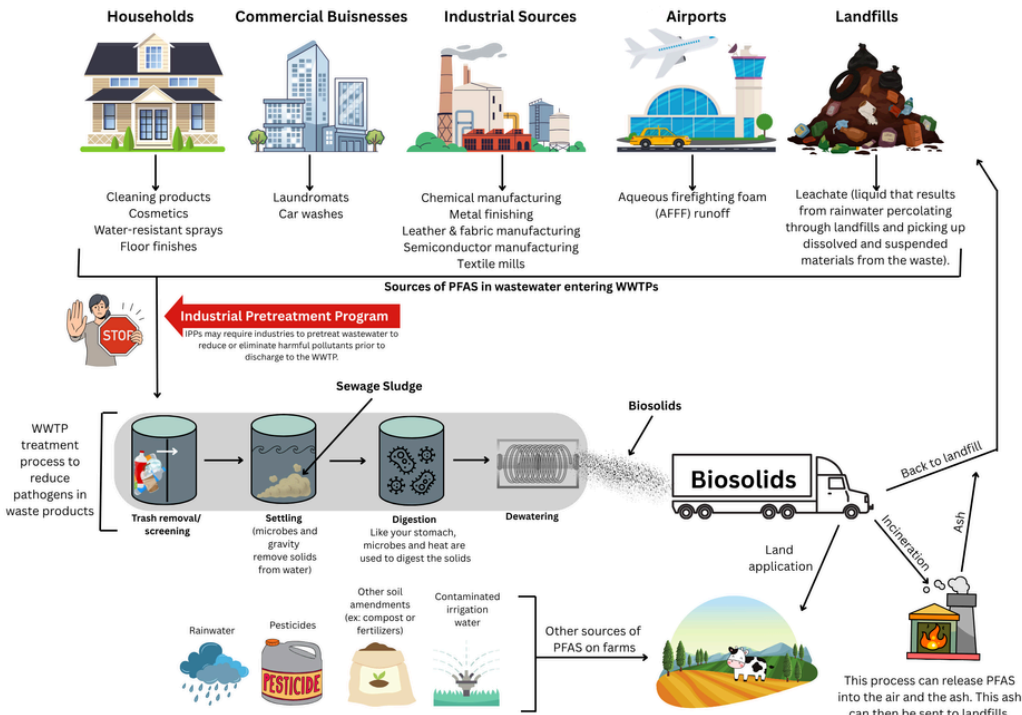


PFAS AND BIOSOLIDS

WHAT ARE BIOSOLIDS?

Biosolids are the organic materials that remain after the treatment of sewage sludge at wastewater treatment plants (WWTPs). Sewage sludge refers to the solids that settle out during the wastewater treatment process and are not yet treated to reduce pathogens or contaminants. There are three options for disposal of these waste products: landfilling, incineration and land application.

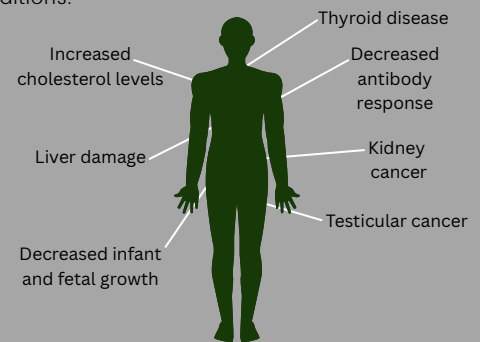


CONSIDERATIONS FOR LAND APPLICATION OF BIOSOLIDS

Land application of biosolids can be beneficial to farmland. Biosolids can improve soil organic matter and soil health. Increases in soil organic matter can lead to greater aeration, water infiltration, erosion resistance, and greater microbial diversity. Biosolid land application can also be a cost-effective fertilizer source compared to other commercial products. In 2024, biosolids were applied to 0.38% of Michigan agricultural land. While biosolids are a great option for some farms, there are considerations before applying them to farmland including potential for environmental contamination, odors and challenging neighbor relations. Despite going through several treatment processes to stabilize the materials and kill pathogens, biosolids can still carry detectable levels of synthetic chemicals, metals, microplastics and pharmaceuticals. WWTPs are ineffective at destroying PFAS, so they often remain in biosolids. More research is needed to determine the impact of these remaining contaminants on food safety.

WHAT ARE PFAS?

PFAS stands for per- and polyfluoroalkyl substances, a large group of over 12,000 different human-made chemicals with properties of being resistant to oil, water and stains. PFAS are commonly used in a variety of products like makeup, food packaging, firefighting foam, non-stick cookware, etc. These compounds do not naturally degrade in the environment and bioaccumulate in plants, water, soil, and animals, including humans. High levels of exposure are associated with several different health conditions.



MICHIGAN'S RESPONSE

Since 2018, Michigan's Department of Environment, Great Lakes, and Energy (EGLE) has monitored WWTPs influent, effluent and biosolids and aimed to reduce or eliminate major sources of PFAS from entering WWTPs (Industrial Pretreatment Programs or IPP). EGLE has also developed an interim strategy that determines appropriate land application rates based on the concentrations of PFOS and PFOA, which are two of the most toxic and bioaccumulative PFAS compounds. In 2024, 89% of biosolids in Michigan were in the category of the lowest PFAS concentration (<20 µg/kg or ppb). Although EGLE only regulates the concentrations of PFOS and PFOA, they are monitoring 28 different PFAS compounds in biosolid products. For more information on Michigan's response to PFAS in biosolids, scan the QR code below.

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**FOR MORE
INFORMATION**



✓ Contact Faith Cullens-Nobis (cullensf@msu.edu) or Katie King (kingka22@msu.edu)

OR VISIT

[HTTPS://WWW.CANR.MSU.EDU/PFAS/](https://www.canr.msu.edu/pfas/)

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