Pew

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Submitted via regulations.gov

The Honorable Lee Zeldin, Administrator
U.S. Environmental Protection Agency
EPA Docket Center, Water Docket
Mail code: 28221T
1200 Pennsylvania Ave, NW
Washington, DC 20460

**RE: Rescission of Regulatory Determinations and Removal of Related Provisions for Four PFAS Substances (PFHxS, PFNA, HFPO–DA (GenX), and the Mixture of These Three PFAS Plus PFBS); Notice of Proposed Rule (EPA-HQ-OW-2025-0654)**

Dear Administrator Zeldin:

On behalf of The Pew Charitable Trusts (Pew), thank you for the opportunity to provide comments on the Environmental Protection Agency's (EPA) proposal to rescind both the regulatory determinations and the associated drinking water regulations covering a subset of per- and polyfluoroalkyl substances (PFAS) under the Safe Drinking Water Act (SDWA), promulgated as the PFAS National Primary Drinking Water Regulations (NPDWR) (PFAS Drinking Water Rule).[1]

Pew is a non-profit, nonpartisan research and policy organization dedicated to informing the public, improving public policy, and invigorating civic life with several initiatives related to the health and well-being of American communities, including Pew's safer chemicals project focused on reducing Americans' exposures to endocrine-disrupting chemicals (EDCs).

## Overview

[1] U.S. Environmental Protection Agency (EPA), "Rescission of Regulatory Determinations and Removal of Related Provisions for Four PFAS Substances (PFHxS, PFNA, HFPO–DA (GenX), and the Mixture of These Three PFAS Plus PFBS," Federal Register 91, no. 97 (May 20, 2026):29413, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf.

EPA's proposal to rescind the regulatory determinations and National Primary Drinking Water Regulations (NPDWRs), Maximum Contaminant Level Goals (MCLGs), and Maximum Contaminant Levels (MCLs) related to PFAS is not supported by the best available science and would fail to protect the public from exposure to these harmful chemicals. Pew recommends that EPA withdraw its rescission proposal covering PFHxS, PFNA, HFPO-DA, and PFBS.

Pew appreciates Administrator Zeldin's work as a member of Congress and now as the Administrator of EPA to acknowledge the adverse health effects of PFAS and his efforts to address contamination in New York and across the country.[2, 3] EPA's 2025 announcement of PFAS action as part of the Powering the Great American Comeback initiative charted a course that was previously outlined in EPA's 2019 PFAS Action Plan[4] and its 2021 PFAS Strategic Roadmap.[5] Across all of these actions, progress toward advancing the science, reducing harmful exposures, and cleaning up legacy PFAS contamination are appropriately prioritized.

However, EPA's proposed rescission of the PFAS Drinking Water Rule and the agency's recent position in ongoing litigation[6,7,8] are at odds with these efforts. The rescission proposal, if adopted, would halt needed action on a suite of PFAS occurring in drinking water that disrupt the endocrine system and pose other risks to human health.

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[2] U.S. EPA, "Administrator Zeldin Announces Major EPA Actions to Combat PFAS Contamination," news release, April 28, 2025, https://www.epa.gov/newsreleases/administrator-zeldin-announces-major-epa-actions-combat-pfas-contamination.

[3] U.S. EPA, "EPA Advances Comprehensive PFAS Strategy with Legally Defensible, Practical, Scientifically Sound Drinking Water Protections," news release, May 18, 2026, https://www.epa.gov/newsreleases/epa-advances-comprehensive-pfas-strategy-legally-defensible-practical-scientifically.

[4] U.S. EPA, "EPA's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan," 2019, https://www.epa.gov/sites/default/files/2019-02/documents/pfas_action_plan_021319_508compliant_1.pdf.

[5] "PFAS Strategic Roadmap: EPA's Commitment to Action 2021-2024," US EPA, https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.

[6] Motion for Partial Vacatur, American Water Works Association v. EPA, 24-1188, (D.C. Cir. 2024).

[7] Motion to Sever and Hold Challenges to Index PFAS In Abeyance, American Water Works Association v. EPA, 24-1188, (D.C. Cir. 2024).

[8] Respondents' Reply in Support of their Motion to Sever and Hold Challenges to Index PFAS In Abeyance, American Water Works Association v. EPA, 24-1188, (D.C. Cir. 2024).

**EPA's Approach to its 2024 PFAS Drinking Water Rule is Consistent with the Requirements of SDWA**

The procedural approach followed for the 2024 PFAS Drinking Water Rule is permitted by SDWA; reflects the intent of multiple Congresses; and efficiently advances science-based, public health protection. The law clearly allows EPA to make positive regulatory determinations at the point at which scientific evidence supports that a contaminant or group of contaminants meet the criteria set out in the law, whether or not the contaminants in question have been previously listed on the Contaminant Candidate List (CCL).[9] In addition, SDWA states that the agency "may publish such proposed regulation concurrent with the determination to regulate."[10]

The statute also establishes a strict deadline for EPA to propose a NPDWR upon making a regulatory determination: regulations must be proposed "no later than 24 months," after such a finding. The law does not, however, contain any corresponding restriction on how early a proposal may be drafted and released for comment.[11]

The Agency's current rationale for its decision to rescind a health-protective regulatory standard appears to rest on the contention that the 2024 rule was unduly rushed and therefore flawed.[12] Pew disagrees with the Agency's conclusion and asserts that EPA's prior action to advance the regulatory determinations and NPDWRs for this group of contaminants concurrently was allowed and appropriate.

**The PFAS Drinking Water Rule Is Responsive to the Concerns of Congress and the Public**

Passage of the original SDWA in 1974 and Congressional action since that time reflected serious concern with the safety of public drinking water supplies and interest in establishing and

[9] Safe Drinking Water Act (SDWA) Amendments of 1996, Pub. L. No. 104–182, 110 Stat. 1613 (1996) §1412 (b)(1)(B)(ii)(III)
[10] Safe Drinking Water Act (SDWA) Amendments of 1996, Pub. L. No. 104–182 §1412 (b)(1)(E)
[11] *Ibid.*
[12] U.S. Environmental Protection Agency (EPA), "Rescission of Regulatory Determinations and Removal of Related Provisions for Four PFAS Substances (PFHxS, PFNA, HFPO–DA (GenX), and the Mixture of These Three PFAS Plus PFBS," Federal Register 91, no. 97 (May 20, 2026):29413, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf.

enforcing protective federal standards to govern water quality.[13] The U.S. House of Representatives Committee on Commerce report on the SDWA of 1996 noted:

> Twelve years after its enactment, the Safe Drinking Water Act had not been fully implemented. Members of Congress were especially critical of EPA's failure to establish regulations for new contaminants. For example, from 1974 to 1986, only 1 of 22 interim regulations had been revised and no new regulations had been promulgated since 1976.[14]

The 1986 amendments to SDWA required EPA to promulgate regulations for contaminants that had been studied by the Agency but not acted upon. Congress gave EPA until June 1989 to regulate more than 80 contaminants referenced in the amendments.[15] The 1986 amendments also called for EPA to regulate an additional 25 contaminants every three years.[16] EPA failed to meet that schedule, however, and in 1996 Congress revised the law again, recognizing that health effects and occurrence data were crucial to sound regulatory decisions.[17]

The updated law provided more flexibility on deadlines but also included provisions for both the Unregulated Contaminant Monitoring Rule (UCMR) and the CCL.[18] Notably, EPA has consistently included PFAS in the UCMR beginning with UCMR 3 in 2009.[19] UCMR data has been indispensable to understanding PFAS exposures from U.S. public drinking water systems, providing EPA and the public with important information to characterize risks and support the regulation of multiple PFAS chemicals.

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[13] U.S. EPA, Office of Water, "25 Years of the Safe Drinking Water Act: History and Trends," EPA 818-R-99-007, December 1999.
[14] US House of Representatives Committee on Commerce, Safe Drinking Water Act Amendments of 1996, H.R. Rep. No.104-632 Part 1, https://congress.gov/104/crpt/hrpt632/CRPT-104hrpt632-pt1.pdf.
[15] Humphreys E.H., Congressional Research Service (CRS). "Regulating Contaminants under the Safe Drinking Water Act (SDWA)," 2024, https://www.congress.gov/crs-product/R46652.
[16] Safe Drinking Water Act (SDWA) Amendments of 1986, Pub. L. No. 99-339, 100 Stat. 642 (1986)
[17] U.S. EPA, Office of Water, "25 Years of the Safe Drinking Water Act: History and Trends," EPA 818-R-99-007, December 1999.
[18] Humphreys E.H., Congressional Research Service (CRS). "Regulating Contaminants under the Safe Drinking Water Act (SDWA)," 2024, https://www.congress.gov/crs-product/R46652.
[19] U.S. EPA. "Drinking Water Contaminant Candidate List 3" Federal Register 74, no. 194 (October 8, 2009):51850, https://www.govinfo.gov/content/pkg/FR-2009-10-08/pdf/E9-24287.pdf.

While the 1996 amendments offered new flexibility to EPA and removed the strict schedule for primary drinking water regulations, it did not signal a lack of concern with the pace of rulemaking.[20]

Specific to PFAS, Congress in 2019, through the FY 2020 National Defense Authorization Act, again pressed for action, this time requiring the Agency to include all unregulated PFAS with validated testing methods in UCMR 5. Congress also established a National Emerging Contaminant Research Initiative and created a federal interagency workgroup to address emerging contaminants, among other provisions.[21]

**EPA Has Provided Multiple Opportunities for Public Comment on Regulating Groups of PFAS**

EPA's proposed rule claims that the PFAS Drinking Water Rule process that combined regulatory determinations for the four PFAS with NPDWRs did not allow for sequential and therefore sufficient public comment.[22] While Pew strongly supports sufficient opportunity for public comment as part of any rulemaking process, we disagree with EPA's contention that public comment on the 2024 regulatory determinations and NPWDR was inadequate.

EPA's current proposal diminishes the long public dialogue among federal, state and local stakeholders around regulating individual PFAS chemicals and groups of such chemicals under SDWA. Additionally, this concern implies that EPA's activities under SDWA should or must be viewed in isolation from other important relevant agency efforts, including the actions taken

[20] US House of Representatives Committee on Commerce, Safe Drinking Water Act Amendments of 1996, H.R. Rep. No.104-632 Part 1, https://congress.gov/104/crpt/hrpt632/CRPT-104hrpt632-pt1.pdf.
[21] National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116–92, 133 Stat. 1198 (2019).
[22] U.S. Environmental Protection Agency (EPA), "Rescission of Regulatory Determinations and Removal of Related Provisions for Four PFAS Substances (PFHxS, PFNA, HFPO–DA (GenX), and the Mixture of These Three PFAS Plus PFBS," Federal Register 91, no. 97 (May 20, 2026):29413, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf.

under the agency's PFAS Strategic Roadmap, including draft or final toxicity assessments for PFBA,[23] PFHxA,[24] PFHxS,[25] PFNA,[26] PFDA,[27] GenX,[28] and PFBS.[29]

Since at least 2009, when EPA finalized CCL 3, the possibility of regulating multiple PFAS under SDWA, either individually or as a group, has been a matter of public discussion and engagement. In finalizing CCL 3 in 2009, which included PFOS and PFOA, for example, EPA noted comments from its Science Advisory Board (SAB) "...that perfluorochemicals may be a class of contaminants that the Agency should consider as a group based on their similar structures and chemical makeup."[30] In the same notice, EPA signaled its intention to regulate PFAS chemicals beyond PFOA and PFOS: "The Agency will continue to evaluate perfluorinated compounds to ascertain whether they possess similar toxicological properties and if they are anticipated or known to occur in public water systems."[31]

EPA issued a timeline for upcoming chemical assessments, which included review of PFDA, PFHxS, PFHxA, PFBA, and PFNA in 2018.[32] In 2020, EPA made clear in proposing regulatory

[23] U.S. EPA, "IRIS Toxicological Review of Perfluorobutanoic Acid (PFBA, CASRN 375- 22-4) and Related Salts," December 2022, https://assessments.epa.gov/risk/document/&deid%3D356425#downloads.
[24] U.S. EPA, "IRIS Toxicological Review of Perfluorohexanoic Acid (PFHxA, CASRN 307-24-4) and Related Salts," April 2023, https://assessments.epa.gov/risk/document/&deid%3D357314#downloads.
[25] U.S. EPA, "IRIS Toxicological Review of Perfluorohexanesulfonic Acid (PFHxS, CASRN 335-46-4) and Related Salts," January 2025, https://iris.epa.gov/document/&deid%3D363894#downloads.
[26] U.S. EPA, "IRIS Toxicological Review of Perfluorononanoic Acid (PFNA) and Related Salts," March 2024, https://assessments.epa.gov/risk/document/&deid%3D355409#downloads.
[27] U.S. EPA, "IRIS Toxicological Review of Perfluorodecanoic Acid (PFDA) and Related Salts," July 2024, https://iris.epa.gov/document/&deid%3D361797#downloads
[28] U.S. EPA, "Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3)," October 2021, https://www.epa.gov/system/files/documents/2021-10/genx-chemicals-toxicity-assessment_tech-edited_oct-21-508.pdf.
[29] U.S. EPA, "Human Health Toxicity Values for Perfluorobutane Sulfonic Acid and Related Compound Potassium Perfluorobutane Sulfonate." April 2021, https://www.epa.gov/chemical-research/learn-about-human-health-toxicity-assessment-pfbs.
[30] U.S. EPA. "Drinking Water Contaminant Candidate List 3-Final" Federal Register 74, no. 94 (October 8, 2009):51850, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf. final.
[31] *Ibid.*
[32] U.S. EPA Integrated Risk Information System (IRIS), "IRIS Program Outlook- December 2018," 2018, https://www.epa.gov/sites/default/files/2018-12/documents/iris_program_outlook_december_2018.pdf.

determinations for multiple chemicals including PFOA and PFOS, that it was considering a class-based approach to PFAS regulation and included a section entitled "Consideration for Additional PFAS."[33] EPA also informed the public that it was working on hazard assessments for PFBS, PFNA, PFBA, PFDA, PFHxA, PFHxS, and GenX chemicals.[34]

In 2021, when the Agency finalized the regulatory determinations for PFOS and PFOA, EPA again provided public notice of its continuing interest in possible regulation of additional PFAS chemicals, noting that the Agency "remains committed to…completing peer reviewed toxicity assessments and collecting nationally representative occurrence data for additional PFAS to support future regulatory determinations…." EPA also stated that it was "...committing to making regulatory determinations in advance of the next SDWA deadline for additional PFAS for which the Agency has a peer reviewed health assessment, has nationally representative occurrence data in finished drinking water, and has sufficient information to determine whether there is a meaningful opportunity for health risk reduction...." In this same announcement, EPA discussed the toxicological assessments for PFBS, PFBA, PFHxS, PFHxA, PFNA, PFDA, and HFPO-DA that were in development, writing that, "when complete, these assessments will summarize available scientific information regarding the anticipated human dose-response relationship for these chemicals, which is a key information need for informing a variety of Agency decisions."[35]

Also in 2021, EPA noted in the release of the PFAS Strategic Roadmap that it was "...focused on improving its ability to address multiple chemicals at once, thereby accelerating the effectiveness of regulations, enforcement actions, and the tools and technologies needed to remove PFAS from

[33] U.S. EPA. "Announcement of Preliminary Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List," Federal Register 85, no. 47 (March 10, 2020):14098, https://www.govinfo.gov/content/pkg/FR-2020-03-10/pdf/2020-04145.pdf.
[34] *Ibid.*
[35] U.S. EPA, "Announcement of Final Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List," Federal Register 86, no. 40 (March 3, 2021): 12272, https://www.govinfo.gov/content/pkg/FR-2021-03-03/pdf/2021-04184.pdf.

air, land, and water."[36] In early 2023, the Agency conducted multiple PFAS regional and Tribal listening sessions on the Roadmap and its progress.[37,38]

EPA was also responsive to the public input it received in its proposed PFAS Drinking Water Rule, as evidenced by changes made in the final rule and supporting analyses. For example, in announcing its 2024 final PFAS Drinking Water Rule, EPA changed course and chose to defer an individual regulatory determination to develop an MCL for PFBS, noting that "...after considering the public comments, the EPA has decided to further consider whether occurrence information supports a finding that there is a substantial likelihood that PFBS will individually occur in public water systems and at levels of health concern."[39] Additionally, EPA adjusted its final cost estimates in between the proposed rule and final rule as a response to public comments.[40]

These examples, together with extensive public discussion accompanying various EPA PFAS toxicity assessments, demonstrate that the Agency's consideration of PFAS drinking water regulations has been thorough and has provided multiple opportunities for the public to share perspectives and to submit any relevant data and information.

**The Health Risks of PFHxS, PFNA, HFPO-DA, and PFBS Are Highly Relevant to the PFAS Drinking Water Rule**

Pew disagrees with the Agency's position that information about health risks associated with PFAS is out of the scope of its proposed rule.[41] The scientific evidence on the adverse health

[36] U.S. EPA. "PFAS Strategic Roadmap: EPA's Commitment to Action 2021-2024," 2021, https://www.epa.gov/system/files/documents/2021-10/pfas-roadmap_final-508.pdf.
[37] U.S. EPA, "PFAS Strategic Roadmap Presentation Slides" (presentation, 2023 Regional PFAS Roadmap Listening Sessions), https://www.epa.gov/pfas/2023-regional-pfas-roadmap-listening-sessions.
[38] *Ibid.*
[39] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32539, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.
[40] *Ibid.* at 32626.
[41] U.S. Environmental Protection Agency (EPA), "Rescission of Regulatory Determinations and Removal of Related Provisions for Four PFAS Substances (PFHxS, PFNA, HFPO–DA (GenX), and the Mixture of These Three PFAS Plus PFBS," Federal Register 91, no. 97 (May 20, 2026):29413, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf.

effects of the PFAS in question is highly relevant to the Agency's proposal, and if finalized, EPA's recission proposal would undermine action needed to protect Americans from exposure to these harmful chemicals.

The regulatory determinations for PFHxS, PFNA, HFPO-DA individually and in combination with PFBS, provided in the PFAS Drinking Water Rule, are based on a large body of research indicating harm to human health associated with exposure to individual chemicals as well as the toxicological similarity among the four PFAS, meaning similar or shared adverse health effects in multiple biological systems.[42] All four of these PFAS have been linked to serious health effects in animal studies, epidemiological studies or both, including impacts to lipids such as high cholesterol, growth and development effects such as low birth weight, the liver such as altered liver enzymes, immune function such as reduced vaccine response in children, the endocrine system such as reductions in thyroid hormone levels, and harm to the thyroid and circulatory systems, as documented by EPA's extensive literature reviews and toxicity assessments.[43, 44]

The need to address exposure to mixtures of PFAS is evidenced by the most recent U.S. Centers for Disease Control National Health and Nutrition Examination Survey (NHANES) monitoring data from 2017 to 2020, which found two of these PFAS, PFNA and PFHxS, are each present in more than 96% of the U.S. population simultaneously with PFOA and PFOS.[45] EPA applied a Hazard Index (HI) approach for the four PFAS (PFHxS, PFNA, HFPO-DA, and PFBS) acknowledging that adverse health effects may occur from chemicals in a mixture when they are present at concentrations below those levels that would elicit harm from exposure to the chemical in isolation.[46]

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[42] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32532, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.
[43] *Ibid.*
[44] U.S. EPA. "Maximum Contaminant Level Goals (MCLGs) for Three Individual Per- and Polyfluoroalkyl Substances (PFAS) and a Mixture of Four PFAS." April 2024. https://www.epa.gov/system/files/documents/2024-04/pfas-hi-mclg_final508.pdf
[45] Julianne Cook Botelho et al., "Per- and Polyfluoroalkyl Substances (PFAS) Exposure in the U.S. Population: NHANES 1999–March 2020," *Environmental Research* 270 (2025): 120916, https://www.sciencedirect.com/science/article/pii/S0013935125001677.
[46] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32533, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.

**Regulation of a Mixture of PFAS Is Needed for Effective Health Protection, Including Protection of Sensitive Subpopulations**

Given the shared health effects and co-occurrence in drinking water and in people, a regulatory approach to address these four chemicals as a group is appropriate, necessary, and urgently needed to protect public health. In fact, the Agency's own SAB noted more than a decade ago "...that perfluorochemicals may be a class of contaminants that the Agency should consider as a group." [47]

The 2024 PFAS Drinking Water Rule applies an HI approach based on dose additivity, an approach vetted by the EPA's SAB in 2022, writing:

> The information included in the draft framework supports the conclusion that toxicological interactions of chemical mixtures are frequently additive or close to additive. It also supports the conclusion that dose additivity is a public health protective assumption that typically does not underestimate the toxicity of a mixture...[48]

Dose additivity has been applied to other regulatory assessments, such as EPA's cumulative risk assessment for phthalates under TSCA,[49] and is also widely accepted across the scientific community[50,51] and documented in the literature as an appropriate approach to assess harm from

[47] U.S. EPA. "Drinking Water Contaminant Candidate List 3-Final" Federal Register 74, no. 94 (October 8, 2009):51850, https://www.govinfo.gov/content/pkg/FR-2026-05-20/pdf/2026-10085.pdf.
[48] U.S. EPA Science Advisory Board (SAB), "Review of EPA's Analyses to Support EPA's National Primary Drinking Water Rulemaking for PFAS, Final Report." August 22, 2022." https://sab.epa.gov/ords/sab/r/sab_apex/sab/meeting?p19_id=975&clear=19#minutes.
[49] U.S. EPA, "Revised Draft Technical Support Document for the Cumulative Risk Analysis of Di(2-Ethylhexyl) Phthalate (DEHP), Dibutyl Phthalate (DBP), Butyl Benzyl Phthalate (BBP), Diisobutyl Phthalate (DIBP), Dicyclohexyl Phthalate (DCHP), and Diisononyl Phthalate (DINP) under the Toxic Substances Control Act (TSCA)," May 2025, https://www.epa.gov/system/files/documents/2025-08/28.-draft-revised-cumulative-risk-analysis-.-public-release-.-hero-.-may-2025.pdf.
[50] National Research Council, *Phthalates and Cumulative Risk Assessment: The Tasks Ahead* (Washington, DC: The National Academies Press, 2008).
[51] Olwenn Martin et al., "Ten years of research on synergisms and antagonisms in chemical mixtures: A systematic review and quantitative reappraisal of mixture studies." *Environ Int.* 146(2021):106206. https://doi.org/10.1016/j.envint.2020.106206.

multiple PFAS. Since EPA's publication of the 2024 rule, numerous peer-reviewed studies on human populations, in animals, and *in vitro*, have been published, further supporting the scientific foundation for application of a hazard index approach to regulate this group of PFAS, and underscoring the deleterious health effects associated with exposure to PFAS mixtures.

In the Environmental Influences on Child Health Outcomes (ECHO) cohort, the largest U.S. study on PFAS exposure and birth outcomes involving data from more than 3,300 mother-child pairs, exposure to individual PFAS, as well as the sum concentration for five PFAS, PFOA, PFOS, PFNA, PFHxS and PFDA, measured in maternal serum, was associated with decreased birth weight, based on birthweight-for-gestational-age z-scores, or the odds of being small or large for gestational age. In the model assessing small-for-gestational-age, the observed sum effect was based on equal contributions from each chemical.[52] Long term research on the impacts of being born preterm and at a low birth weight demonstrate an increase in risk of adverse health outcomes, particularly cardiovascular and metabolic outcomes, later in life.[53] In a pregnancy cohort in Arkansas, a mixture of six PFAS measured in serum including PFOA, PFOS, PFNA, PFHxS, PFBS, and PFHxA was associated with cardiometabolic outcomes including reduced levels of circulating triglycerides and cholesterol.[54]

Animal studies, particularly rodent models, have been used to study PFAS exposure to individual PFAS and PFAS mixtures, with many using concentrations and mixtures based on real-world exposure scenarios. In mice, exposure to a mixture of equal concentrations of PFOA, PFOS, PFHxS, PFNA, and GenX increased circulating cholesterol levels.[55] In mice exposed to PFAS mixtures based on levels in surface water (PFOS, PFHxS, PFHxS, and PFOA) and soils (PFOS, 6:2FTS, and 8:2 FTS) from firefighting foam contamination, liver weight increased based on

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[52] Amy M. Padula et al., "Birth Outcomes in Relation to Prenatal Exposure to Per- and Polyfluoroalkyl Substances and Stress in the Environmental Influences on Child Health Outcomes (ECHO) Program." *Environ Health Perspect*. 2023 Mar;131(3):37006, https://doi.org/10.1289/EHP10723.

[53] Tonse N.K. Raju, MD et al., "Long-Term Healthcare Outcomes of Preterm Birth: An Executive Summary of a Conference Sponsored by the National Institutes of Health," *The Journal of Pediatrics* 181 (2017): 309-18.e1, https://doi.org/10.1016/j.jpeds.2016.10.015.

[54] Clark R. Sims et al., "Individual and Mixtures of PFAS during Pregnancy Are Associated with Maternal Cardiometabolic Outcomes during Pregnancy," *Environmental Health* 24, no. 1 (2025): 26, https://doi.org/10.1186/s12940-025-01181-8.

[55] K. Roth et al., "Exposure of Ldlr-/- Mice to a Pfas Mixture and Outcomes Related to Circulating Lipids, Bile Acid Excretion, and the Intestinal Transporter ASBT," no. 1552-9924 (Electronic).

dose additivity.[56] In another study, exposure to a nine chemical-PFAS mixture (PFOS, PFHxS, PFHxA, PFHpS, PFOA, PFBS, PFPeS, PFPeA, PFHpA) caused changes to the levels of circulating sex hormones in male mice and changes to sperm and embryo gene expression profiles.[57] And, in female adolescent mice exposed to a mixture of PFOA, PFOS, HFPO-DA and PFBS, the PFAS mixture led to altered ovarian function in adulthood, including disruption of the estrous cycle, a reduction in the number of primordial and primary follicles, and an increase in luteinizing hormone.[58]

*In vitro* studies of PFAS mixtures in cells generally support a dose additivity approach. In an assessment of seven different PFAS mixtures, gene expression changes in liver spheroids were accurately predicted using dose addition.[59] Similarly, concentration addition was indicative of neurotoxic effects in a cell line exposed to three different mixtures spanning environmental relevant concentrations of 12 PFAS, including one based on four PFAS (PFOS, PFOA, PFHxS and PFNA) commonly detected in blood.[60] One recent study that tested 20 different human exposure-relevant PFAS mixtures in eight human cell types representing 50 cellular outcomes generally found greater than additive effects for the mixtures, with liver and neuronal cells being particularly sensitive to PFAS exposure.[61]

Together, these data, and other studies previously evaluated by EPA, indicate that PFAS mixtures can contribute to the development of adverse health outcomes, such as changes in

[56] Andrew G. East et al., "Using Dose-Additive Models to Predict Exposure and Effects of a Military Site Risk-Relevant Pfas Mixture in Mice," *ACS Environmental Au* (2026), https://doi.org/10.1021/acsenvironau.5c00241.
[57] Leah Gillespie et al., "Exposure of Mice to Environmentally Relevant Per- and Polyfluoroalkyl Substances (PFAS) Alters the Sperm Epigenome," *Communications Biology* 8, no. 1 (2025): 1487, https://doi.org/10.1038/s42003-025-08865-4.
[58] Kendra L Clark, Jitu W George, John S Davis, Adolescent exposure to a mixture of per- and polyfluoroalkyl substances (PFAS) depletes the ovarian reserve, increases ovarian fibrosis, and alters the Hippo pathway in adult female mice, Toxicological Sciences, Volume 202, Issue 1, November 2024, Pages 36–49, https://doi.org/10.1093/toxsci/kfae103
[59] Gregory C. Addicks et al., "Per- and Polyfluoroalkyl Substances (PFAS) in Mixtures Show Additive Effects on Transcriptomic Points of Departure in Human Liver Spheroids," *Toxicological Sciences* 194, no. 1 (2023): 38-52, https://doi.org/10.1093/toxsci/kfad044.
[60] Karla M. Ríos-Bonilla et al., "Neurotoxic Effects of Mixtures of Perfluoroalkyl Substances (Pfas) at Environmental and Human Blood Concentrations," no. 1520-5851 (Electronic).
[61] Lucie C. Ford et al., "Probabilistic Concentration-Response Modeling and Risk Prioritization of Defined Mixtures of Pfas Using Human in Vitro Assays," no. 1520-5851 (Electronic).

growth and development, reproductive outcomes, cardiometabolic outcomes, and potentially impacts on the brain, largely consistent with individual PFAS combining to have dose-additive (or greater) effects.

Rescinding drinking water regulations for the individual PFAS (PFNA, PFHxS, HFPO-DA) as well as mixtures of these three plus PFBS would put public health at risk by allowing for continued exposure to these PFAS and by eliminating the monitoring and reporting requirements that alert water users to the presence of these harmful mixtures in their drinking water. Such a repeal would be especially concerning to pregnancies and infants, given PFAS exposure during these critical periods of development are associated with elevated health risks. Recent EPA draft and final toxicological reviews for PFNA and PFHxS identify reduced birth weight from PFNA exposure during pregnancy and reduced vaccine response in children from PFHxS exposure during pregnancy as critical effects associated with exposure to these chemicals, based on evidence from studies in humans.[62, 63] EPA's current proposal would eliminate significant, science-based protections for drinking water.

**Regulation of Groups or Subgroups of Contaminants Is Allowable and Has Precedent under SDWA**

Grouping chemicals is not a novel approach under the SDWA. Indeed, EPA noted in the docket for the 2021 announcement of the final regulatory determinations for PFOS and PFOA, "[r]egulation by groups is a regulatory strategy that is already used for certain regulated contaminants like disinfection byproducts, polychlorinated biphenyls, and radionuclides."[64] As EPA itself stated in 2021, "if EPA attempts to research them [PFAS] one at a time, it will be

[62] U.S. EPA, "IRIS Toxicological Review of Perfluorononanoic Acid (PFNA) and Related Salts (Public Comment and External Review Draft)," 2024, https://iris.epa.gov/document/&deid=355409#overview.
[63] U.S. EPA, "IRIS Toxicological Review of Perfluorohexanesulfonic Acid (PFHxS, Casrn 335-46-4) and Related Salts," 2025, https://iris.epa.gov/static/pdfs/0705tr.pdf.
[64] U.S. EPA, "Announcement of Final Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List," Federal Register 86, no. 40 (March 3, 2021): 12272, https://www.govinfo.gov/content/pkg/FR-2021-03-03/pdf/2021-04184.pdf.

impossible for EPA to expeditiously understand, let alone address, the risks these substances may pose to human health and the environment."[65]

An NPDWR addressing a group or subgroup of contaminants is both allowable and necessary. While exact estimates vary, there are many thousands of existing PFAS.[66] As in the case of radionuclides,[67] disinfection byproducts,[68] and PCBs,[69] regulating substances that are chemically similar and present in mixtures is not only within EPA's SDWA statutory authority but has been upheld in court, establishing precedent for this approach.[70] Not only does EPA's 2024 rule illustrate the appropriateness of grouping certain PFAS, but it has sought advice from its SAB,[71] its National Drinking Water Advisory Council, and received input from stakeholders[72] on its intent to group PFAS in a drinking water regulation since at least 2020.[73,74]

**Monitoring Data on Co-occurrence of the Four PFAS Supports the Regulatory Determinations and Regulations in the PFAS Drinking Water Rule**

[65] US EPA, "National PFAS Testing Strategy: Identification of Candidate Per- and Polyfluoroalkyl Substances (PFAS) for Testing," 2021, https://www.epa.gov/system/files/documents/2021-10/pfas-natl-test-strategy.pdf.
[66] "PFAS|EPA: PFAS Structures in DSSTox," US Environmental Protection Agency, 2026, https://comptox.epa.gov/dashboard/chemical-lists/PFASSTRUCTV6.
[67] U.S. EPA. "Rule National Primary Drinking Water Regulations; Radionuclides; Final Rule," Federal Register 65, no. 236 (December 7, 2000): 76708, https://www.govinfo.gov/content/pkg/FR-2000-12-07/pdf/00-30421.pdf.
[68] U.S. EPA. "National Primary Drinking Water Regulations: Disinfectants and Disinfection Byproducts," Federal Register 63, no. 241 (December 16, 1998): 69390, https://www.govinfo.gov/content/pkg/FR-1998-12-16/pdf/98-32887.pdf.
[69] U.S. EPA, "National Primary Drinking Water Regulations—Synthetic Organic Chemicals and Inorganic Chemicals; Monitoring for Unregulated Contaminants; National Primary Drinking Water Regulations Implementation; National Secondary Drinking Water Regulations," Federal Register 56, no. 20 (January 30, 1991): 3526, https://archives.federalregister.gov/issue_slice/1991/1/30/3521-3597.pdf.
[70] City of Waukesha v. E.P.A, 320 F.3d 228 (D.C. Cir. 2003).
[71] U.S. EPA Science Advisory Board (SAB), "Review of EPA's Analyses to Support EPA's National Primary Drinking Water Rulemaking for PFAS, Final Report." August 22, 2022, https://sab.epa.gov/ords/sab/r/sab_apex/sab/meeting?p19_id=975&clear=19#minutes.
[72] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32532, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.
[73] U.S. EPA. "Announcement of Preliminary Regulatory Determinations for Contaminants on the Fourth Drinking Water Contaminant Candidate List," Federal Register 85, no. 47 (March 10, 2020):14098, https://www.govinfo.gov/content/pkg/FR-2020-03-10/pdf/2020-04145.pdf.

Under SDWA, EPA has the authority to issue a regulatory determination and move forward with a drinking water regulation if:

> (i) the contaminant may have an adverse effect on the health of persons;
> (ii) the contaminant is known to occur or there is a substantial likelihood that the contaminant will occur in public water systems with a frequency and at levels of public health concern; and
> (iii) in the sole judgment of the Administrator, regulation of such contaminant presents a meaningful opportunity for health risk reduction for persons served by public water systems.[75]

Data collected by EPA under UCMR 3 and UCMR 5, information from cleanups at federal facilities in many states, state monitoring data,[76] and additional sources of water testing data[77] have confirmed occurrence and co-occurrence in many drinking water systems of the PFAS proposed for rescission by EPA. In the PFAS Drinking Water Rule, EPA indicates, "[t]he total number of systems estimated to be exceeding one or more MCLs in the rule was 4,100–6,700 (compared to 3,400–6,300 in the proposal) serving a total population of 83–105 million people. Among these systems, 100–300 are estimated to be exceeding the Hazard Index without exceeding the PFOA or PFOS MCLs."[78] The widespread exposure to PFAS from contaminated drinking water systems across the U.S. emphasizes the substantial benefits that nationwide public health protections in the 2024 final rule afford millions of Americans.

**Conclusion**

EPA has a critical opportunity to protect communities across the United States by maintaining the science-based drinking water regulation that addresses PFAS contamination effectively. Pew

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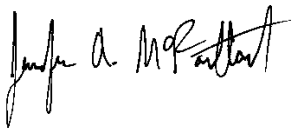
[75] Safe Drinking Water Act (SDWA) Amendments of 1996, Pub. L. No. 104–182 §1412 (b)(1)(A)
[76] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32532, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.
[77] Katherine E. Pelch, Taryn McKnight, and Anna Reade, "70 Analyte PFAS Test Method Highlights Need for Expanded Testing of PFAS in Drinking Water," *Science of the Total Environment* 876 (2023): 162978, https://www.sciencedirect.com/science/article/pii/S0048969723015966.
[78] U.S. EPA. "Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation," Federal Register 89, no. 82 (April 26, 2024):32532, https://www.govinfo.gov/content/pkg/FR-2024-04-26/pdf/2024-07773.pdf.

urges EPA to withdraw its proposal to rescind the 2024 regulation and instead work to ensure and support its effective implementation.

We appreciate the opportunity to comment. Please contact Velma Smith, Senior Officer, Government Relations (vsmith@pewtrusts.org) for additional information or questions.

Sincerely,



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