



Economics of Biosolids Management

VT Biosolids Forum

VT DEC Waterbury, Vermont

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Facilities in CSWD Biosolids Program

Wastewater Treatment Plant	Stabilization Process	Classification	Current Disposition
Burlington Main Plant *	None	Unclassified	Landfill
Burlington East Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Burlington North Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Essex (Tri Town)	Anaerobic Digestion - Meso	Permitted Class B	Land Application/Landfill
Milton	Aerobic Digestion	Potential Class B	Landfill
Richmond	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 1	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 2	Aerobic Digestion	Potential Class B	Landfill
So Burlington Bartlett Bay	Aerobic Digestion	Potential Class B	Land Application/Landfill
So Burlington Airport Pkwy**	Anaerobic Digestion - Thermo/Meso	Permitted Class A	Land Application/Landfill
Winooski	Aerobic Digestion	Potential Class B	Landfill

* Burlington Main Plant dewateres sludge from Burlington East, North and Winooski WWTPs

** So Burlington Airport Pkwy Plant processes sludge from the So Burlington Bartlett Bay Plant

Facilities in CSWD Biosolids Program - Current Land Application in Vermont

Wastewater Treatment Plant	Stabilization Process	Classification	Current Disposition
Burlington Main Plant *	None	Unclassified	Landfill
Burlington East Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Burlington North Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Essex (Tri Town)	Anaerobic Digestion - Meso	Permitted Class B	Land Application/Landfill
Milton	Aerobic Digestion	Potential Class B	Landfill
Richmond	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 1	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 2	Aerobic Digestion	Potential Class B	Landfill
So Burlington Bartlett Bay	Aerobic Digestion	Potential Class B	Land Application/Landfill
So Burlington Airport Pkwy**	Anaerobic Digestion - Thermo/Meso	Permitted Class A	Land Application/Landfill
Winooski	Aerobic Digestion	Potential Class B	Landfill

* Burlington Main Plant dewateres sludge from Burlington East, North and Winooski WWTPs

** So Burlington Airport Pkwy Plant processes sludge from the So Burlington Bartlett Bay Plant

Facilities in CSWD Biosolids Program - Potential Land Application in New York

Wastewater Treatment Plant	Stabilization Process	Classification	Current Disposition
Burlington Main Plant *	None	Unclassified	Landfill
Burlington East Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Burlington North Plant	Anaerobic Digestion - Meso	Potential Class B	Landfill
Essex (Tri Town)	Anaerobic Digestion - Meso	Permitted Class B	Land Application/Landfill
Milton	Aerobic Digestion	Potential Class B	Landfill
Richmond	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 1	Aerobic Digestion	Potential Class B	Landfill
Shelburne Plant 2	Aerobic Digestion	Potential Class B	Landfill
So Burlington Bartlett Bay	Aerobic Digestion	Potential Class B	Land Application/Landfill
So Burlington Airport Pkwy**	Anaerobic Digestion - Thermo/Meso	Permitted Class A	Land Application/Landfill
Winooski	Aerobic Digestion	Potential Class B	Landfill

* Burlington Main Plant dewateres sludge from Burlington East, North and Winooski WWTPs

** So Burlington Airport Pkwy Plant processes sludge from the So Burlington Bartlett Bay Plant

Biosolids Management Disposal

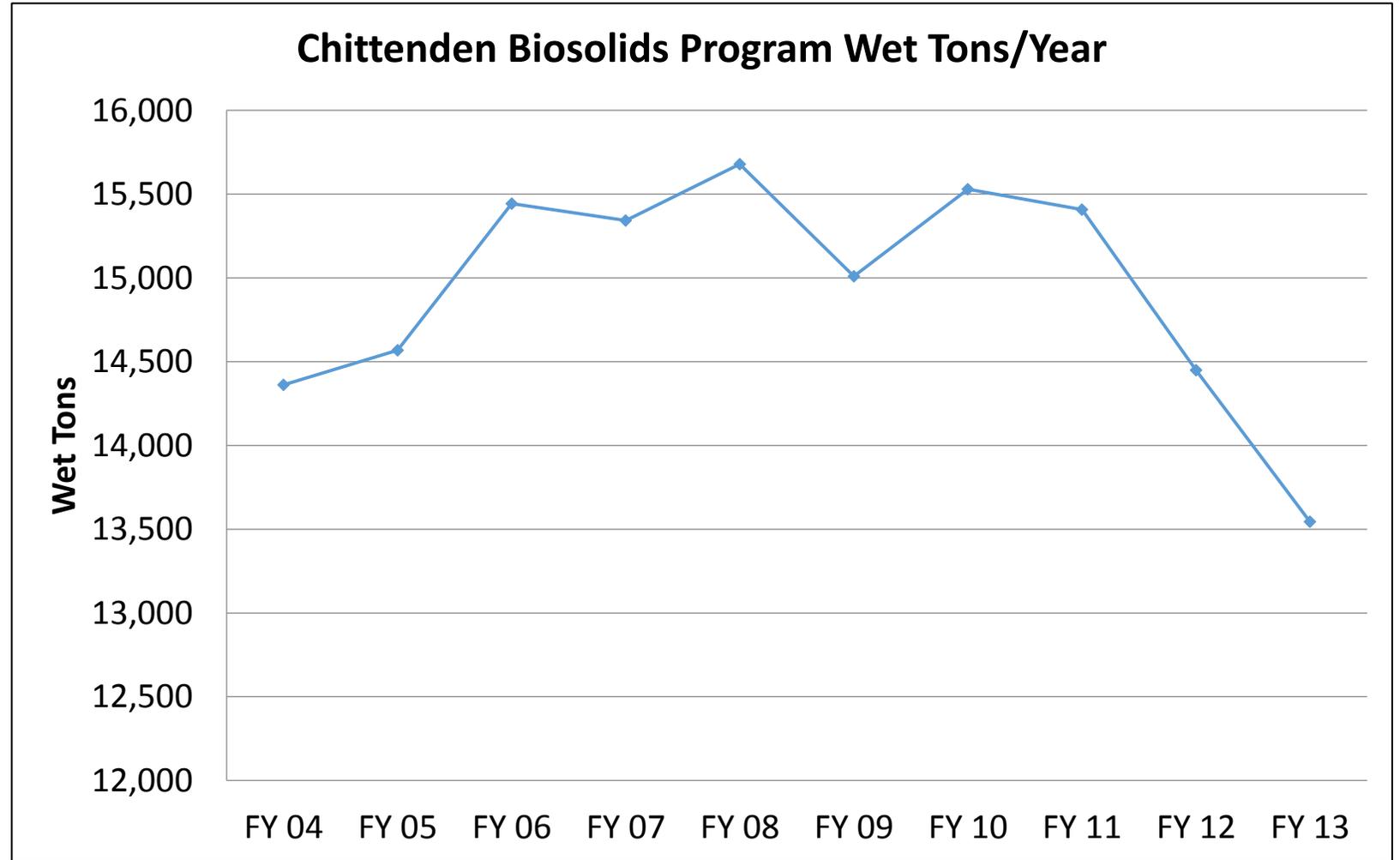
Chittenden County Member Town Biosolid Generation (Wet Tons/Year)

member town	Burlington*	South Burlington	Essex Junction	Milton	Richmond	Shleburne
FY 2013	8,287	1,833	1,354	483	776	811
5 year average total	8,870	1,897	1,778	375	839	957
10 year average total	9,422	1,915	1,519	304	720	923

* Winooski included in Burlington

Biosolids Management Disposal

	Total Wet Tons/Year
FY 04	14,361
FY 05	14,568
FY 06	15,443
FY 07	15,342
FY 08	15,679
FY 09	15,009
FY 10	15,529
FY 11	15,407
FY 12	14,449
FY 13	13,544



Biosolids Management Disposal

Chittenden County Member Town Biosolid Total Generation (Wet Tons since 1998)

member town	Burlington	South Burlington	Essex Junction	Milton	Richmond	Shelburne	Winooski	Total
FY 1998- FY2014	155,443	31,946	17,608	4,306	8,641	10,246	1,345	229,535

Biosolids Management Disposal Costs

Chittenden County Disposal Costs per Wet Ton				
Landfill	Grasslands Manufacturing Facility			
	Burlington*	Shelburne*	Richmond*	Milton*
\$92.30 - \$94.30	\$86.06	\$87.43	\$87.51	\$88.68
* costs vary based on analytical requirements				

Biosolids Management Disposal Costs

Chittenden County Land Application Cost Savings vs. Landfill

Member Town	Burlington	Shelburne	Richmond	Milton
estimated savings per wet ton generated	\$8.24-\$6.24	\$6.87 - \$4.87	\$6.79 - \$4.79	\$5.62 - \$3.62
estimated annual savings*	\$68,262 - \$51,688	\$5,569 - \$3,948	\$5,265 - \$3,713	\$2,717 - \$1,750
estimated savings over the life of 5-year contract	\$341,312 - \$258,442	\$27,864 - \$19,740	\$26,327 - \$18,569	\$13,588 - \$8,753

*Estimated Annual Savings based on FY 2013

Biosolids Management Disposal Costs

Savings from Land Application vs. Landfill		
Member Town →	South Burlington	Essex Junction
estimated savings per wet ton generated	\$46.38 - \$44.38	\$19.87 - \$17.87
estimated annual savings	\$85,012 - \$81,347	\$26,906 - \$24,198
estimated savings over the remaining life of contract	\$170,025 - \$162,694	\$157,623 - \$144,082

Biosolids Management Disposal Costs

Chittenden County Land Application Cost Savings vs. Landfill	
<u>Member Town</u> estimated annual savings	\$193,731 - \$166,644

CSWD - Biosolids Management Summary

- Land application of biosolids saves CSWD member communities money versus landfilling
- Land application of biosolids is promoted by the current Vermont Solid Waste Management Plan
- CSWD has always adhered to the highest standard for land application, whether it is Vermont Standards or the recipient State/Province Standards