

Global PFAS regulations, guidance,
and regulatory methods

PFAS in Water Legislation Overview

eBook



Contents

Introduction	3	European Union legislation for PFAS in drinking water	17
Regulation, regulatory guidance, and regulatory methods	4	EU Drinking Water Directive (EU 2020/2184)	17
Keeping PFAS testing labs up to date	4	Methodology and instrumentation	18
Current standards and consensus methods for PFAS analysis in environmental water	5	European Union legislation for PFAS in surface water	19
United States legislation for PFAS in drinking water	9	Water Framework Directive (WFD)	19
EPA method 533 versus EPA method 537.1	10	Environmental Quality Standards Directive (EQSD)	19
Methodology and instrumentation	11	Environmental Quality Standards (EQS)	20
United States legislation for PFAS in nonpotable water, soil, and tissue	12	Ground Water Directive (GWD)	20
National Pollutant Discharge Elimination System (NPDES)	12	Methodology and instrumentation	20
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)	13	European Union legislation for PFAS in wastewater and sediment	21
Toxic Substances Control Act (TSCA)	13	Water Framework Directive (WFD), Environmental Quality Standards (EQS), and Environmental Quality Standards Directive (EQSD)	21
Methodology and instrumentation	14	Urban Wastewater Treatment Directive (UWWTD)	22
United States legislation for PFAS in nonpotable water	15	Industrial and Livestock Rearing Emissions Directive (IED 2.0)	22
EPA method 8327 versus EPA method 1633A	16	Regulations for PFAS in sediment	22
Methodology and instrumentation	16	Methodology and instrumentation	22
		Solutions for PFAS testing in water	23

PFAS in Water Legislation Overview

Introduction

Per- and polyfluoroalkyl substances (PFAS) have garnered significant attention due to their persistence in the environment and potential health impacts.¹ Environmental PFAS regulations aim to protect public health by setting guidelines and enforceable limits for PFAS in water, soil, and air. However, keeping up with rapid legislative changes and managing analytical challenges, such as detecting low concentrations and avoiding contamination, is difficult. The complexity of regulations, which vary by local, federal, and regional jurisdictions, further complicates compliance efforts.



Introduction

Regulation, regulatory guidance, and regulatory methods

Regulations set legally enforceable limits for monitoring PFAS. Regulatory methods provide standardized testing protocols to ensure data quality across laboratories. Regulatory guidance, on the other hand, offers recommendations that are not legally enforceable but serve the public interest and often progress into regulations over time. Together, these elements form a comprehensive framework for PFAS monitoring and compliance.

Globally, PFAS legislation has evolved significantly, with notable differences in approaches. In the United States, the Environmental Protection Agency (EPA) has published a few PFAS testing methods after multi-lab validation and public comment process, which are ready for easy adoption to use for most matrices frequently analyzed in the environmental testing labs.² In contrast, European Regulatory bodies prescribe performance criteria for testing with detection limits based on safe exposure limits, with specified quality criteria and demonstrated calculation of method detection limits below these limits. This allows for flexibility in testing approaches while defined validation processes and accreditation of methods ensure high quality data.

Keeping PFAS testing labs up to date

Given the dynamic nature of PFAS regulations, it is imperative for testing laboratories to remain current with the latest legislative developments. This ensures that they can provide accurate and compliant testing services, meeting both regulatory requirements and client needs. Current trends indicate that PFAS testing will likely become more comprehensive, detecting more compounds at lower limits while expecting faster turnaround time for results. By understanding the importance of regulations, the challenges faced, and the distinctions between different types of regulatory frameworks, laboratories can better navigate this intricate field and contribute to the protection of public health and the environment.

References

1. U.S. Environmental Protection Agency. Our Current Understanding of the Human Health and Environmental Risks of PFAS. <https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas> (accessed April 28, 2025).
2. U.S. Environmental Protection Agency. PFAS Analytical Methods Development and Sampling Research. <https://www.epa.gov/water-research/pfas-analytical-methods-development-and-sampling-research> (accessed April 28, 2025).

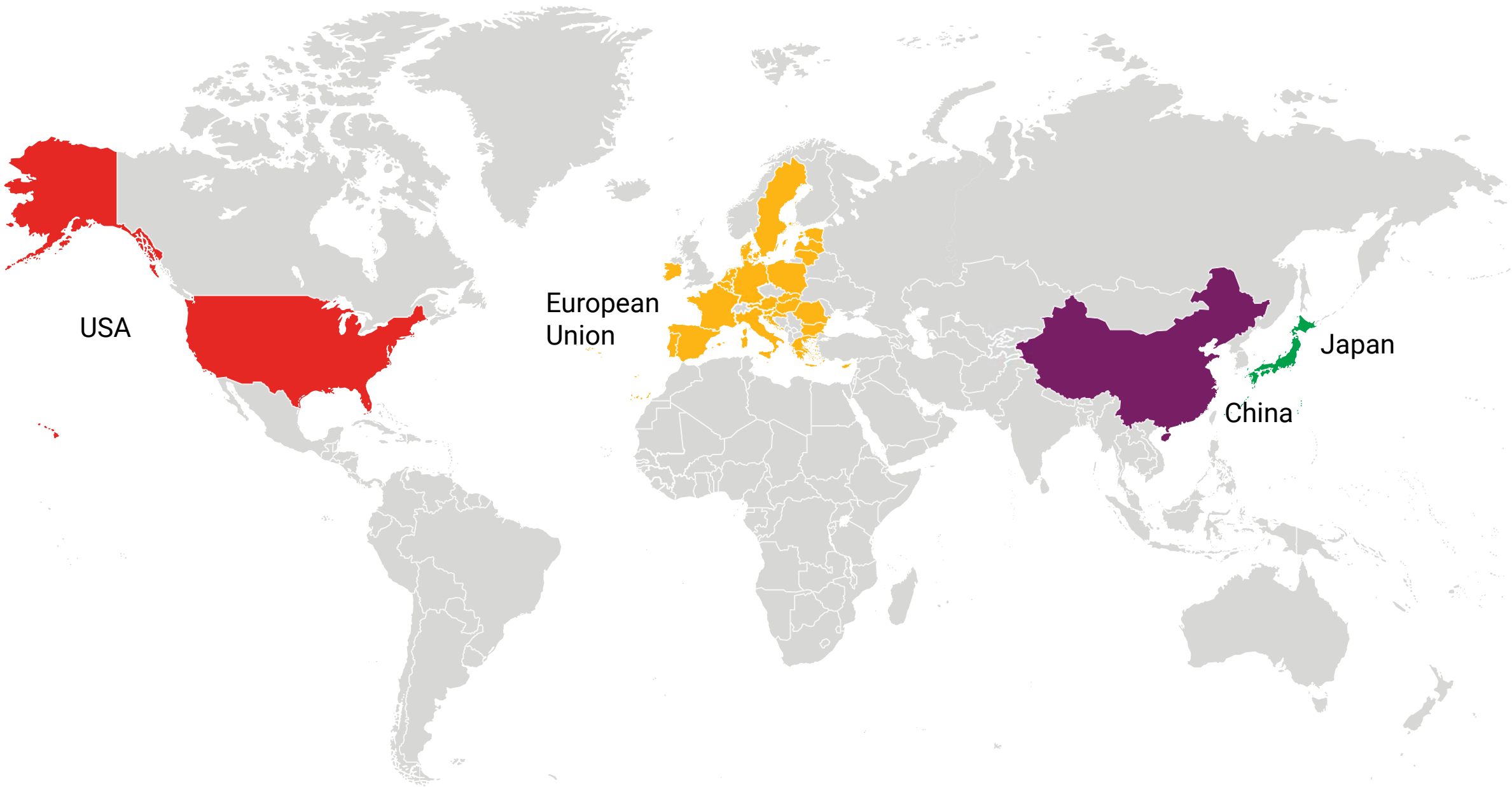
PFAS in Water Legislation Overview

Current standards and consensus methods for PFAS analysis in environmental water

The safety of drinking water is increasingly threatened by the presence of PFAS. As research continues to uncover the extent and toxicity of PFAS in the environment—and their impact on wildlife, food sources, and human health—additional compounds of concern are being identified. This growing body of evidence underscores the urgent need for effective management and robust analytical testing.

Governments and regulatory agencies worldwide are actively developing and implementing testing frameworks to ensure water safety. With regulations expanding across global jurisdictions, it is essential for laboratories and stakeholders to stay informed and adopt the most effective approaches to PFAS testing.

The next regulatory wave is coming—and those unprepared may find themselves dangerously outpaced.



Legislation for PFAS Testing in Environmental Water

Current standards and consensus methods for PFAS analysis in environmental water

PFAS Methods/Guidelines Summary

Region	Matrix	Methods, Guidelines	Number of PFAS Compounds	Instrument	Sample Preparation
United States	Drinking water	EPA 533	25	LC/TQ	SDVB SPE
	Drinking water	EPA 537.1	18	LC/TQ	WAX SPE
	leachate, wastewater, groundwater, surface water, animal tissue (fish tissue)	EPA 1633A	40	LC/TQ	WAX SPE + carbon SPE
		EPA 1621	Absorbable organic fluorine	CIC (combustion ion chromatography)	Carbon cartridge
	Surface water, groundwater, wastewater	EPA 8327	24	LC/TQ	Co-solvation
ASTM	Water, sludge, wastewater	ASTM D7979	NA	LC/TQ	Co-solvation
ASTM	Soil	ASTM D7698	NA	LC/TQ	Co-solvation
ASTM	Soil, biosolids	ASTM D8535	NA	LC/TQ	Co-solvation
ASTM	Aqueous	ASTM D8421	44	LC/TQ	Co-solvation
Global ISO	Nonfiltered water (drinking water, natural water, wastewater)	ISO 21675:2019	30	LC/TQ	WAX SPE
China	Drinking water	GB 5749-2022	2	NA	NA
	Drinking water	GB/T 5750.8-2023	11	LC/TQ	WAX SPE
	Surface water, groundwater, wastewater, sewage, sea water	HJ 1333-2023	2	LC/TQ	WAX SPE
	Soil, sediment	HJ 1334-2023	2	LC/TQ	WAX SPE
European Union	Drinking water	EN 17892:2024	Sum of 20 PFAS, PFAS total	NA	NA

European member states implement based on European Directives. See local legislation for accurate information.

Legislation for PFAS Testing in Environmental Water

Current standards and consensus methods for PFAS analysis in environmental water

PFAS Regulations in Water

Region	Regulations	Regulated Water Types	What is Regulated		
United States	National Primary Drinking water Regulation by Safe Drinking Water Act (SDWA)	Drinking water	PFAS comound	MCL (maximum contaminant level)	MCLG (maximum contaminant level goal)
			PFOA	4.0 ppt (ng/L)	Zero
			PFOS	4.0 ppt (ng/L)	Zero
			PFHxS	10 ppt (ng/L)	10 ppt (ng/L)
			PFNA	10 ppt (ng/L)	10 ppt (ng/L)
			HFPO-DA	10 ppt (ng/L)	10 ppt (ng/L)
			Mixture of tow or more of PFHxS, PFNA, HFPO-DA, PFBS	Hazard Index 1	Hazard Index 1
	Clean Water Act (CWA)	Nonpotable water (wastewater, groundwater, landfill leachate)	The Clean Water Act prohibits anybody from discharging "pollutants" through a "point source" into a "water of the United States" unless they have an NPDES permit. The permit will contain limits on what you can discharge, monitoring and reporting requirements, and other previsions to ensure that the discharge does not hurt water quality or people's health. In essence, the permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.		
	Resource Conservation and Recovery Act (RCRA)	Hazardous waste TSDFs (treatment, storage, and disposal facilities)	On 8 February 2024, EPA proposed changes to the Resource Conservation and Recovery Act regulations by adding nine particular PFAS compounds, their salts, and their structural isomers to its list of hazardous constituents in Title 40 of the Code of Federal Regulations Part 261 Appendix VIII.		
			PFBA		
			PFHxA		
			PFOA		
			PFNA		
			PFDA		
			HFPO-DA		
			PFOS		
			PFHxS		
			PFBS		

Legislation for PFAS Testing in Environmental Water

Current standards and consensus methods for PFAS analysis in environmental water

PFAS Regulations in Water				
Region	Regulations	Regulated Water Types	What is Regulated	
European Union	(EU) 2020/2084 Drinking Water Directive	Drinking water	Sum of 20 PFAS: 100 ng/L (PFBS, PFDA, PFDoDA, PFHpA, PFHxS, PFHxA, PFNA, PFOS, PFOA, PFTrDA, PFUnDA, PFBA, PFHpS, PFPeA, PFPeS, PFNS, PFUnDS, PFDoDS, PFTrDS)	
			PFAS total: 500 ng/L	
	(EU) 2000/60/EC Water Framework Directive	All water types	Proposed to include more PFAS in 202	
	(EU) 2008/105/EC, Environmental Quality Standard Directive	All water types		
	(EU) 2006/118/EC, Groundwater Directive	Groundwater		
China	National Standard for Drinking Water Quality, GB 5749-2022	Drinking water	PFAS compound	Limit
			PFOA	80 ng/L
			PFOSA	40 ng/L
Japan	Provisional Drinking Water Limits	Drinking water	Sum of 3 PFAS (provisional)	
			PFOS	50 ppt
			PFOA	
			PFHxS	

European member states implement based on European Directives. See local legislation for accurate information.

PFAS in Water Legislation Overview

United States legislation for PFAS in drinking water

EPA methods 533 and 537.1

The Safe Drinking Water Act (SDWA) is the primary federal law that ensures the quality of Americans’ drinking water.¹ Under the SDWA, the U.S. Environmental Protection Agency (EPA) is authorized to set national standards for drinking water to protect against both naturally occurring and synthetic contaminants. EPA methods 533 and 537.1 are integral to this regulatory framework, providing standardized procedures for measuring PFAS levels in drinking water.² These methods support the enforcement of the National Primary Drinking Water Regulations (NPDWR) for PFAS, ensuring that public water systems monitor and control these contaminants effectively.³

The information obtained through EPA methods 533 and 537.1 is used to regulate PFAS in drinking water by establishing maximum contaminant levels (MCLs) for specific PFAS compounds. The EPA has set enforceable MCLs for several PFAS, including PFOA (4 ng/L), PFOS (4 ng/L), PFHxS (10 ng/L), PFNA (10 ng/L), HFPO-DA (10 ng/L), and mixtures containing two or more of PFHxS, PFNA, HFPO-DA, and PFBS by unitless Hazard Index.⁴ Public water systems are required to monitor these compounds and take corrective actions if levels exceed the established MCLs.

$$\text{Hazard Index (1 unitless)} = \left(\frac{[\text{HFPO - DA}]_{\text{ppt}}}{[10 \text{ ppt}]} \right) + \left(\frac{[\text{PFBS}]_{\text{ppt}}}{[2000 \text{ ppt}]} \right) + \left(\frac{[\text{PFNA}]_{\text{ppt}}}{[10 \text{ ppt}]} \right) + \left(\frac{[\text{PFHxS}]_{\text{ppt}}}{[10 \text{ ppt}]} \right)$$

United States legislation for PFAS in drinking water

EPA method 533 versus EPA method 537.1

EPA method 533 is designed to detect a broader range of 25 PFAS compounds including short-chain ones, specifically those with carbon chain lengths of C4 to C12.⁵ Method 533 is particularly useful for detecting newer, short-chain PFAS that are increasingly used as replacements for longer-chain compounds. These short-chain PFAS are more soluble and mobile in water, making them a concern for groundwater contamination.

Alternatively, EPA method 537.1 focuses on a different set of 18 PFAS compounds, including some longer-chain variants.⁶ Method 537.1 is used for a comprehensive analysis of both short- and long-chain PFAS, providing a broader assessment of potential contamination. Laboratories may choose between these methods based on the specific PFAS compounds they need to analyze, compliance needs, and specific client demands. In some cases, state regulations may require one method or the other.



United States legislation for PFAS in drinking water

Methodology and instrumentation

EPA method 533 uses isotope dilution with solid-phase extraction (SPE) for sample clean-up and concentration followed by liquid chromatography/tandem mass spectrometry (LC/TQ) for detection and analysis. This method involves extracting PFAS from water samples using a weak anion exchange (WAX) SPE cartridge, followed by elution with methanol and 2% ammonium hydroxide.

EPA method 537.1 employs SPE with styrene-divinylbenzene (SDVB) media, followed by LC/TQ analysis. The extraction process involves eluting PFAS with methanol, concentrating the extract, and reconstituting it with a methanol-water mixture.

The detection limits for compounds in these methods vary but are generally in the low parts per trillion (ppt) range, ensuring that even trace levels of PFAS can be accurately measured.

Agilent offers comprehensive start-to-finish PFAS testing workflows. Our solutions feature certified PFC-free consumables and flow path to eliminate potential sources of lab-introduced PFAS contamination—ensuring confident, accurate results. Learn more here: [EPA method 533](#) and [EPA method 537.1](#).

References

1. U.S. Environmental Protection Agency. Safe Drinking Water Act (SDWA). <https://www.epa.gov/sdwa> (accessed April 28, 2025).
2. U.S. Environmental Protection Agency. EPA PFAS Drinking Water Laboratory Methods. <https://www.epa.gov/pfas/epa-pfas-drinking-water-laboratory-methods> (accessed April 28, 2025).
3. U.S. Environmental Protection Agency. Safe Drinking Water Act (SDWA) and Polyfluoroalkyl Substances (PFAS). <https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas> (accessed April 28, 2025).
4. U.S. Environmental Protection Agency. PFAS NPDWR Fact Sheet: Hazard Index. https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_fact-sheet_hazard-index_4.8.24.pdf (accessed April 28, 2025).
5. U.S. Environmental Protection Agency. Method 533: Determination of Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution. <https://www.epa.gov/dwanalyticalmethods/method-533-determination-and-polyfluoroalkyl-substances-drinking-water-isotope> (accessed April 28, 2025).
6. U.S. Environmental Protection Agency. Public Record Report: NERL. https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NERL&dirEntryId=343042 (accessed April 28, 2025).

PFAS in Water Legislation Overview

United States legislation for PFAS in nonpotable water, soil, and tissue

EPA method 1633A

EPA method 1633A is a comprehensive analytical procedure designed for the determination of PFAS in various environmental matrices, including aqueous, solid, biosolids, and tissue samples.¹ This method plays a critical role in the regulatory framework for PFAS in the United States. By providing a standardized approach for detecting and quantifying PFAS in environmental samples, it supports the implementation of NPDES permits, CERCLA cleanups, and TSCA regulations.

National Pollutant Discharge Elimination System (NPDES)

The NPDES program, established under the Clean Water Act, regulates the discharge of pollutants into U.S. waters.^{2,3} While there are currently no EPA-approved methods specifically for PFAS under 40 CFR Part 136,⁴ method 1633A is recommended for use in NPDES permits to monitor PFAS discharges from industrial and municipal sources. This method provides a consistent approach for detecting and quantifying PFAS in wastewater, surface water, and groundwater, ensuring compliance with effluent limitations and protecting water quality.



United States legislation for PFAS in nonpotable water, soil, and tissue

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

CERCLA, also known as Superfund, addresses the cleanup of hazardous waste sites and holds responsible parties accountable for contamination.⁵ In 2024, the EPA designated perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) as hazardous substances under CERCLA. This designation requires immediate reporting of releases that meet or exceed reportable quantities and enables the EPA to take enforcement actions to ensure cleanup and cost recovery. Method 1633A can be used to assess PFAS contamination at Superfund sites, providing critical data for remediation efforts.

Toxic Substances Control Act (TSCA)

TSCA provides the EPA with authority to regulate the manufacture, import, processing, and distribution of chemicals, including PFAS.⁶ Under TSCA, the EPA has implemented reporting and recordkeeping requirements for PFAS, requiring manufacturers to provide information on PFAS uses, production volumes, and potential exposures. Additionally, the EPA has issued significant new use rules (SNURs) to prevent the reintroduction of certain PFAS into the market without prior review. Method 1633A supports TSCA regulations by providing a reliable means to monitor PFAS in various environmental and industrial contexts.



United States legislation for PFAS in nonpotable water, soil, and tissue

Methodology and instrumentation

EPA method 1633A employs liquid chromatography/tandem mass spectrometry (LC/TQ) to identify and quantify 40 specific PFAS compounds. The method involves sample preparation, extraction, and analysis steps to ensure accurate and reliable results; exact sample preparation procedures vary and are matrix dependent. The limits of detection for PFAS compounds using method 1633A vary but are generally in the low parts per trillion (ppt) range, making it suitable for detecting trace levels of these contaminants.

Agilent provides complete solutions for PFAS environmental testing, offering workflows for [EPA method 1633A](#) to ensure accurate results from the start.

References

1. U.S. Environmental Protection Agency. Method 1633A: December 5, 2024. <https://www.epa.gov/system/files/documents/2024-12/method-1633a-december-5-2024-508-compliant.pdf> (accessed April 28, 2025).
2. U.S. Environmental Protection Agency. National Pollutant Discharge Elimination System (NPDES). <https://www.epa.gov/npdes> (accessed April 28, 2025).
3. U.S. Environmental Protection Agency. Summary of the Clean Water Act. <https://www.epa.gov/laws-regulations/summary-clean-water-act> (accessed April 28, 2025).
4. U.S. Environmental Protection Agency. Title 40, Chapter I, Subchapter D, Part 136. <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-D/part-136> (accessed April 28, 2025).
5. U.S. Environmental Protection Agency. Summary of the Comprehensive Environmental Response, Compensation, and Liability Act. <https://www.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act> (accessed April 28, 2025).
6. U.S. Environmental Protection Agency. Summary of the Toxic Substances Control Act. <https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act> (accessed April 28, 2025).

PFAS in Water Legislation Overview

United States legislation for PFAS in nonpotable water

EPA method 8327

EPA method 8327 is designed for the rapid screening of 24 selected PFAS in various water matrices, including surface water, groundwater, and wastewater.¹ This method is suggested for compliance with environmental regulations, particularly under the Resource Conservation and Recovery Act (RCRA) and Superfund programs, which address hazardous waste management and contaminated site remediation, respectively.



RCRA regulates the management of hazardous waste from its generation to disposal, ensuring that PFAS-contaminated waste is handled properly.² Recently, the EPA proposed listing certain PFAS as hazardous constituents under RCRA, which would enhance the agency's ability to address PFAS contamination through the RCRA Corrective Action Program.³ These compounds include perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), hexafluoropropylene oxide-dimer acid (HFPO-DA or GenX), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), perfluorodecanoic acid (PFDA), perfluorohexanoic acid (PFHxA), and perfluorobutanoic acid (PFBA).

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) is a federal program aimed at cleaning up sites contaminated with hazardous substances.⁴ In 2024, the EPA designated two PFAS compounds, PFOA and PFOS, as hazardous substances under CERCLA, facilitating cleanup efforts and holding responsible parties accountable.

EPA method 8327 versus EPA method 1633A

EPA method 8327 is typically used for rapid screening and quantification of PFAS in nonpotable water samples, offering a quicker turnaround time compared to other methods. However, it has higher detection limits and may be less precise in complex matrices. In contrast, EPA method 1633A, which is more comprehensive and validated for a broader range of matrices, provides lower detection limits and greater accuracy but requires more time and resources. These distinctions make EPA method 8327 suitable for initial assessments and routine monitoring, and EPA method 1633A preferred for detailed analysis and regulatory compliance.

Methodology and instrumentation

In EPA method 8327, samples are prepared and analyzed directly by liquid chromatography/tandem mass spectrometry (LC/TQ) without extensive extraction or concentration steps, making it faster but less sensitive than other methods. Detection limits vary but are generally higher than EPA 1633.

Agilent offers robust PFAS testing solutions with PFAS-free consumables and instrument flow paths, ensuring quick turnaround times and reliable results. Learn more about our comprehensive workflows for [EPA method 8327](#).

References

1. U.S. Environmental Protection Agency. SW-846 Test Method 8327: Polyfluoroalkyl Substances (PFAS) by Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). <https://www.epa.gov/hw-sw846/sw-846-test-method-8327-and-polyfluoroalkyl-substances-pfas-liquid-chromatographytandem> (accessed April 28, 2025).
2. U.S. Environmental Protection Agency. Summary of the Resource Conservation and Recovery Act. <https://www.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act> (accessed April 28, 2025).
3. U.S. Environmental Protection Agency. RCRA Corrective Action Cleanup Enforcement. <https://www.epa.gov/enforcement/rcra-corrective-action-cleanup-enforcement> (accessed April 28, 2025).
4. U.S. Environmental Protection Agency. Summary of the Comprehensive Environmental Response, Compensation, and Liability Act. <https://www.epa.gov/laws-regulations/summary-comprehensive-environmental-response-compensation-and-liability-act> (accessed April 28, 2025).

PFAS in Water Legislation Overview

European Union legislation for PFAS in drinking water

The European Union (EU) Drinking Water Directive (Directive (EU) 2020/2184) sets the legal framework for ensuring the safety and quality of water intended for human consumption.¹ This directive, which came into force on January 12, 2021, introduces limits for PFAS compounds. In the EU, PFAS compounds are regulated as a class, unlike in the U.S. where they are only regulated individually. Limits are set for the collective total of PFAS in a sample. By regulating specific PFAS compounds and monitoring additional substances, the EU aims to mitigate the risks associated with these persistent pollutants and ensure the provision of safe drinking water.

EU Drinking Water Directive (EU 2020/2184)

EU 2020/2184 mandates the regulation of specific PFAS compounds, which are known for their persistence and bioaccumulative properties. To maintain compliance, the directive establishes parametric values for the sum of 20 PFAS compounds. The maximum limit is 0.1 µg/L (100 ppt) for the sum of the 20 regulated PFAS. The directive also sets a limit of 0.5 µg/L (500 ppt) for the total concentration of all PFAS in drinking water. The directive requires the monitoring of PFAS compounds ranging from C4 to C13 to provide a comprehensive assessment of water quality.



European Union legislation for PFAS in drinking water

Methodology and instrumentation

Methods in the EU are performance based, and there is no specific method required to comply with EU 2020/2184 as long as sensitivity and specificity criteria are met. The primary methodologies include liquid chromatography coupled with tandem mass spectrometry (LC/TQ) and gas chromatography/mass spectrometry (GC/MS). Solid-phase extraction (SPE) is commonly used for sample preparation, providing excellent sensitivity by concentrating the sample. Automated SPE systems can additionally improve productivity of the testing laboratories.

Approaches to European legislation can vary depending on each country's concerns, geography, and previous findings. A flexible and scalable approach to initial analytical method selection is critical. Agilent develops methods and tools for future-proof experimental design. The sample preparation and LC flow path are specifically created to eliminate lab-introduced PFAS contamination. Additionally, the choice of offline sample preparation, online sample preparation, and direct injection approaches are supported and can be tailored to maximize coverage and capability. Learn more about how Agilent solutions can be used to meet [European regulations for PFAS in water](#).

References

1. European Union. Directive (EU) 2020/2184 on the quality of water intended for human consumption. <https://eur-lex.europa.eu/eli/dir/2020/2184/oj/eng> (accessed April 28, 2025).

PFAS in Water Legislation Overview

European Union legislation for PFAS in surface water and ground water

The regulation of PFAS in surface water within the European Union (EU) is governed by a comprehensive legislative framework designed to protect both human health and the environment. This framework includes several key directives and standards.

Water Framework Directive (WFD)

The WFD, established in 2000, is the primary legislative instrument for water protection in the EU.¹ It aims to achieve good qualitative and quantitative status of all water bodies, including surface waters, by setting environmental objectives and quality standards. The WFD identifies priority substances and mandates member states to monitor and manage these pollutants to meet the established standards. The directive requires member states to develop river basin management plans and implement measures to reduce pollution from priority substances.²

Environmental Quality Standards Directive (EQSD)

The EQSD complements the WFD by establishing specific environmental quality standards (EQS) for priority substances, includes 24 proposed PFAS compounds.³ These standards assess the chemical status of water bodies and ensure pollutant levels do not exceed safe thresholds. The EQSD includes provisions for estuaries and coastlines, recognizing their unique chemical dynamics compared to freshwater systems. It sets standards for pollutants in saline waters and biota, protecting organisms from harmful levels of PFAS. The EQSD specifies annual average concentrations and maximum allowable concentrations for various PFAS compounds, which member states must adhere to in order to achieve good chemical status for their water bodies.

European Union legislation for PFAS in surface water

Environmental Quality Standards (EQS)

The EQS are critical components of the WFD and EQSD. They define the acceptable concentration levels of priority substances, including PFAS, in surface water.⁴ The EQS for PFAS are based on scientific assessments of their potential risks to human health and the environment. These standards are periodically reviewed and updated to reflect new scientific knowledge and technological advancements.

Ground Water Directive (GWD)

Unlike broader water management directives, the GWD specifically mandates the establishment of threshold values for pollutants tailored to national or regional conditions, ensuring localized protection.⁵ It emphasizes the identification and reversal of significant upward trends in pollutant concentrations, enabling proactive measures to prevent environmental damage. The GWD integrates seamlessly with the WFD, ensuring a coordinated and comprehensive strategy for water quality management across the EU.

Methodology and instrumentation

To ensure compliance with these directives, member states are required to implement robust monitoring programs. No specific method is required for compliance monitoring, but generally liquid chromatography coupled with tandem mass spectrometry (LC/TQ) is employed to detect and quantify PFAS in surface water at very low concentrations. The monitoring data is used to assess the chemical status of water bodies and to identify any exceedances of the established EQS.

References

1. European Union. Water Framework Directive. https://environment.ec.europa.eu/topics/water/water-framework-directive_en (accessed April 28, 2025).
2. European Environment Agency. Emerging Chemical Risks in Europe. <https://www.eea.europa.eu/publications/emerging-chemical-risks-in-europe/emerging-chemical-risks-in-europe> (accessed April 28, 2025).
3. European Union. Environmental Quality Standards Applicable to Surface Water. <https://eur-lex.europa.eu/EN/legal-content/summary/environmental-quality-standards-applicable-to-surface-water.html> (accessed April 28, 2025).
4. European Chemicals Agency. Environmental Quality Standards. <https://echa.europa.eu/environmental-quality-standards> (accessed April 28, 2025).
5. European Union. Groundwater. https://environment.ec.europa.eu/topics/water/groundwater_en (accessed April 28, 2025).
6. European Commission. Proposal for a Directive of the European Parliament and of the Council. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52022PC0540> (accessed April 28, 2025).

PFAS in Water Legislation Overview

European Union legislation for PFAS in wastewater and sediment

The European Union (EU) has implemented comprehensive legislation to regulate PFAS in wastewater and sediment. The regulatory framework is like that employed for the regulation of PFAS in surface water. However, regulation for wastewater and sediment is more complex and involves multiple directives and regulations.

Water Framework Directive (WFD), Environmental Quality Standards (EQS), and Environmental Quality Standards Directive (EQSD)

The WFD establishes a framework for protecting all water bodies in the EU, aiming for good chemical and ecological status.¹ EQS are legally binding limits for specific pollutants, including PFAS, designed to protect human health and the environment.² The EQSD complements the WFD by setting specific EQS for priority substances, ensuring member states monitor and report on these substances in water bodies.³



Urban Wastewater Treatment Directive (UWWTD)

The UWWTD aims to protect the environment from the adverse effects of urban wastewater discharges.⁴ It sets stringent requirements for the collection, treatment, and discharge of urban wastewater, including the removal of PFAS compounds. This directive ensures that wastewater treatment plants implement effective measures to reduce PFAS levels before discharge into water bodies.

Industrial and Livestock Rearing Emissions Directive (IED 2.0)

The IED 2.0 regulates emissions from industrial installations, including those that may release PFAS into the environment.⁵ It mandates the use of best available techniques to minimize emissions and protect water quality. Industries are required to monitor and report their emissions, ensuring that PFAS levels are kept within safe limits.

Regulations for PFAS in sediment

Regulation of sediment is addressed through the Marine Strategy Framework Directive (MSFD) and the Habitats Directive. The MSFD aims to maintain good environmental status for EU marine waters by monitoring and reducing pollution from hazardous substances.⁶ Member states must develop strategies to address PFAS contamination and protect marine ecosystems. The Habitats Directive focuses on conserving biodiversity by protecting natural habitats and wild species, including measures to prevent PFAS pollution that could harm these areas.⁷ It requires member states to implement conservation measures and monitor PFAS impacts on vulnerable ecosystems.

Methodology and instrumentation

No specific method is prescribed to comply with EU regulations for PFAS in wastewater and sediment, however testing is performance based. Typically, liquid chromatography/tandem mass spectrometry (LC/TQ) is used due to its sensitivity and specificity. The limits of detection for these compounds vary but typically range from low parts per trillion (ppt) to parts per billion (ppb) levels, ensuring compliance with regulatory limits.

References

1. European Union. Water Framework Directive. https://environment.ec.europa.eu/topics/water/water-framework-directive_en (accessed April 28, 2025).
2. European Chemicals Agency. Environmental Quality Standards. <https://echa.europa.eu/environmental-quality-standards> (accessed April 28, 2025).
3. European Union. Environmental Quality Standards Applicable to Surface Water. <https://eur-lex.europa.eu/EN/legal-content/summary/environmental-quality-standards-applicable-to-surface-water.html> (accessed April 28, 2025).
4. European Union. Directive (EU) 2024/3019. <https://eur-lex.europa.eu/eli/dir/2024/3019/oj> (accessed April 28, 2025).
5. European Union. Directive 2010/75/EU on Industrial Emissions (integrated pollution prevention and control). <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:02010L0075-20240804> (accessed April 28, 2025).
6. European Union. Marine Strategy Framework Directive. https://research-and-innovation.ec.europa.eu/research-area/environment/oceans-and-seas/eu-marine-strategy-framework-directive_en (accessed April 28, 2025).
7. European Union. Habitats Directive. https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en (accessed April 28, 2025).

PFAS in Water Legislation Overview

Solutions for PFAS testing in water

PFAS pose a significant risk to consumers, water suppliers, and environmental health. Contamination can occur through industrial discharge, wastewater treatment plants, and even household products. Effective and efficient analytical testing is crucial for managing exposure, ensuring water safety, and maintaining regulatory compliance. Given the complexity of regulations and testing requirements, a simplified and scalable solution is essential—allowing for adjustments in the compounds analyzed, detection limits required, and the number of samples tested.

Agilent offers PFAS water testing workflows designed for various water matrices, providing rapid and simplified analyses that reduce the risk of false positives.

Ensure your water safety testing laboratory can achieve compliance simply and confidently.



Reduce PFAS background contamination from [instruments](#), [samples](#), and [solvents](#).



Agilent [PFAS environmental startup kits](#) are pre-tested for PFAS background and optimized for isolating PFAS from water samples.



Robust [HPLC](#) and [LC/MS](#) instrumentation ensure minimal sample reruns and maximum uptime.

Compound Name	EPIC Name	CAS	Formula	ChemSpider	Polarity	MW	Resonance	Product	Prog
PFOS	Heptafluorooctanoic acid	375-26-4	C ₈ F ₁₇ O ₂	5505	Negative	311.36	213	180	1
PFNA	Nonafluorooctanoic acid	279-05-3	C ₉ F ₁₉ O ₂	5506	Negative	323.39	231	219	1
PFHxS	Hexafluorooctanoic acid	307-24-4	C ₈ F ₁₅ O ₂	5504	Negative	313.35	213	209	1
PFHxS	Undecafluorooctanoic acid	307-24-4	C ₁₁ F ₁₉ O ₂	5505	Negative	313.35	213	178	1
PFHpA	Tetrafluorooctanoic acid	375-05-3	C ₈ F ₁₇ O ₂	5505	Negative	303.30	203	219	1
PFHpA	Tetrafluorooctanoic acid	375-05-3	C ₈ F ₁₇ O ₂	5505	Negative	303.30	203	180	1

Accelerate method development with verified methodologies tailored to EPA, EU, and ASTM standards, along with a curated [PFAS MRM database](#).

Next >

PFAS in Water Legislation Overview

Solutions for PFAS testing in water

PFAS pose a significant risk to consumers, water suppliers, and environmental health. Contamination can occur through industrial discharge, wastewater treatment plants, and even household products. Effective and efficient analytical testing is crucial for managing exposure, ensuring water safety, and maintaining regulatory compliance. Given the complexity of regulations and testing requirements, a simplified and scalable solution is essential—allowing for adjustments in the compounds analyzed, detection limits required, and the number of samples tested.

Agilent offers PFAS water testing workflows designed for various water matrices, providing rapid and simplified analyses that reduce the risk of false positives.

Ensure your water safety testing laboratory can achieve compliance simply and confidently.



Calibrate your workflow with our portfolio of [standards](#).



Familiar, easy-to-use software simplifies data analysis with Agilent MassHunter software and streamlines data management with Agilent [SLIMS](#).



Take advantage of a team of PFAS testing [experts](#) customized training, and method consulting services to get your laboratory up and running quickly.



Explore the breadth of solutions in the Agilent portfolio for [environmental testing](#), including [PFAS testing in water](#) and [PFAS testing in soil](#).

[< Previous](#)

Learn more:

www.agilent.com/en/solutions/environmental/water-testing/pfas-in-water

Get answers to your technical questions and
access resources in the Agilent Community:

community.agilent.com

U.S. and Canada

1-800-227-9770

agilent_inquiries@agilent.com

Europe

info_agilent@agilent.com

Asia Pacific

inquiry_lsca@agilent.com

[Return to table of contents](#)

This information is subject to change without notice.
DE-009207

© Agilent Technologies, Inc. 2025
Published in the USA, October 1, 2025
5994-8689EN

