

**APPENDIX D**  
**Version - FINAL - Part 1 of 2**  
**December 31, 2007**

**U.S. and State-by-State  
Biosolids Regulation  
Quality, Treatment, and  
End Use and Disposal Data**

This document is available at [www.nebiosolids.org](http://www.nebiosolids.org).

## U. S. TOTALS

Dry U. S. Tons	Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)
293,656,842	3,537,413	83	
Total Cropland in Farms (acres, USDA, 2002) 434,164,946	Number of Farms With That Total Cropland (USDA, 2002) 1,751,450	Application rate if all state biosolids (adj. estimate) were applied to cropland at typical cropland (units/ac) 0.017	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac) 0.6%

Total Biosolids Used or Disposed in 2004*:	From State Survey	Adjusted Estimate***
	7,171,222	7,180,000

Total Number of TWTDS in 2004**:	From CWNS	From Survey Q24
	16824	8776
Total number of TWTDS sending to Separate Preparers in 2004:		2300
Number of Separate Preparers:		186
Number of operating sludge incinerators^:		90+
Fluidized bed:		28+
Multiple hearth:		42+

<sup>\*</sup> Incinerators were underreported; NACWA data notes 105+ multiple hearth alone.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	4639	3,502,845	49%
Disposal	3166	3,247,666	45%
Other (long-term storage, etc.)	1149	420,712	6%
Total	8776	7,171,222	100.00%

#### Beneficial Use

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Agricultural	3999	2,620,146	37%
Forestland	28	26,452	0%
Reclamation	94	96,900	1%
Class A EQ Distribution	449	759,347	11%
Total	4461	3,502,845	49%
Other (long-term storage, etc.)	1149	420,712	6%

#### Disposal

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
MSW landfill (incl dly cvr)	2600	2,023,508	28%
Surface Disposal	54	142,684	2%
Incineration	512	1,081,474	15%
	3166	3,247,666	45%

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	478	1,473,867	22%
Other Class A	12	57,659	1%
Class B	3898	2,273,039	34%
Other (no data, etc.)	5524	2,902,575	43%
Total	9912	6,707,141	100%

### Summary of Current Biosolids Treatment Practices

	Reported Estimates of Number of TWTDS Using...	Reported Estimates of Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	2200	85,000	<b>CAUTIONS IN USING</b>
Digestion-anaer./other	1000	1,217,000	<b>THIS DATA:</b> These are minimum estimates from incomplete data from states and other sources. Includes data from ~50% of states regarding numbers of TWTDS (column 1) and ~25% of states regarding quantities of biosolids (column 2).
Lime/Alkaline	900	285,000	
Composting	200	471,000	
Thermal (not incineration)	60	112,000	
Long-term (lagoons, reed beds, etc.)	500	97,000	
Other	20	5,400	
Belt Filter Press	650	415,000	
Plate & Frame Press	50	65,500	
Screw Press	10	3,400	
Centrifuge	150	880,000	
Vacuum Filter	20	4,200	
Drying beds	400	380,000	
Other	40	600	<b>They serve only to provide a rough sense of the relative importance of various technologies.</b>

\* The total biosolids "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in each state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

\*\*\*Totals do not include Puerto Rico and other territories. An estimated U. S. total, with territories included, is 7,210,000 dry U. S. tons.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Alabama**

### **REGULATION AND PERMITTING**

**[TWTDS = Treatment works treating domestic sewage]**

Delegated by EPA for biosolids? Alabama is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion and the solid waste program of Alabama's environmental agency along with Region 4 EPA and the state health department regulates biosolids management, disposal, and end use. The environmental agency permits wastewater treatment facilities and EPA oversees biosolids disposal and end use. Alabama relies solely on the 503 regulations, EPA region 4 regulates all biosolids end use and disposal.

Holder of liability Alabama does not allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Alabama does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. There is no good inventory for this data, so they do not know at how many sites this is taking place.

NPDES equivalent: There is a state equivalent to NPDES in Alabama (CHAPTER 335-6-6 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM). All NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0. Alabama relies completely on the federal Part 503 regulations.

Biosolids regulations updated: Alabama has no state regulations. Part 503 sets all requirements and management practices.

Management practices: As of today, Alabama's biosolids regulations are not more restrictive than the federal Part 503 rule. Part 503 sets all requirements and management practices in Alabama. Alabama does not require additional monitoring at Class B land application sites. Nitrogen is the basis for the agronomic loading rate for land application. Alabama does not require formal nutrient management plans. Alabama does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Alabama does not require any additional oversight and certification to occur at biosolids land application sites.

In Alabama some biosolids management groups perform the following oversight and certification voluntarily:

- Independent inspections or monitoring at land application sites.

Acres applied: No data available.

Reporting and Record-keeping: Only major facilities are required to report biosolids information and data. The public can access these reports by mail or in person from EPA Region 4 office. The data and reports are not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Alabama, use/disposal is being positively impacted by development of, or changes to, local (county, municipal) biosolids ordinances/regulations. These activities are likely to have the effect of

expanding beneficial use. Local ordinances are not an issue in Alabama; Jefferson County may have a local ordinance, but that would be the only one.

## **TRENDS**

The beneficial use of biosolids is increasing in Alabama. More facilities are reaching a threshold in the amount of waste that can be processed from outside sources, thus increasing the use of biosolids.

Most significant current pressures on biosolids recycling: No data provided.

## **SEPTAGE MANAGEMENT**

Grease is regulated by the department of agriculture and septage is overseen by the health department.

Septage regulations updated: October 19, 1994.

Number of full-time equivalent staff (FTEs) for septage program: 1

Septage haulers based in state (estimated): 316

Septage management: Septage can be land applied if it meets part 503. POTWs are not required to accept septage. However, 75-80 % TWTDS accept septage.

Percentage of each management practice:

- Land applied = 20 %
- Hauled to TWTDS = 77 %
- Disposed in lagoons = 1 %
- Composted = 2 %

Other concerns: Alabama considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the Code of Alabama 1975, sections 22-27-70 through 22-27-73 and updated as section 22-27-90 through 22-27-94; Grease Law. Alabama does not have a proactive program to collect FOG and keep it out of the general wastewater flow. All FOG programs are primarily reactive vs. proactive. Some municipalities and treatment facilities require separators or a certain quality of biological oxygen demand (BOD).

## Alabama

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
4,525,375	50,744	89	3,732,751	34,073	0.019	0.6%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	61,243	<b>62,000</b>		96,868	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	47,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	278	52				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		probably 0				
Number of operating sludge incinerators:		1				
Fluidized bed:		no data				
Multiple hearth:		no data				
Percent of population served by on-site (e.g. septic systems):		30%				
<b>UNITS:</b> Dry Metric Tons						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey  
(Goldstein, 2000)

96,868 47,000

NOTES: All data in these tables are from EPA Region 4 and a compilation of data from the largest facilities for years 2002 - 2006, with each facility represented only once. This data represents 63% of the total flow reported in the 2004 Clean Watersheds Needs Survey, or an estimated ~56% of the seweraged population. Smaller facilities (the large majority of the total 278 TWTDS in Alabama) are not included, but many of these do not produce solids every year (lagoons are cleaned out only every 15 - 20 years). Alabama's total annual solids use and disposal is therefore estimated to be about 70,000 dmt.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	39	42,402	69%	
Disposal	12	18,784	31%	
Other	1	57	0%	
Total	52	61,243	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	30	29,372	48%	
Forestland	0	-	0%	
Reclamation	9	13,030	21%	
Class A EQ Distribution	0	-	0%	
Total	39	42,402	69%	
Long-term storage	1	57	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	11	12,784	21%	
Surface Disposal	0	-	0%	
Incineration	1	6,000	10%	
	12	18,784	31%	

### NOTES:

The "Other" line includes 8,476 dry metric tons (14 TWTDS) that are land applied, but for which the Class A or Class B quality was not reported.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	1	3,550	6%
Other Class A	0	-	0%
Class B	23	30,266	49%
Other (no data, etc.)	28	27,427	45%
Total	52	61,243	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	no data	no data	
Digestion-anaer./other	no data	no data	
Lime/Alkaline	no data	no data	
Composting	no data	no data	
Thermal (not incineration)	no data	no data	
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **ALASKA**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Alaska is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The solid waste portion of Alaska's environmental agency regulates biosolids and utilizes solid waste permits to regulate end use and disposal and land application sites.

Holder of liability: Alaska does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. All land applicator or land owners hold some legal liability.

More than one Class B biosolids on one site? Alaska does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, but this is not being done on any sites.

NPDES equivalent: ADEC Wastewater Discharge Program is the state equivalent to NPDES, however, Alaska is in the process of obtaining delegation for NPDES. All ADEC/NPDES permits include requirements for biosolids use or disposal. Permits are not specific, but do contain stipulation that sludge must be properly disposed.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.2

Biosolids regulations updated: August 2003.

Management practices: Alaska's biosolids regulations are not more restrictive than the federal Part 503 rule. Alaska does not require additional monitoring at Class B land application sites. Nitrogen is the basis for the agronomic loading rate for land application. Alaska does not require formal nutrient management plans. Alaska does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Alaska requires the following oversight and certification to occur at biosolids land application sites:

- Other requirements or actions to control odors at land application sites.

In Alaska, some biosolids management groups perform the following oversight and certification voluntarily:

- Other requirements or actions to control odors at land application sites.

Acres applied: In 2004, biosolids were applied to a total of 29 acres. In 2004, no new site permits/approvals were issued.

Reporting and Record-keeping: Sludge-only processing facilities are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. There is no electronic database for biosolids, but it may become part of a new web-based database that is being developed for all solid waste facilities.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Alaska, development of, or changes to, state biosolids regulations is happening or is imminent and will likely have no significant affect on beneficial use. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. There are no towns or counties in Alaska that have adopted more restrictive biosolids application ordinances.

## **TRENDS**

The beneficial use of biosolids is increasing in Alaska. Beneficial use appears to be increasing, based on the environmental agency receiving more inquiries and based on receipt of new applications in 2006.

Most significant current pressure on biosolids recycling: Agriculture is not a big business in Alaska, and may be declining.

## **SEPTAGE MANAGEMENT**

Septage – permitting of septic systems and septage management is in the water quality program.

## **ADDITIONAL NOTES**

See [http://www.dec.state.ak.us/eh/sw/SW\\_types/biosolids.html](http://www.dec.state.ak.us/eh/sw/SW_types/biosolids.html)

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Alaska

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	Yes	Yes	Yes	-	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	Yes	-	-
Pathogen reduction (Class A or B)	Yes	Yes	Yes	-	-
Vector attraction reduction (VAR)	Yes	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	-	for land application permits 1 time/year	Paper	No	-
Part 503 metals	Yes	-	Up to 3 times/year depending on permit	Paper	No	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	No	-	-	-	-	-
Cumulative Pollutant Loading Rates	No	-	-	-	-	-
How biosolids achieve Class A or B	Yes	-	Up to 3 times/year depending on permit	Paper	No	-
How biosolids achieve Vector Attraction	Yes	-	Up to 3 times/year, depending on permit	Paper	No	-
Solids stabilization processes used	Yes	-	Up to 3 times/year, depending on permit	Paper	No	-
Other biosolids treatments	No	-	-	-	-	-
End use/disposal practice	Yes	-	1 time/year	Paper	No	-

## Alaska

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
657,755	571,951	1	98,131	479	0.173	5.8%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	16,921	<b>17,000</b>				
<b>Total Number of TWTDS in 2004**:</b>		From CWNS	From Survey Q24			
	172		4			
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		1				
Number of operating sludge incinerators:		2				
Fluidized bed:		1				
Multiple hearth:		1				
Percent of population served by on-site (e.g. septic systems):		50%				
<b>UNITS:</b> Dry U.S. Tons						

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	1	9,497	56%	
Disposal	3	7,424	44%	
Other	0	-	0%	
Total	4	<b>16,921</b>	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	0	-	0%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	1	9,497	56%	Fairbanks' biosolids compost.
Total	1	9,497	56%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	1	10	0%	This is Haines' composted biosolids used for landfill cover.
Surface Disposal	0	-	0%	
Incineration	2	7,414	44%	
	3	7,424	44%	These biosolids are produced & incinerated at Anchorage (6,587 dry tons) & Juneau.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	1	9,497	56%	
Other Class A	1	10	0%	
Class B	0	-	0%	
Other (no data, etc.)	2	7,414	44%	
Total	4	16,921	100%	

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	no data	no data	
Digestion-anaer./other	no data	no data	
Lime/Alkaline	a few	no data	
Composting	2	9,507	
Thermal (not incineration)	0	-	
Long-term (lagoons, reed beds, etc.)	several	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **ARIZONA**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Arizona is delegated by the USEPA for Part 503.

State agency regulating biosolids: The water portion of the AZ Department of Environmental Quality regulates wastewater and biosolids land application sites and the solid waste management portion regulates biosolids composting and disposal.

Holder of liability: Data not provided.

More than one Class B biosolids on one site? Data not provided.

NPDES equivalent: Data not provided.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.2

Biosolids regulations updated: 2003.

Management practices: The AZ Department of Environmental Quality issues permits, administers compliance and enforcement, and oversees the activities of all biosolids disposal, use, and transportation within Arizona. Incineration of biosolids is prohibited in AZ.

Additional Management Actions: Data not provided.

Acres applied: Data not provided.

Reporting and Record-keeping: Data not provided.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Arizona, there are no known developing or imminent changes to state biosolids regulations.

### **TRENDS**

The beneficial use of biosolids is not increasing or decreasing in Arizona.

Most significant current pressure on biosolids recycling: No data provided.

### **SEPTAGE MANAGEMENT**

No data provided.

## Arizona

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
5,739,879	113,634	51	1,261,894	4,440	0.071	2.4%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	90,000	90,000				
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	166	43				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		2				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b> Dry Metric Tons						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

95,698 50,000

NOTES: Data in these tables are from EPA Region 9. Some medium and small TWTDS transfer their solids to larger TWTDS; for example, the largest municipality, Phoenix, treats solids received from several surrounding community TWTDS. Arizona biosolids management is impacted significantly by importation of wastewater solids from southern California - 95,000 dry metric tons in 2004, about 10,000 dmt of which was treated and then returned to California; these data are not included in the totals below (they are included in the California data). The two Arizona separate preparers processed mostly California biosolids.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	18	71,000	79%	
Disposal	15	9,000	10%	
Other	10	10,000	11%	
Total	43	90,000	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	16	70,000	78%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	2	1,000	1%	
Total	18	71,000	79%	
Long-term storage	10	10,000	11%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	10	6,000	7%	
Surface Disposal	5	3,000	3%	
Incineration	0	-	0%	
	15	9,000	10%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	4	1,000	1%
Other Class A	0	-	0%
Class B	24	80,000	99%
Other (no data, etc.)	15	9,000	0%
Total	43	90,000	100%

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	5	2,500	Includes one ATAD system (which does not produce Class A).
Digestion-anaer./other	10	68,000	
Lime/Alkaline	0	-	
Composting	2	10,090	
Thermal (not incineration)	1	400	
Long-term (lagoons, reed beds, etc.)	many	-	
Other	0	-	
Belt Filter Press	0	-	
Plate & Frame Press	0	-	
Screw Press	0	-	
Centrifuge	0	-	
Vaccum Filter	0	-	
Drying beds	22+	-	Long-term drying and Alternative 4 to meet Class A standards were used by three TWTDS.
Other	0	-	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Arkansas**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Arkansas is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion and the solid waste portion of Arkansas's environmental agency, along with the department of Health and Human Services, regulate biosolids management, disposal, and end use. The solid waste division oversees composting. The water/wastewater division permits TWTDS over 5000 GPD (gallons per day). The Department of Health and Human Services permits TWTDS under 5000 GPD. Arkansas utilizes specific NPDES-type permits and solid waste permits to regulate end use and disposal of wastewater solids. Land application sites are issued separate site-specific permits.

Holder of liability: Arkansas does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Arkansas does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, as long as site permit limits are not exceeded.

NPDES equivalent: Arkansas is delegated for the NPDES program. All NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.5

Biosolids regulations updated: Arkansas does not have state biosolids regulations; it relies solely on the federal 40 CFR Part 503 regulations.

Management practices: Despite not having its own biosolids-specific regulations, Arkansas does require some additional management practices. For example, the state requires increased setbacks to surface waters, drinking water sources, property lines, and dwellings, as well as slope restrictions. In addition, phosphorus (P) can be a limit for determining the agronomic rate of biosolids applications in areas designated as having a nutrient surplus. Arkansas's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive than Part 503, and Arkansas does not require additional monitoring at Class B land application sites. Formal nutrient management plans are not required. Arkansas uses a P index for certain areas of the state to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Arkansas requires some independent inspections or monitoring at land application sites. In Arkansas, some biosolids management groups take additional voluntary actions to control odors at land application sites.

Acres applied: Biosolids were applied to a total of about 12,000 acres in 2006. The number of new site permits/approvals that were issued in 2004 was not reported.

Reporting and Record-keeping: Both major and minor facilities are required to report biosolids information and data. The public can access these reports from the state website, by mail or in person from the state agency, and from POTW or TWTDS websites. The data and reports are compiled electronically with Excel.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Arkansas, no regulation or legislative activity is happening that would affect biosolids. As of today, local

units of government are allowed to adopt ordinances that are more restrictive than state law, but the number of towns and counties in Arkansas that have done so was not reported.

## TRENDS

### Most significant current pressures on biosolids recycling:

1. Nutrient-surplus-designated areas are limiting beneficial land application operations.
2. Cost of producing EQ biosolids.

## TESTING AND REPORTING

No information was provided by the state regarding the requirements for testing and reporting, but, because Arkansas relies on Part 503, it is assumed that only Part 503 testing and reporting requirements are necessary in Arkansas.

## SEPTAGE MANAGEMENT

Septage regulations updated: Arkansas has adopted the federal Part 503 regulations, with some simplifications. The AR Department of Health and Human Services (DHHS) deals with septage, licensing septage haulers through the central state office. Trucks are licensed, and fees are based on the number of trucks. To be licensed, the hauler must have letters of permission to discharge at TWTDS and/or site plans for land application sites. Annual inspections of trucks, equipment, records, and land application sites are done by the regional state DHHS offices. In addition, county environmental health specialists are employees of the state DHHS and may be involved in overseeing septage management.

Number of full-time equivalent staff (FTEs) for septage program: 0.05 at the central state level, plus 0.05 FTE regional staff in each of the five state DHHS regions.

Septage haulers based in state: 181 licensed

Septage management: Septage can be land applied, but must be done so in accordance with the federal Part 503 rule; however, Arkansas has removed some of the treatment options in Part 503 and only allows 1) raising the pH (e.g. lime treatment) and surface application, 2) subsurface injection, or 3) land applying and tilling into the soil within six hours. TWTDS are not required to accept septage; however, many do, and most septage haulers dispose of septage at TWTDS (most haulers have two to ten TWTDS that have given them permission to discharge at them).

Percentage of each management practice:

Land applied: ~5%, on non-food crops, such as sod and hay.

Discharged at TWTDS: ~95%

Septage-only lagoons are not allowed in Arkansas.

Other concerns: Fats, oils, and grease (FOG) are a concern, and some wastewater treatment facilities are especially concerned about receiving loads of septage that include a lot of FOG (this has led to stricter record-keeping regarding the source of materials). FOG is not regulated by DHHS; the state Department of Environmental Quality oversees its management, and individual site-specific permits regulate the use and disposal of grease trap waste, but there is no special proactive program to keep it out of the general wastewater flow.

## Arkansas

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
2,750,000	52,068	53	9,576,047	36,908	0.006	0.2%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	52,178	<b>53,000</b>		57,543	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	no data
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	350	41				
Total number of TWTDS sending to Separate Preparers in 2004:	0					
Number of Separate Preparers:	0					
Number of operating sludge incinerators:	2					
Fluidized bed:	0					
Multiple hearth:	0					
Percent of population served by on-site (e.g. septic systems):	no data					
<b>UNITS:</b> Dry Metric Tons						

NOTES: Data in these tables were provided by EPA Region 6 and the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator - and the data are incomplete. The data represents the largest TWTDS in the state and at least 55% of the total daily flow, as reported in the 2004 CWNS data.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	22	23,391	45%	All "land applied" biosolids reported in the EPA Region 6 database was assumed to be Class B biosolids applied to agricultural land.
Disposal	12	23,485	45%	
Other	7	5,302	10%	This 5,302 dmt is actually "disposed by other method," and its final use or disposal is not known.
Total	41	52,178	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	22	23,391	45%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	0	-	0%	
Total	22	23,391	45%	
Other	7	5,302	10%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	11	23,186	44%	
Surface Disposal	1	299	1%	
Incineration	0	-	0%	
	12	23,485	45%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	0	-	0%
Other Class A	0	-	0%
Class B	22	23,391	45%
Other (no data, etc.)	19	28,787	55%
Total	41	52,178	100%

All "land applied" biosolids reported in the EPA Region 6 database was assumed to be Class B biosolids.

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...
Aerobic Digestion	62	no data
Digestion-anaer./other	15	no data
Lime/Alkaline	9	no data
Composting	0	no data
Thermal (not incineration)	0	no data
Long-term (lagoons, reed beds, etc.)	179	no data
Other	0	no data
Belt Filter Press	17	no data
Plate & Frame Press	0	no data
Screw Press	0	no data
Centrifuge	0	no data
Vaccum Filter	0	no data
Drying beds	31	no data
Other	0	no data

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **California**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? California is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion of California's environmental agency regulates biosolids and utilizes solid waste licenses / permits (for landfill disposal / alternative daily cover use) to regulate end use and disposal, along with a permit issued pursuant to the California Water Code. Land application sites are permitted by issuance of a general permit or a site specific permit, both issued pursuant to the California Water Code.

Holder of liability: California does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use; 10 – 20 land owners currently hold legal liability for biosolids end use.

More than one Class B biosolids on one site? California does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. This is being done on 10 – 20 sites.

NPDES equivalent: Waste Discharge Requirements pursuant to the California Water Code (CWC) non-chapter-15 regulatory program is the state equivalent to NPDES. All NPDES and State-issued permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 1.5 to 2

Biosolids regulations updated: July 2004.

Management practices: The management practices of California's biosolids regulations are more restrictive than the federal Part 503 rule. California rules include storage and transportation requirements, cultural resources preservation, minimum biosolids moisture content, and wind velocity at time of application. California's pathogen and/or vector attraction reduction limits are not more restrictive than Part 503. California has more restrictive pollutant (trace metals, etc.) limits. California requires additional monitoring at Class B land application sites; these requirements vary according to site-specific conditions. Often they involve quarterly monitoring for general minerals and nutrients and, less frequently, for metals. As required by site-specific conditions, nitrogen is the basis for the agronomic loading rate for land application, and California requires formal nutrient management plans. Phosphorus concentrations in biosolids generally do not control allowable biosolids application rates in California.

Additional Management Actions: California requires the following oversight and certification to occur at biosolids land application sites:

- Certification of biosolids land applicators who manage or implement land application programs.
- Other requirements or actions to control odors at land application sites.

In California, some biosolids management programs voluntarily conduct independent inspections or monitoring at land application sites.

Acres applied: In 2004, biosolids were applied to a total of 70,000 – 80,000 acres. In 2004, less than 10 new site permits/approvals were issued.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports in person from the state agency, from the EPA regional office, or – in some cases – from POTW or TWTDS web sites. The EPA Region 9 office maintains information on major facilities in the EPA Biosolids Data Management System (BDMS). The state may have some relevant data in the California Integrated Water Quality System.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In California, use/disposal is being negatively impacted by development of, or changes to, local (county, municipal) biosolids ordinances/regulations. These activities are likely to have the effect of reducing opportunities for beneficial use. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. Approximately 30 counties in California have adopted more restrictive biosolids application ordinances, and this number is likely to remain the same or increase slowly.

## TRENDS

The beneficial use of biosolids is slowly increasing in California. While it may be more difficult to land apply biosolids in certain communities or areas, land application remains one of the more attractive options for biosolids reuse. Ordinances have forced generators to evaluate and improve their residuals handling processes. All of this has been beneficial to water quality. Unfortunately, air quality may have suffered, as generators are forced to haul biosolids further and, in some cases, into neighboring states (resulting in increased fuel use and resultant air impacts). Beneficial use *in-state* may not necessarily be increasing, but regionally (i.e., CA, AZ, and NV), it is increasing. The quality of biosolids continues to improve.

### Most significant current pressures on biosolids recycling:

1. Absence of resources needed to fully implement a regulatory program, which results in a backlog of permit requests and threatens to compromise enforcement and compliance efforts.
2. Restrictive local ordinances and subsequent pending legal decisions, which delay or prohibit authorizations to utilize biosolids.

## SEPTAGE MANAGEMENT

Septage regulations updated: Separate septage management regulations do not exist; however, septage is regulated pursuant to the California Water Code.

Number of full-time equivalent staff (FTEs) for septage program: 0 at the state level.

Septage haulers based in state (estimated): “Agencies reported 785 registered septage pumbers with 1,699 vehicles. This number does represent some duplication as the same hauler and vehicle may be registered in more than one jurisdiction” (California Wastewater Training and Research Center, California State University, Chico; 2002).

Septage management: Septage can be land applied if it meets part 503 and additional state requirements pursuant to the plans and policies of the California Water Boards (e.g., California Water Code, California Code of Regulations, Basin Plans, etc.). Statewide standards require that septage that is land applied must...

- “not allow public contact
- “meet and certify pathogen reduction and vector attraction reduction
- “follow prescribed best management practices

- “utilize site and crop specific nutrient application rates
- “assure domestic nature of the applied material, and
- “develop and maintain a record keeping system”

(California Wastewater Training and Research Center, California State University, Chico; 2002). POTWs are not required to accept septage; however, three-quarters of POTWs in California do.

Percentage of each management practice:

- Land applied = 2 %
- Hauled to TWTDS = 84 %
- Disposed of in lagoons = 11%
- Independent special treatment systems = 2 %

Total volume is estimated to be 230 million gallons/year of septage from approximately 1.2 million septic systems in the state; in addition, there is another 5 million gallons/year of grease waste. Note that an estimated 10% of new housing is relying on septic systems.

Other concerns: California considers fats, oils, and grease (FOG) to be a significant issue (FOGs play a significant part in the sanitary sewer overflow prevention program). The use and disposal of grease trap waste is also subject to the California Water Code. California has a proactive program to collect FOG and keep it out of the general wastewater flow. FOG is addressed via pretreatment programs, permits issued by local TWTDS, and the sanitary sewer overflow prevention program.

## ADDITIONAL RESOURCES

- <http://www.ciwmb.ca.gov/Organics/Biosolids>
- An excellent, but becoming-outdated, picture of biosolids use and disposal in California is the California Association of Sanitation Agencies' 1999 *Biosolids Management Practices Survey in the State of California*.
- Septage information from California Wastewater Training and Research Center, California State University, Chico; 2002. *Survey of Septage Treatment, Handling, and Disposal Practices in California*. Retrieved 2/14/07 from [http://www.waterboards.ca.gov/ab885/docs/septage\\_survey\\_rpt2002.pdf](http://www.waterboards.ca.gov/ab885/docs/septage_survey_rpt2002.pdf).

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: California

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	Yes	Yes	Yes	-	-
Other metals (boron, silver...)	-	-	-	-	-
Dioxins/furans	-	-	-	-	-
PCBs	Yes	Yes	-	Yes	-
Priority pollutants	-	-	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	-	-	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)			-	-	If expected in collection system monitoring is required for all sewage sludge and those beneficially used
Nutrients (NPK)	Yes	Yes	Yes	Yes	-
Pathogen reduction (Class A or B)			-	-	Analytical work may not be required, but must be consistent w/503 Rule
Vector attraction reduction (VAR)			-	-	Analytical work may not be required, but must be consistent with 503 Rule

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	Yes	Often monthly/WDRs for site	Paper	No	-
Part 503 metals	Yes	Yes	-	Paper	No	-
Other metals	Yes	-	-	Paper	No	-
Dioxins/furans	-	-	-	-	No	-
PCBs	Yes	-	-	Paper	No	-
Priority pollutants	-	-	-	-	No	-
Other organic compounds	Yes	-	-	Paper	No	-
Radioactive isotopes	-	-	-	-	No	-
Nutrients (N, P, K)	Yes	Yes	-	Paper	No	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	Paper	No	-
How biosolids achieve Class A or B	Yes	Yes	-	Paper	No	-
How biosolids achieve Vector Attraction	Yes	-	-	Paper	No	-
Solids stabilization processes used	-	-	-	-	No	-
Other biosolids treatments	-	-	-	-	No	-
End use/disposal practice	Yes	-	-	Paper	No	-

## California

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
35,842,038	155,959	230	10,994,161	61,810	0.065	2.2%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	715,500	<b>715,500</b>		858,962	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	700,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	633	87				
Total number of TWTDS sending to Separate Preparers in 2004:	69					
Number of Separate Preparers:	15					
Number of operating sludge incinerators:	2					
Fluidized bed:	0					
Multiple hearth:	2					
Percent of population served by on-site (e.g. septic systems):	10%					
<b>UNITS:</b> Dry Metric Tons						

**Estimates from other sources:**  
 Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)  
 858,962

Dry tons, reported to BioCycle Survey  
(Goldstein, 2000)

700,000

NOTES: The data in these tables is from EPA Region 9, which tracks data for 270 major and minor TWTDS and separate preparers. Data for the many small facilities is not available.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	178	499,000	70%	
Disposal	73	206,500	29%	
Other	14	10,000	1%	
Total	87	<b>715,500</b>	100.00%	

#### Beneficial Use

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	98	499,000	70%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	11	part of above	0%	
Total	0	499,000	70%	
Long-term storage	14	10,000	1%	

#### Disposal

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	65	163,000	23%	
Surface Disposal	6	18,400	3%	
Incineration	2	25,100	4%	
	73	206,500	29%	

#### Notes:

Amounts landfilled are estimated by EPA Region 9, because those TWTDS disposing of biosolids do not have to file annual data. Includes 73,000 dmt of San Jose, Heyward, and other Class A biosolids that were used as alternative daily or final cover on landfills.

Includes 5,000 dmt used in a cement kiln. Palo Alto incinerates its solids; some of the resulting ash is used as fertilizer.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	0	433,800	61%
Other Class A	0	-	0%
Class B	0	198,200	28%
Other (no data, etc.)	0	83,500	12%
Total	0	715,500	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...
Aerobic Digestion	25	4,000
Digestion-anaer./other	160	650,000
Lime/Alkaline	4	44,000
Composting	0	226,400
Thermal (not incineration)	0	-
Long-term (lagoons, reed beds, etc.)	6	-
Other	0	-
Belt Filter Press	205	160,000
Plate & Frame Press	4	12,000
Screw Press	2	3,000
Centrifuge	35	344,000
Vaccum Filter	0	-
Drying beds	80	305,038
Other	0	-

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Colorado**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Colorado is planning to seek delegation from USEPA sometime in the future, when resources allow.

State agency regulating biosolids: The water/ wastewater program and the solid waste program of Colorado's environment agency regulate biosolids. The water/wastewater program regulates land application, while the solid waste program regulates surface disposal and disposal at MSW facilities. Colorado utilizes general NPDES-type permits to regulate end use and disposal. Land application sites are permitted by the state using separate, site-specific permits. EPA Region 8 issues biosolids general permits.

Holder of liability: Colorado does allow land applicators (who may not be the TWTDS generator) to become the holder of legal liability for biosolids end use. For example, there are two major land application companies in Colorado that are permitted by the state to land apply biosolids on specific sites (some such sites are actually owned by the land application company).

More than one Class B biosolids on one site? Colorado does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. This is actually being done, but the number of instances is not readily-available data.

NPDES equivalent: There is no state equivalent to NPDES in Colorado. EPA issues 503 NPDES permits.

Number of full-time equivalent staff (FTEs) for biosolids program: 1

Biosolids regulations updated: June 30, 2003

Management practices: The management practices of Colorado's biosolids regulations are more restrictive than the federal Part 503 rule. The state rules include setback requirements for surface waters and public and private wells, public access restrictions, slope restrictions, depth to groundwater, soil conditions, winter prohibition, and nutrient restrictions. Colorado's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are the same as Part 503. Colorado requires additional monitoring at Class B land application sites, with soil tests required prior to the initial application and on a once-per-application basis thereafter; testing is for pH, ammonium as N, nitrate as N, and total phosphorus. Also, Colorado requires testing of soil for all of the Part 503 metals prior to the initial application and once every five years thereafter. Nitrogen is the basis for the agronomic loading rate for land application, including soil N. Colorado does not require formal nutrient management plans, however the state does receive operation plans that contain nutrient information, and contractors use standard operating procedures that include some nutrient management information. Colorado uses tests of total P in the soil, tests of available P in the soil, and a P index to manage or control the application of phosphorus in biosolids. Also, in CO, groundwater is a "water of the state," so that creates additional restrictions: for some biosolids land application, 5 feet (the depth of the principal root zone) is required from the surface to groundwater.

Additional Management Actions: In Colorado, land application sites are inspected regularly by both state and, in some counties, trained county inspectors. Participating counties receive funding for these state-trained inspectors. For example, Weld County conducts 200 inspections

each year. The program land applying New York City biosolids to rangeland in eastern Colorado is inspected twice each week, and reports from inspections are emailed immediately to EPA Region 8 and the state.

Acres applied: In 2004, approximately 111,000 dry tons of biosolids (78,500 generated in state; 27,175 from NYC (Class B cake); and 5,500 from New England Fertilizer Company (Class A pellets)) were applied to an estimated total of 225,000 acres (this does not include Class A biosolids distributed for general public use). The number of new site permits/approvals that were issued in 2004 is not known. In 2006, there is a cumulative total of about 2000 sites permitted for biosolids land application in Colorado, but most are old and out-of-service and may have been converted to other land uses (e.g. development). Approximately 200 sites are actually used at least once during any three-year period (most of these are hundreds or thousands of acres in size).

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. Colorado provides access to this information by request (it is not yet available on the state website). Some data and reports are compiled electronically with BDMS (the Region 8 EPA-developed Biosolids Data Management System).

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Colorado, some revisions to the state regulations were completed in early 2007; these changes are not expected to have any significant impacts on the use or disposal of sewage sludge in the state. The biggest change will be codification of a formula to calculate plant-available nitrogen (PAN); otherwise there will be some new administrative procedures for de-permitting (closing) sites.

Half a dozen counties in Colorado have ordinances that mimic state regulations (are not too different from Part 503). No municipalities have such ordinances (except, for example, Denver, which gives a rebate to homeowners who use any kind of compost – including biosolids - on their lawns), and it is not likely that county or local regulation will increase. However, the county involvement in inspections may increase, as the state is encouraging more counties to participate in their innovative program that provides counties training and funding to conduct inspections of biosolids land application sites and events.

## TRENDS

Beneficial use of biosolids in Colorado has been high for several years: 70% or greater of sewage sludge produced in the state. Colorado is also a significant importer of biosolids products, with 31,000 dry tons from New York City and 3,600 dry tons from New England Fertilizer Company in 2004; the amounts imported are increasing each year, resulting in an increase in the total tonnage of land applied biosolids increasing at an estimated 8% per year.

Most significant current pressures on biosolids recycling: none identified.

## TESTING AND REPORTING

Colorado mostly follows the federal Part 503 for its testing and reporting requirements. Biosolids applied to soils must be tested (and reports submitted), in accordance with the frequencies and other requirements of Part 503, for Part 503 metals and nutrients, and they must meet pathogen and vector attraction reduction requirements. Colorado requires composters and others that add amendments to biosolids to use final production quantities to calculate the frequency of testing.

Landfilled biosolids are required to undergo TCLP and paint-filter tests.

## **SEPTAGE MANAGEMENT**

Information on septage management in Colorado is difficult to obtain. State involvement is limited, and only some counties have formal regulatory programs. These county requirements were created in response to poor management of some septage land application programs. Such county regulations essentially mimic the requirements of the federal Part 503 rule, which is the only formal regulation that applies to land application of septage for most of the state.

### **Additional information provided:**

<http://www.cdphe.state.co.us/wq/PermitsUnit/biosolids/>

## Colorado

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
4,601,821	103,717	44	11,530,700	22,240	0.009	0.3%
<b>Total Biosolids Generated in 2004*:</b>	From State Survey Q24	<b>Adjusted Estimate</b>				
	102,912	<b>103,000</b>				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS	From Survey Q24				
	315	200				
Total number of TWTDS sending to Separate Preparers in 2004:		no data				
Number of Separate Preparers:		no data				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		25%				
<b>UNITS:</b>	<b>Dry Metric Tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

87,642 85,000

NOTES: The data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator and EPA Region 8.

Colorado produces 100 billion liters septage at 600,000 onsite systems (Siegrist, RL).

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	164	78,500	76%	
Disposal	35	14,109	14%	
Other	1	10,303	10%	
Total	200	102,912	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	144	64,309	62%	
Forestland	6	3,647	4%	
Reclamation	6	6,273	6%	
Class A EQ Distribution	8	4,271	4%	
Total	164	78,500	76%	
Long-term storage	1	10,303	10%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	33	9,860	10%	
Surface Disposal	2	4,249	4%	
Incineration	0	-	0%	
	35	14,109	14%	

#### NOTES:

These amounts of beneficially used biosolids do not include imported biosolids; for example, about 27,175 dry metric tons from New York City and 5,500 dmt from New England Fertilizer Co. were land applied in Colorado in 2004.

Colorado Springs typically surface disposes of 11,500 dry metric tons annually; in 2004, most went to storage in their facultative stabilization basins - this is what the 10,303 dmt in storage refers to.

#### NOTES:

Colorado Springs (4,164 dry metric tons) and Snowmass.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	0	4,271	4%	The quantities here are estimated from the use and disposal numbers in the table above; the amounts of Class A and Class B are based on a state coordinator estimate that 20% were Class A (5% ATAD systems, 10% composting, and 5% air drying with demonstration of Class A by testing).
Other Class A	0	11,429	11%	
Class B	0	62,800	61%	
Other (no data, etc.)	0	24,412	24%	
Total	0	102,912	100%	

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	109	16,507	
Digestion-anaer./other	33	67,341	
Lime/Alkaline	3	84	
Composting	22	10,588	
Thermal (not incineration)	0	-	
Long-term (lagoons, reed beds, etc.)	6	-	
Other	0	-	
Belt Filter Press	20	7,894	
Plate & Frame Press	0	-	
Screw Press	0	-	
Centrifuge	29	53,707	
Vaccum Filter	1	-	
Drying beds	29	-	
Other	0	-	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Connecticut**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Connecticut is not planning to seek delegation from EPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion, along with the air division of Connecticut's environmental agency, regulates biosolids and utilizes specific NPDES type permits to regulate end use and disposal. The air division regulates emissions from incinerators, and water/wastewater regulates all other. There are no land application sites in Connecticut.

Holder of liability: Connecticut does not have any land application programs.

More than one Class B biosolids on one site? There are no land application sites in Connecticut.

NPDES equivalent: The surface water discharge permit and enforcement program is the state equivalent to NPDES. All surface water discharge permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.1

Biosolids regulations updated: Connecticut does not have any sewage sludge management regulations. Connecticut relies solely on the 503 regulations. Almost all of the wastewater solids produced in CT are incinerated.

Management practices: CT has no formal state biosolids regulations; no land application occurs, and there is only a little composting; the resulting compost is not generally accepted in CT and is sent out of state.

Additional Management Actions: Not applicable.

Acres applied: Not applicable.

Reporting and Record-keeping: Few, if any, TWTDS are required to report biosolids information and data, as almost all incinerate their wastewater solids.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Connecticut, no legislative or regulation activity is happening or imminent that will impact beneficial use. No towns or counties in Connecticut have adopted more restrictive biosolids application ordinances. Local ordinances are not a problem in Connecticut, because there is no land application.

### **TRENDS**

The beneficial use of biosolids is not increasing in Connecticut. For decades, 95% or more of the solids in the state have been incinerated and this trend is expected to continue for the foreseeable future.

Most significant current pressures on biosolids recycling:

1. Traditional disposal by incineration is prevalent and it is hard to change that practice.
2. The state has not developed regulations that permit beneficial uses.

**TESTING AND REPORTING** is in accordance with Part 503.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: Connecticut has no septage management regulations; the state relies on the 503 rule.

Number of full-time equivalent staff (FTEs) for septage program: data not reported

Septage haulers based in state (estimated): data not reported

Septage management: Septage can not be land applied. POTWs are not required to accept septage, but some do. Some septage is disposed at the state's incinerators.

Percentage of each management practice (estimated):

- Hauled to TWTDS = 70%.
- Incineration = 30%

Other concerns: Connecticut considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls mostly under local regulations. However, Connecticut has a proactive program to ensure that FOG is collected and kept out of the general wastewater flow. Connecticut's Department of Environmental Protection has a progressive program that provides towns with incentives and support to establish tough monitoring and enforcement of grease trap cleanouts and proper management of FOG.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Connecticut

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	Yes	Yes	X		
Other metals (boron, silver...)					
Dioxins/furans					
PCBs					
Priority pollutants					
Other organic compounds (e.g. PDBEs, pharmaceuticals)					
Radioactive isotopes (alpha, beta, Ra 224, etc.)					
Nutrients (NPK)	Yes	Yes	X		
Pathogen reduction (Class A or B)					
Vector attraction reduction (VAR)					

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed						
Part 503 metals	Yes	X				
Other metals						
Dioxins/furans						
PCBs						
Priority pollutants						
Other organic compounds						
Radioactive isotopes						
Nutrients (N, P, K)						
Cumulative Pollutant Loading Rates						
How biosolids achieve Class A or B						
How biosolids achieve Vector Attraction						
Solids stabilization processes used						
Other biosolids treatments						
End use/disposal practice						

## Connecticut

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
3,498,966	4,844	722	170,673	3,395	0.586	19.5%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	118,000	99,000				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS	From Survey Q24				
	94	89				
Total number of TWTDS sending to Separate Preparers in 2004:	96					
Number of Separate Preparers:	4					
Number of operating sludge incinerators:	6					
Fluidized bed:	3					
Multiple hearth:	3					
Percent of population served by on-site (e.g. septic systems):	no data					
<b>UNITS:</b>	<b>Dry U. S. Tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

79,603 84,000

NOTES: All reported quantities of wastewater solids in these tables are estimates developed by CT DEP by 1) multiplying (for each plant and for the state total) TWTDS permitted design flows by .71 (the estimated average proportion in the state of actual flows to design flows); 2) multiplying the result by 365 days to determine total actual flow per year; 3) multiplying the result by 200 (representing the solids generated per gallon) and multiplying again by 8.34 pounds/gallon to estimate pounds of dry solids produced; 4) dividing the result by 2000 pounds/tons to find the dry U. S. tons. The "Adjusted Estimate" is an average of this total and the total from the EPA biosolids generation factor method. The 4 separate preparers are four of the six wastewater solids incinerators that dispose of almost all wastewater solids in Connecticut.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	2	2,000	2%	
Disposal	87	116,000	98%	
Other	0	-	0%	
<b>Total</b>	<b>89</b>	<b>118,000</b>	<b>100.00%</b>	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	0	-	0%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	2	2,000	2%	
<b>Total</b>	<b>2</b>	<b>2,000</b>	<b>2%</b>	Fairfield, Farmington, and sometimes Southbury composted biosolids; the resulting compost was exported to other states.
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	7	5,000	4%	
Surface Disposal	0	-	0%	
Incineration	80	111,000	94%	
	87	116,000	98%	NOTES:  Large incinerators at Hartford, Middletown District (Cromwell), Naugatuck, New Haven, Waterbury, and West Haven dispose of almost all CT's wastewater solids and have for decades (the last four are privately operated). All but New Haven and W. Haven accept solids from other TWTDS. Some CT solids are incinerated at Woonsocket, RI.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	2	2,000	2%
Other Class A	0	-	0%
Class B	0	-	0%
Other (no data, etc.)	109	116,000	98%
Total	113	118,000	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	no data	no data	
Digestion-anaer./other	no data	no data	
Lime/Alkaline	no data	no data	
Composting	no data	no data	
Thermal (not incineration)	no data	no data	
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Delaware**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Delaware is planning to seek delegation from USEPA sometime in the future, when resources allow.

State agency regulating biosolids: The water/wastewater portion of Delaware's environmental agency regulates biosolids and utilizes specific NPDES type permits to regulate end use and disposal and land application sites.

Holder of liability: Delaware does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. There are 3 land applicators or land owners that hold legal liability.

More than one Class B biosolids on one site? Delaware does not allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year.

NPDES equivalent: Delaware essentially follows the NPDES permit system. All NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 1

Biosolids regulations updated: October 1999.

Management practices: The management practices of Delaware's biosolids regulations are more restrictive than the federal Part 503 rule. Delaware continues to use the 40 CFR part 257 A "land treatment unit" concept. Delaware's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive than Part 503. Delaware requires additional monitoring at Class B land application sites, with site specific soil testing and groundwater testing. Nitrogen is the basis for the agronomic loading rate for land application. Delaware does require formal nutrient management plans. Delaware, as of January 1, 2007, uses site limitations, increased distance to surface water, total P in soil, available P in soil, a P index, and slope to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Delaware requires the following oversight and certification to occur at biosolids land application sites:

- Independent inspections or monitoring
- Certification of biosolids land applicators who manage or implement land application programs
- Other requirements or actions to control odors at land application sites
- Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing

In Delaware, biosolids management programs do not perform any additional oversight and certification voluntarily.

Acres applied: In 2004, biosolids were applied to a total of 4224 acres. In 2004, no new site permits/approvals were issued.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by Freedom Of Information Act (FOIA) requests of the state agency. The data and

reports are compiled electronically with the EPA developed Biosolids Data Management System (BDMS).

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Delaware, phosphorus-based nutrient management plans will be enacted on January 1, 2007. This will likely reduce beneficial use for liquid Class B biosolids. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. There are ordinances for conditional zoning for liquid Class B land application. Three counties in Delaware have adopted more restrictive biosolids application ordinances. Overall, the number of more restrictive ordinances is remaining the same.

## **TRENDS**

The beneficial use of biosolids is not increasing in Delaware. Beneficial use is remaining about the same, with horticultural uses replacing lost agricultural uses.

Most significant current pressures on biosolids recycling:

1. Over-development and subsequent loss of agricultural land.
2. Competition for remaining agricultural land with manure generators.
3. P-based nutrient management.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: 1988.

Number of full-time equivalent staff (FTEs) for septage program: 1

Septage haulers based in state (estimated): 50

Septage management: Septage can be land applied if it meets Part 503 and the following additional requirements: it must meet the same metals, pathogen, and vector requirements as Class B biosolids. POTWs are not required to accept septage. Approximately 7 POTWs accept septage.

Percentage of each management practice:

- Land applied = 20 %
- Hauled to TWTDS = 80 %

Other concerns: Delaware considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the land treatment regulations derived from 40 CFR part 257A. Delaware does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## **ADDITIONAL NOTES**

See <http://www.dnrec.delaware.gov/>

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Delaware

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	Yes	Yes	Yes	-	-
Other metals (boron, silver...)	Yes	Yes	-	Plant micronutrients: SAR	-
Dioxins/furans	No	-	-	-	-
PCBs	Yes	Yes	Yes	-	-
Priority pollutants	Yes	Yes	Yes	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	-	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	-	-	-	-
Nutrients (NPK)	Yes	Yes	Yes	Also Nutrient Management	-
Pathogen reduction (Class A or B)	Yes	Yes	Yes	-	-
Vector attraction reduction (VAR)	Yes	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	Yes	-	Electronic	No	-
Part 503 metals	Yes	Yes	-	Electronic	No	-
Other metals	Yes	-	-	Electronic	No	-
Dioxins/furans	-	-	-	-	-	-
PCBs	Yes	Yes	-	Electronic	No	-
Priority pollutants	Yes	Yes	-	Electronic	No	-
Other organic compounds	-	-	-	-	-	-
Radioactive isotopes	-	-	-	-	-	-
Nutrients (N, P, K)	Yes	Yes	-	Electronic	No	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	Electronic	No	-
How biosolids achieve Class A or B	Yes	Yes	-	Electronic	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Electronic	No	-
Solids stabilization processes used	Yes	Yes	-	Electronic	No	-
Other biosolids treatments	Yes	Yes	-	Electronic	No	-
End use/disposal practice	Yes	Yes	-	Electronic	No	-

## Delaware

	Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~3 dry ton/ac)
	830,069	1,953	425	457,201	1,826	0.046	2%
<b>Total Biosolids Generated in 2004*:</b>							
		From State Survey Q24	<b>Adjusted Estimate</b>				
		21,000	<b>21,000</b>				
<b>Total Number of TWTDS in 2004**:</b>							
		From CWNS	From Survey Q24				
		19	6				
Total number of TWTDS sending to Separate Preparers in 2004:			0				
Number of Separate Preparers:			0				
Number of operating sludge incinerators:			0				
Fluidized bed:			0				
Multiple hearth:			0				
Percent of population served by on-site (e.g. septic systems):			30%				
<b>UNITS:</b> Dry Metric Tons							

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

21,198 21,000

NOTES: Data in these tables are from National Biosolids Use & Disposal Survey completed by state biosolids coordinator.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	6	21,000	100%	
Disposal	0	-	0%	
Other	0	-	0%	
Total	6	21,000	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	3	8,500	40%	Applications of biosolids to agricultural lands include Class A (advanced lime treated) biosolids. The reclamation number is from Wilmington (biggest WWTF in DE), using biosolids mixed with coal ash for a vegetative layer on a landfill cap.
Forestland	1	1,000	5%	
Reclamation	1	10,000	48%	
Class A EQ Distribution	1	1,500	7%	This represents one facility that produced compost.
Total	6	21,000	100%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	0	-	0%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
	0	-	0%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	6	21,000	100%	Includes compost and advanced lime treatment.
Other Class A	0	-	0%	
Class B	0	-	0%	
Other (no data, etc.)	0	-	0%	
Total	6	21,000	100%	

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		
Aerobic Digestion	6	no data		
Digestion-anaer./other	0	no data		
Lime/Alkaline	1	no data		
Composting	1	no data		
Thermal (not incineration)	0	no data		
Long-term (lagoons, reed beds, etc.)	2	no data		
Other	0	no data		
Belt Filter Press	7	no data		
Plate & Frame Press	0	no data		
Screw Press	0	no data		
Centrifuge	0	no data		
Vaccum Filter	0	no data		
Drying beds	3	no data		
Other	0	no data		

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

## District of Columbia

	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
Estimated population	554,239	61	9,086	-	-	not applicable
						not applicable
<b>Total Biosolids Used or Disposed in 2004*:</b>	From State Survey Q24	<b>Adjusted Estimate</b>				
	480,850	480,850				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS		From Survey Q24			
	1		3			
Total number of TWTDS sending to Separate Preparers in 2004:			0			
Number of Separate Preparers:			0			
Number of operating sludge incinerators:			0			
Fluidized bed:			0			
Multiple hearth:			0			
Percent of population served by on-site (e.g. septic systems):			1%			
UNITS:	<b>Wet U. S. Tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

76,220 no data

NOTES: Data in these tables are from the District of Columbia Water and Sewer Authority (DC WASA). Note that units are wet U. S. tons. With the average solids for 2004 estimated to be 22%, this equates to 105,800 dry U. S. tons of biosolids applied to farmlands, forestry, and marginal lands in need of topsoil (reclaimed lands) - mostly in Maryland and Virginia.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	3	480,850	100%	
Disposal	0	-	0%	
Other	0	-	0%	
Total	3	480,850	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	1	440,420	92%	
Forestland	1	36,161	8%	
Reclamation	1	4,269	1%	
Class A EQ Distribution	0	-	0%	
Total	3	480,850	100%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	0	-	0%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
	0	-	0%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	0	-	0%
Other Class A	0	-	0%
Class B	1	480,850	100%
Other (no data, etc.)	0	-	0%
Total	1	480,850	100%

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	0	-	
Digestion-anaer./other	0	-	
Lime/Alkaline	1	480,850	
Composting	0	-	
Thermal (not incineration)	0	-	
Long-term (lagoons, reed beds, etc.)	1	-	
Other	0	-	
Belt Filter Press	0	-	
Plate & Frame Press	0	-	
Screw Press	0	-	
Centrifuge	1	480,850	
Vacuum Filter	0	-	
Drying beds	0	-	
Other	0	-	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Florida**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Florida is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water / wastewater portion of Florida's environmental agency, Florida Department of Environmental Protection (FL DEP), regulates biosolids and NPDES permits are used to regulate end use and disposal. The state does not issue separate permits for land application sites; rather, generators of biosolids include site details in their NPDES permit application and the sites are incorporated into that permit. An imminent revision to the FL DEP regulations will include a new "site registration" program.

Holder of liability: Florida mostly does not allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use, but there has been some partial transfer of liability to the land applicator in some cases.

More than one Class B biosolids on one site? Florida does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, and this is being done on approximately 230 sites.

NPDES equivalent: Florida has a wastewater facility permitting program that is the state equivalent to NPDES; these permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: Florida DEP has two budgeted FTE's dedicated to the biosolids program in its central office in Tallahassee.

However, permit writers and inspectors in each of the six regional districts devote some time to biosolids, but this time is not tracked, although it is estimated to be equivalent to another 7.5 FTEs for a total of 9.5 FTEs statewide.

Biosolids regulations updated: March 1998. Florida DEP biosolids regulations are currently being updated; they should be complete by the end of 2007.

Management practices: The management practices of Florida's biosolids regulations are more restrictive than the federal Part 503 rule. These rules include increased and additional setbacks especially to surface waters, buildings, water wells, and sinkholes; 12-month restricted public access to all Class B application sites; slope limitations; groundwater level limitations; signage requirements; and phosphorus restrictions in certain parts of the state. Florida's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive. Florida does not require additional monitoring at Class B land application sites, but additional requirements are in the proposed draft rule. Nitrogen and phosphorus are the basis for the agronomic loading rate for land application. Phosphorus is currently the basis in four areas of the state, but both nitrogen and phosphorus are in the proposed rule. Florida does not require formal nutrient management plans (NMP); currently Florida has formal agricultural use plans that act like NMPs, but are not technically NRCS-approved NMPs. Formal NMPs are in the proposed draft rule. Florida uses tests of available P in soil to manage or control the application of phosphorus in biosolids in four areas of the state.

Additional Management Actions: Florida requires the following:

- Other requirements or actions to control odors at land application sites. There is a basic “no nuisance odors” provision in the rules, but it is difficult to enforce.
- Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing. This is not yet required, but is being proposed in the draft rules.

In Florida, no biosolids management groups are known to perform any additional oversight and certification voluntarily. However, there are five biosolids management programs in the state that have joined the National Biosolids Partnership Environmental Management System program.

Acres applied: The number of acres to which biosolids were applied and the number of new permits in 2004 cannot be readily determined, as only paper records contain this information.

Reporting and Record-keeping: Both major and minor TWTDS, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency and the state web site. The data and reports are compiled electronically using the state’s Oracle database. Note that the information reported is limited and not in a form that is readily available or easily compiled.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Florida, use/disposal is being impacted by development of, or changes to, state biosolids regulations, and local (county, municipal) biosolids ordinances/regulations. These activities are likely to have the effect of reducing beneficial use. Another impact on biosolids use is the Governor’s initiative to improve Lake Okeechobee, St. Lucie Estuary, and Caloosahatchee Estuary. This initiative includes goals to eliminate all land-applied biosolids from those watersheds by 2011. However, since the initiative was unveiled, there have been no legislation or other necessary actions toward this goal. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law and 20 – 25 counties in Florida have adopted more restrictive biosolids application ordinances. Overall the number of more restrictive ordinances is increasing.

## TRENDS

The volume of beneficially used biosolids is increasing in Florida, because of population increases. However, the percentages of use and disposal methods are remaining fairly constant.

### Most significant current pressures on biosolids recycling:

1. Truck traffic, odors, and other nuisance issues
2. Public perception / County ordinances
3. Development, growth, and loss of farms and remote areas
4. Nutrient issues, TMDLs - primarily phosphorus, but also nitrogen and fecal pathogens

## SEPTAGE MANAGEMENT

The Florida Department of Health (DOH) is the lead agency dealing with septage and onsite systems. However, when a septage hauler manages more than 20,000 gallons in a single day or more than 10,000 gallons as a daily average, then a FL DEP permit, similar to a NPDES permit, is required and regulatory responsibility lies with FL DEP.

Septage regulations updated: May 24, 2004.

Number of full-time equivalent staff (FTEs) for septage program: There are 67 County Health Departments, which are regional offices of DOH; in these offices there are 300 people who work on on-site system permitting, installation, maintenance, etc.; part of their responsibility is inspecting septage land application sites.

Septage haulers based in state (estimated): There are 454 DOH regulated septic haulers.

Septage management: Septage can be land applied if it meets Part 503 requirements and has been stabilized with lime for 2 hours. In addition, there are setbacks and field condition requirements that must be met that are more stringent than Part 503; these are found in the state on-site regulations. POTWs are not required to accept septage, but there are many that do.

Percentage of each management practice: 50% goes to wastewater treatment facilities (i.e. POTWs), 45% is land applied, 5% is landfilled after dewatering (usually from regional facilities that handle large volumes and are permitted by FL DEP). There are 119 DOH-regulated septic facilities that screen and lime-treat septage; most are located at land application sites; a few are regional facilities that take from several haulers, but most of them are single hauler systems. Most land-applied septage is put on pastureland and some on hay crops.

Other concerns: Florida does consider fats, oils, and grease (FOG) to be a significant issue. FOG becomes regulated when mixed with septage or biosolids, but separated FOG by itself is not regulated. It can be taken to POTWs or septic management facilities. Sometimes it is blended with septage and land applied. Many local wastewater treatment facilities keep FOG from causing issues at the facility by addressing it in pretreatment programs. Florida has few issues with illegal FOG disposal – it has not been a big problem, so there is no special state program for it.

#### **ADDITIONAL NOTES**

<http://www.dep.state.fl.us/water/wastewater/dom/reshome.htm>

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Florida

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	EQ monthly	-
Other metals (boron, silver...)	-	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	Yes	EQ monthly	-
Pathogen reduction (Class A or B)	No	Yes	Yes	EQ monthly	-
Vector attraction reduction (VAR)	No	Yes	Yes	EQ monthly	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements		Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	Partial	-	-	Both	No	*Yes for EQ which is done electronically
Part 503 metals	Yes	Yes	-	Both	No	*Yes for EQ
Other metals	No	-	-	-	-	Attached are the following
Dioxins/furans	No	-	-	-	-	report(s) or summary(ies) or
PCBs	No	-	-	-	-	they are available at the
Priority pollutants	No	-	-	-	-	following web address:
Other organic compounds	No	-	-	-	-	<a href="http://www.dep.state.fl.us/water/wastewater/dom/docs/2004AA.pdf">http://www.dep.state.fl.us/water/wastewater/dom/docs/2004AA.pdf</a>
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	Yes	-	Both	-	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	Both	-	-
How biosolids achieve Class A or B	Permit	-	-	Both	-	-
How biosolids achieve Vector Attraction	Permit	-	-	Both	-	-
Solids stabilization processes used	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	Permit	-	-	Both	-	-

## Florida

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
17,385,430	53,926	322	3,715,257	27,348	0.081	2.7%
<b>Total Biosolids Generated in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
	300,000	<b>300,000</b>			294,291	270,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	322	1220				
Total number of TWTDS sending to Separate Preparers in 2004:						
		900				
Number of Separate Preparers:						
		34				
Number of operating sludge incinerators:						
		0				
Fluidized bed:						
		0				
Multiple hearth:						
		0				
Percent of population served by on-site (e.g. septic systems):						
		no data				
UNITS: <b>Dry U.S. Tons</b>						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

294,291 270,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator and are estimated by knowledgeable staff of the Florida DEP, based on a late 1980s survey, with tracking of changes and updates since that time. The total number of TWTDS includes many small package plants. There are approximately 380 facilities that are greater than 0.5 MGD; these account for >90% of all sewage sludge produced in Florida. Miami, Florida's largest city, utilizes a diversity of biosolids management options: much goes to agricultural land application , some to compost, and some to landfills.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:  These percentages are estimates and include only sewage sludge and biosolids generated in Florida. An additional 80,000 - 100,000 dry U. S. tons of Class A pelletized biosolids are imported into Florida each year (e.g. from New England Fertilizer Co. (Boston), Ocean County NJ, New York Organic Fertilizer Co. (NY City), two Baltimore pelletizing facilities, a facility in GA, and Milwaukee WI (Milorganite)).
Beneficial Use	1220	249,000	83%	
Disposal	0	51,000	17%	
Other	0	-	0%	
Total	1220	<b>300,000</b>	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES: FL DEP estimated in 1997 that half of the state's facilities run local land application programs. Almost all of these biosolids are surface applied to hay crops and pasture land, mostly in liquid form (although there are an increasing number of facilities that dewater biosolids because hauling distances to farms is increasing). Some biosolids applied to agricultural land is applied to citrus crops. Applications can occur any time of year, and usually no storage is needed. Farmers use the biosolids as a free nutrient supplement to increase crop yield. Many programs are managed by private companies, and applications of biosolids from different TWTDS to one site are common. Land application is preferred by most, because landfills that will take biosolids are few and far between, making the costs of hauling and disposing relatively high.
Agricultural	1200	198,000	66%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	20	51,000	17%	
Total	1220	249,000	83%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:  There are no operating wastewater solids incinerators in Florida.
MSW landfill (incl dly cvr)	no data	51,000	17%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
		<b>51,000</b>	17%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	24	107,000	36%	
Other Class A	0	-	0%	
Class B	1176	163,000	54%	
Other (no data, etc.)	1200	30,000	10%	
Total	2400	300,000	100%	The quantity of Class A EQ biosolids reported here is final product mass, not wastewater solids input to the process. Approximately 20 facilities produce Class A EQ ("AA") via ATADs, RDP, N-Viro, BioSet, pelletizing (e.g. Tampa - some heat-dried pellets go to fertilizer blenders; much goes to agricultural land), heat drying, composting (e.g. Palm Beach County), etc. Most of these Class A EQ products are distributed in bulk to farmers.

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	a majority	no data	This is estimated to be the most common stabilization practice in Florida.
Digestion-anaer./other	several	no data	Only some cities (larger TWTDS) have anaerobic digestion.
Lime/Alkaline	600	no data	Maybe half of programs that land apply use lime treatment to meet Class B standards.
Composting	4	no data	Major composters are Miami, Palm Beach, Sarasota, Reedy Creek (Disneyworld).
Thermal (not incineration)	7	no data	There are an estimated 5 pelletizers and 2 Dragon dryers.
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vacuum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Georgia**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Georgia is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The Watershed Protection and Land Protection branches of the Georgia Environmental Protection Division (EPD) regulate biosolids management, disposal, and end use, while the Georgia Department of Human Resources regulates the management and disposal of septage. Watershed Protection regulates sludge produced, treated, and disposed of by POTWs under NPDES or Land Application System (LAS) permits. The Land Protection Branch regulates biosolids treatment, disposal, and processing facilities operated by third party preparers under Solid Waste Handling Permits. The approval of sites for biosolids land application is also done under existing permits (NPDES, LAS, or Solid Waste).

Holder of liability: Georgia does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. At this time there are no land applicators or land owners that hold liability.

More than one Class B biosolids on one site? The Georgia regulations allow for biosolids from more than one TWTDS to be land applied on the same site in the same crop year, however Georgia's best management practices recommend that biosolids be segregated onto separate fields within sites or blended prior to land application.

NPDES equivalent: Georgia issues NPDES permits. A section of the permit authorizes a treatment plant to land apply biosolids and includes requirements for that practice (as described under Management Practices below).

Number of full-time equivalent staff (FTEs) for biosolids program: 2

Biosolids regulations updated: July 1996.

Management practices: The management practices of Georgia's biosolids regulations are more restrictive than the federal Part 503 rule. There are setback requirements / buffers restrictions of greater than 35 feet to state waters. Testing for soil pH is required annually; soil fertility testing is now being added to NPDES and LAS permits. Georgia's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive than Part 503. Georgia requires additional monitoring at one Class B land application site for nitrates in groundwater. Nitrogen is the basis for the agronomic loading rate for land application. Georgia does not require formal nutrient management plans. Georgia does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: In Georgia, some biosolids management groups perform the following oversight and certification voluntarily:

- Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing.
- Testing of some municipal sludge is done for priority pollutants under industrial pretreatment programs, but this is a recommendation not a requirement, so not all municipal facilities are doing this.

Acres applied: In 2004, four NPDES or LAS permits were amended to authorize the land application of biosolids onto approximately 300 acres of agricultural land. Information on the number of acres to which biosolids was applied is reported to the state, but is not tabulated.

Reporting and Record-keeping: All POTWs permitted in Georgia are required to report the amount of biosolids disposed as part of the Discharge Monitoring Report form. The data and reports are compiled electronically using Excel and Access. POTWs land applying biosolids must submit an annual report that includes biosolids quality data, disposal locations, and amounts. The public can access these reports from the EPD Watershed Protection Branch. EPA Region 4 office maintains annual reports for major facilities.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Georgia, there are no legislative or regulatory activities happening or imminent that will impact biosolids management. The establishment of a biosolids management workgroup to address regulatory issues, data tracking, and long-term management will likely expand beneficial use. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. Some have attempted banning Class B biosolids in groundwater recharge areas. The number of towns and counties in Georgia that have adopted more restrictive biosolids application ordinances is unknown and it is unknown if the number of more restrictive ordinances is increasing or decreasing.

## TRENDS

The beneficial use of biosolids is not increasing in Georgia, because of public opposition and the low cost of available capacity at landfills.

Most significant current pressures on biosolids recycling:

1. Public opposition (odors and fears regarding pathogens and health)
2. Regulatory hurdles for large-scale / regional facilities
3. Complexity in tracking and reporting (land application)
4. Decrease in available farmland in the metro areas or other suitable areas for composting

## SEPTAGE MANAGEMENT

Septage regulations updated: 1994.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.2

Septage haulers based in state (estimated): 332

Septage management: Septage can be land applied if it meets part 503 and the following additional requirements: Maximum rate of 40,000 gallons annually per acre. POTWs are not required to accept septage. The number of POTWs that accept septage is unknown.

Percentage of each management practice: Not known.

Other concerns: Georgia considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under commercial waste rules 391-3-6-.24. Georgia has a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Georgia

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	Yes	-	-
Pathogen reduction (Class A or B)	No	Yes	Yes	-	-
Vector attraction reduction (VAR)	No	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	yes for beneficial	All facilities report qty each month	Paper	No	-
Part 503 metals	Yes	Yes	-	Paper	No	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	No	-	-	-	-	-
Cumulative Pollutant Loading Rates	Yes	Yes	For facilities in existence pre 1993	-	-	-
How biosolids achieve Class A or B	Yes	-	-	Paper	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Paper	No	-
Solids stabilization processes used	No	-	Not required but usually provided	-	-	-
Other biosolids treatments	No	-	-	-	-	-
End use/disposal practice	Yes	Yes	-	Paper	No	-

## Georgia

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland at typical rate (~ 3 dry ton/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
8,918,129	57,906	154	4,676,567	34,660	0.043	1.4%
<b>Total Biosolids Generated in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
	200,000	<b>200,000</b>		155,500		175,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	350	462				
Total number of TWTDS sending to Separate Preparers in 2004:						
		12				
Number of Separate Preparers:						
		1				
Number of operating sludge incinerators:						
		4				
Fluidized bed:						
		0				
Multiple hearth:						
		4				
Percent of population served by on-site (e.g. septic systems):						
		no data				
UNITS: <b>Dry U.S. Tons</b>						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

155,500

175,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. The 663 TWTDS include city/county-owned (342) and private (108) facilities (excludes industrial wastewater treatment plants). 450 to 473 of these are mechanical plants (non pond systems) that generate sludge routinely. Approximately 205 TWTDS in Georgia are pond treatment systems; they are not included in the tracking of biosolids data, since they do not generate sludge routinely.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	57	49,224	25%
Disposal	404	150,051	75%
Other	1	725	0%
Total	462	200,000	100.00%

#### Beneficial Use

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Agricultural	52	39,121	20%
Forestland	0	-	0%
Reclamation	0	-	0%
Class A EQ Distribution	5	10,103	5%
Total	57	49,224	25%
Long-term storage	1	725	0%

#### Notes:

The only separate preparer is a compost facility, ERTH Products, that produces Class A compost that is sold in bags; 12 TWTDS send their sewage sludge to this compost facility. There are 3 TWTDS that make their own Class A compost and one TWTDS that has a pelletizing facility, the Class A pellets from which are land applied for agriculture (the quantity of these pellets is unknown and not included). Some of the land applied biosolids went to AL (1,679 dt). A separate preparer in SC took 57 dt.

#### Disposal

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
MSW landfill (incl dly cvr)	400	108,533	54%
Surface Disposal	0	-	0%
Incineration	4	41,518	21%
	404	150,051	75%

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	5	10,103	5%
Other Class A	0	-	0%
Class B	50	39,121	20%
Other (no data, etc.)	407	150,776	75%
Total	462	200,000	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	no data	no data	Georgia does not collect this data.
Digestion-anaer./other	no data	no data	
Lime/Alkaline	no data	no data	
Composting	no data	no data	
Thermal (not incineration)	no data	no data	
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## Hawaii

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Hawaii is planning to seek delegation for Part 503 sometime in the future, when resources allow.

State agency regulating biosolids: The water/wastewater portion of Hawaii's environmental agency regulates biosolids and utilizes wastewater permits to regulate end use and disposal and land application sites.

Holder of liability: Hawaii does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use, but this is not being done.

More than one Class B biosolids on one site? Hawaii does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, and this is being done at one site.

NPDES equivalent: Hawaii has no state equivalent to NPDES. All NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.75

Biosolids regulations updated: December 2004

Management practices: The management practices of Hawaii's biosolids regulations are more restrictive than the federal Part 503 rule – they include additional setback requirements.

Hawaii's pathogen and/or vector attraction reduction limits are also more restrictive. They have eliminated Option 3 for Class A, and have restricted Option 4. The pollutant (trace metals, etc.) limits are more restrictive. Hawaii does not require additional monitoring at Class B land application sites. Nitrogen is the basis for the agronomic loading rate for land application.

Hawaii does require formal nutrient management plans. Hawaii does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Hawaii does not require any additional oversight and certification to occur at biosolids land application sites. In Hawaii, biosolids management groups do not perform any additional oversight and certification voluntarily.

Acres applied: No Class B land application occurred in 2004. Where Class A biosolids is not tracked.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Hawaii, no regulation or legislative activity is happening or imminent that would affect biosolids. No county has adopted any restrictive biosolids ordinances.

### **TRENDS**

The beneficial use of biosolids is increasing in Hawaii, due to the consent decree discussed below.

Most significant current pressures on biosolids recycling:

A consent decree between U. S. EPA and the City of Honolulu requires the City to reuse a certain amount of biosolids. In accordance with this, the City has constructed a pelletizer and has begun processing some of its solids at this facility.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: December 2004

Number of full-time equivalent staff (FTEs) for septage program: 0.25

Septage haulers based in state (estimated): 65

Septage management: Septage can be land applied if it meets Part 503. POTWs are not required to accept septage. It is not known how many actually do.

Percentage of each management practice:

- Hauled to TWTDS = 100 %

Other concerns: Hawaii considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the wastewater rules. Hawaii does not have a proactive program to collect FOG and keep it out of the general wastewater flow. Local counties have FOG ordinances. Hawaii registers FOG pumpers and requires recordkeeping and reporting.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Hawaii

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	-	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	Yes	Same frequency as 503 though not req'd by 503	-
Pathogen reduction (Class A or B)	No	Yes	Yes	-	-
Vector attraction reduction (VAR)	No	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements		Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	Yes	Yes	-	Paper	No	-
Part 503 metals	No	-	-	-	-	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	No	-	-	-	-	-
Cumulative Pollutant Loading Rates	-	-	-	-	-	-
How biosolids achieve Class A or B	Yes	Yes	-	Paper	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Paper	No	-
Solids stabilization processes used	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	Yes	Yes	-	Paper	No	-

## Hawaii

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
1,262,124	6,422	197	211,120	4,755	0.095	3.2%
<b>Total Biosolids Generated in 2004*:</b>	From State Survey Q24  19,601	<b>Adjusted Estimate  20,000</b>				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS 21	From Survey Q24 18				
Total number of TWTDS sending to Separate Preparers in 2004:		9				
Number of Separate Preparers:		2				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		50%				
<b>UNITS:</b>	<b>Dry Metric Tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

28,105

17,000

NOTES: Data in these tables are from EPA Region 9. The data reported is for the largest facilities in Hawaii. The other (approx. 200) facilities are small plants, such as package plants, that mostly transport their solids to larger plants (thus, their solids are accounted for).

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	9	8,491	43%	
Disposal	9	11,110	57%	
Other	0	-	0%	
<b>Total</b>	<b>18</b>	<b>19,601</b>	<b>100.00%</b>	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	0	-	0%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	9	8,491	43%	
<b>Total</b>	<b>9</b>	<b>8,491</b>	<b>43%</b>	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	9	11,110	57%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
	<b>9</b>	<b>11,110</b>	<b>57%</b>	

### NOTES:

Two major compost facilities (Barbers Point and EKO Maui) provide composting of solids for at least 9 TWTDS. Reported here is the mass of solids entering the 2 major composting facilities; the total mass of final finished compost may be larger. The finished compost is used mostly for landscaping.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	2	8,491	43%
Other Class A	0	-	0%
Class B	0	-	0%
Other (no data, etc.)	9	11,110	57%
Total	11	19,601	100%

NOTES:

These are the 2 major compost facilities (Barbers Point and EKO Maui).

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...
Aerobic Digestion	no data	no data
Digestion-anaer./other	no data	no data
Lime/Alkaline	no data	no data
Composting	2	8,491
Thermal (not incineration)	no data	no data
Long-term (lagoons, reed beds, etc.)	no data	no data
Other	no data	no data
Belt Filter Press	no data	no data
Plate & Frame Press	no data	no data
Screw Press	no data	no data
Centrifuge	no data	no data
Vaccum Filter	no data	no data
Drying beds	no data	no data
Other	no data	no data

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Idaho**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Idaho is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water / wastewater portion, along with the solid waste program, of Idaho's environmental agency regulates biosolids. Water / wastewater regulates beneficial use, and solid waste regulates landfilling. Idaho utilizes specific NPDES-type permits and other actions to regulate end use and disposal. Land application sites require an approved sludge management plan or site-by-site approvals.

Holder of liability: Idaho does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use; however, no data was provided regarding whether or not this is being done.

More than one Class B biosolids on one site? Idaho does not allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year.

NPDES equivalent: No data provided.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.6

Biosolids regulations updated: January 1996.

Management practices: The management practices of Idaho's biosolids regulations are more restrictive than the federal Part 503 rule. The Idaho rules include setback requirements. Idaho's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive. Idaho does not require additional monitoring at Class B land application sites. Nitrogen is the basis for the agronomic loading rate for land application. Idaho does not require formal nutrient management plans. Idaho does not separately manage or control the application of phosphorus in biosolids.

Additional Management Actions: Idaho does not require any additional oversight and certification to occur at biosolids land application sites, and biosolids management groups are not known to perform any additional oversight and certification voluntarily.

Acres applied: No data provided.

Reporting and Record-keeping: Only major facilities are required to report biosolids information and data. The public can access these reports from the EPA regional office. The data and reports are not compiled electronically by the state.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Idaho, no regulatory or legislative activity is happening that would affect biosolids management. A growth in the state population is increasing sludge volumes, but it is also decreasing the available land for land application. This activity may reduce beneficial use. As of today, local units of government are not allowed to adopt ordinances that are more restrictive than state law.

### **TRENDS**

The beneficial use of biosolids is increasing in Idaho. This increase is due to rapid growth in population.

Most significant current pressures on biosolids recycling: Population growth.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: 1991.

Number of full-time equivalent staff (FTEs) for septage program: 0.1

Septage haulers based in state (estimated): 86

Septage management: Septage can be land applied if it meets part 503. POTWs are not required to accept septage. However, several TWTDS accept septage.

Percentage of each management practice: No data provided.

Other concerns: It was not reported whether Idaho considers fats, oils, and grease (FOG) to be a significant issue. Grease trap waste is handled under solid waste regulations and goes to landfills.

## **ADDITIONAL NOTES**

Idaho has many TWTDS that rely on lagoons for treatment; these are cleaned out every 10 - 15 years. There are less than 25 mechanical plants in the state. These include the following (biosolids management practice appears in parentheses):

- Aberdeen
- Blackfoot (land applied Class B biosolids)
- Boise (dedicated farm for land application of Class B biosolids)
- Caldwell (land applied Class B biosolids), Cour d'Alene (Class A compost)
- Eagle (minimal treatment, then hauls to Boise)
- Hailey (land reclamation using Class B biosolids)
- Idaho Falls (land applied Class B biosolids)
- Ketchum (land reclamation using Class B biosolids)
- Lewiston (solids are treated by contracted composter)
- Meridian (land applied Class B biosolids)
- Mt. Home Air Force Base (developing alkaline drying treatment to produce Class A; land application)
- Nampa (land applied Class B biosolids)
- Pocatello
- Post Falls
- Preston
- Rexburg (land applied Class B biosolids)
- Soda Springs (long-term storage, then land application or landfill)
- Twin Falls (land applied Class B biosolids)

## Idaho

	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
Estimated population	1,395,140	82,747	17	6,152,611	18,366	0.004
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
		<b>23,209</b>	<b>23,300</b>		27,727	no data
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	186	27				
Total number of TWTDS sending to Separate Preparers in 2004:		2				
Number of Separate Preparers:		2				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
UNITS: <b>Dry U. S. Tons</b>						

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	18	19,139	82%	
Disposal	9	4,070	18%	
Other	0	-	0%	
Total	27	23,209	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	15	17,454	75%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	3	1,685	7%	
Total	18	19,139	82%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	9	4,070	18%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
	9	4,070	18%	

NOTES:  
 Includes 9 TWTDS and ~4,000 dry U. S. tons that is assumed to be Class B land applied, but for which there was no data.  
 This is compost created by 2 separate preparers (Coeur d'Green and EKO Compost) and the town of Grangeville.

NOTES:  
 These are estimates made with the assumption that 1/2 of the larger TWTDS for which there is no data sent solids to landfill and half of the solids for which there is no data went to landfill.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	3	9,508	41%
Other Class A	0	-	0%
Class B	5	5,562	24%
Other (no data, etc.)	19	8,139	35%
Total	27	23,209	100%

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		NOTES:
Aerobic Digestion	2	-		This data is incomplete; small facility data not available.
Digestion-anaer./other	24	14,970		Includes Coeur d'Alene, Lewiston, Meridian, Nampa, Pocatello,
Lime/Alkaline	1	-		EKO Compost, Coeur d'Green, and Grangeville
Composting	3	1,636		
Thermal (not incineration)	0	-		
Long-term (lagoons, reed beds, etc.)	0	-		
Other	0	-		
Belt Filter Press	3+	3,915		
Plate & Frame Press	0	-		
Screw Press	0	-		
Centrifuge	2	8,715		Coeur d'Alene, Meridian
Vacuum Filter	0	-		
Drying beds	4+	2,083		
Other	0	-		

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Illinois**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Illinois plans to become delegated for Part 503.

State agency regulating biosolids: The water / wastewater portion of Illinois' environmental agency regulates biosolids and utilizes state operating permits to regulate end use and disposal and land application sites.

Holder of liability: Illinois does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. Eleven permitted sludge haulers currently hold legal liability for biosolids end use.

More than one Class B biosolids on one site? Illinois does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. This is actually being done, but the number of sites on which it is done is unknown – it is common, especially in northeast Illinois.

NPDES equivalent: There is a state permit program for biosolids management. NPDES permits, which are separate from these state permits, have standard boiler-plate language for biosolids.

Number of full-time equivalent staff (FTEs) for biosolids program: 1.5

Biosolids regulations updated: January 1984; a new rule-making has been proposed, but has been delayed in legal review and by concerns about how to manage the impacts on biosolids management of naturally occurring radium in groundwater (especially documented in northern Illinois). (Radium is a precursor of radon gas, which might become an issue in homes built on converted farmland; however, DEQ calculates that biosolids use is unlikely to create any risk by this scenario, but is awaiting concurrence from state radiation experts).

Management practices: The management practices of Illinois' biosolids regulations are more restrictive than the federal Part 503 rule. The Illinois rules include setback requirements for wells and surface water, restricts use of some soil types, and requires a soil pH of 6.5 for application. Illinois' pathogen and/or vector attraction reduction limits are not more restrictive than Part 503; however, Illinois has more restrictive pollutant (trace metals, etc.) limits, specifically for Cumulative Pollutant Loading Rates (CPLR) to soils (Cd = 10 mg/kg, Cu = 250 mg/kg, Pb = 1000 mg/kg, Ni = 100 mg/kg, and Zn = 500 mg/kg). Illinois does not require additional monitoring at Class B land application sites. Nitrogen and phosphorus are the basis for the agronomic loading rate for land application. Illinois does not require formal nutrient management plans. Illinois uses testing based on available P in the soil to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Biosolids land applicators do not have to be certified in Illinois, and there is no requirement for independent monitoring or special odor control measures. However, odor complaints to DEQ lead to DEQ inspection; DEQ often then requires the land applicator to take follow-up actions like incorporation or lime treatment.

Acres applied: The number of acres in Illinois to which biosolids were applied in 2004 is not known.

Reporting and Record-keeping: Both major and minor facilities are required to report biosolids information and data. The public can access these reports from POTW or TWTDS websites and

via Freedom of Information Act (FOIA) requests of IL EPA. The data and reports are not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Illinois, development of, or changes to, state biosolids regulations is expected in the next year or two, but will likely have no significant affect on beneficial use. As of today, local units of government are not allowed to adopt ordinances that are more restrictive than state law.

## TRENDS

It is likely that the number of TWTDS that apply biosolids to soils is decreasing, because there is a relatively new \$2,500 fee for biosolids land application permits; for small facilities, this makes landfilling the cheaper option. However, because only small plants are impacted by this fee, the quantity of biosolids being land applied has remained fairly stable from year to year. In general, wastewater treatment facilities seem to be continuing their existing practices for biosolids use and disposal, rather than using new or different methods.

### Most significant current pressures on biosolids recycling:

1. Loss of land application sites due to urban sprawl
2. Naturally occurring radium in source water, and, therefore, biosolids
3. Potential legislative requirement to apply sludge at phosphorous rate rather than nitrogen rate

## SEPTAGE MANAGEMENT

In Illinois, septage is generally managed in accordance with the federal Part 503 regulations. Annual reporting regarding septage management activities is also required to the Illinois Department of Health's private sewage division.

Septage regulations updated: The Illinois regulations pertaining to septage management were last updated in 2003; these are in Section 905.170, which deals with septage (or private sewage) collection, storage, and disposal in accordance with Part 503. All septage pumbers/haulers are licensed by the state. Annual reporting to the state is required regarding the disposal methods for septage, where it is used or disposed, and the volumes, etc. The use or disposal options for septage are lagoons, incinerators, landfills, disposal at TWTDS, and land application to agricultural land.

Number of full-time equivalent staff (FTEs) for septage program: 1 (assisted by local health departments for complaints and enforcement)

Septage haulers based in state (estimated): 723 (February 2007 data)

Septage management: In Illinois, TWTDS are not required to accept septage, but many do – although the number that do is declining.

Percentage of each management practice: No data provided.

Other concerns: Illinois considers fats, oils, and grease (FOG) to be somewhat of an issue – and it is becoming more of an issue. FOG is considered a special waste by IL EPA; some is recycled.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Illinois

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	-	Annual to monthly based on design average flow	Frequency based on design average flow
Other metals (boron, silver...)	-	-	-	-	-
Dioxins/furans	-	-	-	-	-
PCBs	-	-	-	-	-
Priority pollutants	-	-	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	-	-	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	Yes	-	Semi-annual	-
Nutrients (NPK)	No	Yes	-	Annual to monthly based on design average flow	Frequency flow
Pathogen reduction (Class A or B)	-	-	-	-	-
Vector attraction reduction (VAR)	-	-	-	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements		Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	Yes	-	Semi-annually	Paper	-	-
Part 503 metals	Yes	-	Annually to monthly based on design average flow	Paper	-	-
Other metals	-	-	-	-	-	-
Dioxins/furans	-	-	-	-	-	-
PCBs	-	-	-	-	-	-
Priority pollutants	-	-	-	-	-	-
Other organic compounds	-	-	-	-	-	-
Radioactive isotopes	-	-	-	-	-	-
Nutrients (N, P, K)	Yes	-	Annually to monthly based on design average flow	Paper	-	-
Cumulative Pollutant Loading Rates	-	-	-	-	-	-
How biosolids achieve Class A or B	-	-	-	-	-	-
How biosolids achieve Vector Attraction	-	-	-	-	-	-
Solids stabilization processes used	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	Yes	-	Semi-annually	-	-	-

## Illinois

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
12,712,016	55,583	229	24,171,260	68,750	0.014	0.5%
<b>Total Biosolids Generated in 2004*:</b>	From State Survey Q24	<b>Adjusted Estimate</b>				
	348,063	<b>348,000</b>				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS	From Survey Q24				
	721	557				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		0				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b>	<b>Dry U. S. tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

459,576 390,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. Some TWTDS use more than one use or disposal method for their biosolids. Chicago accounts for 59% of the sewage sludge produced in Illinois in a typical year.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Beneficial Use	364	203,618	59%	
Disposal	77	124,877	36%	
Other	116	19,568	6%	
<b>Total</b>	<b>557</b>	<b>348,063</b>	<b>100.00%</b>	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	348	178,968	51%	
Forestland	0	-	0%	
Reclamation	6	22,771	7%	
Class A EQ Distribution	10	1,879	1%	
<b>Total</b>	<b>364</b>	<b>203,618</b>	<b>59%</b>	
Long-term storage	116	19,568	6%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	77	124,877	36%	
Surface Disposal	0	-	0%	
Incineration	0	-	0%	
	<b>77</b>	<b>124,877</b>	<b>36%</b>	

### NOTES:

Three of these TWTDS produce 85,659 U.S. dry tons of sewage sludge that is used for landfill daily cover.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	10	1,879	1%
Other Class A	0	-	0%
Class B	454	354,484	99%
Other (no data, etc.)	0	-	0%
Total	464	356,363	100%

NOTES:

IL regulations do not differentiate Class A "EQ" from Class A biosolids.

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		NOTES:
Aerobic Digestion	probably 400	no data		
Digestion-anaer./other	approximately 45	no data		
Lime/Alkaline	approximately 20	no data		
Composting	few to none	no data		
Thermal (not incineration)	none	no data		Chicago is building a heat-drying pelletizing plant.
Long-term (lagoons, reed beds, etc.)	49	no data		These lagoon storage systems are mostly small; however, Danville, for example, is fairly large and has huge lagoons that store solids for five years at a time before they are all handled in one large clean-out.
Other	0	no data		
Belt Filter Press	many	no data		
Plate & Frame Press	0	no data		
Screw Press	0	no data		
Centrifuge	1	no data		
Vaccum Filter	0	no data		
Drying beds	many	no data		
Other	0	no data		Chicago uses centrifuges.

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Indiana**

**REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Indiana is planning to seek delegation from USEPA sometime in the future when resources allow.

State agency regulating biosolids: The solid waste program portion of Indiana's environmental agency regulates biosolids and utilizes a solid waste license/permit to regulate end use and disposal and land application sites. Each TWTDS that land applies biosolids must obtain a land application permit; all sites are approved under that permit either in a site-specific permit or a non-site-specific permit.

Holder of liability: Indiana does not allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Indiana does allow *Class B* biosolids from more than one TWTDS to be land applied on the same site in the same crop year – this could happen on any of the 1,000+ permitted land application sites in Indiana; how often it happens is not known.

NPDES equivalent: Not applicable. The solid waste program oversees biosolids recycling to land through site-specific permitting.

Number of full-time equivalent staff (FTEs) for biosolids program: 3

Biosolids regulations updated: August, 2003.

Management practices: The management practices of Indiana's biosolids regulations are more restrictive than the federal Part 503 rule. These rules include setback requirements and slope restrictions. Indiana's pathogen and/or vector attraction reduction limits are not more restrictive. Indiana has more restrictive pollutant (trace metals, etc.) limits. Indiana requires additional monitoring at Class B land application sites; soil pH must be at least 5.5. Nitrogen is the basis for the agronomic loading rate for land application, unless the metal concentrations are high, then application rates are based on metal annual loading rates. Indiana does not require formal nutrient management plans. Indiana does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Additional voluntary measures taken by biosolids management programs, if any, are not known.

Acres applied: In 2004, biosolids were applied to a total of 14,976 acres. The number of new site permits/approvals issued is not known exactly, but there were 100 combined renewals and new permits – mostly renewals – in 2004. In total, there are currently 1,596 permitted land application sites (1,309 are site-specific and 279 are non-site-specific); of that total, 507 actually received biosolids in 2004.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data - and only if they hold a land application or marketing and distribution permit. The public can access these reports by mail or in person from the state agency. The data and reports are compiled electronically in Access.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Indiana, there are no reported legislative or regulatory activities happening or imminent impacting biosolids. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state regulations. It is unknown how many towns and counties in Indiana have adopted more restrictive biosolids management ordinances.

## TRENDS

The beneficial use of biosolids is increasing in Indiana. Regional biosolids centers are becoming more popular. Smaller facilities are disposing of their biosolids at these regional centers, which recycle the biosolids to soils. Most of these centers are handling Class B biosolids for agricultural use. By regulation, the centers must blend any biosolids material with at least one other biosolids and/or other organic residuals so that it becomes the regional center's generated product. In order to be shipped to one of these regional centers, a TWTDS biosolids must be Class B and meet Part 503 Table 1 pollutant standards.

### Most significant current pressures on biosolids recycling:

1. Compaction on farm ground.
2. Increase in development of agricultural ground to new home construction or industrial activity.
3. Governmental regulation and oversight.

## SEPTAGE MANAGEMENT

Septage regulations updated: July 2002.

Number of full-time equivalent staff (FTEs) for septage program: 1.5

Septage haulers based in state (estimated): 350

Septage management: Septage can be land applied if it meets part 503. POTWs are not required to accept septage, however, 175 do.

### Percentage of each management practice:

- Land applied = 10%
- Hauled to TWTDS = 80%
- Sent to other septage-only treatment facility = 10%

Other concerns: Indiana considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the septage rules. Indiana does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Indiana

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	Based on amount generated as outlined in Part 503
Other metals (boron, silver...)		No	-	-	-
Dioxins/furans	-	No	-	-	-
PCBs	-	Yes	-	annually	-
Priority pollutants	-	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	-	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	-	No	-	-	-
Nutrients (NPK)	-	Yes	-	-	Monthly as land application occurs
Pathogen reduction (Class A or B)	-	Yes	Yes	-	-
Vector attraction reduction (VAR)	-	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING: Class A, B, VAR and CPLR collected as part of permit but not submitted to state	Reporting required? Yes/No	Frequency of reporting		How is the data stored by the state? Paper/Electronic	Is data compiled by the state in reports or summaries?	
		In accordance with Part 503 requirements	Other... please specify		Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	-	Only those who hold a land app permit must submit a monthly report	Electronic	No	Some reports may be created upon request
Part 503 metals	Yes	Sampled at same	Monthly as land app occurs	Electronic	No	-
Other metals	No	-	-	-	No	-
Dioxins/furans	No	-	-	-	No	-
PCBs	Yes	-	-	Paper	No	-
Priority pollutants	No	-	-	-	No	-
Other organic compounds	No	-	-	-	No	-
Radioactiv e isotopes	No	-	-	-	No	-
Nutrients (N, P, K)	Yes	-	-	-	No	-
Cumulative Pollutant Loading Rates	No	-	-	-	No	-
How biosolids achieve Class A or B	No	-	-	-	No	-
How biosolids achieve Vector Attraction	No	-	-	-	No	-
Solids stabilization processes used	No	-	-	-	No	-
Other biosolids treatments	No	-	-	-	-	-
End use/disposal practice	Yes	-	-	-	-	-

## Indiana

	Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
	6,226,537	35,866	174	12,909,002	53,725	0.015	0.5%
<b>Total Biosolids Generated in 2004*:</b>							
	From State Survey Q24	<b>Adjusted Estimate</b>					
	196,963	<b>197,000</b>					
<b>Total Number of TWTDS in 2004**:</b>							
	From CWNS	From Survey Q24					
	411	193					
Total number of TWTDS sending to Separate Preparers in 2004:		36					
Number of Separate Preparers:		7					
Number of operating sludge incinerators:		1					
Fluidized bed:		0					
Multiple hearth:		1					
Percent of population served by on-site (e.g. septic systems):		no data					
UNITS: <b>Dry U.S. Tons</b>							

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004) Dry tons, reported to BioCycle Survey (Goldstein, 2000)

212,866 60,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator and individual TWTDS. In Indiana, 848 wastewater treatment plants hold an NPDES permit. The land application program of the state's solid waste division only tracks those TWTDS that hold a land application or marketing and distribution permit. The numbers reported here are based on 300 currently permitted facilities, plus several larger TWTDS that dispose of solids. The rest (500+) TWTDS are not tracked by the solid waste department; their solids go to one of the following: a regional center, out of state, to another TWTDS, to disposal, or long-term storage.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	145	106,099	54%
Disposal	48	90,864	46%
Other	0	-	0%
Total	193	<b>196,963</b>	100.00%

#### Beneficial Use

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Agricultural	133	43,977	22%
Forestland	0	-	0%
Reclamation	0	-	0%
Class A EQ Distribution	12	62,122	32%
Total	145	106,099	54%
Long-term storage	0	-	0%

#### Disposal

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
MSW landfill (incl dly cvr)	46	39,041	20%
Surface Disposal	0	-	0%
Incineration	2	51,823	26%
	48	90,864	46%

NOTES: Landfilling numbers are Muncie and Gary, as well as a little (973 U.S. dry tons) from Indianapolis. More small facilities may landfill, making for somewhat higher disposal totals.

Indianapolis, the state's largest city (13% of IN population, plus 41,000 businesses) has two WWTFs and a multiple hearth incinerator. In 2004, Indianapolis landfilled 973 U.S. dry tons when the incinerator was being serviced.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	11	61,197	31%
Other Class A	1	924	0%
Class B	135	45,753	23%
Other (no data, etc.)	0	90,864	46%
Total	147	198,738	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	662	no data	
Digestion-anaer./other	94	no data	
Lime/Alkaline	19	no data	
Composting	3	no data	
Thermal (not incineration)	17	no data	
Long-term (lagoons, reed beds, etc.)	4	no data	
Other	0	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## Iowa

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Iowa is not planning to seek delegation for Part 503.

State agency regulating biosolids: The water/ wastewater portion of Iowa's environmental agency regulates biosolids and utilizes general NPDES type permits to regulate end use and disposal and land application sites.

Holder of liability: Iowa does not allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Iowa does not allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year.

NPDES equivalent: Iowa issues state operation permits that work with NPDES permits to regulate biosolids use and disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.5

Biosolids regulations updated: August 1994.

Management practices: The management practices of Iowa's biosolids regulations are more restrictive than the federal Part 503 rule. However, Iowa's pathogen and/or vector attraction reduction limits are not more restrictive. Iowa's pollutant (trace metals, etc.) limits are more restrictive. Iowa does not require additional monitoring at Class B land application sites.

Nitrogen is the basis for the agronomic loading rate for land application. Iowa does not require formal nutrient management plans, because they consider the regulations to sufficiently manage nutrients. Iowa does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Iowa requires the following oversight and certification to occur at biosolids land application sites:

- Certification of biosolids land applicators who manage or implement land application programs.

In Iowa, it is not known whether any biosolids management groups perform additional oversight or certification voluntarily.

Acres applied: Data on the number of acres in Iowa to which biosolids were applied in 2004 is not easily compiled and was not provided.

Reporting and Record-keeping: Only major facilities are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. The data and reports are compiled electronically with the EPA Biosolids Data Management System (BDMS).

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Iowa, no regulation or legislative activity is happening that would affect biosolids management. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. One county in Iowa has adopted a more restrictive biosolids application ordinance. Overall, the number of more restrictive ordinances is remaining the same.

### **TRENDS**

The beneficial use of biosolids remains consistent in Iowa.

Most significant current pressures on biosolids recycling: None identified.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: August 1994.

Number of full-time equivalent staff (FTEs) for septage program: 0.125

Septage haulers based in state (estimated): data not available

Septage management: Septage can be land applied in accordance with Part 503. POTWs are not required to accept septage. However, 10 TWTDS accept septage.

Percentage of each management practice:

- Land applied = 85 %
- Hauled to TWTDS = 10 %
- Disposed of in Lagoons = 5%

Other concerns: Iowa does not consider fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste is not regulated. Iowa does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Iowa

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	-
Other metals (boron, silver...)	-	No	-	-	-
Dioxins/furans	-	No	-	-	-
PCBs	-	No	-	-	-
Priority pollutants	-	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	-	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	-	No	-	-	-
Nutrients (NPK)	-	Yes	Yes	-	-
Pathogen reduction (Class A or B)	-	Yes	Yes	-	-
Vector attraction reduction (VAR)	-	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	Yes	-	Paper	No	-
Part 503 metals	Yes	Yes	-	Paper	No	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	Yes	-	-	No	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	-	No	-
How biosolids achieve Class A or B	Yes	Yes	-	-	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	-	No	-
Solids stabilization processes used	Yes	Yes	-	-	No	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	Yes	Yes	-	-	No	-

## Iowa

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
2,952,904	55,869	53	27,153,291	84,755	0.002	0.1%
<b>Total Biosolids Generated in 2004*:</b>	From State Survey Q24	<b>Adjusted Estimate</b>				
	66,660	<b>67,000</b>				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS	From Survey Q24				
	730	78				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		ND				
Number of operating sludge incinerators:		2				
Fluidized bed:		1				
Multiple hearth:		1				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b>	<b>Dry U.S. Tons</b>					

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

73,743 50,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. These numbers are rough estimates from IA Dept. of Natural Resources. Only major utilities report to the state.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	76	50,200	75%	
Disposal	2	16,460	25%	
Other	0	-	0%	
<b>Total</b>	<b>78</b>	<b>66,660</b>	<b>100.00%</b>	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	65	48,200	72%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	11	2,000	3%	
<b>Total</b>	<b>76</b>	<b>50,200</b>	<b>75%</b>	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	0	-	0%	
Surface Disposal	0	-	0%	
Incineration	2	16,460	25%	
	2	16,460	25%	

### NOTES:

There are likely additional smaller facilities that land apply biosolids. Some land applied is likely Class A.

Davenport, which, each year, feeds ~2,000 U.S. dt of sewage sludge into its compost.

### NOTES:

Incineration is at Dubuque (3,832 U.S. dry tons burned in perhaps the oldest operating fluidized bed unit in the U.S. (1968)) and Cedar Rapids (12,628 U.S. dry tons incinerated in multiple hearth unit; they also land applied 3,538 dt lime-treated biosolids when incinerator was having maintenance done).

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	11	5,200	8%
Other Class A	0	-	0%
Class B	65	45,000	68%
Other (no data, etc.)	0	16,460	25%
Total	76	66,660	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	25	no data	
Digestion-anaer./other	44	no data	
Lime/Alkaline	8	no data	
Composting	1	no data	
Thermal (not incineration)	0	no data	
Long-term (lagoons, reed beds, etc.)	0	no data	
Other	0	no data	
Belt Filter Press	4	no data	
Plate & Frame Press	0	no data	
Screw Press	0	no data	
Centrifuge	3	no data	
Vaccum Filter	5	no data	
Drying beds	25	no data	
Other	0	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## Kansas

### **GENERAL**

Kansas City and Johnson County are the largest TWTDS in Kansas; together, they service about 1/3 of the state's population. They landfill their biosolids. There is one compost facility, for the City of Olathe, and the city of Arkansas is the only other facility that creates a Class A biosolids product which is land applied. There are 140 Kansas facilities that create Class B biosolids and land apply them. There are approximately 150 TWTDS in Kansas with mechanical systems and 700 with lagoon systems. The lagoons don't have to be dredged for 25 – 35 years; it is unknown if any lagoon systems removed biosolids in 2004.

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Kansas is not planning to seek delegation for Part 503. Kansas is administering the day-to-day monitoring for compliance with the Part 503 program, but does not have primacy. The Kansas legislature will not allow the state to adopt rules more stringent than required under federal law.

State agency regulating biosolids: The water/ wastewater portion of Kansas's environmental agency regulates biosolids. Kansas relies solely on the federal Part 503 regulations and does not use permits to regulate biosolids end use and disposal or land application sites.

Holder of liability: Kansas does not allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Kansas does not allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year.

NPDES equivalent: Kansas water pollution control is the state equivalent to NPDES. Kansas water pollution control/NPDES permits do not always include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.25

Biosolids regulations updated: Kansas has no state regulations.

Management practices: Part 503 sets all requirements and management practices in Kansas. Kansas does not require additional monitoring at Class B land application sites. Nitrogen is the basis for the agronomic loading rate for land application. Kansas does not require formal nutrient management plans. Kansas does not manage or control the application of phosphorus in biosolids.

Additional Management Actions: Kansas does not require any additional oversight or certification to occur at biosolids land application sites and no biosolids management programs perform any additional oversight or certification voluntarily.

Acres applied: In 2004, biosolids were applied to an unknown number of acres (there is currently no tracking mechanism), and Kansas does not require permits for land application sites.

Reporting and Record-keeping: Both major and minor facilities are required to report biosolids information and data. These reports may be obtained from the state agency by mail or in person. The data and reports are not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Kansas, no regulation or legislative activity is happening that would affect biosolids management. Although

local units of government are allowed to enact ordinances that are more restrictive than state law, no towns or counties do.

## **TRENDS**

The beneficial use of biosolids is not increasing in Kansas. There is an increasing use of landfills, in order to avoid the hassle of land application.

Most significant current pressures on biosolids recycling:

1. Public opposition.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: Kansas has no state regulations; the state relies on the federal Part 503.

Number of full-time equivalent staff (FTEs) for septage program: 0. The septage program is delegated to the county health departments to administer. The state does not have the resources at the state level to oversee septage.

Septage haulers based in state (estimated): About 2 per county, which leads to a total of about 110 statewide.

Septage management: Septage can be land applied if it meets part 503. POTWs are not required to accept septage, and it is unknown how many do.

Percentage of each management practice (estimated):

- Land applied = 50 %
- Hauled to TWTDS = 50 %

Other concerns: Kansas considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the solid waste rules. Kansas does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Kansas

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	Yes	-	-
Pathogen reduction (Class A or B)	No	Yes	Yes	-	-
Vector attraction reduction (VAR)	No	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	No	-	-	-	-	-
Part 503 metals	Yes	Yes	-	Paper	No	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	Yes	-	Paper	No	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	Paper	No	-
How biosolids achieve Class A or B	Yes	Yes	-	Paper	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Paper	No	-
Solids stabilization processes used	No	-	-	-	-	-
Other biosolids treatments	No	-	-	-	-	-
End use/disposal practice	Yes	Yes	-	Paper	No	-

## Kansas

Estimated population	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
2,733,697	81,814	33	29,542,022	56,703	0.001	0.0%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	31,957	32,000		56,196	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	no data
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	634	25				
Total number of TWTDS sending to Separate Preparers in 2004:	0					
Number of Separate Preparers:	0					
Number of operating sludge incinerators:	1					
Fluidized bed:	no data					
Multiple hearth:	no data					
Percent of population served by on-site (e.g. septic systems):	40%					
<b>UNITS:</b> Dry U. S. Tons						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey  
(Goldstein, 2000)

56,196 no data

NOTES: Data in these tables are from the largest TWTDS in Kansas and accounts for an estimated 77% of the wastewater flow in the state. Additional information from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	10	12,886	40%	
Disposal	15	19,071	60%	
Other	0	-	0%	
Total	25	31,957	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Agricultural	9	11,992	38%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	1	894	3%	
Total	10	12,886	40%	
Long-term storage	0	-	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
MSW landfill (incl dly cvr)	14	11,417	36%	
Surface Disposal	0	-	0%	
Incineration	1	7,654	24%	
	15	19,071	60%	

#### NOTES:

Class B land application by Arkansas, Lawrence, Topeka (3 TWTDS), and Wichita (4 TWTDS).

Olathe produces biosolids compost.

#### NOTES:

Johnson County (7 TWTDS) and Topeka sent solids to landfills.

In 2004, Kansas City incinerated most of its solids and sent some to landfill.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	1	894	4%
Other Class A	1	-	0%
Class B	140	11,992	0%
Other (no data, etc.)	15	19,071	96%
Total	157	31,957	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	NOTES:
Aerobic Digestion	75	no data	Incomplete data.
Digestion-anaer./other	25	no data	
Lime/Alkaline	2	no data	
Composting	1	no data	
Thermal (not incineration)	0	no data	
Long-term (lagoons, reed beds, etc.)	0	no data	
Other	0	no data	
Belt Filter Press	25	no data	
Plate & Frame Press	0	no data	
Screw Press	0	no data	
Centrifuge	1	no data	
Vaccum Filter	3	no data	
Drying beds	0	no data	
Other	0	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## Kentucky

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Kentucky is planning to seek delegation from USEPA sometime in the future when resources allow.

State agency regulating biosolids: The solid waste portion of Kentucky's environmental agency regulates biosolids and utilizes solid waste permits to regulate end use and disposal.

Holder of liability: Kentucky does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. Currently there are approximately 18 landowners or land applicators that hold legal liability.

More than one Class B biosolids on one site? Kentucky does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year; however, this is not currently being done.

NPDES equivalent: KPDES is the state equivalent to NPDES. Not all KPDES/NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.6

Biosolids regulations updated: June 1992

Management practices: The management practices of Kentucky's biosolids regulations are more restrictive than the federal Part 503 rule. These rules include setbacks, soil depths, depths to groundwater, and grazing requirements. Kentucky's pathogen and/or vector attraction reduction limits are not more restrictive. Kentucky has more restrictive pollutant (trace metals, etc.) limits. Kentucky requires additional monitoring at Class B land application sites, with annual soil monitoring for heavy metals (Cd, Cu, Ni, Pb, Zn). Nitrogen is the basis for the agronomic loading rate for land application. Kentucky does not require formal nutrient management plans. To manage or control the application of phosphorus in biosolids, Kentucky encourages Best Management Practices (BMPs) that rely on assessing total P or using a P index; the penalty for not following these BMPs is a potential loss of agricultural subsidies.

Additional Management Actions: Kentucky requires the following oversight and certification to occur at biosolids land application sites:

- Certification of biosolids land applicators who manage or implement land application programs.
- Other requirements or actions to control odors at land application sites.

Acres applied in 2004: No data provided.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. This data is not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Kentucky, there are no legislative or regulatory activities happening or imminent impacting biosolids. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law. Six counties in Kentucky have adopted more restrictive biosolids application ordinances.

Overall, the number of more restrictive ordinances is remaining the same.

## **TRENDS**

The beneficial use of biosolids is increasing in Kentucky. For example, Louisville Metropolitan Sanitary District is now creating heat dried pelletized biosolids, and other municipalities are obtaining permits to land apply Class B biosolids.

### Most significant current pressures on biosolids recycling:

1. State regulations.
2. Cheap landfill disposal costs.
3. Public acceptance (a distant third, usually not a problem).

## **SEPTAGE MANAGEMENT**

The Kentucky Department of Public Health regulates septage.

Septage regulations updated: August, 1996.

Number of full-time equivalent staff (FTEs) for septage program: No data provided.

Septage haulers based in state (estimated): No data provided.

Septage management: Septage can be land applied in Kentucky. POTWs are not required to accept septage, and the number of facilities that do is not known.

Percentage of each management practice: No data provided.

Other concerns: Kentucky does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Kentucky

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes (except minimum)	-	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	Yes	-	-	*testing requirements for beneficial use may be waived by generator knowledge
Priority pollutants	No	-	-	-	*TCLP required for landfill disposal Frequency determined by landfill usually 1x every 3 years
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	-	-	-
Pathogen reduction (Class A or B)	No	Yes	-	-	-
Vector attraction reduction (VAR)	No	Yes	-	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements		Other... please specify	Paper/Electronic
The amounts of biosolids/sewage sludge used or disposed	Yes	-	-	Paper	No	*reporting required if used, not required if disposed
Part 503 metals	Yes	-	-	-	-	-
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	-	-	-	-	-
Cumulative Pollutant Loading Rates	Yes	-	-	-	-	-
How biosolids achieve Class A or B	Yes	-	-	-	-	*Reporting required if by testing
How biosolids achieve Vector Attraction	Yes	-	-	-	-	*Reporting required if by method
Solids stabilization processes used	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	-	-	-	-	-	*Reporting required only if beneficially reused

## Kentucky

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
4,141,835	39,728	104	8,412,354	80,927	0.010	0.3%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	85,484	<b>85,500</b>				
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	245	29				
Total number of TWTDS sending to Separate Preparers in 2004:		6				
Number of Separate Preparers:		6				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b> Dry Metric Tons						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004) Dry tons, reported to BioCycle Survey (Goldstein, 2000)

68,235 65,000

NOTES: Data in these tables are from EPA Region 4, individual largest TWTDS in the state, and the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. EPA Region 4 data was a compilation of years (2002-2006), with no individual TWTDS counted more than once. Data represents approximately 65% of the flow reported in the 2004 EPA CWNS data, including the largest flows from the largest population centers. Generally, smaller facilities do not produce solids that are used or disposed of every year, and/or they transport solids to larger facilities.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	
Beneficial Use	16	23,194	27%	
Disposal	15	61,480	72%	
Other	1	810	1%	
Total	32	<b>85,484</b>	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	12	19,961	23%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	4	3,233	4%	
Total	16	23,194	27%	Class A EQ distribution included Louisville heat-dried pellets, one compost, and two others.
Other	1	810	1%	Managed by a private contractor; use or disposal unknown.
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	13	61,263	72%	
Surface Disposal	2	217	0%	
Incineration	0	-	0%	
	15	61,480	72%	Louisville had recently installed a heat-drying facility and was making Class A fertilizer pellets, many of which were landfilled in 2004. In 2006, almost all Louisville pellets were beneficially used.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	4	30,502	38%
Other Class A	0	-	0%
Class B	6	13,934	16%
Other (no data, etc.)	21	41,047	46%
Total	31	85,483	100%

NOTES:

Includes Louisville Class A pellets that were landfilled in 2004.

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	0	-	
Digestion-anaer./other	0	-	
Lime/Alkaline	0	-	
Composting	1	1,738	
Thermal (not incineration)	1	26,417	
Long-term (lagoons, reed beds, etc.)	0	-	
Other	2	1,275	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

NOTES:

Incomplete data

Louisville

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## Louisiana

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Louisiana is planning to seek delegation from USEPA sometime in the future, when resources allow.

State agency regulating biosolids: Louisiana is presently undergoing transition, in regulation of biosolids, from the solid waste portion to the water/ wastewater portion of Louisiana's environmental agency. The state utilizes sewage sludge (biosolids) use or disposal permits to regulate end use and disposal and land application sites.

Holder of liability: Louisiana does allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. There is one landowner that holds legal liability; that person was issued a permit, by the state, to land apply biosolids and is responsible for meeting all requirements of the permit, such as buffers, sampling and analysis, agronomic rate, management practices, and financial assurance (liability).

More than one Class B biosolids on one site? Louisiana does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. There are approximately 10 – 15 sites that are doing this.

NPDES equivalent: Louisiana is delegated by EPA to run the NPDES Water Permitting Program; the program is called the Louisiana Pollutant Discharge Elimination System (LPDES) Permitting Program. However, it is the state that permits biosolids management activities. EPA Region VI issued a General Permit for biosolids management in Louisiana in 1998, but it has never been reissued. Not all NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 1.5

Biosolids regulations updated: Louisiana's state sewage sludge management regulations are being updated, and some of the new requirements are already being enforced under an Emergency Rule that was signed in September, 2005. The rule revision is expected to formally begin in late 2006 and be completed in 2007.

Management practices: The management practices required by Louisiana's biosolids regulations are more restrictive than the federal Part 503 rule and include slope restrictions, water table restrictions, and buffer zones. Louisiana's pathogen and/or vector attraction reduction limits are more restrictive: laboratory certifications and pathogen testing (mostly fecal coliform) are required for all alternatives, regardless of whether or not EPA 40 CFR 503 requires such pathogen testing. In addition, any lab that conducts this sampling and analysis work must be certified by the state agency (LELAP). Louisiana's pollutant (trace metals, etc.) limits are not more restrictive than Part 503. In addition, Louisiana requires monitoring at Class B land application sites and has restrictions on applications based on annual water table levels (the proposed minimum depth to the high water table is 2 feet: anything less would prohibit land application at that time; the information for the annual high water table can be obtained by utilizing the NRCS Soil Surveys for each parish in the state or by installation of water table meters). Nitrogen is the basis for the agronomic loading rate for land application. Louisiana does require formal nutrient management plans. Louisiana does not manage or control the application of phosphorus in biosolids.

**Additional Management Actions:** Louisiana requires the following oversight and certification to occur at biosolids land application sites:

- In the proposed new regulations, there will be a requirement that generators, preparers, and land appliers of sewage sludge/biosolids will have to go through training and pass an exam to obtain certification. To maintain certification, a certain number of continuing education hours will be required on a biannual basis.
- The state requires additional buffer zones to control odors at land application sites.

In Louisiana, some biosolids management groups voluntarily perform the following:

- Additional steps to control odors at land application sites.

**Acres applied:** In 2004, Class B biosolids were applied to an estimated 2000 to 5000 acres in Louisiana. The number of new site permits/approvals that were issued in 2004 is not known.

**Reporting and Record-keeping:** Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. Some of the data and reports are compiled electronically and are part of the new Department of Environmental Quality's Electronic Document Management System (EDMS); see <http://www.deq.louisiana.gov/portal/tabid/2604/Default.aspx>.

**Legislative, regulatory, or other activity impacting biosolids use/disposal:** The development of new state biosolids regulations is imminent and will likely have no significant affect on beneficial use. Louisiana has not had an issue of local units of government adopting ordinances that are more restrictive than state law.

## TRENDS

The beneficial use of biosolids is increasing in Louisiana. The cost associated with disposal in landfills is higher than associated costs with beneficial use. There has been a slight increase in the demand for biosolids from farmers.

**Most significant current pressures on biosolids recycling:**

1. Public perception – odor, disease.
2. Lack of public education.
3. Difficult to break away from traditional practices.
4. The need for more support from the EPA.

## SEPTAGE MANAGEMENT

In Louisiana, septage management is overseen through licensure of septage pumping and hauling companies by a program in the state's Office of Public Health. A license is granted to a company (no matter how many individual trucks the company has) after the trucks have been inspected and the company has provided documentation that it has permission to discharge septage at a receiving site (e.g. a permitted wastewater treatment facility).

**Septage regulations updated:** While the Office of Public Health licenses haulers, the Department of Environmental Quality (DEQ) is responsible for the end use or disposal of septage in Louisiana. DEQ is planning to establish new regulations in the next year or two that will require all domestic septage, as well as grease removed from food service facilities when the grease is mixed with sewage sludge, be regulated under the sewage sludge/biosolids management regulations.

There are approximately 110 licensed septage hauling companies based in Louisiana.

Septage management: Septage can be land applied if it meets the federal Part 503 and the same state requirements as those for land application of sewage sludge. POTWs are not required to accept septage, and the number of facilities that do is not known.

Estimated percentage of each management practice:

- Hauled to TWTDS = 30%
- Disposed of in lagoons = 65%
- Sent to other septage-only treatment facility = 5%

In the past, more septage haulers took septage to municipal wastewater treatment facilities; now these facilities are less interested in accepting septage due to concerns about meeting their effluent permit limits. There is at least one facility that is dedicated to receiving only septage. But today, most septage is being disposed in oxidation ditches/lagoons.

Other concerns: Louisiana considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the biosolids/sludge rules (if it is mixed with septage, sludge, or biosolids) *or* the solid waste regulations (if it is *not* mixed with septage, sludge, or biosolids). Louisiana does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Louisiana

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	-	State Developed Schedule	Dependent upon amount of biosolids produced
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	Yes	-	State requirement of 1/year	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	-	State Developed Schedule	Dependent upon amount of biosolids produced
Pathogen reduction (Class A or B)	-	Yes	-	State Developed Schedule	Dependent upon amount of biosolids produced
Vector attraction reduction (VAR)	-	Yes	-	State Developed Schedule	Dependent upon amount of biosolids produced

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?		
		Yes/No	In accordance with Part 503 requirements		Other... please specify	Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	Yes	-		State developed schedule	Electronic	No	All submittals can be obtained by contacting the Department's Record Section at (225) 219-3168 or <a href="http://www.doe.louisiana.gov">http://www.doe.louisiana.gov</a>
Part 503 metals	Yes	-		State devlped sched	Electronic	No	-
Other metals	No	-		-	-	-	-
Dioxins/furans	No	-		-	-	-	-
PCBs	Yes	-		1/year	Electronic	No	-
Priority pollutants	No	-		-	-	-	-
Other organic compounds	No	-		-	-	-	-
Radioactive isotopes	No	-		-	-	-	-
Nutrients (N, P, K)	Yes	-		Utilized only for Agronomic Rate Determiniations	Electronic	No	-
Cumulative Pollutant Loading Rates	Yes	-		State developed schedule	Electronic	No	-
How biosolids achieve Class A or B	Yes	-		Pathogen testing w/reporting by state developed schedule and monitoring of process (process monitoring records)	Electronic	No	-
How biosolids achieve Vector Attraction	Yes	-		Same as Class A or Class B	Electronic	No	-
Solids stabilization processes used	Yes	-		Monitoring of process (process monitoring records remain on site)	Electronic	No	-
Other biosolids treatments	Yes	-		-	Electronic	No	-
End use/disposal practice	Yes	-		Only as part of the permit application	Electronic	No	-

## Louisiana

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
4,506,685	43,561	103	5,071,537	20,368	0.011	0.4%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
		<b>57,235</b>	<b>57,500</b>		112,482	no data
<b>Total Number of TWTDS in 2004**:</b>		From CWNS	From Survey Q24			
		353	73			
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		0				
Number of operating sludge incinerators:		2				
Fluidized bed:		1				
Multiple hearth:		1				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b> Dry Metric Tons						

NOTES: Data in these tables are from EPA Region 6, with some information from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. The data on total biosolids used and disposed represents ~80% of wastewater flow, according to CWNS data.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Beneficial Use	20	9,818	17%	This is the total "Land Applied," according to EPA Region 4 data.
Disposal	34	42,936	75%	
Other	19	4,481	8%	
Total	73	<b>57,235</b>	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	16	4,909	9%	The total "Land Applied," according to EPA Region 4 data, was assumed to be half Class A general distribution and half Class B agricultural land application.
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	4	4,909	9%	
Total	20	9,818	17%	
Long-term storage	19	4,481	8%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	31	29,577	52%	
Surface Disposal	1	59	0%	
Incineration	2	13,300	23%	
	34	42,936	75%	

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:  The total "Land Applied," according to EPA Region 4 data, was assumed to be half Class A and half Class B. The quality of most of the state's solids is unknown, in large part because incinerated and landfilled biosolids are not regularly tested and may not have to meet Class A or Class B standards.
Class A EQ	4	4,909	9%	
Other Class A	0	-	0%	
Class B	12	4,909	9%	
Other (no data, etc.)	57	47,418	83%	
Total	73	57,236	100%	

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	no data	no data	
Digestion-anaer./other	no data	no data	
Lime/Alkaline	no data	no data	
Composting	no data	no data	
Thermal (not incineration)	no data	no data	
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

# National Biosolids Quality and End Use Survey

## Summary of state coordinator response for coordinator review

### Maine

#### REGULATION AND PERMITTING

Delegated by EPA for biosolids? Maine will not seek delegation for 40 CFR Part 503.

State agency regulating biosolids: The Solid Waste Division of the Maine Department of Environmental Protection regulates biosolids and utilizes solid waste licenses/permits to regulate end use and disposal. Land application sites are permitted as separate general permits and separate site specific permits.

Holder of liability: Maine does not allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Maine does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, but this is not being done.

NPDES equivalent: MEPDES is the state program equivalent to the federal NPDES program.

Number of full-time equivalent staff (FTEs) for biosolids program: 6 (but they also spend time on septage).

Biosolids regulations updated: December 1999.

Management practices: The management practices of Maine's biosolids regulations are more restrictive than the federal Part 503 rule and include site permits, setbacks, soil testing, monitoring, nutrient management planning, and more for Class B land application programs.

Maine's pathogen and/or vector attraction reduction limits are not more restrictive than Part 503. The pollutant (trace metals, etc.) limits are more restrictive and the testing requirements are far greater than Part 503. Maine requires additional monitoring at Class B land application sites, with nutrient testing annually. Nitrogen and phosphorus are the basis for the agronomic loading rate for land application. Maine does require formal nutrient management plans. Maine uses time of year, site limitations, increased distance to surface water, total P in soil, and slope to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Maine requires the following oversight and certification to occur at biosolids land application sites: odors must be controlled to avoid any nuisance.

Acres applied: Maine DEP has not tabulated acreage on which Class B biosolids was utilized; acreage on which Class A sewage sludge is land-applied is not reported to DEP. In 2004, two new site permits/approvals were issued.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the Maine Department of Environmental Protection.

Some of the data and reports are compiled electronically using Excel.

Legislative, regulatory, or other activity impacting biosolids use/disposal: There is no legislative or regulatory activity concerning biosolids management happening or imminent in Maine. As of today, local units of government are not allowed to adopt ordinances that are more restrictive than state law; however, there are several towns that have done so, but a legal challenge to one (Brunswick) in 2007 resulted in court annulment of the ordinance's restriction on use of

biosolids. The number of other local ordinances is remaining the same, although their legality may now be in question.

## TRENDS

The beneficial use of biosolids is not increasing in Maine. Beneficial use has remained relatively level over the past few years, although, during the past decade, there has been a steady shift from Class B land application to forms of Class A distribution and use (mostly compost).

### Most significant current pressures on biosolids recycling:

1. Public concerns about biosolids use on soils.
2. Stricter state regulations, including nutrient management and stockpiling requirements.

## SEPTAGE MANAGEMENT

### Septage regulations updated: 1996

Number of full-time equivalent staff (FTEs) for septage program: The six residuals utilization program staff are responsible for septage licensing, compliance, and enforcement in addition to their responsibilities of overseeing biosolids and other residuals (such as paper mill residuals).

Septage haulers based in state: There are 235 licensed septage haulers in Maine.

Septage management: Maine has Septage Management Regulations. Each site upon which septage is land applied must be individually licensed. Licenses are issued for a five-year term and are renewable. Septage storage facilities must also be licensed. Septage can be land applied if it meets Part 503 and all requirements of the state regulations. POTWs are not required to accept septage, but some do.

### Percentage of each management practice:

- Land applied = 25 %
- Hauled to TWTDS = 50 %
- Disposed of in lagoons = There are no septage-only lagoons in Maine and this is not allowed as a disposal practice.
- Composted = 25 %

Other concerns: Maine has some concerns about fats, oils, and grease (FOG), but does not regulate the use and disposal of brown grease and other forms of FOG through any special program – most is treated like septage, because it tends to be mixed with septage.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Maine

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	-	-	Depends on the amount of sewage sludge generated
Other metals (boron, silver...)	No	Yes	-	-	Depends on the amount of sewage sludge generated, facility inputs and design flow.
Dioxins/furans	No	Yes	-	-	Depends on the amount of sewage sludge generated, facility inputs and design flow.
PCBs	No	Yes	-	-	Depends on the amount of sewage sludge generated, facility inputs and design flow.
Priority pollutants	No	Yes	-	-	Depends on the amount of sewage sludge generated, facility inputs and design flow.
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	Yes	-	-	Depends on the amount of sewage sludge generated, facility inputs and design flow.
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	
Nutrients (NPK)	No	Yes	-	-	Depends on the amount of sewage sludge generated.
Pathogen reduction (Class A or B)	No	Yes	-	-	Depends on the amount of sewage sludge.
Vector attraction reduction (VAR)	No	Yes	-	-	Depends on the amount of sewage sludge generated.

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	-	-	Both	-	-
Part 503 metals	Yes	-	-	Both	-	-
Other metals	Yes	-	-	Paper	-	-
Dioxins/furans	Yes	-	-	Both	-	-
PCBs	Yes	-	-	Paper	-	-
Priority pollutants	Yes	-	-	Paper	-	-
Other organic compounds	Yes	-	-	Paper	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	-	-	Paper	-	-
Cumulative Pollutant Loading Rates	Yes	-	-	Paper	-	-
How biosolids achieve Class A or B	Yes	-	-	Paper	-	-
How biosolids achieve Vector Attraction	Yes	-	-	Paper	-	-
Solids stabilization processes used	Yes	-	-	Paper	-	-
Other biosolids treatments	Yes	-	-	Paper	-	-
End use/disposal practice	Yes	-	-	Both	-	-

## Maine

	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland at typical rate (~ 3 dry ton/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
Estimated population	1,314,985	30,861	43	536,839	5,929	0.060
<b>Total Biosolids Used or Disposed in 2004*:</b>						
From State Survey Q24		<b>Adjusted Estimate</b>				
	32,208	<b>32,200</b>				
<b>Total Number of TWTDS in 2004**:</b>	From CWNS 148	From Survey Q24 103				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		4				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
<b>UNITS:</b> Dry U.S. Tons						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

28,149 25,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator and individual TWTDS data provided by Maine DEP. In that data, 46 TWTDS reported zero wastewater solids production in 2004 (35 were lagoon systems that would not produce solids most years). Some TWTDS are counted more than once in the totals, below, because they used more than one method of use or disposal. Data received in cubic yards were converted to dry U. S. tons, assuming 1700 lbs/yard and 22% solids for dewatered wastewater solids.

Biosolids Use and Disposal Summary (2004 data)			
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	86	25,549	79%
Disposal	10	6,169	19%
Other	7	490	2%
Total	103	32,208	100.00%
Beneficial Use			
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Agricultural	31	10,549	33%
Forestland	0	-	0%
Reclamation	0	-	0%
Class A EQ Distribution	55	15,000	47%
Total	86	25,549	79%
Long-term storage	7	490	2%
Disposal			
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
MSW landfill (incl dly cvr)	10	6,169	19%
Surface Disposal	0	-	0%
Incineration	0	-	0%
	10	6,169	19%

### NOTES:

Quantities are for wastewater solids coming from TWTDS, not quantities of final compost or N-Viro products, the mass of which will be significantly larger.

7 TWTDS stockpiled 490 dry U. S. tons in 2004.

### NOTES:

Agricultural land application of Class B biosolids in Maine is diminishing (of the total, about 4145 dry U. S. tons is Class B land application), but agricultural use of Class A N-Viro biosolids (produced by Soil Preparation, Inc.) was increasing in 2004.

A plurality of TWTDS in Maine send wastewater solids to the New England Organics Hawk Ridge Compost Facility for composting. However, Class A EQ distribution also includes two cities sending 3,565 dry U.S. tons to compost in Quebec.

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	55	21,404	66%	Approximately 70% of the Class A EQ product (compost) is distributed to a variety of landscaping and horticultural uses and about 30% is treated by N-Viro process and land applied to farm fields.
Other Class A	0	-	0%	
Class B	31	4,145	13%	
Other (no data, etc.)	20	6,659	21%	Landfilled and stockpiled solids comprise the amounts for which there is no data on
Total	106	32,208	100%	

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		
Aerobic Digestion	no data	no data		
Digestion-anaer./other	one or two	no data		
Lime/Alkaline	many	no data		
Composting	many	no data		
Thermal (not incineration)	0	no data		
Long-term (lagoons, reed beds, etc.)	several	no data		
Other		no data		
Belt Filter Press	many	no data		
Plate & Frame Press	some	no data		
Screw Press	several	no data		
Centrifuge	few to none	no data		
Vacuum Filter		no data		
Drying beds		no data		
Other		no data		

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Maryland**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Maryland is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The solid waste portion of Maryland's environmental agency regulates biosolids and utilizes solid waste licenses/ permits to regulate end use and disposal. Land application sites are permitted using separate site-specific permits.

Holder of liability: Maryland does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use. There are five land applicators or land owners that hold such liability.

More than one Class B biosolids on one site? Maryland does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year; this is being done, but the number of sites involved is not known.

NPDES equivalent: NPDES is delegated to Maryland's environmental agency water management administration. Not all NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.1 FTE

Biosolids regulations updated: 2000

Management practices: The management practices of Maryland's biosolids regulations are more restrictive than the federal Part 503 rule. Maryland's pathogen and/or vector attraction reduction limits are not more restrictive. Maryland's pollutant (trace metals, etc.) limits are more restrictive. Maryland requires additional monitoring at Class B land application sites, with soil tests after each season of application and prior to a new nutrient management plan. The basis for the agronomic loading rate for land application is calculated from data, submitted by the farmer, regarding his or her three highest crop yields. Maryland does require formal nutrient management plans developed with the assistance of a certified nutrient management planner. Maryland uses time of year, site limitations, increased distance to surface water, total P in soil, available P in soil, P index, and slope to manage or control the application of phosphorus (P) in biosolids.

Additional Management Actions: Maryland requires the following oversight and certification to occur at biosolids land application sites:

- Independent inspections or monitoring at land application sites (which are conducted by the state environmental agency's solid waste program), and
- Other requirements or actions to control odors at land application sites.

In Maryland, it is not known if and when biosolids management groups perform any additional oversight and certification voluntarily.

Acres applied: In 2004, 56 new site permits/approvals were issued.

Reporting and Record-keeping: Both major ( $>$  or  $=$  1 MGD) and minor facilities are required to report biosolids information and data. The public can access these reports by submitting a Freedom of Information Act (FOIA) request to the state agency. The data and reports are compiled electronically with Excel and Access, for tracking only, not reporting.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Maryland, use/disposal is being positively impacted by development of, or changes to, state biosolids regulations. These activities are likely to have the effect of expanding beneficial use. Changes to state statutes regarding biosolids management are happening in Maryland, but will likely have no significant affect on beneficial use. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law; the number that have done so was not reported.

## TRENDS

The beneficial use of biosolids is increasing in Maryland.

Most significant current pressures on biosolids recycling:

1. Over-application rate leading to nutrient leaching
2. Odors
3. Contamination to the waters of the state and groundwater

**TESTING AND REPORTING** No data was provided on state testing and reporting requirements (if they are different from Part 503).

## SEPTAGE MANAGEMENT

Septage regulations updated: Maryland doesn't have septage regulations. Septage management is overseen by counties.

Number of full-time equivalent staff (FTEs) for septage program: 0 / Not applicable.

Septage haulers based in state (estimated): No data provided.

Septage management: Septage can be land applied if it meets the requirements of Part 503.

Some POTWs are required to accept septage, and at least 12 do.

Percentage of each management practice: No data provided.

Other concerns: Maryland does not consider fats, oils, and grease (FOG) to be a significant issue, nor do they regulate the use and disposal of grease trap waste. Maryland does not have a proactive program to collect FOG and keep it out of the general wastewater flow.

## Maryland

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland at were applied to cropland (dry U.S. tons/ac)	Percentage of acres needed if all state biosolids typical rate (~ 3 dry ton/ac)
5,561,332	9,773	569	1,487,218	10,188	0.075	2.5%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	619,201	<b>619,000</b>		91,477	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	151,000
<b>Total Number of TWTDS in 2004**:</b>		From CWNS	From Survey Q24	NOTES: Data in these tables were provided by the state biosolids coordinator and the national Biosolids Quality and End Use Survey. Maryland tracks solids use and disposal in WET U.S. TONS, and the data reported in these tables are in those units. When used with other data to create national totals, we assumed an average 18% solids, resulting in a state total biosolids used or disposed of 111,000 dry U.S. tons. Maryland reports 113 TWTDS that hauled solids to another TWTDS in 2004; these solids are accounted for here in the final production by the receiving TWTDS. Approximately 2,000 wet tons of out-of-state solids were hauled into Maryland for treatment. Another 73,337 wet tons of treated solids were imported from other states or DC and used or disposed in Maryland (this amount is not included in the data in these tables).		
		161	217			
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		3				
Number of operating sludge incinerators:		1				
Fluidized bed:		no data				
Multiple hearth:		no data				
Percent of population served by on-site (e.g. septic systems):		no data				
		<b>UNITS: Wet U.S. Tons</b>				

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:	
Beneficial Use	129	272,362	44%	Hauled out of state to unknown use or disposal.	
Disposal	53	76,521	12%		
Other	35	270,318	44%		
Total	217	619,201	100.00%		
<b>Beneficial Use</b>					
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)		
Agricultural	99	167,089	27%	Includes Baltimore heat-dried biosolids pellets, which are shipped far and wide.	
Forestland	0	-	0%		
Reclamation	20	43,871	7%		
Class A EQ Distribution	10	61,402	10%		
Total	129	272,362	44%		
Other	35	270,318	44%		
<b>Disposal</b>					
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	Includes some Baltimore solids.	
MSW landfill (incl dly cvr)	52	56,659	9%		
Surface Disposal	0	-	0%		
Incineration	1	19,862	3%		
	53	76,521	12%		

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Class A EQ	10	61,402	10%	All data reported by Maryland as land application was assumed to be Class B biosolids.
Other Class A	0	-	0%	
Class B	119	210,960	34%	
Other (no data, etc.)	88	346,840	56%	
Total	217	619,202	100%	

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		
Aerobic Digestion	no data	no data		
Digestion-anaer./other	no data	no data		
Lime/Alkaline	no data	no data		
Composting	no data	no data		
Thermal (not incineration)	no data	no data		
Long-term (lagoons, reed beds, etc.)	no data	no data		
Other	no data	no data		
Belt Filter Press	no data	no data		
Plate & Frame Press	no data	no data		
Screw Press	no data	no data		
Centrifuge	no data	no data		
Vacuum Filter	no data	no data		
Drying beds	no data	no data		
Other	no data	no data		

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Massachusetts**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Massachusetts is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion of Massachusetts' Department of Environmental Protection (MA DEP) regulates biosolids. Site specific permits are used to regulate land application. There are very few land application programs in Massachusetts – and only one Class B program (Hamilton). Class A EQ biosolids from Greater Lawrence and Boston (Mass. Water Resources Authority) are land applied in bulk occasionally for reclamation at landfills or sand and gravel mine sites. Such land application sites must be permitted by MA DEP. Land applied Class A products and Class A biosolids for general distribution require an “Approval of Suitability” from MA DEP, which is awarded to biosolids that have submitted a sampling and analysis plan and the results from the sampling and testing specified by the plan. MA DEP recognizes three types of biosolids/residuals products: Types 1, 2, and 3. Type 1 is essentially equivalent to EPA’s Class A EQ, and Type 2 is essentially the same as EPA’s Class B.

Holder of liability: Data was not provided regarding whether MA allows land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Massachusetts does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, but there is so little Class B land application that it does not happen.

NPDES equivalent: The MA DEP watershed permitting program is the state equivalent to NPDES. All watershed permitting program/NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 1.3

Biosolids regulations updated: September 1992.

Management practices: Massachusetts's biosolids regulations are more restrictive than the federal Part 503 rule. Massachusetts has more restrictive pollutant (trace metals, etc.) limits. Massachusetts does require additional monitoring at Class B land application sites. There are annual testing requirements, and regulations allow for requiring groundwater and soil testing. Nitrogen is the basis for the agronomic loading rate for land application. Massachusetts does not require formal nutrient management plans. Massachusetts uses site-specific tests to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Massachusetts requires the following oversight and certification to occur at biosolids land application sites:

- Other requirements or actions to control odors at land application sites: nuisance controls in MA DEP regulations require that biosolids be applied within 24 hours of delivery, as much as possible, to avoid odor and other potential issues.
- Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing.

In Massachusetts some biosolids management groups perform the following oversight and certification voluntarily:

- Other requirements or actions to control odors at land application sites. These include setbacks.
- Sampling and testing of Class A biosolids for the presence of pathogens if three weeks or more have elapsed since processing. This is dependent on the particular sampling and analysis plan provided to MA DEP by the biosolids manager.

Acres applied: In 2004, Class B biosolids were applied to a total of less than 30 acres. No new biosolids site permits were issued in 2004.

Reporting and Record-keeping: Only biosolids processors are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. The data and reports are compiled electronically using a database and Excel.

Legislative, regulatory, or other activity impacting biosolids use/disposal: Massachusetts does not have any regulatory or legislative activity occurring that will impact biosolids management. MA DEP has long placed minimal emphasis on, and provided limited funding toward, the biosolids/residuals program. Local units of government are allowed to adopt ordinances that are more restrictive than state regulations. A very few towns and cities in Massachusetts have adopted more restrictive biosolids application ordinances (e.g. Uxbridge). The number of such ordinances has not changed in recent years and does not seem likely to.

## TRENDS

The beneficial use of biosolids is increasing slowly in Massachusetts, due to increasing population and increased efficiencies and capacity at existing biosolids treatment facilities (e.g. the compost facility at Marlborough).

Most significant current pressures on biosolids recycling:

1. Public perception
2. Seasonal restrictions
3. Cost

## SEPTAGE MANAGEMENT

Septage regulations updated: April, 2006. Regulated through Title V.

Number of full-time equivalent staff (FTEs) for septage program: 0 – Septage management is handled by wastewater staff, when necessary. Most septage is discharged and treated at POTWs.

Septage haulers based in state (estimated): No data provided.

Septage management: Septage can not be land applied in Massachusetts. POTWs are not required to accept septage, but at least 80 do so.

Percentage of each management practice:

- Hauled to TWTDS = 100% (on average, each day, 1,547,000 gallons of septage are accepted by MA POTWs, as reported in a 2005-06 MA DEP study)

Other concerns: Massachusetts does not consider fats, oils, and grease (FOG) to be a significant issue, nor does it regulate the use and disposal of grease trap waste. Massachusetts does not have a proactive program to collect FOG and keep it out of the general wastewater flow. Grease is addressed through state plumbing codes (requirements include traps, regular inspections, pumping by an approved hauler, etc.). Some local POTWs do more than others to enforce keeping FOG out of sewers at the local level (e.g. Newburyport).

## MORE INFORMATION

<http://www.mass.gov/dep/water/wastewater/residual.htm>

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Massachusetts

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes			< 1mgd, no industrial = 6 months < 1 mgd, industrial = 3 months
Other metals (boron, silver...)		Yes			1-5 mgd = 3 months > 5 mgd = 1 month
Dioxins/furans		Yes			
PCBs		Yes			
Priority pollutants		Yes			
Other organic compounds (e.g. PDBEs, pharmaceuticals)					
Radioactive isotopes (alpha, beta, Ra 224, etc.)					
Nutrients (NPK)		Yes			
Pathogen reduction (Class A or B)		Yes			
Vector attraction reduction (VAR)					

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?		
		Yes/No	In accordance with Part 503 requirements		Other... please specify	Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	-	-	-	-	-	-	-
Part 503 metals	-	-	-	-	-	-	-
Other metals	-	-	-	-	-	-	-
Dioxins/furans	-	-	-	-	-	-	-
PCBs	-	-	-	-	-	-	-
Priority pollutants	-	-	-	-	-	-	-
Other organic compounds	-	-	-	-	-	-	-
Radioactive isotopes	-	-	-	-	-	-	-
Nutrients (N, P, K)	-	-	-	-	-	-	-
Cumulative Pollutant Loading Rates	-	-	-	-	-	-	-
How biosolids achieve Class A or B	-	-	-	-	-	-	-
How biosolids achieve Vector Attraction	-	-	-	-	-	-	-
Solids stabilization processes used	-	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-	-
End use/disposal practice	-	-	-	-	-	-	-

## Massachusetts

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
6,407,382	7,840	817	207,734	4,898	0.818	27.3%
<b>Total Biosolids Used or Disposed in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
		153,235	153,300		160,764	269,000
<b>Total Number of TWTDS in 2004**:</b>		From CWNS	From Survey Q24			
		128	128			
Total number of TWTDS sending to Separate Preparers in 2004:		21				
Number of Separate Preparers:		7				
Number of operating sludge incinerators:		5				
Fluidized bed:		1				
Multiple hearth:		4				
Percent of population served by on-site (e.g. septic systems):		40%				
UNITS: <b>Dry U.S. tons</b>						

<b>Biosolids Use and Disposal Summary (2004 data)</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Beneficial Use	17	53,513	35%	
Disposal	110	99,146	65%	
Other	1	576	0%	
Total	128	153,235	100%	This is one facility that reports storage in a lagoon; there may be other small facilities doing this as well.
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	2	587	0%	
Forestland	0	-	0%	
Reclamation	0	-	0%	
Class A EQ Distribution	15	52,926	35%	In addition to the separate preparers listed in the note above and the products they produce, the Class A EQ distribution here includes utilities that compost their own biosolids, including as Billerica, Dartmouth, Mansfield, Pepperell, and Williamstown.
Total	17	53,513	35%	
Long-term storage	1	576	0%	
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	21	41,588	27%	60% of the landfilled quantity is landfilled out of state.
Surface Disposal	0	-	0%	MA incinerators are located at the following TWTDS: Brockton, Fall River, Fitchburg, Lynn, and Upper Blackstone (Worcester area). Some MA TWTDS send solids to incinerators in RI and CT.
Incineration	89	57,558	38%	
	110	99,146	65%	

### Biosolids Quality Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	15	52,926	35%
Other Class A	0	-	0%
Class B	2	587	0%
Other (no data, etc.)	110	99,722	65%
Total	127	153,235	100%

### Summary of Current Biosolids Treatment Practices

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	no data	no data	
Digestion-anaer./other	no data	no data	
Lime/Alkaline	no data	no data	
Composting	no data	no data	
Thermal (not incineration)	no data	no data	
Long-term (lagoons, reed beds, etc.)	no data	no data	
Other	no data	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vacuum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Michigan**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Michigan received delegation for Part 503 in 2006.

State agency regulating biosolids: The water/ wastewater portion of Michigan's environmental agency regulates biosolids and utilizes both specific and general NPDES type permits to regulate end use and disposal and land application sites.

Holder of liability: Michigan does not allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Michigan does not allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year.

NPDES equivalent: Michigan is delegated for NPDES.

Number of full-time equivalent staff (FTEs) for biosolids program: 5.5

Biosolids regulations updated: November 1999.

Management practices: The management practices of Michigan's biosolids regulations are more restrictive than the federal Part 503 rule and are detailed in the State's Part 24 Rules (available at the state DEQ website). Michigan's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive. Michigan does not require additional monitoring at Class B land application sites. Nitrogen and phosphorus are the basis for the agronomic loading rate for land application. Michigan does not require formal nutrient management plans. Michigan uses testing based on available P in the soil to manage or control the application of phosphorus in biosolids.

Additional Management Actions: None described.

Acres applied: The state has not compiled information on how many acres biosolids were applied to in 2004 or how many new site permits/approvals were issued that year; however, this information is available on paper from the DEQ.

Reporting and Record-keeping: Both major and minor facilities are required to report biosolids information and data to the State. The public can access these reports by mail or in person from the state agency. Some of the data submitted are compiled electronically in Michigan's NPDES Management System (NMS).

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Michigan, there are no legislative or regulatory activities happening or imminent that will significantly impact biosolids management. As of today, local units of government are allowed – but only with DEQ's approval – to adopt ordinances that are more restrictive than state law. One town in Michigan has adopted a more restrictive biosolids application ordinance, and the number of such towns is not increasing.

### **TRENDS**

The beneficial use of biosolids is not increasing in Michigan. This is due to cheap landfill and disposal rates.

Most significant current pressures on biosolids recycling:

1. Inexpensive landfill tipping fees.

2. Competition for land from combined animal feeding operations (CAFOs).
3. The state requires a per-ton land application fee, and there is no fee for landfilling or incinerating.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: 1994 (Part 117, a law; there are no regulations)

Number of full-time equivalent staff (FTEs) for septage program: 3.5

Septage haulers based in state (estimated): 465

Septage management: Under Part 117, the state licenses septage businesses through a fee-based program; vehicles are licensed as well. On average, there are 203,000,000 gallons of pumped septage used or disposed of each year. There is a one-time fee for each new land application site permit. There are roughly 400 permitted septage land application sites in the state. Land applied septage must meet requirements of Part 503 and state law Part 117, which has more restrictive requirements than Part 503 – soil testing for N & P (total P is limiting factor – 300 pounds / acre limit), agronomic rate applications, ban on winter application when soil is frozen; septage must be screened; surface applied septage must be incorporated in 6 hours or must be direct injected. The state does not require POTWs to accept septage; 18 POTWs have DEQ authorization to accept septage (such authorization is required). Stand-alone septage storage facilities are permitted by the state (requires engineering plans, site plans, etc.). Three counties and two local municipalities have bans or restrictions on land application of septage; however, in general, counties have provided good septage treatment capacity.

Percentage of each management practice:

- Land applied: ~50%
- Hauled to TWTDS: ~50% (average price for disposal at POTWs is 7.5 cents/gallon)
- Septage only facilities: there are 5 stand-alone septage facilities that remove solids and return effluent to POTWs.

Other concerns: Michigan does consider fats, oils, and grease (FOG) to be a significant issue and regulates the use and disposal of grease trap waste. Most POTWs won't accept FOG. The septage law requires mixing FOG 1 to 3 with regular septage for land application or that FOG be taken to a POTW that is willing to receive it.

## **MORE INFORMATION**

[www.michigan.gov/deqseptage](http://www.michigan.gov/deqseptage)

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## **DIFFERENCES BETWEEN 40 CFR PART 503 AND MI BIOSOLIDS REGULATIONS**

### **GENERAL**

- ✓ Michigan rule only addresses that portion of 40 CFR Part 503 dealing with the land application of biosolids, not incineration or surface disposal.
- ✓ Michigan rule does not discriminate between Class 1 sludge management facilities, i.e. design flow > 1 mgd and serving >10,000 people and other land applying facilities.

- ✓ Michigan rule adds definitions to include: Act, distributor, biosolids, derivative, Detroit Consumer Index, generator, Department, exceptional quality, incorporation, injection, land application plan, land with low potential for public exposure, land with high potential for public exposure, listed land application site, local unit, pathogenic organisms, pH, residuals management program, retail, saturated or saturated zone, site, specific oxygen uptake rate (SOUR), surface water, total solids, unstabilized solids, vector attraction, volatile solids and revises the definition of agronomic rate to include “total nutrient management plan.”

## MORE STRINGENT REQUIREMENTS

- ✓ Out-of-state biosolids applied to land in the state is subject to fee requirements and any cost recovery in the case of environmental contamination resulting from the land application of biosolids.

## LOCAL ORDINANCES

- ✓ A local unit may enact, maintain, and enforce an ordinance that prohibits the land application of biosolids or a derivative if monitoring indicates a pollutant concentration in excess of the ceiling concentration limits until subsequent monitoring indicates that pollutant concentrations do not exceed the ceiling concentration limits.
- ✓ Except as otherwise provided, Michigan rule preempts a local ordinance, regulation, or resolution of a local unit that would duplicate, extend, revise, or conflict with existing law.
- ✓ Except as otherwise provided, a local unit shall not enact, maintain, or enforce an ordinance, regulation, or resolution that duplicates, extends, revises, or conflicts with existing state or federal laws.
- ✓ The department may contract with a local unit to act as its agent for the purpose of enforcing existing law.
- ✓ The department has the sole authority to assess fees.

## PERMIT

- ✓ Michigan rule requires a generator or distributor to have a valid permit before land applying or distributing biosolids or a derivative in the state.
- ✓ Michigan rule requires the submittal of a residuals management program (RMP) to be approved by the department as a part of the permitting process. An updated land application site list including the location by latitude and longitude of each site shall be submitted as a part of the RMP. Modifications to the RMP may be made during the 5 year permit cycle according to an approved land application plan which outlines the criteria for adding land application sites to the list for individual facilities.

## FEES

- ✓ Michigan rule requires payment of fees for the land application of biosolids and annual reporting of the amount in dry tons applied to land. The total fee is comprised of a \$400.00 administrative fee plus a dollar amount per dry ton applied to land. Fees generated annually not to exceed \$650,000.
- ✓ By January 31 of each state fiscal year, each biosolids generator or biosolids distributor shall pay its biosolids land application fee.
- ✓ The permittee shall pay an additional amount equal to 0.75% of the payment due for each month or portion of a month that the payment remains past due. The failure by a person to pay a fee imposed by this rule in a timely manner is a violation of this part.

## EXCLUSIONS

- ✓ Michigan rule does not include requirements for the land application of septage or sludges generated in the treatment of industrial wastewater, including sludge generated during the treatment of industrial wastewater combined with domestic sewage.

## APPLICABILITY OF CERTAIN PROHIBITIONS AND MANAGEMENT PRACTICES TO EXCEPTIONAL QUALITY BIOSOLIDS

- ✓ In Michigan rule CPLR tracking requirements and generator notification requirements do not apply when bulk biosolids or a derivative meet criteria for exceptional quality.
- ✓ In Michigan rule restrictions on winter application and slope requirements do not apply when bulk biosolids or a derivative meet criteria for exceptional quality.
- ✓ In Michigan rule certain required prohibitions and management practices do not apply when non-bulk biosolids or derivatives are sold or given away in a bag or other container and meet criteria for exceptional quality.

## LAND OWNER CONSENT AND AGREEMENTS

- ✓ Michigan rule requires written consent from the property owner or farm operator to land apply biosolids.
- ✓ Michigan rule requires a written agreement between the generator and the farmer not to apply biosolids from other sources or septage to a listed land application site. Biosolids from other sources may be land applied to a site only after that site is relinquished in writing to another generating facility.

## MONITORING FREQUENCY

- ✓ Michigan rule requires that if the monitoring of biosolids or a derivative indicates a pollutant concentration in excess of Table 3-Pollutant Concentrations, then the monitoring frequency shall be increased to not less than twice that provided for in Table 7-Frequency of Monitoring.
- ✓ Michigan rule requires that a person that applies biosolids shall perform soil fertility tests on soils sampled from each application site before initial biosolids application. The person shall resample and test on a regular basis so that the last soil fertility test is not more than 2 years old at the time of the next biosolids application.

## PROHIBITIONS

- ✓ Michigan rule requires that a person shall not knowingly apply biosolids from more than 1 source or septage to the same land application site within the same crop year.

## NOTIFICATION

- ✓ Michigan rule requires written notification of land application activity not less than 10 days prior to the initial land application activity at a site to the following locations: District office of the Surface Water Quality Division, DEQ; County health department and the city, village or township clerk in the jurisdiction where land application sites are identified.
- ✓ Michigan rule requires that a generator or distributor shall promptly provide a copy of any record required to be created under these rules to the appropriate county health department and the city, village, or township clerk when biosolids are applied to land in that local unit. The copy shall be delivered free of charge.

## MANAGEMENT PRACTICES

- ✓ Michigan rule requires that for agricultural land, if the Bray P1 soil test level exceeds 300 pounds (P) per acre (150 ppm), or if the Mehlich 3 soil test level exceeds 340 pounds (P) per acre (170 ppm) in site soils, then the person shall not apply biosolids until the soil P test level decreases to less than 1 of these values.
- ✓ Michigan rule requires that for silvicultural land, such as forest land and tree farms, a person shall base the agronomic rate for silvicultural land on the quantity of plant-available nitrogen (PAN) that growing trees will take up annually. A person may reapply biosolids at rates that will provide PAN additions up to a maximum of 5 years, using the annual PAN additions listed in table 5 [R323.2410(10)] to calculate total PAN additions for 1 year up to a 5- year maximum for the particular tree species and age of the stand receiving biosolids. A person may reapply biosolids after the time interval selected for the previous application expires, as long as the trees are still growing.
- ✓ Michigan rule requires that for silvicultural land, if the Bray P1 soil test level exceeds 200 pounds (P) per acre (100 ppm) or the Mehlich 3 soil test level exceeds 220 pounds (P) per

acre (110ppm), then a person shall not apply biosolids until the soil P test level decreases to less than 1 of these values.

- ✓ Michigan rule requires that certain slope restrictions and isolation distances be observed when land applying biosolids, including depth to groundwater.
- ✓ Michigan rule requires that a person may subsurface inject bulk biosolids on frozen or snow-covered ground as long as there is substantial soil coverage of the applied biosolids.
- ✓ Michigan rule requires that a person shall not surface apply bulk biosolids, other than exceptional quality biosolids, on frozen or snow-covered ground, unless otherwise approved by the department.

## RECORDKEEPING AND REPORTING

- ✓ Michigan rule requires that a generator or preparer of biosolids retain for 5 years, unless a longer period is specified: the annual average, annual minimum and annual maximum concentration of the required pollutants monitored in biosolids.
- ✓ Michigan rule requires that a generator or distributor that land-applied biosolids or a derivative to land within the state at any time during the previous state fiscal year shall report to the department the required information on or before October 30.
- ✓ Michigan rule requires that each biosolids generator and biosolids distributor shall annually report to the department for each state fiscal year, beginning with the 1997 state fiscal year, the number of dry tons of biosolids it generated or the number of dry tons of biosolids in derivatives it distributed that were applied to land in the state of Michigan in the state fiscal year.
- ✓ The report is due 30 days after the end of the state fiscal year. By December 15 of each state fiscal year, the department shall determine the generation fee on a per dry ton basis.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Michigan

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	Yes, Part 24 Rules	-
Other metals (boron, silver...)	-	-	-	-	-
Dioxins/furans	-	-	-	-	-
PCBs	-	-	-	-	-
Priority pollutants	-	-	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	-	-	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	-	-	-	-	-
Nutrients (NPK)	No	Yes	Yes	-	-
Pathogen reduction (Class A or B)	No	Yes	Yes	-	-
Vector attraction reduction (VAR)	No	Yes	Yes	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	-	Specified in Part 24 Rules	Both	Yes	<a href="http://www.michigan.gov/deq/1,1607,7-135-3313_3683_3720--,00.html">http://www.michigan.gov/deq/1,1607,7-135-3313_3683_3720--,00.html</a>
Part 503 metals	Yes	Yes	-	Both	No	-
Other metals	-	-	-	-	-	-
Dioxins/furans	-	-	-	-	-	-
PCBs	-	-	-	-	-	-
Priority pollutants	-	-	-	-	-	-
Other organic compounds	-	-	-	-	-	-
Radioactive isotopes	-	-	-	-	-	-
Nutrients (N, P, K)	Yes	Yes	-	Both	No	-
Cumulative Pollutant Loading Rates	Yes	Yes	-	Paper	No	-
How biosolids achieve Class A or B	Yes	Yes	-	Paper	No	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Paper	No	-
Solids stabilization processes used	-	-	-	-	-	-
Other biosolids treatments	-	-	-	-	-	-
End use/disposal practice	Yes	Yes	-	Both	No	-

## Michigan

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi.)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
10,104,206	56,803	178	7,983,574	47,904	0.047	1.6%
<b>Total Biosolids Generated in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>			Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)	Dry tons, reported to BioCycle Survey (Goldstein, 2000)
		<b>373,516</b>	<b>374,000</b>		290,354	260,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	404	214				
Total number of TWTDS sending to Separate Preparers in 2004:						
			0			
Number of Separate Preparers:						
			0			
Number of operating sludge incinerators:						
			6			
Fluidized bed:						
			0			
Multiple hearth:						
			5			
Percent of population served by on-site (e.g. septic systems):						
			35%			
UNITS: <b>Dry U.S. Tons</b>						

### Estimates from other sources:

Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)

Dry tons, reported to BioCycle Survey (Goldstein, 2000)

260,000

NOTES: Data in these tables are from the national Biosolids Quality and End Use Survey completed by the state biosolids coordinator. In Michigan, 201 facilities used or disposed of biosolids in 2004 (13 of them land applied and disposed, resulting in the 214 counted in these tables). The other 518 TWTDS are lagoon systems or small package plants (such as mobile home parks) that have their partially stabilized solids hauled to larger TWTDS. Two facilities land applied in WI; the quantity of biosolids involved is not known.

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	174	88,312	24%
Disposal	40	285,204	76%
Other	0	-	0%
Total	214	<b>373,516</b>	100.00%

#### Beneficial Use

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Agricultural	170	87,186	23%
Forestland	1	202	0%
Reclamation	3	924	0%
Class A EQ Distribution	0	-	0%
Total	174	88,312	24%
Long-term storage	0	-	0%

#### NOTES:

Beneficial use in Michigan is almost all Class B land application to agricultural lands. Excanaba applied to forestland, and Marquette, Rogers City, and Portage Lake biosolids were used for mine reclamation in old copper mining areas.

#### Disposal

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
MSW landfill (incl dly cvr)	34	109,333	29%
Surface Disposal	0	-	0%
Incineration	6	175,871	47%
	40	285,204	76%

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	3	1,359	2%
Other Class A	0	-	0%
Class B	171	87,257	98%
Other (no data, etc.)	545	-	0%
Total	719	88,616	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...		NOTES: Data in this table is from 2006; 2004 data was unavailable.
Aerobic Digestion	1	312		
Digestion-anaer./other	0	-		
Lime/Alkaline	14	43,340		
Composting	1	200		
Thermal (not incineration)	1	312		
Long-term (lagoons, reed beds, etc.)	no data	no data		
Other	no data	no data		
Belt Filter Press	no data	no data		
Plate & Frame Press	no data	no data		
Screw Press	no data	no data		
Centrifuge	no data	no data		
Vaccum Filter	no data	no data		
Drying beds	no data	no data		
Other	no data	no data		

Of the alkaline stabilized solids, 610 dry tons were Class A and the rest were Class B.

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**

**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Minnesota**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Minnesota is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion of Minnesota's environmental agency regulates biosolids and utilizes specific NPDES type permits to regulate end use and disposal. The mechanism for permitting land application involves an individual site approval under the NPDES type permit.

Holder of liability: Minnesota does not allow land applicators or land owners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use.

More than one Class B biosolids on one site? Minnesota does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, but this is not actually being done.

NPDES equivalent: NPDES/SDS is the state equivalent to NPDES. All NPDES/SDS and NPDES permits do not include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 1.5

Biosolids regulations updated: April 1997.

Management practices: The management practices of Minnesota's biosolids regulations are more restrictive than the federal Part 503 rule. These rules include setback requirements for surface water, tile inlets, sinkholes, wetlands, wells, and residences. There are also slope restrictions. Minnesota's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive. Minnesota requires additional monitoring at Class B land application sites, with soil tests for texture, organic matter content, pH, extractable P & K and soluble salts. Nitrogen is the basis for the agronomic loading rate for land application.

Minnesota does not require formal nutrient management plans. For controlling application of phosphorus (P) in biosolids, Minnesota uses the Bray-1 soil test; if a soil tests over 200 ppm, the land applicator must consult USDA Natural Resource Conservation Service (NRCS) to determine what special erosion control measures are required.

Additional Management Actions: Facilities are required to have a Type IV land application certified operator. Certification of these operators is administered by the state.

Acres applied: In 2004, biosolids were applied to a total of 16,722 acres. The number of new site permits/approvals that were issued in 2004 is not tracked.

Reporting and Record-keeping: Both major and minor facilities are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency or from the EPA regional office (for major facilities only). The data and reports are compiled electronically with Oracle.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Minnesota, there are no legislative or regulatory activities happening or imminent that will impact biosolids management. Local units of government outside of the state's seven county metropolitan area are allowed to adopt ordinances that are more restrictive than state law; this is not allowed within the seven county metropolitan area. Ten cities and towns and two counties in Minnesota have

adopted more restrictive biosolids application ordinances. Overall, the number of more restrictive ordinances is increasing.

## **TRENDS**

The beneficial use of biosolids is not increasing in Minnesota.

Most significant current pressures on biosolids recycling:

1. Competition for land due to huge livestock business.
2. Phosphorus issues.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: Minnesota does not have septage regulations, just guidelines.

Number of full-time equivalent staff (FTEs) for septage program: 0.1 - mainly on enforcement of licensed septage pumpers/haulers. MN licenses and takes enforcement actions on pumpers/haulers, even though there are no state septage regulations; violations are usually due to not having a septage pumping/hauling license or due to egregious land application practices.

Septage haulers based in state (estimated): 424 licensed pumpers/haulers

Septage management: Septage can be land applied if it meets the requirements of Part 503.

POTWs are not required to accept septage, and the number that do is not known.

Percentage of each management practice (estimated): 75% land applied, 25% hauled to TWTDS. Less than 1% is disposed of in landfills.

Other concerns: Minnesota does not consider fats, oils, and grease (FOG) to be a significant issue at this time; does not regulate the use or disposal of brown grease (grease trap waste); and has no proactive program for keeping FOG out of the general wastewater flow.

Septage contact: Mark Westpetal (phone 651-296-9322, email mark.westpetal@state.mn.us).

## **ADDITIONAL INFORMATION**

<http://www.dnr.state.mn.us/index.html>

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Minnesota

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	representitive	-
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	Yes only	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	No	Yes	-	-	-
Pathogen reduction (Class A or B)	Test??	Not sure of	-	-	-
Vector attraction reduction (VAR)	Test??	-	-	-	-

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
	Yes/No	In accordance with Part 503 requirements	Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	Yes	-	Both	Yes	X Some reports attached for your reference
Part 503 metals	Yes	-	-	Both	Yes	X
Other metals	No	-	-	-	-	-
Dioxins/furans	No	-	-	-	-	-
PCBs	No	-	-	-	-	-
Priority pollutants	No	-	-	-	-	-
Other organic compounds	No	-	-	-	-	-
Radioactive isotopes	No	-	-	-	-	-
Nutrients (N, P, K)	Yes	I don't think these	-	Both	Yes	X
Cumulative Pollutant Loading Rates	Yes	-	-	Both	Yes	-
How biosolids achieve Class A or B	Yes	Yes	-	Both	-	-
How biosolids achieve Vector Attraction	Yes	Yes	-	Both	-	-
Solids stabilization processes used	Yes	Yes	-	Both	-	-
Other biosolids treatments	-	Yes	-	-	-	-
End use/disposal practice	Yes	-	-	Both	No	-

## Minnesota

Estimated population	Land area (sq. mi.) (www.quickfacts.census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
5,096,546	79,610	64	22,729,158	73,458	0.007	0.2%
<b>Total Biosolids Generated in 2004*:</b>						
	From State Survey Q24	<b>Adjusted Estimate</b>				
	151,942	<b>152,000</b>		95,196	Dry tons, reported to BioCycle Survey (Goldstein, 2000)	265,000
<b>Total Number of TWTDS in 2004**:</b>						
	From CWNS	From Survey Q24				
	516	277				
Total number of TWTDS sending to Separate Preparers in 2004:	2					
Number of Separate Preparers:	0					
Number of operating sludge incinerators:	2					
Fluidized bed: 1 facility -3 beds						
Multiple hearth: 1 facility -2 incinerators						
Percent of population served by on-site (e.g. septic systems):	28%					
UNITS:	<b>Dry U.S. Tons</b>					

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Beneficial Use	254	46,800	31%	
Disposal	7	105,082	69%	
Other	16	60	0%	
Total	277	151,942	100.00%	
<b>Beneficial Use</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Agricultural	250	45,550	30%	
Forestland	0	-	0%	
Reclamation	4	1,250	1%	
Class A EQ Distribution	0	-	0%	
Total	254	46,800	31%	
Long-term storage	16	60	0%	This includes 14 reed beds & 2 facilities that haul biosolids (60 dt) to WI for treatment.
<b>Disposal</b>				
	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
MSW landfill (incl dly cvr)	4	842	1%	
Surface Disposal	1	17,960	12%	
Incineration	2	86,280	57%	
	7	105,082	69%	This incineration results in 17,000 tons of remaining incinerator ash that is disposed of.

### **Biosolids Quality Summary (2004 data)**

	Number of Entities (TWTDS & Sep. Preparers) Producing...	Quantity of Biosolids	Percentage (quantity)
Class A EQ	8	13,000	9%
Other Class A	0	-	0%
Class B	242	32,550	21%
Other (no data, etc.)	27	106,392	70%
Total	277	151,942	100%

### **Summary of Current Biosolids Treatment Practices**

	Estimated Number of TWTDS Using...	Estimated Quantity of Biosolids Produced Using...	
Aerobic Digestion	29	no data	
Digestion-anaer./other	53	no data	
Lime/Alkaline	24	no data	
Composting	0	no data	
Thermal (not incineration)	3	no data	
Long-term (lagoons, reed beds, etc.)	14	no data	
Other	0	no data	
Belt Filter Press	no data	no data	
Plate & Frame Press	no data	no data	
Screw Press	no data	no data	
Centrifuge	no data	no data	
Vaccum Filter	no data	no data	
Drying beds	no data	no data	
Other	no data	no data	

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Mississippi**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Mississippi is planning to seek delegation from USEPA sometime in the future when resources allow.

State agency regulating biosolids: The solid waste portion of Mississippi's environmental agency regulates biosolids and utilizes solid waste permits to regulate end use and disposal and land application sites. This includes the oversight of parts of Part 503 for which they are not delegated, but still regulate (i.e. septage and incineration).

Holder of liability: Mississippi does not allow land applicators or landowners (who are not the TWTDS generator) to become the holder of liability for biosolids end use.

More than one Class B biosolids on one site? Mississippi does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year. This is happening on 2 sites.

NPDES equivalent: Mississippi NPDES is the state equivalent to NPDES. Not all Mississippi NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.7

Biosolids regulations updated: April 2005

Management practices: The management practices of Mississippi's biosolids regulations are more restrictive than the federal Part 503 rule. These regulations include site restrictions for locating a land application site. Mississippi's pathogen and/or vector attraction reduction limits and pollutant (trace metals, etc.) limits are not more restrictive. Mississippi requires additional monitoring at Class B land application sites, with annual soil monitoring at all land application sites; groundwater monitoring may also be required for double cropping. Nitrogen is the basis for the agronomic loading rate for land application. Mississippi does not require formal nutrient management plans. Mississippi uses increased distance to surface water to manage or control the application of phosphorus in biosolids.

Additional Management Actions: Mississippi does not require any additional oversight or certification to occur at biosolids land application sites. In Mississippi, no biosolids management groups perform any additional oversight or certification voluntarily.

Acres applied: In 2004, biosolids were applied to a total of approximately 6,075 acres. In 2004, no new site permits/approvals were issued.

Reporting and Record-keeping: Sludge-only processing facilities are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency. The data and reports are not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Mississippi, use/disposal is being positively impacted by development of, or changes to, state biosolids regulations regarding biosolids management. These activities are likely to have the effect of expanding beneficial use. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law, but none do.

## **TRENDS**

The beneficial use of biosolids is increasing in Mississippi. Beneficial use is increasing because it is a better and cheaper way to manage biosolids, and it also helps save costly space at MSW landfills.

### **Most significant current pressures on biosolids recycling:**

1. Lack of necessary resources to seek Part 503 delegation from USEPA.
2. Making further changes to the state regulations for biosolids management.
3. Generating an annual report on land application activities conducted in Mississippi.
4. Creating a biosolids website.
5. Public concern.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: 2002

Number of full-time equivalent staff (FTEs) for septage program: 2

Septage haulers based in state (estimated): 63

Septage management: 50% of the state's population relies on septic systems. Septage can be land applied if it meets part 503. POTWs are not required to accept septage. The number of POTWS that do is not known. Most major cities do.

Percentage of each management practice:

- Hauled to TWTDS = 100 %

Other concerns: Mississippi considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste falls under the solid waste rules. Mississippi has a proactive program to collect FOG and keep it out of the general wastewater flow. The state Health Department and /or local government entities conduct periodic inspections to ensure proper collection of FOG wastes. MDEQ regulates the disposal of FOG wastes through its solid waste program.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Mississippi

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)	No	Yes	Yes	-	Depends on the amount of biosolids used
Other metals (boron, silver...)	No	No	-	-	-
Dioxins/furans	No	No	-	-	-
PCBs	No	No	-	-	-
Priority pollutants	No	No	-	-	-
Other organic compounds (e.g. PDBEs, pharmaceuticals)	No	No	-	-	-
Radioactive isotopes (alpha, beta, Ra 224, etc.)	No	No	-	-	-
Nutrients (NPK)	-	Yes	Yes	-	Depends on the amount of biosolids used
Pathogen reduction (Class A or B)	-	Yes	Yes	-	Depends on the amount of biosolids used
Vector attraction reduction (VAR)	-	Yes	Yes	-	Depends on the amount of biosolids used

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?			
		Yes/No	In accordance with Part 503 requirements		Other... please specify	Paper/Electronic	Yes/No	
The amounts of biosolids/sewage sludge used or disposed	Yes	-		semi-annual		Paper	No	-
Part 503 metals	Yes	-		semi-annual		Paper	No	-
Other metals	No	-		-		-	-	-
Dioxins/furans	No	-		-		-	-	-
PCBs	No	-		-		-	-	-
Priority pollutants	No	-		-		-	-	-
Other organic compounds	No	-		-		-	-	-
Radioactive isotopes	No	-		-		-	-	-
Nutrients (N, P, K)	Yes	-		semi-annual		Paper	No	-
Cumulative Pollutant Loading Rates	Yes	-		annual		Paper	No	-
How biosolids achieve Class A or B	Yes	-		semi-annual		Paper	No	-
How biosolids achieve Vector Attraction	Yes	-		semi-annual		Paper	No	-
Solids stabilization processes used	No	-		-		-	-	-
Other biosolids treatments	No	-		-		-	-	-
End use/disposal practice	Yes	-		semi-annual		Paper	No	-

## Mississippi

	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
Estimated population	2,900,768	46,906	62	5,822,786	29,021	0.010
						0.3%
<b>Total Biosolids Used or Disposed in 2004*:</b>	From State Survey Q24 <b>54,200</b>	<b>Adjusted Estimate 61,000</b>	Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004) 60,847	Dry tons, reported to BioCycle Survey (Goldstein, 2000) no data		
<b>Total Number of TWTDS in 2004**:</b>	From CWNS 317	From Survey Q24 24				
Total number of TWTDS sending to Separate Preparers in 2004:		0				
Number of Separate Preparers:		4				
Number of operating sludge incinerators:		0				
Fluidized bed:		0				
Multiple hearth:		0				
Percent of population served by on-site (e.g. septic systems):		no data				
UNITS:	<b>Dry U.S. Tons</b>					

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)	NOTES:
Beneficial Use	24	54,200	100%	This is land applied biosolids, most likely all Class B.
Disposal		no data		
Other		no data		
Total				

### INCOMPLETE DATA

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.

**National Biosolids Quality and End Use Survey, May 2006**  
**SUMMARY OF STATE COORDINATOR RESPONSES**

## **Missouri**

### **REGULATION AND PERMITTING**

Delegated by EPA for biosolids? Missouri is not planning to seek delegation from the USEPA for Part 503.

State agency regulating biosolids: The water/ wastewater portion of Missouri's environmental agency (the Department of Natural Resources) regulates biosolids and utilizes specific NPDES type permits to regulate end use and disposal and land application sites.

Holder of liability: Missouri does allow land applicators or landowners (who are not the TWTDS generator) to become the holder of legal liability for biosolids end use, but the number that do so is not known.

More than one Class B biosolids on one site? Missouri does allow Class B biosolids from more than one TWTDS to be land applied on the same site in the same crop year, but it was not reported whether this is being done at any sites.

NPDES equivalent: Missouri is delegated for NPDES. All NPDES permits include requirements for biosolids use or disposal.

Number of full-time equivalent staff (FTEs) for biosolids program: 0.01

Biosolids regulations updated: They were created in 1982.

Management practices: As of today, Missouri's biosolids regulations are generally not more restrictive than the federal Part 503 rule, although the state requires state operating permits for all persons who operate, use, or maintain facilities for the storage, treatment, or disposal of sewage sludge and/or biosolids, as well as construction permits for those who build such facilities.

Otherwise, the federal Part 503 regulations determine all requirements and management practices in Missouri. Missouri does not require additional monitoring at Class B land application sites.

Nitrogen is the basis for the agronomic loading rate for land application. Missouri does not require formal nutrient management plans. The state uses a test of available phosphorus (P) in soil to manage or control the application of P in biosolids.

Additional Management Actions: Missouri does not require any additional oversight or certification to occur at biosolids land application sites, but some biosolids management groups perform the following oversight and certification voluntarily:

- Certification of biosolids land applicators who manage or implement land application programs, and
- Sampling and testing of Class A biosolids for the presence of pathogens, if three weeks or more have elapsed since processing.

Acres applied: How much biosolids were applied to land in Missouri in 2004 was not reported.

Reporting and Record-keeping: Both major and minor facilities, along with sludge-only processing facilities, are required to report biosolids information and data. The public can access these reports by mail or in person from the state agency and from the EPA regional office. The data and reports are not compiled electronically.

Legislative, regulatory, or other activity impacting biosolids use/disposal: In Missouri, there are no legislative or regulatory activities happening or imminent that are likely to impact biosolids

management. As of today, local units of government are allowed to adopt ordinances that are more restrictive than state law, but the number that have done so was not reported.

## **TRENDS**

The beneficial use of biosolids is increasing in Missouri, because more is being produced.

Most significant current pressure on biosolids recycling: Limited land base.

## **SEPTAGE MANAGEMENT**

Septage regulations updated: This was not reported.

Number of full-time equivalent staff (FTEs) for septage program: 0.01

Septage haulers based in state (estimated): 50

Septage management: Septage can be land applied if it meets Part 503 and the following additional requirements: it must be lime stabilized. POTWs are not required to accept septage. The number of TWTDS accepting septage is not known.

Percentage of each management practice:

- Land applied = 40 %
- Hauled to TWTDS = 45 %
- Sent to septage only facility = 15 %

Other concerns: Missouri considers fats, oils, and grease (FOG) to be a significant issue, and the use and disposal of grease trap waste is regulated through conditions in a general permit.

Missouri has a proactive program, in pretreatment regulations, to collect FOG and keep it out of the general wastewater flow.

## BIOSOLIDS TESTING & REPORTING REQUIREMENTS - 2006

State: Missouri

**Current testing requirements, 2006:** for each of the following constituents in biosolids, indicate if testing is required by your state:

TESTING	...for all sewage sludge or biosolids	...for biosolids being beneficially used as fertilizers and soil amendments	FREQUENCY OF TESTING...		IF frequency depends on wastewater flow or amount of biosolids used or disposed of, please explain:
			In accordance with Part 503 requirements	Other...Please specify:	
Part 503 metals (As, Cu, Hg, etc.)			X		
Other metals (boron, silver...)			X		
Dioxins/furans					
PCBs					
Priority pollutants					
Other organic compounds (e.g. PDBEs, pharmaceuticals)					
Radioactive isotopes (alpha, beta, Ra 224, etc.)					
Nutrients (NPK)				X	
Pathogen reduction (Class A or B)					
Vector attraction reduction (VAR)					

**Current reporting requirements, 2006:** for each of the following, indicate what TWTDS and/or biosolids preparers must report to the state:

REPORTING:	Reporting required?	Frequency of reporting		How is the data stored by the state?	Is data compiled by the state in reports or summaries?	
		Yes/No	In accordance with Part 503 requirements		Paper/Electronic	Yes/No
The amounts of biosolids/sewage sludge used or disposed	Yes	X		Paper	No	
Part 503 metals						
Other metals						
Dioxins/furans						
PCBs						
Priority pollutants						
Other organic compounds						
Radioactive isotopes						
Nutrients (N, P, K)	Yes				No	
Cumulative Pollutant Loading Rates						
How biosolids achieve Class A or B						
How biosolids achieve Vector Attraction						
Solids stabilization processes used						
Other biosolids treatments						
End use/disposal practice						

## Missouri

	Land area (sq. mi.) (www.quickfacts. census.gov)	Pop. Density (pop/sq.mi)	Total Cropland in Farms (acres, USDA, 2002)	Number of Farms With That Total Cropland (USDA, 2002)	Application rate if all state biosolids (adj. estimate) were applied to cropland (units/ac)	Percentage of acres needed if all state biosolids were applied to cropland at typical rate (~ 3 dry ton/ac)
Estimated population	5,759,532	68,885	84	18,884,920	89,662	0.009
						0.3%
<b>Total Biosolids Used or Disposed in 2004*:</b>	From State Survey Q24  -  <b>Total Number of TWTDS in 2004**:</b> From CWNS 732	<b>Adjusted Estimate</b>  <b>170,000</b>  From Survey Q24 no data	Dry U. S. tons, from EPA Biosolids Generation Factor x Flow (EPA CWNS, 2004)  165,753	Dry tons, reported to BioCycle Survey (Goldstein, 2000)  227,000		
Total number of TWTDS sending to Separate Preparers in 2004: Number of Separate Preparers: Number of operating sludge incinerators: Fluidized bed: Multiple hearth: Percent of population served by on-site (e.g. septic systems):		no data no data no data no data no data			NOTES: Data in these tables are estimates from total wastewater flow, using the USEPA "Biosolids Generation Factor." The percentages of landfilled and land applied biosolids included here are best estimates for use only for the purposes of calculating national use and disposal estimates.	
		UNITS: <b>Dry U. S. Tons</b>				

### Biosolids Use and Disposal Summary (2004 data)

	Number of Entities (TWTDS & Sep. Preparers) Going To...	Quantity of Biosolids	Percentage (quantity)
Beneficial Use	0	85,000	50%
Disposal	0	85,000	50%
Other	0	-	0%
Estimated Total	0	170,000	100.00%

### INCOMPLETE DATA

\* "Total biosolids generated in 2004" and all other amounts reported in these tables are in the units noted (dry U.S. tons, dry metric tons, or wet U.S. tons). The total "From State Survey Q24" was reported by the state biosolids coordinator, the regional USEPA office, and/or the largest individual TWTDS in the state. The "Adjusted Estimate" is an appropriately rounded figure to indicate some level of uncertainty; it is used in national totals.

\*\* "Total Number of TWTDS in 2004" shows two totals: the number of individual TWTDS reporting flow in the 2004 CWNS data, and, "From Survey Q24," the sum of TWTDS shown in the "Beneficial Use" and "Disposal" tables, below. The second total can be higher than the number of individual TWTDS that actually used or disposed of solids in 2004, because many facilities send solids to two or more use or disposal options in a given year. TWTDS = Treatment Works Treating Domestic Sewage. CWNS = Clean Watershed Needs Survey, 2004 data.