NATIONAL BIOSOLIDS DATA PROJECT

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DELAWARE

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

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In Delaware...

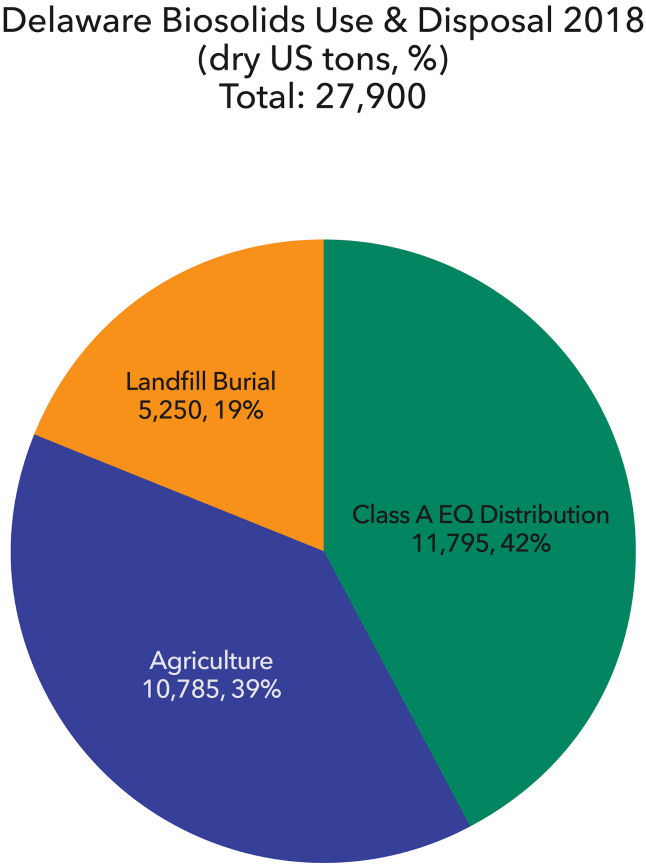
- *Biosolids composting and other Class A EQ treatments are common and popular in the small state of Delaware, with the biosolids products used locally and new biosolids facilities being developed for additional EQ production.*
- *Delaware Class B biosolids, including Wilmington's, are mostly land applied out of state (e.g. in Pennsylvania).*
- *Delaware's biosolids regulatory program is robust and is influenced by nutrient management requirements in Pennsylvania and other regional destinations for biosolids.*

Biosolids Management in Delaware

Thirty-three WRRFs handle sanitary waste in Delaware: 21 with NPDES permits that discharge to streams and 12 that use the cleaned effluent to spray irrigate (a significant portion of DE's total wastewater flow). Several plants send their effluent or sludge to be processed by larger plants. Composting has long been popular in Delaware, both for domestic and industrial wastes, food wastes, and for biosolids recycling. The majority of Delaware's biosolids go to beneficial use, either as Class A EQ products treated and sold in-state, or as Class B biosolids for land application out of state. In 2018, Delaware produced 27,830 dry U.S. tons of biosolids. Three facilities – Kent County, Sussex County, City of Seaford, with notable biosolids recycling programs – processed 11,795 dry tons of biosolids into Class A EQ products. Class B biosolids that were land applied mostly went to neighboring Pennsylvania: 10,495 dry U.S. tons from Wilmington's WRRF. Within Delaware, 290 dry tons of Class B biosolids were applied on a total of 55 acres (City of Rehoboth 235 dry tons; Sussex County 55 dry tons). The remaining 5,250 dry tons of biosolids went to disposal in landfills. Most WRRFs handle their biosolids in-house; only and estimated 10% of DE's biosolids are managed by private contractors.

With an abundance of agriculture not too far from the urban areas of the Interstate 95 corridor, Pennsylvania has a regional influence as a destination for biosolids. Forthcoming regulations on phosphorus in several Mid-Atlantic states could disrupt current arrangements, setting lower agronomic loading rates beyond the current nitrogen-based restrictions. This shift toward

regulating P is largely because of nutrient management for Chesapeake Bay, into which waters flow from Delaware, Pennsylvania, and other states in the region.



Agency/Department Oversight

Delaware's biosolids program is overseen by the Department of Natural Resources and Environmental Control (DNREC), Division of Water. Land application and landfilling of biosolids are governed by the Guidance and Regulations Governing the Land Treatment of Wastes (7 DE Admin. Code 7103). The last major update to biosolids rules in DE was in 1999. Proposed updates to regulations are under review by DNREC management, as of December 2020; they include recommendations for modernization of groundwater monitoring wells, additional language about phosphorus, and changes to storage amounts.

One FTE runs the biosolids and residuals program at DNREC. Approximately 60% of their time is spent on biosolids and septage. The amount of time spent on septage is negligible (less than 5%).

State Regulations, Permitting and End Use/Disposal

Delaware has additional restrictions on management practices and pollutant limits for biosolids that go beyond the requirements in the U.S. EPA 40 CFR Part 503 biosolids rules. For Class B land application, each site must be permitted under an individual permit, though several fields can be on one permit. Detailed soils work and groundwater monitoring wells are required for Class B sites, with exceptions for sites that have not applied biosolids in many years and have no plan to apply in the future. (If these sites were to apply Class B biosolids in the future, monitoring wells would need to be installed.) Public meetings are required to be held in the early stages of the biosolids permitting process. Metals limits differ slightly from Part 503, in part by including chromium limits. Pathogen/VAR is the same as the EPA regulations. For odor/nuisance control, actions are required on a case-by-case basis, but odor complaints have been rare in Delaware. For Class A biosolids, additional testing for pathogens may be required on a case-by-case basis if the biosolids are not land applied soon after they are processed.

DE has slightly different PCB testing requirements than Part 503. In Wilmington, PCB testing is required every two months; in Kent County, every month. At Sussex County's South Coastal facility, PCB testing is required quarterly, as with metals.

Permits for land application are similar to NPDES permits. Land application permits can be issued to land owners and land appliers, as well as to WRRFs and other biosolids generators. In 2018, the basis for the DE agronomic loading rate was nitrogen (N), but land application can also be limited by phosphorus (P), based on the state's P Site Index. Formal nutrient management plans (NMPs) are required wherever biosolids are land applied. Additionally, in two counties, conditional use zoning requirements are placed on land application sites.

Land applied biosolids are tracked in Delaware, but DNREC does not keep records of how much biosolids are disposed of in landfills. When biosolids are landfilled in DE, they do not have to meet Class B standards, but have to be over 20% solids. Some biosolids going out of state to PA might be used as alternative daily cover (ADC).

Reporting to the DNREC is required by all major and minor WRRFs. Biosolids entering the state for land application can only be Class A EQ and must be permitted. This means that out-of-state biosolids are rare, as permits are costly, and metals limits are stricter in Delaware than in nearby states.

Pressures on Biosolids Management and Land Application

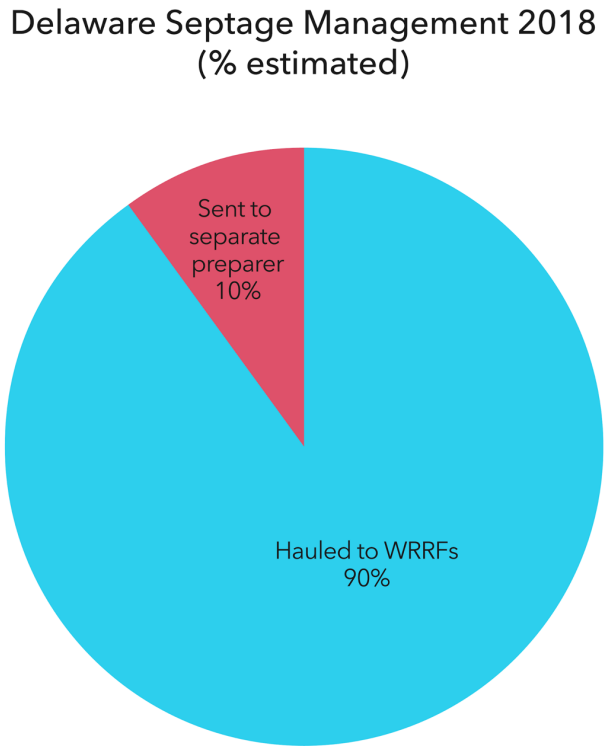
Pressures on biosolids in Delaware as of 2018, as identified by the state biosolids coordinator, include...

1. ENVIRONMENTAL ISSUES – impacts to soils, organisms, public health, contaminants (pathogens, metals, organic chemicals, etc.)
2. ENVIRONMENTAL ISSUES – nutrient management, phosphorus, nitrogen
3. PUBLIC INVOLVEMENT – concerns of neighbors, environmental groups, and others
4. NUISANCE ISSUES – odors, truck traffic, dust, etc.
5. AGRICULTURAL ISSUES – declining farmland due to less agriculture or due to development, sprawl, seasonal restrictions, or competition with manures, etc.

The beneficial use of biosolids was not increasing in DE as of 2018. As of 2020, it is increasing, though minimally.

Septage Management

In Delaware, an estimated 25% of the population is served by on-site systems, a number that is decreasing. An estimated 10 septage haulers operate in Delaware. The two WRRFs that accept septage handle an estimated 90% of it, while two separate preparers handle the other estimated 10%, which is lime stabilized and land applied. DNREC does not track or have readily available information on other outside wastes going to WRRFs. Septage can be land applied in DE, so long as it meets Part 503 requirements, with additional time at a pH of 12 (2 hours in total). DE has a proactive program to collect fats, oils, and grease (FOG), including a section in the land application regulations regarding brown grease (grease trap waste).



Major WRRFs, Separate Preparers, and Notable Projects

- Wilmington is Delaware's largest WRRF and biosolids generator. In 2018, Wilmington sent all of its biosolids to land application in PA (10,495 dry U.S. tons). That year, the U.S. EPA recognized Wilmington's Renewable Energy and Biosolids Facility for excellence in clean water infrastructure. In 2014, Wilmington installed anaerobic digestion (AD) and a thermal drying system for biosolids. Energy is recovered from AD biogas, generating enough electricity to cover 90% of the WRRF's needs. In early 2020, Wilmington and Veolia (the private contractor running the facilities at the time) applied for a permit to produce and market Class A EQ biosolids. In July 2020, Jacobs Engineering took over operation of Wilmington's WRRF, combined sewer overflow facilities, and the Renewable Energy Biosolids Facility. Concerns persist regarding the texture of Wilmington's final product - it's very powdery, making it difficult to transport and land apply.

- The Kent County Regional Resource Recovery Facility (RRRF) has long been a leader in sustainable biosolids, regularly looking for new technologies to embrace. As of 2018 - 2020, the facility's biosolids are dewatered and lime stabilized before the majority are heat treated in thermal dryers to reach both pasteurization (70˚C for 30 minutes) and 50% solids. 10-15% of biosolids are treated in passive solar dryers. Kent Co. is a publicly-

run treatment facility that has farmers as direct customers for its biosolids. Its Class A EQ product is called "Kentorganite" and is applied locally by the county on both private and county-owned farmland. Kent Co. RRRF is a Platinum Certified member of the National Biosolids Partnership.

- Sussex Co.'s South Coastal WRRF uses pasteurization and lime stabilization, similar to Kent Co. Its Class A EQ biosolids are used on local land sites, where WRRF staff applied 55 dry U. S. tons in 2018. South Coastal also produces a Class B product that is applied on fields adjacent to the facility. As of 2020, Sussex County has plans to construct a regional composting facility, which will take in solids currently being composted at the South Coastal WRRF and the City of Seaford's composting facility.

- The City of Seaford has a long-time biosolids composting facility that produces a Class A EQ product available to the public year-round for $10/cubic yard.

- Rehoboth Beach uses anaerobic digestion to produce an almost odor-free Class B biosolids that is land applied at a nearby farm. In 2018, the facility land applied 235 dry U.S. tons.

- A private contractor runs a WRRF and composting facility at a chicken processing plant owned by Perdue Farms. It processes some sanitary waste. The company plans to install anaerobic digestion and take in waste from other food production facilities in the area, recovering energy from AD and continuing the composting operation. They currently hold a land application permit for forested land and cultivated fields, but did not land apply any biosolids in 2018.

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