted in late 2019 on Norfolk Island identified elevated levels of PFAS from three test sites on public land. These sites were located within the headwaters of the Mission Creek catchment directly below the aviation fire services training drill ground, adjacent to Norfolk Island International Airport. Water samples were taken from three public locations, the World War II Dam in the headwaters of Mission Creek, the nearby airport groundwater bore and a surface water sample where Mission Creek crosses Douglas Drive.

Following analysis of these initial sample results from the three sites, the department is progressing detailed environmental investigation, which include a Preliminary Site Investigation and a Detailed Site Investigation for Norfolk Island, to identify the nature and extent of PFAS in the local environment (including soil, sediment, surface water, groundwater and biota) related to the historical use of firefighting foams at Norfolk Island International Airport. If required, a Human Health Risk Assessment and/or an Ecological Risk Assessment may be conducted to determine any potential exposure risks to people or the environment. The first stage of the investigations (the Preliminary Site Investigation) is complete.



About per- and polyfluoroalkyl substances (PFAS)

PFAS are manufactured chemicals used in a wide range of industrial and household applications globally. Some types of PFAS have been used in fire-fighting foams, particularly at places like airports, fuel storage facilities, and Defence bases, because they are very effective at extinguishing liquid fuel fires.

PFAS were also used across Australia and internationally in a range of common household products and specialty applications, including in the manufacture of non-stick cookware; fabric, furniture and carpet stain protection applications; food packaging and in some industrial processes. As a result, most people living in the developed world will have levels of PFAS in their body.

Concerns have been raised about PFAS globally, because they are persistent and highly mobile in the environment, and some types of PFAS have also been shown to be toxic to some organisms. Uses of these types of PFAS are being phased out, under an international agreement called the "Stockholm Convention".

Currently, there is limited evidence of significant impacts on human health from exposure to PFAS chemicals. Research in Australia and overseas continues to be undertaken.

Health based guidance values

The Department of Health, Food Standards Australia New Zealand (FSANZ) and the National Medical Research Council (NHMRC) have developed health based guidance values (HBGVs) for three of the PFAS of concern - perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS). These values aim to protect the general community from exposure to PFAS from food, drinking water and recreational water. The guidance values for drinking water and recreational water quality are available in NHMRC's [Australian Drinking Water Guidelines \(2011\)](#) and [Guidance on per- and poly-fluoroalkyl substances \(PFAS\) in recreational water](#).

HBGVs indicate the amount of a chemical in food or drinking water that a person can consume on a regular basis over a lifetime without any significant risk to health.


Purpose of the Preliminary Site Investigation

The Preliminary Site Investigation (PSI) has been completed to report on the identification of PFAS sources, contaminant transport pathways and receptors and to present the findings of the initial, targeted investigation into the nature and extent of PFAS Norfolk Island Airport at the Norfolk Island Airport and surrounding catchments.

The objectives of this PSI included:

- investigation of potential PFAS source areas
- identification of PFAS migration pathways and sensitive receptors
- the targeted assessment of drinking water sources across the island.

The scope of work included a two week on-island investigation undertaken in January 2020 to meet with the community, identify potential PFAS source areas, assess sensitive human and ecological receptors and confirm key drinking water sources that should be assessed for PFAS impact. The targeted sampling undertaken



included the collection of 172 samples consisting of 25 groundwater samples, 17 surface water samples, 41 sediment samples and 89 soil samples both on the airport and across the wider island.

Results of the Preliminary Site Investigation

Six significant potential PFAS primary source areas were identified within the Airport that may have contributed to the elevated PFAS concentrations detected within the Mission Creek catchment. All six sources were associated with firefighting training and storage and maintenance of fire trucks that historically used PFAS containing aqueous film-forming foam (AFFF).

A further 11 lower significant potential PFAS source areas were identified on and outside the airport within the Mission Creek and other catchments.

All privately-owned drinking water sources that were sampled by Senversa were found to have concentrations below the adopted health-based guidance value (HBGV) for PFAS. The privately-owned drinking water sources assessed included three of five known water carters and tanks / groundwater bores within the Mission Creek catchment.

PFAS levels above the adopted HBGV were identified in three public facilities (hospital, works depot and fire station) at internal water taps and groundwater tanks. Alternative drinking water supplies have been provided at these locations and other potentially affected public facilities – including the airport, which is understood to have previously used the same water source as the facilities mentioned above.


The elevated PFAS levels at all three public facilities was linked to supply of water from the same Airport Bore within the Mission Creek catchment that was identified by CSIRO in December 2019 as having elevated concentrations of PFAS.

It is understood that Airport Bore water is also used in public toilets across the island but the potential for exposure during toilet-flushing and hand-washing will be relatively low given the frequency and duration of exposure, the non-volatile nature of PFAS, and the limited potential for PFAS absorption through the skin. Signage is in place at toilet facilities across the island to indicate the water should not be drunk.

PFAS was identified in three water sources used for the watering of stock, chickens and vegetables within the Mission Creek catchment. Exposure to the measured concentrations of PFAS is unlikely to impact upon the health or condition of cattle. However, where PFAS is present in water used for stock watering and/or irrigation, it can be taken up into meat, eggs and produce and people who consume these products can be subsequently exposed. Further testing is needed before any conclusive advice can be provided on these potential sources of exposure, and this will be a part of the next phase of the investigations to be conducted by Senversa.

Concentrations of PFAS above the HBGV in groundwater was restricted to the Mission Creek surface catchment. The 11 groundwater samples obtained in five other surface water catchments on the island were all below laboratory detection limits with the exception of one groundwater sample obtained adjacent Headstone Creek, which was above laboratory detection limits but below the HBGV.

Elevated concentrations of PFAS above the HBGV was identified in the surface waters of Mission Creek and Watermill Creek. Concentrations above laboratory detection limits but below the HBGV was identified in



Headstone Creek, with the one surface water sample obtained from Broken Bridge Creek below detection limits.

Is it safe to swim in the Mission Creek and Watermill Creek areas?

The advice not to drink water from Mission Creek or Watermill Creek remains and will be refined during the Detailed Site Investigation. People may be exposed to PFAS-affected water while swimming, however PFAS have very low/negligible absorption rates through the skin.

What are the next steps?

Senversa recommend a Detailed Site investigation in order to close a number of data gaps identified in the Preliminary Site Investigation relating to the nature and extent of PFAS in groundwater, surface water, soil, sediment and biota on Norfolk Island.

Senversa are returning to Norfolk Island in March 2021 for two weeks to collect additional samples as part of the Detailed Site Investigation.

Is the water safe to drink?

All privately-owned drinking water sampled by Senversa were found to have concentrations of PFAS below adopted health guidelines.

Three public facilities were found to have concentrations of PFAS above adopted health guidelines. These facilities now have alternative drinking water supplies.

The supply of alternative drinking water will continue until the Detailed Site Investigation results become available.

Should people be concerned about using the water for livestock or food production? Or consuming local animal products and fresh produce?


Further assessment of other potential exposure pathways – including agriculture and food production – will be undertaken as part of the ongoing investigations. We will then be able to provide the community with more specific information on this issue.

PFAS accumulates in humans over long periods of exposure to PFAS-affected sources, such as food or water. Given this, while further testing and analysis is undertaken, continuing with current practices would not have a significant impact on exposure.

What is the Norfolk Island PFAS Detailed Environmental Investigation?

The Department has engaged Senversa to undertake a detailed environmental investigation in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM). There are three main steps to the investigation process:

- a Preliminary Site Investigation (PSI)
- a Detailed Site Investigation (DSI)

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- a Human Health Risk Assessment (HHRA) and/or an Ecological Risk Assessment (ERA). The HHRA and/or ERA is only conducted if the results of the DSI deem it is necessary.

Throughout the investigation, the Department is also undertaking management initiatives. These may include supplying alternative drinking water, conducting public information sessions, erecting warning signs, reducing the spread of PFAS and managing contaminated soil and water.

What are the Detailed Environmental Investigation steps?

A **Preliminary Site Investigation (PSI)** includes a desktop historical review, site inspections, interviews and limited sampling to determine the potential for PFAS contamination.

A **Detailed Site Investigation (DSI)** follows a PSI and includes sampling, analysis and interpretation of soil, water, plants, animals and other environmental media which may be affected by PFAS contamination. A DSI identifies the areas where legacy firefighting foam was previously used (source areas) and how far it has spread in the environment. Depending on the outcomes of a DSI, a human health and/or ecological risk assessment may be required.

A **Human Health Risk Assessment (HHRA)** and/or an **Ecological Risk Assessment (ERA)** may be conducted if the DSI identifies that contamination is present and humans may have the potential to be exposed or that sensitive ecological receptors such as marine life, plants or animals may be affected, an assessment will be undertaken into the risk of PFAS contamination to human health and/or the environment.

Where can I get more information?

If you have questions or would like further information, we encourage you to contact NIPFAS@infrastructure.gov.au. Community members can also contact the Department on 23315.

For further information on PFAS, please go to www.pfas.gov.au. For health information, go to <http://www.health.gov.au/pfas>.

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