



New York Water
Environment Association

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What are Biosolids?

Water Resource Recovery Facilities (WRRFs) accept and treat wastewater from society to remove pollution, protecting public health and aquatic environments. The use of WRRFs accelerated after the implementation of the Clean Water Act, and these facilities have been critical in reversing polluted waterways of the United States.

Biosolids are a byproduct of the wastewater treatment process, or what is left over after clean water is reclaimed at a WRRF. The terms “biosolids” and “sewage sludge” are often used interchangeably by the public; however, **the US EPA typically uses the term “biosolids” to mean sewage sludge that has been further treated to meet the requirements in the EPA’s regulations for composting and land application.** These treated solids are intended to be applied to land as a soil conditioner or fertilizer; providing a beneficial use.

There are only three options for use or disposal of sewage sludge or biosolids:

1. Land application
2. Landfilling
3. Incineration

The transportation of biosolids away from a WRRF generally involves the use of trucks or in some instances barges at large facilities. There is very limited capacity available in landfills or incinerators for additional biosolids. To demonstrate, it is estimated that 20% to 30% of the biosolids produced in New York are disposed at out of State facilities, which in many instances requires transportation at higher cost by rail after leaving the WRRF by truck.

What is PFAS?

Per- and polyfluoroalkyl substances (PFAS) have been in the news recently. PFOA and PFOS have been added to commercial products for over 50 years to make them stain-resistant, water-repellant, and nonstick—and are found in everything from clothing, cosmetics, food packaging, and more. PFAS compounds are so common that studies have shown most adults have some levels of PFOA and PFOS in their blood.

That is one reason why PFOA and PFOS are no longer in use by industry since the early 2000s. The result of phasing out these chemicals has made a difference, as demonstrated by the Center for Disease Control (CDC) through monitoring of blood levels in the US population. Removing these chemicals at the source makes a difference.

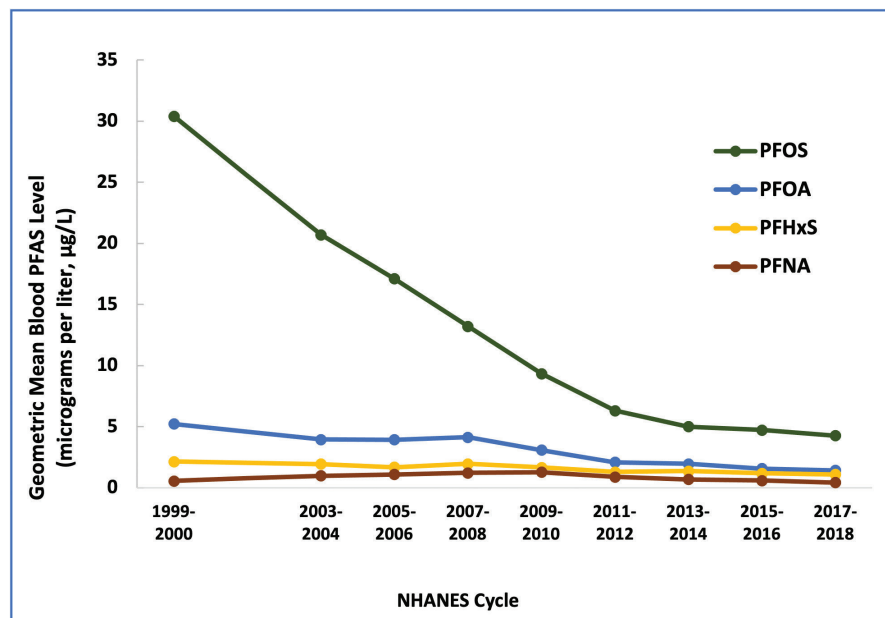


Chart: Agency for Toxic Substances and Disease Registry (ATSDR)



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Key Findings of the US EPA Draft Risk Assessment of PFAS in Biosolids



Because PFAS is everywhere and hence is present in dirty water and other items that go down the drain and into the sewer system, these compounds can also be found in biosolids. For the past several years the USEPA has been conducting a risk assessment of two PFAS chemical—PFOA and PFOS—in biosolids. The USEPA Risk Assessment is currently under review by peer risk assessors to determine the quality of the study and key underlying assumptions.

The draft risk assessment quantitatively evaluated potential human health risks through 18 potential exposure pathways from two common biosolids management practices: land application and surface disposal in a monofill. Risks associated with sludge incineration were described only qualitatively due to a lack of data.

The quantitative assessment focused on a hypothetical “farm family” that lives on or near a site where biosolids are disposed of in a monofill or land-applied annually at a rate of 10 metric tons (dry) per hectare for 40 years. The assessment assumes that the farm family sustains itself primarily on the crops, milk, meat, eggs, and drinking water from the impacted land for 10 years.

Key Findings Include:

- EPA’s acceptable risk thresholds may be exceeded for the farm family under some modeled scenarios when biosolids containing 1 part per billion (ppb) of PFOA or PFOS is land-applied.
- Human health risks may occur from drinking contaminated groundwater near inadequately lined surface monofills with sewage sludge containing 1 ppb PFOA or 4-5 ppb PFOS.
- While incinerating sewage sludge might affect nearby communities, EPA needs more data to quantify the risks.
- The draft risk assessment focused on the hypothetical farm family and did not assess risks to the general population who typically have a diverse diet and are not in close contact with land-applied biosolids.

Source: Carollo Engineers Technical Bulletin 1-25

What the EPA Recommended (January 2025) and What this Means for States

The draft risk assessment is not a regulation and does not compel action. The EPA’s draft risk assessment indicates that each of the three common use or disposal options may result in elevated risk levels when sewage sludge with typical concentrations of PFOA or PFOS is managed. With the understanding that eliminating these risks is likely not possible at this time, the EPA recommends, in addition to pre-treatment to reduce PFAS at the source, that states consider management options or practices that can mitigate or lessen risks. The EPA recognizes that states may have constrained options for sewage sludge management and changes may not be possible, particularly in the near term.

The EPA is continuing to recommend 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 prevent 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.” 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 and the environment.

Source: Draft Sewage Sludge Risk Assessment for PFOA and PFOS: Information for State Water Agencies January 2025



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What Happens if New York Bans Land Application of Biosolids?

It is important to note that the concentration of PFAS compounds in biosolids will vary depending on the upstream sewer users, including landfills. Biosolids with PFAS levels that exceed the DMM7 thresholds will be required to be disposed of and not land applied. However, if there is a biosolids land application ban we believe the following to be true based on the Maine experience:

- **Farmers who use biosolids will face higher costs** for chemical fertilizer and receive less benefits of water retention.
- **WRRF rate payers will be saddled with increased biosolids disposal costs.** Maine saw a 210% increase in the cost to dispose of biosolids, which was before the US imposed tariffs on Mexico and Canada where significant supply chain requirements to improve the transportation exist and will be relied upon.
- **PFAS won't stay in the landfill.** Landfill leachate is typically treated at municipal WRRFs. Banning land application will increase landfilling of biosolids. The villages and towns that operate these WRRFs will bear the financial burden of treating PFAS. Because the alternative infrastructure capacity required (incineration capacity, landfill capacity, transportation capacity) does not currently exist, if one of the three existing methods to use or dispose of biosolids is eliminated, it will most likely cause solids to accumulate at WRRFs. This ultimately could negatively impact the ability of WRRFs to protect the waterbodies of New York, causing more harm than good.
- **Greater carbon emissions.** A key component of New York State's strategy related to the "Climate Leadership and Community Protection Act" (CLCPA) is encouraging biosolids land application because of its benefits related to carbon sequestration. Not only would a ban eliminate the benefit of carbon sequestration, carbon emissions will increase from transporting the biosolids to landfills or incineration of biosolids. Landfilled biosolids will generate methane as well. The 2017 New York State Methane Reduction Plan identifies diversion of organic materials (biosolids) from landfills as an action NYS DEC would undertake to reduce methane emissions.
- **Water quality could directly be affected** across the state as the biosolids market finds new disposal sites. This requires permitting, approval and ultimately time.

New York State Department of Environmental Conservation (NYSDEC) Actions



Over the past several years, the NYSDEC has developed Technical Operational Guidance Series (TOGS) Permitting Strategy for Implementing Guidance Values for PFOA, PFOS, and 1,4-Dioxane (TOG 1.3.13) and draft Permitting Strategy for Implementing Guidance Values for PFOA, PFOS, and 1,4-Dioxane (TOG 1.3.14). These TOGS recognize that biosolids are passive receivers of these compounds, and hence takes a scientific approach by reducing PFOA and PFOS at the source through enhanced controls of industrial discharges and pretreatment programs, in line with US EPA guidance. NYSDEC Department of Materials Management has instituted a program policy, DMM7 Biosolids Recycling Interim Strategy for the Control of PFAS Compounds, which is the most stringent policy in the United States. DMM7 requires sampling of biosolids that are recycled and based on those sampling results, specific actions are taken—including prohibitions of land application of certain biosolids if PFOA and PFOS concentrations are too high from a particular source.

What Happened When Maine Banned Land Application?

Maine banned the land application of all biosolids in April 2022 (HP1417 – LD1991). The ban was largely due to findings at a single farm where biosolids were land applied. The source of PFAS was a WRRF that treated wastes from a major industry that utilizes PFAS compounds. **As a result of the ban, the cost to dispose of biosolids in the state rose 210% on average.** Maine has a population of 1.4M people compared to New York with a population of over 20M people.