



Randy E. Hayman, Water Commissioner

May 30, 2023

U.S. Environmental Protection Agency
Office of Ground Water and Drinking Water
1200 Pennsylvania Avenue NW
Washington, DC 20460

Re: **Docket ID No. EPA-HQ-OW-2022-0114**
Per- and Polyfluoroalkyl Substances (PFAS) National Primary Drinking Water Regulation

To Whom It May Concern:

The Philadelphia Water Department (PWD) appreciates the opportunity to provide comment on the Environmental Protection Agency's (EPA's) landmark proposed rulemaking for enforceable limits on the presence of per- and polyfluoroalkyl substances (PFAS) in drinking water. Given that the presence of PFAS in drinking water may pose a risk to human health over a lifetime of exposure, PWD fully supports regulating these compounds.

PWD is the largest public utility in the Commonwealth of Pennsylvania, providing 1.6 million residents with clean drinking water and more than 2.2 million people with reliable wastewater and stormwater collection and treatment services. PFAS have been used in a multitude of industries since the 1940s, but it has only been recently that the general scientific community has developed a better understanding that they accumulate and cycle throughout the environment, entering air, water, soil, and biota. As a combined utility providing water, wastewater, stormwater, and biosolids treatment services, PWD is particularly concerned with PFAS as these harmful and persistent chemicals can exist throughout our collection and treatment systems.

PWD operates three drinking Water Treatment Plants (WTPs) with a combined maximum rated capacity of over 500 million gallons per day (MGD). Like many regions across the country, Philadelphia is subject to pollution from the producers, manufacturers, users, and disposers of PFAS and, like many other water suppliers across the nation, PFAS exists throughout Philadelphia's source waters, impacting the greater water supply area and the Delaware River Watershed.

PWD has the following overarching comments related to the draft National Primary Drinking Water Rule (NPDWR):

- EPA should reevaluate the proposed MCL values for PFOA and PFOS and must consider more factors in evaluating technical and economic feasibility.
- EPA must utilize a holistic regulatory approach to rulemaking that includes considerations for PFAS generators, an extension to the implementation timeline of up to two years to accommodate capital improvements associated with proposed Best Available Technology (BATs)

and competing regulatory requirements when determining implementation of MCLs for PFOA and PFOS.

- EPA should pursue a separate rulemaking determination from PFOA and PFOS for the constituents considered in the Hazard Index (HI) and should provide more data supporting its analyses.
- EPA should provide additional clarification and support around compliance and implementation.

PWD appreciates the opportunity to provide comments and has taken this opportunity to provide detailed comments to support these positions below. PWD greatly appreciates EPA's steadfast commitment to implementing the holistic management approach in the *PFAS Strategic Roadmap* and its continued efforts to address one of the most significant environmental challenges facing the nation.

Sincerely,



Randy E. Hayman

Commissioner and Chief Executive Officer

Philadelphia Water Department

EPA should reevaluate the proposed MCL values for PFOA and PFAS and must consider more factors in evaluating technical and economic feasibility.

1. *The EPA has not demonstrated the feasibility of the BATs for large systems to achieve the proposed MCL of 4 ppt for PFOA and PFOS.*

In Section VI.D, EPA states that its “proposal is based upon its proposed finding that an MCL of 4.0 ppt for PFOA and PFOS and an HI of 1.0 for perfluorohexane sulfonate (PFHxS), hexafluoropropylene oxide-dimer acid (HFPO-DA), perfluorononanoic acid (PFNA), and perfluorobutanesulfonic acid (PFBS) are feasible because treatment technologies are available that treat to below these levels and there are analytical methods that can reliably quantify at these levels”. Similarly, in Section VI.A, EPA states that it “has determined that 4.0 ppt represents what is achievable for BATs given the standard of ‘reasonable cost based on large and metropolitan water systems.’” EPA determines feasibility for treatment techniques based on seven conditions including the capability of a high removal efficiency, the history of full-scale operation, the reasonable cost on large and metropolitan water systems, and the compatibility with other water systems (criteria 1, 2, 4, and 6). However, PWD believes that EPA’s assessment of the three proposed BATs falls short of these four criteria, especially in the case of large metropolitan water systems that have a surface water source. PWD strongly recommends that EPA revisit its determination for the application of the proposed MCLs at large surface water treatment plants or release additional data that supports the ability of the BATs to achieve the MCLs at these types of water treatment plants.

In the EPA’s “Best Available Technologies and Small System Compliance for Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water” document (Reference USEPA, 2023g in the Proposed rulemaking), EPA provides more information to discuss the proposed BATs and whether they meet the five criteria to determine feasibility.

Regarding the first feasibility criterion of the BATs having “the capability of a high removal efficiency”: In USEPA 2023g, when assessing whether the technology is reliable enough to continuously meet a drinking water MCL, EPA states “Yes. Numerous full-scale drinking water facilities are using Granularly Activated Carbon (GAC) to meet current state drinking water requirements for PFAS”. While PWD does not dispute this statement, the assessment of whether these BATs can effectively treat to various state MCLs is not relevant to this rulemaking as the EPA’s proposed MCLs are lower than all state MCLs. Even in instances where GAC has been shown to effectively remove PFAS to comply with higher MCLs, the lower MCLs proposed in the draft NPDWR will affect the overall feasibility in terms of operational and maintenance costs, logistics of GAC replacement, and GAC availability. It is unclear how effective these BATs will be at meeting this stricter MCL when it only appears to have been assessed to the state required MCLs.

Regarding the second feasibility criterion of the BATs having a “history of full-scale operation”: For GAC, while there are many examples of GAC being implemented for PFAS treatment, the vast majority are referencing small groundwater sources. Of the two

examples of full-scale implementation in a large, surface water Public Water System (PWS), both have questionable references without a comprehensive or cursory review of their implementation. For the first example, in Ann Arbor, Michigan, the source cited in USEPA 2023g is a non-scientific digital news article. Even so, the article, which gives a single data point on removal, clearly states that the PWS attributed the decreases observed in finished water PFAS levels to a combination of the GAC system and drastically reduced source water concentrations. For the second example cited in USEPA 2023g, a PWS in North Carolina installed GAC at one of their treatment facilities. The citation used for this example was from a non-peer-reviewed article published in Journal AWWA that discussed the decision-making process to implement GAC and the design and piloting steps taken. This article was published in October 2020 and construction on the full-scale implementation was not expected to be finished until February of 2022. No additional information about operations at the North Carolina PWS was provided. **PWD recommends that EPA release any additional information available demonstrating the successful application of GAC at large, surface water treatment plants.**

This lack of evidence relating to implementation in surface water sources is compounded by the observation by EPA that increased levels of Natural Organic Matter (NOM) can reduce the efficacy of GAC. Surface water sources are likely to experience far higher levels of NOM with greater ranges in concentration than groundwater sources. Higher levels of NOM have a high potential to compete with PFAS for sorption sites. EPA does not present clear evidence that this technology can effectively remove PFAS with varying levels of NOM at full-scale. While EPA states in USEPA 2023g, “it should be possible to reliably manage the impact of natural organic matter through piloting, selection of design parameters, and operational monitoring,” PWD questions whether EPA’s belief in the “possible” demonstrates what is technical and feasible. For Ion Exchange (IX), EPA cites a limited number of full-scale implementation examples in USEPA 2023g; however, they are all groundwater sources and at low flow rates. There is no evidence presented that this technology will be scalable for a large, surface water PWS. For Reverse Osmosis and Nano Filtration (RO/NF), EPA does not provide any examples of RO/NF being implemented at full-scale for PFAS removal with performance data available. **Overall, the full-scale feasibility of the three BATs has not been demonstrated for surface water PWSs within USEPA 2023g and additional investigation is warranted.**

Regarding the fourth feasibility criterion of the BATs having “reasonable cost based on large and metropolitan water systems”: For many large and metropolitan PWSs, the population is served by a surface water source. Given the lack of evidence in USEPA 2023g on full-scale implementation of the proposed BAT in large, surface water PWSs, it is unclear how EPA can accurately estimate the costs associated with these BATs in large and metropolitan sources. Given the high percentage of large PWSs that are expected to exceed one of the three proposed MCLs (estimated at ~25% in rulemaking reference USEPA 2023j), a slight underestimation of cost when extrapolating costs from small and medium PWS implementations could result in a severe underestimation in the overall cost of this rulemaking. Given the fact that a large portion of the cost associated with this rulemaking will be passed along to the PWS ratepayers, PWD believes that EPA should not

underestimate the possible costs of this rulemaking. Additionally, in USEPA 2023g, when evaluating the fourth feasibility study, EPA assessed the “reasonable cost basis for large and *medium* systems” rather than “large and *metropolitan*” systems as stated in the rulemaking. As a result, EPA uses examples of implementation in medium systems (defined in USEPA 2023g as flow rate greater than 1 MGD and less than 10 MGD) to support this criterion. For GAC, the two large system examples are detailed above as having questionable citations and for RO/NF, they cite two large systems that have started implementation but do not have performance data available to assess their success. Additionally, the largest example facility has a rated capacity (50 MGD) that is significantly smaller than the smallest of PWD’s three WTPs (86 MGD). These issues make it difficult to accurately assess both capital and operation and maintenance costs associated with these technologies in large and metropolitan water systems. This issue is further compounded by the lack of nationwide occurrence data to accurately assess the economic impact that this rulemaking will have especially on large PWSs, which are stated to serve over 200 million people across this country (rulemaking reference USEPA 2023j). PWD would also like to note that the capital cost estimates using the cost equations for large PWS for RO/NF place this technology as requiring lower capital investment than GAC or IX pressure vessels, which does not align with the experience PWD has with cost estimation for these technologies. There are several unknowns that could significantly impact capital costs that do not appear to be accounted for in these cost equations, such as utility requirements (e.g., electrical connections), land acquisition, land availability, and ancillary infrastructure needs to mitigate unintended consequences. **PWD believes that EPA’s implementation cost estimates significantly underestimate total capital costs for large and metropolitan surface water systems and these costs cannot be extrapolated from small and medium systems for large PWSs.**

Regarding the sixth feasibility criterion of the BATs having “compatibility with other water treatment processes: The information cited in USEPA 2023g does not accurately reflect the necessary level of site-specific research that is needed for implementation to account for impacts to other treatment processes and downstream water quality. For all three BATs, the EPA states that “[a]dditional research will not be required” to determine the compatibility with other treatment processes. This statement is overly broad and does not account for the varied water quality, particularly in drinking water treatment facilities that use surface water as a source. This statement also does not account for the potential impacts to other treatment processes or downstream water quality. Specifically, IX and RO/NF are noted to increase corrosivity of finished water in Section 3.4.1 and Section 4.5.1, respectively, which would require investigation with pipe loop studies using harvested pipes. Impacts on corrosivity and its deleterious effects on compliance with the existing lead and copper rule (LCR) and future LCR Revisions or LCR Improvements (LCRR/LCRI) are not properly accounted for. Additionally, for high-pressure membranes, the EPA notes in Sections 4.4.1 and 4.5.1 that adverse effects may occur during operation of these technologies, but that additional research is not required. Pilot-scale and phased full-scale evaluations are vital to understanding these impacts and should not be dismissed.

Given the issues detailed above regarding the first, second, fourth, and sixth criteria of assessing feasibility of BATs for all three of the proposed BATs, especially in large, surface

water PWSs, PWD believes that the criteria for determining feasibility were not met. EPA should re-assess the feasibility of achieving the proposed MCLs for PFOA, PFOS, and the HI through BATs, especially in large surface water systems (population over 50,000 people) which serve over 50% of the population in the United States (see Table 4-4 in rulemaking reference USEPA 2023j).

2. The cost estimates of the BATs developed by the EPA are based on incomplete or non-applicable information and more than likely represent an underestimation of the costs that will be borne by ratepayers.

There are several shortcomings in the cost estimation process for the BATs used by the EPA to justify the draft rule. First, cost curves require a significant number of case studies to develop, which does not appear to be present for surface water PWS. The EPA acknowledges in USEPA 2023g and “Economic Analysis for the Proposed Per- and Polyfluoroalkyl Substances National Primary Drinking Water Regulation” (hereafter “Economic Analysis”) that the BATs will perform differently for surface water and groundwater PWSs. In Section 5.3.1.2.2 of the Economic Analysis, the EPA acknowledges that the work breakdown structure (WBS) spreadsheet model for GAC was peer reviewed in 2006, the WBS IX model was peer reviewed in 2005, and the WBS RO/NF model was peer reviewed in 2007. However, from the list of full-scale installations in USEPA 2023g (Section 2.2.1 for GAC; Section 3.2.1 for IX; and Section 4.2.1 for RO/NF), no full-scale installations treating surface water for PFAS existed at the point when these models were created. PWD requests that EPA provide more information on how full-scale surface water treatment facilities were factored into the cost model. Additionally, these WBS models do not account for the increased costs of construction in densely populated areas. Many urban WTPs are space-constrained and the likely need for additional land is both costly and politically tenuous. There are many additional costs that pose challenges to urban utilities, such as coordination, staging, utility relocation, that do not appear to be accounted for in the Economic Analysis. Section 2.4.4 of the documentation for each WBS model provides some clarification of how add-on costs, such as land acquisition, are estimated; however, this documentation does not provide adequate details around how the land cost estimates are generated or adjusted to account for land cost increases over time.

Second, the occurrence data for PFAS in the HI raises questions that have a significant impact on the cost estimates. Under Section 5.3.1.1.1 of the EPA’s “Economic Analysis”, the EPA notes that a key parameter estimating the operating costs of GAC and IX is the expected bed life. PWD agrees with this assessment and understands that some uncertainty will always exist when estimating this parameter on a nationwide scale. However, EPA notes in Section 5.3.1.1.1.2 that removal of the PFAS compounds in the HI is estimated using only one PFAS compound, PFHxS, due to a lack of occurrence data. This lack of data for the other three compounds in the HI suggests that EPA may have over-estimated bed life in the “Economic Analysis.” Given the competition of sorption sites in GAC and IX when there is co-occurrence of PFAS, results calculated based on only one PFAS compound would result in an overestimation for the life of the media.

Third, the operational costs do not account for the potential change to the designation of spent media as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or hazardous waste under the Resource Conservation and Recovery Act (RCRA). In September 2022, the EPA proposed a Draft Rule to designate PFOA and PFOS as hazardous substances under CERCLA, creating liability concerns for any waste streams containing these substances. Additionally, EPA is in the process of evaluating changes to RCRA that would designate certain PFAS compounds as a hazardous waste, making disposal of contaminated material like spent media both more difficult and costly. In Appendix N, Section N.2 of the Economic Analysis, the EPA estimates that this change in designation from a non-hazardous waste to a hazardous waste would result in a 4-6% increase in annualized costs. PWD requests that EPA share their supporting calculations to verify these cost assumptions. PWD recommends that these elevated operational costs should be included in the Economic Analysis to account for future challenges for disposal of PFAS-laden media and the diminishing available landfill volume. Additionally, the increased costs of media disposal would not be equally distributed, as the disposals costs are regional and the distances PWSs may need to transport these wastes will vary greatly, and thus some facilities will bear a more significant financial strain to dispose of spent media.

Fourth, the EPA recommends discharge of the concentrate stream from RO/NF into a non-potable body of water (brackish estuary or ocean) at less than 10,000 feet from the PWS. In December 2022, Assistant EPA Administrator Radhika Fox issued a memorandum to state regulatory agencies entitled “Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs”, which details the implementation of technology-based effluent levels for PFAS discharges under the National Pollutant Discharge Elimination System (NPDES). The inclusion of NPDES discharge limits on PFAS would necessitate additional treatment on the concentrate stream. The cost for this additional treatment is not currently accounted for in the Economic Evaluation for the proposed NPDR and should be included in any final cost assessments.

Finally, the addition of unit processes into the drinking water treatment train has the potential to pose hydraulic limitations which are not clearly accounted for in the Economic Analysis. The hydraulic restrictions from the addition of unit processes may necessitate the addition of raw water booster or mid-process pumping that is not accurately accounted for in the EPA’s cost estimations. The documentation for the GAC and IX WBS models state that the assumption for small systems (<1 MGD) will require no additional pumping and the details of the method for determining additional pumps for larger systems is not clearly defined. Site-specific constraints may prevent the addition of booster pumps in existing raw water pumping stations and may necessitate the construction of a new building. It is not clear if the EPA is accurately accounting for the additional pumping that will be required to add these unit processes to treat for PFAS.

There appear to be several issues with the Economic Analysis including an underestimate of the impact to large systems, which serve approximately 50% of the US population.

Altogether, the Economic Analysis includes several shortcomings that potentially result in a underestimation of the cost that will be borne by ratepayers. **PWD is requesting that the EPA recalibrate the WBS models used to form cost estimates, using case studies for large surface water PWS to more accurately estimate the financial burdens of the capital improvements required to comply with the draft NPDWR.**

EPA must utilize a holistic regulatory approach to rulemaking that includes considerations for PFAS generators, implementation time, and cost of capital improvements associated with proposed BATs, and competing regulatory requirements when determining implementation of MCLs for PFOA and PFOS.

3. Many public water systems impacted by PFAS contamination, including PWD, have limited options for affordable and timely remediation.

PWD is the single largest public water system in the Commonwealth of Pennsylvania. PWD's three water treatment plants treat approximately 250 million gallons of drinking water per day sourced from the Delaware and Schuylkill Rivers, PWD does not own its watershed area above our WTPs and these rivers are the only viable source of water for the City of Philadelphia. Similarly, Philadelphia's 3,180 miles of water system mains do not have the interconnections that would allow for the distribution of purchased water from a neighboring system with PFAS treatment. While PWD does have a resilient system, with the ability to draw water from two rivers, both sources will be impacted by the proposed PFAS rule.

In a likely scenario, should PWD's average PFOA and PFOS results from the proposed rule's monitoring period exceed the MCLs, PWD will have to reevaluate the use of advanced water treatment technologies and consider other potential operational modifications to achieve compliance. Treatment modifications are expensive, and the scale of PWD's treatment operations further magnifies capital and operating costs. PWD expects that PWSs across the country will experience similar issues. Given that PFAS is widespread and persistent in the environment, the proposed regulation may be a catalyst for the most significant modifications to the nation's water treatment infrastructure to date.

Stakeholders must understand that modifications to water treatment systems cannot happen overnight. Philadelphia, as a large system serving 1.6 million residents, would need substantial time to complete a thorough evaluation of system improvement options, procure resources to pilot new or established technologies, complete those piloting efforts to determine design conditions, acquire regulatory approval for implementation, design full-scale infrastructure, acquire funding, procure construction services, and implement any necessary capital improvements. Considering the scale at which the proposed regulations will impact PWSs, it is reasonable to estimate lengthened capital improvement timelines due to extended review/approval times by regional and state regulatory agencies, which will face resource constraints, and widespread competition for a limited pool of construction contractors and equipment vendors. PWD is requesting that clear and consistent guidance

for extensions for treatment upgrades, either from the compliance date or following an MCL exceedance, be provided to primacy agencies to communicate to the regulated community. **Given the magnitude of systems that EPA expects to exceed an MCL during initial monitoring, PWD is also requesting that a blanket extension to the compliance period for this regulation be granted for all PWSs by an additional two years to provide PWSs with adequate time to implement the required remedial actions, which in most cases will require significant capital improvements.** This action of extending the compliance timeline up to two years is applicable to instances where significant capital improvements are required as detailed in SDWA §1412(b)(10).

Additionally, water utilities that implement technologies to remove PFAS will have to manage PFAS-containing treatment residuals or spent treatment media. If EPA's proposal to classify PFAS as hazardous substance under the CERCLA is finalized, operating costs to manage treatment residuals will place additional financial burden on water utilities and could make finding outlets for PFAS contaminated media difficult. These impacts will be compounded should EPA follow through with their evaluation to make changes to RCRA that would designate certain PFAS compounds as a hazardous waste. As has been seen in Maine, the ban on biosolids land application due to PFAS concerns has created a crisis for utilities, with landfills increasingly refusing to take this waste, forcing sludge to be transported into Canada for ultimate disposal. If the proposed CERCLA changes become final, this will result in significant increases to the implementation time and cost of these BATs. The higher costs will ultimately be borne by the utilities and ratepayers and the increased implementation time will impact PWSs' compliance status. EPA should include this consideration in its cost assessments and its proposed compliance timeline.

4. *Despite historic infrastructure funding, it is still a possibility that customers will bear the cost of PFAS clean-up.*

PWD applauds Congress for passing the historic *Infrastructure Investment and Jobs Act* (IIJA) and *Drinking Water and Wastewater Infrastructure Act* – known as the *Bipartisan Infrastructure Law* (BIL) – to invest more than \$50 billion to improve the nation's water, wastewater, and stormwater infrastructure. PWD appreciates acknowledgement of the challenges that emerging contaminants, such as PFAS, pose to the water industry through the availability of \$4 billion to the Drinking Water State Revolving Fund (SRF), with an additional \$5 billion to support these efforts in small and disadvantaged communities. However, this funding will not be sufficient to cover the costs that will be incurred because of this proposed NPDWR. While these investments are unprecedented and commended by PWD, the proposed NPDWR may necessitate the nation's largest water infrastructure investment to date, requiring additional funding from either PWSs, state governments, or the federal government to close the anticipated funding gap.

Unfortunately, at this time, Philadelphia does not qualify for grant funding or principal forgiveness through Pennsylvania's SRF due to the size of our system, PWD's financial structure, and the applied affordability methodology. For Philadelphia and other communities impacted by these eligibility limitations, this translates to repaying the loans provided through BIL funding with the revenue generated from rate increases. In other

words, PWD customers ultimately bear the cost of the treatment upgrades needed to remove PFAS from drinking water.

Like many major cities, citizens in Philadelphia have a higher poverty rate (22.8%, per the 2020 US Census) than the United States as a whole (11.4%, per the 2020 US Census). While PWD has made great efforts to ease the financial burden on its most vulnerable ratepayers with the implementation of [senior discounts and the tiered assistance program \(TAP\)](#), the majority of the financial burden for implementing PFAS treatment technologies as proposed by the NPDWR will fall on ratepayers.

PWD does not believe that its customers should pay for addressing PFAS pollution that they did not create. The solution to the complex challenge of managing PFAS contamination should not lie solely with the public nor the water industry. Although PWD is willing to do its part to address PFAS' pervasive and extensive damage, ultimately the polluters—those who are manufacturing and producing PFAS—should be held accountable for environmental remediation. **PWD advocates for the creation of a defined compensation mechanism by which PFAS generators are financially liable for the cost of remediating the public health and environmental damage caused by the historic and continuing manufacturing of PFAS compounds.**

5. *In assessing the benefits and costs analysis for this rule, the EPA evaluated cumulative benefits on other regulatory programs but not the cumulative cost impacts resulting from this regulation on other ongoing regulatory activity, such as LCRR/LCRI implementation and compliance.*

Currently, PWSs are facing simultaneous compliance issues for various ongoing regulatory changes at the EPA level such as the Lead and Copper Rule Revisions, revisions to National Pollutant Discharge Elimination System (NPDES) permit requirements for ammonia discharges, and combined sewer overflow discharge limits. Together, these current and upcoming regulations, in addition to the numerous other regulatory requirements to which PWSs are subject, represent a significant allocation of resources in the coming years. Given PWD's inability to access SRF grant funding, as mentioned above, these burdens will be shouldered by our ratepayers. **With the significant costs associated with the proposed PFAS NPDWR and other ongoing regulatory requirements, EPA should not be assessing the cost of this rulemaking in a vacuum. Rather, EPA's Economic Evaluation should be re-evaluated to consider the cost of this proposed rulemaking in the context of other ongoing regulatory requirements and the financial capabilities of utilities.**

6. *EPA significantly underestimated the costs associated with Public Notifications for this rulemaking by assuming that all systems would be in compliance with the NPDWR.*

EPA should re-evaluate its assessment of costs and benefits of their proposed rulemaking to ensure consistency in its assumptions of compliance with the proposed rulemaking to ensure an accurate balance between the two. In section XIII.G, EPA assessed the health benefits that would occur through the reduction in Disinfection By-Products (DBPs) via the

implementation of PFAS removal treatment technologies. In this assessment, EPA used its occurrence model to estimate the number of PWSs that would exceed one of the three proposed MCLs to determine how many would install PFAS treatment. This estimate was then used to estimate the health benefits associated with co-removal of DBPs. In EPA's Economic Analysis for the Proposed PFAS NPDWR, it is estimated that over 25% of large systems will exceed one of the three proposed MCLs. However, in section XIII.C.1.h, EPA states that its "cost analysis assumes full compliance with the rule throughout the period of analysis and, as a result, EPA does not estimate costs for the [Public Notification (PN)] requirements in the proposed rule". The assumption stated in section XIII.C.1.h appears to directly contradict the underlying assumption made in section XIII.G. If EPA estimates that 25% of large water systems will exceed one of the three proposed MCLs there are likely to be significant costs associated with issuing the required PNs. **It is recommended that EPA re-evaluate their cost assessment in a manner that maintains consistent assumptions throughout the process.**

EPA should pursue a separate rulemaking determination from PFOA and PFOS for the constituents considered in the Hazard Index (HI) and should provide more data supporting its analyses:

7. EPA should remain consistent with the use of national occurrence data from the Unregulated Contaminant Monitoring Rule (UCMR) to determine if the contaminant occurs in public water systems at levels of public health concern.

The EPA's proposed rulemaking includes a preliminary regulatory determination for PFBS, PFNA, PFHxS, and HFPO-DA and its ammonia salt (trade name "GenX"). The notice also includes a proposed NPDWR and health-based Maximum Contaminant Level Goals (MCLGs) for a mixture of these chemicals. The use of a Hazard Index (HI) for the MCL and MCLG is proposed to account for the combined health risks from exposure to multiple PFAS in drinking water. The proposed HI compares measured exposure to PFBS, PFNA, PFHxS, and HFPO-DA to health-based reference values prior to combining them to see if they remain under the safe threshold value of 1 (unitless).

Regulatory determinations are made following the collection of nationwide data through the UCMR to determine whether regulation of a contaminant in drinking water presents a meaningful opportunity for public health risk reduction. Although data from 29 PFAS will soon be collected during the implementation of the Fifth Unregulated Contaminant Monitoring Rule (UCMR5), currently the Third Unregulated Contaminant Monitoring Rule (UCMR3) is the only national dataset to include PFAS. Of the six PFAS included in UCMR3, only PFOA and PFOS resulted in a positive preliminary regulatory determination after considering the extent and degree of PFAS occurrence in public water systems.

National occurrence data generated from UCMR3 is insufficient to inform a National Primary Drinking Water Regulation for the proposed mixture of PFAS. It is unclear if EPA has sufficient national data to determine the extent of occurrence for HFPO-DA, PFNA, and PFHxS in drinking water at the proposed Health-Based Water Concentrations (HBWCs).

Similarly, PWD is not aware of a national dataset for HFPO-DA, and it was not a required analyte of the UCMR3 sampling program. While EPA has used state-level data, this information is regionally focused and includes an inconsistent suite of PFAS species for each state. It is unclear how EPA made a preliminary regulatory determination for this contaminant without having an indication as to its occurrence in public water systems across the country.

The other three PFAS included in the preliminary regulatory determination (PFBS, PFNA, PFHxS) were collected during UCMR3 (2013-2015). However, at the time of the data collection and analysis, the minimum reporting levels (MRLs), or the lowest concentration that could be reported, was much greater than it is currently. The HBWCs currently proposed for PFNA and PFHxS are less than the MRL from UCMR3, which makes the UCMR3 dataset questionable in assessing the occurrence of these compounds at the proposed HBWCs.

In the interest of transparency, PWD is requesting that the occurrence data used to inform the development of a HI be made available to the public.

Given the extent of PFAS in the environment, the proposed HI represents less than 0.1% of PFAS. The EPA notice cites likely co-occurrence in drinking water as part of the justification for the public health protections of a Hazard Index. PWD is requesting that the EPA's analysis on the co-occurrence of PFBS, PFNA, PFHxS, and HFPO-DA be made publicly available as well.

8. EPA should clearly define what threshold constitutes the determination that there is a "substantial likelihood that the contaminants will occur or co-occur with a frequency and at levels of public health concern".

Throughout section III.C and in the preamble for rulemaking reference USEPA 2023e ("Per- and Polyfluoroalkyl Substances (PFAS) Occurrence and Contaminant Background Support Document"), EPA states that the four HI compounds being discussed are found to have a "substantial likelihood [to occur] with a frequency and at levels of public health concern in drinking water systems across the United States". However, it is unclear what threshold was used to make this determination. For two of the HI compounds (PFNA and HFPO-DA), the percent of samples and systems with detects from most states was less than 10%. For all four of these compounds most states and systems had under 30-40% detections. PWD requests that EPA define what threshold it used to determine that each of these compounds have a "substantial likelihood" for occurrence.

9. Combining a preliminary regulatory determination within a notice of proposed rulemaking is inconsistent with EPA's established process for the promulgation of drinking water regulations under the SDWA.

Of the six PFAS included in the proposal, only PFOA and PFOS went through the established regulatory determination process as mandated in the Safe Drinking Water Act. PWD appreciates efforts to streamline the regulatory process, but not at the expense of scientifically sound regulations. It is recommended that EPA use the regulatory determination process to gather more data to inform the rulemaking for PFNA, PFHxS, PFBS, and HFPO-DA.

10. Potential for additional PFAS compounds not in proposed rule being added as individual MCL or to HI in final rule

In Section III, EPA requests comment on whether there is peer-reviewed information on additional PFAS that EPA should include in this rulemaking. PWD believes that EPA should not add PFAS as individual MCLs or in the HI that were not included in the proposed rule. Doing so would prevent stakeholders from commenting and reviewing the addition of these new compounds and circumvents the overall rulemaking process. PWD recommends that EPA use the standard regulatory determination process to inform rulemaking for any additional PFAS compounds.

11. EPA should consider a single approach to regulating PFAS, either through individual MCLs or considering the effects of PFAS mixtures.

PWD recognizes the unique regulatory challenges posed by a family of greater than 9,000 different chemical compounds. It has long been a subject of debate in the scientific community as to whether PFAS should be regulated as a class, like disinfection by-products, or as individual species, each with their own MCL. These contaminants together can pose a greater health risk than they do individually and PWD appreciates the EPA's proposal to capture site-specific risks from PFAS mixtures. However, promulgating regulations that include both an approach to regulate individual contaminants as well as mixtures may create confusion across the water industry, primacy agencies, and the general public.

PWD understands that EPA classifies PFOA and PFOS as carcinogens and employs a different policy established by the Safe Drinking Water Act to regulate those chemicals as close as feasible to an MCLG of 0 ppt. Given their carcinogenicity classification and how the HI is calculated, those PFAS cannot be included in the proposed HI calculation. Because the nuances of EPA's methodology can be difficult to explain to customers, PWD is requesting that EPA provide clearer messaging to help our customers understand the different regulatory approaches and stay informed of the potential health effects from exposure to these contaminants. PWD recommends that the HI concept be removed from this NPDWR to reduce the complexity of the rulemaking.

12. EPA requests comments on the derivation of the HBWC for each of the four PFAS considered and on significant figures.

In section IV.A, In the explanation for the determination of MCLG (and HBWC) values, EPA defines the formula for calculating the MCLG based on the Reference Dose (RfD), drinking water intake-body weight (DWI-BW), and Relative source criteria (RSC) as:

$$MCLG = \left(\frac{RfD}{DWI - BW} \right) * RSC$$

In section V.C.2 of the preamble of the proposed rule, EPA defines the RfD and DWI-BW for the four PFAS compounds included in the Hazard Index. The calculations are further detailed in rulemaking reference USEPA 2023a, with step-by-step calculation of each of the four HBWCs. Throughout the preamble of this rulemaking, supporting reference documents, and in the rulemaking itself, there is inconsistent use of significant figures for the HBWC values. In the proposed rulemaking, the proposed HBWC values are reported as 9.0 ppt, 10.0 ppt, 10.0 ppt, and 2000.0 ppt. However, in USEPA 2023a, the calculated HBWC values in mg/L are rounded to a single significant figure (i.e., for PFNA 0.000014 mg/L is rounded to 0.00001 mg/L). When the value is converted to ppt it is shown in USEPA 2023a as 10 ppt (equivalent to 0.000010 mg/L) and in the proposed rulemaking as both 10 ppt (equivalent to 0.000010 mg/L) and 10.0 (equivalent to 0.0000100 mg/L). EPA should remain consistent in their use of significant figures and not add additional significant figures after the number is rounded and converted to parts per trillion. The number of significant figures used in the rulemaking has significant impacts on how results are reported (always in mg/L) and how many significant figures are used and how rounding is handled. **PWD requests that EPA remain consistent in its use of significant figures throughout the document and clearly define how many significant figures should be used when calculating compliance values.** A few specific examples of significant figure inconsistencies are shown in Table 1.

Furthermore, using the values provided in section V.C.2 and USEPA 2023a and the equation shown above, the calculated MCLG/HBWC differ from those proposed in the rulemaking and those that are shown in USEPA 2023a. For example, in USEPA 2023a, the HBWC equation for PFHxS is shown on page 16 to be calculated as 0.0000092 mg/L (then rounded to 0.000009 mg/L and then converted to 9.0 ppt). However, when the numbers are calculated as shown in USEPA 2023a, the correct output for the PFHxS HBWC is 0.000012 mg/L, which would round to 0.00001 mg/L (or 10 ppt) rather than 9.0 ppt.

PWD requests that if the HI requirement is kept in place, that the HBWC values be updated to match their correctly calculated values using a consistent number of significant figures.

Table 1 Examples of inconsistent significant figures for HBWC values throughout the rulemaking and supporting documents

Compound	Reported HBWC	Section/Reference
PFHxS	9	USEPA 2023a, V.C.2
	9.0	VI.B, VI.D, 141.50 paragraph (b), 141.61 paragraph (c)
HFPO-DA	10	USEPA 2023a, V.C.2, VI.B (HI MCL Equation), VI.D, 141.50 paragraph (b), 141.61 paragraph (c)
	10.0	VI.B (text), 141.50 paragraph (b), 141.61 paragraph (c)
PFNA	10	USEPA 2023a, V.C.2, VI.B (HI MCL Equation), 141.50 paragraph (b), 141.61 paragraph (c)
	10.0	VI.B, V.1.B (text), 141.61 paragraph (c)
PFBS	2,000	USEPA 2023a, V.C.2, VI.B, 141.50 paragraph (b), 141.61 paragraph (c)
	2,000.0	141.50 paragraph (b), 141.61 paragraph (c)
	2e10^3	VI.D

EPA should provide additional clarification and support around compliance and implementation:

13. PWD recommends reducing rule complexity by removing the proposed trigger level

The proposed MCLs for PFOA and PFOS are at, or very close to, laboratories' measurement capability. The application of a trigger level less than the proposed PQLs for PFOA and PFOS creates confusion since measured concentrations greater than the method detection limit but lower than the reporting (or quantitation) limit are only considered estimates by the labs making those measurements. EPA states in this proposed rulemaking that "EPA has sufficient confidence that while measurements below the PQL may be slightly less precise and accurate, they are achievable by individual laboratories...". It is stretching the limits of the analytical technology to base actionable triggers on concentrations that are so low that they are only considered to be estimated concentrations. Additionally, EPA states in section VI.A that it "anticipates there would not be sufficient laboratory capacity if the quantitation level were set at a level below 4.0 ppt". **If EPA does not expect there to be sufficient lab capacity for analyzing PFOA and PFOS below the PQL, then it should not be considering setting trigger levels or screening thresholds below these levels as this will have disproportionate negative impacts on underfunded systems and all PWSs.**

Establishing the trigger level below the determined PQL will also result in confusion regarding the enforcement of the trigger level between PWSs and primacy agencies. Some primacy agencies, such as PADEP, will not allow PWSs or laboratories to report qualified results that are reported below the MRL. It is unclear in this rulemaking how PWSs should report and qualify these results to primacy agencies in order to assess whether a system is able to move to reduced monitoring. This may result in some states enforcing their current reporting requirements and no system in that state are able to move to reduced monitoring not because they are above the trigger level, but because the primacy agency will not allow them to report results below the MRL. For some primacy agencies, results below the MRL are instructed to be reported as zero. PWD recommends that results below the MRL should be reported as zero.

EPA has previously established a “trigger level” in the LCRR. The proposed trigger level in the LCRR has created a large amount of confusion both for water utilities and the public in how to interpret sample results. As a part of the on-going review of the LCRR and the solicitation for comments related to the development of the LCRI, the EPA is already considering removing the trigger level to “reduce rule complexity” before the compliance date for the LCRR has even passed. PWD recommends that EPA avoid causing similar confusion in this PFAS MCL rulemaking and remove the proposed trigger level altogether. Reduced monitoring should be implemented if a system can reliably demonstrate that results are below the PQL.

In Section IX.A, EPA requests comment on whether alternate values should be used for the trigger level, specifically 2.0 ppt for PFOA and PFOS and 0.50 for the HI PFAS. **PWD, as stated above, believes that EPA should remove the trigger level altogether and not rely on results below the PQL.**

14. Using the trigger level to calculate Locational Running Annual Averages (LRAA)

Under the current proposed rule, any results for PFOA and PFOS that are less than the respective PQLs would be included in the LRAA as zero. In section VI.A of the preamble, the EPA requested comment on using proposed trigger level for any results below the PQL in the calculation of the locational running annual averages. PWD recommends that EPA retain their current proposal to use zero in the calculation of the LRAA for results that are below the PQL. This would remain consistent with other regulations, such as the Stage 2 Disinfectant and Disinfection By-Products Rule, that utilize LRAA calculations for determining compliance which use zero in place of results less than the PQL/MRL.

15. EPA should clearly define when compliance monitoring would begin under the final rule

PWD supports EPA’s decision to allow the use of monitoring data collected before the compliance date of this rulemaking (such as UCMR5) for initial compliance monitoring. However, PWD is requesting that EPA clearly define when compliance monitoring would begin after the compliance date of the final rule. If the final rule compliance date is in the middle of a calendar year, would compliance monitoring begin at the start of the next quarter or at the start of the next year? EPA should provide this clarification so that PWS and primacy agencies can properly plan for the start of compliance monitoring.

16. EPA's requirement that any single point that would cause the LRAA to exceed the MCL would immediately trigger a violation

In Section 141.903(e) of the proposed rulemaking, EPA states "If any sample result will cause the running annual average to exceed the MCL at any sample point, the system is out of compliance with the MCL immediately." PWD believes that this is intended to capture any single results that are so high (i.e., greater than 4x the MCL) that would trigger an exceedance even if the remaining quarters are non-detect. While PWD does not oppose this stipulation, it believes that this stipulation as written will disincentivize systems from establishing routine monitoring at the entry point to distribution on a more frequent schedule than the regulatory requirement. An example: If PWS A is already over a year into compliance monitoring then a new LRAA will be generated every quarter. PWS A has established a monthly compliance monitoring program to provide more granular insight into PFAS levels in their system. Over the last three quarters, PWS A has had quarterly averages of 0 ppt, 0 ppt, and 4 ppt and their LRAA at the end of last quarter was calculated as 2 ppt (i.e., 0 ppt). This first monthly result of the next quarter was 12.5 ppt and would result in the subsequent LRAA being above the MCL if the LRAA was calculated after just this first quarterly sample. Based on the rule's current language, PWS A would be out of compliance before the remaining two monthly samples could be collected for the quarter, which could have resulted in the quarterly average being well below 12.5 ppt (as low as 4.2 ppt if the second and third month were below the PQL). This clause in the rulemaking may disincentivize systems from voluntarily implementing more than the minimum monitoring schedules to avoid situations like the example above.

EPA should revise Section 141.903(e) to read "If any quarterly sample result or quarterly average, if more than one sample is available for the quarter, will cause the running annual average to exceed the MCL at any sampling point, the system is out of compliance with the MCL immediately." Alternatively, if EPA does not wish to change the language of Section 141.903(e), EPA could add an additional subclause to Section 141.903(f) that states "For systems monitoring more frequently than quarterly, systems must average all the results in a quarter, then average the quarterly averages. Quarterly averages should not be computed until all samples within the quarter are collected."

Conclusion

PWD applauds EPA for making strides to better protect residents across the country from exposure to PFAS. PWD fully supports the EPA's efforts to develop drinking water regulations for PFAS, however, PWD believes that further evaluation of the costs, benefits, and feasibility of reducing PFAS to concentrations less than the proposed maximum contaminant levels is needed. Like many systems across the country, PWD may have to make significant changes to its water treatment systems to comply with the proposed MCLs. Funding to implement the upgrades required must be made more financially accessible to ensure that PWD and water systems across the country have the same ability to treat or remove PFAS from drinking water. Given the challenges PWD has faced in acquiring federal infrastructure funding, **PWD requests that EPA prioritizes providing clear and consistent funding**

guidelines to state revolving funds to ensure low-income communities can receive BIL funds regardless of their size.

PWD requests that the EPA consider the following actions:

- EPA should reevaluate the proposed MCL values for PFOA and PFOS and must consider more factors in evaluating technical and economic feasibility.
- EPA must utilize a holistic regulatory approach to rulemaking that includes considerations for PFAS generators, an extension to the implementation timeline of up to two years to accommodate capital improvements associated with proposed Best Available Technology (BATs) and competing regulatory requirements when determining implementation of MCLs for PFOA and PFOS.
- EPA should pursue a separate rulemaking determination from PFOA and PFOS for the constituents considered in the Hazard Index (HI) and should provide more data supporting its analyses.
- EPA should provide additional clarification and support around compliance and communication and allow more time for implementation.