



STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Ohio

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	216 (survey), 780 CWNS	1,290	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	no data	9	-----
Total number of your state's WWTPs sending to those Separate Preparers:	0	no data	-----
Number of operating sludge incinerators in your state (total):	no data	8	-----
Fluidized bed:	no data	0	-----
Multiple hearth:	no data	0	-----
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	no data	-----
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	128	-----
Number of WWTPs in your state with <i>sludge lagoons</i> :	data not requested for 2004	1 large, many small	-----
Wastewater Flow Totals			
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	no data	-----
Total statewide WWTP design capacity for wastewater flow (MGD):	data not requested for 2004	no data	-----
Total statewide average daily dry weather flow (MGD):	data not requested for 2004	no data	-----
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	no data	-----
Number of WWTPs involved in those complaints:	data not requested for 2004	no data	-----
Percent of population served by on-site systems (e.g. septic systems):	20-25%	20%	-----

Total WWTPs is based on facilities that are permitted under OH EPA's sludge rule and submitted annual biosolids reports in 2018, as required: 1290 in total (224 majors (>1 MGD), 1066 minors). Of those, 420 were permitted to use or dispose of sludge (171 majors, 249 minors); the other 870 were permitted for transfer to another facility. • Separate preparers: There are 9 private anaerobic digestion facilities, some at WWTPs and some stand-alone, that take in solids from a variety of WWTPs. This is a relatively new biosolids management practice in Ohio, and some of these AD facilities are causing some public concerns and odor complaints in 2018 - 2020. • See below for details about the Incinerators at Cincinnati and Cleveland. • Lagoons: there is one large private storage lagoon where digested sludge is stored before distribution. In addition, as in other states, there are many small WWTPs that store solids in lagoons, cleaning them out and using or disposing of the solids every 5 - 20 years. • Ohio EPA did not have a systematic biosolids odor complaint tracking system in 2018 because they received relatively few complaints of this nature and they were just documented in staff files. A new tracking system was developed in 2019-2020.

Biosolids Use and Disposal

UNITS:	Dry metric tons	Dry U.S. tons	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total): 283,100			
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)	118	158,056	160 102,907
Disposal & Alternative Dispositions	71	138,292	318 180,219
Other	27	27,347	
TOTAL	216	323,695	478 283,126
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)	116	120,480	143 90,390
Forestland (EQ, Class A, & Class B)	0	0	0 0
Reclamation (EQ, Class A, & Class B)	0	0	0 0
Class A EQ Distribution (bagged or bulk, public distribution, or unsure where it went)	2	37,576	17 12,517
Beneficial Use Subtotal	118	158,056	160 102,907
Long-term storage	27	27,347	no data no data
Number of acres to which biosolids were applied:	data not provided		no data
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)	63	56,941	314 98,916

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.

Data included here are from 420 facilities permitted by OH EPA to use or dispose of biosolids. Some facilities were permitted for multiple end use/disposal methods. • This includes 11 facilities that are merchant AD operations, privately owned and operated but treating domestic sludge (16,580 dt) and, in some cases, other liquid organic residuals (wastes).

Data are from annual reports provided by WWTPs to OH EPA. • An estimated 50% of total EQ biosolids produced (25,034 dt) went to agricultural land: 12,517 dt. • 11 merchant AD operations produced 16,580 dt of Class B biosolids, all of which went to agricultural lands.

Burial	data not requested for 2004	data not requested for 2004	no data	no data
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	no data	no data
Surface Disposal	6	2,803	no data	no data
Incineration	2	78,548	4	81,303
Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	no data	no data
Deep well injection	data not requested for 2004	data not requested for 2004	no data	no data
Gasification	data not requested for 2004	data not requested for 2004	no data	no data
Pyrolysis	data not requested for 2004	data not requested for 2004	no data	no data
Disposal & Alternative Dispositions Subtotal	71	138,292	318	180,219
TOTAL	216	323,695	478	283,126

A few larger northeast Ohio facilities landfill their solids. Many small WWTPs also landfill solids. • The two incineration operations are at Cincinnati and Cleveland. In Cincinnati, solids from the central Mill Creek WWTP are incinerated in 3 fluidized bed units (commissioned in 2011); the other large WWTP, Little Miami, incinerated solids in a fluidized bed unit (ca. 2000) until recently, when new anaerobic digesters and biosolids recycling to soil commenced. At Cleveland, the Northeast Ohio Regional Sewer District has three WWTPs. The Westerly facility burns its solids in 2 multiple hearth incinerators (MHIs). NEORS's Easterly WWTP sends solids for incineration at the Southerly plant, where, in 2009 - 2013, 3 fluidized bed incinerators (FBIs) replaced 4 ~early 1980s MHIs. Heat from the new units is used to generate ~25% of the Southerly plant's electricity, and, beginning in 2018, ash from the Southerly incinerators is used in top soil and concrete mixtures. Cincinnati is also researching use of its ash in soil amendment blends.

Biosolids Quality Summary

	Number of Entities (WWTPs & Sep. Preparers) Producing...	Quantity of Biosolids	Number of Entities (WWTPs & Sep. Preparers) Producing...	Quantity of Biosolids	NOTE: For "number of entities," the total may not match because some entities go to more than one use or disposal.
Class A EQ	2	37,576	17	25,034	
Other Class A	no data	20,023			
Class B	116	100,457	143	77,873	*Other* is solids that are disposed, their quality not tracked.
Other (no data, etc.)	90	165,639	no data	180,219	
TOTAL	208	323,695	160	283,126	

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)	11	2,536	2	no data	
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	no data	no data	
Class B	data not requested for 2004	data not requested for 2004	no data	no data	
Anaerobic digestion (AD) (total)	4	5,624	no data	no data	
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	no data	no data	
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	no data	no data	
WWTPs co-digesting (FOG, food, glycol, etc.)	data not requested for 2004	data not requested for 2004	no data	N/A	
Biogas used (heating, electricity, fuel, etc.:scf/year)	data not requested for 2004	data not requested for 2004	no data	N/A	
Lime/Alkaline (total)	1	1,653	6	no data	
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	no data	no data	
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	no data	no data	
Composting	7	28,358	3	no data	
Thermal (e.g. heat drying, not incineration/gasificatn/pyrol)	0	0	no data	no data	
Gasification	data not requested for 2004	data not requested for 2004	no data	no data	
Pyrolysis	data not requested for 2004	data not requested for 2004	no data	no data	
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	no data	N/A	
Long-term (lagoons, reed beds, etc.)	5	39,463	1	N/A	
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	no data	N/A	
Other stabilization technology	0	0	no data	no data	
Dewatering					
Belt Filter Press	6	5,233	no data	no data	
Plate & Frame Press	1	175	no data	no data	
Screw Press	0	0	no data	no data	
Centrifuge	2	66,247	no data	no data	
Vacuum Filter	1	108	no data	no data	
Drying beds (open-air)	12	6,104	no data	no data	
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	no data	no data	
Other dewatering technology	0	0	no data	no data	
Thickening					
Gravity thickener	data not requested for 2004	data not requested for 2004	no data	no data	
Gravity belt thickener (GBT)	data not requested for 2004	data not requested for 2004	no data	no data	
Centrifuge	data not requested for 2004	data not requested for 2004	no data	no data	
Dissolved air flotation (DAF)	data not requested for 2004	data not requested for 2004	no data	no data	
Other thickening technology	data not requested for 2004	data not requested for 2004	no data	no data	
Other					
Biosolids sold in bags (explain at right what size bags)	data not requested for 2004	data not requested for 2004	0	0	

This information was pulled from annual reports that had been submitted electronically. At the time there were still some reports being submitted via paper file. This is an estimate based on the electronic- submitted data. All of the annual reports are required to be submitted electronically now, and in the future these data will be more accurate.

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		
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)		
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)	no	yes	yes		
Vector attraction reduction (VAR)	no	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	not applicable (N/A)		
Paint Filter Liquids Test	no	no	not applicable (N/A)		

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		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)	no
Dioxins/furans	no	not applicable (N/A)		not applicable (N/A)	no
PCBs	no	not applicable (N/A)		not applicable (N/A)	no
Priority pollutants	no	(please select)		not applicable (N/A)	no
Other organic compounds (e.g. PDBEs, pharmaceutical)	no	not applicable (N/A)		not applicable (N/A)	no
Radioactive isotopes (alpha, beta, Ra 226, etc.)	no	not applicable (N/A)		not applicable (N/A)	no
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	yes	yes		electronic	no
Other biosolids treatments	yes	yes		electronic	no
End use or disposal practice	yes	yes		electronic	no
PFAS (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	no
Microplastics (as of 2018)	no	not applicable (N/A)		not applicable (N/A)	no
TCLP (toxicity characteristic leaching procedure)	no	not applicable (N/A)		(please select)	no
Paint Filter Liquids Test	no	not applicable (N/A)		(please select)	no