



Preliminary Site Investigation into Per- and Polyfluoroalkyl Substances (PFAS) - Executive Summary

Norfolk Island Airport

Prepared for:

Department for Infrastructure, Transport, Regional Development and Communications

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Executive Summary

Senversa was engaged by the Department of Infrastructure, Transport, Cities and Regional Development (DITCRD) now the Department for Infrastructure, Transport, Regional Development and Communications (DITRDC) to prepare a Detailed Environmental Investigation of per- and poly-fluoroalkyl substances (PFAS) site conditions at Norfolk Island Airport (the site) and surrounding catchments.

The investigation was initiated after a CSIRO led investigation identified elevated levels of PFAS in the Mission Creek surface water catchment in December 2019.

This report is the preliminary site investigation (PSI) which 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 Preliminary Site Investigation (PSI) included investigation of potential PFAS source areas; identification of PFAS migration pathways and sensitive receptors; and 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 and 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.

Through the completion of the PSI and targeted groundwater, surface water, soil and sediment assessment works, Senversa was able to achieve the objectives outlined in **Section 1.2** and draw the following conclusions:

PFAS Source Areas

- Six significant potential PFAS primary source areas (Group 1 Source Areas) were identified within the Airport that may have contributed to the elevated PFAS concentrations identified within the Mission Creek catchment.
- All six sources were associated with the training, 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 (Groups 2 – 4 Source Areas) were identified on and outside the airport within the Mission Creek and other catchments.

PFAS Impact to Utilised Water

- 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 (sum of PFOS + PFHxS). The privately owned drinking water sources assessed included three of five known water carters and tanks / groundwater bores within the Mission Creek catchment.
- Concentrations of PFAS above the adopted HBGV was identified in three public facilities (hospital, works depot and fire station) at internal water taps and groundwater tanks. Upon confirmation of the analytical results alternative drinking water supplies were implemented at these locations and other potentially impacted public facilities (including the airport, which is understood to have previously used the same water source as the facilities mentioned above). The elevated PFAS concentrations 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 utilised in public toilets across the island but the potential for exposure during hand washing will be relatively low given the frequency and duration of exposure, the limited potential for PFAS adsorption through the skin and the non-volatile nature of PFAS. Signage is understood to be in place at toilet facilities across the island to indicate the water should not be drunk. These measures will effectively manage potential exposures to PFAS within public toilets. As a number of the public toilets run septic systems there is the potential for the use of PFAS impacted water at these facilities to pose a secondary source of PFAS impacts to groundwater. However, it is noted that the mass and concentrations of PFAS associated with these uses is likely to be very small when compared with primary sources associated with the on-site direct use of AFFF.
- PFAS was identified in three water sources used for the watering of stock, chicken eggs 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 the produce can be subsequently exposed. It is noted that there is no available regulatory screening level specifically for these pathways; the presence of PFAS in this water does not necessarily indicate potential risks, but does indicate that further assessment of these pathways is required. It is noted that when cattle source their water from a variety of sources (i.e. not all of the water they drink is from the PFAS impacted source) this will reduce the potential exposures via this pathway.

PFAS Impact to Surface and Groundwater

- Concentrations of PFAS above the HBGV in groundwater was restricted to the Mission Creek surface water 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 within 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.

Data Gaps and Further Investigation

- Following a qualitative assessment of source-pathway receptor linkages, eight data gaps requiring further assessment and / or completion of a Tier 2 or 3 risk assessment were identified.
- A detailed site investigation is proposed to address the identified data gaps relating to the nature and extent PFAS in groundwater, surface water, soil and sediment and biota on Norfolk Island.



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