

Senate Enquiry 2024 Regarding PFAS Contamination.

This is still my story.

I submitted the attached to the Senate enquiry in 2020. I never heard any resolution from that enquiry. For this submission I am going to resubmit everything that I can find that I've submitted to you before and just give you an update of my life now.

I've just spent \$6,200 concreting the base of the chicken roost. This is because since I can no longer free range my chickens, I have had a problem with rats digging up the floor that I had put down that would stop the chickens from accessing the soil which is contaminated with PFAS this is how I got my chickens to be free contamination. By putting down a base that they couldn't dig through to get to the soil and covering the top with sawdust. So now as a 74-year-old woman on a pension I have to buy sawdust and fresh green greens for my chickens because they're no longer able to free range and healthy chickens need a variety of stuff in their diet I have to undertake additional work of cleaning out the sawdust and replacing it especially after heavy rains. This work is very physical and quite hot at the moment. All the things that I described in my other submissions are still a factor including the fact that the defence force isn't going to bother to clean up the area is no longer interested in the residence of the Hawkesbury and has closed down their PFAS investigations for the area. I was lucky enough to get a payout in the class action which is a good thing but nowhere near covers what I have had to pay. And I am concerned about all people all across Australia who have lost businesses and money and haven't been able to get any kind of recompense. And there is the emotional factor, how you can become obsessed with trying to be healthy and checking everything to make sure it doesn't contain any chemicals. You begin studying and reading and over thinking the issue and all the time nobody has said sorry. The government has just moved on and nobody has acknowledged that we have had a violation perpetrated upon us which amounts to physical and mental health issues, who knows what the future will hold for people who have been contaminated and the worst thing is you wouldn't even do blood tests so that people could see how they were contaminated unless it was in their drinking water.

My home was my castle I was so proud of it because I bought it myself and look what you've done and look how nobody is taking responsibility; arrogant defence force personnel and is in its hierarchy not bothering to pass onto people on the ground. An email from 1987 from Sydney water board telling us that they changed the filter in the Hawkesbury plant in 1986. A filter from 1986 would not deal with PFAS. And now in 2024. The local media are suddenly all over it because of the Blue Mountains but no mention of all the other areas that have been contaminated this is a nationwide problem it needs a nationwide solution. Richmond wrath is an example of this an individual defence space making a plan to clean up just the defence force area and nowhere else. That is a travesty of justice. Your Sincerely Joanna Pickford.

INQUIRY INTO PFAS REMEDIATION IN AND AROUND DEFENCE BASE: 2020

OUTCOMES I WOULD LIKE TO SEE FROM THIS ENQUIRY.

- Many responses by the government cite Oakey, Williamtown and Tindale in Kathrine. Undertaking to address issues in these areas only is not fair or equitable, every site should have their issues addressed and not have their issues referred back to what is happening in the above areas which may be totally different. I strongly believe that the defence force had glazed over the contamination in the Hawkesbury with the notion that we are not as badly affected as people in the above locations. Yet we are considered the food bowl of Sydney and the lowlands still has cattle sheep chickens and vegetables being farmed. It is not just turf farms.
- The clean-up of the contamination to extend beyond the boundaries of the base as outlined by Richmond Defence in their management plan.
- Blood testing for everyone in the contaminated areas who want the blood testing done.
- Informing the community in the Hawkesbury area has been very hit and miss. We believe there are farmers who may not have English as a 1st language who will not have been informed also many lowlands landowners do not have mail boxes so would not have been included in the very basic letter drops that Richmond defence undertook.
- Retesting of Richmond Lowlands area since the flooding to see how this has affected the plume in this area.
- The process for claiming financial loss is not easy. Nor is Defence keeping people informed. It is totally unfair to not to contact a person who has made a claim from time to time to let them know their claim had not been put in the too hard basket. I had to fight to get information about my claim and this is not good for people who more than likely have mental health issues arising out of the whole contamination issue.
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This is my story.

I still, if people ask about it, after over 2 years tear up and find it hard to speak. Every day little things pop into my head to remind me.

I am a single parent, When I arrived in Australia, I worked hard to save enough to buy this little house for myself and my daughter. I was proud of my achievement. My daughter and myself went without for many years so we could pay the loan off. I used to say to my daughter, "when I own this house it will be your insurance policy in the event of any catastrophe." I loved this place, it was my refuge and my solace. I loved my garden and birds and insects and frogs. I used to say, "the land must be good because I have frogs." Although not very good at gardening I would try and grow our vegetables. I enjoyed the successes and kept retrying various methods to get better.

For as long as I can remember I have been and environmentalist. I never use harsh chemicals; I used to make my own laundry liquid before you could purchase environmentally friendly products. I had a book called the green cleaner from 1990 and I used to and still do make my own cleaning products. I allow the spider webs to stay. I saved up and had the house renovated inside to make it workable and comfortable and easy to maintain. It was to be my last home a place to stay till the end. It was my haven.

When I discovered my land and my beautiful chickens were contaminated it was like being punched in the guts at full force. I was devastated I cried a lot. I became angry and still I feel a low-level anger all the time and that's not good.

Here are some of the ways I am affected daily by the contamination that was caused by defence. In the words of the EPA "defence is responsible Defence is the polluter."

Throwing away eggs was an impossible task. I worried that for years I had been contaminating my family and friends particularly my grandchildren who loves boiled eggs laid by Foxy or Goosie or Dotti. My grandsons stopped running out to collect the eggs when they came, they lost that joy, the youngest said "Nana they are no good to eat any more."

Dust because of the drought became a worry. Mowing and sweeping is a very dusty activity. Then I remember. I made a digging patch down near the chook run for my grandchildren when they stayed. We dug the dirt and dust made raceways for cars and sometimes we made mud and mud pies. Sometimes we rolled in the wet muddy grass and got filthy and took photos for Mummy. Then we had a hot bath and got all clean. I agonise now as to whether my youngest grandsons' propensity to every little bug going around and random skin conditions could be triggered could be cause by me allowing these fun activities in contaminated soil. They played in the mud from babies because I am an early childhood teacher and understand what is good for children, but it turns out I was wrong, and it was not good for them.

I suddenly could not eat my own produce any more not just the eggs, but the fruit, vegetables and herbs. All defence would say is that tests elsewhere showed that fruit and vegetables were unlikely to be contaminated. How can an individual assess "unlikely"? This adds a level of anxiety, the not knowing. People who knew about the contamination were not keen to eat any of my produce. Perception is a very powerful agent. I couldn't blame them. The level of miss information flowing around the place added to the confusion. Still Defence staunchly refused to test any of our home grown produce to alleviate any of our concerns. Everyone is then left hanging and wondering and worrying, not knowing. Do we eat or not eat? I decided not to.

When gardening I sometimes am surprised about the things I suddenly think. For example, here in the Hawkesbury we have fairly recently given green bins which I fill up easily because I have so many trees and weeds and I wonder am I inadvertently contaminating someone else's garden because this waste is used for mulch. What about compost. I compost all the sawdust from the chicken run. I certainly don't put it in my new vegetable beds because I don't want to contaminate what I eat. But am I re contaminating my garden if I put it on the flower beds?

When I dig up a cutworm, I can no longer feed it to my chickens because it will be contaminated. You might not know this, but chickens are highly social and make beautiful clucking and crooning noises when they find a treat, they call to the others to come and share. I fed them cut worms out of my hand they would be so excited and hang round close to where I was digging so I could show them the treat. I miss so much not being able to have them free range my garden. They would come and look for me at 4.30 every day to remind me that they would be going to roost soon, and would I please give them their night-time treat? As someone who now lives alone my chickens were friends who talked to me and kept me company whilst I was gardening.

How contaminated are we is a question I ask myself? Defence staunchly refuses us blood tests because they say that there is nothing we can do with the information. But there is a lot an individual can do. If they knew the contamination in their blood was minimal, they could stop worrying. If it is higher, they could start looking at lifestyle and reduce as best as possible contact with the PFAS chemicals. I strongly believe that knowing the PFAS level in me and my families blood would help me stop worrying. If I feel like this imagine how others feel. Defence is also not gathering the information needed to assess how people across the spectrum are affected. This is bad for science. It is bad science.

I could go on about all the little things like what if I need to sell, do I have to tell the people looking at the house its contaminated? Will it affect the price? There are so many facets to this problem. I think that bureaucrats just don't get it. I undertook the makeover to minimise PFAS in my garden using money from my superannuation. I needed to undertake this project for my mental well-being. Now I'm in a waiting game to see if Defence will compensate me. Defence has access to legal advice. I do not. I am not holding my breath.

1st Submission

Having read that the Government has structures in place for dealing with PFAS issues across Australia and that this is working; we here in the Hawkesbury can say that this is not evident in the Hawkesbury. What is evident to us that the response is fractured and not nationwide, in fact it appears that Defence is using data from only 3 sites and then disseminating that information at other locations assuming it is relevant across Australia.

We believe the area surrounding Richmond RAAF Base has not been fully considered in the response. There are farms on the lowlands know to be high in PFAS. Western Sydney University testing demonstrated that areas of the lowlands around Bakers Lagoon have PFAS readings of 300 parts per million. This area is still growing beef, sheep, chickens, vegetables and turf. These are all probably being sold locally and through other markets. We have evidence of cattle from the lowlands sold in Mossvalley is returning to the Hawkesbury to Wilberforce for distribution.

The area around Pughs Lagoon where people are often seen fishing has PFAS readings of 100 parts per million.

Turf in the drought turns up a lot of dust. This means that turf farmers in this area could absorb a lot of PFAS via dust. None of this has been considered. If Defence has done any testing of beef or other produce from the lowlands, we are unaware of it. It would appear data from Williamstown and Oakey have been used to assume the contamination level in produce in this area.

Most landowners on the lowlands do not have letterboxes and some have English as a second language. None this has been considered. There has been a totally inadequate communication with these landowners. If it were not for a local community group forming to inform the community, many more people would be unaware of PFAS being a serious issue in this area. It has been left to community volunteers to undertake informing the community without any budget.

When we heard the very high readings of PFAS in the blood of Lowlands farmers we asked for blood testing however we are not considered to be of high enough concern for testing to be undertaken and we do not agree. We want blood testing to be available to those people living in the area who wish to have their blood tested.

The only information we have about the high levels of PFAS in the blood of people in the area was provided by Channel 9 undertaking testing. In a farming family the PFAS levels ranged from ... t ...and in their cattle

The cost of undertaking testing ourselves, is cost prohibitive and having spoken to a phlebotomist in the area the cost should not be as high as it is based on the simplicity of the test compared to other blood tests. We believe we should be able to access the tests on medicare in the same way as testing for lead in the blood can be undertaken through medicare. There should be ongoing testing for people with high levels in their blood.

We believe doctors clinics in the area should be briefed on the contamination to better assist with health information and so you can gather data on instances of conditions that may be higher in the Hawkesbury than other unaffected communities.

The Hawkesbury PFAS Community Network approached Defence about re-testing the lowlands after the recent flooding but have had no response. The area is flood prone and as PFAS was used from the 70's to about 2003 flood movement could really affect the distribution of PFAS. Defence Richmond has been totally deaf to this probably because there had not been a flood in the area since 1992 until the recent floods. However, during the period from 1970 to 1992 there were 23 floods of higher than 5 metres. The floodplain stretches across the river to Wilberforce. No testing has been done there.

Council has not been equipped to undertake any kind of support of the community regarding PFAS. There has been no dissemination of information relevant to ratepayers or residents by Council who have remained totally silent on the matter despite our best efforts to get them to assist us in this matter. It seems as though they have been somehow 'silenced' If Richmond Defence had worked with Council the community would have been much better informed. We are aware that properties affected by PFAS are being bought and sold and the information of contamination is not raised at any level. It is being left to individuals purchasing properties to find out for themselves that the land is or is not contaminated and how would they be expected to know that, when Defence, Council and indeed real-estate agents do nothing to inform them. People who buy property, as we have evidence, are not aware their land is contaminated. In East Richmond many houses are up for sale and people buying would believe there was nothing to stop them from keeping chickens or growing their own vegetables. There are several properties up for sale in the Lowlands again no information for potential buyers who could unknowingly start producing produce for market which is high in PFAS.

The Defence force and AECOM have produced tomes of information like the Human health Risk Assessment which is too onerous for individuals to read to find specific information. It does not follow that providing huge documents to the lay community equals transparency.

Richmond Defence produced a management plan for the area. There was no community consultation prior to the plan being released. Defence held an 'Information session' for the community. It was not well advertised and the way we were expected to get information on the management plan was through a continual automated power point display. People could not ask questions on the management plan with no ability to read it at the session. Since the session we have ploughed our way through the plan and two stark points were the result.

1. Defence only plans to remediate the Base property. And individual landowners are expected to approach defence to have their land remediated. There is no information how to do this and no one is paying costs except landowners themselves. The whole area where Defence sewerage is being disposed is highly contaminated this includes most of Richmond Lowlands including Bakers Lagoon and Coley Creek. None of this area is covered by the management plan.
2. Defence is not planning to start stop the flow of the chemicals into Bakers lagoon in the immediate future.

The EPA has a policy that the 'Polluter pays' The EPA NSW has clearly stated that Defence is the Polluter of the Hawkesbury and that Defence is responsible, but our community has not experienced this policy in action. Basically, we have been left to fend for ourselves, undertake our own remediation and pay for it ourselves. Of the claims submitted to Defence, and we are aware of some being made. No claim has been dealt with in fact the claims once submitted seem to sit in a 'to hard' box and residents hear nothing more about their claims after initially being informed that the claim has been received.

Western Sydney University undertook some testing of the lowlands and we were given information on Richmond lowlands indicating levels of PFAS chemical in different areas. What our community needs is an accurate heat map of the chemical distribution, signage alerting people not to eat food from the most

contaminated areas, assistance with remediation, regular updates of where claims are at, blood testing for those who want it undertaken, accurate information for the area in a form that is easy to read and digest, Council to be involved with Defence so the whole community is informed, and more proper community involvement in resolving this issue. At no time have we as stake holders in this matter, been included in a discussion for a viable solution and remediation compensation. We have not been told about how defence will monitor the contamination in this area.

Twenty things you need to know about PFAS in the Hawkesbury.

1. Per- and poly-fluoroalkyl substances (PFAS) are manufactured chemicals that do not occur naturally in the environment.
2. Due to PFAS water and heat resistance, they have been used in a wide range of consumer products including surface treatments such as non-stick cookware, and notably in aqueous film forming foam used to extinguish fires. In Australia the defence force used these fire fighting foams for practice. They did not contain the chemical but allowed it to enter the ground water system.
3. Humans can be exposed to PFAS present in food, consumer products, dust and drinking water.
4. The Defence Force in its own investigation in 2003. "Environmental Issues associated with defence use of aqueous foam." states '*Current Defence AFFF use and waste management practices are inconsistent and generally fall below the best practice of other national and international organisations*'. Richmond Defence Force was included in the study.
5. While the import of some PFAS in Australia has been reduced since 2002 (Environmental Health Standing Committee, 2017), historical use in fire fighting foams has resulted in detections of PFAS at a number of sites including a plume in the Richmond Lowlands area that has contaminated ground water, soil and waterways including Rickabys Creek and Bakers Lagoon in the lowlands. Richmond Defence has confirmed that PFAS is still leaching into the ground from the base.
6. Standard water treatment technologies including coagulation followed by physical separation, aeration, chemical oxidation, UV irradiation, and disinfection have little or no effect on PFOS or PFOA concentrations
(Dickenson and Higgins, 2016; Health Canada, 2016).
7. It is almost impossible to get a plain English interpretation of the amount of PFAS that is considered an acceptable level in Humans. USA, Europe, and the Netherlands all have lower acceptable levels than Australia.
8. The following summarises Food Standards Australia and NZ findings:
 - It is not possible to identify any causal associations between PFOS, PFOA and PFHxS and human health effects from epidemiological studies due to limitations in study design and inconsistency in study results (FSANZ, 2017).
 - While there is evidence of associations with increased serum cholesterol and decreased body weights

at birth, it is not possible to determine whether PFOS or PFOA cause the changes, or whether other factors are involved. As these are observational studies, FSANZ considers that the meaning and clinical significance of the associations for PFOS and PFOA for decreased birth weight and increased cholesterol in humans are uncertain and should be interpreted with caution (FSANZ, 2017).

9. The health-based guideline value of 70 ng /L (Nano Gram/ Per Litre) for PFOS was determined as follows: $70 \text{ ng/L equivalent to } 0.07 \text{ } \mu\text{g/L} = 20 \text{ ng/kg body weight/day} \times 70 \text{ kg} \times 0.12 \text{ L/day}$. This was based on a study in rats. It was all calculated using the basis of an average weight of 70 kilos per adult. And that adults would drink 2 litres of water a day. There appear to be no studies about other forms of ingestion.
10. The biggest environmental concern about PFOS and PFOA is that they do not break down in the environment and can travel long distances in water and air currents. They have been shown to be widespread global contaminants and many countries are now monitoring and restricting their use.
11. PFOS and PFOA have been shown to be toxic to some animals, and because they don't break down they can bio accumulate and bio magnify in some wildlife, including fish. This means that fish and animals higher in the food chain may accumulate high concentrations of PFOS and PFOA in their bodies.
12. The general public are exposed to small amounts of PFOS or PFOA in everyday life through exposure to dust, indoor and outdoor air, food, water and contact with consumer products that contain these chemicals. There is a list of products known to contain PFAS on our Facebook page.
13. PFOS and PFOA are readily absorbed through the gut and are not metabolised or broken down in the body. These chemicals are only very slowly eliminated from the body. Studies have shown that Australians have small amounts of PFOS and PFOA in their blood. PFOS and PFOA can also be found in urine and breast milk. There is some question about how long it takes to remove PFAS from people's systems but it is thought to be around 7 years, However, without knowing all the products that we consume that contain PFAS it is hard to know if you are ever going to be clear of PFAS. Because the elimination of PFASs from the human body is slow there is a risk that continued exposure to PFOS and PFOA could cause adverse health effects
14. The general advice from the government is that if a producer has contaminated produce, they can sell it on the wider market but not consume it themselves. This is based on what we believe to be a flawed idea of dilution. That is that if we spread the toxin around across the whole population no one will get too much in their system.
15. The Government says that where larger quantities of PFOS and PFOA have been released into the environment, as in the Hawkesbury communities located near those sites may be exposed to higher levels than the general public. They say that it is important to understand how people living near contaminated areas may come into contact with PFOS and PFOA so that exposure may be minimised. However, they are refusing blood testing so people in the Hawkesbury do not know what they are dealing with and have no way of knowing if they are reducing the contamination in their bodies.
16. They say as a precaution, people living in or near an area that has been identified as having been contaminated with PFOS, PFOA or PFHxS should take steps to limit their exposure to these chemicals. In the Hawkesbury it has been quietly recommended that you do not eat fish caught in the local

waterways of eat locally produced fruit and vegetables. However, we do not necessarily know where the produce we are purchasing comes from so have no way of determining what may or may not contain the chemicals.

17. The Australian government states that PFOS and PFOA are not known to cause adverse health effects on unborn babies. However, as a precaution, pregnant women living in or near an area that has been identified as having been contaminated with PFOS or PFOA should take steps to limit their exposure to these chemicals. Again, we are not told how to do this.
18. A blood test can tell a person if they have PFOS or PFOA in their blood and at what levels. These levels can be compared with the levels seen in the general Australia population. Blood tests can also inform a community if they have been exposed to PFASs at a level above or below that of the general population. The monitoring of pooled community blood samples over time may help determine the success of exposure reduction measures. However, a blood test cost over \$600.00. We are not being offered free blood tests.
19. If you live in a PFAS affected area
 - Do not use groundwater, bore water or surface water for drinking or cooking.
 - Avoid swallowing groundwater or surface water when bathing, showering, swimming and paddling.
 - It is safe to drink water from the reticulated supply (town water).
 - Avoid eating home grown food produced using contaminated water, including home slaughtered meat, eggs, milk, poultry, fruit and vegetables.
 - Moderate intake of, and seek further advice, regarding home produce that was grown within the area but was not produced with contaminated water.
 - People who personally source and eat fish and seafood from a body of water where the water is contaminated, such as fishers and local residents, should moderate the number of servings of individual species.
20. In the USA health data was analysed by a team of scientist and then evaluated by a panel of three independent expert epidemiologists who concluded that a 'probable link' existed between PFOA exposure and kidney cancer, testicular cancer, ulcerative colitis, thyroid disease, pregnancy induced hypertension and hypercholesterolemia

where:

- A Tolerable Daily Intake (TDI) of 20 ng/kg bodyweight per day has been established by FSANZ on the basis of decreased parental and offspring body weight gains in a multigenerational reproductive toxicity study in rats.

- Because of the large differences observed in the half-lives of PFOS in humans compared to animals, pharmacokinetic modelling was applied to the serum PFOS concentrations measured in experimental animals at the no-observed-adverse-effect level (NOAEL) to calculate the human equivalent dose.

The FSANZ TDI incorporates an uncertainty factor of 30, applied to the human equivalent dose

(HED: A dose in humans anticipated to provide the same degree of effect as that observed in animals at a given dose), which includes a default factor of 3 to account for interspecies differences in

toxicodynamics and a default factor of 10 for intraspecies differences in the human population.

- 70 kg is taken as the average weight of an adult.
- 0.1 is a proportionality factor based on the conservative assumption that drinking water accounts for 10% of the TDI.
- 2 L/day is the reference value of water consumed by an adult.
- The rounding conventions described in Chapter 6 have not been applied in the derivation of the health-based guideline value for PFOS in order to align with guidance published by the Department of Health.

Points to note about PFAS in Australia

- PFAS are water soluble and are consequently widely present in the environment.
- A study of the levels of PFAS in Australian blood donors from Southeast Queensland showed that PFAS levels have dropped by >50% between 2002/3 - 2010/11.
- There is a poor understanding of the mechanism/s by which PFAS could have adverse health effects.
- PFAS are still manufactured in a number of countries, but their use is generally being phased out both here and overseas.
- The Australian Department of Defence is investigating a number of its bases to determine the impact of the historic use of PFAS on the surrounding environment.
- FSANZ's Hazard Assessment Report—PFOS, PFOA and PFHxS of April 2017 gives recommendations for Australia's final health-based guidance values for use during site investigations in Australia.

The International Agency for Cancer Research (IARC)

has classified PFOA as possibly causing some cancers.

If people ingest **PFAS** (by eating or drinking food or water that contain **PFAS**), the **PFAS** are absorbed, and **can** accumulate in the **body**. **PFAS can** be found in blood, and at much lower levels in urine, breast milk and in umbilical cord blood. **PFAS** stay in the human **body** for long periods of time.

Key Findings by a defence investigation that RAAF Richmond was involved in.

The key findings of this investigation are

1. Defence uses Aqueous Film Forming Foam (AFFF) product produced by the 3M company. This AFFF product contains nonbiodegradable fluorosurfactants (specifically nperfluorooctane sulfonate (PFOS) and perfluorooctanic acid (PFOA)) that are environmentally persistent, bioaccumulative and toxic to animals and humans. Both PFOS and PFOA have been implicated with a variety of cancers and toxic health effects in humans that have had long term exposure to products containing PFOS/PFOA. 3M are ceasing the production of this AFFF product in 2003, and Defence will have to source an alternative product. Appropriate drainage, containment and disposal of foam waste-water will still be required for any replacement foam product. (p.20)

2. Current Defence AFFF

use and waste management practices are inconsistent and generally fall below the best practice of other national and international organisations. (p.40,44)

3. Across many Defence facilities AFFF waste-water is not appropriately collected or disposed of. Based on these past and current practices there is a risk that PFOS/PFOA has contaminated Defence land as well as neighbouring properties, creeks, dams, and reservoirs. (p.44)

4. There is no Australian Regulatory Actions in place that specifically encompass the use and disposal of products containing PFOS/PFOA, although regulations are currently being developed by the Australian National Industrial Chemical Notification and Assessment (NICNAS).

(p.27)

5. On 30th April 2003, 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 purposes

(p. 20,45).

6. Defence Materiel Organisation (DMO) are currently producing new DEF(AUST) standards in anticipation of a replacement AFFF product. AFFF waste-water handling in Defence is also currently being reviewed for the next amendment of the Manual for Fire Protection Engineering (MFPE). The findings in this report are being considered as a part of the MFPE review process (p. 45).

Chemical risk at Richmond sparks warning on meat, eggs and fish

By [Carrie Fellner](#)

November 7, 2018 — 6.25pm

People living on toxic land surrounding the Richmond RAAF Base have been warned the consumption of large amounts of locally-grown meat, eggs and fish could pose an unacceptable risk to their health.

But levels of the potentially carcinogenic per- and poly-fluoroalkyl [PFAS] chemicals in livestock reared in the area and sold to the general public remains an area of "uncertainty", according to risk assessments released by Defence on Wednesday.

The reports, by consultancy AECOM, examined the risks to humans and wildlife from the base's use of firefighting foams containing PFAS over several decades

Overseas studies have linked the chemicals – historically manufactured by 3M – to a slew of health effects including immune suppression and kidney dysfunction.

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The report found residents who eat large amounts of locally-grown food should strive to reduce their intake of meat, fish and eggs, where animals have had contact with contaminated water.

Separately, an ecological risk assessment found the pollutants posed a "potentially unacceptable" risk to plants and animals in the area.

Joanna Pickford with her hen Goosie Loosie at her home in East Richmond. PFAS contamination has been found in all three of her chickens' eggs. *CREDIT: SARAH FALSON*

Testing has detected PFAS in eggs on the property of East Richmond resident Joanna Pickford. She offered a basket containing dozens of the toxic eggs to Defence officials before a community meeting on Wednesday evening.

"They quickly emptied it so nobody could see them," she laughed.

But Ms Pickford holds serious concerns about the government's decision to allow farmers to continue to sell contaminated produce on the open market, on the basis that consumers purchase food from a wide variety of locations.

"They keep going it's highly unlikely you would buy meat from the same place twice," she said.

"And I'm thinking this is the Hawkesbury, how would I know that? This is the food bowl of Sydney isn't it?"

"It's like saying smoke one cigarette, you'll be fine, but don't smoke more than one because you'll get cancer."

Member for Macquarie Susan Templeman described the findings as "concerning" but welcomed confirmation that local fruits and vegetables are not likely to be affected.

"This is a report we should have had long before now," the Labor MP said. "Now it is time for Defence to outline what action they will be taking to remediate the contamination."

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The report found a "low and acceptable" risk to horticultural, agricultural and council workers in the area, residents who do not consume home-grown eggs and people from outside the area who use local waterways for recreation.

However, it was acknowledged that the absence of any blood test results for humans and livestock was a "data gap" in the investigation.

Official reassurances about contaminated dust and soil were called into question last year when [blood testing commissioned as part of a class action near Newcastle](#) found a consistent relationship between residents who worked the land and high blood contamination levels.

The AECOM report identified a risk from consuming groundwater, but noted it was not aware of any residents who used it as a drinking water source.

Bakers Lagoon was a contamination hotspot and it was recommended Defence limit the release of contaminated water from its sewage treatment plant into the lagoon.

Chronology Of the PFAS Contamination.

- As far back as 1978 3M was aware that the fire fighting foam was problematic.
- According to 4 Corners Programme on the contamination Defence was warned in 1987 and again in 1991 that the fire fighting foam was problematic and should not be used.
- Internal defence report “Report environmental issues associated with defence use of aqueous film” appears to be 2002 or 2003. Link to report below is also on the face book page.
- In 2016 Professor Mark Phillips put together a report which includes a chronology. 2nd Link Below. Also on the face book page.
- September 2017. 1st Meeting by Richmond defence
- 14th June 2018 2nd Meeting
- 7th November 2018 3rd Meeting
- 16th April 2019 4th Meeting.

<https://studylib.net/doc/18377293/environmental-issues-associated-with-defence-use-of-aqueo?fbclid=IwAR2HJw1f4DilSuFLvgRWQd4MuMAykVGZSr3yCr-SX903TvSIhGgt0oKnjcA>

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RUNOFF: A ten-square-kilometre plume of PFAS has been found in the groundwater under the Richmond RAAF base, with runoff into Rickabys Creek. Picture: Geoff Jones

AN investigation into PFAS contamination on and around the Richmond RAAF Base has found a ten-square-kilometre plume of the chemical in groundwater.

The PFAS contamination came from the use of legacy firefighting foam at the Base, and this type of foam was phased-out in 2004.

A Department of Defence and AECOM report on the investigation released on Thursday, June 14 identified five sites on the RAAF Base as source areas for the plume.

All major on-site drainage systems were found to contain levels of PFAS above the reporting limit for drinking and detections were also found at locations where surface water discharges from the site, including tributaries to Rickabys Creek and Bakers Lagoon.

Defence hosted a walk-in [session for community members](#) at Hawkesbury Central Library, where it explained the findings and what they mean for residents.

Luke McLeod, assistant secretary PFAS Investigation and Management, said there was no evidence of residents using the contaminated groundwater for drinking, and use of groundwater for watering stock and irrigation was found to be limited.

He said over 150 residents were involved in a community water use survey, and none were using bore water as their main source for drinking.

“It’s a good result from the point-of-view of human health,” he told the *Gazette*.

“More broadly, we’re not finding significant levels of contamination throughout the investigation area.”

Rickabys Creek and Bakers Lagoon were found to have PFAS levels above guidelines for recreational water use - a guidance designed to cover the incidental ingestion of water during recreational activities like swimming - however Mr McLeod said guidelines were designed to be “highly protective” of human health.

He advised locals using Rickabys Creek and Bakers Lagoon for recreation should “take sensible precaution”.

“Unless they were using it every day and swimming or recreating in it for reasonable periods of time such that they were incidentally ingesting over 200mL, then I would just say take sensible precaution - try not to drink significant mouthfuls of the water - but also not to be concerned about the health impact of doing so,” he said.

Samples from the Hawkesbury River, a farm dam, and drains close to the Base and Rickabys Creek, found PFAS concentration below the health-based guidance for recreational use.

The latest community briefing released the findings from the Detailed Site Investigation (DSI), which involved sampling and laboratory analysis of groundwater, surface water, soil and sediment to better understand how PFAS moves on the Base and in the surrounding area.

Sampling involved 89 groundwater samples from new and existing groundwater monitoring wells, analysing 49 soil samples, and analysing 37 surface water samples and 36 sediment samples.

The area to be studied was identified from a review of information on environmental conditions in the area including topography, surface water drainage, hydrogeology and land use.

The next steps in the investigation will be the Human Risk Assessment (HHRA) and Ecological Risk Assessment (ERA), and PFAS Management Area Plan (PMAP).

This will assess potential exposure to PFAS from contact with skin, incidental ingestion of water and recreational use of affected water; potential for bioaccumulation in livestock, poultry, fish and other aquatic organisms; and potential exposure via ingestion of fish caught within the affected area, and fruit and vegetables grown within the area.

Community briefings on the results of these assessments will be held later in the year.

Defence began its environmental investigation into the presence of per- and poly-fluoroalkyl substances (PFAS) contamination on and around RAAF Base Richmond in 2016.

For more information about the investigation, call the community hotline on 1800 789 291 or visit defence.gov.au/environment/pfas/Richmond.

NOVEMBER 8 2018 - 11:00AM

PFAS contamination: Richmond residents warned against eating home-grown eggs, red meat

□ Sarah Falson

Local News

RESIDENTS who live around the Richmond RAAF Base have been advised against eating eggs and red meat sourced from the local area.

The advice comes from the Department of Defence (DOD) and AECOM, who together delivered a Human Health Risk Assessment (HHRA) report to residents that attended a community consultation at the Hawkesbury Library on Tuesday, November 7.



CONTAMINATION: Richmond resident Joanna Pickford has been told it is not safe to eat her chickens' eggs. Picture: Sarah Falson

The report is the final outcome of the RAAF Base Richmond PFAS Investigation, which followed the discovery of a ten-square-kilometre plume of per- and poly-fluoroalkyl substances (PFAS) in the groundwater under the Richmond RAAF base, with runoff into Rickabys Creek and Bakers Lagoon.

The PFAS contamination came from the use of legacy firefighting foam at the Base, which Defence said was phased-out in 2004.

Residents are advised to minimise intake of eggs from home-grown backyard chickens that have been exposed to water or soil containing detectable PFAS.

They have also been advised to minimise intake of home-grown red meat from sheep or cattle that have consumed water containing detectable PFAS, or have grazed in areas irrigated or flooded with water containing detectable PFAS in the vicinity of Bakers Lagoon and the surrounding water network.

The report noted that there is “currently no consistent evidence that exposure to the PFAS assessed in the HHRA causes adverse human health effects”.

“However, because these chemicals have been shown to have health effects in animals and because these chemicals persist in humans and the environment, enHealth recommended ‘that human exposure to these chemicals is minimised as a precaution’.”

The report concluded that typical exposure to PFAS to most people in the Study Area around the RAAF Base is unlikely to result in cumulative PFAS intakes that exceed the ‘tolerable daily intake’, and therefore the health risk is “low and acceptable”.

This “low and acceptable” risk refers to residents who don’t eat home-grown eggs, horticultural/agricultural workers, recreational users of local waterways who do not live in the Study Area, and Council workers that during a work day may undertake activities such as maintenance of service pits and surface water drainage networks.

The report marks the completion of the detailed environmental investigation for RAAF Base Richmond.

Defence states it will now focus on management of PFAS with the development of a PFAS Management Area Plan which will outline activities that Defence will undertake to manage and monitor PFAS, within the study area.

The Richmond Human Health and Ecological Risk Assessment Reports and related factsheets can be viewed at: www.defence.gov.au/environment/pfas/richmond/publications.asp.

OCTOBER 25 2018 - 4:00PM

PFAS contamination, RAAF Base Richmond: Upcoming community information session

Local News

THE Department of Defence is holding a Community Information Session, to provide information on the detailed environmental investigation into per-and poly-fluoroalkyl substances (PFAS) at RAAF Base Richmond and nearby areas.

Defence has now completed a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA), to identify potential exposure pathways to people, plants and animals, and inform actions to reduce PFAS exposure.



PFAS has been found in areas surrounding the Richmond RAAF Base, including in nearby Rickaby's Creek. Picture: Geoff Jones

The Session includes a presentation about the HHRA and ERA findings, and an update about the next steps in the investigation, including the PFAS Management Area Plan.

Light refreshments will be provided and all are welcome.

For further information about the environmental investigation, go to www.defence.gov.au/environment/pfas/Richmond/.

The Community Information Session will take place on Wednesday, November 7, from 4-7pm (visit any time; presentation at 6pm) in the Tebbutt Room at Hawkesbury Central Library, 300 George Street, Windsor.

RSVP to the RAAF Base Richmond Project Team before Tuesday, November 6.

For questions about the Session or the environmental investigation, contact the Project Team on 1800 789 291 or richmond.defence@aecom.com.

Open Letter to The Sydney Morning Herald.

If a person rears chickens for meat and they use hens to lay the eggs which are like mine, contamination by the soil, water and probably the grass etc. If those fertilised eggs hatch into chickens for meat consumption. Is that meat then high in contaminations like the eggs? You said my hens were fine because they put all the PFAS into the eggs. It has to go somewhere.

Now I have been reading all kinds of information about the level of acceptable contamination in a product for it to be consumed and the amount varies wildly depending on who you are listening to. It seems to me that any contamination is too much contamination when no one knows the full impact of probable or actual causes that may result from having high or even some PFAS in one's system. So how can someone like me, not knowing whether my vegetables and herbs are contaminated, eat them when I have no idea how much contamination there is and do not understand how to calculate accurately how much I am consuming.

If I make an assumption that being here in the Hawkesbury some of the fruit and vegetables I purchase have contamination because of locality; some of the produce including meat and eggs that I purchase are contaminated based on your scatter principle, everyone is getting a little; how much I have ingested in the past from Teflon coated products; How do I then add the amount in my eggs which the base still says I should eat. The amount in my mandarins, lemons, and finger lime. The probable amount in my herbs, potatoes, sweet potatoes, tomatoes etc.

Do you see my confusion. I have such a lovely crop of self sewn rocket from last year. Do I eat it? Do I eat my parsley and basil? I just find it all very confusing and am baffled by the assumption of the EPA and Food standards that there is an acceptable level of consumption for a toxic chemical. It seems to me like saying if you only smoke a few cigarettes you won't get cancer or if you just breathe in a small amount of asbestos each day your lungs won't fail you.

"Philippe Grandjean, a Danish scientist and professor at Harvard University's School of Public Health, who has studied immune effects of the chemicals, is among the most cautious on them. He suggests a safe level of 1 ppt for PFAS overall. That's less than 1 drop in an Olympic-size pool."
Now that is scary.

I took my cat to the vet for a \$200 Blood test for his hyperthyroidism, Do you know that All my 68 years of life I have had cats and yet only here in Richmond on my little slice of contaminated heaven have I ever had cats with Hyperthyroidism. Smudge died in 2005 from cancer related to hyperthyroidism and Now my lovely Dougal has it too. Is that coincidence?

I think I told you that I and my daughter also have a problem. Hypothyroidism.

I do actually want you to think about my questions and also take on board that information when discussing probabilities with any powers that be because this is serious. I would even actually like an easy way to calculate risk so I can decide if I eat my herbs and chillies!

I used to love growing my own produce I felt like it was one way to be super healthy. Now I don't have that pleasure any more.

PFAS contamination near Richmond Air Base prompts egg and meat consumption warning

By [Kathleen Calderwood](#)

Updated 7 Nov 2018, 5:42pm



PHOTO: [Joanna Pickford from Richmond has been told not to eat her chickens' eggs.](#) (ABC News: Kathleen Calderwood)

RELATED STORY: [Unsafe PFAS levels found in waterways near Richmond RAAF base](#)

Residents near the Richmond Air Base should reduce their intake of locally caught fish and locally grown eggs and red meat because of PFAS contamination, the Department of Defence has warned.

The Air Force started phasing out the use of the firefighting chemical in 2004 and is now undertaking a national review of its impact on the environment around bases.

In June, the Air Force announced a **10-square-kilometre plume of PFAS contamination** had been found in the ground water below and around the Richmond Air Base, 50 kilometres north-west of Sydney's CBD. Twenty-five surface water test sites were also found to have had PFAS contamination above safe drinking levels, including Rickabys Creek and Bakers Lagoon. It was also found at low levels in the Hawkesbury River.

At the time, the assistant secretary of PFAS Investigation and Management, Luke McLeod, said there was no need to advise anyone to not use or swim in the water, and no-one used the surface water for drinking.



PHOTO: The RAAF Richmond base, where a 10-square-kilometre plume of contamination was found. (Supplied: Airforce)

However, the Human Health Risk Assessment released today says people living in the area should limit their intake of locally grown eggs and red meat, and locally caught fish to reduce their exposure to the chemical.

The report said people living in the investigation area around the air base should not eat more than 24 eggs per month, 50 serves of red meat per month or 12 servings of fin fish per month that have been grown or caught locally. That amount is smaller for children.

Joanna Pickford lives in Richmond and has been told not to eat her chicken's eggs.

"Each chook egg had a different level of PFAS in it. Some of them were above the level that you should eat and some of them were considered to be edible by adults," Ms Pickford said.

"I was really distressed, particularly because I'd been feeding them to my grandchildren — one of whom is under six.

"I just wish they would be honest and open with the public and say, look, we made a mistake and we're going to do something about it."

An ecological risk assessment also released today found unacceptable risks of contamination for animals and the environment on and around the base.

The report says there is moderate to high potential for exposure to PFAS for animals and birds on the Richmond base, while the risk is moderate at nearby Bakers Lagoon.

There is also some exposure risk for animals and birds in the Hawkesbury River, the assessment found.

According to NSW Health, PFAS does not break down in the environment and can accumulate and persist for a long time in humans and the environment.

An independent health panel told the Government earlier this year that while health effects could be ruled out, there was **limited or no evidence to link exposure to PFAS chemicals with human disease.**

They noted that scientific studies showed a "possible link" with an increase risk of testicular and kidney cancer.

Topics: [health](#), [defence-forces](#), [defence-and-national-security](#), [richmond-2753](#), [sydney-2000](#)

Hi Joanna,

While PFAS chemicals have been used for a long time, the potential adverse impact of their use has only emerged in recent times. The risks from these chemicals come from consumption over an extended period of time. The investigation by the Commonwealth Defence Department shows that the contamination moves from the Richmond RAAF base contaminated land downstream towards the sea. Sydney Water estimates that the chances of levels of concern of these chemicals reaching the North Richmond Water Filtration Plant (WFP) are low, considering the plant is 8.6 kilometres upstream. This is borne out by the recently released river testing by Defence. Sydney Water also maintains an effective method for removing these chemicals from water (Granulated Activated Carbon) at the North Richmond WFP.

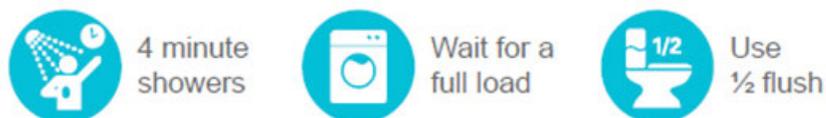
As written to you previously, it is unlikely that PFAS contamination would move as far upstream as the water filtration plant intake including as a result of king tides or floods.

Sydney Water and NSW Health will continue to review any new information that may come to light. If you have any further health concerns you can contact the Local Public Health Unit on 1300 066 055 and speak with the Environmental Health Officer.

If you have any environmental concerns please contact the EPA on the Environment Line 131 555 or email them at

PFAS.project@epa.nsw.gov.au.

Kind regards



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Here is another question.

So the time between 1970's when the Base started using PFAS foam and 1986 when you installed the in ***Granulated activated carbon*** you can absolutely guarantee that no water to households could have been contaminated? PFAS can stay in the body a long time and you can't just guess with these things. People in this area have not just been exposed in 2017 when all the testing began they have been exposed since the early 1970's . This is very important to know particularly for people with health condition that have PFAS as a probably cause.

My comment regarding rainfall was not isolated to rainfall alone I was asking if you had heavy rain a, king tide and water out of Warragamba causing, as it did 23 major floods of over 6 . 5 meters whether this could have contaminated the treatment plant and this is a very fair question considering your filter wasn't installed until 1986.

Many of those floods were prior to 1986.

Thanks Joanna Pickford.

Dear Joanna,

Thank you for contacting Sydney Water and we can assure you that the drinking water provided by the North Richmond Water Filtration Plant is safe to drink.

I have prepared a response to your specific questions regarding PFAS and Sydney Water's treatment processes:

When did you start using the " *Granulated activated carbon*" as a barrier and has it definitely been proven effective in the removal of PFAS chemicals? Is it a conventional treatment or a new treatment?

- The granulated activated carbon (GAC) was installed in 1986.
- The GAC is considered a conventional water treatment process.
- International research has shown that GAC is highly effective for removal of PFOS and similar chemicals, removing at least 90% from the water.
- Again, Sydney Water reinforces NSW Health advice that the public water supply at North Richmond is safe.

What were your treatment methods in 1976 and can you be sure that your filtering system was getting all the PFAS out then even now considering that PFAS is "relatively hydrophilic, resistant to biotransformation and chemically inert, which significantly reduces

effectiveness of some water treatment technologies”?

- The North Richmond WFP was built in the 1940s with one clarifier and four sand filters, designed to remove particles. In 1986, two additional sand filters were added and dissolved air flotation was installed to improve algal treatment. The GAC filters were also added at this time to the process stream.

It is unlikely that PFAS contamination would move as far upstream as the water filtration plant intake. Rainfall would not contribute to elevated PFAS as there are no known PFAS locations upstream, and the increased flow associated with rainfall would drive any potential runoff from the RAAF base further downstream (not back upstream).

Sydney Water is in close consultation with NSW EPA and NSW Health. The EPA has advised that no community wide precautionary advice is required for Richmond.

The EPA can be contacted on the Environment Line 131 555 or emailed at PFAS.project@epa.nsw.gov.au.

I hope this allays some of your concerns. Please contact me if you have any further questions.

Kind regards





4 minute
showers



Wait for a
full load



Use
1/2 flush

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Sorry I got you name mixed up in my last email. Another point fact you may not be aware of to add to the question I asked you is this. In the timeframe that the RAAF Base told me they started PFAS early 1970's. There have been 23 major floods. By major I mean floods that are recorded as being over 6.5 metres. I have got this information from the Gazette. They gathered the information together for their 2018 calander. I can send a copy if your interested. Saying that a treatment plant, that you say is within the tidal zone is '*unlikely*' to move that far upstream. Is not a fact. To me king tide , rain, water let out of the dam through its spillways as happened in many floods is a fact and I would be more inclined to say that the word to be used is likely. I await further information from you

Thanks

Joanna Pickford

Dear Joanna,

Thank you for contacting Sydney Water. In response to your concerns regarding the drinking water at North Richmond:

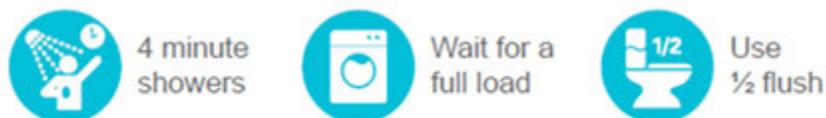
The North Richmond Water Filtration Plant (WFP) is located upstream of the RAAF Base at Richmond. While the tide does rise and fall at the North Richmond water filtration plant, it is unlikely that PFAS contamination would move that far upstream. The North Richmond WFP has granulated activated carbon as part of its standard treatment process. Granulated activated carbon is one of the most effective treatment barriers available.

Sydney Water and NSW Health will continue to review any new information that may come to light. At present, NSW Health advises that the public water supply at North Richmond is safe. More information can be found

at: <http://www.health.nsw.gov.au/environment/factsheets/Pages/pfos.aspx>

In response to your specific question I have a mains sewer running through my property close to the mains water. Is it possible this could be a source of contamination in my mains water?

No. The water and sewer pipes are both pressurised, so under normal operating conditions the two cannot mix as they are separate assets. Both pipes would have to have a break at the same time for a potential contamination of the water from sewer and the likelihood of this occurring is extremely rare.



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