



STATE BIOSOLIDS SURVEY

2018 data
conducted 2020-2021
biosolidsdata.org

Kentucky

Infrastructure & Wastewater

	2004 Data	2018 Data	
Total Number of WWTPs:	29 (survey), 245 CWNS	123	
WWTP & Biosolids Infrastructure Totals			
Number of Separate Preparers (in- or out-of-state, receiving solids from your state):	6	likely 0	-----
Total number of your state's WWTPs sending to those Separate Preparers:	6	likely 0	-----
Number of operating sludge incinerators in your state (total):	0	0	-----
Fluidized bed:	0	0	-----
Multiple hearth:	0	0	-----
Number of Part 258 landfills in your state accepting sewage sludge:	data not requested for 2004	23	-----
Number of WWTPs in your state with industrial pre-treatment programs:	data not requested for 2004	70	-----
Number of WWTPs in your state with <i>sludge</i> lagoons:	data not requested for 2004	-60	-----
	70		
Total statewide average daily wastewater flow (MGD):	data not requested for 2004	422	-----
Total statewide WWTP <i>design</i> capacity for wastewater flow (MGD):	data not requested for 2004	718	-----
Total statewide average daily <i>dry weather</i> 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):	no data	40%	-----

All of the larger water resource recovery facilities (WRRFs) in KY have industrial pretreatment programs, including Louisville, Lexington, and Bowling Green, as tracked by KY EEC's pretreatment program. • The number of facilities that have storage lagoons for solids is not tracked by EEC; solids from those lagoons are typically removed only every 10 - 30 years, and only then are they used or disposed and possibly tracked by KY EEC. The estimate of ~60 lagoon systems is from independent local expert input to the NBDP project. • The percentage of homes relying on septic systems is from <http://www2.ca.uky.edu/agcomm/pubs/HENV/HENV502/HENV502.pdf>

Biosolids Use and Disposal

UNITS:	Dry metric tons	Dry U.S. tons	
BIOSOLIDS USED OR DISPOSED, 2018 (adjusted total): 112,000			
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)	16	23,194	40 19,672
Disposal & Alternative Dispositions	15	61,480	23 92,760
Other	1	810	60 no data
TOTAL	32	85,484	123 112,432
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)	12	19,961	39 19,281
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)	4	3,233	1 391
Beneficial Use Subtotal	16	23,194	40 19,672
Long-term storage	1	810	60 no data
Number of acres to which biosolids were applied:	no data 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

NOTE: Quantity of sewage sludge or biosolids used or disposed means the quantity that goes out the gate of the WWTPs. Quantities are in the units (the form of measurement) indicated above.

The most common process for use or disposal of KY wastewater solids (sludge) is dewatering by belt filter press followed by landfill disposal.

2018 data shown here are from U.S. EPA's ECHO database; they are confirmed by similar data for 2019 provided by the state biosolids coordinator at the Energy and Environment Cabinet (KY EEC). Note, however, that EEC does not require submittal of data using the categories shown here at left. KY EEC tracks whether material is managed at a landfill, a composting facility, or given away by a generator to end users. Therefore, the separate categories of beneficial use tonnages at left are based on NBDP estimates based on U.S. EPA ECHO data. • Louisville data are from their own online reports, which indicate that the tonnages of biosolids produced in 2018 - 13,350 dry U.S. tons fertilizer and 1,276 dry U.S. tons landfilled - are significantly lower than in prior years, which they say is due to aging and failing infrastructure. Louisville is upgrading its heat drying system and expects to be operating with the potential for increased production in 2022. • KY EEC notes that some KY WRRFs have considered following Louisville's lead and creating Class A EQ biosolids, but many see that option as being too expensive. Landfill disposal is simple and fairly inexpensive. • An estimated 60 or more small WRRFs store solids in lagoons, which are typically cleaned out only every 10 - 30 years. Many of these are currently in need of clean-out, but communities are struggling to find the money to do so.

Landfill (total)	13	61,263	23	92,760
Burial	data not requested for 2004	data not requested for 2004	23	92,760
Alternative daily (ADC), intermediate, or final cover	data not requested for 2004	data not requested for 2004	no data	no data
Surface Disposal	2	217	0	0
Incineration	0	0	0	0
Cement kiln or industrial furnace	data not requested for 2004	data not requested for 2004	0	0
Deep well injection	data not requested for 2004	data not requested for 2004	0	0
Gasification	data not requested for 2004	data not requested for 2004	0	0
Pyrolysis	data not requested for 2004	data not requested for 2004	0	0
Disposal & Alternative Dispositions Subtotal	15	61,480	23	92,760
TOTAL	32	85,484	123	112,432

KY EEC does not compile data separating out wastewater solids that are sent to landfills. The estimate here for landfilled tonnage is derived from U.S. EPA ECHO data. KY EEC confirms that, other than the Class A EQ biosolids produced at Louisville, Paducah, and Morehead, almost all other wastewater solids go to landfills, so the number of facilities sending to solids is likely more than 100.

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	4	30,502	3	12,584	This information is not provided in annual reports submitted to KY EEC. Kentucky regulations use a different classification method which designates facilities as Type A or Type B. • Based on U.S. EPA ECHO data and local sources, NBDP finds that three WRRFs - Louisville, Paducah, & Morehead - produce Class A EQ products. The remainder of the land applied biosolids are assumed to be Class B. • The remaining WRRFs, those that send solids to landfill, do not classify and/or report on their solids, because it is not required for landfill disposal.
Other Class A	0	0	0	0	
Class B	6	13,934	38	7,088	
Other (no data, etc.)	21	41,047	100	92,760	
TOTAL	31	85,483	141	112,432	

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					Many WRRFs rely on aerobic digestion of solids, but some can't achieve Class B, and, in most cases anyway, the solids are sent to landfills. Many of the aerobic systems use tanks that were once for anaerobic digestion (AD). The one ATAD facility is at Morehead. • AD used to be more common across the state, but, because of perceived operating complexity, has been abandoned in most communities. It is still in prominent use in the Louisville biosolids program, where biogas is used for renewable energy. • The one biosolids composting operation is at Paducah. • The one thermal facility is the heat-drying fertilizer production system at Louisville, producing "Louisville Green." • For dewatering, ~90% of WRRFs use belt filter presses. Louisville, Lexington, and Bowling Green use centrifuges. A few small plants use screw presses. As in other states, there used to be plate & frame presses, but those have gone out in recent decades. There are no DAFs in use for municipal wastewater solids. There are 2 – 3 drying beds left, but they're less common than they used to be. • Louisville Green has been bagged and sold in farm supply stores.
Aerobic Digestion (total)	0	0	many	no data	
Class A (ATAD/Other)	data not requested for 2004	data not requested for 2004	1	85	
Class B	data not requested for 2004	data not requested for 2004	many	no data	
Anaerobic digestion (AD) (total)	0	0	few	no data	
Class A (e.g. thermophilic)	data not requested for 2004	data not requested for 2004	0	0	
Class B (mesophilic)	data not requested for 2004	data not requested for 2004	1	12,108	
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	1	N/A	
Lime/Alkaline (total)	0	0	few, if any	no data	
Class A lime/alkaline	data not requested for 2004	data not requested for 2004	--	--	
Class B lime/alkaline	data not requested for 2004	data not requested for 2004	--	--	
Composting	1	1,738	1	391	
Thermal (e.g. heat drying, not incineration/gasification/pyro)	1	26,417	1	12,108	
Gasification	data not requested for 2004	data not requested for 2004	0	0	
Pyrolysis	data not requested for 2004	data not requested for 2004	0	0	
Hydrolysis (thermal, chemical, etc.)	data not requested for 2004	data not requested for 2004	0	N/A	
Long-term (lagoons, reed beds, etc.)	0	0	~60	N/A	
Oxidation ditch / extended aeration	data not requested for 2004	data not requested for 2004	several, including 3 at Frankfort	N/A	
Other stabilization technology	2	1,275	no data	no data	
Dewatering					
Belt Filter Press	no data	no data	very common	no data	
Plate & Frame Press	no data	no data	0	0	
Screw Press	no data	no data	a few	no data	
Centrifuge	no data	no data	3	no data	
Vacuum Filter	no data	no data	no data	no data	
Drying beds (open-air)	no data	no data	~3	no data	
Solar drying (e.g. in greenhouse)	data not requested for 2004	data not requested for 2004	0	0	
Other dewatering technology	no data	no data	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	1	a few hundred tons maybe	

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

Numbers entered 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)		10		450	250			50		900
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	no	Yes	See comments
Other metals (boron, silver...)	no	no	not applicable (N/A)		
Dioxins/furans	no	no	not applicable (N/A)		
PCBs	no	yes	no	Yes	
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	no	Yes	
Pathogen reduction (Class A or B)	no	yes	no	Yes	
Vector attraction reduction (VAR)	no	yes	no	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	yes	no	no		

Kentucky biosolids regulations can be found here:
<https://apps.legislature.ky.gov/law/kar/401/045/100.pdf>. Testing frequency is based on design treatment capacity of WRRF. Two samples must be provided for plants that treat less than 1,000,000 gallons per day (1 MGD), 4 samples for plants that treat >1 and up to 10 MGD, and 12 samples for plants that treat more than 10 MGD. • The only testing required for biosolids that go to landfills is a TCLP test.

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	not applicable (N/A)	reported annually	electronic	no
Part 503 metals (As, Cu, Hg, etc.)	yes	not applicable (N/A)		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	not applicable (N/A)		not applicable (N/A)	(please select)
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	not applicable (N/A)		electronic	no

Some of this information, such as how the facility achieves Class A or B or VAR is included in the permit application but is not reported annually. Kentucky receives reports from regulated facilities which are scanned and stored electronically as images. These data may be obtained through an open records request.

Cumulative Pollutant Loading Rates (CPLR)	yes	not applicable (N/A)		electronic	no
How biosolids achieve Class A or Class B	no	not applicable (N/A)		not applicable (N/A)	(please select)
How biosolids achieve vector attraction reduction (VAR)	no	not applicable (N/A)		not applicable (N/A)	(please select)
Solids stabilization process(es) used	no	not applicable (N/A)		not applicable (N/A)	(please select)
Other biosolids treatments	no	not applicable (N/A)		(please select)	(please select)
End use or disposal practice	yes	(please select)		electronic	no
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)

