



MARYLAND

BIOSOLIDS MANAGEMENT 2018 - STATE SUMMARY

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

In Maryland...

- *The majority of Maryland biosolids are applied to soils (~88%), much as Class A EQ compost or heat dried fertilizer, such as that produced at Baltimore and WSSC Water, outside Washington, DC. Bulk land application occurs on farms around the state and in neighboring Virginia. Some MD biosolids are used for reclamation of marginal and disturbed sites, such as former strip mines in West Virginia.*
- *Roughly 12% of MD's wastewater solids are disposed of, largely in landfills, with some surface disposal. There was no incineration of MD biosolids in 2018 – the last occurrence was in 2017.*
- *Maryland is unique in its governance of wastewater services. Public wastewater management organizations serve multiple local governments and operate multiple water resource recovery facilities (WRRFs): DC Water (which accepts wastewater flow from DC suburbs in MD), WSSC Water (also serving suburbs of DC – formerly Washington Suburban Sanitary Commission), Maryland Environmental Services (an independent State of Maryland agency operating 70 WRRFs across the state). Additionally, many county or super-county organizations provide wastewater and biosolids services.*
- *The Maryland Department of Environment (MDE) regulates biosolids, issuing Sewage Sludge Utilization (SSU) Permits. Nutrient management is a central focus of MDE, driven by the influence of the multi-state management of pollutant loading to the Chesapeake Bay. All farms are required to have Nutrient Management Plans, and application rates for biosolids (and other organics) are carefully determined based on calculated plant available nutrients.*
- *Many larger MD WRRFs have embraced advanced biosolids treatment technologies, including anaerobic digestion and biogas capture for renewable energy generation, and thermal hydrolysis.*

Biosolids Management in Maryland

Most Maryland biosolids (~88%) are applied to soils, much – e.g. from Baltimore and WSSC Water, near Washington DC – as Class A EQ compost or heat dried fertilizer. Bulk land application of Maryland biosolids mostly occurs on farms around the state and in neighboring Virginia. Some is also used for reclamation of marginal lands and disturbed sites. The remaining biosolids were disposed at landfills (10%) and surface disposal sites (2%) in 2018. The last incineration of Maryland biosolids occurred in 2017, and none were incinerated in 2018 or 2019, according to MDE data.

For this report, data from the U.S. EPA ECHO database were analyzed, along with several responses to the National Biosolids Data Project (NBDP) online WRRF survey – a total of 38 of the largest facilities in the state had reported data. Additional estimates for several other large facilities resulted in data for 44 MD water resource recovery facilities (WRRFs), representing ~93% of the state’s total wastewater flow. For comparison, MDE data on biosolids management, reported in wet U.S. tons, are available at <https://mde.maryland.gov/programs/land/rmp/pages/index.aspx>. They include in-state and out-of-state biosolids land applied in Maryland, and they do not track how biosolids leaving the state are used (although it is assumed they are land applied or distributed for use). This makes comparisons to the NBDP data challenging. NBDP data track the use and disposal of Maryland-generated wastewater solids in 2018, whether they are used or disposed in-state or out of state. However, the two datasets are certainly in the same order of magnitude and roughly corroborate each other.

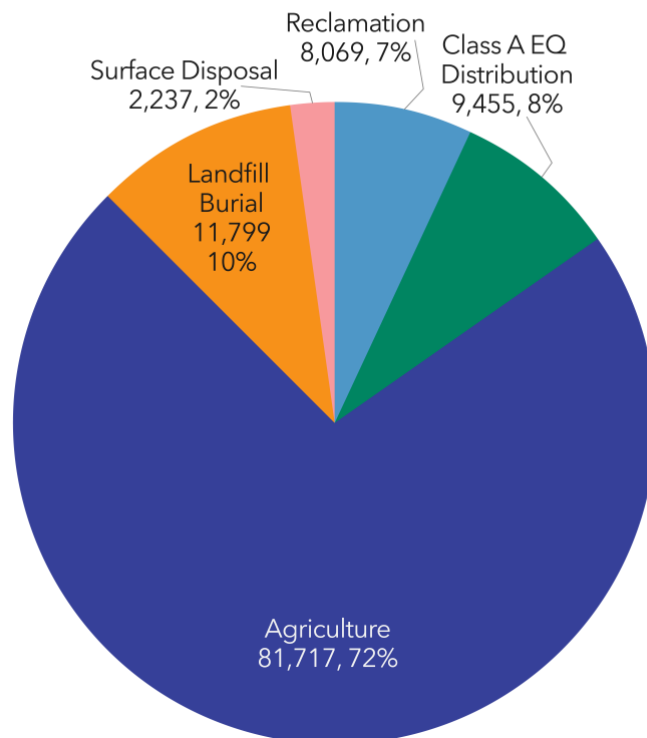
Biosolids management in Maryland has several attributes that are distinctive in the national database. A primary attribute is the governance of wastewater services. There are several public wastewater management organizations that serve multiple local governments and operate multiple WRRFs. For example, DC Water accepts wastewater flow from significant parts of Maryland in the Washington DC suburbs. WSSC Water (formerly the Washington Suburban Sanitary Commission) operates for its constituent jurisdictions six WRRFs and appurtenant interceptor sewers – also in the suburban Washington DC area. Away from Washington DC, the Maryland Environmental Services (MES), an independent State of Maryland agency, operates a wide variety of environmental services, including yard debris composting and tank inspections. But a special niche for MES is wastewater engineering and operations, a service conducted at over 70 WRRFs in mostly rural jurisdictions, including six significant biosolids generators. In addition, regional wastewater services are provided by county or super-county organizations, as in Howard, Harford, and Anne Arundel counties, and the Northeast Maryland Waste Disposal Authority.

A second distinctive element is the history of biosolids treatment technologies in Maryland. From the early days of the national investment in secondary wastewater treatment (1980s – 1990s), many facilities in Maryland embraced the technology of lime (alkaline) stabilization to produce a recyclable soil amendment, while others built several of the earliest biosolids composting facilities in the nation. As these technologies have aged, agencies have been transitioning to anaerobic digestion (AD) with biogas for energy recovery and thermal drying for mass reduction. And – as of the early 2020s – the new thing is solids pretreatment by thermal hydrolysis. These options piggyback on the experience in the City of Baltimore, with its advanced digestion approaches and dryers, and on the leadership at DC Water with Class A thermal hydrolysis for advanced digestion with energy recovery. The transition from lime stabilization to AD may account for the lower tonnage of biosolids reported in 2018 (~118,00 dmt) compared to 2004 (123,500 dmt). Adding lime makes more tons of biosolids; AD converts tons of biosolids to biogas that is used for renewable energy.

A third distinctive element in Maryland biosolids management is the role of state agencies in calculating – for each source of biosolids and for each permitted site – the allowable biosolids application rate based on state calculations of plant available nutrients. The Maryland Department of Agriculture (MDA) and Maryland Department of the Environment (MDE) require all farms to have certified Nutrient Management Plans. Sites with elevated soil phosphorus levels are required to utilize a Phosphorus Management Tool to calculate phosphorus-based application rates. The result is sometimes very low allowable application rates for some biosolids products and on some lands. This is driven by the influence of the multi-state management of pollutant loading to the Chesapeake Bay. In response to obligations for Maryland to control releases of nitrogen and phosphorus to the Bay, state authorities have set rules on use of organic residuals, including manures as well as biosolids, to minimize accumulation of soil phosphorus and to reduce non-growing season releases of nutrients to streams and groundwater.

According to MDE, “although MDE has issued more than 4,900 sludge permits since 1974, there have been no documented cases of ill health effects or water pollution from sewage sludge use on farms in Maryland. About 60,000 acres on more than 500 farms throughout Maryland are currently permitted to receive sewage sludge. In Maryland, sewage sludge is recycled more than any other material, both in terms of quantity (over 440,000 tons per year) and rate (about 88%)” (<https://smchd.org/wp-content/uploads/SewageSludge.pdf>).

Maryland Biosolids Use & Disposal 2018
(dry metric tons, %)
Total: 113,000



Agency Oversight, Regulations, and Permitting

From the [Maryland Department of Environment Biosolids Fact Sheet](#):

The Maryland Department of the Environment (MDE) is the primary agency regulating the utilization of sewage sludge. Maryland Sewage Sludge Utilization (SSU) Permits are issued in accordance with State law and regulations. A sewage sludge utilizer submits an application for a SSU Permit to MDE. The application includes the results of soil and sewage sludge tests and other information used to ensure that all regulatory requirements are met. The utilization site is also inspected to ensure that the permit application is accurate. Provided that the SSU Permit Application meets the minimum requirements under the Code of Maryland Regulations (COMAR) 26.04.06, MDE must issue the SSU Permit with the applicable control measures. To support the administration of the sewage sludge program, sewage treatment plants are charged fees based on the amount of sewage sludge they generate and how it is utilized.

The following provides details regarding biosolids use permits:

<https://mde.maryland.gov/programs/land/RMP/Pages/sewagesludge.aspx>

Pressures on Biosolids Management and Land Application

Maryland's program seems largely guided by the demands of the Chesapeake Bay management plan. The consequences of policies to protect the Bay – especially from excess nutrients – leave a narrow window for land application of biosolids and a small tolerance for biosolids-derived phosphorus loads on farm soils. Biosolids also competes with poultry manure as a source of residuals-based nutrients for farmers, and it thereby competes, too, for the political support that is needed to gain permission for land application of recycled products. Thus, the regulatory climate for biosolids recycling in Maryland is no longer a positive driver for public utilities, which are increasingly reliant on export of biosolids to Virginia and Pennsylvania, even as public agencies have been engaging in major capital investments to produce high quality biosolids suited for agricultural and horticultural uses.

Septage Management

There is a dearth of available data on septage management in MD. Some septage is land applied; a notable example is the dedicated farming site owned and operated by [Talbot County](#), a county on the eastern shore of the Chesapeake.

Major WRRFs, Separate Preparers, and Notable Projects

The **Baltimore Department of Public Works'** Back River and Patapsco facilities treat an average of 72 and 55 MGD respectively. Baltimore has been an example of an effective public-private partnership (PPP) for biosolids processing and utilization. The [biosolids composting facility](#) is operated by Veolia, under a long-term contract to accept biosolids from Baltimore's Back River WWTP. Synagro has been the long-standing operator of dryers located close to the Patapsco and Back River plants for dewatering and drying biosolids. The Back River facility has a pair of iconic egg-shaped digesters, which, along with its use of acid digesters, has sought advanced stabilization from this facility. The Patapsco wastewater solids are not digested prior to heat drying.

In recent years, the Baltimore WRRFs have [failed to meet their wastewater effluent quality requirements](#), causing scrutiny and orders from U.S. EPA and the state. In March 2022, MDE ordered that management of the [Back River WWTP be taken over](#) by Maryland Environmental Services.

Maryland Environmental Services (MES) is chartered to be an arm of state government for [operating wastewater facilities](#) in the state. It operates a half dozen plants of significant size (designed for over 1 MGD of flow) and many dozen smaller facilities and ancillary pump stations. It also provides field inspection services for contract biosolids applications in Maryland and Virginia. As MES reported in the NBDP survey, "We have a contractor land apply our stabilized biosolids in another state. About 47% of our material is managed this way (on a dry wt. basis). So far this has worked out great for us. But there are concerns about how long we can keep exporting material out of jurisdiction. We are currently exploring Class A options to remedy this situation. Also, one of our plants needs extensive capital upgrades, as some of the equipment is quite old (34 years) and is very prone to breakdowns."

WSSC Water (Washington Suburban Sanitary Commission) is second to Baltimore in the total production of biosolids from its five WRRFs. Its biosolids have long been land applied on area farms in MD and VA. In the early 2020s, WSSC is installing thermal hydrolysis to boost biogas production from its anaerobic digestion (AD) systems, reduce biosolids tonnages, and [generate more renewable energy](#). From its website: "At WSSC Water, the biosolids are thickened, dewatered, and then treated with lime to raise the pH level to stabilize them (that is, to eliminate pathogens and minimize odors). In the future, [the Bio-Energy project](#) will process the dewatered solids from the WRRFs to produce high-quality Class A biosolids and generate renewable energy." The new facility will be located at its Piscataway plant. WSSC is seeking to match with its future biosolids product the success of DC Water with its production and marketing for local uses of Bloom Soil (see [the DC page](#) at NBDP's biosolidsdata.org).

Howard County Department of Utilities has had a long-standing program of agricultural utilization of lime amended biosolids, with approximately 16,000 dry metric tons of both Class A and Class B biosolids production. It is becoming a leading example of sustainable biosolids treatment at its Little Patuxent Water

Reclamation Plant, with the 2021 development of a system for anaerobic digestion, biogas capture, and Class A EQ biosolids production with a belt dryer.

Frederick County WRRF, northwest of Washington, DC, produced lime-stabilized Class B biosolids in 2018, which were managed by Synagro and mostly land applied on farms at a cost of ~\$413 / dry U.S. ton (paid by the County to Synagro). As has happened at other WRRFs in the region, reliance on lime stabilization is being questioned, and, like DC Water and WSSC Water, [anaerobic digestion is being considered](#).

Westernport, in the northwest corner of the state, has a WRRF that typically treated about 20 MGD – including in 2018. The Upper Potomac River Commission operates the WRRF, which, in 2018, treated wastewater from nearby towns, but primarily served a large pulp and paper mill. According to a contact at the Upper Potomac River Commission, biosolids generated largely went to reclamation of strip mines in West Virginia, with some biosolids land applied more locally on marginal sites. In 2019, the pulp and paper mill shut down, drastically changing operations at the WRRF as wastewater flow decreased from 20 MGD to ~1.5 MGD.

References

The U.S. EPA ECHO database was the source of most of the data provided, supplemented with input from several experts in the state. Additional information was obtained from the following online sources:

MDE Biosolids Program:

Facts about Sewage Sludge:

<https://mde.maryland.gov/programs/LAND/RecyclingandOperationsprogram/Documents/sewage%20sludge%20utilization%20in%20md%2001%2022%20%2715.pdf>

Biosolids Regulations:

Sewage Sludge Utilization Regulations: <http://mdrules.elaws.us/comar/26.04.06.09>

Permit Requirements: <https://mde.maryland.gov/programs/land/RMP/Pages/sewagesludge.aspx>

City of Baltimore:

City of Baltimore Compost Facility: <https://www.nmwda.org/baltimore-city>

<https://www.veolianorthamerica.com/case-studies/baltimores-award-winning-biosolids-project>

Synagro Patapsco Dryer: <https://www.synagro.com/locations/patapsco-pelletizer-facility/>

Baltimore-Back River Pelletech Facility: <https://www.synagro.com/locations/baltimore-back-river-pelletech-facility/>

Recent violations: https://www.bayjournal.com/news/pollution/major-pollution-violations-found-at-maryland-s-two-largest-sewage-treatment-plants/article_f550550a-0bde-11ec-9c71-9bc89c747083.html

<https://www.baltimoresun.com/news/environment/bs-md-back-river-mde-20220327-4tz2nkvn55fcvhvhbadexqafq-story.html>

WSSCWater:

Biosolids program: <https://www.wsscwater.com/wastewater-treatment>

Piscataway Water Resource Recovery Facility: <https://www.wsscwater.com/bioenergy>

Article on the new project in *TPO*: https://www.tpomag.com/online_exclusives/2019/06/massive-biosolids-project-in-maryland-will-help-protect-chesapeake-bay

Maryland Environmental Services:

Wastewater operations and engineering: https://menv.com/service_category/water-wastewater/

MES biosolids program: <https://menv.com/service/biosolids-management/>

Howard County Department of Utilities:

<https://www.howardcountymd.gov/public-works/little-patuxent-water-reclamation-division>

Westernport:

https://www.times-news.com/news/local_news/with-mill-shutdown-westernport-treatment-plant-facing-big-changes/article_4882b37b-dfdb-5f6e-ad5d-3c3af3271cff.html

Frederick County:

https://www.fredericknewspost.com/news/environment/if-not-the-landfill-then-where-nutrients-take-different-paths-back-to-the-land-in/article_a6c312ef-b4cb-597b-845e-b8519f0eaac4.html

Talbot County:

https://talbotcountymd.gov/bio_solids