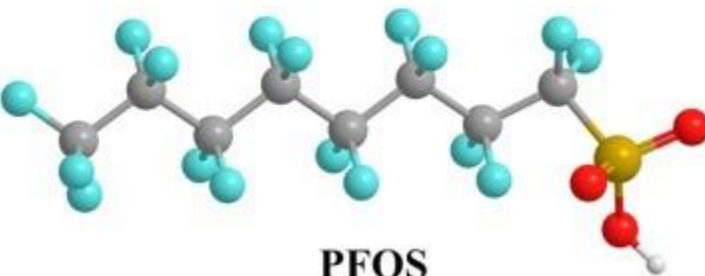
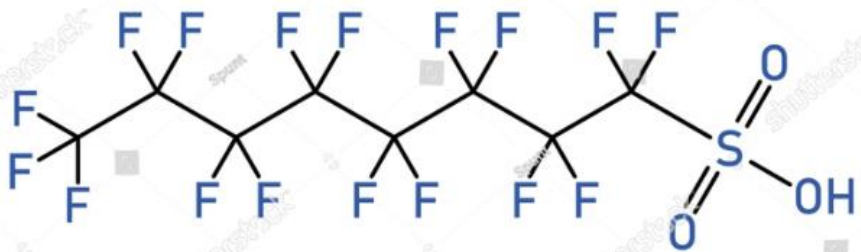


PFOA



PFOS

Perfluorooctanesulfonic acid



PFAS FOREVER CHEMICAL AND SCARY – ARE WE THERE YET?

The Occupational Health
Society of Australia (WA)

13 August 2024

Professor Dr Jimmy Seow
Environ Pty Ltd

environ

EXPERTISE RELEVANT TO THE TALK

- PFAS AND FIREFIGHTING FOAM
 - PFAS Adviser and consultant to companies and organisation.
 - Not on payroll of PFAS manufacturers nor firefighting foam manufacturers.
 - Member international PFAS subject matter experts group members US, Canada, UK and the EU, consisting of lawyers, scientists, toxicologists, epidemiologists, regulators and policy makers.
 - Publications
 - Jimmy Seow, Fire Fighting Foams with Perfluorochemicals, Environmental Review March 2013.
 - Nigel Holmes & Jimmy Seow, Queensland Department of Environment and Heritage Protection Firefighting Foam Use Policy July 2016.
 - Jennifer A. Field & Jimmy Seow (2017) Properties, Occurrence, and Fate of Fluorotelomer Sulfonates, Critical Reviews in Environmental Science and Technology, 47:8, 643-691.
 - Citations - Parliamentary Inquiry on Fiskville, Victoria [Link to Presentation](#).
- Adjunct Professor Curtin University for PFAS research.
- Adjunct Professor Murdoch University for PFAS research.
- Research Fellow HELP University Kuala Lumpur Malaysia.

THERE IS NOW MUCH MORE AWARENESS OF PFAS – THE SCARY BIT

- Now commonly reported in the news and social media
- Given an appropriate name – FOREVER CHEMICAL
- More and more of:
 - Research – PhD, Masters, papers, reports etc – on it in many countries
 - Policies and regulation for its manufacture, use, storage, treatment, disposal and transport growing and evolving
 - Human health impact reported and documented
 - Reports of affected food chain
 - Class actions
 - More consultants and lawyers now working on it

WHAT IS PFAS? – THE FOREVER CHEMICAL

OECD Definition 2021

- PFASs are defined as fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it), i.e. with a few noted exceptions, any chemical with at least a perfluorinated methyl group (-CF₃) or a perfluorinated methylene group (-CF₂-) is a PFAS
- ECHA stated in 2023 there are now 10,000 or more PFASs !! And intends via REACH and European Commission to restrict PFAS all together. ECHA estimates that around 4.4 million tonnes of PFASs would end up in the environment over the next 30 years unless action is taken.

WHY IS IT SO USEFUL?

- Water, stain and dirt proofing properties
- Reduces surface tension
- Very stable chemically hence very persistent and bioaccumulative the humans, biota and environment - PBT, vPvB
- Hence widely used in many commercial products and industrial processes worldwide e.g. firefighting foam, PFTE (nonstick treatment e.g. Teflon), flouropolymers, clothing, footwear, carpets, food packaging etc etc
- Found everywhere – you name it – in you too !

WHAT IS IT CONCERNING?

- Environmental impact
- Health impact
 - Increased cholesterol levels.
 - Decreased vaccine response in children.
 - Changes in liver enzymes.
 - Increased risk of high blood pressure
 - Pre-eclampsia in pregnant women.
 - Small decreases in infant birth weights.
 - Increased risk of kidney or testicular cancer.
 - Disruption in normal thyroid hormone function
 - Endocrine disruptor

POLICY AND REGULATION

- Stockholm Convention on Persistent Organic Pollutants (POPs) 2009 restricts the use of PFOS, PFOA and PFHxS.
- EU proposes to ban all PFAS use by 2025 with exemptions.
- New Zealand is banning PFAS in cosmetics from 2026, in what could be the first example of a country doing so.
- Australia
 - July 2016 – Queensland Department of Environment and Heritage Policy Environmental Management of Firefighting Foam
 - 30 January 2018 - South Australia Environment Protection (Water Quality) Policy 2015 – blanket ban on foams with PFAS to come in place 2 years' time
 - NSW EPA 2022 Protection of the Environment Operations (General) Regulation 2022 (the Regulation) bans and restricts the use of PFAS firefighting foam in NSW.
 - Currently WA does not have a PFAS foam use policy.
 - PFAS NEMP Version 3 – 2022 – has health guidelines for drinking water and PFAS contamination guidance values
 - Commonwealth has effectively banned the import, use and manufacture of some of the more prominent types of PFAS (PFOS, PFOA and PFHxS) from 1 July 2025



ASK YOURSELF THESE 3 QUESTIONS

- Are you at risk ?
- Are you prepared ?
- Have you taken actions to address your PFAS risks

WHAT ARE THE PFAS RISKS TO YOU AND YOUR COMPANY/ORGANISATION

- Most know about PFAS now. It will not go away and will get more attention
- Human health cost to all
- Class actions
- Corporate/organisational liability and loss of reputation
- Personal liability
- Costly remediation and contamination treatment
- Site cannot be used or sold or transferred due to PFAS contamination

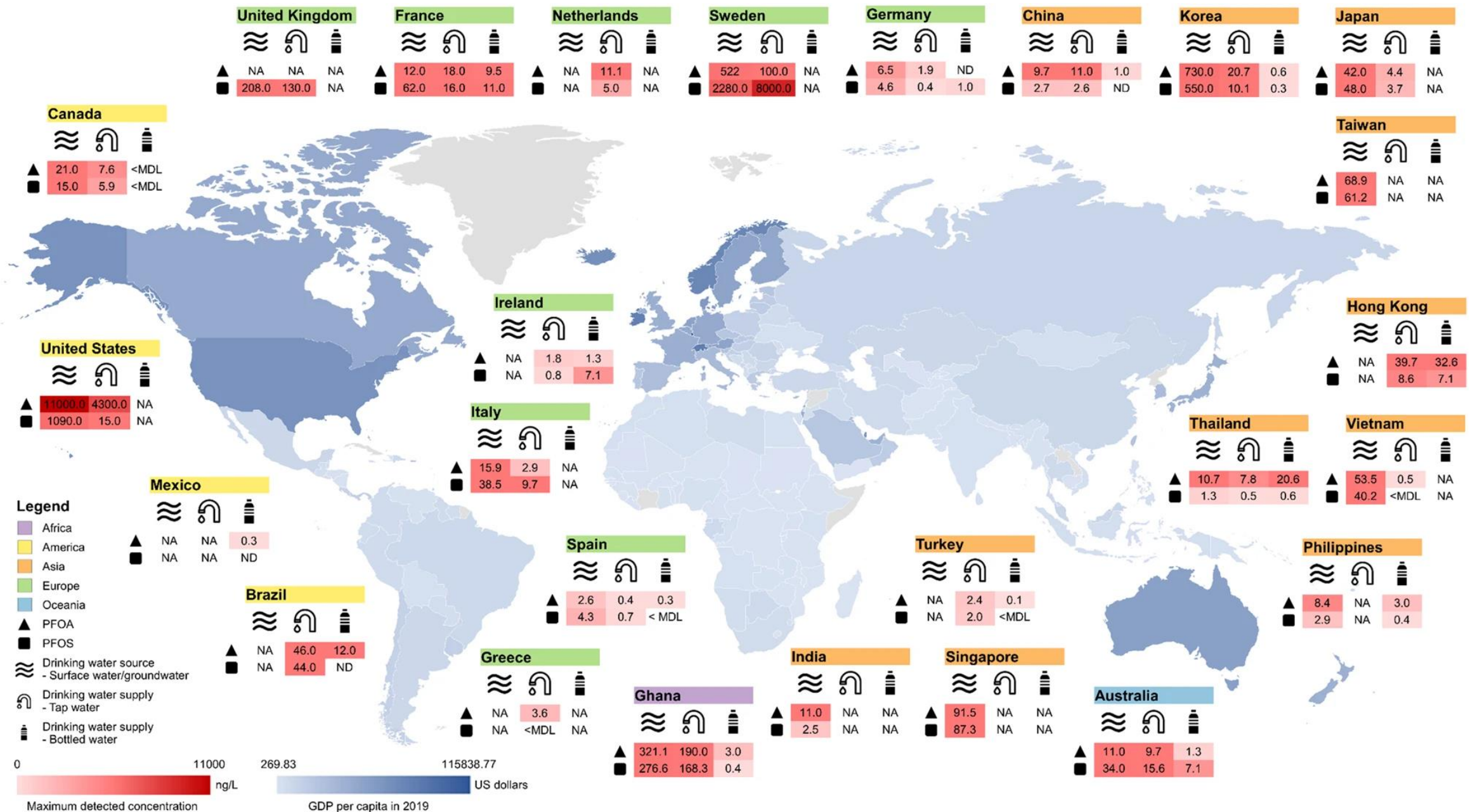
PFAS DRINKING WATER HEALTH GUIDELINES

	Australia	USEPA	EU	UK
PFOS	70 ppt	0.02 ppt	100 ppt Total of 20 PFASs is 500 ppt	1000 ppt
PFOA	560 ppt	0.004 ppt	100 ppt	5000 ppt
Gen X		10 ppt		

TDI Tolerable Daily Intake

EFSA 4.4 ng per kg of body weight per week of total PFOS PFOA PFHxS PFNA

Australia 140 ng per kg of body weight per week PFOS + PFHxS, 1120 ng per kg of body weight per week PFOA



PFAS IN BLOOD RISK GUIDELINES

Germany	US NIH
PFOS 5ng/mL PFOA 2ng/mL	20 ng/ml presents health risk based upon taking sum of MeFOSAA, PFHxS, PFOA, PFDA, PFUnDA, PFOS and PFNA

Table 1: Estimated 95th percentile for the Australian population, 2016–2017¹

Compound	Age group	ng/mL
PFOS	1–4 years	7.2
	5–15 years	6.9
	16–30 years	8.0
	31–45 years	10.4
	46–60 years	13.1
	>60 years	16.7
PFOA	1–4 years	5.7
	5–15 years	4.0
	16–30 years	4.0
	31–45 years	3.9
	46–60 years	3.9
	>60 years	5.3
PFHxS	1–4 years	3.4
	5–15 years	4.2
	16–30 years	5.3
	31–45 years	5.1
	46–60 years	5.7
	>60 years	6.2
PFNA	1–4 years	1.3
	5–15 years	0.9
	16–30 years	1.1
	31–45 years	1.1
	46–60 years	1.1
	>60 years	1.4
PFDA	1–4 years	0.7
	5–15 years	0.6
	16–30 years	0.7
	31–45 years	0.7
	46–60 years	0.7
	>60 years	0.7

Ref: <https://www.practiceassist.com.au/PracticeAssist/media/Practice-Connect/GP-PFAS-ANU-PFAS-Study-advice-December-2021.pdf>

WHAT YOU MUST DO TO REDUCE YOUR RISK AND TO BE REGULATORY/POLICY COMPLIANT

- Don't use PFAS
- Store, store and treat later, store and removed or store, treat and removed
- Treat and removal PFAS contaminated water and soil – removal and destruction
 - Water - granular activated carbon, ion exchange resins, and high-pressure membrane systems
 - Soil/sediment – soil washing, thermal incineration
 - Air ??
 - Emerging science and technology
- Blood testing – background and affected employees. What next
- Before you do the above – risk assess for PFAS and what PFAS you are dealing with – **PFAS Aint PFAS**
- Good luck and get a PFAS subject matter expert to give you informed advise and don't get caught out

ASK CHATGPT !!

- Q - What is a safe level for pfas in blood?
- In terms of blood levels, there isn't a universally agreed-upon safe level for PFAS. Blood levels can vary widely depending on exposure sources (such as contaminated drinking water, food packaging, or occupational exposure) and individual factors (such as metabolism and elimination rates). If you are concerned about PFAS exposure or have reason to believe you may have been exposed, it's advisable to consult with healthcare professionals or environmental health experts who can provide personalized guidance based on your specific situation and local guidelines.

ARE WE THERE YET
to ensure PFAS does not present a
risk or harm to the environment and
human health

DON'T THINK SO !!

