



OHIO

BIOSOLIDS MANAGEMENT 2018 – SUMMARY

This summary, a dashboard of statistics, & further data are at www.biosolidsdata.org

In Ohio...

- *Wastewater solids produced in Ohio are sent in approximately equal volumes to three options for use and disposal: application to soils, landfill disposal, and incineration.*
- *Incineration has been the routine at Cincinnati and Cleveland (NE Ohio Regional) for decades, and, in the past decade, modern fluidized bed units have replaced the original older, less efficient multiple hearth furnaces.*
- *Biosolids play a role in a growing number of advanced co-digestion (anaerobic digestion) facilities that generate biogas and renewable energy.*
- *Ohio EPA recently implemented a robust electronic reporting system that helps ensure quality data, tracking, and monitoring of wastewater solids.*

Biosolids Management in Ohio

Ohio's Environmental Protection Agency (OEPA) has run a stable, successful biosolids oversight program since the 1990s. In 2005, Ohio received partial delegation from U.S. EPA to administer the federal biosolids rule, 40 CFR Part 503. Ohio's Part 503 delegation does not include septage regulation or incineration of biosolids. Septage is largely regulated by the OH Department of Health. Incineration was likely not included when Part 503 delegation was granted because of the involvement of additional air quality regulations.

Land application of Class B biosolids is the most common beneficial use in Ohio, accounting for 23% of total solids generated in 2018: 61,293 dry U.S. tons. WRRFs hold permits for land application and tend to manage biosolids end use in-house, rather than relying on other facilities for processing, though they may use contractors for transport or land application. Much of Ohio's total land is in active agricultural use, and eastern Ohio especially has lots of larger pastures on reclaimed mine sites that have had biosolids land applied. Nutrient management is one of the challenges currently facing land application of biosolids in Ohio, with restrictions derived from nutrient reduction goals for surface water bodies such as Lake Erie.

Landfilling of wastewater solids (for which OEPA also has delegation) accounts for the largest portion of Ohio's total generated solids, about 37%. There are two sewage sludge incineration operations in Ohio, at three WRRFs: Northeast Ohio Regional Sewer District's Southerly and Westerly plants and Cincinnati's Mill Creek plant. Though not directly regulated by OEPA, incinerators must report total

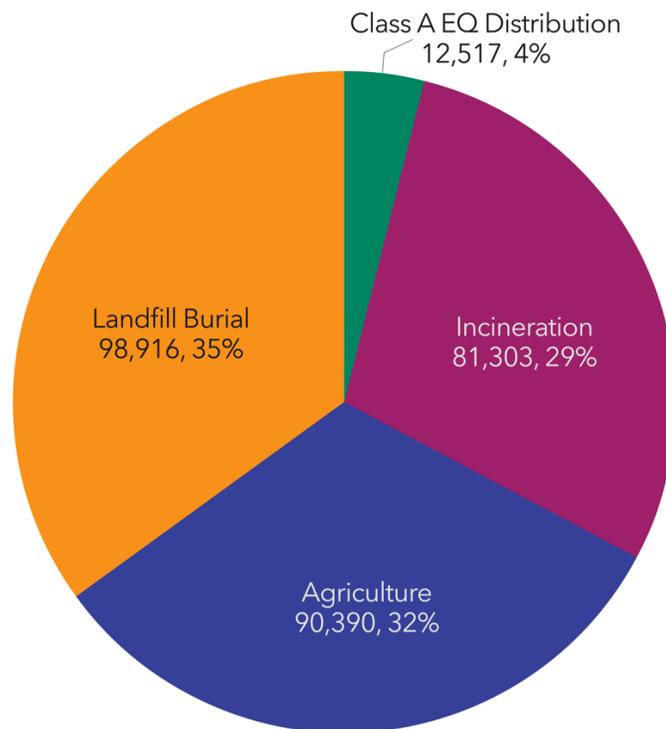
biosolids generated and incinerated to the state annually; 31% of OH’s biosolids were incinerated in 2018.

Ohio has several merchant anaerobic digesters that accept sewage sludge, manure, food waste, FOG, and other high-strength wastes. This is part of the new focus in biosolids management on renewable energy generation through co-digestion, and Ohio operations are helping lead this entrepreneurial work. However, the challenges that come with new developments (odor concerns, public acceptance, etc.) are garnering significant regulatory attention from OEPA.

There’s one large, permitted, privately-owned sludge lagoon in OH, where Class B biosolids from merchant AD operations are stored. All other sludge lagoons are associated with small WRRFs and are only cleaned out every 5 - 20 years.

Ohio has a few composting facilities, most of which are located at WRRFs and only process solids produced onsite. Columbus has a robust and long-standing biosolids composting program. Most of OH’s Class A EQ biosolids go to bulk land application.

Ohio Biosolids Use & Disposal 2018
(dry US tons, %)
Total: 283,100



Agency/Department Oversight

Biosolids in Ohio are regulated by the state's Environmental Protection Agency through Ohio Administrative Code (OAC) 3745-40, with partial delegation for administration of Part 503 by U.S. EPA (as noted above). Permits for WRRFs and land application are issued by the Division of Surface Water. Ohio has a robust regulatory program that identifies and solves issues in innovative ways.

OEPA describes their biosolids program in the following paragraph:

Ohio EPA's biosolids program regulates the disposal and/or beneficial use of sewage sludge and biosolids generated by non-industrial wastewater treatment plants in Ohio, as well as any sewage sludge or biosolids brought into Ohio by out-of-state, non-industrial wastewater treatment plants. The goals of the biosolids program are to protect public health and the environment, encourage the beneficial reuse of biosolids and minimize the creation of nuisance odors.

Since 2018, OEPA has implemented a tracking system for biosolids-specific complaints and notices of violations.

State Regulations and Permitting

OEPA issues site-specific NPDES-type permits for biosolids end use and disposal that implement the requirements of OAC 3745-40. Individual site approvals are required for Class B biosolids land application (but not EQ). OEPA maintains a database with a publicly available interactive map of approved land application sites.

Biosolids generators (e.g. WRRFs) hold legal liability for biosolids end use. OEPA requires annual reporting from all biosolids generators - majors, minors, separate preparers - through their new, robust electronic reporting system.

Beyond Part 503, Ohio requires additional management practices for land application, site monitoring, and nuisance mitigation. Pollutant limits are identical to Part 503. Additional management practices include:

- Consideration of phosphorus (P) as a limiting nutrient when determining agronomic rates for the beneficial use of biosolids;
- Signage requirements for Class B biosolids land application sites, intended to inform the general public that land application has occurred and to minimize inadvertent contact;
- Screening requirement (5/8 in.) for all biosolids, to remove plastics and other non-biodegradable trash ("inerts") prior to land application;
- Requirement for site authorizations for Class B biosolids application - an important tool for oversight and general public awareness of approved land application sites;

- Requirement for application of bulk EQ biosolids at agronomic rates (for nutrient management).

A rule change in late 2018 implemented the bulk EQ application requirement and also addressed nontraditional anaerobic digestion (AD) feedstocks and granted OEPA more authority over odor concerns. The screening requirement was amended with an option for a waiver if <1% inerts could be demonstrated, similar to state compost rules. When a site is approved for Class B land application, it never expires. To ensure compliance with setbacks and isolations in the case of new development near a site, OEPA requires a site certification form to be submitted each time a land site is used, demonstrating that no new homes or wells were built too close since the last use.

Phosphorus (P) management plays a significant role in Ohio's biosolids program. Biosolids are land applied at the agronomic rate that is the most limiting depending on soil P levels. Soil testing at land application sites for pH and phosphorus is required to be less than three years old. If soil P is under 40 ppm (Bray), the biosolids application rate may be based on crop nitrogen needs. For soils with higher P, the rate will usually be limited to the P needs of the crop. If soil P is particularly high, land appliers may calculate application rates using the state's P site index. Land appliers are required to submit agronomic rate calculations that include all sources of nutrients at the site. Potassium (K) testing is required – which is unusual – with K test results submitted to farmers for soil nutrient management planning.

All biosolids products have labeling requirements. These include signage at land application sites and notice of necessary information sheets. Any bulk EQ biosolids entering Ohio must be reported (except for bagged products).

Pressures on Biosolids Management and Land Application

Pressures on biosolids in Ohio as of 2018, as identified by the state biosolids coordinator, include...

1. ENVIRONMENTAL ISSUES - nutrient management, phosphorus (P), nitrogen (N)
2. MANAGEMENT ISSUES - hauling distances
3. NUISANCE ISSUES - odors, truck traffic, dust, etc.
4. PUBLIC INVOLVEMENT - concerns of neighbors, environmental groups, and others
5. REGULATIONS ON DISPOSAL - strict regulations or fees on disposal

In 2020, most biosolids-related complaints received by OEPA were odor-related, and most involved a handful of facilities that have proven challenging to regulate given their new and unique role in the biosolids economy, such as merchant anaerobic digesters (AD). These have sparked citizen interest and gained attention because of the enormous amounts of liquid material they process and transport. Due in part to these nuisance issues, a few privately-owned AD facilities that accepted sludge in 2018 have since switched to exclusively processing food waste and animal manure. OEPA is in the process of refining permits and restrictions to better mitigate odors and other community concerns regarding

such operations. One change will require liquid biosolids to be injected into agricultural soils, rather than sprayed on the surface.

Septage Management

Septage in OH is regulated by the Ohio Department of Health, which has 112 districts in charge of permitting septic systems and disposal. These districts operate fairly independently, so data on state-wide septage management are not readily available.

Rules and restrictions on septage disposal and land application vary between localities, but are governed state-wide by Ohio Administrative Code 3701-29-20. This code allows for land application of septage with district approval, so long as Part 503 requirements are met, and specifies setbacks, slope, and land application site permit requirements from the board of health. Nitrogen is the basis of the agronomic loading rate for septage, but land application sites must be tested for phosphorus every two years so as not to exceed recommended concentrations. OEPA has jurisdiction over WRRFs treating septage and any septage that is not directly land applied from the hauler's truck - that is, if septage is stored, mixed, and/or treated in bulk before being spread on fields. 396 companies submitted Septage Hauler bonds in 2018.

NBDP Team estimates 46.8 million gallons of septage are produced in OH, based on # of households, assuming 5% are pumped out each year.

Major WRRFs, Separate Preparers, and Notable Projects

- The City of Columbus has two wastewater treatment plants, Jackson Pike and Southerly. Both plants send solids to the city's Southwesterly Composting Facility, where they are mixed with chipped yard waste and wood chips and become Class A EQ biosolids. The resulting compost is sold as "Com-Til," available in bulk from the facility and local retailers. As of early 2021, construction in progress at the compost facility is aimed at reducing odors and improving monitoring and leachate management, among other things. The compost facility also manages the city's biosolids land application program - injecting liquid biosolids into agricultural soils within a 30-mile radius of Jackson Pike or Southerly.
- Northeast Ohio Regional Sewer District (NEORS) manages three wastewater treatment plants, Easterly, Southerly, and Westerly. The latter two WRRFs house two of the state's sewage sludge incinerators (SSIs). The Westerly facility burns its solids in 2 multiple hearth incinerators (MHIs). NEORS's Easterly WRRF sends solids for incineration at the Southerly plant, where, in 2009 - 2013, 3 fluidized bed incinerators (FBIs) replaced 4 ~early 1980s MHIs.

In 2018, a local landscaping company, Kurtz Bros., Inc. received approval from the OEPA to mix

the phosphorus-rich ash from NEORSD's SSIs into topsoil that they sell to the general public. Previously, the ash was mixed into a slurry and sat in lagoons. When the lagoons filled, disposal options were limited to trucking to a landfill, so NEORSD pursued alternatives. This was the first time a third party was permitted for biosolids ash end use in OH. Kurtz Bros., Inc. showed early interest in the incinerator ash, unsurprisingly, given their proximity to the Southerly plant, and the fact that their family of companies already deal in biosolids and waste management, bioenergy, anaerobic digestion, and more. NEORSD's Southerly plant also features a Renewable Energy Facility where energy is recovered from fluidized bed incinerators and used to produce electricity through a system of heat exchange and steam turbines, providing about 25% of the plant's electricity.

- The Metropolitan Sewer District of Greater Cincinnati (MSD) operates seven wastewater treatment plants. The largest, Mill Creek, hosts an incineration system that was upgraded from multiple hearth to fluidized bed in 2010, in the interest of cutting air emissions and improving fuel efficiency. Solids are dewatered in centrifuges before being incinerated. Little Miami, MSD's second-largest WRRF, recently replaced their FBI (*ca.*2000) with anaerobic digestion. The digested solids will be land applied.
- The Akron Renewable Energy Facility processes all of Akron's biosolids. The facility is operated in a public-private partnership with KB Bioenergy (a member of the Kurtz Bros., Inc. family of companies). The REF was built starting in 2007, on the site of the compost facility that had previously processed Akron's biosolids, in partnership with what was then KB Composting. Thickened sludge from Akron's Water Reclamation Facility is pumped to the REF, where it undergoes a process of dewatering, anaerobic digestion, and drying to produce an EQ biosolids product, sold as a soil amendment. Biogas from AD feeds central heating and power units (CHPU) and the biosolids dryer. Akron's shift from composting to AD was driven by persistent odors associated with composting, aging infrastructure, and a desire to stabilize the costs of biosolids processing.

References

The state biosolids coordinator and other state biosolids experts provided most of the information in this summary report. Additional information was obtained from:

Akron, OH:

https://www.akronohio.gov/cms/resource_library/files/08da6bb62b4a8284/plant_brochure_2016.pdf

Columbus, OH:

<https://www.columbus.gov/utilities/water-protection/comtil/Land-Application/>

https://www.columbus.gov/utilities/Projects/Sewer_CIPs/Compost_Facility_Odor_Control_Improvements/

<https://www.columbus.gov/utilities/water-protection/comtil/>

KB Bioenergy:

<https://www.kbbioenergy.com/our-operations/facility-process-overview/>

Kurtz Bros., Inc.:

<https://www.kurtz-bros.com/about-us/>

News 5 Cleveland:

<https://www.news5cleveland.com/news/local-news/cleveland-metro/for-neorsd-one-mans-ash-becomes-their-treasure>

North East Ohio Regional Sewer District:

<https://neorsd.medium.com/the-making-of-a-big-ash-deal-b3ce2fdda72f>

https://www.wefnet.org/nbp/January%202010/NBP_Bob%20Dominak_012710.pdf

OEPA:

<https://www.epa.state.oh.us/dsw/sludge/biosolid#137944360-rules>

https://epa.ohio.gov/dsw/rules/3745_40

State of Ohio:

<http://codes.ohio.gov/oac/3701-29-20>

Welsh, Ryan & Linn, Don & Holscher, Melissa & Reed, Scott & Rowan, Jim & Welp, Jim. (2011). The Greener Solution to Biosolids Incineration: Cincinnati's Switch from Multiple Hearth to Fluidized Bed Incineration. Proceedings of the Water Environment Federation. 2011. 796-811.