



# RAAF Base Townsville – Human Health Risk Assessment Findings

## PFAS Investigation and Management Program

### About the Investigation

In March 2017, Defence commenced a detailed environmental investigation to identify the nature and extent of per- and poly-fluoroalkyl substances (PFAS) on, and in the vicinity of, RAAF Base Townsville as a result of the historical use of legacy firefighting foams at the Base.

The objective of the investigation is to identify whether the use of these foams has resulted in exposure to people, animals and the environment. Understanding the potential PFAS pathways will help develop strategies to minimise exposure, should these be required.

### Investigation update

As part of the environmental investigation, a Human Health Risk Assessment (HHRA) has been completed. The primary objectives of the HHRA were to understand the potential PFAS exposure risks to people and identify the main exposure pathways within the Investigation Area.

The assessment follows the completion of the first two stages of the investigation, the Preliminary Site Investigation (PSI) and Detailed Site Investigation (DSI).

The HHRA report is available to view at [www.defence.gov.au/environment/pfas/Townsville](http://www.defence.gov.au/environment/pfas/Townsville)

### Human Health Risk Assessment

The HHRA involved a detailed scientific process to analyse the results of sampling conducted during the PSI and DSI.

The scope of the assessment included:

- An evaluation of PFAS concentration levels in groundwater, surface water, soil, sediment, plants and animals.
- Further refinement of the Conceptual Site Model described in the DSI, based on additional data.
- Collection and evaluation of samples of locally caught seafood (marine and estuarine).
- Estimation of PFAS intakes for groups of people potentially affected by contamination.
- Calculation of the potential level of PFAS exposure for people potentially affected by the contamination.

### HHRA Key Findings

The table (over the page) summarises the exposure risks identified in the HHRA. The risk categories range from 'no detect' to 'potentially elevated exposure risk'.





Overall, potential exposure risks to people living and working in the Investigation Area are **low and acceptable**. To further minimise exposure to PFAS, people should continue to follow the Food Standards Australia and New Zealand fish consumption advice to eat no more than three serves of fish per week.

**No detect**

PFAS was not detected above the limit of reporting. The limit of reporting is the lowest concentration level that the laboratory is able to measure in a sample with a reasonable degree of certainty.

**No complete exposure pathway**

PFAS was detected above the limit of reporting but no complete exposure pathway was identified.

**Low exposure risk**

The estimated exposure to PFAS is below the relevant tolerable daily intake or guideline screening value.

**Approaching a potentially elevated exposure risk**

There is a low exposure risk if you are only exposed to PFAS through this pathway. If you are exposed to PFAS through this pathway, and others, the combined exposure may exceed the tolerable daily intake and present an elevated exposure risk. Further investigation or management may be required.

**Potentially elevated exposure risk**

The estimated exposure to PFAS is above the relevant tolerable daily intake or guideline screening value. Further investigation or management is required.

Assessed Exposure Risks	
<b>No detect</b>	<p>PFAS was not detected in surface water at the mouth of the Bohle River, Three Mile Creek and Mundy Creek.</p> <p>PFAS has not been detected in edible aquatic plants (samphire and sargassum).</p>
<b>No complete exposure pathway</b>	<p>Bore water has not been identified as a drinking water source in the Investigation Area.</p> <p>Bore water has not been identified as a resource for stock watering, including as drinking water for chickens.</p> <p>Bore water has not been identified as a resource to fill swimming pools and spas.</p>
<b>Low exposure risk</b>	<p>Inhalation of windblown dust from the Base.</p> <p>Incidental ingestion of soil by children at the on-Base kindergarten.</p> <p>Incidental ingestion of surface soil by Defence personnel at the Base.</p> <p>Consumption of homegrown fruit and vegetables irrigated with groundwater.</p> <p>Incidental ingestion of bore water used for irrigation, sprinkler play, etc.</p> <p>Incidental ingestion of groundwater intersected during excavation activities off-Base.</p> <p>Incidental ingestion of soil by residents where soil has been irrigated with bore water.</p> <p>Ingestion of prawns, crabs and molluscs caught in the investigation area.</p>
<b>Low exposure risk / Approaching a potentially elevated exposure risk</b>	<p>Incidental ingestion of soil at depths greater than 0.5 meters below ground surface if it is excavated during on-Base maintenance activities.</p> <p>Incidental ingestion of groundwater if it is intersected during on-Base excavation activities.</p> <p>Application of workplace health and safety measures will manage these exposures.</p>
<b>Potentially elevated exposure risk</b>	<p>You may exceed the PFAS tolerable daily intake if you eat more than three serves per week of fish flesh from the Investigation Area. As a precaution, you should follow the FSANZ Mercury in Fish health advisory to limit your exposure:</p> <p><a href="http://www.foodstandards.gov.au/consumer/chemicals/mercury/Pages/default.aspx">http://www.foodstandards.gov.au/consumer/chemicals/mercury/Pages/default.aspx</a></p> <p>Samples of fish livers contained PFAS. You can further manage your exposure by not consuming the offal or cooking the offal in preparation.</p>





### Investigation Sampling

RAAF Base Townsville Samples

Sample Type	No. On-base	No. Off-base
Soil	165	41
Groundwater	182	130
Drinking water	Nil	Nil
Surface water	45	78
Sediment	29	68

RAAF Base Townsville Samples

Sample Type	No. On-base	No. Off-base
Aquatic plants	0	57
Estuarine animals	0	319
Marine animals	0	226
Terrestrial animals	0	84

The samples were taken from within the Investigation Area, shown on the map above.





## Government Guidance

The Department of Health established an Expert Health Panel (the Panel) to advise the Australian Government on the potential health impacts associated with PFAS exposure and identify priority areas for further research.

The Panel's findings support the previous Environmental Health Standing Committee's (enHealth) advice in 2016 that there is no consistent evidence that exposure to PFAS causes adverse human health effects. However, because these substances persist in humans and the environment, enHealth recommends that human exposure is minimised as a precaution.

**Department of Health PFAS Information Line Phone:** 1800 941 180 | **Web:** <http://www.health.gov.au/pfas>

## Next Steps

The HHRA has provided Defence a greater understanding of the risk of PFAS exposure to people living and working in the Investigation Area.

The HHRA has been developed in consultation with the Technical Advisor and the Queensland Government Technical Working Group, which includes Department of Health, Department of Environment & Science, and other Queensland Government agencies.

### *DSI Addendum*

Defence have commenced development of a DSI Addendum Report which will include wet season environmental sampling of surface water, sediment and groundwater from the Investigation Area. The sample locations mirror those in the DSI Report, which was publicly released in May 2018. Data generated from the wet season sampling has been included in the HHRA and ERA reports. The DSI Addendum is expected to be released in the first-quarter of 2019.

### *Ecological Risk Assessment*

Defence have commenced an Ecological Risk Assessment (ERA) to evaluate the potential risks of PFAS exposure to

the natural environment. Aquatic (water-based) and semi-terrestrial (water- & land-based) ecosystems within the Investigation Area that are potentially affected by PFAS from the RAAF Base Townsville have been included in the ERA. The ERA is expected to be released in the first-quarter of 2019.

### *PFAS Management Area Plan*

As the investigation phase of the Defence response to PFAS contamination at RAAF Base Townsville concludes, one of the final stages will be the development of a plan for the future management of PFAS contamination.

This plan is known as a PFAS Management Area Plan (PMAP). This plan will flow on from investigation outcomes and reports, including the DSI, HHRA and ERA.

The RAAF Base Townsville PMAP will guide Defence's actions to manage known sources of contamination, ongoing monitoring, and community engagement.

## Keeping the Community Informed

Defence will continue to keep the community informed on the outcomes of further sampling and the implementation of management plans. As well as community information sessions, updates will be provided through the project website, newsletters and factsheets as new information becomes available.

## Contact Information

### Contact: RAAF Base Townsville Investigation Team

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