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August 13, 2025

Mr. David Tobias
Office of Water
Office of Science and Technology
Health and Ecological Criteria Division
Environmental Protection Agency
1301 Pennsylvania Ave., NW
Washington, DC 20460

SUBMITTAL VIA ELECTRONIC PORTAL

Re: Water Environment Federation Comments related to
Docket ID No. EPA-HQ-OW-2024-0504; Draft Sewage Sludge Risk Assessment:
Perfluorooctanoic Acid and Perfluorooctane Sulfonic Acid

Dear Mr. Tobias,

The Water Environment Federation (WEF) thanks the U.S. Environmental Protection Agency (EPA) for the opportunity to provide comments on Docket ID No. EPA-HQ-OW-2024-0504; Draft Sewage Sludge Risk Assessment: Perfluorooctanoic Acid and Perfluorooctane Sulfonic Acid.

WEF is a not-for-profit technical and educational organization of over 31,000 individual members and 75 affiliated Member Associations representing water quality professionals worldwide. Since 1928, WEF and its members have protected public health and the environment. As a global water sector leader, our mission is to inspire the water community in pursuit of human and environmental well-being toward a life free of water challenges. WEF connects and enriches the expertise of water professionals, increases the awareness of the impact and value of water, and provides a platform for water sector innovation.

This draft risk assessment is essential to WEF stakeholders, who are leading the way towards a circular water economy by maximizing our nation's water resources. Circular water practices, including land application of biosolids, can generate up to $47 billion annually for U.S. utilities through the adoption of three pillars: reduce, recover, and regenerate[1]. Converting waste into valuable resources, like biosolids, is key to recovering valuable nutrients, including nitrogen and phosphorous[2].

[1] Valuing the Circular Water Economy: A $47 Billion Opportunity for U.S. Utilities. WEF. 2025
[2] Circular Water Economy 101. Water Environment Federation. 2025. https://www.wef.org/topics/hot-topics/circular-water-economy/

There are over 15,000 municipal water resource recovery facilities (WRRF) in the United States, all of whom clean our nation's water and manage the sewage sludge[3] from that treatment process. To advance America's circular water economy, it is imperative that we prioritize the beneficial use of natural byproducts, most critically by preserving and promoting land application of biosolids, a natural byproduct generated daily through the wastewater treatment process. WEF's members do not believe that this draft risk assessment accurately characterizes the risk associated with land application of biosolids containing Perfluorooctane Sulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA), as compared to the other available management options for sewage sludge, i.e., incineration and landfilling, or compared to exposure from food packaging and thousands of household products used every day that contaminate the environment with PFAS on an ongoing basis[4,5,6].

EPA should include a risk management evaluation as a part of the final risk assessment to ensure that policy makers, state regulators, and the public have a clear understanding of the available options and solutions for managing sewage sludge with PFOA and PFOS contamination.

While WEF's members appreciate EPA's efforts to quantify the risk associated with PFOA and PFOS in biosolids, our members are concerned that the absence of a risk management component significantly reduces the utility and usefulness of the assessment as a decision-making tool. A risk management component would include important factors for consideration by decision makers, including an economic, cost-benefit analysis and evaluation of treatment and source control measures, best practices for land application of biosolids, and other sludge management options, with an evaluation of tradeoffs and associated risks. Understanding risk management options within the context of the risk assessment is critical for policymakers and state regulators to make informed decisions that minimize risks and maximize the benefits of biosolids. If a risk management component is to be developed at a later time, at minimum the risk assessment should include a primer for policymakers that clearly outlines assumptions and emphasizes the fact that the scenario evaluated in the draft risk assessment does not represent typical practice for land application, nor do the findings indicate a risk to the general public or national food supply.

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[3] Throughout this document we use the term "biosolids" to mean sewage sludge that has been treated to meet the requirements in 40 CFR part 503 and is intended to be applied to land as a soil conditioner or fertilizer, while "sewage sludge" is used in regards to untreated material that may be disposed of in a landfill or incinerated, if it is not converted to biosolids.

[4] Kotthoff et. al., D. Perfluoroalkyl and polyfluoroalkyl substances in consumer products Environ. Sci. Pollut. Res. 2015, 22 (9) 14546– 14559

[5] Guo, Z et. al. Perfluorocarboxylic Acid Content in 116 Articles of Commerce. EPA/600/R-09/033; Office of Research and Development, National Risk Management Research Laboratory, U.S. Environmental Protection Agency: Research Triangle Park, NC, 2009

[6] Schaider et. al. Fluorinated Compounds in U.S. Food Packaging. Environ. Sci. Technol. Lett. 2017, 4, 3, 105–111

Without the risk management component, the findings of this assessment are presented without the necessary context. This draft assessment has resulted in misinterpretation by some policymakers and advocacy groups who believe that there is an outsized public health risk associated with biosolids based on these draft results, when the comparative risk of common household and food products containing PFAS is much higher. Since the release of the draft risk assessment, policymakers in numerous states and jurisdictions have proposed restrictions and bans on biosolids land application—without consideration of the risk of alternative sewage sludge management options. While EPA indicates that the conclusions of the risk assessment do not represent a risk to the general public, EPA also indicates that each of the management options evaluated likely pose an "unacceptable risk" based on the modeled scenario, a juxtaposition that has resulted in confusion and further misunderstanding. Had risk management been evaluated and included in the draft risk assessment, some of this uncertainty would have been avoided and policymakers would have a clearer understanding of the management challenges and options for sewage sludge, including through land application as biosolids.

EPA should ensure alignment across all programs in the process framework and methodology for conducting risk assessments.

EPA should aim for cross-program alignment in the process framework used to conduct risk assessments, reflecting the many ways in which the public can be exposed to PFAS compounds. While different considerations may be needed for different statutes or media, the overall framework and methodology should be consistent across the Agency's portfolio. WEF's members have indicated that this risk assessment did not align with the approach taken historically.

Additionally, EPA's typical unit-risk factors for human health were not utilized in this draft. EPA should ensure the final risk assessment is aligned with the standard framework, risk quantification values, and process utilized for other environmental programs. If steps and risk values are not in alignment with other programs, EPA should address this concern and provide clear justification for declining to take such steps.

EPA should provide data on common sources of PFAS, including relative exposure levels, to contextualize the risk assessment within the greater scope of the ubiquitous nature of the global PFAS contamination issue.

When introducing and providing overall justification and context for this risk assessment, EPA should include data and information regarding sources of PFOS and PFOA, outlining the vectors in which the contaminant enters our water supply and ultimately biosolids. A table or comparison that demonstrates the potential risk of exposure of PFOS and PFOA in biosolids land application or sewage sludge through any

of the management scenarios presented alongside the risk of exposure of PFOS and PFOA from widely-used household products, food packaging, etc. would provide helpful context, especially considering the orders of magnitude difference in median PFAS concentration and direct exposure pathways in some cases[7].

By including this data in the introduction and background materials for this risk assessment, policymakers and other non-expert readers would gain a more holistic understanding of PFAS contamination and where action could be taken to most cost-effectively reduce PFAS exposure. For example, policymakers who want to take action based on the findings of the risk assessment would make those decisions with a more complete understanding of where PFAS are entering our environment and water supply, and where human exposure occurs.

EPA should consider a whole-of-government cross-media approach to ensure the final risk assessment is supported by robust data and fully evaluates all sewage sludge management options.

There are limited management and disposal options for sewage sludge, and only one of those options—land application as biosolids—provides a beneficial use for the public. Ensuring this nutrient-rich resource continues to be responsibly utilized is critical to driving the circular water economy forward and minimizing waste.

EPA outlines the management options available for sewage sludge, including land application as biosolids, incineration, landfilling, and deep well injection. EPA did not include an evaluation of deep well injection within the risk assessment. EPA indicates that while over 90% of sewage sludge disposed of at landfills occurs at municipal solid waste (MSW) landfills, EPA did not evaluate MSW landfills within the risk assessment because these facilities are regulated under RCRA in 40 CFR part 258 and are outside of the scope of Clean Water Act section 405. In addition to land application of biosolids, EPA evaluated sewage sludge monofills, regulated under the CWA in 40 CFR Part 503 and sewage sludge incinerators, regulated under CWA in 40 CFR Part 503 as well as the Clean Air Act. EPA indicates in the draft assessment that there was insufficient data to fully evaluate the incineration management option but did not give any indication as to attempts to obtain the necessary data to fill those gaps. While monofills are evaluated to some extent, the risk assessment focuses primarily on land application of biosolids.

The draft risk assessment concludes that land application of biosolids, surface disposal in a sewage sludge monofill, and incineration of sewage sludge contaminated with PFOS or PFOA may each pose an "unacceptable risk" based on the modeled scenario. The

[7] Solid Waste Association of North America. "PFAS Concentrations and Exposures Factsheet." 2022. https://swana.org/docs/default-source/resources-documents/pfas-resources/pfas-concentrations_and_exposures-factsheet_final.pdf

limited scope of this draft risk assessment does not take into account the fact that a sludge management strategy will always be needed. It provides little value to policymakers, state regulators, or the public for decision making purposes and increases uncertainty for farmers and communities around biosolids land application.

The average person contributes about 37 pounds of waste annually, resulting in a collective 5.6 million dry tons per year in the United States[8]. Since sewage sludge will continue to be generated, a responsible management strategy is critical for all utilities. Therefore, a complete accounting of all tradeoffs in different management options needs to be evaluated to determine the strategies that minimize risk and maximize benefits while recognizing that there is no perfect or one-size-fits-all solution. EPA should consider a more robust risk assessment, incorporating all potential management methods for sewage sludge and their associated risk, which may be more beneficial for policymakers at the state, local, and national level to make science-based decisions regarding the risks and benefits of land applying biosolids in their jurisdiction, versus pursuing management and disposal options that do not recover valuable resources or contribute to the circular water economy.

EPA should update the final risk assessment to address water sector and Science Advisory Board concerns with the model.

While EPA has utilized probabilistic models for several other recent contaminants, EPA chose to use a deterministic model in this draft risk assessment. Deterministic models use single point inputs, while probabilistic models use a full range of values and thus are more realistic for measuring risk. WEF's members recommend EPA include a probabilistic model in the final risk assessment.

EPA should update model assumptions to align with typical biosolids use scenarios. For example, site restriction requirements in 40 CFR 503(32)(b)(5) limit access and exposure for biosolids as a fertilizer and soil amendment; EPA should incorporate these site restriction requirements into the modeled scenarios. Another example is with the model's assumptions regarding water use in dry land farming areas, where irrigation may not be used and there is limited application of biosolids. EPA needs to reevaluate the assumptions used for biosolids land application to ensure accuracy and that they reflect relevant practices that are commonly implemented.

EPA should also reevaluate assumptions made within the model related to drinking water wells. The depths modeled were all less than 2 meters, which may be inconsistent with typical screened depths in domestic or public water system wells. Additionally, while the Centers for Disease Control recommends wells be at least 100 feet from where

[8] Water Environment Federation. "After the Flush." 2025. https://www.wef.org/topics/practice-areas/biosolids-resource-recovery/after-the-flush/

fertilizer is stored or handled[9], the risk assessment models wells that are only 5 meters (16.4 feet) from the edge of the farm field; this recommendation is a requirement in states like Virginia, where the regulation specifically mentions that "no private well shall be placed closer than 100 feet from a field…on which biosolids are being applied or have been applied in the last 12 months"[10]. WEF recommends EPA ensure assumptions are in alignment with regulatory requirements and standard practice by engaging the appropriate stakeholders for validation.

Our members highlighted concerns in alignment with those brought up by EPA's Science Advisory Board in their review of EPA's Standardized Framework for Sewage Sludge Chemical Risk Assessment. Members have concerns with the partitioning factors used by EPA because of the nuances necessary to effectively evaluate biosolids and the biosolids-soil matrix. Additionally, the model does not account for the air-water interface, which affects transport of PFAS.

WEF's members also emphasized their alignment with comments outlined by the National Association of Clean Water Agencies and the research scientists from the US Department of Agriculture W-5170 Multi-State Research Team whose comments on this docket were provided by the California Association of Sanitation Agencies and the Mid-West Biosolids Association. WEF urges EPA to address model and assumption concerns outlined in these comments in the final risk assessment, in addition to those discussed herein.

EPA should revise the final risk assessment to utilize a Reasonable Maximum Exposure framework, rather than a Maximally Exposed Individual framework, to more accurately quantify risk.

WEF's members agree with the Science Advisory Board's concerns that the risk assessment framework, and associated assumptions, aligns with that for a Maximally Exposed Individual rather than for a Reasonable Maximum Exposure. The Science Advisory Board further highlighted concerns that the assumptions are not realistic and do not reflect current family farming practices or typical biosolid land application scenarios. The compounding assumptions utilized to support the farm family model have resulted in the overly conservative conclusions presented in this draft. Because PFOS and PFOA are ubiquitous compounds, more consideration is needed for how high-end assumptions compare to reasonable, real-world scenarios, and to determine if EPA's modeling is accurately predicting risk to human health or drawing overly conservative conclusions.

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[9] Centers for Disease Control. "Well Water Safety." 2024. https://www.cdc.gov/drinking-water/safety/index.html
[10] Virginia Administrative Code. Title 12. Health » Agency 5. Department of Health » Chapter 630. Private Well Regulations » Part III. Design and Construction Criteria » Article 2. General Provisions » 12VAC5-630-380. Well location.

EPA should update the final risk assessment to include data and research reflecting typical biosolids land application scenarios and recent research.

Research on the fate and transport of PFAS is constantly evolving and is a top priority for the water sector. PFAS were first introduced in the 1940s and their broad spectrum of use has widely distributed PFAS throughout the water environment. Initial research and studies on PFAS were conducted in areas that have been heavily impacted by these pollutants. Such studies, reflecting areas heavily impacted by PFAS pollution, were used by EPA to develop and support the model used in this risk assessment.

For example, to support the occurrence of high groundwater transport, EPA cites concentrations in Michigan, Maine, and Alabama that are specific to biosolids impacted by industrial use and also cites Brusseau et. al., where all but two sites were known to be industrially impacted or in aqueous film-forming foam (AFFF) training sites or source zones[11]. These studies do not reflect the typical land application scenario, as these biosolids have been disproportionally impacted by PFAS from industrial sites and AFFF training areas. In the final model, EPA should include data from biosolids application scenarios that are more representative of typical practice, including site location, loading rate, number and frequency of applications, and site restriction requirements.

As detection and sampling methods have become more sensitive, it has been possible to measure and detect low, background levels of PFAS. EPA should include studies focused on more typical land application scenarios, to build the model and not solely rely on studies from highly impacted areas that can be considered outliers. Featuring primarily studies from highly impacted areas may skew the model and mis-characterize the risk from biosolids land application.

Additionally, the model should incorporate ongoing and emerging research on crop uptake. The studies utilized in the risk assessment for crop uptake were limited; there are numerous ongoing research studies expected to be released within the next year that could help inform the model.

EPA should prioritize actions to eliminate PFAS from our supply chain and implement source control measures.

WEF supports EPA's ongoing efforts to remove PFAS at the source and suggests the Agency prioritize effluent limitation guidelines that would require PFAS generators to treat their wastewater ahead of sending their waste to municipal facilities and increased investment into industrial pre-treatment programs. Actions like this, especially when combined with additional guidance on applying the National Pretreatment Program, will

[11] Brusseau et. al. PFAS concentrations in soils: Background levels verses contaminated sites. Science of the Total Environment. 740. 2020.

enable the responsible and beneficial application of biosolids, while preventing large-scale contamination events.

WEF also supports policies aimed at removing PFAS from household products as soon as possible, as these are major contributors to PFAS found at WRRFs, and subsequently the biosolids produced through the treatment process. Further, EPA should coordinate with the Food and Drug Administration to remove PFAS from food and food packaging. As long as PFAS continue to be introduced into our supply chain through everyday products, PFAS will continue to be received by our nation's WRRFs.

EPA should address communication concerns ahead of the release of the final risk assessment.

EPA's conclusions in this draft risk assessment have resulted in misunderstandings and mischaracterizations regarding the risk of biosolids to the general public by policymakers, the media, advocacy groups, and the public. EPA should clearly communicate the purpose and the results of the risk assessment, its potential implications, as well as provide overall context for PFAS risks in the environment to provide a holistic analysis of the risk posed to human health. It's important that the inherent limitations of a risk assessment, the necessity of having a responsible sewage sludge management strategy, and the complex nature of PFAS are clear to both the intended audience of this risk assessment, and policymakers who may seek to use its conclusions beyond EPA's intended purpose.

EPA should also prioritize clear communication of the assumptions driving the outcomes of the analysis. The rationale supporting assumptions should be clearly provided. As currently drafted, this information is not available for many assumptions. For example, EPA does not provide an explanation regarding the implications of assuming the median PFOA and PFOS concentration is 1 ppb. It is critical for EPA to be transparent about all assumptions used in the model.

WEF's members also brought up concerns about the interchangeable use of "biosolids" and "sewage sludge" by EPA. While the terms are often used interchangeably with the public, there is a clear difference between these terms. EPA defines "biosolids" to mean sewage sludge that has been treated to meet the requirements in 40 CFR part 503 and is intended to be applied to land as a soil conditioner or fertilizer, while "sewage sludge" is used in regards to untreated waste material. This is an important distinction in public communications and EPA should clearly outline the difference and utilize the correct language in the final risk assessment.

EPA should issue interim guidance to WRRF to outline the Agency's expectations around the responsible management of PFAS in biosolids.

The water sector's understanding of effective mitigation strategies for PFAS in water, waste streams, and biosolids continues to evolve. Water professionals are dedicated to responsibly managing the risk of PFAS in water, wastewater, and biosolids, as the water community stands as a last line of defense against PFAS contamination. At the same time, recovering nutrients, and preserving the land application of biosolids is critical for the circular water economy. In absence of regulations around 503 requirements for PFAS, and as EPA moves to finalize the risk assessment, WEF members recommend EPA adopt interim guidance for the management of PFAS in biosolids. Guidance from EPA would provide a standardized, nationwide approach that would provide WRRFs with more certainty in their biosolids management approaches while the risk assessment is updated based on real-world application scenarios. WEF's members recommend that this interim guidance model the Michigan Department of Environment, Great Lakes, and Energy's Interim Strategy for the Land Application of Biosolids Containing PFAS[12]. This strategy is implementable, scalable, and based on real-world data. The results from monitoring have demonstrated a quantifiable reduction in PFAS in biosolids over time. This approach minimizes risks and maximizes the benefits of biosolids and should be adopted as an interim mitigation measure while EPA works to finalize the risk assessment.

EPA's actions should help drive progress towards a circular water economy.

Unfortunately, the draft risk assessment has become a barrier to the progress towards a circular water economy, as the draft assessment did not include a risk management component nor did it fully evaluate all available management options for sewage sludge. While EPA indicates that the risk assessment conclusions do not indicate a risk to the general public, some policymakers in numerous states, including New York, Maryland, Texas, and Oklahoma, proposed restrictions or bans on biosolids land application following the release of the draft risk assessment. While many of these policies did not move forward, WEF's members request better communication from the Agency to ensure that your conclusions are not misinterpreted or used in unintended ways.

WEF's Members are concerned that the siloed approach taken by EPA in developing this risk assessment, along with the omission of a risk management analysis has led to a misunderstanding of the risks associated with biosolids land application among the public and policymakers. EPA should ensure the final risk assessment accurately reflects the risks associated with managing sewage sludge and land applying biosolids through a

[12]Michigan Department of Environment, Great Lakes, and Energy. "Interim Strategy for the Land Application of Biosolids Containing PFAS." 2022. https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/WRD/Biosolids/PFAS-Biosolids-Interim-Strategy-2022.pdf

risk management and source control lens. This should include information on common PFAS exposure pathways to highlight that the overall risk assessment is only evaluating a small and specific portion of the potential risk of PFAS exposure from all vectors.

The final risk assessment will have implications on the water sector for many years to come. It will drive new policies, potential restrictions, treatment requirements, or regulations for biosolids management, directly affecting WRRFs that rely on land application to responsibility manage an unavoidable byproduct in a way that minimizes risk and maximizes benefits. The final risk assessment should not lead to policies that misinterpret its conclusions, where communities are encouraged or forced to waste or incinerate this nutrient-rich, renewable resource at significant costs to ratepayers. Instead, future policies should be built upon a foundation of sound, science- and data-based conclusions, that utilizes the most recent research, real-world data, and accurate assumptions.

Thank you for the opportunity to comment on this important document. Please direct questions regarding these comments to WEF's Senior Manager of Regulatory Affairs, Ashley Voskuhl at avoskuhl@wef.org, or myself at sdye@wef.org.

Sincerely,

Steve Dye
Senior Director of Government Affairs
Water Environment Federation