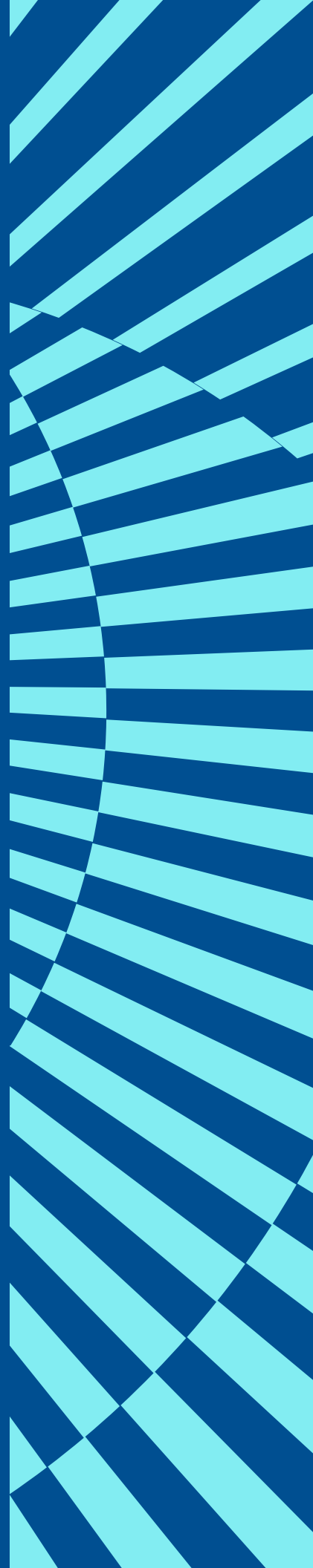


U.S. Chamber of Commerce

PFAS Treatment Technologies & Policy Outlook

Cost Realities, Deployment Barriers,
and Policy Framework for Action

July 2026



Executive Summary

There are pressures at all levels of government to address PFAS environmental management. In 2024, the Environmental Protection Agency (EPA) [finalized](#) a rule imposing the first-ever federal national primary drinking water standards for PFAS — including maximum contaminant levels (MCLs) of 4 parts per trillion (ppt) for PFOA and PFOS — subjecting an estimated 66,000 public water systems and other facilities to a legal compliance framework. These levels are at the upper limits of modern laboratory science for detection and will result in significant costs and unintended consequences on public and private stakeholders. In May 2026, EPA issued a proposed rule to enable water systems to opt into extending the compliance deadline to 2031 should they meet certain requirements. In addition, EPA issued a second proposed rule to rescind the part of the 2024 rule that applied to four PFAS substances (PFHxS, PFNA, HFPO-DA (GenX), and the mixture of these three PFAS Plus PFBS). In the proposed rescission rule, EPA conceded that the 2024 rule had not followed the procedural requirements of the Safe Drinking Water Act. The public comment period for these two proposed rules ended July 20, 2026. Litigation challenging the 2024 rule is pending in the D.C. Circuit.

A central question is whether the technologies, financing, and regulatory architecture are in place to effectively remedy PFAS in the environment at scale.

The short answer is: partially. Separation and treatment technologies capable of removing PFAS from drinking water are commercially available and widely deployed. The harder challenges -- destruction, permanence, and cost -- remain unresolved. Concentrated PFAS waste streams produced by treatment systems must go somewhere, and many destruction technologies, while advancing, remain expensive, geographically limited, or at the pilot stage. Compounding these technical gaps, EPA's PFAS R&D statutory authority [lapsed](#) at the end of fiscal year (FY) 2024, and recent state revolving funds (SRF) appropriations, while nominally [restored](#), face [earmarking constraints](#) that fall well short of the coming compliance wave.

This document evaluates the technology landscape for monitoring, treatment, disposal, and destruction of PFAS, the cost and deployment barriers public and private operators face, and policy approaches that can close the gaps -- including the potential for voluntary industrial water reuse initiatives—drawing on multistakeholder engagement compiled by the U.S. Chamber of Commerce during 2025-2026.¹ The framework that emerges favors best-available science, incremental risk minimization, and alignment across government, industry, technology providers, utilities, and the research community.

¹ U.S. Chamber of Commerce. Initial PFAS Clean Water Solutions Technology Inventory: Draft Concept Note (October 2025). Crowdsourced inventory of 150+ vendor entries; not an endorsement of any specific technology or vendor. PFAS Clean Water Solutions Policy Roundtable: Discussion Topics Summary (2026).



Regulatory Landscape

- **Status of 2024 EPA Rule Setting Drinking Water Standards for PFAS.** After the change in Administrations, EPA decided to retain the portion of the 2024 rule that imposed enforceable MCLs of 4 ppt for PFOA and PFOS and proposed to allow water systems to opt into extending the compliance deadline to 2031, so long as they meet certain requirements and take steps to protect public health. In May 2026, EPA published proposed rules to extend this compliance deadline and to rescind the MCLs for the four additional Index PFAS compounds (PFHxS, PFNA, HFPO-DA (GenX), and PFBS). All the MCLs set forth in 2024 rule remain in place in the interim, with ongoing litigation challenging the MCLs in the D.C. Circuit adding further uncertainty. Several states, including [Pennsylvania](#), [Vermont](#), and [Connecticut](#), are enacting standards, though not uniformly: some are stricter than the federal baseline, while others are less so, creating a fragmented compliance landscape and implications on interstate commerce for multi-state operators.
- **Status of 2024 EPA Rule Designating Two PFAS (PFOA and PFOS) as Hazardous Substances under CERCLA.** EPA's 2024 rule designating PFOA and PFOS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which EPA decided to retain after the change in Administrations, exposes potentially responsible parties to joint-and-several cleanup liability while giving regulators and private parties cost-recovery authority. In August 2026, a panel of D.C. Circuit judges issued a decision upholding the rule. EPA's [enforcement discretion policy](#) accompanying the rule, which is guidance rather than a binding rule, deprioritizes enforcement against farmers, municipal landfills, water utilities, municipal airports, and local fire departments—categories of parties typically thought likely to have handled PFAS-containing products without being their source (i.e. “passive receivers”). The policy provides no protection to such parties (or any other parties) against private lawsuits under CERCLA, leaving a very wide range of affected persons and entities with substantial legal exposure that remains unresolved. The business community remains concerned regarding the significant costs and unintended consequences of utilizing CERCLA to try to facilitate cleanup of PFAS in the environment – and continues to pursue alternative policies that are likely to be more effective and efficient in achieving this goal.
- **Residuals & Waste Streams.** Deploying separation technologies such as granular activated carbon (GAC) and reverse osmosis (RO) produces concentrated PFAS residuals that must be managed downstream. The business community has also proposed alternative approaches to EPA's pending [proposed](#) RCRA rule to list nine PFAS as hazardous constituents and the updated analytical methods for PFAS. Without those methods, facilities cannot reliably demonstrate compliance or design effective pretreatment systems, creating regulatory uncertainty for operators managing residual streams and products of incomplete destruction.

PFAS Treatment Landscape At-A-Glance

Three functional categories constitute the PFAS treatment landscape. **Separation technologies** are the current compliance backbone. **Destruction technologies** are the necessary endpoint for permanently eliminating PFAS. **Monitoring technologies**—critical for detection and compliance verification—remain inconsistent and under-deployed. The table below summarizes readiness, cost, and limitations across all three, drawn from the U.S. Chamber of Commerce's stakeholder technology inventory and EPA cost modeling.

Category	Key Technologies	Readiness, Cost & Deployment Profile
Separation	- Granular Activated Carbon (GAC) - Ion Exchange Resin (IXR) - Reverse Osmosis (RO) / Nanofiltration - Foam Fractionation - Colloidal Activated Carbon - Powdered Activated Carbon (PAC) - Thermal Desorption (soil remediation)	Readiness: Commercial scale — EPA-designated Best Available Technologies Cost: Operating costs vary significantly by technology and system size; GAC and IXR typically cost \$0.10–\$0.60/kgal at municipal scale² Key Limitation: Captures/concentrates PFAS but does not destroy — spent media, residuals, and brine require downstream management
Destruction	- Supercritical Water Oxidation (SCWO) - High-Temperature Incineration - Alkaline Hydrothermal Reaction (AHR) - Electrochemical Oxidation (EO) - UV Photolysis / Adv. Reduction Process - Non-Thermal Plasma - Photocatalytic Destruction Using Nanomaterials	Readiness: SCWO & incineration: commercial but geographically limited; EO, plasma, UV-ARP at pilot/demonstration phase Cost: SCWO: ~\$40–\$370/kgal³ for concentrated residuals (early projections); cost-effectiveness improves significantly when paired with pre-concentration via RO or GAC. Costs for other destruction technologies not yet established at scale Key Limitation: The 2026 NDAA created a certification pathway for the Department of War, which could be replicated with other federal agency destruction performance standards or certification pathways; relevant RCRA rulemaking remains pending
Monitoring	EPA Methods 537.1 / 1633A/ 621 (lab-based) - OTM-45 and OTM-50 methods to evaluate products of incomplete combustion. - Electrochemical & fluorescence sensors (university R&D) - Fluorescence-based field sensors - Colorimetric sensors - Rapid mass spectrometry	Readiness: Lab methods validated for compliance; field sensors bench/pilot scale only Key Limitation: No rapid, low-cost field detection widely available; EPA has not yet promulgated analytical methods for waters and wastewaters, delaying industrial pretreatment programs. In addition, EPA has not promulgated PFAS air emission performance tests. There is also no pathway for alternative methods other than laboratory testing for risk detection or compliance monitoring.

NOTE: A significant share of commercial destruction and advanced separation technology originates from European firms, reflecting earlier regulatory action in the European Union. Domestic investment has direct implications for U.S. market competitiveness in a sector projected to reach \$3.9 billion by 2033.

² U.S. Environmental Protection Agency. Technologies and Costs for Removing Per- and Polyfluoroalkyl Substances (PFAS) from Drinking Water (April 2024).

³ Nagar, K. and Deshusses, M.A. "Supercritical Water Oxidation (SCWO)." Environmental Restoration Wiki (enviro.wiki), SERDP/ESTCP. Accessed April 2026.

Deployment Barriers & Policy Approaches

PFAS remediation is a potential liability and business continuity issue for industrial operators and other parties, not only a public infrastructure challenge. Manufacturing facilities, landfills, military contractors, and agricultural operations face direct CERCLA exposure and [National Pollutant Discharge Elimination System](#) (NPDES) permit obligations under the Clean Water Act, independent of utility compliance timelines. EPA estimates sector-wide annual compliance costs for the MCL at \$1.5 billion;⁴ AWWA's updated 2024 analysis puts the annualized figure at \$2.7–3.5 billion—roughly twice EPA's estimate—with total capital investment requirements of \$37.1–48.3 billion over the next five years alone.⁵ The Chamber's 2022 Monte Carlo modeling, conducted in anticipation of a then-pending federal MCL, projected treatment investment costs exceeding \$12 billion at a 10 ng/L or ppt threshold, rising sharply as MCLs tighten below that level – a trajectory confirmed by the now-finalized 4 ppt standard. Against these figures, the \$5 billion in federal infrastructure funding dedicated to PFAS represents a small fraction of the projected need. The destruction technology gap compounds this financing challenge: without finalized performance standards and liability clarity, private capital cannot underwrite treatment infrastructure at scale. The following table maps the key barriers to corresponding policy approaches, reflecting input from the U.S. Chamber of Commerce's roundtable stakeholders.⁶

Policy Lever	What It Addresses	Status & Considerations
Restore & Expand Federal R&D Authority	EPA's PFAS R&D statutory authority lapsed at the end of FY2024, interrupting federal research on treatment, monitoring, and destruction technologies. Reauthorization would restore the foundation for SBIR/STTR funding and interagency coordination under the 2024 PFAS Federal R&D Strategic Plan . An interagency process to align priorities and leverage funding across EPA, DOE national laboratories, the Department of Defense (DoD), the Department of Agriculture (USDA), and academia would accelerate progress without duplicating efforts.	Reauthorization legislation could consider EPA's authority through FY2029 — the most proximate near-term vehicle.⁷ National Lab testbed networks for pilot and demonstration projects represent a high-leverage, cost-shared model.⁸

⁴ U.S. Government Accountability Office. Report on a Major Rule: Environmental Protection Agency — PFAS National Primary Drinking Water Regulation (RIN: 2040-AG18). B-336287. May 13, 2024. Citing EPA Economic Analysis estimating annual quantified costs of \$1,548,640,000, including total public water system costs and primacy agency costs.

⁵ American Water Works Association (AWWA). "AWWA Releases Updated National PFAS Cost Estimate." August 2, 2024. Analysis conducted by Black & Veatch and Corona Environmental using EPA UCMR 5 data. Available via: Association of State Drinking Water Administrators (ASDWA), asdwa.org.

⁶ U.S. Chamber of Commerce. Initial PFAS Clean Water Solutions Technology Inventory: Draft Concept Note (October 2025). Crowdsourced inventory of 150+ vendor entries; not an endorsement of any specific technology or vendor. PFAS Clean Water Solutions Policy Roundtable: Discussion Topics Summary (2026).

⁷ H.R. 6667 (PFAS R&D Reauthorization Act). Introduced by Rep. Chris Pappas (D-NH) and Brian Fitzpatrick (R-PA), referred to the Subcommittee on Water Resources and Environment. Reauthorizes through FY2029.

⁸ U.S. Environmental Protection Agency. Clean Water Act Methods Update Rule 22 for the Analysis of Contaminants in Effluent. Proposed January 21, 2025.

Policy Lever	What It Addresses	Status & Considerations
Establish Destruction & Residual Standards	No finalized federal performance-based standard defines adequate PFAS destruction — no destruction removal efficiency (DRE) threshold, effluent discharge criteria, or technology certification pathway exists. Separately, policies are needed to manage residuals and waste streams produced by effective separation technologies (GAC, RO, incineration). Until RCRA hazardous constituent rulemaking is finalized and analytical methods for natural waters and wastewaters are promulgated, and disposal requirements remain inconsistent. The latest interim guidance on PFAS disposal and destruction is open for public comment and does not include approaches for new technologies. Whether pretreatment programs are needed is unclear.	Interim guidance for disposal and destruction must include appropriate and workable solutions and should be implemented in partnership with industry. RCRA rulemaking to list nine PFAS as hazardous constituents: pending finalization. The Chamber has recommended that if EPA finalizes the rule, it should apply only to PFOA and PFOS. CWA Methods Update Rule 22 (Jan. 2025): proposed, not finalized.
Pilot, Demonstration & Test Bed Programs	Performance and cost data for emerging destruction technologies at real-world scale are insufficient for utility procurement, regulatory approval, or private financing. Structured demonstration programs — including test bed networks at National Laboratories for monitoring, treatment, disposal, and destruction technologies — would generate standardized data packages and accelerate the pathway from lab to commercial deployment. The DoD's Environmental Security Technology Certification Program (ESTCP) is the primary existing model; a civilian counterpart co-administered by EPA and the Department of Energy (DOE) is the logical extension.	No active civilian demonstration program currently exists. FY2026 EPA funding restored to FY2025 levels by Congress (H.R. 6938, Jan. 2026). Risk minimization and risk-based definition offers a framework to make progress while ensuing costs are appropriately considered. Cost-benefit analysis requirements for agency programs should be strengthened to ensure demonstrated impact for taxpayer investments and environmental performance. Agencies should be required to review outcomes.
Market-Making & Financing	The primary financing barrier is market structure, not a shortage of available funds. Private capital cannot underwrite PFAS treatment infrastructure without regulatory certainty. Voluntary compliance incentives and beyond-compliance approaches, including industrial water reuse, closed-loop industrial processes, and public-private partnerships for shared destruction infrastructure, can reduce both treatment costs and PFAS discharges without waiting for federal action. Appropriate mechanisms for directing available funds toward destruction-infrastructure and cleanup warrant further debate and policy development.	Federal infrastructure funding stabilized: \$10B PFAS/emerging contaminants; \$26B SRF — earmarking constrains availability.

Policy Lever	What It Addresses	Status & Considerations
Water Reuse & Voluntary Source Remediation	Policies and incentives should foster increased adoption of industrial water reuse and closed-loop industrial processes as a primary mechanism to reduce PFAS discharges at the source — going beyond minimum compliance. Keeping PFAS in closed-loop industrial processes (with opportunities for in-loop recycling) minimizes environmental release and reduces downstream treatment burdens. Traditional collaboration between wastewater utilities and the agricultural community — including land application of biosolids — should be preserved through commonsense, tiered risk management frameworks (e.g., Michigan's tiered biosolids model) rather than categorical prohibition.	No federal industrial water reuse incentive framework specific to PFAS currently exists. Voluntary initiatives to increase adoption of industrial water reuse should be pursued.

This document draws on the U.S. Chamber of Commerce's multi-stakeholder PFAS technology inventory, post-roundtable discussion input, federal regulatory and appropriations records, peer-reviewed literature, and current legislative tracking. It is intended as a resource for discussion.



Appendix: PFAS Regulatory & Statutory Reference

Summary of proposed and final rulemakings, statutory authorities, and funding mechanisms referenced throughout this white paper. Status reflects information available as of April 2026.

Regulation / Authority	Legal Basis	Status	Key Date(s)	Scope & Relevance
Drinking Water Standards (Safe Drinking Water Act And Clean Water Act)				
PFAS NPDWR — PFOA & PFOS MCLs (4 ppt)	SDWA	FINAL — RETAINED (in litigation) Proposed Rule – Extension of Compliance Timeframe	Final: Apr. 2024 Retained by EPA leadership: May 2025 Proposed Rule Extension of Compliance Deadline (to 2031) was open for public comment until July 20, 2026.	Establishes enforceable MCLs of 4 ppt for PFOA and PFOS. Subjects ~66,000 public water systems to monitoring and compliance obligations. Challenge to rule remains to be decided by D.C. Circuit. A proposed rule for water systems to opt into a compliance deadline extension to 2031 was open for public comment until July 20, 2026. Standards remain in effect pending litigation.
PFAS NPDWR — Index PFAS MCLs (PFHxS, PFNA, HFPO-DA/GenX, PFBS)	SDWA	FINAL (in litigation) — RESCISSION Is PROPOSED	Final: Apr. 2024 Rescission was open for public comment until July 20, 2026.	Sets MCLs of 10 ppt for PFHxS, PFNA, HFPO-DA, and a Hazard Index MCL for mixtures. Challenge to rule remains to be decided by D.C. Circuit; EPA confessed error in that litigation, citing procedural deficiencies. A proposed rule to rescind these MCLs was open for public comment until July 20, 2026. Standards remain in effect pending litigation.
Clean Water Act (CWA) Methods Update Rule 22 — Analytical Methods for PFAS	CWA	PROPOSED — NOT FINALIZED	Proposed: Jan. 2025	Would promulgate standardized analytical methods for PFAS in effluent, natural waters, and wastewaters. The absence of finalized methods is directly delaying the development of industrial pretreatment programs and NPDES compliance. Key gap identified in the Residuals & Waste Streams section.

Status Key:

Final / In Effect / Enacted	Proposed / Pending Finalization	Proposed Rescission / Lapsed Authority	Guidance / No Active Federal Program
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Regulation / Authority	Legal Basis	Status	Key Date(s)	Scope & Relevance
Drinking Water Standards (Safe Drinking Water Act And Clean Water Act)				
Draft Sewage Sludge Risk Assessment for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS)	CWA	Draft January 2025 – NOT FINALIZED	TBD	The draft risk assessment indicates that in some scenarios, the EPA's acceptable risk thresholds may be exceeded when sewage sludge containing PFOA and PFOS is land applied for beneficial reuse or surface disposed. The draft risk assessment focuses on people living on or near impacted farms or those that rely primarily on their products. The findings presented in the draft risk assessment are preliminary. The EPA expects to publish a final risk assessment after reviewing public comments and revising the draft risk assessment accordingly. Once finalized, the risk assessment will provide information on risk from use or disposal of sewage sludge and will inform the EPA's potential future regulatory actions under the Clean Water Act (CWA). Traditional collaboration between wastewater utilities and the agricultural community — including land application of biosolids — should be preserved through commonsense, tiered risk management frameworks (e.g., Michigan's tiered biosolids model) rather than categorical prohibition. Michigan's tiered biosolids model represents a state-level risk-minimization approach worth evaluating as a federal template.
Hazardous Substance Designation (Cercla / Superfund)				
CERCLA Hazardous Substance Designation — PFOA & PFOS	CERCLA	FINAL — RETAINED (in litigation)	Final: Apr. 2024 Retained by EPA leadership: May 2025	Designates PFOA and PFOS as hazardous substances under CERCLA (the Superfund statute), triggering joint-and-several cleanup liability and cost-recovery authority for regulators and private parties. Creates significant exposure for industrial operators, municipalities, landowners, and agricultural operations. In August 2026, a panel of D.C. Circuit judges issued a decision upholding the rule. Rule remains in effect pending litigation.

Status Key:

Final / In Effect / Enacted	Proposed / Pending Finalization	Proposed Rescission / Lapsed Authority	Guidance / No Active Federal Program
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Regulation / Authority	Legal Basis	Status	Key Date(s)	Scope & Relevance
Waste Management (Resource Conservation And Recovery Act — RCRA)				
EPA CERCLA Enforcement Discretion Policy for Passive Receivers	CERCLA (Guidance)	GUIDANCE — IN EFFECT	Issued: Apr. 2024	Deprioritizes CERCLA enforcement against farmers, municipal landfills, water utilities, municipal airports, and local fire departments. Guidance only — does not confer immunity from private lawsuits.
RCRA Listing — 9 PFAS as Hazardous Constituents	RCRA	PROPOSED — PENDING	Proposed: Feb. 2024	Would list nine PFAS as hazardous constituents and establish disposal and management requirements for PFAS-containing waste streams, including spent GAC and RO brine. The Chamber has recommended that should EPA finalize the rule, EPA should list only PFOA and PFOS as hazardous constituents.
Federal R&D Authority & Funding				
EPA PFAS R&D Statutory Authority	PFAS Action Act (H.R. 6667)/ NDAA	LAPSED — REAUTH. PENDING	Lapsed: Dec. 2024 H.R. 6667 Intro: Dec. 2025	EPA's authority to conduct and fund PFAS research and development lapsed at the end of FY2024, interrupting federal research on treatment, monitoring, and destruction technologies. Bipartisan reauthorization legislation (H.R. 6667) introduced in December 2025 would restore authority through FY2029.
FY2026 EPA Appropriations / State Revolving Funds (SRF)	Annual Appropriations	ENACTED	Enacted: Jan. 2026 (H.R. 6938)	Restores EPA and SRF funding to FY2025 nominal levels. Earmarking constraints effectively reduce available capacity for PFAS compliance below projected demand. \$10B PFAS/emerging contaminants and \$26B SRF available under Bipartisan Infrastructure Law (IIJA).
Bipartisan Infrastructure Law — PFAS Drinking Water Funding	Infrastructure Investment & Jobs Act (2021)	ENACTED	Enacted: Nov. 2021	\$5B dedicated to PFAS testing and treatment at public water systems; \$9B total for emerging contaminants; \$12B for general drinking water improvements. The Chamber's 2022 modeling and AWWA 2024 analysis indicate available federal funding falls well short of total projected remediation demand at 4 ppt.

Status Key:

	Final / In Effect / Enacted		Proposed / Pending Finalization		Proposed Rescission / Lapsed Authority		Guidance / No Active Federal Program
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