Beyond “Forever Chemicals” in Separation Science

Stewarding PFAS Use in Chromatographic Applications for Process Chemistry.

Matthew Osborne - Associate Principal Scientist in Separation Science

Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

October 2026



Why are we talking about PFAS?

PFAS regulation is moving from largely debate to decision !

The analytical question isn't "will this apply in pharma ?" but "where and when can PFAS be replaced, reduced or justified?" in our analytical workflows



Current position: the scientific committee stage is not the final legislation. After ECHA's opinions, the European Commission and Member States will decide on any restriction.

RAC = risk assessment • SEAC = socio-economic analysis • Annex XV = REACH restriction dossier

How to interpret the current position

March 2026 completed one committee opinion and opened the final SEAC Phase

COMPLETE

RAC final opinion

Adopted on 2 March 2026. RAC assessed whether the proposed restriction is appropriate to reduce risks to human health and the environment.

An EU-wide PFAS restriction is necessary to control identified risks; where derogations are granted, they should be accompanied by measures to minimise emissions and manage continued PFAS use.

IN PROGRESS

SEAC final opinion

Draft opinion dated 10 March 2026. SEAC is considering socio-economic impacts and consultation input before adopting its final opinion.

A restriction with use-specific derogations is the most appropriate EU-wide measure on socio-economic proportionality grounds, rather than an immediate universal ban without derogations.

NEXT

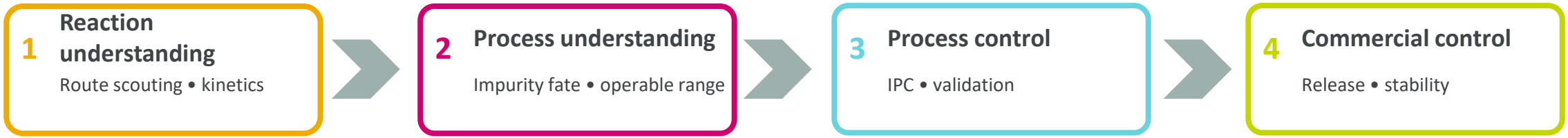
Commission decision-making

Once ECHA's opinions are adopted, they are sent to the European Commission. The Commission and EU Member States then decide on the potential restriction.

"The EU-wide PFAS restriction remains a proposal. RAC has issued its final opinion; SEAC is finalising its opinion. Legislative decisions remain downstream."

Why should process chemists care?

Analytical chemistry, especially chromatography, is the decision layer across the chemical process lifecycle



Certain PFAS reagents and materials are ubiquitous in chromatography influencing speed, sensitivity and transferability of methods along with their environmental burden

WHERE PFAS MAY APPEAR

TFA | HFIP / HFBA | Instrument parts | Columns / filters | Device materials | Packaging interfaces

Current ECHA Position: focussing on the facts

Essential to remember; a derogation is permission rather than an endearing strategy; Stewardship will be essential

DEROGATIONS

Pharmaceutical applications are use-specific

Active substances, PPORD, packaging and devices are not treated identically

No blanket analytical exemptions identified

We cannot assume that routine PFAS use across all pharmaceutical applications will be permanently protected

PPORD derogation may provide protection for qualifying chemical process development activities but final RAC and draft SEAC opinions do not demonstrate routine chromatographic development, QC or commercial analytical use of PFAS fall with PPORD derogations

Eliminate where possible, reduce where necessary, justify where unavoidable, performance remains essential

01	**ELIMINATE**	Design PFAS out
02	**REDUCE**	Minimise concentration and volume
03	**CONTAIN**	Capture & monitor waste and releases
04	**JUSTIFY**	Document need and alternatives
05	**REVIEW**	Reassess as options mature

Product and Process Orientated Research and Development (PPORD)

Impact of restrictions on pharmaceutical control strategies

PFAS use extends across many analytical applications



- Instrument design/manufacture
- Wearable consumable parts
- Single use sample preparation
- Reagents, Modifiers, Buffers

Analytical chemists have the responsibility to steward the switch to more environmentally benign alternatives.

Low pH chromatographic mobile phase additives

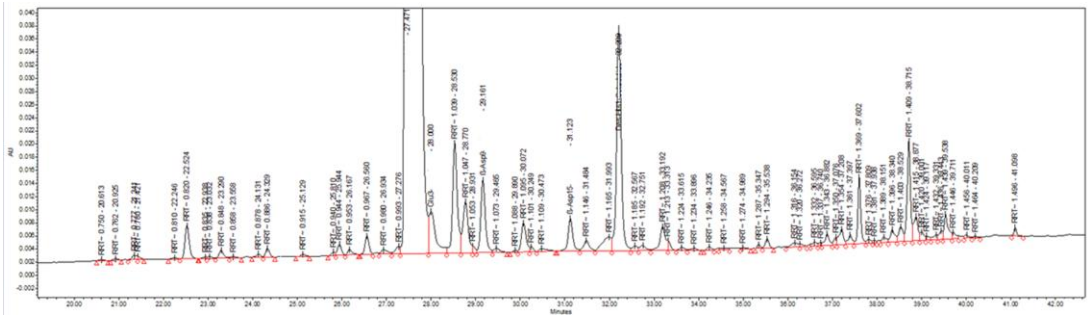
pH additive	CO_2 released (kg)	H_2O used (m^3)	Ozone depletion / 10^{-6} (kg)	Total score
TFA	8.45	0.21	6.50	15.16
MSA	1.05	0.05	0.38	1.48
Acetic acid	1.67	0.04	0.83	2.54
Formic acid	2.98	0.14	5.47	8.59
Perchloric acid	6.48	0.14	2.89	9.51
Phosphate	0.96	0.01	0.35	1.32

SimaPro LCA values for CO_2 emissions, H_2O consumption and ozone depletion for selected pH additives

Bethany Richards, Associate Scientist, Product Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

Prevalence of Per- and Poly-Fluoro Alkyl Substances in Chromatographic Mobile Phases

Peptide Therapeutics



Mobile phase A: 0.03% TFA in water

Mobile phase B: 0.03% TFA in 80:20 acetonitrile:IPA

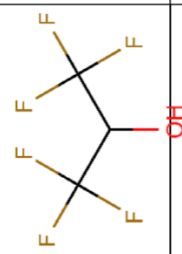
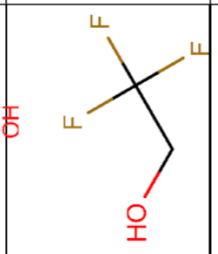
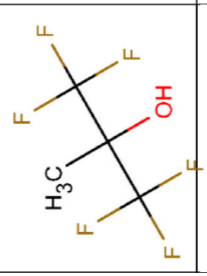
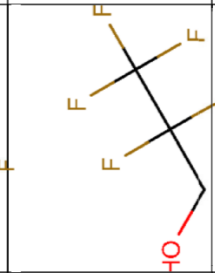
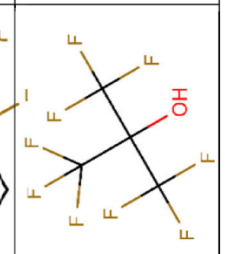
Column: 150 x 2.1 mm, 1.7 µm C18

Flow rate: 0.15 mL/min

Temperature: 50°C

Gradient: 32-65% B in 40 mins (65 min total)

Oligonucleotide Therapeutics

	HFIP	TFE	HFMIP	PFP	NFTB
Structure					

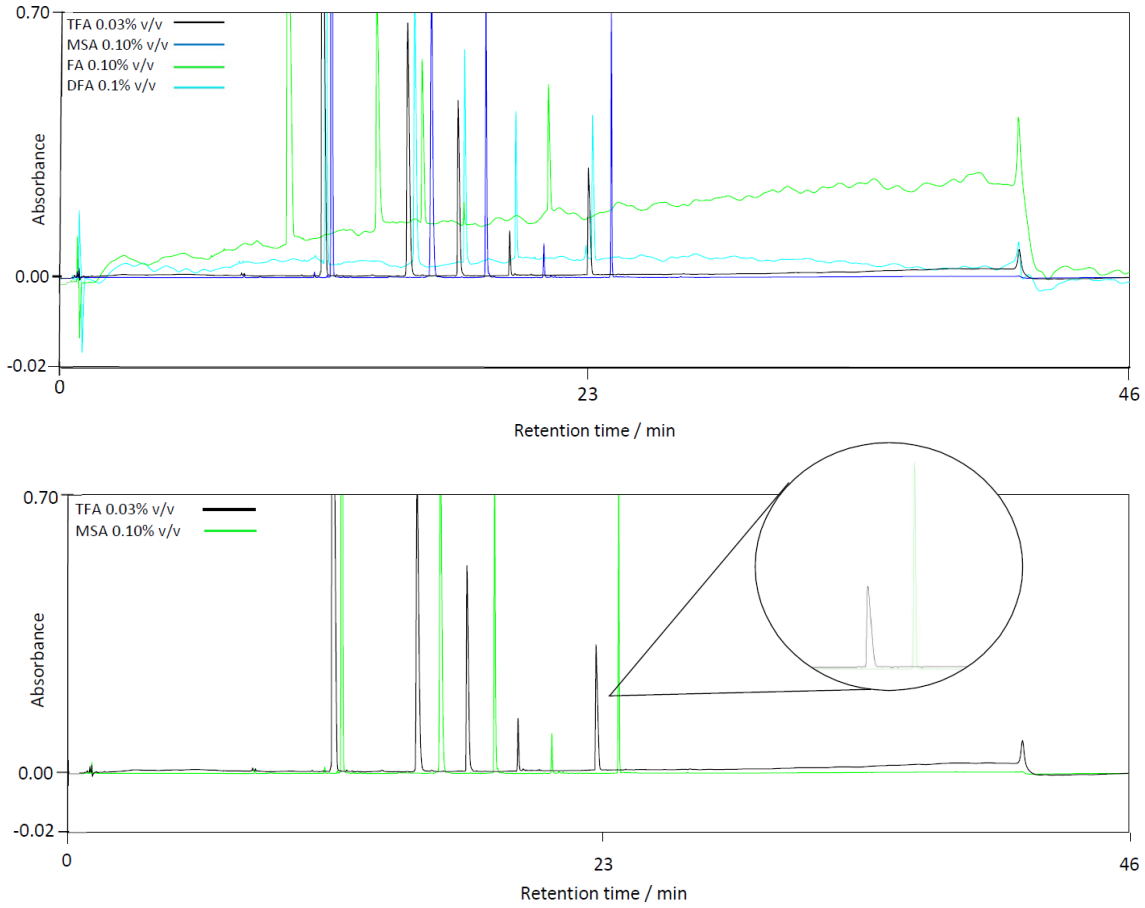
- In 2017, the use of fluorinated alcohols as acidic modifiers in oligo separations was investigated
- Superior MS performance when compared with carboxylic acid modifiers with to significantly improved MS response

Nagaraju Donthibonyia, Senior Scientist, Product Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

Table reproduced from The Role of Fluorinated Alcohols as Mobile Phase Modifiers for LC-MS Analysis of Oligonucleotides Babak Basiri et al. J. Am. Soc. Mass Spectrom. https://pubs.acs.org/doi/10.1007/s13361-016-1500-3

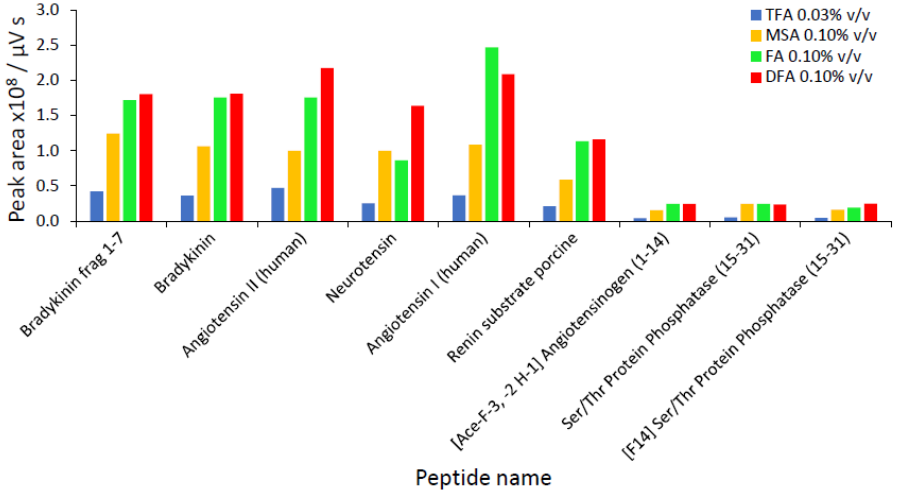
Alternatives to Polyfluoro Alkyl Substances in Peptide Analysis

Other pH modifiers compared with TFA



Comparable Chromatography

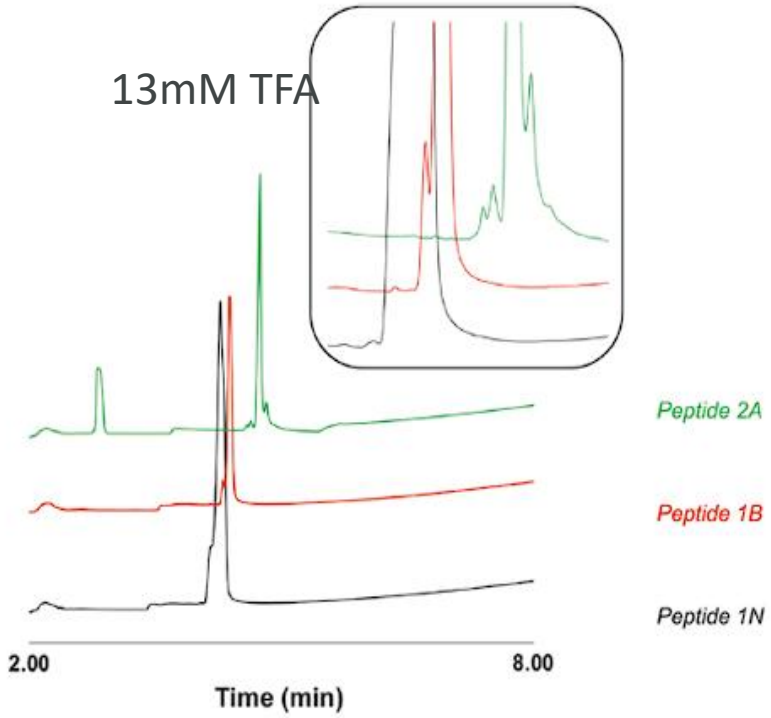
- Methane Sulphonic Acid compared with TFA
- Enhanced analyte response in Mass Spec with MSA

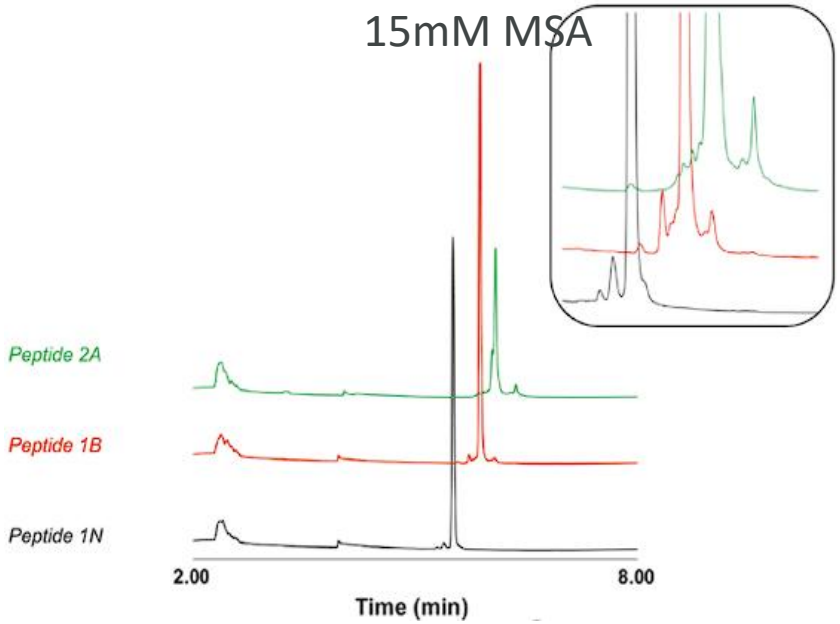


Data generated by Francis Power, Scientist, Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK
and by Bethany Richards, Associate Scientist, Product Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

MSA vs TFA

12 and 13 mer Peptides chromatographed on a Torus 2-PIC column with 13 mM TFA (~0.1% v/v - left) or 15 mM MSA (~ 0.1% v/v - right) as additives in the organic cosolvent.





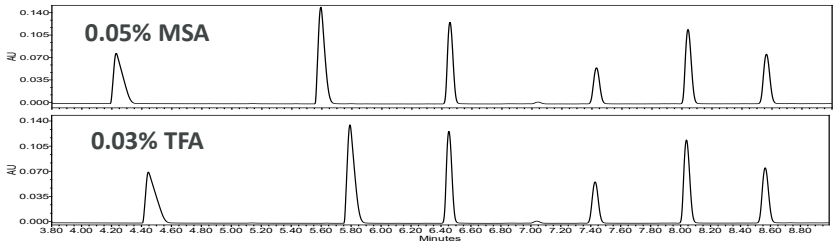
G.L. Losacco *et al.* (2021) *J. Chromatogr. A* **1642,** 462048

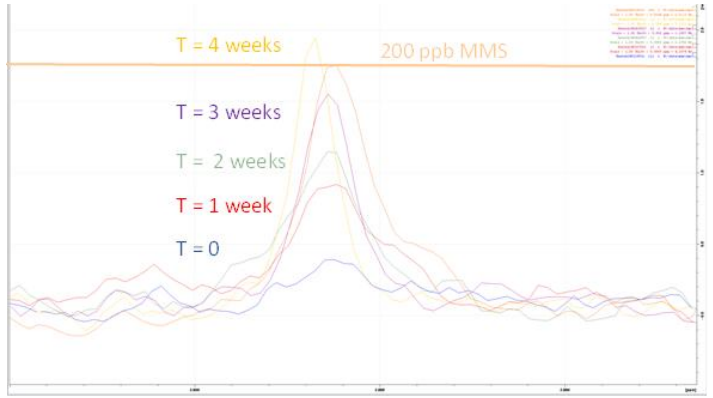


Alternatives to TFA and DFA

- TFA is ubiquitous in chromatographic applications, but it persists & accumulates in the environment.
- Methane Sulphonic Acid (MSA) may offer a greener alternative with some limitations.

Chromatographic Performance UV Response

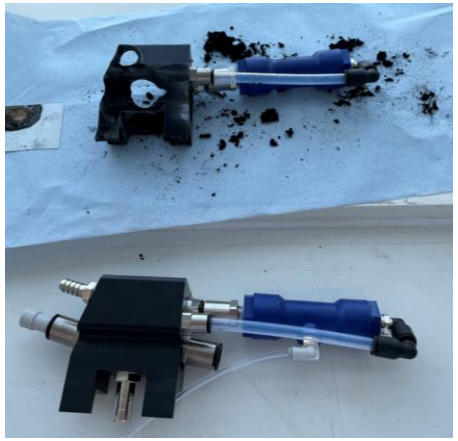




^{1}H NMR of methyl methane sulfonate formation from MSA in 100% Methanol







PFAS – Per- and Polyfluoro Alkyl Substances are substances that contain at least one fully fluorinated methyl (CF3-) or methylene (-CF2-) carbon atom without any H/Cl/Br/I attached.

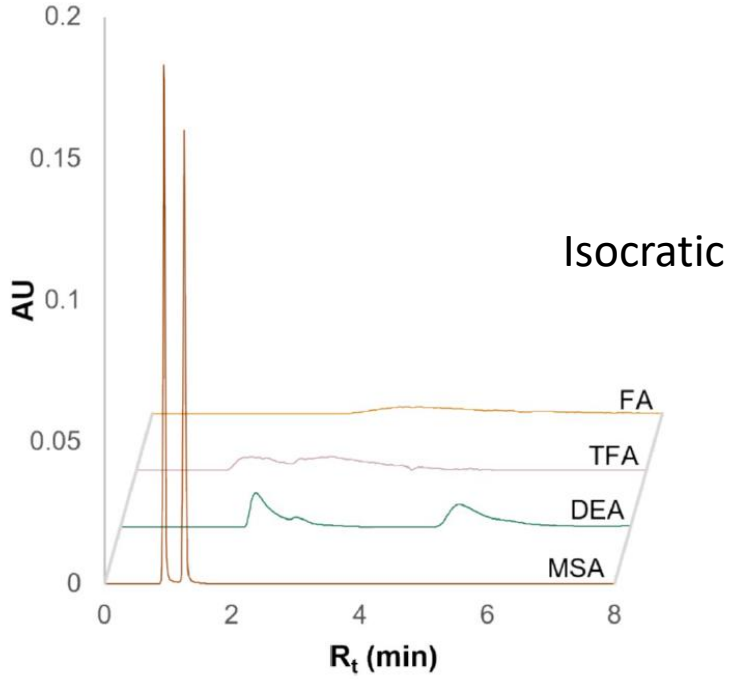
Data generated by Jack Stokes, 2023-2024 Industrial Placement Student, Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

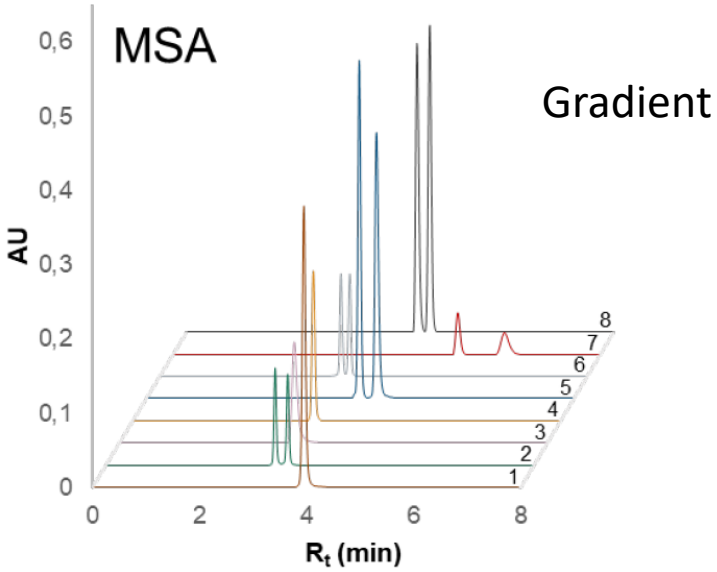
MSA in SFC

Conditions

- Elution: isocratic (40% B for 10 minutes - top) & linear gradient (5-40% B in 5 minutes, 40% B for 5 minutes - bottom)
- where B was MeOH with 20 mM pH additive
- Flow rate 3.5 mL/min, detection 210 nm, column temperature 40°C, BPR 120 bar

*"To be able to increase the loadability while maintaining the peak shape in preparative SFC, the **MSA concentration** was raised to **100 mM**. This later resulted in the **frit of the column imploding**, seemingly from going brittle and no longer withstanding the pressure of preparative SFC"*





V. Spelling *et al.* (2024) *Disc. Chem.* **1** 68

What Did We Learn?

Replacement of acidic PFAS additives with MSA

Comparable UHPLC Performance

Improved Mass Spec response

Significant greenness and sustainability improvements

Some detector and column hardware compatibility concerns

Operational considerations in technique specific areas

Method specific implementation

Not a universal replacement

Some modality-specific applications remain difficult

AZ is looking at alternatives

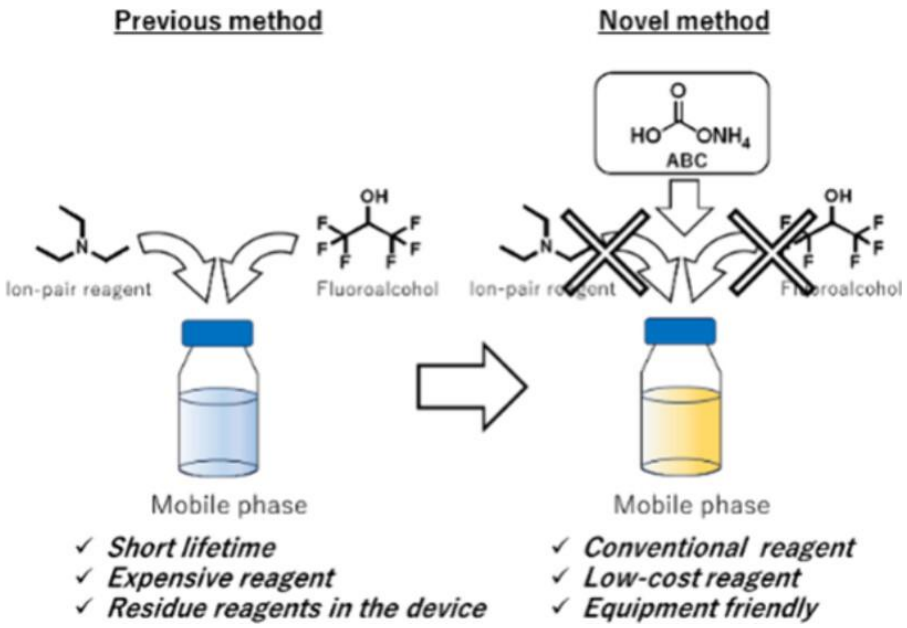
Other potential alternatives to TFA, DFA, HFBA, HFIP are being evaluated – studies are ongoing

- Methane Sulfonic Acid (MSA)
- Formic Acid
- Acetic Acid
- Perchloric Acid
- Ammonium Phosphate
- Ammonium Formate
- Ammonium Bicarbonate



Data generated by Jack Stokes, 2023-2024 Industrial Placement Student, Chemical Development, Pharmaceutical Technology & Development, Operations, AstraZeneca, Macclesfield, UK

Can fluorinated alcohols be replaced in oligo methods?



- A novel[1] non-ion pair approach absent of fluorinated alcohols demonstrated successful retention and resolution of oligonucleotide therapeutics in biological matrices
- Ammonium bicarbonate provided a versatile alternative accommodating the analysis of various natural or chemically modified oligonucleotides without compromising MS sensitivity
- Replacing fluorinated alcohols and ion-pair reagents with ammonium bicarbonate in partnership with an aromatic modified C18 stationary phase[2] further demonstrated opportunities for the optimal separation of therapeutic oligo-nucleotides

[1]**Overcoming Challenges in Oligonucleotide Therapeutics Analysis: A Novel Non-ion Pair Approach**
Yoshiharu Hayashi and Yuchen Sun *Journal of the American Society for Mass Spectrometry* **2024** *35* (9), 2034-2037
DOI: https://doi.org/10.1021/jasms.4c00270

[2]**Separation and identification of oligonucleotides impurities and degradation products by reversed phase ultra-high performance liquid chromatography using phenyl-bonded stationary phases without ion pairs - A step towards sustainability,**
Sylwia Studzińska, Szymon Bocian, Luca Rivoira, Ed Faden, Geoff Faden *Journal of Chromatography A*, **2024** *1736*, 465380
https://doi.org/10.1016/j.chroma.2024.465380

PFAS And The Endearing Analytical Control Strategy

Analytical chemistry, especially chromatography, is the decision layer across the chemical process lifecycle

Analytical method performance remains paramount. Environmental burden is a first-class method-development attribute to be minimised where possible, PFAS stewardship is essential.

PERFORMANCE

resolution • specificity • sensitivity

SUSTAINABILITY

greenness • persistence • hazard

RELIABILITY

robust • rugged • transferable

LIFECYCLE

monitor • improve • reduce

CONTROL STRATEGY DESIGN PRINCIPLE | Ensure patient protecting analytical performance whilst minimizing environmental burden where possible, justifying if necessary and reassessing as options mature

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Understanding PFAS

From Regulation to Real-World Use

Dr Martyn Shenton
Principal Consultant & Head of PFAS Regulatory Services

Martyn.shenton@bluefrogscientific.com





Martyn Shenton
Fluoropolymer & PFAS Expert

- PhD in Low Surface Energy Polymers
- > 20 Years Working For UK Fluoropolymer Manufacturer
- Product & Process Safety Roles
- PFAS, Polymers & REACH Consultant at Blue Frog Scientific



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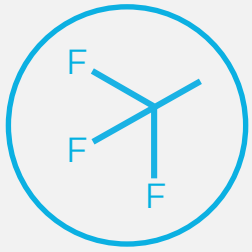
Company Profile: Blue Frog Scientific

Leading Scientific & Regulatory Affairs Consultancy

- Presence in European Union (EU) and United Kingdom (UK)
- Leading experts in regulatory and scientific fields
- Regulatory compliance support across chemicals, biocides, plant protection (including biologicals) and pharmaceuticals
- Dossier preparation, risk assessments, advocacy and ongoing regulatory maintenance
- Scientific depth in chemistry, toxicology, ecotoxicology and environmental fate
- Part of the CERTANIA Group



PFAS Terminology
The Language of PFAS

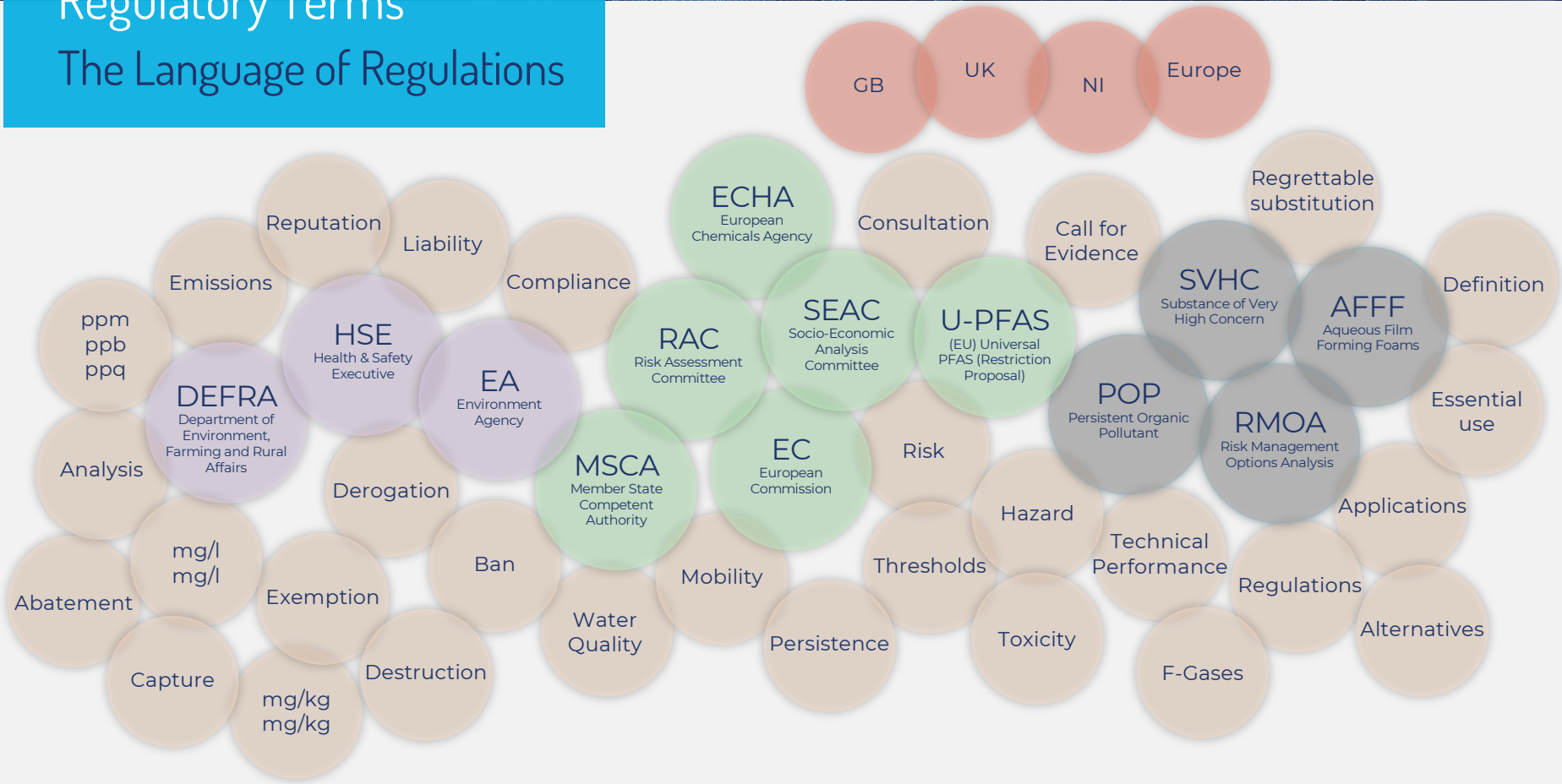




- C-F Bond Strength
- PFAS Diversity
- Durability vs Persistence
- Technical Performance
- Applications & Sustainability



Regulatory Terms
The Language of Regulations





PFAS in the News

The UK Regulatory Journey

Department for Environment, Food & Rural Affairs

Policy paper

PFAS Plan: building a safer future together

Updated 3 February 2026

Contents

- Foreword
- Introduction
- Our PFAS vision for the future
- What are PFAS?
- Our approach
- Section 1: Understanding PFAS sources
- Section 2: Tackling PFAS pathways
- Section 3: Reducing ongoing exposure to PFAS
- Next steps
- List of indicative actions: Section 1
- List of indicative actions: Section 2
- List of indicative actions: Section 3

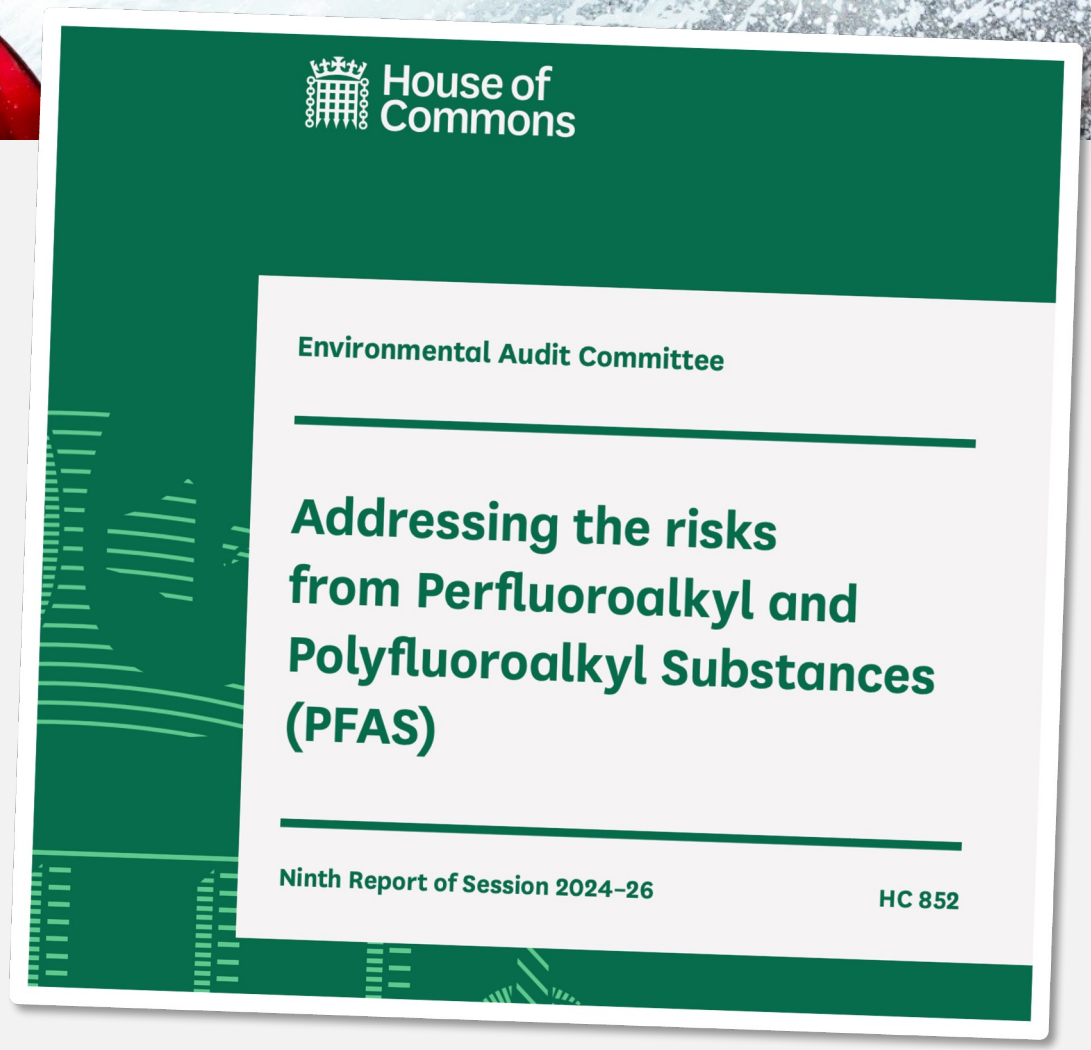


https://www.gov.uk/government/publications/pfas-plan/pfas-plan-building-a-safer-future-together



PFAS in the News
The UK Regulatory Journey

UK Parliament



https://committees.parliament.uk/publications/52776/documents/294134/default/

PFAS in the News

ECHA recommends TFA's classification as a reprotoxic substance



https://bluefrogscientific.com/chemical-regulatory-news-and-views/echa-recommends-new-hazard-classifications-tfa-its-inorganic

PFAS in the News
Reputation & Liability

The Guardian UK

EPA quietly backtracks on claims US has phased out toxic Pfas compounds

Agency changes wording on website as Texas-based firm continues manufacture of plastic container barriers



Though the agency stopped short of a ban, the 'phase- out' was viewed as major progress on reining in Pfas pollution. Photograph: Rohane Hamilton/Alamy

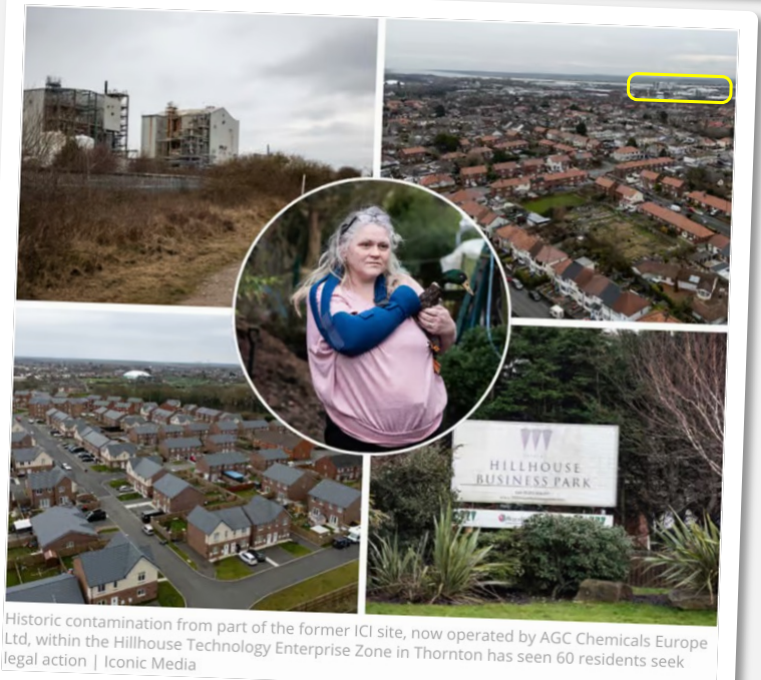
https://www.theguardian.com/environment/2026/oct/18/epa-pfas-compounds-toxins

PFAS in the News
Reputation & Liability

News

200 jobs to go as AGC chemicals at former Thornton ICI site announces it will 'cease production' in December

The Gazette



Historic contamination from part of the former ICI site, now operated by AGC Chemicals Europe Ltd, within the Hillhouse Technology Enterprise Zone in Thornton has seen 60 residents seek legal action | Iconic Media

https://www.blackpoolgazette.co.uk/news/200-jobs-to-go-as-thornton-chemical-giant-agc-announces-site-will-cease-production-in-december-9064605

PFAS in the News
Reputation & Liability

Polimerica
PLASTICS & RUBBER NEWS

New life for Dyneon

The Bavarian fluoropolymer specialist is leaving 3M and preparing to return to global markets under Capmont ownership.

July 7, 2026 10:56



Swiss private equity firm **Capmont** has acquired **Dyneon**, the Bavarian subsidiary of **3M Group**. The company specialises in the production of **high-performance fluoropolymers** and operates a plant at the **Gendorf Chemical Park** (pictured), with around 400 employees and annual production capacity of **18,000 tonnes**.

https://www.polimericanews.com/articolo.asp?id=939

https://www.cmont.com/en/news/capmont-carves-out-dyneon-gmbh-from-3m-deutschland-gmbh-bringing-a-world-leading-specialty-chemicals-platform-under-focused-ownership

PFAS Applications
Reputation & Liability

Fluoropolymers
Product Group of Plastics Europe



https://fluoropolymers.eu/essential-uses-of-fps/



PFAS Applications
Water Supply, Treatment & Sewage

- Fluoropolymers
- Side Chain Fluorinated Polymers
- Poly-fluorinated n-alkanes & Alkenes (Excl. F-gases)
- Perfluoroalkanes (Excl. F-Gases)
- Perfluoropolyethers
- F-Gases (HFCs, HFOs, ...)
- Fluorotelomers
- Perfluoroalkane Sulfonamides
- Perfluoroalkane Sulfonyl Fluorides
- Perfluoroalkyl Acids
- Perfluoroalkyl Aldehydes
- Fluorotelomer-Based Compounds
- Perfluoroalkyl Iodides
- Polyfluoroalkane Sulfonamido Derivatives
- Epoxides



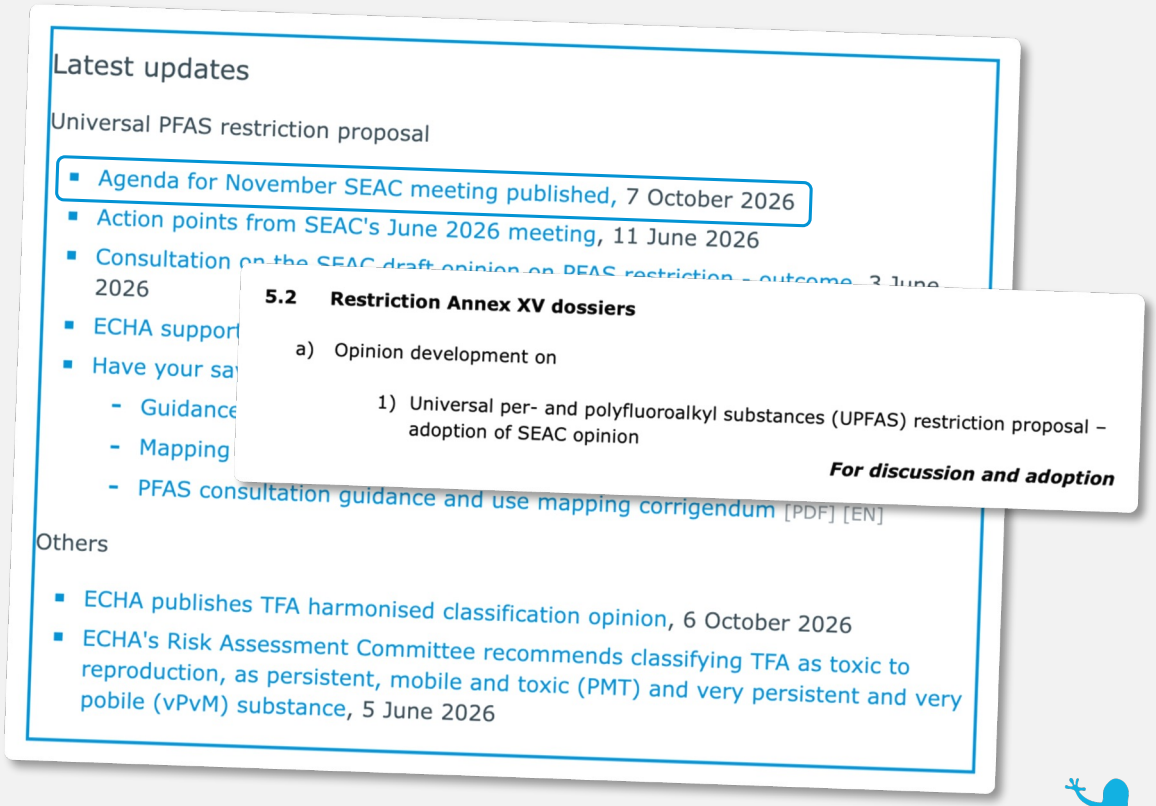
Source: Cefic Report by Ricardo; https://corporateeurope.org/sites/default/files/2024-10/economic-analysis-of-the-impacts-of-a-reach-restriction-on-the-manufacture-placing-on-the-market-and-use-of-pfas_finalv2.pdf

PFAS Regulations
EU U-PFAS Restriction Proposal

An agency of the European Union

ECHA

EUROPEAN CHEMICALS AGENCY



Latest updates

Universal PFAS restriction proposal

- Agenda for November SEAC meeting published, 7 October 2026
- Action points from SEAC's June 2026 meeting, 11 June 2026
- Consultation on the SEAC draft opinion on PFAS restriction – outcome, 3 June 2026
- ECHA support
- Have your say
  - Guidance
  - Mapping
  - PFAS consultation guidance and use mapping corrigendum [PDF] [EN]

5.2 Restriction Annex XV dossiers

a) Opinion development on

1) Universal per- and polyfluoroalkyl substances (UPFAS) restriction proposal – adoption of SEAC opinion

For discussion and adoption

Others

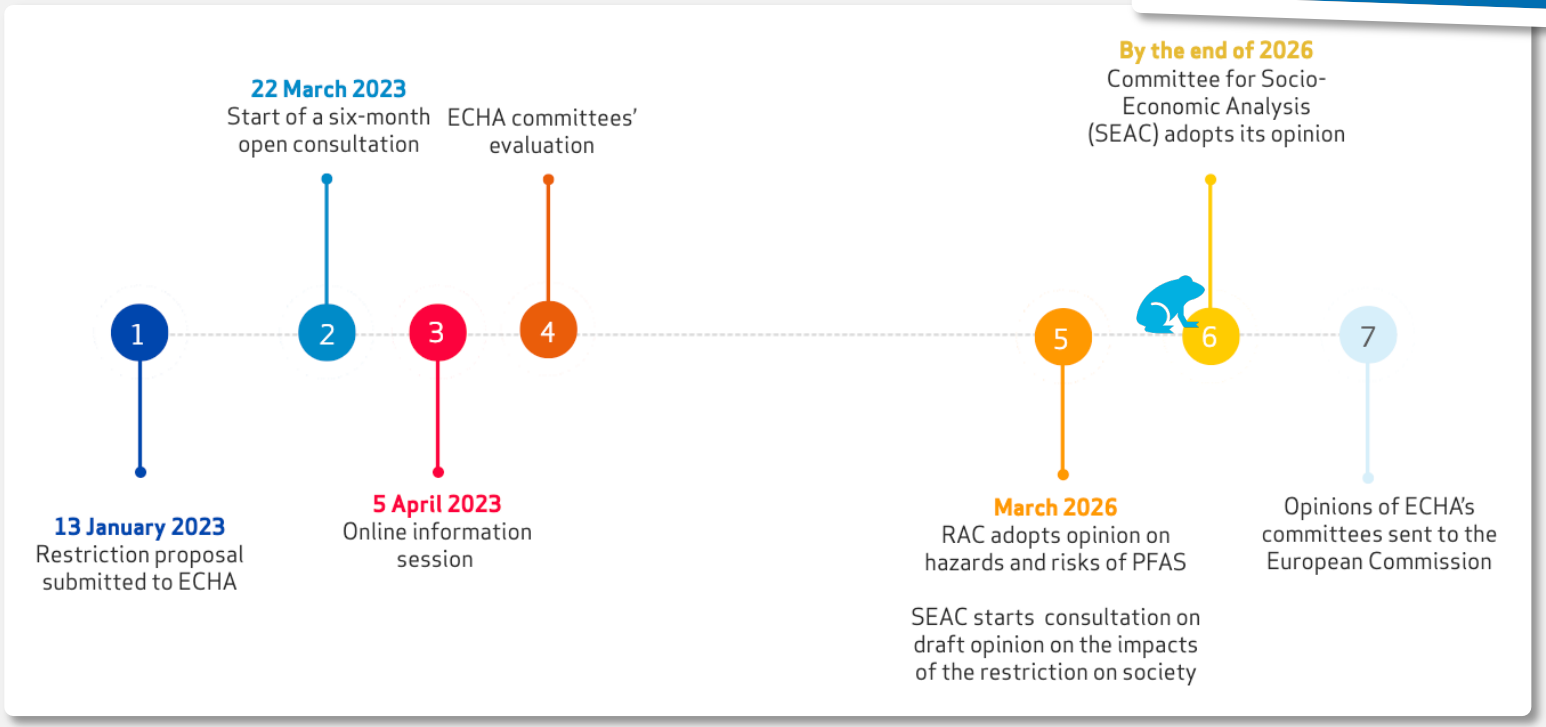
- ECHA publishes TFA harmonised classification opinion, 6 October 2026
- ECHA's Risk Assessment Committee recommends classifying TFA as toxic to reproduction, as persistent, mobile and toxic (PMT) and very persistent and very pobile (vPvM) substance, 5 June 2026

https://echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas

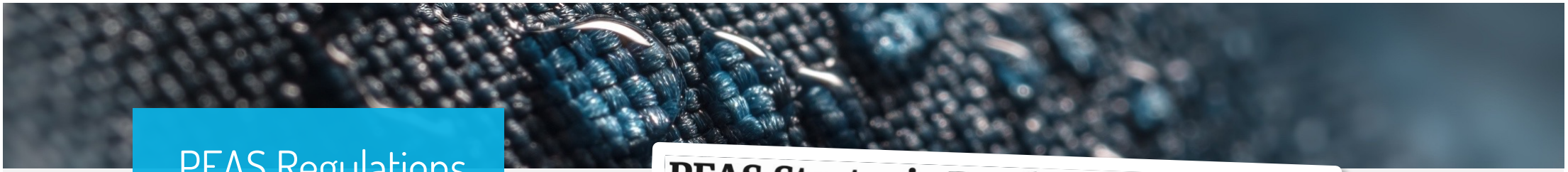
PFAS Regulations
EU U-PFAS Restriction Proposal

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ECHA
EUROPEAN CHEMICALS AGENCY



https://echa.europa.eu/hot-topics/perfluoroalkyl-chemicals-pfas



PFAS Regulations

USA – Federal

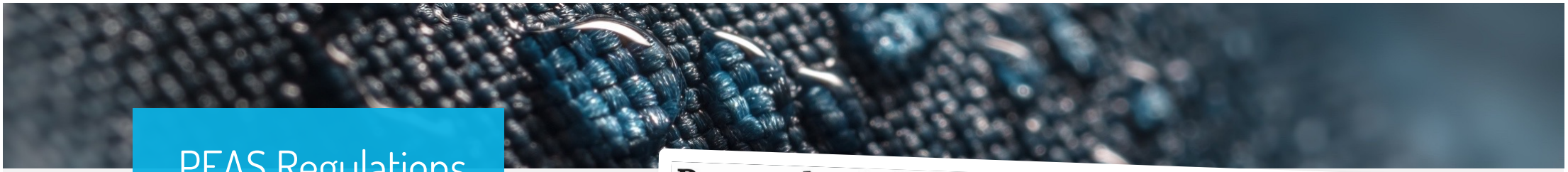
PFAS Strategic Roadmap: EPA's Commitments to Action 2021–2024

- Consider the Lifecycle of PFAS
- Get Upstream of the Problem
- Hold Polluters Accountable
- Ensure Science-Based Decision-Making
- Prioritize Protection of Disadvantaged Communities

TSCA Section 8(a)(7) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances

https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024

https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/tsca-section-8a7-reporting-and-recordkeeping



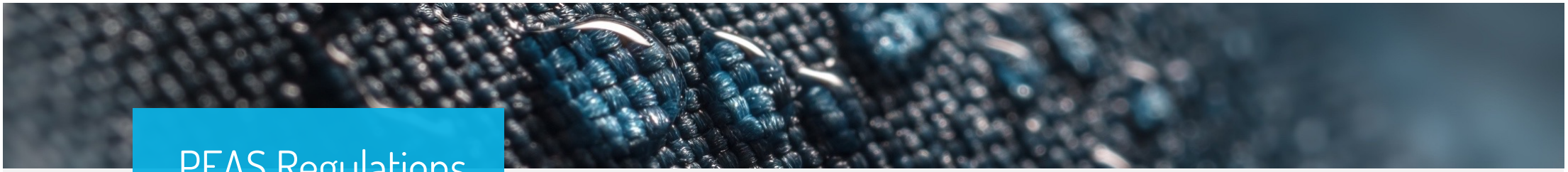
PFAS Regulations
USA – Federal

Per- and Polyfluoroalkyl Substances (PFAS)
Final PFAS National Primary Drinking Water Regulation

EPA United States Environmental Protection Agency

Compound	Final MCLG	Final MCL (enforceable levels)[1]
PFOA	Zero	4.0 parts per trillion (ppt) (also expressed as ng/L)
PFOS	Zero	4.0 ppt
PFHxS	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
HFPO-DA (commonly known as GenX Chemicals)	10 ppt	10 ppt
Mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS	1 (unitless) Hazard Index	1 (unitless) Hazard Index

https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas



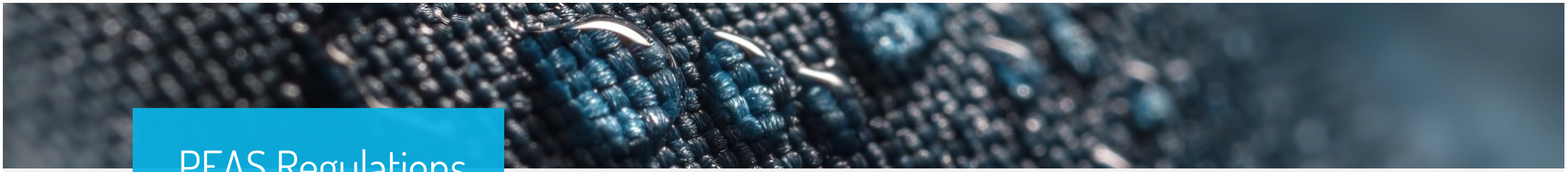
PFAS Regulations
USA – States

Class-based PFAS bans in key sectors with implementation dates

	All Products	Artifical Turf	Apparel	Carpets / Rugs	Cleaning Products	Cookware	Dental Floss	Fabric Treatments	Firefighting Foam	Food Packaging	Incontinence Products	Juvenile Products	Menstrual Products	Cosmetics/Personal Care Products	Pesticides	Ski Wax	Textile Articles	Turnout Gear
Alaska									2025									
California			★2025	2021**				2022**	2022	2023		2023	2029	2025			★2025	
Colorado		2026	2028	2024	2026	2026	2026	2024	2023	2024		2024	2026	★2025		2026	2028	
Connecticut			2028	2028	2028	2028	2028	2028	2021	2023		2028	2028	2028		2028	2028	★2028
Hawaii									2024	2024								
Illinois			2032				2032		2025			2032	2032	2032				2027
Maine	2032	★2029	2029	2023	2026	2026	2026	2023	2022	2022		2026	2026	2026	★2030	2026	2026	
Maryland				2024					2024	2024				2025*				
Massachusetts																		2027
Minnesota	2032			2025	★2025	★2025	★2025	2025	2024	2024		2025	★2025	2025		2025	2025	
New Hampshire									2020									
New Jersey				2028					2027	2028				2028				
New York			2025	2024					2020	2022								2028
Oregon										2025		2023**		2027				
Rhode Island		2029	2027	2027		2027		2027	2025	2025		2027	2027	2027		2027	2027	2027
Vermont		2026	2028	★2023	2027	2028	2027	★2023	2023	2023	★2026	2026	2026	2026		★2023	2026	2029
Washington	★2023**		2027	2025	2027			2025	★2020	★2022				2025			2026	
Totals	**3**	**4**	**9**	**11**	**6**	**6**	**6**	**8**	**15**	**13**	**1**	**9**	**8**	**12**	**1**	**6**	**8**	**6**

* not class-based; covers some PFAS substances but not all
** ongoing regulation
★ indicates the state was the first to adopt policy banning PFAS in that specified key sector

https://www.saferstates.org/resource/state-action-on-pfas/



PFAS Regulations

USA – States

MINNESOTA POLLUTION CONTROL AGENCY

PFAS reporting system

PFAS Product Reporting Information System for Manufacturers (PRISM) is used by manufacturers and their representatives to submit PFAS in product reports and pay related fees. Anyone may use PRISM to review PFAS in product data, except trade secrets, after a review period.

Access PRISM | PRISM support

MAINE DEPARTMENT OF Environmental Protection

- Sales prohibited on products containing Intentionally added PFAS for many consumer applications.
- Current Unavoidable Use (CUU) exemptions come with fees and reporting requirements.

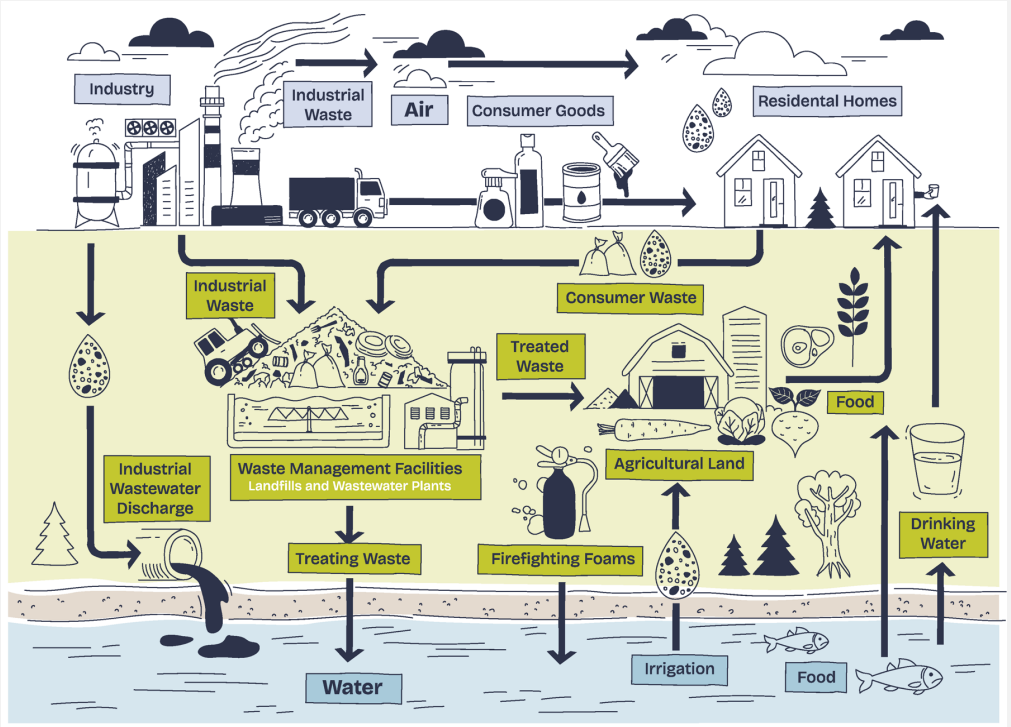
https://www.pca.state.mn.us/air-water-land-climate/reporting-pfas-in-products

https://www.maine.gov/dep/spills/topics/pfas/PFAS-products/



PFAS Life-Cycle

Complex & Includes Capture & Destruction



- Analysis
- **Capture**
- Recycling (of capture mediums, *e.g.*, GAC)
- **Destruction (PFAS)**
- **Reuse (PFAS)**



Does PFAS have a future?
Complex Regulatory Landscape

- EU Universal PFAS Restriction Proposal
- EU Individual PFAS Restrictions
- EU Member State Restrictions
- UK PFAS Plan
- USA Federal and State PFAS Regulations
- Reporting requirements
- Global inconsistency

Substance(s)			EU	UK	USA
PFAS					
Perfluoroalky acids	Perfluorocarboxylic acids	TFA			
		C4-C7 PFCAs			
		PFHxA			
		PFOA, its salts and related substances			
		C9-C14 PFCA			
		LC-PFCA (C9 - C21)			
	Perfluorsulfonic acids	PFBS			
		PFHxS, its salts and related substances			
		PFOS, its salts and related substances			
Fluorinated polymers		Fluoropolymers			
		Fluoroelastomers			
		Side chain fluorinated polymers			
Fluorotelomers					
Perfluoroalkanes/perfluorocycloalkanes					
F-gases					

Regulated	Partially regulated (some USA states)	Regulation proposed	Data gathering

Ensuring Critical PFAS have a Future
Responsible Manufacture, Use and Disposal

- Product and process knowledge
- Emission minimisation
- Technical role
- Supply chain communication
- Alternatives
- Stakeholder engagement



What's Next for PFAS? The Journey Continues

- Complex global regulatory landscape
- Supply chain knowledge
- Obsolescence Risks & Reduced PFAS Availability
- Increased engagement between PFAS stakeholders and regulators
- Reduced Emissions
- Advances in PFAS Abatement, Remediation & Recycling



BLUE FROG SCIENTIFIC

Chemical Regulatory Compliance

Scientific & Consulting Services for the Chemical Industry

bluefrogscientific.com

Department
for Environment,
Food & Rural Affairs

Update on chemicals policy & the PFAS Plan

27 October 2026

Ed Latter, Emerging Chemical Risks Policy Team Leader, Defra

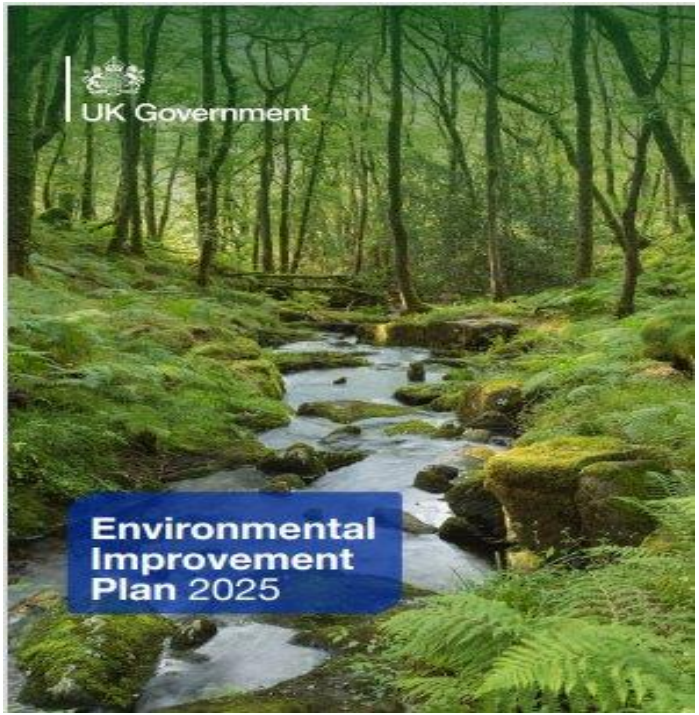
Background

- Defra holds lead responsibility for **UK REACH** (Registration, Evaluation, Authorisation & Restriction of Chemicals)
- We lead on regimes implementing international Conventions (**Persistent Organic Pollutants** (POPs) and **Mercury**)
- We lead on chemicals policy more widely including in relation to Perfluoroalkyl and Polyfluoroalkyl Substances (**PFAS**)

Environmental Improvement Plan 2025

We published the new EIP 2025 in December 2025

- Long-term plan for improving the natural environment and enjoyment of it
- Sets out approach to managing chemicals and pesticides
- Includes prioritised actions to minimise environmental risk from chemicals



Goal 4: Chemicals and pesticides

We will minimise environmental and health risks from chemicals and pesticides

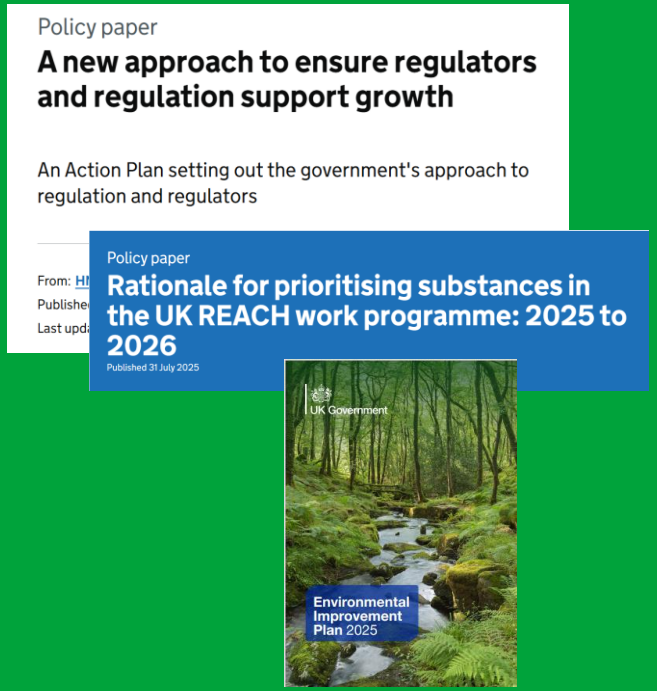
We have a robust regulatory regime – and we aim to:

- Ensure chemicals are used and managed safely
- Reduce impact of legacy chemicals
- Minimise environmental risks from chemicals and pesticides

Commitment 40: Reform UK REACH to enable protections that address chemical pollution to be applied more quickly, efficiently and in a way that is more aligned with our closest trading partners, especially the EU, by December 2028.

Commitment 41: Take action on PFAS through a new PFAS Plan

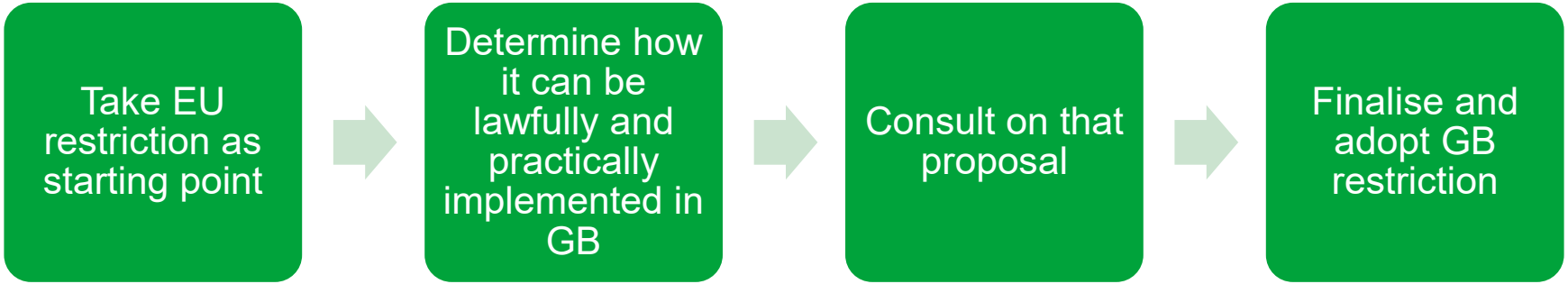
UK REACH: policy direction



- Stop duplication of regulatory work carried out by other trusted jurisdictions
- Increase stability, predictability and consistency
- More alignment with our closest trading partners, especially the EU
- Support economic growth by reducing business complexity and trade barriers

UK REACH restrictions: emerging thinking

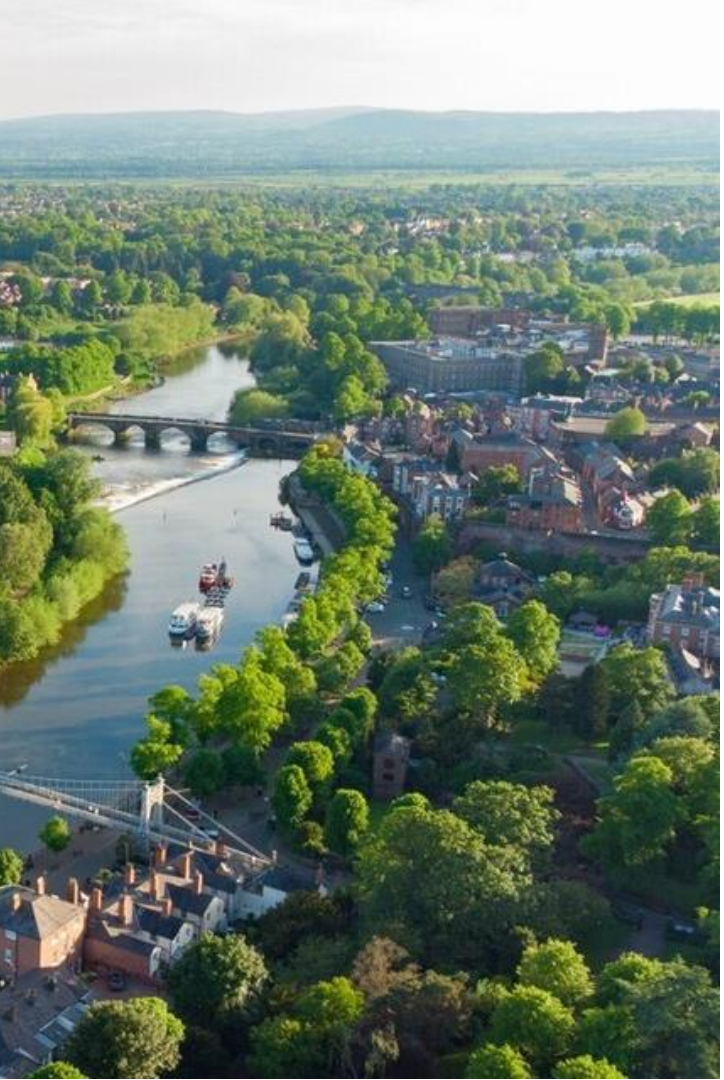
EIP commitment 40: Reform REACH to address chemical pollution more quickly, efficiently and more in line with trading partners, especially the EU, by December 2028.



- Shorter than current restriction process
- Only diverge from an EU restriction in **exceptional circumstances**

Restrictions: next steps

- Develop detail of **policy**:
  - Assess risks and benefits
  - Define exceptional circumstances, and what happens if these apply
  - Understand voluntary alignment with existing EU restrictions
  - Consider timeframe for following an EU restriction
- Public **consultation**
- Secondary **legislation** (by end 2028)



PFAS Plan

Building a safer future together

- The Plan sets out a vision and our approach for managing PFAS risks.
- It covers a range of regulatory and non-regulatory interventions, measures and initiatives with specific actions and delivery milestones.

Our long-term vision is to work in partnership, taking a **science-based and proportionate approach**, to **reduce and minimise the impacts of harmful PFAS** on public health and the environment, including through the **transition to safer alternatives**.



PFAS Plan- Structure

- Set out under 3 pillars:
    1. **Understanding PFAS Sources**
    2. **Tackling PFAS Pathways**
    3. **Reducing ongoing exposure to PFAS**

- The 3 sections work together to manage PFAS risks in a coordinated way. Understanding PFAS helps deliver effective and well prioritised interventions that, in the longer term, contribute together to reducing PFAS risks across the environment and society. This will, in turn, reduce our reliance on costly preventative measures at the point of exposure.

Section 1 Outcomes

- The outcomes we hope to achieve on understanding PFAS sources and impacts are:
  - improved knowledge of the uses, extent and impact of PFAS across society and in our natural environment
  - more efficient and effective use of evidence for societal benefit, including by designing and delivering better coordinated research programmes across government, academia, industry and other stakeholders
  - improved evidence of PFAS across different environmental compartments (such as land, air and water) and improved knowledge of PFAS exposure pathways to support effective interventions, prioritised according to risk

Section 2 Outcomes

- The outcomes we hope to achieve on tackling PFAS pathways are:
  - environmental monitoring of PFAS demonstrating a significant reduction of emissions of PFAS to the environment from production, use and disposal
  - industry moving away from PFAS in manufacturing and consumer products, towards the growing international market for PFAS alternatives
  - the public having clear, accessible information on PFAS risks and product content, enabling informed choices regarding the products they buy and use and supporting demand for PFAS-free alternatives

Section 3 Outcomes

- The outcomes we hope to achieve by reducing ongoing exposure are:
  - public health and environmental risks from PFAS exposure are reduced, as shown by ongoing monitoring of PFAS exposure levels
  - regulations to reduce exposure to PFAS from different routes are in place and work together, to ensure a high level of protection for public health
  - improved join-up between the regulations and approaches that reduce wildlife exposure to PFAS and that contribute to nature recovery, ensuring sensitive ecosystems are better protected

Key activities since launch of the plan

- Progressing our delivery of actions in the plan.
- Provided government response to Environmental Audit Committee’s report on PFAS
- Stakeholder engagement activities to promote the Plan and our ambitions

Next Steps

- Focus on delivery of the actions. To monitor implementation of the plan, the Plan includes a list of actions in the with delivery outlook and responsible owners.
- Engagement with stakeholders which will help shape delivery.
- This plan is a stepping stone to meet our longer-term vision.
- As a commitment set out in the Environment Improvement Plan (EIP), review and reporting of this plan will become part of our statutory reporting cycle for the EIP.

Engagement



UK REACH developments and consultations

We encourage you to sign up for the HSE eBulletin – go to the HSE website.



Contacting Defra

You can contact us directly for any questions on UK REACH and Chemicals policy: chemicalsengagement@defra.gov.uk