RAAF Base Tindal PFAS Investigation

In March 2017, Defence commenced a detailed environmental investigation into per- and poly-fluoroalkyl substances (PFAS), related to the historical use of legacy firefighting foams on RAAF Base Tindal (the Base). The aim of the investigation is to understand the source areas of PFAS contamination, where it is travelling to, and how it is moving through the environment.

Due to seasonal variations in environmental conditions and when the investigation commenced, it was decided to complete a Detailed Site Investigation in two parts:

- the primary Detailed Site Investigation addressing Dry Season environmental conditions with the majority of testing and observations,
- followed by some additional testing of Wet Season conditions to identify these effects, which is being presented in the Supplementary Detailed Site Investigation.

Detailed Site Investigation

A Detailed Site Investigation Report was published in February 2018 based on the field work conducted from April to October 2017. The field work involved a comprehensive sampling program of land and water-based plants and animals, soil, sediment, and surface water and groundwater on-and-off Base.

Sampling and analysis confirmed that the Fire Station and the Fire Training Area located on-base are the source areas that require remediation works. Other minor source areas were identified that don’t warrant management to prevent future spreading of contamination.

The Detailed Site Investigation determined potential pathways for the PFAS to move through the environment including:

- From soil in source areas to the groundwater (into the Tindall Aquifer)
- From soil in source areas to surface water (into drains and Tindal Creek)
- In groundwater flowing towards Uralla, the town of Katherine and the Katherine River
- From surface water runoff into drains and along Tindal Creek
- Uptake by animals and some plants from PFAS contaminated sediment, groundwater and surface water
- Use of groundwater for domestic use, irrigation and stock watering purposes


Supplementary Detailed Site Investigation

The supplementary investigation extends on the Detailed Site Investigation and includes sampling results and analysis from works carried out from October 2017 to May 2018. The aim of the Supplementary Detailed Site Investigation is primarily to capture the effects of the Wet Season on the findings of the Detailed Site Investigation.

The seasonal cycle of Wet Season and Dry Season has a major influence on the movement of PFAS impacted surface water and may also affect groundwater. Bores and surface water were tested to develop an understanding of how PFAS moves through the environment during the Wet Season.

On-base testing occurred at the Fire Training Area, Fire Station, and other areas around the Base where legacy firefighting foam was identified as potentially being applied in the past. Off-base testing was conducted in areas that may have been impacted from the Base, specifically Tindal Creek, Katherine River, drains, and where impacted groundwater has been used.

Supplementary samples included:

- Groundwater samples were collected from the same areas and across the Investigation Area every two months.
- Surface water testing of the Katherine River, Tindal Creek and drains on RAAF Base Tindal.
- Soil testing including off-base areas irrigated with bore water such as schools, sports grounds and residences.
- Wet Season testing of fish and cherabin from the Katherine River and Daly River.
- Monitoring of fluctuations in groundwater levels throughout the seasons.
Key Supplementary Detailed Site Investigation Findings

The results of the Supplementary Detailed Site Investigation sampling supported the initial Detailed Site Investigation report and did not identify any additional sources or pathways. Sampling through the Wet Season identified the following:

- Concentrations of PFAS in Katherine River fall below the laboratory reporting limit and drinking water guidance value in the Wet Season (approx. January to April) and gradually increase through the Dry Season as groundwater seepage becomes the major component of river flow.
- The highest concentrations in Tindal Creek were reported at the end of the Wet Season when the majority of groundwater seepage occurs into the Creek.
- Concentration of PFAS in groundwater wells fluctuated most near the source of impact, and typically increased in the Wet Season due to increased contact between water and impacted soils. Away from source areas, the seasonal change in concentrations was minor, with some dilution observed in shallow groundwater and areas of high recharge.
- Concentrations in the Katherine Hot Springs was consistent throughout the year and did not exceed health-based drinking water values.
- Concentrations in fish flesh followed a similar trend to Katherine River water concentrations, with the lowest concentrations reported at the end of the Wet Season and gradual increases through the Dry Season.

The majority of PFAS is transported off-base by PFAS-impacted groundwater. Only a small portion of PFAS is leaving the base via Tindal Creek in the Wet Season. A small percentage of this is directly from surface water run-off from drains on RAAF Base Tindal.

The PFAS (PFOS and PFHxS) contamination through the Investigation Area was estimated to be approximately 3,000 kg. A further 1,000 kg of PFAS is potentially accessible for removal from the key source areas on RAAF Base Tindal. Removing this residual mass will significantly reduce the ongoing leaching from the Base and shorten the time for PFAS to flush from the environment. The removal of PFAS from the source areas is unlikely to have a short-term impact on the concentrations of PFAS in groundwater and the Katherine River.

Next Steps

The Ecological Risk Assessment, due to be released in November 2018, utilises data collected as part of the Supplementary Detailed Site Investigation. Findings from soil, water, plants and animals sampling have been used to understand how PFAS moves through the ecological food web.

The findings of the Ecological Risk Assessment and the testing from the Supplementary Detailed Site Investigation do not alter the outcomes of the Human Health Risk Assessment released in June 2018.

The findings of the Supplementary Detailed Site Investigation will inform the RAAF Base Tindal PFAS Management Area Plan which outlines potential activities to manage PFAS contamination and reduce exposure risks, on the Base, and in the wider Katherine Community.
Government Guidance

On 7 May 2018, an independent expert health panel concluded there is mostly limited, or in some cases no evidence, that human exposure to PFAS is linked with human disease. The panel also advised that the evidence does not support any specific health of disease screening or other health interventions for highly exposed groups in Australia, except for research purpose; and decisions and advice by public health officials about regulating or avoiding specific PFAS chemicals should be mainly based on scientific evidence about the persistence and build-up of PFAS.


On 3 April 2017, the Department of Health published Food Standards Australia New Zealand's (FSANZ) report, Perfluorinated Chemicals in Food, which includes health based guidance values for site investigations in Australia, a dietary exposure assessment, and risk management advice, for authorities investigating PFAS contamination. The health based guidance values derived by FSANZ help inform Human Health Risk Assessments.


The investigation is being conducted in accordance with the National Environmental Protection (Assessment of Site Contamination) Measures 1999 (NEPM) and PFAS National Environmental Management Plan (NEMP).

Keeping the Community Informed

Defence will continue to keep the community informed on the outcomes on further sampling and the implementation of management plans. As additional information becomes available, updates will be provided through community information sessions, project website, direct mail, fact sheets and newsletters.

Contact Information

RAAF Base Tindal Information Line
Phone 1800 316 813
Email PFAS.RAAFBasTindal@coffe.com
Website www.defence.gov.au/environment/pfas/Tindal
Post PO Box 2213 Palmerston NT 0831

Media enquiries should be directed to Defence Media Operations on (02) 6127 1999 or media@defence.gov.au