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Safe Drinking Water Act: Proposed National Primary Drinking Water Regulation for Specified PFAS

Detections of per- and polyfluoroalkyl substances (PFAS) in public water supplies have heightened public and congressional interest in the U.S. Environmental Protection Agency's (EPA's) authorities under the Safe Drinking Water Act (SDWA) to limit PFAS in drinking water.

PFAS are fluorinated chemicals that have been used in commercial, industrial, and U.S. military applications since the 1940s. Some of the more common applications include nonstick coatings, food wrappers, waterproof materials, and fire suppressants. According to the Agency for Toxic Substances and Disease Registry, PFAS may have been released to surface or ground water from manufacturing sites, industrial operations, use and disposal of PFAS-containing consumer products, fire/crash training areas, wastewater treatment facilities, and the spreading of contaminated biosolids, among other activities. Scientific information is available for a select number of PFAS. For those select PFAS, studies suggest that exposure to specific PFAS above certain levels may be linked to adverse health effects, such as developmental effects; changes in liver, immune, and cardiovascular function; and increased risk of some cancers. Two of the historically most studied PFAS are perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).

PFAS and Drinking Water

For more than a decade, EPA has been evaluating certain PFAS to determine if these substances warrant regulation under SDWA. After finalizing a determination to regulate PFOA and PFOS in March 2021, EPA proposed a drinking water regulation for these substances on March 14, 2023. At the same time, EPA proposed that the regulation include four other PFAS. Under SDWA, EPA has 18 months (i.e., until September 14, 2024) to finalize the proposal. The following sections provide a brief overview of the SDWA regulatory development provisions and key elements of EPA's proposed regulation, and discuss this development in the context of recent legislative activity.

SDWA Regulatory Development

As amended in 1996, SDWA specifies a multistep process for evaluating contaminants to determine whether a national primary drinking water regulation is warranted (42 U.S.C. §300g-1). The evaluation process includes identifying contaminants of potential concern, assessing health risks, collecting occurrence data (and developing reliable analytical methods necessary to do so), and making determinations as to whether or not regulatory action is needed for a contaminant. For more information, see CRS Report R46652, *Regulating Contaminants Under the Safe Drinking Water Act (SDWA)*.

Every five years, EPA is required to publish a list of contaminants that are known or anticipated to occur in public water systems and may warrant regulation under the act (42 U.S.C. §300g-1(b)). In 2009, EPA placed PFOA and PFOS on the third such contaminant candidate list for evaluation (74 *Federal Register (FR)* 51850).

To generate nationwide occurrence data for unregulated contaminants, SDWA directs EPA to promulgate, every five years, an unregulated contaminant monitoring rule (UCMR) that requires water systems to test for up to 30 contaminants (42 U.S.C. §300j-4). EPA generally requires monitoring by all public water systems that serve more than 10,000 persons, plus a representative sample of smaller systems. In 2012, EPA issued UCMR 3, requiring roughly 5,000 water systems to monitor for 6 PFAS—including PFOA and PFOS—between January 2013 and December 2015. Among the UCMR 3 results, 95 systems had PFOS detections, and 117 systems detected PFOA. In 2020, the National Defense Authorization Act for FY2020 (P.L. 116-92) directed EPA to include on the next UCMR (i.e., UCMR 5) every PFAS for which EPA had identified a validated test method. (EPA has validated test methods for 29 PFAS.) In December 2021, EPA finalized UCMR 5, which requires monitoring for 29 PFAS (including the 6 PFAS identified in UCMR 3) between 2023 and 2025, with data reporting by December 2026 (86 *FR* 73131).

For EPA to make a regulatory determination—a positive RD—that regulation of a contaminant is warranted, SDWA directs EPA to find the following: (1) the contaminant may have an adverse health effect; (2) the contaminant is known to occur or there is a substantial likelihood that it will occur in water systems at a frequency and at levels of public health concern; and (3) in the sole judgment of the EPA Administrator, regulation of the contaminant presents a meaningful opportunity for reducing health risks. EPA finalized positive RDs for PFOA and PFOS in March 2021 (86 *FR* 12272). Since 1996, EPA has finalized a positive RD for one other contaminant: perchlorate. In 2020, EPA withdrew perchlorate's positive RD (85 *FR* 43990).

Once EPA finalizes a positive RD, SDWA prescribes a schedule for promulgating regulations. EPA is required to propose a rule within 24 months and promulgate a final drinking water regulation within 18 months after the proposal. For each contaminant, EPA is required to establish a maximum contaminant level goal (MCLG) at a level at which no known or anticipated adverse health effects occur and which allows an adequate margin of safety (42 U.S.C. §300g-1(b)(4)(A)). Regulations also include a maximum contaminant level (MCL)—an enforceable limit for a contaminant in public water

supplies—or a treatment technique if an MCL is not feasible (42 U.S.C. §300g-1(b)(4)(B)). Concurrent with proposing a regulation, SDWA requires that EPA publish and seek public comment on a "health risk reduction and cost analysis" (HRRCA) for each contaminant covered by the proposed regulation (42 U.S.C. §300g-1(b)(6)(C)).

For each drinking water regulation, SDWA requires EPA to identify a list of best available technologies, treatment techniques, and other means that EPA finds to be feasible for the purposes of meeting the MCL. SDWA requires EPA to identify treatment technologies that achieve the MCL and are "affordable" for small systems (42 U.S.C. §300g-1(b)(4)(E)(ii)). Each regulation also establishes monitoring and reporting requirements. EPA may extend the deadline to publish a final rule for up to nine months (42 U.S.C. §300g-1(b)(1)). Regulations generally take effect three years after promulgation. EPA may allow up to two added years if the Administrator finds that capital improvements are needed. On a system-by-system basis, states can provide the same two-year extension (42 U.S.C. §300g-1(b)(10)).

EPA's Proposed PFAS Regulation

On March 14, 2023, EPA announced its proposed national primary drinking water regulation (NPDWR) for PFOA and PFOS. The agency also proposed a positive RD for several other PFAS: perfluorohexane sulfonic acid (PFHxS), perfluorobutane sulfonic acid (PFBS), hexafluoropropylene oxide dimer acid (HFPO-DA) and its ammonium salt (also known as a GenX chemicals), and perfluorononanoic acid (PFNA). In the same notice, EPA proposed that the NPDWR include these PFAS. EPA's proposal was published at 88 *FR* 18638 on March 29, 2023.

MCLGs and MCLs for PFOA and PFOS

For PFOA and PFOS, EPA proposed to set the MCLG at zero. In NPDWRs, EPA sets the MCLG at zero for microbial contaminants and for a contaminant that EPA (1) has evidence that it may cause cancer, and (2) cannot determine a dose that is considered "safe." SDWA generally requires EPA to establish the MCL as close to the MCLG as feasible (42 U.S.C. §300g-1(b)(4)(B)). The proposed NPDWR includes MCLs for PFOA and PFOS each at 4.0 parts per trillion (ppt), which EPA finds to be the lowest level that can be reliably measured by existing analytical methods, referred to as the *detection limit*.

Hazard Index for Four Other PFAS

Instead of numerical MCLGs and MCLs for each of the other four PFAS in the agency's proposed regulation, EPA proposes to use a *hazard index* approach to evaluate the potential risks of these chemicals in aggregate. This involves assessing concentrations of each substance relative to that substance's "health based water concentration" (HBWC) and combining those relative values together to calculate the hazard index. EPA's proposal includes HBWCs for PFHxS at 9.0 ppt; HFPO-DA at 10.0 ppt; PFNA at 10.0 ppt; and PFBS at 2,000 ppt. Water systems would divide the sampled concentrations of each PFAS by its respective HBWC, and then sum these relative values to calculate the aggregate hazard index value. EPA proposed a MCLG and MCL for the combination of these four PFAS at a hazard index of 1. The hazard index is intended to address the combined risk of potential noncancerous health effects associated with these PFAS.

Treatment Technologies

EPA notes that conventional and most advanced water treatment options are ineffective at removing PFAS from water. To meet the MCLs, EPA proposes that the best available treatment technologies are anion exchange (AIX), granular activated carbon (GAC), reverse osmosis (RO), and nanofiltration (NF). Operation of these technologies would require either waste-stream disposal or treatment-residuals disposal. Nontreatment options available to water systems to achieve compliance include (1) replacing a water source with a new water source that meets the MCLs or (2) buying water that meets the MCLs from another system.

As required by SDWA, EPA's proposal identifies technologies that are "affordable" for small systems. EPA finds that GAC and AIX are affordable for systems that serve 10,000 or fewer individuals. For systems serving more than 3,300 individuals, RO and NF are considered affordable. For systems serving 3,300 individuals or fewer, EPA finds that RO or NF would be affordable when RO or NF point-of-use devices that treat to the MCLs and meet the National Sanitation Foundation (NSF) International /American National Standards Institute certification standard become available. As of the date of EPA's proposal, such devices are not available; accordingly, the affordable technologies for water systems serving 3,300 or fewer individuals are GAC and AIX.

Infrastructure Investment and Jobs Act

The Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) provides supplemental appropriations for the Drinking Water State Revolving Fund (DWSRF) and for another SDWA program dedicated to emerging contaminant projects. IIJA provides $800 million annually for FY2022-FY2026 through the DWSRF for grants to water systems for projects that address emerging contaminants with an emphasis on PFAS. For small and disadvantaged communities, IIJA provides $1.0 billion annually for FY2022-FY2026 for projects to address emerging contaminants. The term "emerging contaminant" has no federal definition but is mainly understood to mean unregulated contaminants for which scientific information on potential risks is still evolving. As such, these IIJA funds are intended for projects to address contaminants without NPDWRs though EPA states that PFAS projects will remain eligible for these funds.

Should EPA meet the SDWA timeframe to finalize the PFAS NPDWR, the regulation would go into effect in September 2027. EPA states that it intends to finalize the rule by the end of 2023 and does not plan to delay the effective date of 2026. EPA's proposal anticipates that smaller systems that need to install treatment to meet the PFAS MCLs would use the IIJA emerging contaminant funds for these projects. These funds could help offset capital costs, yet communities would remain responsible for the operation and maintenance of these technologies.

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