# FACT SHEET

## Draft Sewage Sludge Risk Assessment for PFOA and PFOS

January 2025

On January 14, 2025, the U.S. Environmental Protection Agency (EPA) released its Draft Sewage Sludge Risk Assessment for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonic Acid (PFOS). The draft risk assessment indicates that in some scenarios, the EPA's acceptable risk thresholds may be exceeded when sewage sludge containing PFOA and PFOS is land applied for beneficial reuse or surface disposed. The draft risk assessment focuses on people living on or near impacted farms or those that rely primarily on their products. The findings presented in the draft risk assessment are preliminary. The EPA expects to publish a final risk assessment after reviewing public comments and revising the draft risk assessment accordingly. Once finalized, the risk assessment will provide information on risk from use or disposal of sewage sludge and will inform the EPA's potential future regulatory actions under the Clean Water Act (CWA). The EPA is committed to partnering with states, Tribes, territories, and wastewater treatment plants (WWTPs) to reduce risks from PFOA and PFOS that may occur through the management of sewage sludge, including the land application of sewage sludge.

### What are sewage sludge and biosolids?

When sewage from households and businesses is sent to a WWTP, the liquids are separated from the solids, producing a nutrient-rich product known as "sewage sludge." The EPA typically uses the term "biosolids" to refer to treated sewage sludge that is intended to be applied to land as a soil conditioner or fertilizer. Sometimes biosolids are distributed to farms. While some states, Tribes, or counties may have additional rules around the use of biosolids, federal rules currently allow biosolids to be applied to pastures, feed crops, and crops for direct human consumption. Biosolids can also be applied to forests, tree farms, golf courses, turf farms, and other types of land. In other cases, biosolids are bagged and sold at stores to the general public and are often used on lawns or in home gardens. Not all WWTPs create biosolids for land application; some incinerate sewage sludge and others send it to a landfill. Biosolids are different from manure or industrial sludge (like pulp from a paper mill), which are also sometimes used as a soil amendment. The EPA does not regulate the land application of manure or industrial sludges in the same manner it does for biosolids.

### What are PFOA and PFOS?

PFOA and PFOS are two chemicals in a large class of synthetic chemicals called per- and polyfluoroalkyl substances (PFAS). PFOA and PFOS have been widely studied, and they were once high production volume chemicals within the PFAS chemical class. PFAS have been manufactured and used by a broad range of industries since the 1940s, and there are estimated to be thousands of PFAS present in the global marketplace that are used in many consumer, commercial, and industrial products. PFOA and PFOS tend to persist in the environment for long periods of time and have been linked to a variety of adverse human health effects.[1]

PFAS manufacturers voluntarily phased out domestic manufacturing of PFOA and PFOS and the EPA restricted their use by Significant New Use Rules (SNURs) issued under the Toxic Substances Control Act (TSCA).[2] Though

[1] *see* the EPA's Final Toxicity Assessment for PFOA and Final Toxicity Assessment for PFOS

[2] *see* the EPA's Risk Management for PFAS under TSCA

concentrations of PFOA and PFOS in people's blood have lowered since the voluntary phase out, blood levels can be elevated in communities where there is significant environmental contamination and exposure. [3]

## Why is the EPA concerned about the presence of PFOA and PFOS in sewage sludge?

Although domestic manufacturing of PFOA and PFOS have been phased out and their uses restricted, multiple activities still result in PFOA, PFOS, and their precursors being released to WWTPs.[4] Traditional wastewater treatment technology does not remove or destroy PFOA or PFOS, and these chemicals typically accumulate in the sewage sludge. PFOA and PFOS have strong chemical bonds, which means they do not break down on their own in the environment or in our bodies. The chemicals can move from soils to groundwater or nearby lakes or streams, and be taken up into fish, plants, and livestock. These factors combine to raise questions about the potential risks associated with the presence of PFOA or PFOS in sewage sludge that is land applied as a soil conditioner or fertilizer (on agricultural, forested, and other lands), surface disposed, or incinerated.

## What are the potential sources of PFOA and PFOS in sewage sludge?

Current and historical activities include industrial releases (*e.g.*, certain types of firefighting foam, pulp and paper plants), commercial releases (*e.g.*, car washes, industrial launderers), and down-the-drain releases from homes (*e.g.*, use of consumer products like after-market water resistant sprays, ski wax, floor finishes, and laundering of stain or water-resistant textiles with PFOA or PFOS coatings). If products containing PFOA or PFOS are disposed of at a lined municipal solid waste landfill, because the most common off-site management practice for landfill leachate is to transfer it to a WWTP, then that landfill's leachate could be a source of PFOA and PFOS to a WWTP. Studies have found PFOA and PFOS in sewage sludge even at WWTPs that only receive wastewater from residential and commercial users. At different WWTPs across the country, any of these release mechanisms may play a role in PFOA or PFOS entering the plant and contaminating the sewage sludge.

## What is a sewage sludge risk assessment?

Risk assessment is a scientific process that is used to understand health risks to people, livestock, or wildlife across the country. The EPA uses sewage sludge risk assessments to help evaluate whether actions, including regulation, are needed to protect those who may experience risks from sewage sludge use or disposal. In this sewage sludge risk assessment, the EPA estimates potential human exposures and risks in modeled scenarios where sewage sludge has been land applied or surface disposed. The draft risk assessment focuses on risks to humans because available data indicate that people are much more sensitive to exposures to PFOA or PFOS than livestock or wildlife. Finally, this risk assessment does *not* assess risks to people in the general population, who often have a diversity of sources for their foods.

## What does this draft sewage sludge risk assessment suggest?

The draft risk assessment focuses on those living on or near impacted sites (*e.g.,* farm families and their neighbors) or those that rely primarily on their products (*e.g.,* food crops, animal products, drinking water); the draft risk assessment does *not* model risks for the general public. Based on the modeling in the draft sewage sludge risk assessment, the EPA finds that there may be human health risks exceeding the EPA's acceptable thresholds for some modeled scenarios when land-applying sewage sludge that contains 1 part per billion (ppb) of PFOA or PFOS. The EPA also finds that there may be human health risks associated with drinking

---

[3] *see* the ATSDR's Resources on PFAS Exposure in Impacted Communities

[4] *see* the EPA's Preliminary Effluent Guidelines Program Plan 16 and Multi-Industry Per- and Polyfluoroalkyl Substances (PFAS) Study – 2021 Preliminary Report

contaminated groundwater sourced near a surface disposal site when sewage sludge containing 1 ppb of PFOA or sewage sludge containing 4 to 5 ppb of PFOS is disposed in an unlined or clay-lined surface disposal unit. The EPA provides a qualitative description of the potential risks to communities living near a sewage sludge incinerator (SSI) in the draft risk assessment but does not provide quantitative risk estimates due to significant data gaps related to the extent to which incineration in an SSI destroys PFOA and PFOS and the health effects of exposure to products of incomplete combustion.

The draft risk calculations are not conservative estimates because (1) they model risk associated with sewage sludge containing 1 ppb PFOA or PFOS, which is on the low end of measured U.S. sewage sludge concentrations (2) reflect median exposure conditions (*e.g.,* 50$^{th}$ percentile drinking water intake rates) rather than high end exposure conditions, (3) do not take into account non-sewage sludge exposures to PFOA and PFOS (*e.g.*, consumer products, other dietary sources), (4) do not account for the combined risk of PFOA and PFOS, and (5) do not account for additional exposures from the transformation of PFOA and PFOS precursors. As such, risk estimates that account from multiple pathways, multiple sources of exposure, and multiple PFAS would be greater than presented in this draft assessment.

## What does this mean for communities?

The Agency recognizes that this draft risk assessment may raise many questions, especially for those who have had biosolids applied to their farms or properties. The EPA encourages people who are concerned to learn about PFAS, including actions that may already be underway and opportunities to reduce exposure. The EPA has created answers to a list of important questions related to this announcement to help members of the public learn more.

If you are concerned about PFAS in sewage sludge, the EPA recommends you contact your state environmental agency or county government to learn about its efforts to address PFOA and PFOS, including in wastewater and sewage sludge. You may also contact your local agriculture extension program, your closest USDA Service Center, or your local wastewater utility to learn more about the biosolids applied to your property and to find out whether they have monitoring data for PFAS or can provide any specific recommendations for your community. The EPA recommends that wastewater systems that find PFOA or PFOS in their biosolids that is land applied take steps to inform the users of biosolids, undertake additional sampling to assess the level, scope, and source of contamination, and examine options for steps to limit exposure. Current science indicates that **lower levels of PFAS exposure present less risk**, so these efforts to identify and reduce PFOA and PFOS in sewage sludge help protect public health.

## If you are concerned about PFAS in sewage sludge, the EPA recommends you:

- Consider contacting your state environmental agency or county government to learn about its efforts to address PFOA and PFOS, including in wastewater and sewage sludge.
  - State and regional biosolids contacts: https://www.epa.gov/biosolids/epa-regional-and-state-contacts-biosolids
  - General PFAS resources from your state: https://www.epa.gov/pfas/us-state-resources-about-pfas
- Consider contacting your local agriculture extension program or your closest USDA Service Center.
  - https://extension.org/find-cooperative-extension-in-your-state/
  - https://www.farmers.gov/working-with-us/service-center-locator
- Contact your local wastewater utility to learn more about the biosolids applied to your property and to find out whether they have monitoring data for PFAS or can provide any specific recommendations to request testing of the soil on your property.

- If you have a home drinking water well, ensure you are protecting and maintaining it: https://www.epa.gov/ground-water-and-drinking-water
- Consider testing your home drinking water well for PFOA and PFOS.
    - There is more information about testing private drinking water wells for PFAS in the EPA's factsheet for small and rural communities under the section "Information for Communities and Households Served by Privately-Owned Wells": https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_fact-sheet_monitoring_4.8.24.pdf
- Learn more about the EPA's Research on PFAS: https://www.epa.gov/chemical-research/research-and-polyfluoroalkyl-substances-pfas
- Review the EPA's Meaningful and Achievable Steps You Can Take to Reduce Your Risk: https://www.epa.gov/pfas/meaningful-and-achievable-steps-you-can-take-reduce-your-risk
- Learn more about the National Academies of Science and Medicine's Guidance on PFAS Exposure, Testing, and Clinical Follow-up: https://nap.nationalacademies.org/resource/26156/interactive/

## What is the EPA doing to reduce exposure to PFOA and PFOS in sewage sludge?

The potential risks posed by PFOA, PFOS, and other PFAS demand that the EPA address the problem on many fronts using all applicable statutory authorities. The EPA continues to fund research and take actions to reduce the concentration of PFOA and PFOS discharged to wastewater treatment plants, lower the concentration of these chemicals in sewage sludge, and reduce risk from use or disposal of sewage sludge.[5] Specifically:

- The EPA has provided over twenty million dollars in research funding through the Evaluation of Pollutants in Biosolids and Research for Understanding PFAS Uptake and Bioaccumulation in Plants and Animals in Agricultural, Rural, and Tribal Communities grants.
- The EPA continues to work toward restricting industrial PFAS discharges to WWTPs using Effluent Limitations Guidelines. Current actions include:
    - Revising the Organic Chemicals, Plastics, and Synthetic Fibers Effluent Limitation Guidelines (ELGs) to address wastewater PFAS discharge from PFAS manufacturing facilities;
    - Revising the Metal Finishing and Electroplating ELGs to address wastewater discharge of PFAS from metal finishing and electroplating operations focusing on facilities using PFAS-based fume suppressants and wetting agents; and
    - Revising the Landfills ELGs to address PFAS discharges from landfill leachate.
- The EPA's upcoming Publicly Owned Treatment Works (POTW) Influent PFAS Study will also help the Agency prioritize industrial point source categories for future study and, as appropriate, ELGs.
- To better understand occurrence, the Agency has announced the next National Sewage Sludge Survey to obtain national concentration data on PFAS in sewage sludge.
- The EPA continues to track releases through Toxics Release Inventory Reporting.
- The EPA has updated the Interim Guidance on the Destruction and Disposal of PFAS and Materials Containing PFAS, which presents the state-of-the-science information on methods to remediate, dispose of, and destroy PFAS contamination.
- The Agency has published Final Ambient Water Quality Criteria for Aquatic Life for PFOA and PFOS, which can be used for WWTP effluent permitting.
- The EPA also released draft Human Health Criteria for PFOA, PFOS, and PFBS which, when finalized, can be used for WWTP effluent permitting.

[5] Learn more about PFAS and review the Agency's PFAS Strategic Roadmap: https://www.epa.gov/pfas/pfas-strategic-roadmap-epas-commitments-action-2021-2024

While the PFOA and PFOS sewage sludge risk assessment and these agency actions are underway, the EPA recommends that states monitor sewage sludge for PFAS contamination, identify likely industrial discharges and other sources of PFAS, and implement industrial pretreatment programs where appropriate. Doing so will help reduce downstream PFAS contamination and lower the concentration of PFAS in sewage sludge as described in Section C of the EPA's December 2022 memorandum entitled, "Addressing PFAS Discharges in NPDES Permits and Through the Pretreatment Program and Monitoring Programs."

Learn more about the EPA's recent actions to address PFAS in sewage sludge.

Learn more about the EPA's Draft Sewage Sludge Risk Assessment for PFOA and PFOS.