

**Submission
No 14**

**INQUIRY INTO INQUIRY INTO PFAS CONTAMINATION
IN WATERWAYS AND DRINKING WATER SUPPLIES
THROUGHOUT NEW SOUTH WALES**

Name: Mr Anthony Amis
Date Received: 26 November 2024

Parliament of NSW – Select Committee on PFAS Contamination of Waterways and

November 2024

Anthony Amis

Friends of the Earth Australia

Recommendations

- **The NSW Government should co-ordinate a statewide PFAS drinking water survey testing at multiple locations, for at least 30 PFAS chemicals, not just PFOS, PFHxS and PFOA, with all tests publicly available,**
- **These drinking water tests should be indefinite with support given to regional councils to pay the costs associated with such testing,**
- **The NSW Government should co-ordinate a state-wide survey into the past use of PFAS fire-fighting foam used in vehicle, building and bush fires in domestic water supplies with priority given to such locations for ongoing testing.**
- **The NSW Government should also include testing for Trifluoroacetic Acid in NSW drinking water supplies,**
- **The NSW Government should begin to survey for PFAS chemicals in a number of high conservation value waterways across the state.**
- **The NSW Government should grant legal status to the Australian Drinking Water Guidelines and ANZECC ecological guidelines,**
- **The NSW Government should investigate fluorinated pesticides and their impacts on waterways,**
- **The NSW Government should investigate PFAS leaching from HDPE containers into drinking water,**
- **The NSW Government should further investigate the health consequences of PFAS contamination of water supplies the Blue Mountains (Blackheath, Medlow Bath and Katoomba) and Jervis Bay,**
- **The NSW Government should recommend a ban on drinking water appliances that are coated with Teflon.**
- **The NSW Government should begin intensive testing of biosolids and recycled water throughout NSW for PFAS chemicals. Testing should also include areas where biosolids have been applied in the past and should include investigations into water pollution from such areas, including farms and pine plantations.**

- **The NSW Government should test waterways downstream of landfill facilities across the state for PFAS contamination.**

Introduction

This submission shares information collated over the past few years concerning PFAS detections in NSW drinking water supplies. Friends of the Earth have been watching this issue for some time on a national basis. <https://pfas.australianmap.net/>

Australia's first national study of PFAS contamination of drinking water was published in May 2011 “*Concentrations of PFOS, PFOA and other perfluorinated alkyl acids in Australian drinking water*” <https://pubmed.ncbi.nlm.nih.gov/21531441/>, with 62 samples taken from tap water from 34 locations between August and November 2010. The highest levels detected were PFOS at 16ng/L and PFHxS and PFOA at 13ng/L and 9.7ng/L respectively. In terms of PFAS exposure via drinking water, the study estimated that on average 2-3% of PFAS exposure was from drinking water with a maximum of 22% and 24%. Positive samples were taken in NSW including Bathurst, Blacktown, Campbelltown, Emu Plains, Gundagai, Lithgow, Liverpool, North Richmond, Quakers Hill, Wagga Wagga and Yass. Average levels from NSW were ~2-3ng/L, with the highest detection being PFOS at 8ng/L at North Richmond.

Australia had to wait 13 years for another survey in Australian drinking water. In October 2024, “*Occurrence of Ultrashort-Chain PFASs in Australian Environmental Water Samples*” was published highlighting detections in Australian drinking water of short chain PFAS chemicals, PFBA (52% of samples), PFPrS (67% of samples) and PFBS (76% of samples). Again, some samples were taken from NSW (most likely Sydney).

[https://pubs.acs.org/doi/10.1021/acs.estlett.4c00750#:~:text=Perfluoropropanesulfonic%20acid%20\(PFPrS\)%20was%20the,samples%20from%20major%20Australian%20cities](https://pubs.acs.org/doi/10.1021/acs.estlett.4c00750#:~:text=Perfluoropropanesulfonic%20acid%20(PFPrS)%20was%20the,samples%20from%20major%20Australian%20cities)

Matrix	Site	MPT/GB ^A	PFPrA	PFBA	TFMS	PFETS	PFPrS	PFBS
	SW56	GB	n.d.	0.38	n.d.	0.04	0.40	0.85
	SW57	GB	n.d.	0.24	n.d.	n.d.	0.30	0.73
% frequency of detection in SW			18	88	45	45	100	100
Groundwater (GW)	MW06	GB	0.02	0.08	n.d.	0.14	2.32	6.63
	MW14	GB	0.03	0.08	n.d.	0.02	0.22	1.00
	MW20	GB	0.01	0.02	n.d.	0.01	9.07	24.4
% frequency of detection in GW			100	100	0	100	100	100
Drinking water (DW)	Q13	GB	n.d.	0.02	n.d.	n.d.	0.02	n.d.
	Q27	GB	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
	Q29	GB	n.d.	n.d.	n.d.	n.d.	0.02	0.06
	Q19	GB	n.d.	0.02	n.d.	n.d.	0.02	n.d.
	Q6	GB	n.d.	0.09	n.d.	n.d.	n.d.	0.08
	Q7	GB	n.d.	0.08	n.d.	n.d.	n.d.	0.05
	Q17	GB	n.d.	0.02	n.d.	n.d.	0.02	0.14
	Q10	GB	n.d.	n.d.	n.d.	n.d.	0.02	0.15
	Q16	GB	n.d.	n.d.	n.d.	n.d.	0.03	0.16
	Q9	GB	n.d.	n.d.	n.d.	n.d.	0.03	n.d.
	Q14	GB	n.d.	n.d.	n.d.	n.d.	0.03	n.d.
	Q8	GB	n.d.	0.01	n.d.	n.d.	0.01	0.07
	Q12	GB	n.d.	n.d.	n.d.	n.d.	0.02	0.06
	Q15	GB	n.d.	n.d.	n.d.	n.d.	0.03	0.08
	Q24	GB	n.d.	n.d.	n.d.	n.d.	n.d.	0.07
	Q25	GB	n.d.	0.03	n.d.	n.d.	n.d.	0.04
	Q11	GB	n.d.	0.09	n.d.	n.d.	n.d.	0.07
	Q3	GB	n.d.	0.06	n.d.	n.d.	0.04	0.17
Q2	GB	n.d.	n.d.	n.d.	n.d.	0.03	0.16	
Q4	GB	n.d.	0.03	n.d.	n.d.	n.d.	0.04	
Q5	GB	n.d.	0.08	n.d.	n.d.	0.03	0.13	
% frequency of detection in DW			0	52	0	0	67	76
% frequency of detection in all matrices			19%	70%	24%	30%	83%	92%

These two papers are the only two published in Australia regarding PFAS detected in water supplies. However, there have been a number of detections published by consultants, water authorities, media outlets and local councils but little of this data is available in one document and much of it remains “unpublished”.

Similarly to pesticide reporting, there is no national agency responsible for monitoring biocide and toxic pollution across the country. Even state data is difficult to locate and a large portion of the information in this submission has been sourced from GIPA requests. It is good that some water authorities and councils have started to publish PFAS monitoring details, however sometimes the published data varies considerably to the full details released under GIPA requests.

I would also like to point out that the NSW Government should urgently fast track investigations into TFA (trifluoroacetic acid) as the chemical is being detected frequently throughout Europe. As far as I can tell, there has been no testing for this chemical in Australian drinking water. Research from Germany shows that TFA levels are higher in agricultural areas, potentially linking fluorinated pesticide use to high levels of TFA. <https://www.sciencedirect.com/science/article/pii/S0160412024006470> TFA levels in Europe have been recorded as high as 4,100 ng/L. Fluorinated pharmaceuticals may also contribute to TFA detections.

Many frequently detected pesticides, including fluorinated pesticides (eg Fluoxyprur, Bifenthrin) are not being monitored by the NSW Government. Hundreds of fluorinated pesticides are likely to be in use across NSW. <https://pfas.australianmap.net/2024-may-pfas-chemicals-in-pesticides/>

According to my information, the national pesticide regulator the APVMA has done very little in this space, including PFAS chemicals leaching from HDPE containers.

<https://www.epa.gov/pesticides/pfas-packaging>



I should point out that HDPE containers (above) are also likely to be used for drinking water. <https://foodpackaging2u.com.au/product/5-litre-hdpe-plastic-bottle-jerry-can-with-tamper-evident-cap/>

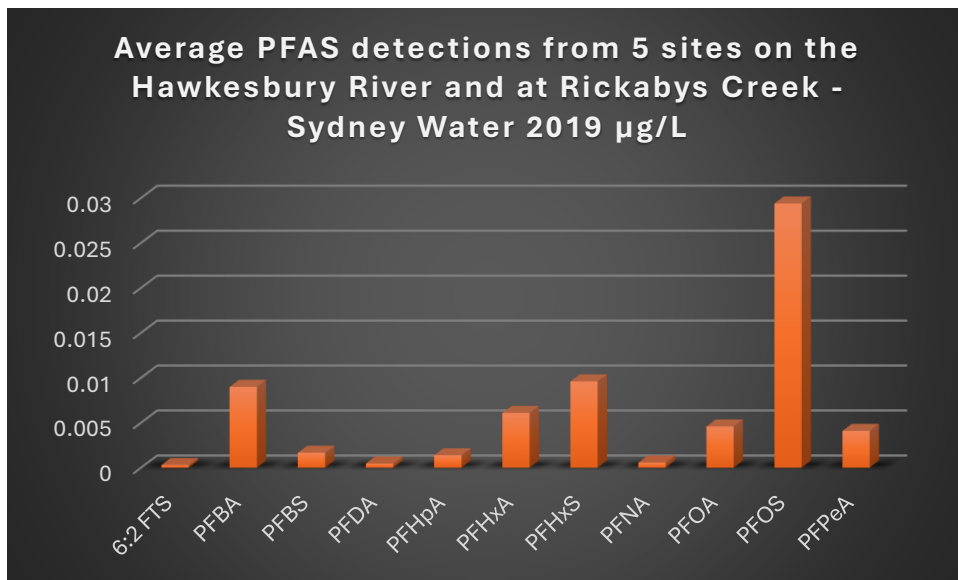
PFAS monitoring by the water industry in Australia is a relatively recent phenomenon. The Department of Defence knew as early as 1991 that fire fighting foams were potentially dangerous. <https://www.theguardian.com/australia-news/2017/aug/01/defence-knew-of-firefighting-foam-dangers-at-queensland-base-in-1991-class-action-alleges>

On the 30th of April 2003 the Australian National Industrial Chemicals Notification and Assessment Scheme (NICNAS) released an alert recommending that PFOS/PFOA products such as AFFF be restricted to essential use only, and that AFFF foam should not be used for fire training/testing purpose. PFOS was also listed under the Stockholm Convention in 2009 (with PFOA listed in 2019 and PFHxS listed in 2022). Yet even after the PFOS listing in 2009, no water authority in Australia was testing for PFAS chemicals.

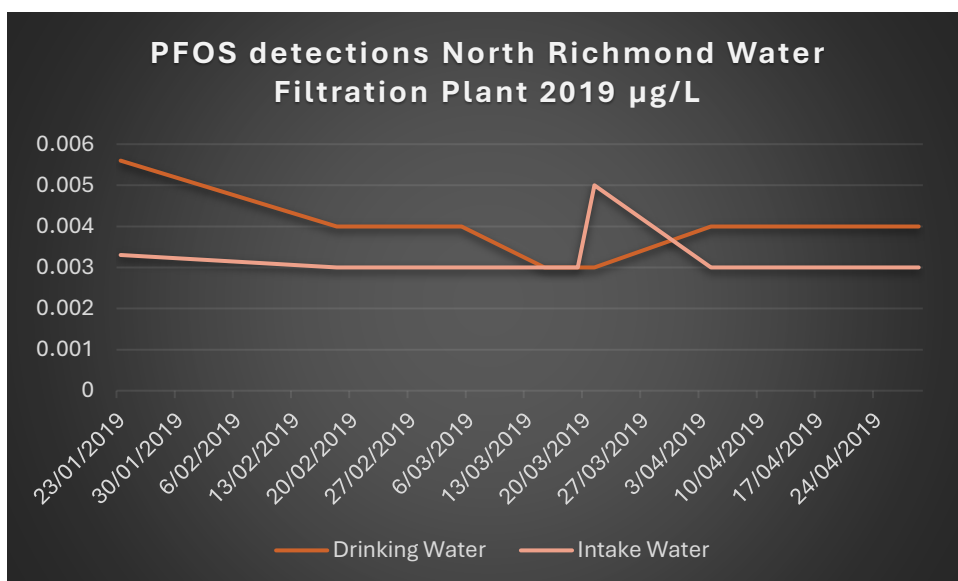
The Defence Department had started monitoring for PFAS in groundwater wells at Tindal (near Katherine) in the Northern Territory in May 2006, so they obviously knew that there was a potential problem emerging. In December 2011 the Defence Department confirmed that elevated PFAS levels were leaving Williamtown base in NSW.

From a recent GIPA request, it would appear that possibly the earliest PFAS sampling in NSW by a local council was Bathurst Council who started testing at their water filtration plant in March 2017 and further up the Macquarie River at Montavella Road in July 2017 (see following sections for more details).

Sydney Water appear not to have conducted any PFAS testing until between January – March 2019 when they tested at 5 locations on the Hawkesbury River (and one location at Rickabys Creek) and at North Richmond Water Filtration Plant until April 2019. The highest waterway recording PFAS was Rickabys Creek, downstream of the contaminated RAAF Richmond base, with one PFOS detection as high as 130ng/L. One of the Hawkesbury test locations was upstream of the North Richmond water filtration plant.



PFHxS in North Richmond drinking water in 2019 averaged 3.45ng/L from 10 samples, with PFOS averaging 3.84ng/L (max 5.6ng/L). PFOA levels averaged 2.97ng/L. Interestingly, Sydney Water during this time was testing for 18 PFAS chemicals, whereas follow up testing in 2024 only tested for 3. Water treatment used at the time, appeared to have little effect in removing PFOS from treatment water (see graph below).

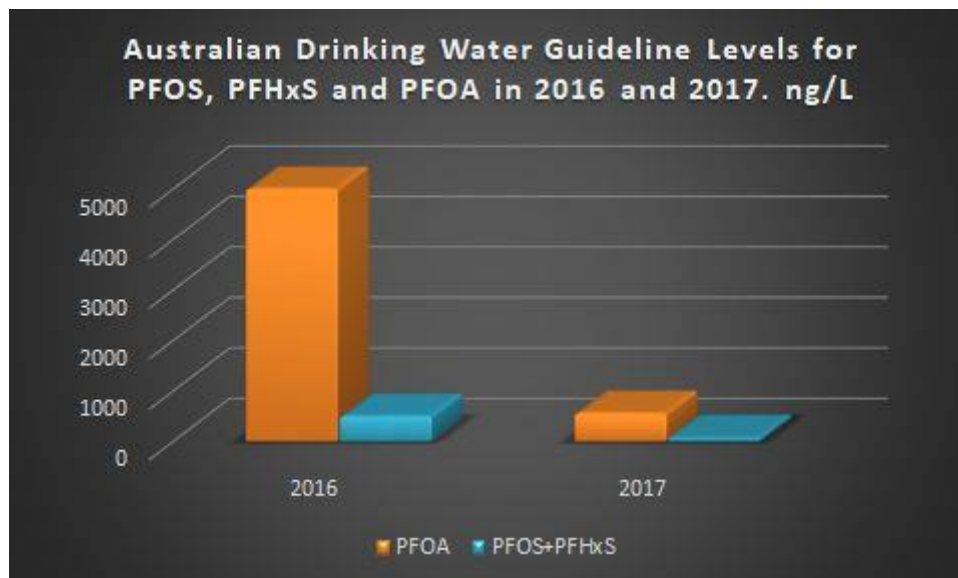


A flurry of testing by Sydney Water also occurred in June 2024 after reports in the Sydney Morning Herald revealed a lack of testing across NSW and Australia. The June 2024 test results, published in August 2024, revealed that the highest levels in PFAS in Sydney's drinking water were recorded at Cascade Water Filtration Plant Blackheath PFOS 15.5ng/L + PFHxS 13.6ng/L [Total PFOS+PFHxS=29.1ng/L] and Cascades Water Filtration Plant Katoomba 16.4ng/L + PFHxS 14.2ng/L [Total PFOS+PFHxS=30.6ng/L]). WaterNSW shut down Medlow Dam in late August 2024, due to the contamination with PFAS+PFHxS levels in (see following sections for more details).

In September 2024, the Sydney Morning Herald revealed that PFAS levels in Greaves Creek, downstream of Lake Medlow but upstream of Lake Greaves had reached 14040ng/L. PFAS levels of 3700ng/L were reported at Adams Creek, just downstream of the small Blue Mountains community of Medlow Bath.

Guidelines

Because of the recent understanding of the risks associated with PFAS, drinking water guidelines in Australia were not published by the NHMRC until 2016, even though the public had been exposed to PFAS chemicals for decades.



Drinking water guidelines levels were then reduced substantially in the space of a year, by the National Health and Medical Research Council (NHMRC), after advice from the Department of Health and Food Standards Australia New Zealand with PFOS+PFHxS guideline levels set 7.5 times lower and PFOA levels set almost 9 times lower than the guidelines introduced a year earlier. A flurry of testing occurred by some water authorities across Australia in 2017 (including at sewage treatment plants including recycled water and biosolids).

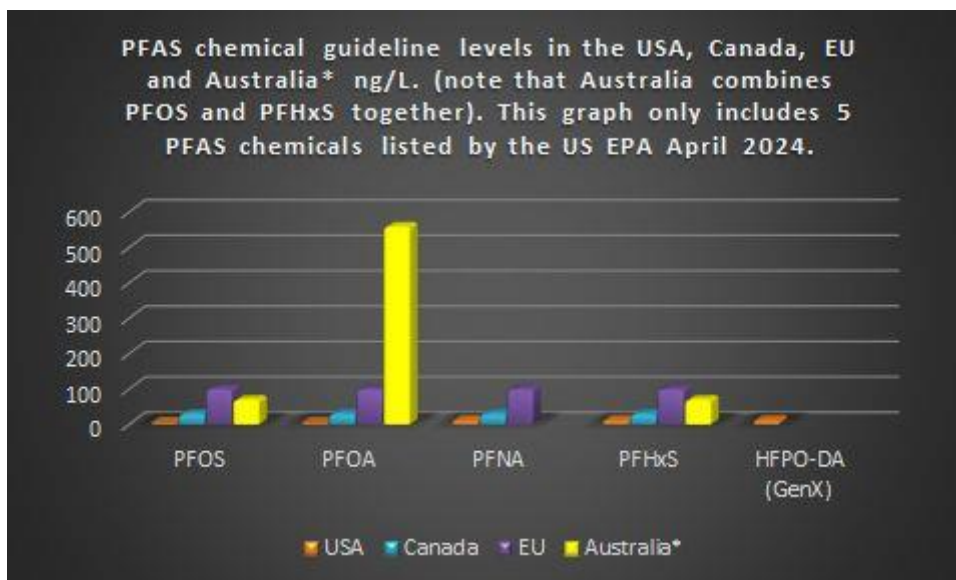
Despite guideline levels being scientifically approved on a national level, there was some doubt in health and water bureaucracies that PFAS was a problem at all (see below).

SA Water Daily Incidents and Hazards Summary Report Page 8 Wed 01 Nov 2017 *"Drinking Water PFAS was discussed at the enHealth regulators group. Utilities are being urged not to sample for PFAS unless a risk assessment identifies a credible potential source, e.g. PFAS use in catchment. DHA recommends that SA Water adopt this approach and only consider PFAS testing where a risk assessment has shown a need for testing."*

This SA Water document released under FoI shows that from May 15 2017 the SA Department of Health, with advice from enHealth did not think that SA Water should test for PFAS chemicals as they believed that the risks were low due to their water supply catchments being located away from known pollution sources. This SA Health decision also included water released from waste water treatment plants and biosolids which have been found elsewhere as being highly polluted with PFAS chemicals.

The document also fails to acknowledge communities relying on bore water which may have high risk activities such as fire stations located in or near groundwater recharge areas. SA Water only tested key reservoirs for PFAS in 2024 and still have not presented any testing data concerning smaller, more 'at risk' water supply catchments in South Australia. Was this also the same attitude with the NSW water industry?

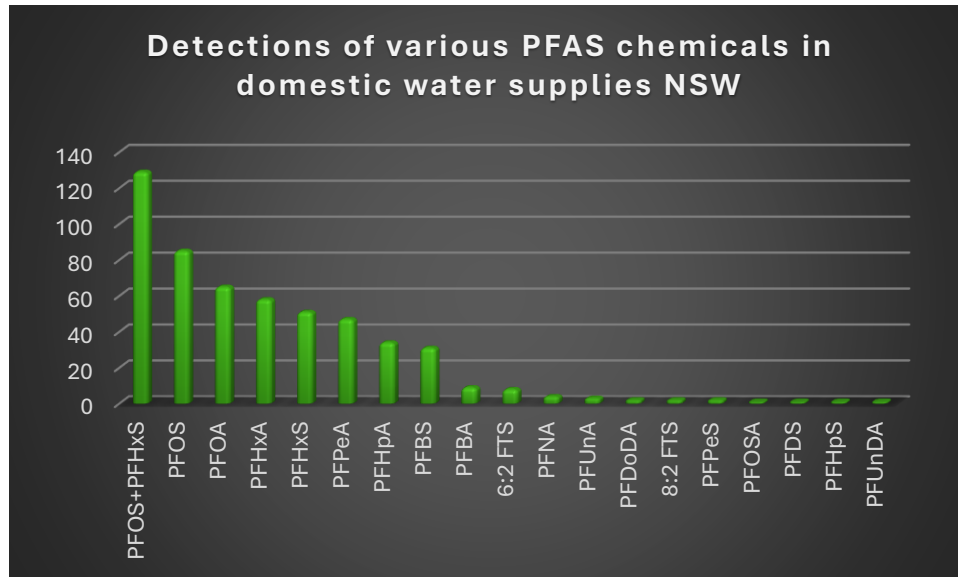
There is no doubt that scientific understanding regarding the health impacts is still evolving, but 'alarm bells' concerning PFAS should have been ringing for many years.



In April 2024, the US EPA announced new guideline levels for 4 PFAS chemicals. The graph above shows that the 2017 Australian Guidelines for PFOA are 140 times higher than the new US guidelines (and 1250 times lower than the Australian 2016 guideline).

The Australian guidelines do not have levels specified for PFNA and HFPO-DA (Gen X) chemicals.

NSW detections in drinking Water



Graph that FoE has compiled based on a 'generalised' database of about <530 PFAS detections from almost 45 locations of PFAS chemicals in drinking water supplies in NSW.

The data in the following graphs is compiled from the FoE list which combines 85 reported detections in water supplies for PFOS, 51 reported detections for PFHxS and 129 reported detections of PFOS+PFHxS. The PFOS+PFHxS detections were initially entered into the dataset not as single chemicals, but as combined data. Some of the reporting data from local councils etc was also presented as PFOS+PFHxS. The issue is further complicated with the 2017 ADGW's granting combined guideline levels for PFOS+PFAS and single guidelines for each of the chemicals under the proposed 2025 guidelines.

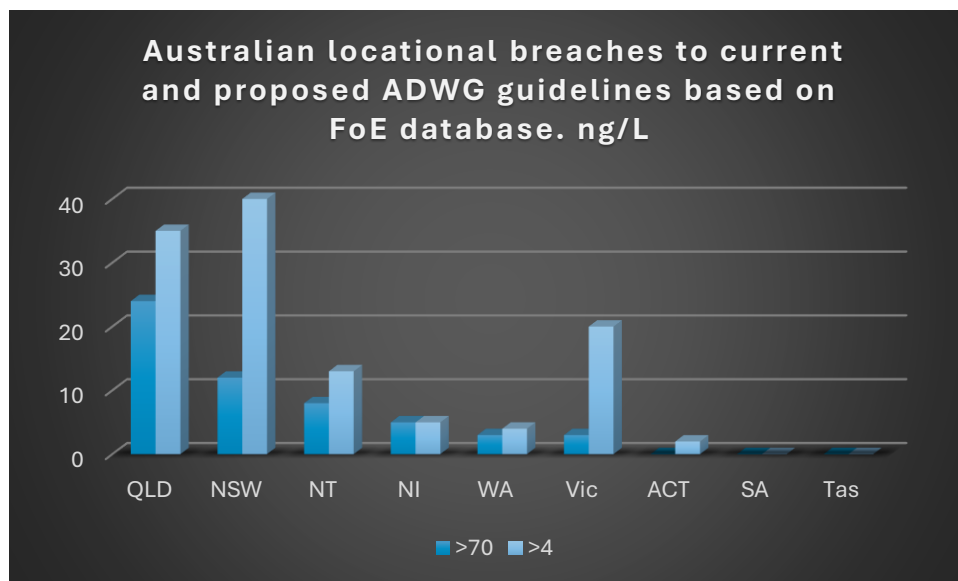
Time has not allowed to differentiate all of the database information into separate PFOS and PFHxS lists. Some of the data could also be skewed based on multiple detections in a location over a period of time.

The average level for all PFOS, PFHxS and PFOS+PFHxS detections on the FoE list is 1621ng/L, with a mean of 4ng/L. The database is heavily skewed towards the high detections, with 6% of all the detections of PFOS+PFHxS >1000ng/L. 11.3% of all the detections are >70ng/L, with 52.8% >4ng/L.

Detections >1000ng/L account for almost ~98.8% of all PFOS, PFHxS, PFOS+PFHxS detected by volume. The database is heavily biased towards detections near the Williamtown RAAF base in New South Wales. 94.8% of the PFOS, PFHxS, PFOS+PFHxS

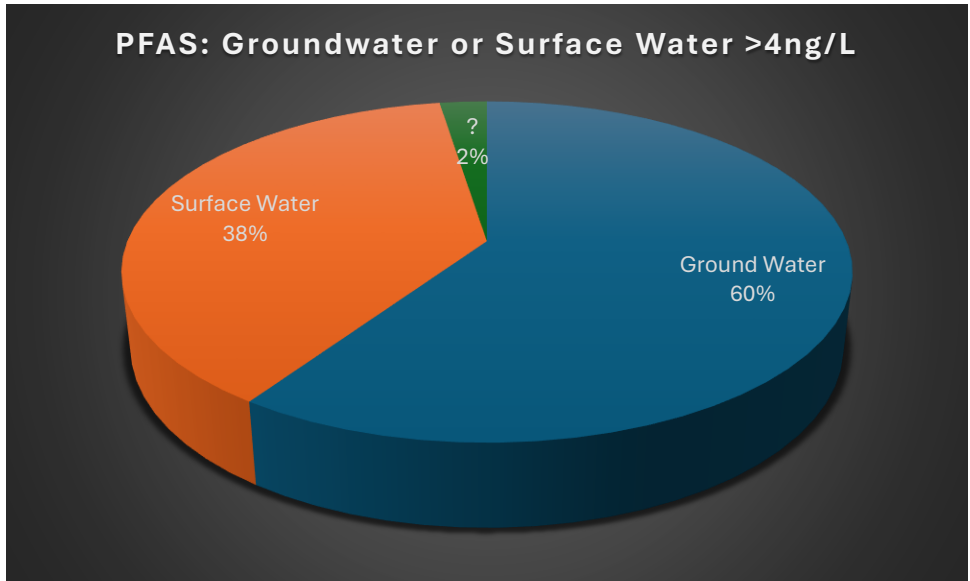
(by volume) on the database is from near Williamstown, due mainly to the excessively high levels detected there including one detection of 136,000ng/L in groundwater south of the base.

Changes to the proposed drinking water guidelines by the NHMRC are significant in terms of lowering PFOS and PFHxS guidelines from 70ng/L to 4ng/L & 30ng/L. The changes in the guidelines could see the amount of potentially impacted communities in NSW swell from several locations (population 50,000) to ~46 locations (population ~530,000 people including major population centres such as Newcastle, north-western Sydney and Bathurst etc). From what appeared to be an issue that impacted only a small number of people, now will impact on far more people.

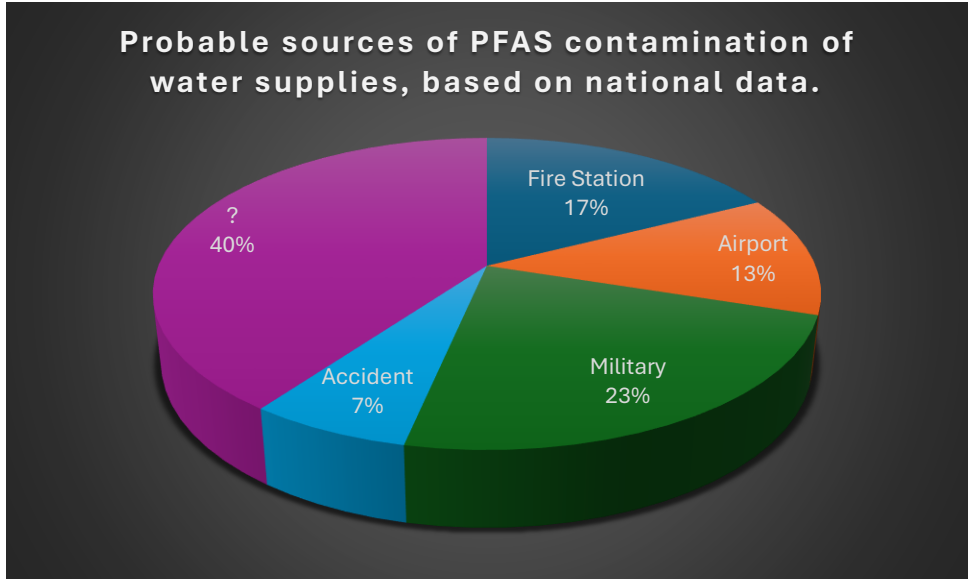


Graph highlighting national detections that PFAS detections on FoE’s national database are largely from Queensland, New South Wales and the Northern Territory. The surge in NSW incidents is based on a number of recent detections at several locations in the Blue Mountains, North Richmond, Grahamstown and Jervis Bay. Bathurst, Wagga Wagga, Tarcutta, Bungendore are also relatively recent and several locations listed in the 2011 study are also included. “Concentrations of PFOS, PFOA and other perfluorinated alkyl acids in Australian drinking water”.

Note that the database includes several detections from Williamstown >70.



Groundwater dominates the majority of PFAS detections >4ng/L in drinking water supplies around Australia. It is most likely that PFAS investigations should focus on communities that have/had airports or fire stations located near groundwater recharge areas.

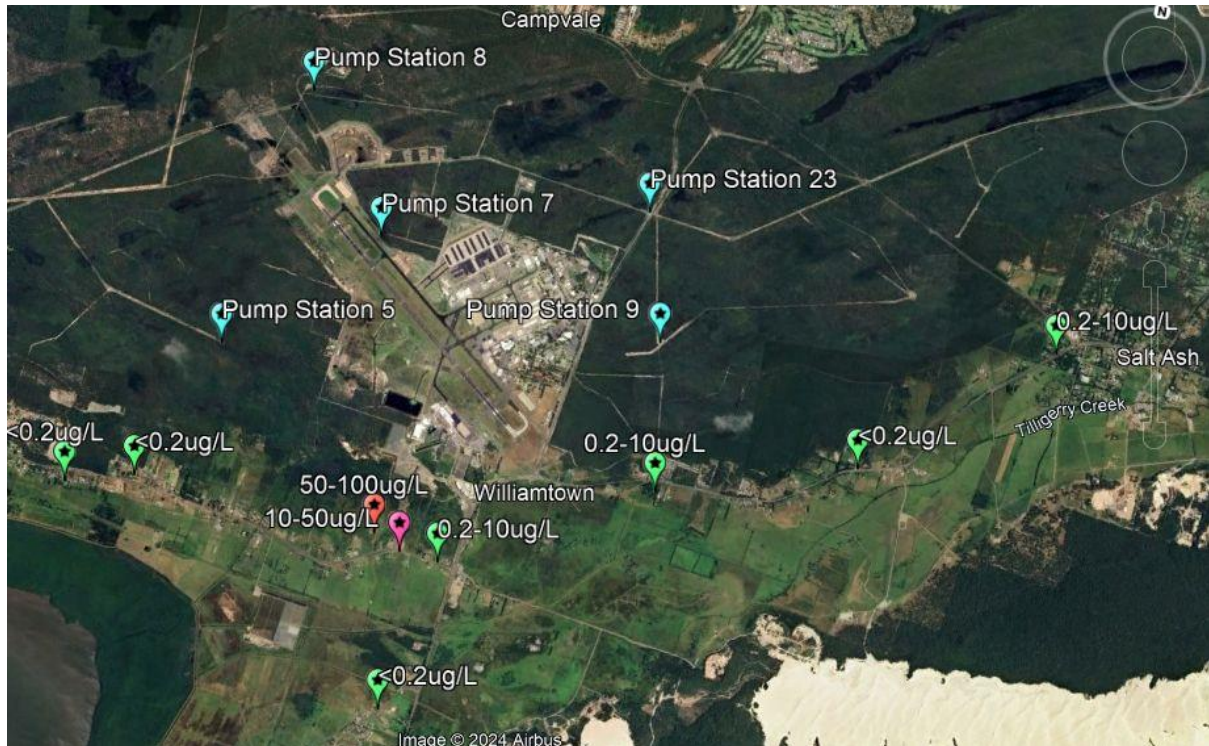


From the FoE dataset, PFAS contamination from military bases appears to be the largest source of PFAS contamination of drinking water supplies in Australia, followed by fire stations. Accidents would include vehicle accidents upstream of water supply offtakes, where fire fighting foam was used to suppress the fire. It would be worthwhile conducting a detailed investigation of where fire fighting foam has been used to suppress vehicle accidents, house fires and bushfires over the past 30 years and how many of these accidents have occurred in domestic water supplies. Almost 40% PFAS pollution incidents in water supplies across Australia appear to have an unknown source.

It should be stated that the amount of people exposed to PFAS chemicals above guideline levels would be far lower as most of the detections of PFAS would have been detected in raw water (pre-treatment) and not all suburbs (particularly in larger towns) would be supplied drinking water from the water source where the PFAS was detected. However, for some areas including residents relying on bore water and some communities where PFAS has been detected at unsafe levels, well after the PFAS has been used in the area, there is probably no denying that they would have been exposed at levels above guideline levels for long periods of time. What health impacts are now being revealed in people who have been drinking PFAS tainted water for years and potentially decades?

Some locations of concern

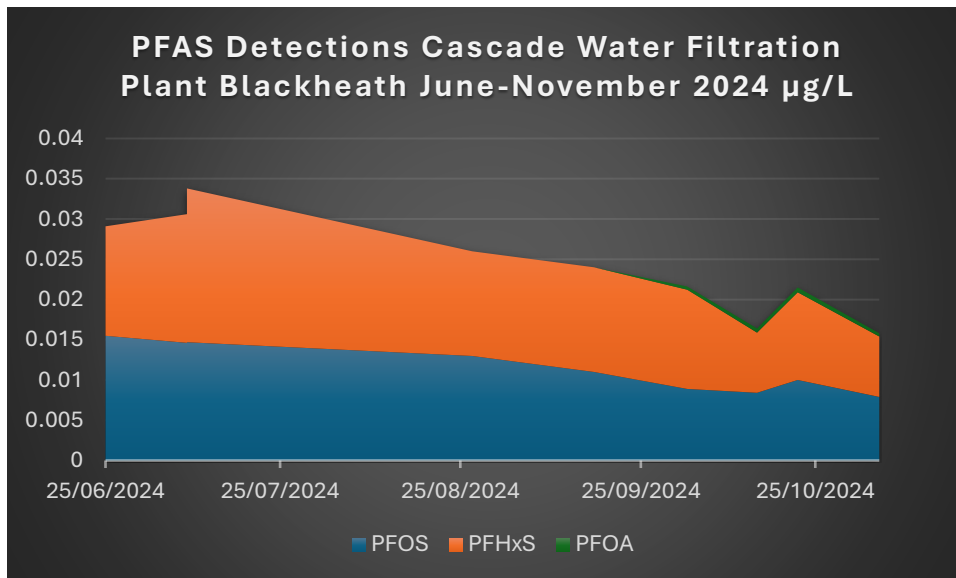
Williamstown (NSW)



The highest levels of PFAS contamination in Australia have occurred south of the Williamstown RAAF Base in New South Wales. The levels in the image above were recorded in 2016. Higher levels were recorded in 2017. Many people living in this area are reliant on bore water. This water was used for drinking and showering, swimming pools, home gardens etc. Animals such as chicken and cattle have also been impacted, as have a range of wild animals. The Pump Station pins relate to old bores used for water production by Hunter Water. Stations 7 & 9 were isolated from production in 2014 and the other bores had been used infrequently over the previous decade. Hunter Water's PFAS detections have been well under the current Australian Guidelines, but in rare instances would be in breach of the new US PFAS guidelines and proposed Australian guidelines. What was happening prior to 2014?

Blue Mountains (New South Wales)

In June 2024, the Sydney Morning Herald published a number of articles on PFAS contamination. The article eventually pressured the NSW Government to undertake PFAS testing in Sydney Water catchments. After the testing it was revealed that the highest PFAS levels appear to be in dams supplying drinking water to a number of communities in the Blue Mountains, namely Katoomba and Blackheath. Subsequent research is now pointing out that the contamination is most likely associated with a truck accident near Medlow Spring where Fire Fighting Foam was used. Local residents witnessed retardant from the accident flowing into the Medlow Dam catchment. The incident raises a number of questions, including where else has fire fighting foam been used in water supply catchments across NSW in both accidents and building fires etc. The use of fire fighting foam in bushfires in the past also needs further urgent investigation.



Cascade WFP in the Blue Mountains. At the current rate of decrease, the PFOS and PFHxS levels at Blackheath could possibly reach 0.004µg/L some time in 2025. PFAS levels are being 'diluted' with water piped in from Oberon Dam, 47km away. What happens to residents drinking this water in the meantime? For how long has this pollution been occurring?

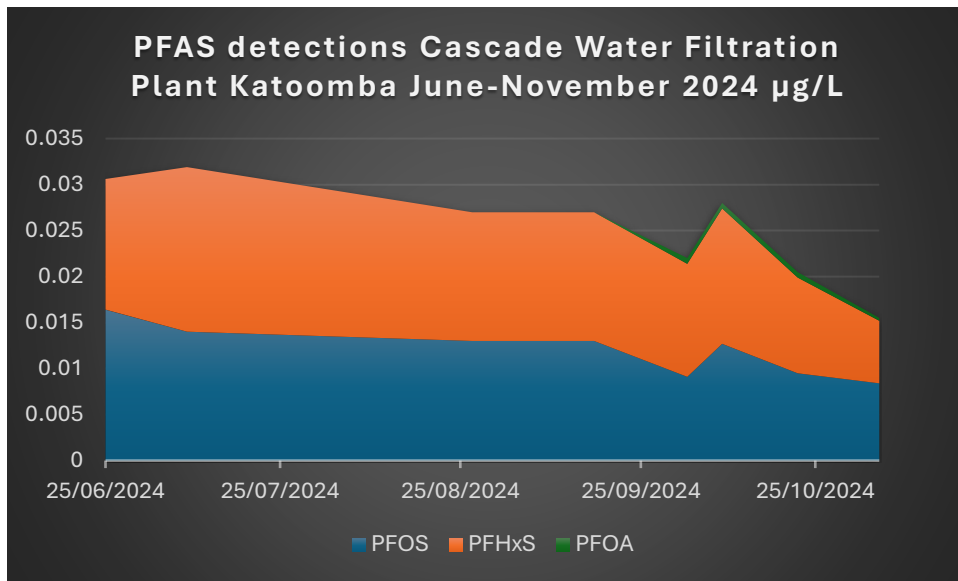
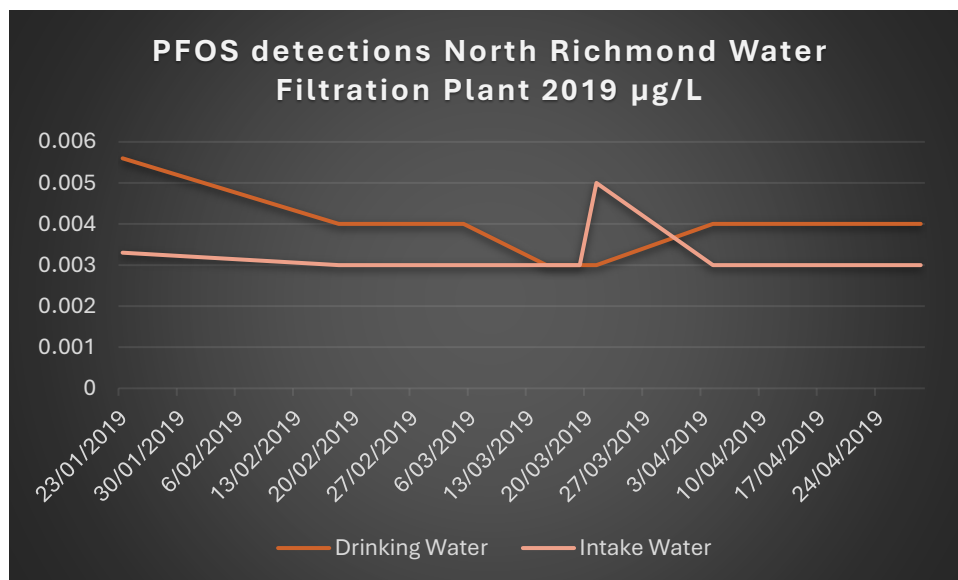


Image of Medlow Dam and Greaves Creek Dam with red pin near Medlow Bath on the Great Western Highway is approximate location of the truck crash in 1992. The crash location is about 1.5km upstream of Medlow Dam.

North Richmond Water Filtration Plant (New South Wales)

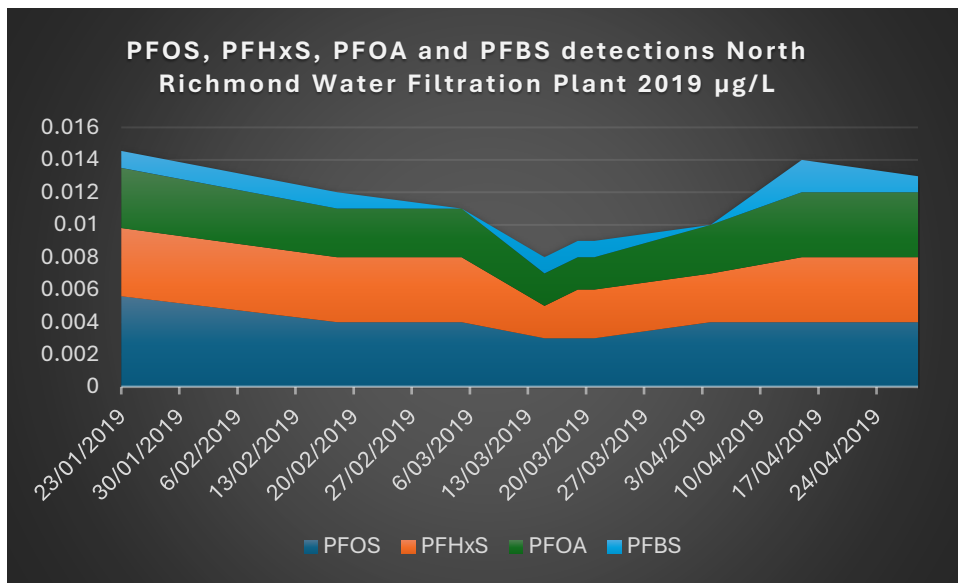


North Richmond WFP in bottom right corner of image looking upstream into the Hawkesbury River Catchment. Where is the PFAS in the Hawkesbury River coming from?

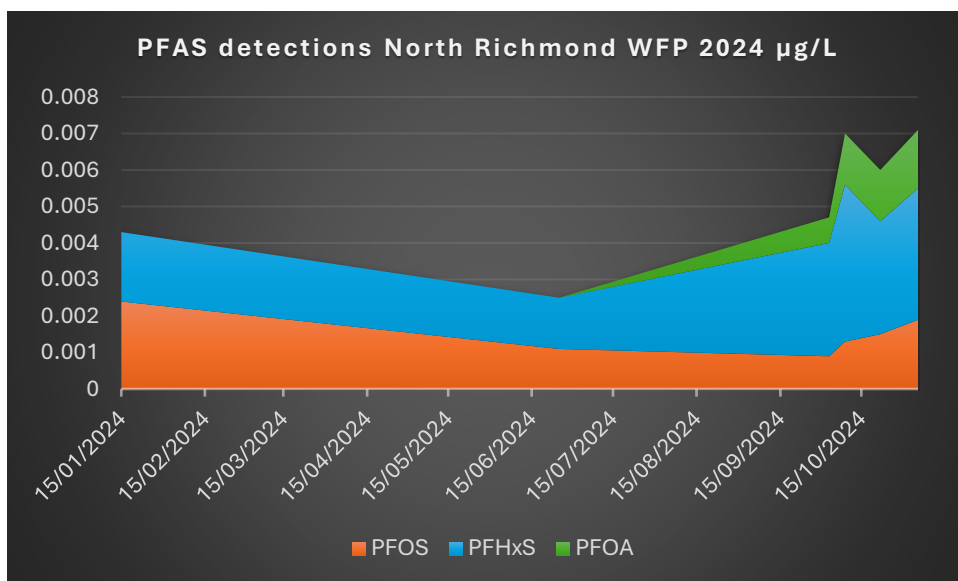


Sydney Water testing at North Richmond Water Filtration plant, indicating levels of PFOS were essentially the same as levels leaving the Filtration Plant, highlighting the likelihood that the water treatment method employed at the facility did not remove PFOS. A PFOS drinking water guideline of $0.07\mu\text{g/L}$ led to some complacency among water companies that levels as low as $0.004\mu\text{g/L}$ were 'safe'. The average PFOS level in

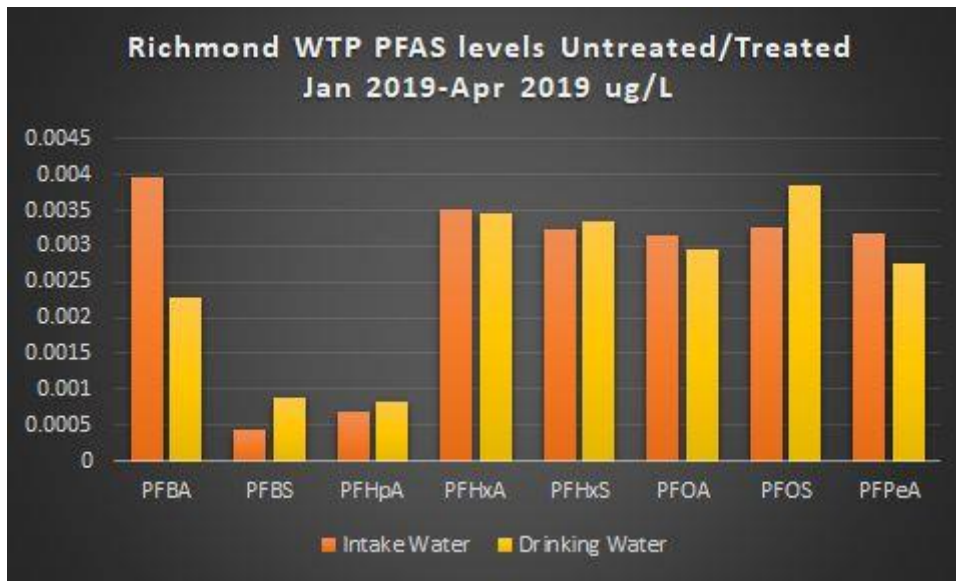
North Richmond drinking water in 2019 was 0.0038µg/L, PFHxS 0.0035µg/L and PFOA 0.0029µg/L



Eight different PFAS chemicals were detected at North Richmond Water Filtration Plant in 2019 (only 4 graphed here), with the highest amounts detected being PFOS, PFHxS, PFHxA and PFOA. Has the source of the ongoing PFAS pollution in the Hawkesbury been investigated?



Detections at North Richmond in 2024 appear to be lower than in 2019, with average PFOS levels 0.00152µg/L, PFHxS 0.0029µg/L and PFOA 0.0008µg/L. Was the use of Granular Activated Carbon initiated at North Richmond WFP in 2022 and has this resulted in a decrease of PFAS chemicals at North Richmond? Have the lower amounts also coincided with Sydney Water testing for far fewer PFAS chemicals?



Treatment used in 2019 appears to have been most successful in reducing levels of PFBA.

Bathurst (New South Wales)

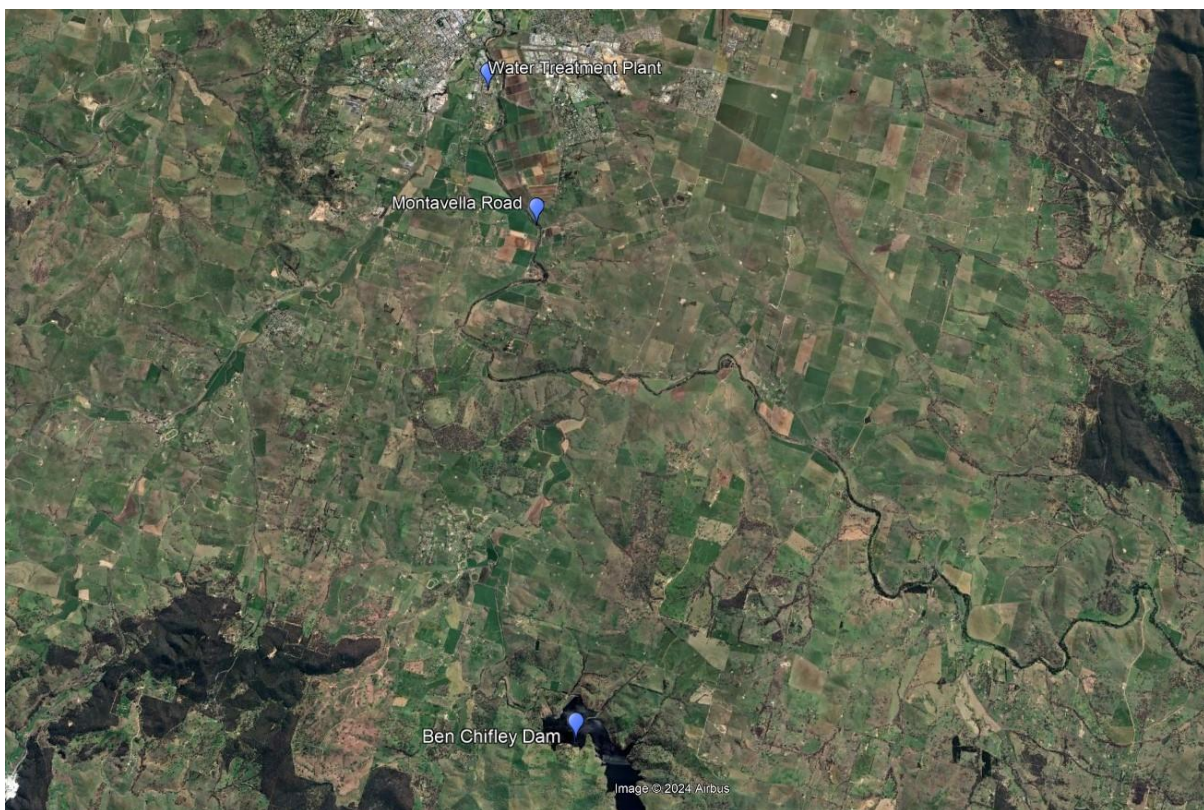
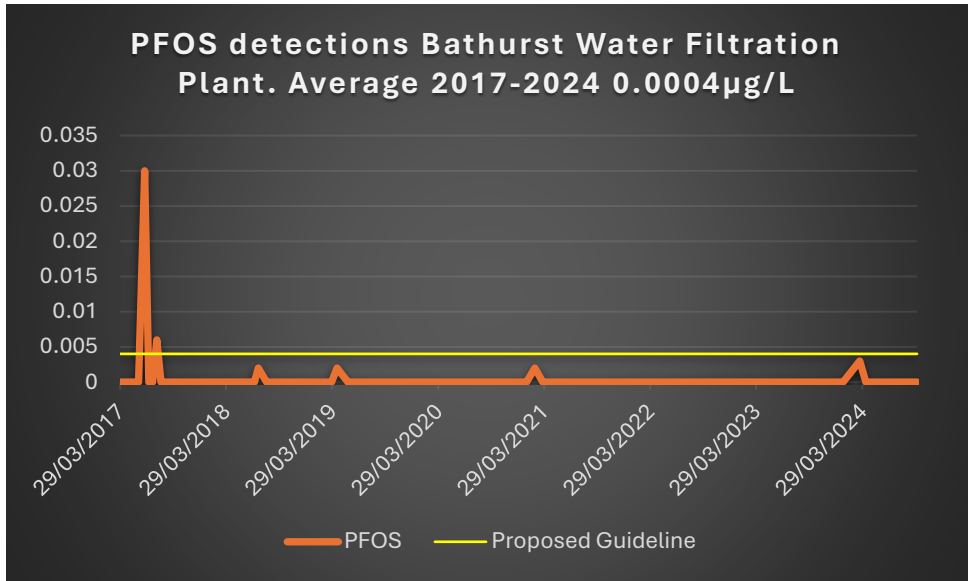
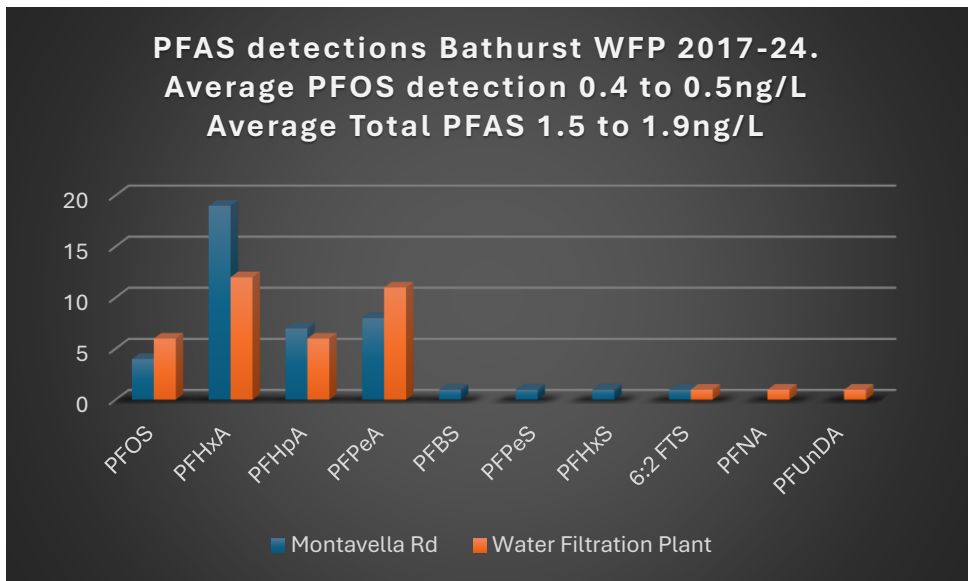


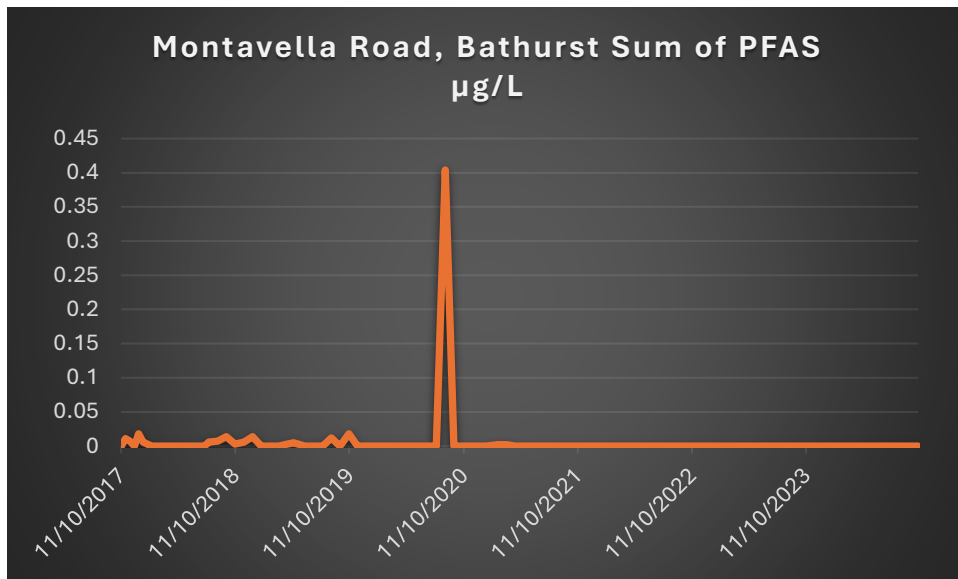
Image showing the two water sampling locations at Montavella Road and the Water Filtration Plant where Bathurst Council have been testing for PFAS since 2017. Ben Chifley Dam has not been tested for PFAS.



The city of Bathurst has been monitoring for PFAS chemicals since 2017. There are two sampling locations, one at the water filtration plant and the other upstream at Montavella Road about 3km upstream on the Macquarie River. The average PFOS detection level at Montavella is about 25% higher than the WFP. What is the source of PFAS chemicals in Bathurst’s drinking water supply? Most of the catchment upstream of Bathurst is farming land.



86% of all detections at Bathurst are dominated by PFHxA, PFPeA and PFHpA. If Bathurst Council embarked on the PFAS testing as done by Sydney Water, the bulk of the PFAS detections would never have been detected at Bathurst.



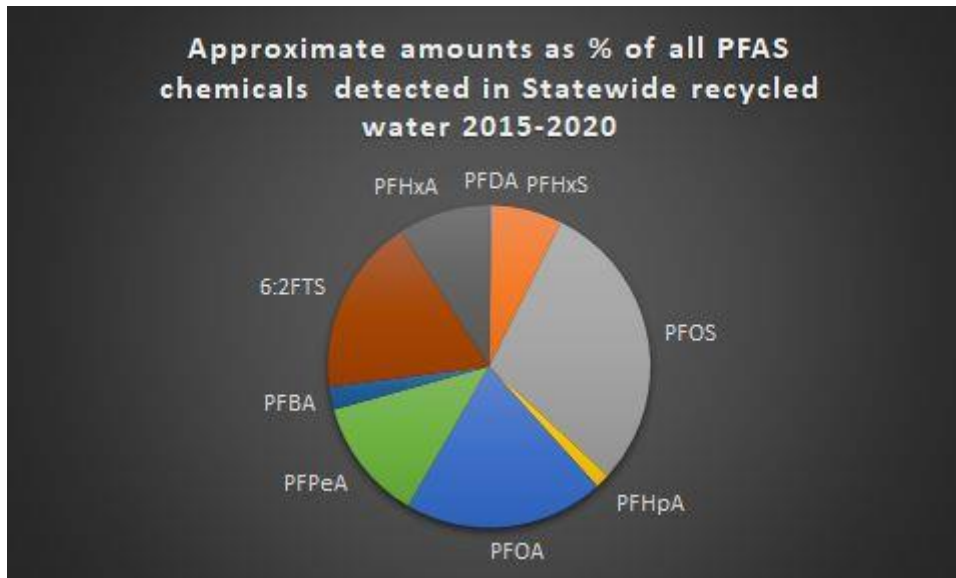
Sum of PFAS at Montavella Road. The spike in August 2020 was largely due to a detection of 6:2 FTS at 0.345µg/L, possibly the highest level of this chemical detected in a domestic water supply in Australia. Drinking water for Bathurst comes from Ben Chifley Dam. Water is released from the dam which then flows into Campbells River and then into the Macquarie River. Ben Chifley Dam has not been monitored for PFAS.



Catchment upstream from Bathurst's water filtration plant. Have biosolids or recycled water been used in this catchment, sourced from waste water treatment plants in

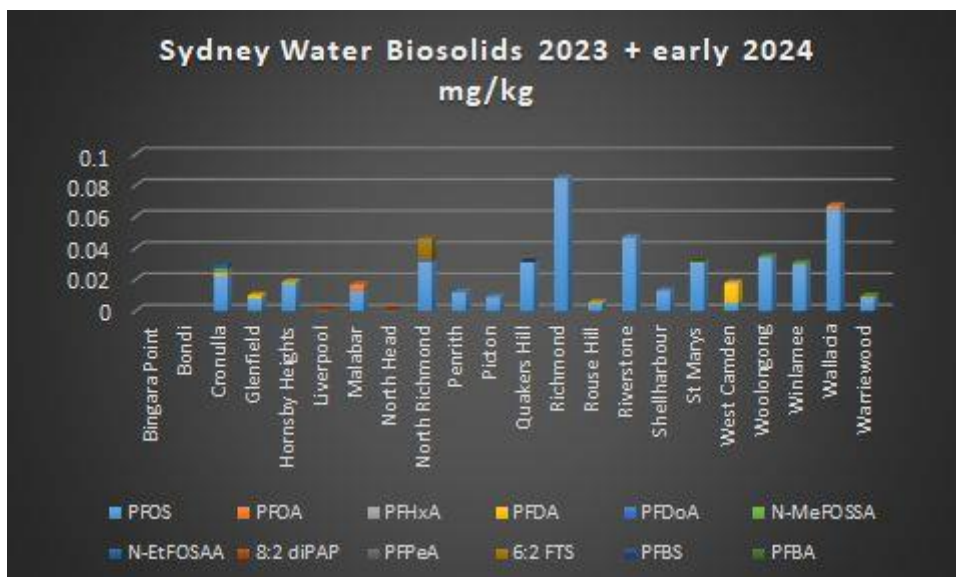
Bathurst or Sydney? Why have the Bathurst results largely ‘flatlined’ since 2021? Has there been a change in land use practice in the catchment since 2021?

Friends of the Earth has been concerned for some time about PFAS contamination from waste-water treatment plant ‘products’ such as biosolids and recycled water. Our main concerns have been regarding impacts of bioaccumulation of PFAS at farms and potential runoff associated with application of biosolids on farms. We have published information concerning biosolids from Victoria, Tasmania and South Australia.



PFAS chemicals found in Victorian Recycled Water. It appears that testing of recycled water for PFAS chemicals is not occurring in NSW. Note 6:2 FTS.

https://www.melbournefoe.org.au/pfas_detected_in_recycled_water_from_victorian_waste_water_treatment_plants



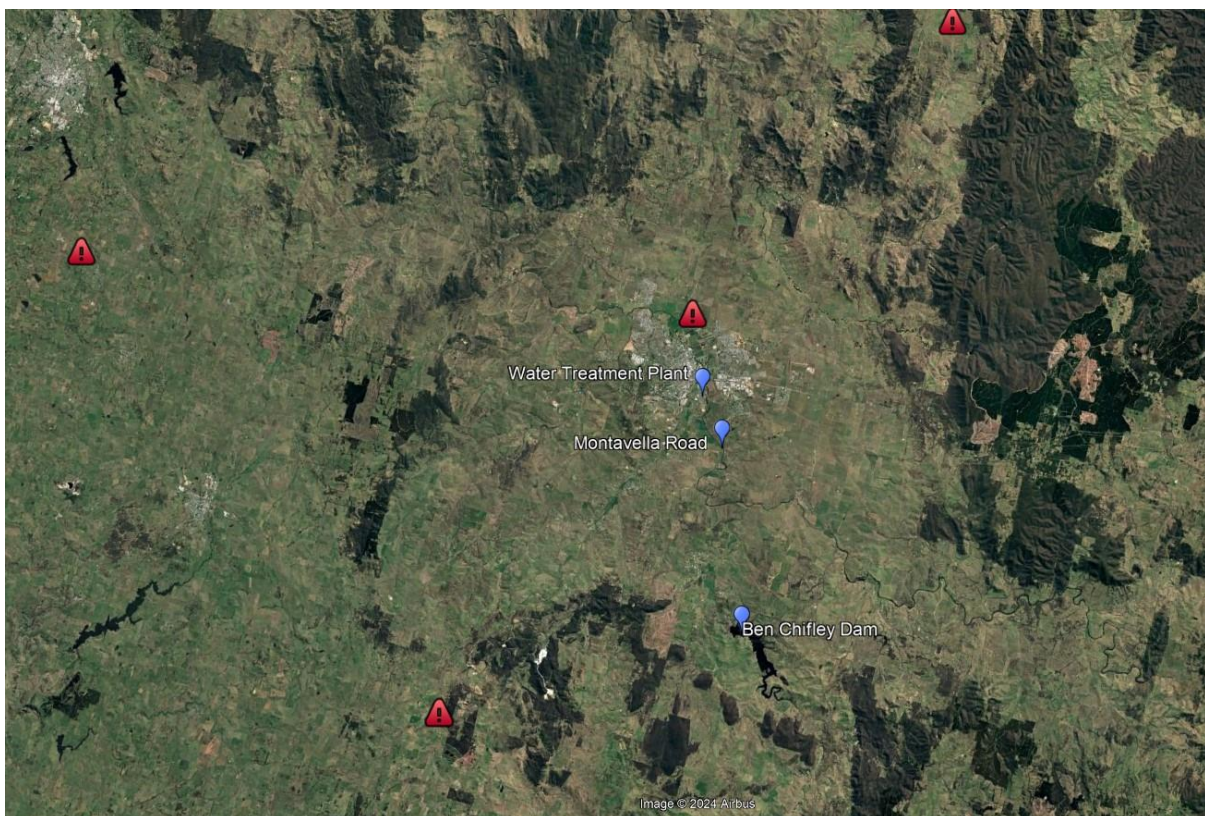
We published a blog outlining our concerns in regards to a GIPA request from Sydney Water in June 2024. https://www.foe.org.au/sydney_water_and_pfas_chemicals

“In 2023/24 almost 86% of monitored treatment plants reported average PFOS+PFHxS levels above the draft NEMP unrestricted use contaminant threshold. This occurred at 19 of the 22 monitored plants.

All 340 PFOS (72.8%) and 2 (0.4%) PFOA detections were above the draft contaminant threshold for PFOS+PFHxS for unrestricted biosolid listed in the PFAS NEMP 3.0 (consultation draft). These detections in 86% of treatment plants also breached the MASCC (Maximum Allowable Soil Contaminant Concentration).*

In 2023/24 almost 23% of monitored treatment plants reported average PFOS+PFHxS levels above the draft NEMP restricted use contaminant threshold. This occurred at 5 of the 22 monitored plants. Quakers Hill, Riverstone, Woolongong and Wallacia. Richmond detections were above the guidelines, but were sampled from a holding basin, not biosolids.

105 PFOS (22.5%) and no PFOA concentrations were above the draft contaminant threshold for PFOS+PFHxS for restricted biosolid use biosolids listed in the PFAS NEMP 3.0 (consultation draft). Does this mean that approximately 25% of Sydney Water Biosolids (40,500 tonnes) require to be landfilled or treated thermally elsewhere?”

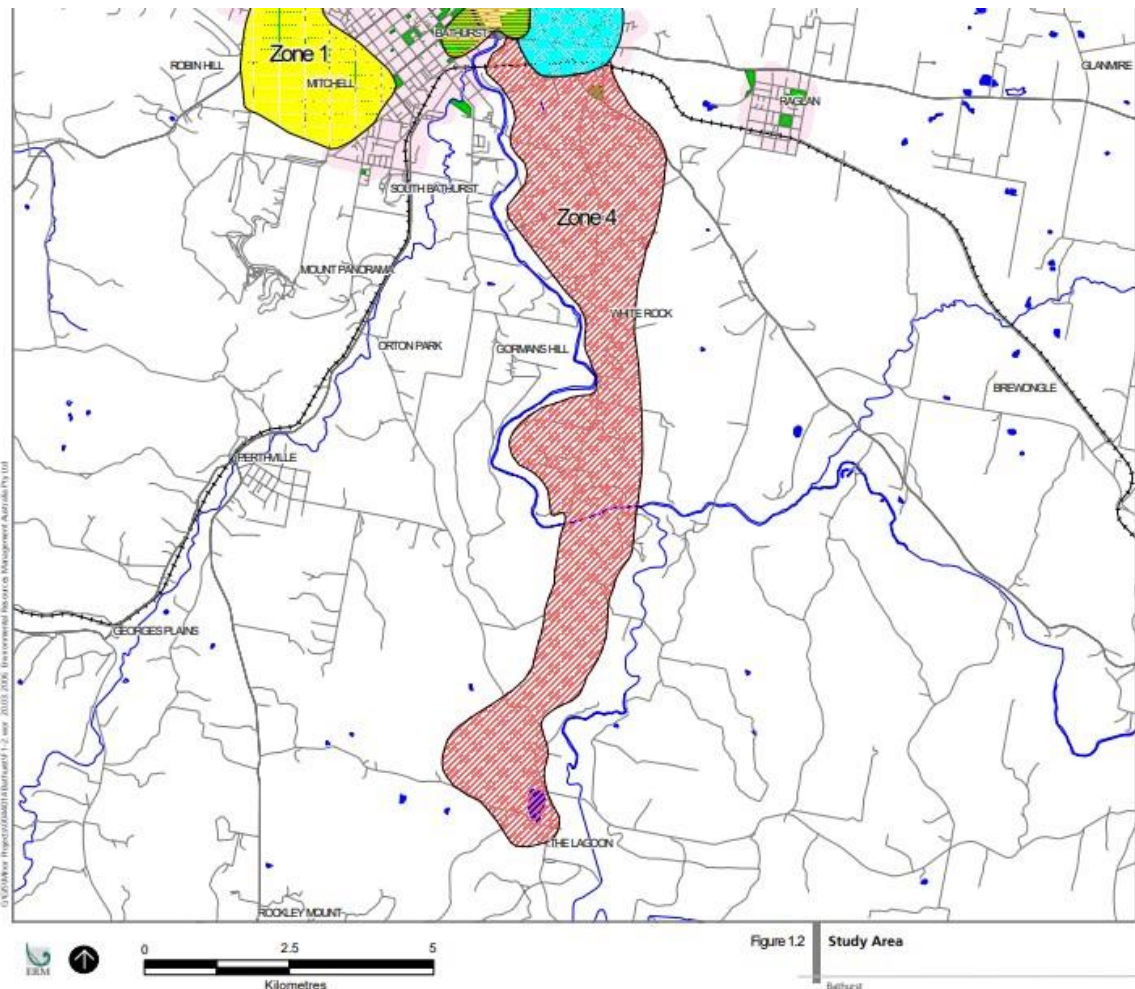


It would appear that biosolids have been applied in these approximate locations surrounding Bathurst. It is not a stretch of the imagination to think that biosolids/ recycled water have been used upstream of the offtake to Bathurst’s drinking water supply. Friends of the Earth recommends that soil and water testing urgently needs to

occur in locations where biosolids have been applied to farmland, particularly biosolids from Sydney Water that have been applied in the Central West.

A proposal in 2006 recommended such an outcome to use recycled water. See Bathurst Regional Council Bathurst Effluent Reuse Scheme Pre-Feasibility Report April 2006.

<https://www.bathurst.nsw.gov.au/files/assets/public/v/1/council/plans-policies/bathurst-effluent-reuse-feasibility-report.pdf>



Stage 4 of the 2006 effluent reuse proposal. Friends of the Earth is unsure if this proposal ever went ahead, but if it did then it could explain the PFAS detections in Bathurst’s water supply, particularly between 2017-2020.

Breaches Existing Guidelines Raw and reticulated water servicing ~50,000* people

‘Chronically’ impacted communities include: Williamtown, Katoomba, Blackheath and Jervis Bay/Wreck Bay. There are many others likely to be impacted in the future as testing is expanded.

Key locations

Chronic PFAS exposure in drinking water supplies			
Location	Estimated Population	Length of time exposed	
Jervis Bay/Wreck Bay (New South Wales)	200?	? - 2020	PFOS, PFHxS
Williamtown (New South Wales)	800?	? - 2019	PFOS, PFHxS, PFOA, PFBS
Blue Mountains*	30,000?	? -2024	PFOS, PFHxS
Total	31,000?		

*Breaches have been detected in raw water in the Blue Mountains at Medlow Dam and Greaves Creek Dam. Detections at Cascade Treatment Plant have been less than the current drinking water guidelines, but higher than the proposed NHMRC guidelines. It is possible that communities in the Blue Mountains such as Blackheath and Katoomba have been drinking high levels of PFAS since the early 1990’s.

Breaching Proposed ADWG Guidelines ~530,000 people

Acute short-term breaches for PFOS >4ng/L have occurred at Bathurst (NSW) 2017 Tarcutta (NSW) 2024, North Richmond WFP (NSW) (2019), Grahamstown WFP (NSW) 2017, Quakers Hill (NSW) 2010, Nelson Bay WTP (NSW) 2017, Bungendore (NSW), Gundagai NSW (2010) and Wagga Wagga (NSW) (2023)

Acute short-term breaches for PFOA >200ng/L appear to have been reported at Jervis Bay.

Ecological Impacts

Drinking water issues cannot entirely be separated from the ecological impacts of PFAS entering waterways. ANZECC guidelines for PFAS chemicals are woefully inadequate and recent amendments, where guidelines levels were actually increased may be premature. *“The DGVs for PFOS in freshwater for 99%, 95%, 90% and 80% species protection are 0.0091µg/L, 0.48µg/L, 2.7µg/L, and 17µg/L, respectively. Because the DGVs do not account for the bioaccumulation of PFOS in aquatic food chains, the 99% species protection DGV for PFOS in freshwater is recommended for application to slightly-to-moderately disturbed ecosystems...”*

<https://www.waterquality.gov.au/sites/default/files/documents/pfos-fresh-dgv-draft-technical-brief.pdf>

Recent detections of PFOS in the Belabula River over 20km exceeding the 99% trigger level is a worrying trend, particularly when a more recent EPA report has suggested that the pollution is even more extensive covering 40km. Has Carcoar Dam also been impacted? Has water from Carcoar Dam been used to irrigate crops?

It would be interesting to understand the source of the pollution. Is the source the waste water treatment plant at Blayney or is the pollution from another source or multiple sources? Is the pollution from use of biosolids or waste management facilities in the Belabula River Catchment? If the pollution of the Belabula River is from the treatment plant, this indicates that the capital cost of resolving the PFAS issue through the building of water treatment plants that can effectively treat PFAS will be enormous.

What impact are PFAS chemicals having on native fish throughout NSW?

A fish hatchery at Wagga Wagga was reportedly impacted by PFAS with thousands of fish growing with twisted spines and deformed skulls.

<https://www.dailyadvertiser.com.au/story/7887058/once-a-thriving-tourist-trap-gregs-business-has-been-floundering-for-decades/?cs=9612>

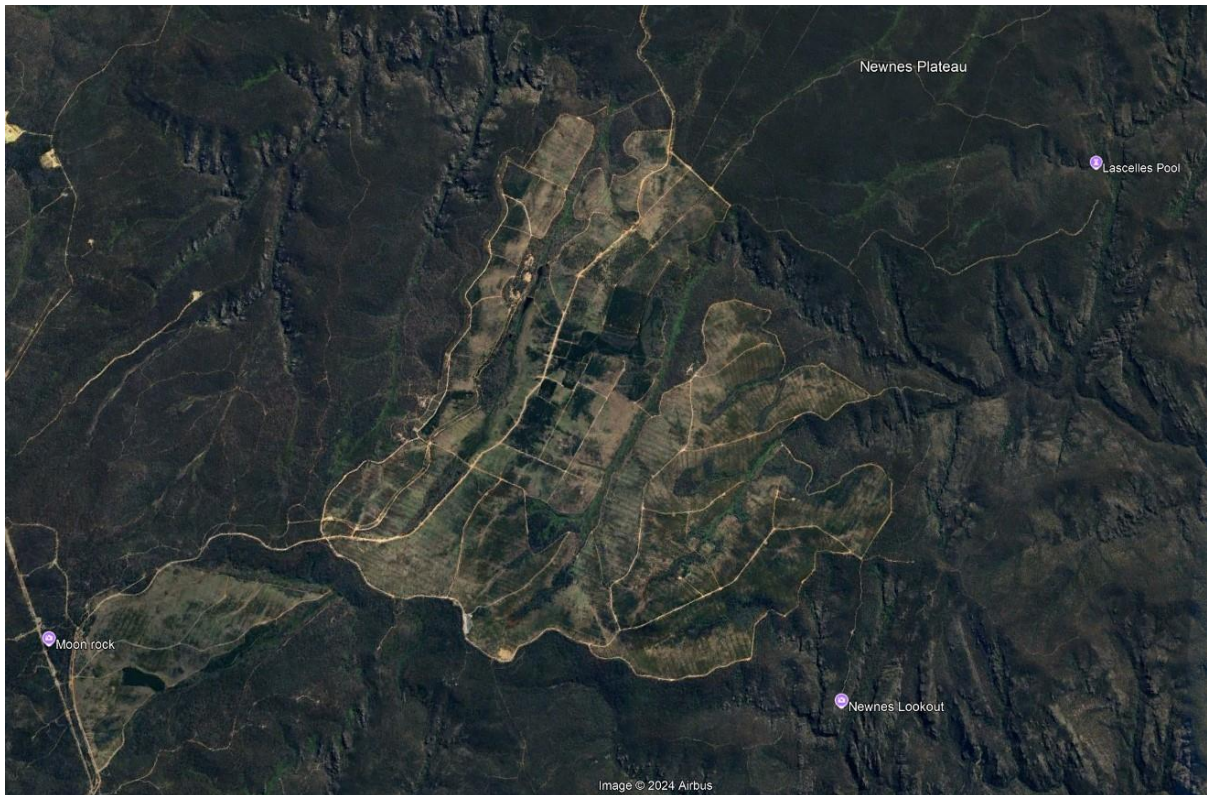
“We've had fish with an extra fin and some silver perch had what's called axe head, which means they develop with depressed skulls. Basically, their skull hasn't formed properly.

“Far more had stunted, shortened bodies and what looked like scoliosis and spina bifida, and tens of millions died as embryonic young.

“Those fish that managed to survive had poor reproductive success and died when still quite young.

“We had a race horse brood mare that appeared to become infertile and a pedigree stock horse that went blind after delivering a severely undersize foal,” he said.

"Nanny goats, mares and miniature cattle have had reproductive problems and looked bloated with distended udders, so much so that vets thought they were pregnant and ready to give birth but they weren't."



This recently logged pine plantation, 12km north-east of Lithgow, in the Blue Mountains is about 2000 hectares in size. Were 60,000 tonnes of Sydney Water biosolids applied to this plantation? Has soil, groundwater or surface water draining from this plantation ever been tested for PFAS/forever chemicals? The plantation lies in the Hawkesbury River catchment. What other pine plantations managed by the Forestry Corporation have received PFAS contamination biosolids over the past 30 years and where are they located?

In terms of ecological issues and health, PFAS pollution has already caused problems in the Hunter River Estuary and Tilligerry Creek, the RAMSAR listed Hunter Wetlands, Lake Macquarie, Saltwater Creek/South West Rocks at Kempsey, Botany Bay and Georges River, Lake Toolooma and Heathcote National Park and perhaps most importantly at Wreck Bay where Aboriginal People and their cultural practices have been impacted.

Defence has since erected signs warning against fishing from waterways in the area, putting an end to Aboriginal practices that have existed inside Jervis Bay Territory for thousands of years.

"We can't go and hunt and gather anymore, we can't teach our younger generation coming through about our culture, like I learnt as a kid," traditional owner James Williams said. "We look at our land like our mother and that's how we treat it — with

respect," Mr Williams said. <https://www.abc.net.au/news/2021-02-03/jervis-bay-aboriginal-community-lodges-pfas-class-action/13112626>

How many more Aboriginal communities will also be or have been impacted by PFAS?

In 2024 impacts on platypus were also reported. In other states dolphins, snakes, turtles, sheep, fish, eels, turtles, sea lions and waterfowl have also been impacted.

<https://www.abc.net.au/news/2024-08-20/australia-forever-chemicals-pfas-drinking-water-platypus/104244072>

Scientists from Western Sydney University (WSU) have discovered PFOS in the livers of eight deceased platypuses collected from numerous eastern NSW rivers, from the north coast in Bellingen to the alps of Jindabyne.

The near-threatened monotremes were mostly collected from areas that are not known PFOS hotspots, fuelling concerns the chemicals are far more prevalent in Australia's environment than previously understood.

Lead researcher and PhD candidate Katherine Warwick said the findings "shocked" her, considering the animals came from areas ranging from remote to urban, meaning there is pollution in those environments.

"Considering PFOS shouldn't be there in the first place, it's a lot," Ms Warwick said.

"What that's telling us is PFOS contamination is much more widespread than what we know."

It is the first study of its kind on platypus and sheds light on yet another threat to a species already vulnerable to impacts associated with human activity.

The study reveals the Australian monotremes have PFOS levels similar to those found in river otters and lower than those in American mink, both of which live in similar freshwater environments.

Species from Hunter River worst affected

All eight wild platypuses collected from NSW waterways over the past two and a half years returned results with concentrations of some PFOS in them, ranging from 4 micrograms per kilogram ($\mu\text{g}/\text{kg}$) to 1,200 $\mu\text{g}/\text{kg}$ — some of the highest concentrations of any species in the world.

The study said there were currently no concentrations considered safe for platypus health, "however, draft guidelines by the Australian government suggest that exposure directly from their diet should not exceed 3.1 $\mu\text{g}/\text{kg}$ of wet weight."

The researchers did not choose the sites where the animals came from and were sent the carcasses by members of the public.

The worst-affected was found in the Hunter River in Morpeth, in the state's Hunter region.

One platypus from the Ourimbah Creek on the Central Coast returned the second-highest results of 740 µg/kg.

The research suggests the platypuses are consuming the chemicals through their diet, and through sediment on the bottom of the creeks and rivers whilst consuming macroinvertebrates or water bugs that may also be contaminated.

They found the larger the platypuses' tails — an indication of fat and health — the higher the concentrations of PFOS.

Afterthought

It's one thing to set guidelines for drinking water, but these guidelines don't apply to appliances that may expose consumers to PFAS through their household drinking water.



“Specifications should mention the internal base is Teflon coated. Russell Hobbs have informed me that the coating is part of the quiet boil technology.”

<https://www.choice.com.au/products/home-and-living/kitchen/kettles-and-tea-makers/russell-hobbs-montana-kettle-rhk142>