



Biosolids

Focus on: Assessment of PFAS levels in Washington State Biosolids

Overview

The Washington Department of Ecology (Ecology) worked with wastewater treatment plants (WWTP) to conduct voluntary, preliminary testing for PFAS in biosolids.

What are PFAS and biosolids

PFAS are a family of chemicals used in a range of common consumer products and industrial applications for their stain-resistant or nonstick properties. From these products, PFAS can eventually end up in wastewater and stormwater.

Biosolids are a byproduct of WWTPs that can be used as a soil amendment to provide nutrients in topsoil, compost and fertilizer products. PFAS make their way into biosolids from residences and industries that discharge to WWTPs. In this way, WWTPs are not producers of PFAS, instead they receive these chemicals from upstream sources.

Investigating PFAS in biosolids

In 2024, Ecology started investigating via sampling whether PFAS might be found in biosolids generated in Washington state, and, if so, at what levels. The sampling was intended to guide future investigations and provide Ecology a better understanding of the sampling process so staff can offer technical support to permittees in the future.

Ecology asked WWTPs to participate in voluntary sampling by Ecology staff and analysis conducted by an independent laboratory, SGS AXYS. There was enough funding to sample biosolids from 44 facilities across the state. The results of this one-time sampling are not statistically meaningful enough to guide potential regulatory actions. However, the data does provide insights into the presence of PFAS in biosolids. The results also identified a limitation with the method of analysis used for certain biosolids.

How PFAS gets into biosolids



Sampling methods and report focus: PFOA and PFOS

The study included WWTPs of differing sizes, with different upstream dischargers, from each region in Washington. Ecology staff conducted sampling at each facility using the methods below as dictated by the [Quality Assurance Project Plan](#).

- EPA's Method 1633
- Total Oxidizable Precursors (TOP)
- Extractable Organic Fluorine (EOF)
- **Novel Non-Targeted Analysis method devised and conducted by EPA's Office for Research and Development. Ecology is awaiting results.**

Ecology's focus in this report is on PFOS and PFOA as these are the PFAS chemicals that EPA and other state agencies are currently focusing on in biosolids.

Results

PFAS contamination was identified in almost every sample from the 44 facilities. The chemicals were found in urban and rural areas, as well as large and small facilities.

This was not surprising by itself – PFAS chemicals are used in a wide range of products and are expected to be present nearly everywhere.



Inconclusive results from liquid biosolids

One significant finding from Ecology’s study is that there is a limitation with the analysis method recommended by the EPA – [Method 1633](#) – when used for liquid biosolids of less than 5% solids. Without further sample preparation, the method as it is currently written does not produce consistent or reproducible results when run on liquid biosolids. Other states including [Colorado](#) and [New York](#) have identified the same limitation.

This limitation affected seven of the participating WWTPs’ results. This means Ecology can’t rely on these results to inform policy.

Dewatered biosolids PFOA and PFOS levels

The remaining 37 WWTPs included in this study generate dewatered biosolids that produced consistent and reproducible data. Meaning Ecology has a high certainty that the results are precise.

The levels of PFAS found in dewatered biosolids in this study were in a range Ecology expected. They are comparable to results from other states where

no known PFAS manufacturing exists. This indicates concentrations consistent with the use of PFAS-containing products, such as stain and water-resistant coatings.

PFOA levels were below 20 ppb in all dewatered biosolids in this study. PFOS levels were below 20 ppb for 70% of the sampled WWTPs. The remaining WWTPs measured between 20-60 ppb PFOS.

In comparison to other states with interim PFAS Strategies for Biosolids, these biosolids would be eligible for land application under both Michigan and Colorado’s PFAS interim strategies for biosolids. The majority (70%) would be eligible for land application without additional requirements.

Residential and industrial inputs

Ecology expected to see larger WWTPs have higher amounts of PFOA and PFOS present in their biosolids compared to smaller WWTPs due to the higher probability of receiving industrial inputs. However, the widespread presence of these chemicals across Major and Minor WWTP facilities indicates that wastewater coming from our homes may have just as much impact on biosolids as discharges coming from businesses and industry.

These results indicate future sampling should not be limited to major urban centers or to locations where industrial uses of PFAS have been identified.

Next steps: Senate Bill 5033

The signing of Washington SB5033 into law on May 17, 2025, temporarily adds PFAS sampling requirements for biosolids generated and land applied in Washington. The law will help generate more data on the levels of PFAS concentrations in Washington biosolids. Ecology will identify appropriate solutions to address the limitations identified with EPA Method 1633 prior to implementation of 5033.

These expanded testing efforts and resulting data will inform the path forward for Washington’s biosolids program.



Emily Kijowski
emily.kijowski@ecy.wa.gov
360-789-6592



To request an ADA accommodation, contact Ecology by phone at 360-407-6831 or email at ecyadacoordinator@ecy.wa.gov, or visit <https://ecology.wa.gov/accessibility>. For Relay Service or TTY call 711 or 877-833-6341.