NATIONAL BIOSOLIDS DATA PROJECT

STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Minnesota

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	**277 (survey), 516 CWNS**	**736**	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	0	2	----------
Total number of your state's WWTPs sending to those Separate Preparers:	2	3	----------
Number of operating sludge incinerators in your state (total):	2 facilities; 5 SSIs	7	----------
Fluidized bed:	1 WWTP (3 FBI)	1 WWTP (4 FBI)	----------
Multiple hearth:	1 WWTP (2 MHI)	2 WWTP (3 MHI)	----------
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	7	----------
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	88	----------
Number of WWTPs in your state with *sludge* lagoons:	data not requested for 2004	381	----------
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	466	----------
Total statewide WWTP *design* capacity for wastewater flow (MGD):	data not requested for 2004	881	----------
Total statewide average daily *dry weather* flow (MGD):	data not requested for 2004	568	----------
Other Totals			
Number of documented odor & nuisance complaints received by state in 2018 related to biosolids transportation and use or disposal outside of the gates of the WWTP:	data not requested for 2004	1	----------
Number of WWTPs involved in those complaints:	data not requested for 2004	1	----------
Percent of population served by on-site systems (e.g. septic systems):	28%	30%	----------

MN has one separate preparer that has a permit for two mobile treatment units with the potential to do mobile Class A/EQ treatment. Even though they are permitted to do so, they have not utilized the Class A option yet in MN (as of January 2021). However they often do mobile dewatering for many WWTPs. The second separate preparer is the West Central Biosolids Facility at River Falls, WI; 3 MN WWTPs reported transferring solids there in 2018. • There were 7 MN landfills that received biosolids from MN. 2 MN WWTPs sent biosolids to two out-of-state landfills. The MPCA does not have information on whether WWTFs outside of MN sent any biosolids to MN landfills. • For the industrial pre-treatment programs, there are 16 delegated programs and 72 undelegated programs for a total of 88 programs. • The 30% of homes served by on-site systems is an estimation.

Biosolids Use and Disposal

UNITS:	Dry U.S. tons	**Dry U.S. tons**	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total):		**161,300**	

Summary

	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids
Beneficial Use (applied to soils, not including ADC)	254	46,800	133	44,318
Disposal & Alternative Dispositions	7	105,082	18	116,954
Other	16	60	141	no data
TOTAL	**277**	**151,942**	**292**	**161,272**

NOTE: Quantity of sewage sludge or biosolids used or disposed means the quantity that goes out the gate of the WWTPs. Use the units (the form of measurement) you chose above.

Beneficial Use includes Class A and Class B biosolids land applied (123 WWTPs), septic tank facilities pulled under MN R. 7041 (4), and EQ bulk application/distribution (8 WWTPs). Septage applied is converted to dry tons from gallons assuming 2% solids. • Disposal & Alternative Dispositions includes facilities that landfill (15 WWTPs) and incinerate (3 WWTPs). • Other = 7 reed beds, 44 marked "No Application Occured", 74 that transferred solids to another WWTP, and 16 that had annual reports that were not submitted/reviewed for 2018 (no data).

Beneficial Use

	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids
Agricultural (EQ, Class A, & Class B)	250	45,550	127	30,529
Forestland (EQ, Class A, & Class B)	0	0	0	0
Reclamation (EQ, Class A, & Class B)	4	1,250	1	454
Class A EQ Distribution (bagged or bulk, public distribution, or unsure where it went)	0	0	5	13,335
Beneficial Use Subtotal	**254**	**46,800**	**133**	**44,318**
Long-term storage	16	60	141	
Number of *acres* to which biosolids were applied:		16,722		14,884

Agricultural includes Class A and Class B biosolids land applied (123), septage land applied (5), and EQ bulk applied (2). • Some additional reclamation could have been reported as hay land/agricultural. • Long-term storage includes annual reports marked as "No Application Occurred" (44), facilities that transferred to reed beds (7), facilities that transferred to another WWTP (74), and facilities with reports that were not submitted/reviewed (16) since there is no section for "Other." • A further note on the reed beds: In 2018 only 7 WWTPs reported quantities of solids transported to their reed beds; however, MN has a total of 18 reed beds. Out of those 18, 14 have non-native phragmites, one has native phragmites, one has a mix of native phragmites and cat tails, and two are operating as drying beds.

Disposal & Alternative Dispositions

	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Going To…	Quantity of Biosolids

Landfill (total)	4	842	14	3,224
Burial	data not requested for 2004	data not requested for 2004	N/A	
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	no data	
Surface Disposal	1	17,960	1	14,776
Incineration	2	86,280	3	98,954
Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	N/A	
Deep well injection	data not requested for 2004	data not requested for 2004	N/A	
Gasification	data not requested for 2004	data not requested for 2004	N/A	
Pyrolysis	data not requested for 2004	data not requested for 2004	N/A	
Disposal & Alternative Dispositions Subtotal	**7**	**105,082**	**18**	**116,954**
TOTAL	**277**	**151,942**	**292**	**161,272**

Some of the landfilled biosolids would have been used for daily cover, but the quantity was not tracked. • The Met Council in Minneapolis/St. Paul region operates 9 WWTPs, some of which send solids to the Met Council fluidized bed sewage sludge incinerators (SSIs), which are some of the most technologically advanced incinerators in the country, with extensive heat recovered for electricity generation and building heat.

Biosolids Quality Summary

	Number of Entities (WWTPs & Sep. Preparers) Producing…	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Producing…	Quantity of Biosolids
Class A EQ	8	13,000	8	13,751
Other Class A	0	0	N/A	N/A
Class B	242	32,550	128	30,567
Other (no data, etc.)	27	106,392	152	116,954
TOTAL	**277**	**151,942**	**288**	**161,272**

NOTE: For "number of entities," the total may not match because some entities go to more than one use or disposal.

The "Other" number of facilitiies includes facilities that landfill (15), transfer solids to another WWTP (74), incinerate (3), have annual reports marked "No Application Occurred" (44), transfer to reed beds (7), and facilities with reports that were not submitted/reviewed (16). The quantity of biosolids in the "Other" row only includes those solids landfilled (18,000 dry tons) and incinerated (98,954 dry tons) - from approx. 17 facilities. It does not include transferred and stored biosolids.

Biosolids Treatment Practices

	Estimated Number of WWTPs or Separate Preparers Using…	Estimated Quantity of Biosolids Produced Using…	Estimated Number of WWTPs or Separate Preparers Using…	Estimated Quantity of Biosolids Produced Using…
Stabilization				
Aerobic Digestion (total)	29	no data	79	
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	4	
Class B	data not requested for 2004	data not requested for 2004	75	
Anaerobic digestion (AD) (total)	53	no data	59	
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	1	
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	58	
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	N/A	N/A
Biogas used (heating, electicity, fuel, etc.;scf/year)	data not requested for 2004	data not requested for 2004		N/A
Lime/Alkaline (total)	24	no data	19	
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	3	
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	16	
Composting	0	no data	N/A	
Thermal (e.g. heat drying, not incineration/gasificatn/pyrol)	3	no data	12	
Gasification	data not requested for 2004	data not requested for 2004	N/A	
Pyrolysis	data not requested for 2004	data not requested for 2004	N/A	
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	1	N/A
Long-term (lagoons, reed beds, etc.)	14	no data	30	N/A
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004		N/A
Other stabilization technology	0	no data	1	
Dewatering				
Belt Filter Press	no data	no data	13	
Plate & Frame Press	no data	no data		
Screw Press	no data	no data	3	
Centrifuge	no data	no data		
Vaccuum Filter	no data	no data		
Drying beds (open-air)	no data	no data	53	
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004		
Other dewatering technology	no data	no data		
Thickening				
Gravity thickener	data not requested for 2004	data not requested for 2004	51	
Gravity belt thickener (GBT)	data not requested for 2004	data not requested for 2004	22	
Centrifuge	data not requested for 2004	data not requested for 2004	14	
Dissolved air flotation (DAF)	data not requested for 2004	data not requested for 2004	17	
Other thickening technology	data not requested for 2004	data not requested for 2004	9	
Other				
Biosolids sold in bags (explain at right what size bags)	data not requested for 2004	data not requested for 2004	N/A	

These data are pulled from MN PCA databases using Tableau Report. Some inconsistencies were caught, but there's no guarantee that all inconsistencies were. • St. Cloud WWTF has a high-strength waste receiving facility which they use then to feed into their anaerobic digester. The energy produced is used to fuel a biofuel generator. MN has a couple other facilities that also capture the energy from their digesters, but MN PCA does not currently actively track that information. • Under "Other" we have one facility that for part of the year uses the Bioset process and produces a Class A/EQ. The other part of the year they produce a Class B biosolids.

State Pollutant (trace metal, etc.) Concentration Limits in Biosolids Applied to Land, 2018

Enter numbers only where state limits differed in 2018 from U.S. EPA limits.

	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Copper (Cu)	Lead (Pb)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Selenium (Se)	Zinc (Zn)
EPA Table 1 (mg/kg)	75	85		4300	840	57	75	420	100	7500
EPA Table 3 (mg/kg) & CPLR (kg/ha)	41	39		1500	300	17		420	36 (CPLR = 100)	2800
State ceiling limit (higher limit) (mg/kg)										
State high quality (lower number) limit (mg/kg)										
State CPLR (kg/ha)										
State APLR (kg/ha/365days)										

TESTING

For each of the following constituents, indicate if testing is required by your state, as of 2018.	Is testing required for *all* sewage sludge or biosolids?	Or is testing required only for biosolids being beneficially used as fertilizers and soil amendments?	Frequency of testing (indicate how often testing must be done for each parameter):		If frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	In accordance with other frequency required by state (if applicable, please specify)	
Part 503 metals (As, Cu, Hg, etc.)	no	yes	yes	mirrors the federal	
Other metals (boron, silver…)	no	no	not applicable (N/A)		
Dioxins/furans	no	no	not applicable (N/A)		
PCBs	no	no	not applicable (N/A)	sewage sludge removed	
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf))	no	no	not applicable (N/A)		
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	no	not applicable (N/A)		
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	no	not applicable (N/A)		
Nutrients (NPK)	no	yes	yes		
Pathogen reduction (Class A or B)	yes	yes	yes		
Vector attraction reduction (VAR)	yes	yes	yes		
PFAS (as of 2018)	no	no	not applicable (N/A)		
Microplastics (as of 2018)	no	no	not applicable (N/A)		
TCLP (toxicity characteristic leaching procedure)	no	no	no		
Paint Filter Liquids Test	no	no	not applicable (N/A)		

Biosolids that are landfilled need to meet the requirements of the landfill accepting the solids. Landfills do usually require the TCLP and the paint filter test. All biosolids that are landfilled need to meet Class B pathogen reduction standards.

REPORTING

For each of the following, indicate what WWTPs and/or biosolids preparers must report to the state:	Is reporting to the state required for these parameters?	Frequency of reporting (indicate how often testing must be done for each parameter):		How are these data stored by the state?	Are data compiled by the state in reports or summaries? Is so, please attach.
		In accordance with Part 503 requirements	In accordance with other frequency required (if applicable, please specify)		
The amounts of biosolids/ sewage sludge used or disposed	yes	yes	more restrictive than the 503 Requirements.	electronic	yes
Part 503 metals (As, Cu, Hg, etc.)	yes	yes		electronic	no
Other metals (boron, silver…)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Dioxins/furans	no	not applicable (N/A)		not applicable (N/A)	(please select)
PCBs	no	yes		paper	no
Priority pollutants (https://www.epa.gov/sites/production/files/2015-09/documents/priority-pollutant-list-epa.pdf)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Nutrients (NPK)	yes	yes		electronic	no
Cumulative Pollutant Loading Rates (CPLR)	yes	yes		electronic	no
How biosolids achieve Class A or Class B	yes	yes		electronic	no
How biosolids achieve vector attraction reduction (VAR)	yes	yes		electronic	no
Solids stabilization process(es) used	no	not applicable (N/A)		not applicable (N/A)	(please select)
Other biosolids treatments	no	not applicable (N/A)		not applicable (N/A)	(please select)
End use or disposal practice	yes	yes		electronic	yes
PFAS (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Microplastics (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	(please select)
TCLP (toxicity characteristic leaching procedure)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Paint Filter Liquids Test	no	not applicable (N/A)		not applicable (N/A)	(please select)

Please note, PCB's are required for pond solids removed if the ponds were built prior to 1984.
If biosolids are being disposed of at a landfill, the landfill will likely require a TCLP and paint filter test. • For the annual reports, the electronic copies are scanned into a database but the data on the scanned reports can't be searched/mined.