

Presented by

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PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) PREVALENCE IN ENGLAND

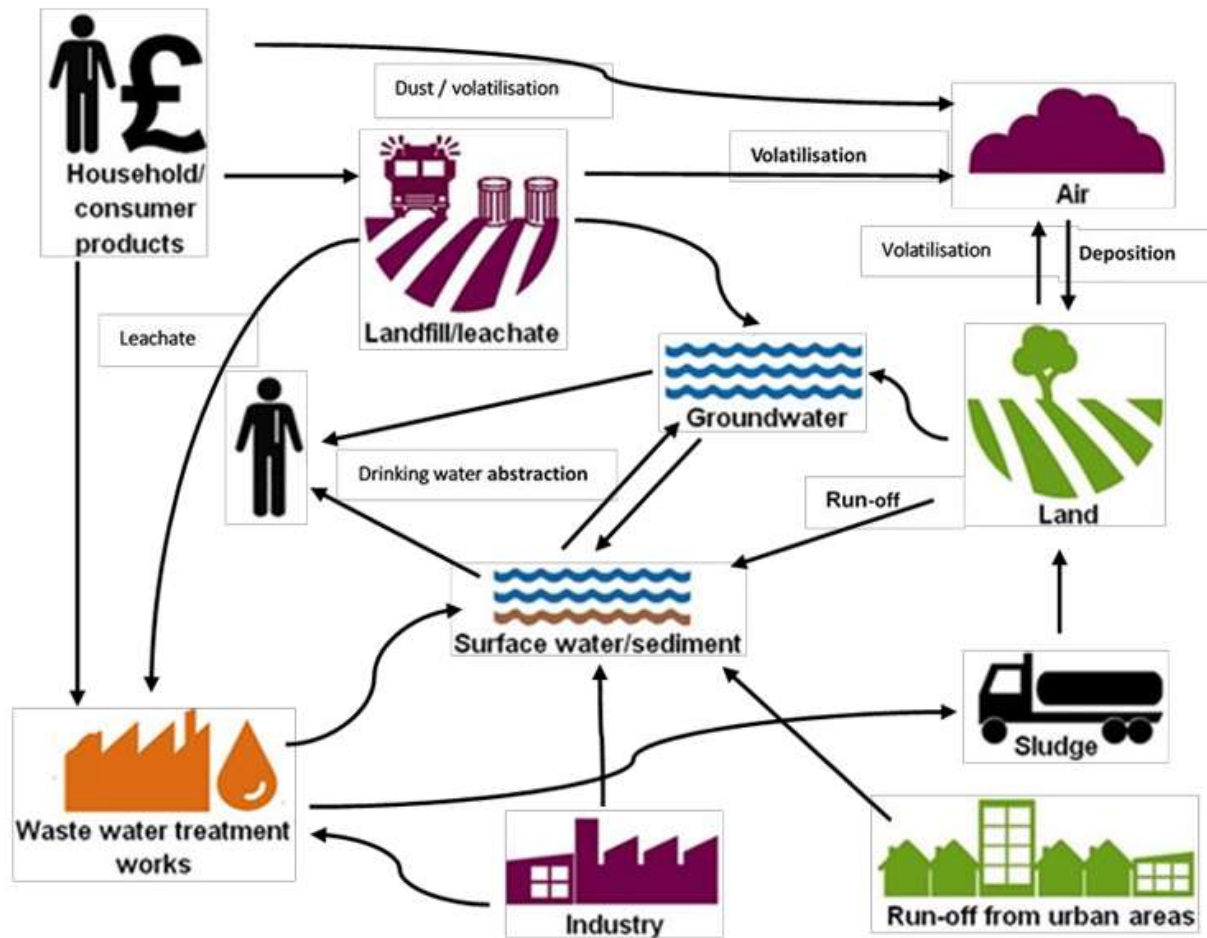
1. What is/are PFAS?
2. What is known about impacts on human health?
3. Regulatory Responses in the US and UK

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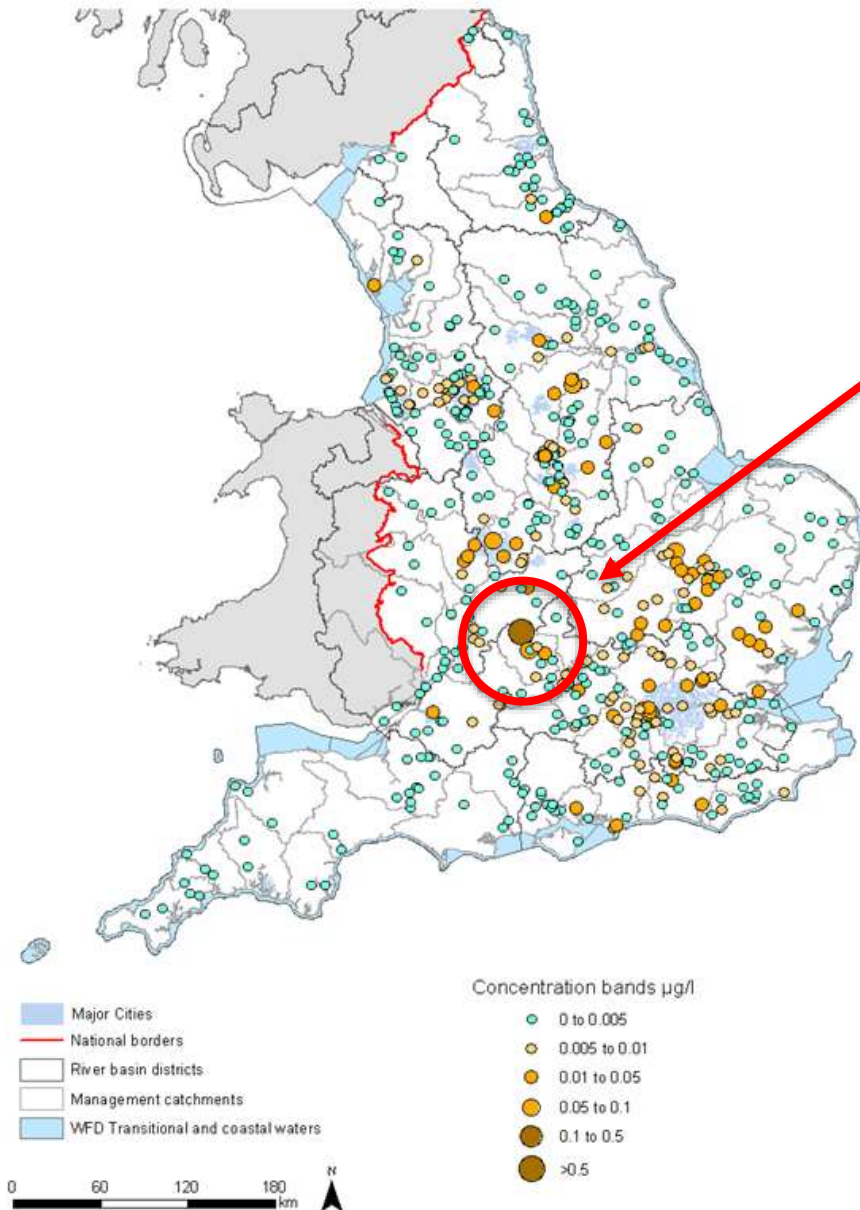
- Per- and poly-fluoroalkyl substances (PFASs) are widely used synthetic chemicals containing the perfluorocarbon moiety. The PFAS family comprises more than 10,000 specific compounds
- They have unique water, oil, heat, stain and grease-repellent properties and are therefore engineered into a wide variety of products including fire suppressants, metal finishing and plating, hydraulic fluids, fluoropolymer production, paper products and packaging, semiconductor manufacturing, and textiles and leather including carpets and furniture.
- Their long half-lives have led to them being referred to as “forever chemicals”.

Sources of PFAS and pathways for environmental exposure



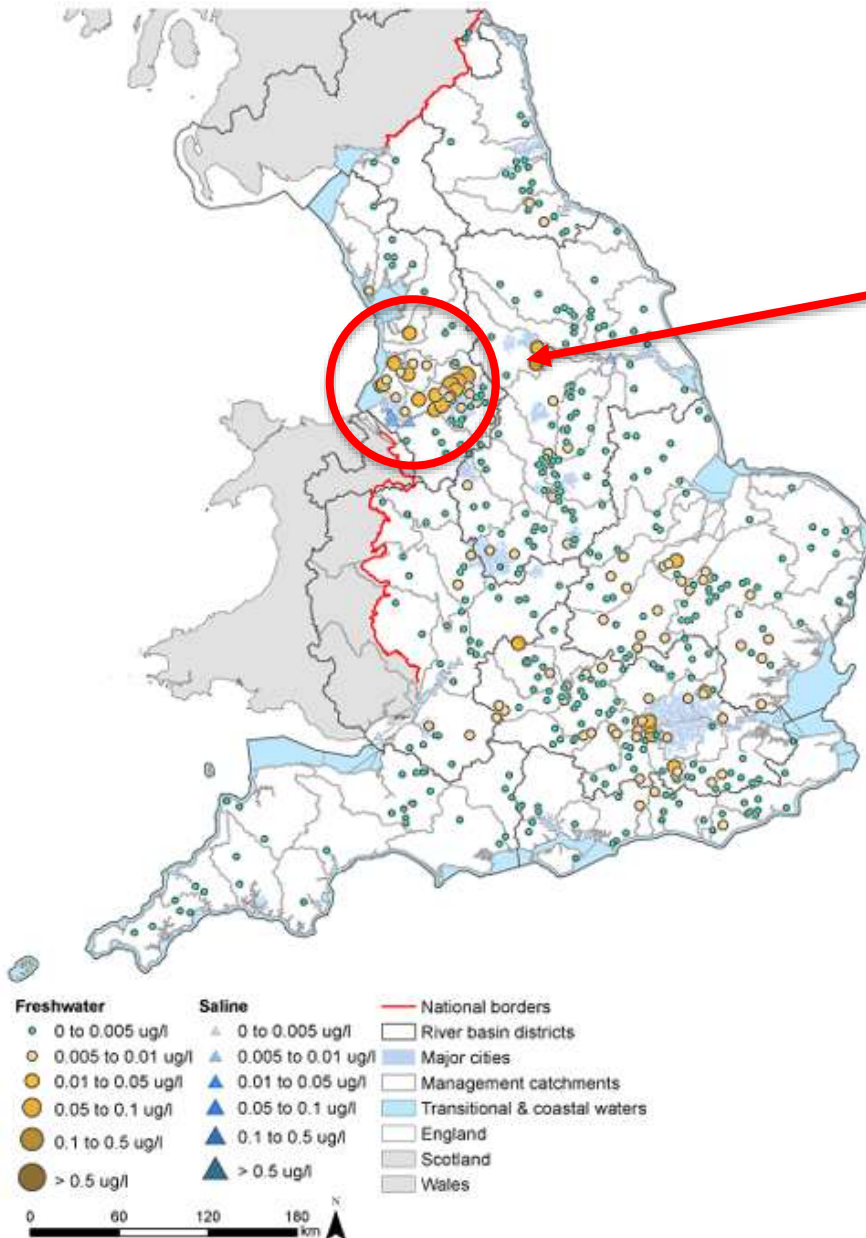
- Data for rivers, lakes, groundwaters, estuaries and coastal waters between 2014 and 2019 suggests that PFAS is likely to be widely present in English surface waters and groundwaters.
- Short chain, more-mobile PFAS (PFBS, PFHxS, PFHxA, PFPeA) are detected at the highest percentage of groundwater, fresh and saline sites
- Longer chain, less-mobile PFAS such as PFUnDA and PFDoDA are very rarely detected in water samples.
- Data for PFOA and PFOS collected at wastewater treatment works through the Chemicals Investigation programme (CIP2) show concentrations are highly variable between works.
- Measurements of PFOS and PFOA at sites upstream of CIP2 works, in the effluent and downstream of the discharge indicate that whilst WWTWs add to the PFAS load, further investigation of sources of PFAS within catchments is needed.

PFOS concentrations from UK surveillance monitoring programme, 2016-2018



- Highest concentrations around airports
- Pervasive throughout nearly all of England

PFOA concentrations in England, 2016 to 2018



- two major UK-based manufacturers of PFAS, both in Lancashire
- Also associated with landfill and wastewater treatment sites

1. What is/are PFAS?

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- PFAS exposure are associated with cancer and other illnesses that decrease quality of life or result in death
- PFAS exposure during critical life stages such as pregnancy or early childhood are also associated with adverse health impacts
- PFAS pollution can have disproportionate impacts on small, disadvantaged, and rural communities already facing environmental contamination.
- Causal links are still under investigation

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There are a wide variety of approaches and suggested limits:

- Risk-based versus precautionary principles
- States versus national agencies

Group	PFAS Species	UK (DWI)	Canada (HC)	Australia	New Zealand	US EPA
PFCA	PFBA	<p><10, <100, >100 ng/L of all 47 PFAS, total sum or individually (Rink, 2021; Rink, 2022)</p>	30000 ng/L			
PFCA	PFPeA		200 ng/L			
PFCA	PFHxA		200 ng/L			
PFCA	PFHpA		200 ng/L			
PFCA	PFOA		200 ng/L	560 ng/L	560 ng/L	4.0 ppt (ng/L)
PFCA	PFNA		20 ng/L			1.0 (unitless) Hazard Index
PFSA	PFBS		15000 ng/L			1.0 (unitless) Hazard Index
PFSA	PFHxS		600 ng/L	70 ng/L	70 ng/L	1.0 (unitless) Hazard Index
PFSA	PFOS		600 ng/L			4.0 ppt (ng/L)
PFECA	HFPO-DA (Gen X)					1.0 (unitless) Hazard Index
FTSA	6:2 FTSA; 6:2 FTS		200 ng/L			

Current Regulations in the USA

The USA tightens regulations in April 2024

- Under the *Safe Drinking Water Act*, the US EPA has the authority to set enforceable National Primary Drinking Water Regulations (NPDWRs) for drinking water contaminants and require monitoring of public water systems. In **March 2021**, EPA published Regulatory Determinations for Contaminants on the Fourth Contaminant Candidate List which included a final determination to regulate PFOA and PFOS in drinking water.
- From **April 2024** the US EPA set enforceable Maximum Contaminant Levels (MCLs) at **4.0 parts per trillion** for PFOA and PFOS, individually.
- For PFNA, PFHxS, and HFPO-DA (GenX Chemicals), the US EPA is setting MCLs of **10 parts per trillion**.

Chemical	Maximum Contaminant Level Goal (MCLG)	Maximum Contaminant Level (MCL)
PFOA	0	4.0 ppt
PFOS	0	4.0 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
Mixture of two or more: PFHxS, PFNA, HFPO-DA, and PFBS	Hazard Index of 1	Hazard Index of 1

*Compliance is determined by running annual averages at the sampling point

Current Regulations in England & Wales

Regulation in England & Wales

- Water companies have a duty to ensure water is “wholesome”.
- DWI has set a guidance limit of 0.1 micrograms per litre (100 ng/l) for PFAS
- water companies required to test for 47 different PFAS types and if levels considered “high-risk” by are reached it should not be used for drinking purposes – voluntary guidelines only

Thank-you!

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