

# The PFAS Problem – Finding it, assessing it, solving it

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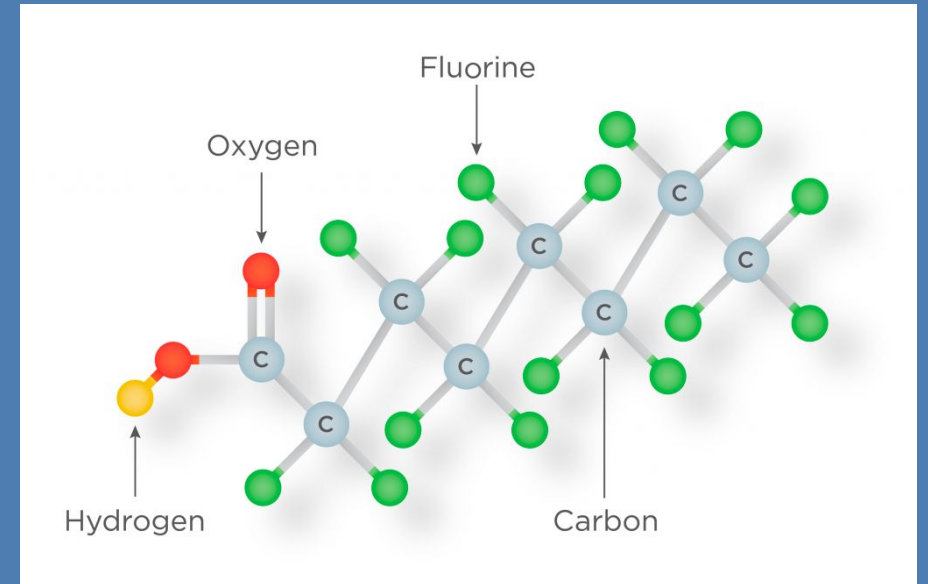


Image credit: awwa.org

*He waka eke noa*  
**Let's do this together**

# Outline

- What are PFAS?
- Why are they relevant to land development?
- Where are PFAS found?
- Risks associated with PFAS on a development site
- Management of development sites with PFAS contamination



# What are PFAS?

- PFAS: Per- and Poly-fluoroalkyl Substances collection of several thousand different chemical compounds
- Human-made, very robust and resistant to degradation
- 1950s
- Widespread use to convey resistance to:
  - Water
  - Oil / grease
  - Heat
  - Friction
  - Stains

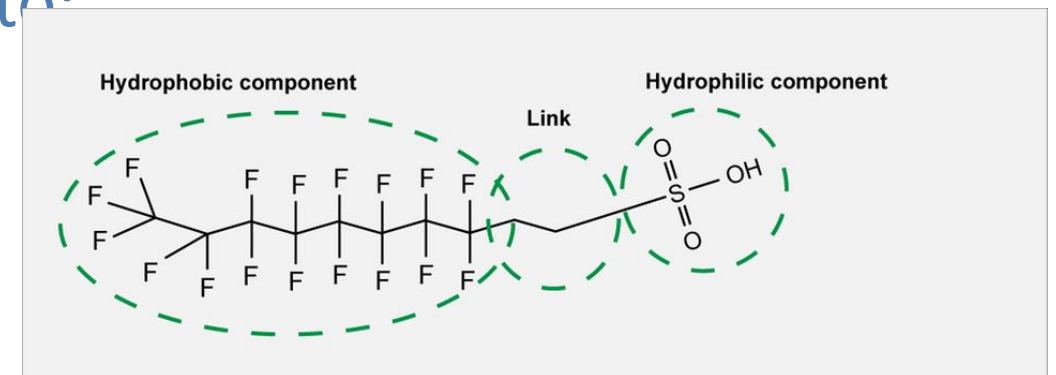


Image credit: Sharifan et al., 2021. ISSN 0048-9697





Image credit: Fayetteville PWC <https://www.faypwc.com/>



# PFAS in Fire Fighting

- Fire fighting foam for fuel, solvent, alcohol fires
- Training, testing and incident response
- Fire suppression systems



Image credit: Sonnek [www.sonnek.com](http://www.sonnek.com), Hawkesfire [www.hawkesfire.co.uk](http://www.hawkesfire.co.uk)



# Why are PFAS a concern?

- Persistent
- Bioaccumulative – in people, plants, animals
- Health effects? Potentially for some compounds
- Ecological effects demonstrated at high concentrations
- Adsorb to soils but then leach over time – long term source
- Can travel significant distance in groundwater & surface water (10's km)



# Why now?

- Concern about PFAS in environment relatively new
- Laboratory equipment to measure PFAS widely available < 10 years
- Initial investigations in Australia – widespread contamination near fire fighting sites
- Investigations in NZ < 8 years

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5:49 pm on 8 February 2023

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# Relevance to Land Development

- HAIL applicable
- NESCS – subdivision/land use change, soil disturbance
- Sample results required for landfill disposal if working on current / former airport etc





# Where is PFAS found?

- Fire stations
- Fire training areas
- Airports and ports
- NZDF Camps and Bases
- Fuel terminals
- Food manufacturing sites
- Places where large volumes of flammable liquids are stored



Image credit: Vanguard-fire.com



# Where else is PFAS found?

- Pulp and paper mills – including waste/biosolids
- Printing & paper manufacturing
- Food packaging manufacturing
- Metal plating
- Textile & carpet manufacturing



Image credit: The Leader ptleader.com



# Where is else PFAS found?

- Landfills
- Wastewater treatment plants
- Sludge and biosolids
- Adjacent sites
- Irrigated sites



Image credit: trihydro.com



# Assessing Sites for PFAS

- Specialist
- Different to other traditional contaminants
- Environmental guidelines and standards are often very low (ppt)
- Rigerous QA/QC required
- Research is ongoing and guidance and best practice is continually being updated
- Peer review common
- Choose a SQEP with PFAS experience



# Risks for Development Sites

- Time and cost for investigations, consenting
- No or limited landfill disposal options
- Groundwater and surface water management



Image credit: aquablok.com



# Management of PFAS Contaminated Development Sites

- Avoid / minimise disturbance of contaminated soil / groundwater
- Retain on site
- Treat soil/water



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