

# FROM WASTE(WATER) TO RESOURCE

## BIOSOLIDS AND PFAS



### WHAT ARE BIOSOLIDS?

Biosolids are the treated materials produced during the processing of wastewater at all wastewater treatment facilities known in Lincoln as water resource recovery facilities (WRRF). Biosolids are rich in nutrients and organic matter and may be used as fertilizer or soil amendments. The quality of biosolids and their proper use are regulated by the U.S. Environmental Protection Agency (USEPA). The USEPA requires biosolids to undergo a treatment process and be tested for certain pollutants to protect human health and the environment. Those processes refine the biosolids so that they can be applied at agronomic rates to meet crop needs, providing a stable and valuable source of plant nutrients and soil enhancements without the use of costly chemical fertilizers.

The City of Lincoln does not distribute biosolids for domestic use or for compost. All biosolids are utilized on agricultural fields growing typical row crops such as sorghum, wheat, soybean and corn.



Comparison of biosolids: liquid form in a clear jar versus dry, soil-like biosolids in a plastic bag.

### WHAT ARE PFAS AND HOW DO THEY GET IN WASTEWATER?

Per- and Polyfluoroalkyl substances (PFAS) are a large group of chemicals used for decades in industrial, commercial, and domestic settings and are found worldwide. Typical materials or processes that use or contain PFAS include firefighting foam, cookware coatings, waterproofing on clothing and carpet, stain resistant consumer products, many household products including detergents and even food wrappers. Some PFAS, including Perfluorooctanoic Sulfonate (PFOS), which are most commonly found in biosolids, have been phased out of production in the United States and are no longer approved for use. Even though they have not been used for years, their legacy remains.



Aerial view of the Theresa Street Water Resource Recovery Facility.

The City of Lincoln's WRRFs do not generate PFAS chemicals, though they may receive discharges from domestic and commercial/industrial sources. As a result, PFAS may be found in treated wastewater and biosolids. Some of those PFAS are known to travel through water, can linger in the environment and air, and have the potential to impact the soil, water and crops. Because of this, the City of Lincoln has partnered with the University of Nebraska – Lincoln to test our biosolids for the presence of 18 different species of PFAS, including PFOS.

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Through our testing, we have found the amount of PFAS detected in biosolids in Lincoln is very low. Because USEPA is still working to complete a risk base evaluation of PFAS in biosolids, two states, Michigan and Illinois, have self-imposed PFAS limits at levels of 100-125 ppb (parts per billion). Lincoln's biosolids have 0.023 ppb total of the 18 species of PFAS tested. The highest concentration was PFOS with .0094 ppb.

In addition, UNL's research has shown **no uptake** of PFAS in typical row crops grown such as sorghum, wheat, soybean and corn. This means these crops are not absorbing and do not contain PFAS from the soil they grow in or from biosolids in the soil they grow in.

Soil samples from fields that had received Lincoln biosolids indicated a total PFAS concentration of 0.0000176 ppb which **was not statistically different** than soil samples that had not received biosolids application at 0.0000130 ppb.

With these results and continued monitoring, the land application continues to be a safe and effective means of utilizing the valuable resources found in Lincoln's biosolids.

## THE FUTURE OF LINCOLN'S BIOSOLIDS PROGRAM

The biosolids program established by USEPA 40 CFR 503 program has been successful for over 35 years. It is an excellent way to provide nutrients and minerals to agricultural ground, reusing resources that would otherwise be landfilled or incinerated.

Currently, the USEPA is working to complete a risk-based evaluation of PFAS in biosolids. In the interim, Lincoln's strategy is a deliberative, disciplined approach which focuses on continuing to monitor our operations. This includes monitoring our biosolids and wastewater as well as working with our commercial / industrial users of our wastewater system to reduce sources of PFAS entering WRRFs providing a safe and effective way to manage Lincoln's wastewater.

## QUESTIONS?

For additional information, please contact Donna Garden, Assistant Director for Lincoln Transportation and Utilities at [dkgarden@lincoln.ne.gov](mailto:dkgarden@lincoln.ne.gov).