NATIONAL BIOSOLIDS DATA PROJECT

biosolidsdata.org

NORTH DAKOTA

BIOSOLIDS MANAGEMENT 2018 – SUMMARY

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

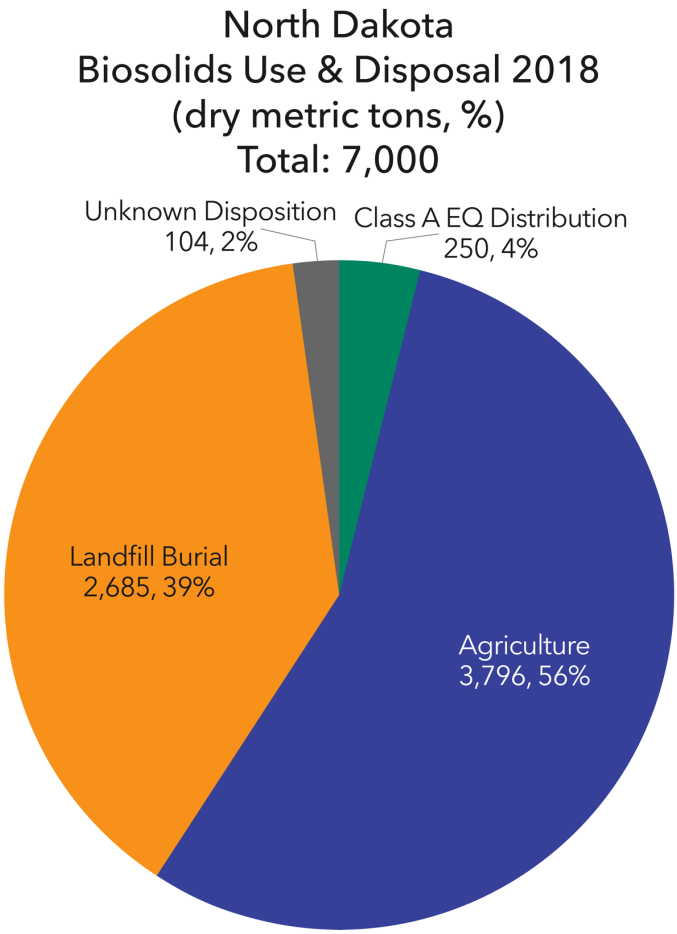
In North Dakota...

- *This large northern plains state has one of the lowest population densities in the U.S. and has abundant agriculture and plenty of landfill capacity. The vast majority of communities are served by wastewater lagoon systems that do not produce solids every year, but only when they are occasionally cleaned out. Those wastewater solids, and the wastewater solids from the state's five largest lagoons and five mechanical water resource recovery facilities (WRRFs), are mostly land applied, with some – including Fargo's – sent to landfill.*
- *U.S. EPA has primacy for oversight and enforcement of biosolids management in North Dakota, and the state's Department of Environmental Quality (ND DEQ) defers to the federal 40 CFR Part 503 regulations for enforcement regarding the management of wastewater solids and septage. There are no formal additional state requirements.*

Biosolids Management in North Dakota

With ample open space and many small communities with populations less than 10,000, the large majority of the ~285 wastewater treatment facilities in North Dakota are lagoon systems from which solids are removed only every 5 - 20+ years. There are nine communities with populations greater than 10,000, and five of these have mechanical water resource recovery facilities (WRRFs) that produce solids regularly. See below for details regarding some of the state's solids management programs.

For 2018, the five mechanical WRRFs reported solids data to the U.S. EPA online electronic biosolids reporting system, as required under the federal biosolids regulations 40 CFR Part 503. That totaled 3,936 dry metric tons. Of the remaining systems – all lagoons – the amount of solids used or disposed was not reported. The National Biosolids Data Project (NBDP) team assumed that the five large lagoon systems all used or disposed of solids in 2018, totaling 3,205 dry metric tons. There are hundreds of small lagoon systems in North Dakota, and it is likely that very few of these systems used or disposed of wastewater solids in 2018. The NBDP team assumed that 5% of the state's small wastewater lagoons were cleaned out in 2018, estimating they landfilled or land applied about 100 dry metric tons.



State Regulations and Permitting

North Dakota Department of Environmental Quality (ND DEQ) has no specific biosolids management regulations. Rather, the management of solids is a topic included in each WRRF's National Pollution Discharge Elimination System (NPDES) permit. All WRRFs are required to follow the U.S. EPA 40 CFR Part 503 regulations, and U.S. EPA is ultimately responsible for enforcement of biosolids management in North Dakota. Most of the state's larger facilities – there are 10 with flows greater than 1 MGD – submit annual biosolids reports to U.S. EPA through the online NPDES electronic reporting system that was established in 2016.

Pressures on Biosolids Management and Land Application

North Dakota communities and WRRFs are relatively small, and the vast majority are lagoon systems, which are generally the lowest-cost wastewater treatment systems. For small communities, capital and operating costs are important and are carefully controlled. Costs are controlled by disposing solids at the local landfill or land applying liquid solids close to the WRRF. These two options involve treating and testing solids the minimum amount, which controls costs and the amount of staff time needed for solids management.

Septage Management

In North Dakota, septage management is regulated under Part 503, similar to biosolids. In 2020, there were 128 listed ND DEQ-approved septage haulers. Land application of septage is allowed. Some is land applied and the rest is transported to WRRFs. According to ND Administrative Code 62-03.1-03, "All waste material shall be disposed of in such a place and in such a manner as will not constitute a nuisance or a menace to public health…Waste material collected by a pumper shall not be discharged into ditches, watercourses, lakes, ponds, tidewater, or at any point where it can pollute any water supply, bathing area, or shellfish growing area. It shall not be deposited on the surface of the ground within one thousand feet [304.8 meters] of any residence or public road."

It is likely that 80% of North Dakota septage is land applied and 20% is hauled to WRRFs and lagoons, as estimated in the prior national biosolids survey of 2004 data.

Quality of state septage data	No recent data provided. NBDP estimates the following:
Septage haulers based in state:	about 100
In-state separate preparers (not WRRFs) taking septage:	0
WRRFs required to take septage?	no
WRRFs that accept septage:	several
Septage received at WRRFs in 2018 (gallons):	no data
Other outside wastes accepted at WRRFs:	no data
Is fats/oil/grease (FOG) a significant issue?	no
Is it regulated?	yes
How?	Department of Health
	https://www.deq.nd.gov/Publications/WM/Guideline39SeptageSumpAndPitWasteAndRestaurantGreaseTrapWasteManagement.pdf
Is there a proactive program to collect FOG?	yes
Can septage be land applied in state?	yes
If yes, what treatment is required?	follow Part 503 and ND Guideline 39 (link above)
Most recent septage regulations update:	2010 or earlier
Full-time equivalent (FTE) at state agency for septage:	no data
Notes:	Based on reporting for 2004, ~80% of septage is land applied in ND.

	NBDP estimates 3.2 million gallons of septage is generated annually in ND.

Major WRRFs, Separate Preparers, and Notable Projects

- Fargo is the largest city in North Dakota, with a population of ~125,000. Fargo wastewater solids are treated with anaerobic digestion, and the biogas produced in that process is used to heat the digesters and buildings. In summer, the solids are dewatered using drying beds; in winter, belt filter presses are utilized. In 2018, the dewatered solids went to the local City-owned landfill. This has been the practice for many years.
- Bismarck is the state capital and the second largest city, with a population of ~74,000. Its ~6.5 million gallons per day (MGD) of wastewater receives secondary treatment with trickling filters, and the solids are treated with anaerobic digestion to Class B standards. Those biosolids are land applied on area farm fields.
- Grand Forks (population ~54,000, 3rd-largest city in ND) provides secondary treatment of wastewater in a simple mechanical plant. The solids are put into large storage lagoons from which solids are removed regularly; in 2018 they were land applied in liquid form on nearby farm fields. In 2020-21, mechanical dewatering has been installed.
- Jamestown, a small community (population ~15,000), provides an example of a combination of commercial and public wastewater treatment. The Jamestown facility treats ~2.7 MGD of wastewater, a small amount of which is from the community and most of which is from a large commercial operation, Cavendish Farms. The process includes a low-rate anaerobic treatment system (LRATS) followed by sequencing batch reactors (SBRs). The amount of solids generated is far greater than would be produced by a population of 15,000 people, because of the significant input from the Farm.
- Mandan provides an example of a small facility that places solids into storage for later land application. Mandan has some small Facultative Stabilization Basins (FSBs) for passive sewage sludge digestion and production of biosolids. For 2018, Mandan reported to U.S. EPA that they generated 463 dry metric tons (dmt) – the amount put into the FSBs. The biosolids sent to land application that year totaled 253 dmt. The NBDP attempts to track just the biosolids that leave the gates of WRRFs, that is, the tonnage used or disposed in 2018. For Mandan, this report includes 253 dmt land applied.
- Williston saw increasing population growth in the 2010s due to an ongoing oil boom and expanded their wastewater treatment capacity rapidly to an average design flow of 6 MGD by 2017, moving from lagoon operations to a mechanical plant. The facility became the first in the state to produce Class A biosolids, which is accomplished with autothermal thermophilic aerobic digestion (ATAD). Screw presses dewater the biosolids, which can then be stored on site if necessary before they are trucked out for land application.

References

Data and information presented here are from the U. S. EPA ECHO database (https://echo.epa.gov/facilities/facility-search?mediaSelected=bio) and from assistance from the North Dakota state biosolids coordinator, supplemented with information from the following sources.

State biosolids & septage webpages:

https://deq.nd.gov/WQ/2_NDPDES_Permits/2_Bio_Sludge/BS.aspx
https://www.legis.nd.gov/information/acdata/pdf/62-03.1-03.pdf
https://deq.nd.gov/publications/WQ/2_NDPDES/SepticPumper/rptBusnList.pdf

Bismarck:

https://bismarcktribune.com/news/bismarck-wastewater-treatment-plant-addresses-sludge-woes-in-both-short-term-and-long-term/article_513268a5-56cc-5630-aa92-fa4159aeea10.html
https://www.bismarcknd.gov/186/Wastewater-Treatment-Plant

Dickinson:

https://dickinsongov.com/departments/waste-water/#1494448471092-2b9375c2-7e68

Fargo:

https://fargond.gov/city-government/departments/wastewater/treatment-process

Grand Forks:

https://www.grandforksgov.com/home/showpublisheddocument/710/635342747854700000
Hasan, H. 2013. A Sustainable Bio-Solids Management For The Grand Forks Wastewater Treatment Plant, Master's Thesis, Univ. of ND.

Jamestown:

https://jamestownnd.gov/departments/public-works/wastewater/
https://www.newsdakota.com/2019/02/21/city-of-jamestown-considers-industrial-wastewater-pretreatment-program/

Mandan:

https://www.cityofmandan.com/index.asp?SEC=37769EDD-704F-4C55-88CE-7A0BE24904D6

Williston:

https://www.cityofwilliston.com/departments/public_works/water_resource_recovery_facility.php