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## Introduction to Anaerobic Digesters

*Anaerobic digesters are used to treat organic materials such as food waste, manure and sewage sludge to produce reusable materials. This process of breaking down organic matter has many beneficial uses to the environment and this fact sheet will help to explain their function in Ohio.*

### What is anaerobic digestion?

Anaerobic digestion is a process where bacteria break down organic matter without oxygen present. Examples of these organic materials include food waste, manure and sewage sludge. These feedstocks are broken down in an anaerobic digester. As the bacteria breaks down the feedstocks, biogas, mostly comprised of methane, is produced as well as digestate (biosolids) that contains many valuable nutrients. Feedstocks that are used in anaerobic digestion are carefully evaluated to ensure that they will not upset the bacteria or jeopardize the use of the product as a fertilizer. Only certain feedstocks are permitted by Ohio EPA to be used in anaerobic digesters.

### Benefits of Biogases

Anaerobic digesters trap the gas produced when organic matter is broken down in the digestion process. This biogas can be further treated and used for electricity, heat production and transportation fuel. In most cases, facilities recapture the gas to use for their own electricity to make the process more sustainable.

### Benefits of Biosolids

The biosolids produced by anaerobic digesters contain nutrients (nitrogen, phosphorus, potassium) that are valuable for agricultural use. The nutrients in biosolids are readily available for plants and less water soluble than nutrients found in synthetic fertilizers. The use of biosolids increases crop yield in a cost-effective manner while also conserving space in solid waste landfills. For more information about Ohio EPA's biosolids program visit [epa.ohio.gov/dsw/sludge/biosolid](http://epa.ohio.gov/dsw/sludge/biosolid).

### Safety of Biosolids

Some Ohioans are concerned about the use of sewage sludge as a feedstock for anaerobic digesters due to the possibility of the presence of disease-causing organisms called pathogens. The sewage sludge received by the digesters has been treated at wastewater treatment plants to reduce the presence of pathogens. The sludge is further treated by the anaerobic digestion process. This is a recognized treatment technology used to eliminate pathogens so that biosolids are safe for land application. Site restrictions followed during land application of biosolids prevent human contact with the small volume of pathogens that may remain in Class B biosolids.

Concerns have also been raised about contaminants that may be present in the sewage sludge that is treated by anaerobic digesters. To date, research and risk assessments have shown that the low concentrations of contaminants that may be present in biosolids have not caused adverse effects to human health or the environment. U.S. EPA continues to assess emerging contaminants, including those that may be present in biosolids, and is updating regulations and guidance as needed.

Overall, the beneficial use of biosolids is protective of human health and the environment when biosolids are treated and managed in accordance with regulations. Ohio is staying informed of the national conversation and current science on biosolids issues and will follow U.S. EPA's lead if changes to biosolids regulations are made.

# Introduction to Anaerobic Digesters

## Ohio EPA's Role

There are currently 10 anaerobic digesters in Ohio that are not located at a wastewater treatment plant and are regulated by Ohio EPA's Division of Surface Water. These anaerobic digesters treat sewage sludge in addition to other organic materials to produce biosolids. These digesters are approved and permitted by Ohio EPA to comply with Ohio's design requirements and sewage sludge rules. Anaerobic digesters may also be required to obtain air permits from Ohio EPA. Anaerobic digesters that are located at farms to treat manure are regulated by the Ohio Department of Agriculture. U.S. EPA has delegated the biosolids program to Ohio EPA but provides oversight and direction for Ohio to follow.

## General Questions

### Storage Tanks and Ponds

Most of the anaerobic digesters in Ohio have tanks or ponds to store biosolids when conditions are not suitable for land application. These storage tanks and ponds are engineered in accordance with environmental rules and industry standards to be protective of the environment and are issued a surface water permit-to-install for construction. Regional storage ponds are also issued a permit to ensure the stored material is in compliance with land application requirements.

### Land Application

The land application of Class B biosolids must comply with rules in the Ohio Administrative Code. Before spreading biosolids, facilities must calculate the appropriate agronomic rate for crop needs based on the soil phosphorus levels and the amount of nutrients in the biosolids. This ensures that the appropriate amount of nutrients is applied to each field to avoid over-application. Soil samples for pH and soil phosphorus must be less than three years old at the time of land application. The soil sample results and agronomic rate calculations are performed by the permittee and submitted to Ohio EPA annually for review. Fields are approved by Ohio EPA prior to land application of biosolids.

### Local Matters

By law, Ohio EPA only has authority to consider specific issues related to protection of the environment and public health. This includes the management of sewage sludge which is regulated by Ohio EPA and is outside of local jurisdiction. However, many public concerns associated with anaerobic digester facilities are outside of Ohio EPA's jurisdiction. For example, concerns about agricultural, commercial or industrial zoning issues are typically addressed at the local level.

Some areas that fall outside of Ohio EPA's authority include:

- local zoning;
- noise;
- truck traffic;
- popularity of a project;
- eminent domain; and
- property value disputes.

## For More Information:

- U.S. EPA: [epa.gov/anaerobic-digestion/basic-information-about-anaerobic-digestion-ad](http://epa.gov/anaerobic-digestion/basic-information-about-anaerobic-digestion-ad)
- U.S. EPA AgSTAR Program: [epa.gov/agstar](http://epa.gov/agstar)
- U.S. EPA Biosolids Program: [epa.gov/biosolids](http://epa.gov/biosolids)
- American Biogas Council: [americanbiogascouncil.org/](http://americanbiogascouncil.org/)

## Contact

For more information, contact Ohio EPA's Public Interest Center at [web.requests@epa.ohio.gov](mailto:web.requests@epa.ohio.gov) or (614) 644-2160.