2018 Nova Scotia Municipal Sold Waste Volume Spreadsheet

Municipality/ Region	Green Organics (Tonne)	Residual Waste (Tonne)	Fibre (Tonne)	Textiles (Tonne)	tyrofoa (Tonne)	Metal (Tonne)	Glass (Tonne)	Plastics (Tonne)	Film / Plastic Bag (Tonne)	collection cost recycling	processing cost recycling
CBRM	9,875	35,213	4,897	na	na	182	907	424	na	$ 398,598	$ 2,201,992
Richmond	866		306	na	na	16	79	38	na	$ 121,292	$ 63,090
Victoria	710	3,171	131	na	na	na	na	na	na	$ 49,850	$ 178,000
Inverness	60	5,594	261	na	na	na	na	53		$ 142,859	$ 359,771
Port Hawk - Reg	No coltn	2,082	81	na	na	4	21	10	na	$ 81,156	$ 11,244
Antigonish T	355	2,685	164	na	na	15	4	24	16	$ 187,369	$ 28,197
Antigonish C	910	2,210	369	na	na	31	10	53	36	$ 247,914	$ 83,210
Guysborough	347	1,088	147	na	na	13	4	21	14	$ 44,970	$ 49,962
Mulgrave	12	561	19	na	na	2	1	3	2	$ 19,800	$ 7,692
Saint Marys	26	456	58			5	2	8	6	$ 131,531	$ 10,022
Pictou - Reg 2	5,979	12,420	1,620	na	na	143	44	233	158	$ 723,746	$ 331,760
East Hants	1,537	5,148	231	3.18	na	20	6	33	23	$ 390,642	$ 111,011
Colchester	8,299	16,945	1,321	18.16	??	116	36	190	129	$ 513,794	$ 2,233,563
Cumberland	4,094	7,871	957	na		74	25	62	63	$ 502,015	$ 787,851
Region 4	50,375	124,890	15,477	na	na	1,186	1,769	1,772	1,352	$ 4,200,833	$ 4,470,447
Region 5	10,580	22,229	3,639	na	11.23	275	230	407	689	$ 562,996	$ 861,674
Region 6	6,826	26,468	3,323	na	na	317	401	423	476	$ 2,037,868	$ 968,873
Region 7	5,147	13,373	1,243	na	na	102	61	147	193	$ 675,072	$ 312,470
Totals	**105,997**	**282,404**	**34,243**	**21**	**11**	**2,501**	**3,599**	**3,899**	**3,156**	**$ 11,032,305**	**$ 13,070,830**
Plese note the municipal composition of the following Regions in the province:											
Region 4 - HRM					Region 5 - Annapolis Valley						
Region 6 - Windsor/West Hants/ South Shore					Region 7 - Argyle/Clare / Digby/ Yarmouth						

Heavy Lifting Required

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approach handling of biosolids, Newell, provided an overview of what options could be considered based on a review of various methods which included: Digestion at a capital cost of $5M-$10M, excluding operating costs; Lime stabilization in a contract with N-Viro requiring $3.5-Million for a new facility, plus operating of $785,000 per year; Lime Stabilization using RDP Technologies was determined as not being feasible, because in addition to the operating costs - $450,000 - being about the same as current expenses with Envirem, plus approximately $4.5-Million for building and equipment.

A batch drying process would have operating costs of $320,000 per year, in addition to capital costs of $9.3-Million. Another possibility could be greenhouse drying technology, but unaffordable with $10.5-Million capital cost and $870,000 for annual operations. To establish a facility to handle in-house composting at Kemptown using a new building is projected to require a new covered building, new equipment, and a curing pad, with a total estimated capital cost of $1.7M. Annual tipping costs, based on $40 per tonne at 4,300 tonnes per year, would be $172,000, and shipping costs are estimated at $110,000 per year. Additional expense would be required to increase solids content from 17% to 20%.

Considering the municipality is examining the possibility of a waste-to-energy project, which would handle a lot more than biosolids, council expressed in interest in exploring duplicating Envirem's method of curing biosolids on an open air clay pad.

For council's consideration Newell outlined other possible considerations which could involve working with the suppliers of dewatering equipment to improve solids content above 17%. A simple increase from 17% to 18% solids can reduce the tonnage of biosolids by 5.5 %; switch to shipping four days per week with larger trailers and other considerations are ongoing.

She concluded her presentation with the observation that because waste-to-energy is being considered and biosolids could be a feedstock the Municipality may not wish to spend capital funds on a biosolids stabilization facility at this time, but to look for ways to significantly reduce costs of the Envirem contract or to consider an open air clay pad.

Other Considerations for Colchester's Biosolids

In her presentation to Colchester Council Director of Public Works, Michelle Newell outline other possible considerations for handling Colchester's biosolids. Options for council to consider included the following findings. Staff at the wastewater treatment facility have considered many ways to reduce disposal costs for biosolids, including the following:

- Working with the suppliers of dewatering equipment to improve solids content above 17%. A simple increase from 17% to 18% solids can reduce the tonnage of biosolids by 5.5 %.
- Changing operations to reduce shipping requirements for biosolids from 5 days per week to 4 days per week,
- Carried out numerous polymer trials to identify the optimum product for producing the driest biosolid possible. These trials continue.
- Working to improve dryness by allowing natural settling to occur in the sludge tanks prior to dewatering.
- Established a 2-trailer system from Envirem to allow for maximum fills of each trailer before leaving the facility. These efforts are ongoing.

Newell summarized her presentation of various options requires determining the most feasible mode of disposing of our biosolids is the long term plan for waste-to-energy. Since biosolids can be used as a feedstock for any waste-to-energy facility. As a result the Municipality may not wish to spend capital funds on a biosolids stabilization facility at this time.

Could Colchester Stabilize and Dispose of Its Own Biosolids?

In order for Colchester to carry out stabilization of its own biosolids, new infrastructure would be required to do one of the following: Digest prior to dewatering; Dry with heat and pelletize; Mix with lime and Compost. The following is a brief description of each process and probable costs.

Digestion: Digestion can occur either in the presence of oxygen (aerobic) or the absence of oxygen (anaerobic). This would require the construction of a large reactor basin at the treatment plant site, which would be covered, and kept at 35 degrees Celsius. Within the basin, biosolids would further be mixed and broken down through mechanical and biological processes. Digesters do create a high strength wastewater stream which would be rerouted to the treatment plant. The cost of building a digester could range between $5M and $10M for capital alone, excluding the operating costs.

Staff has determined the high capital cost, as well as, the expected energy cost and manpower requirements, make this option undesirable.

Lime Stabilization – Contract with N-Viro: The lime stabilization process includes adding an alkaline material (quick lime or cement kiln dust) to increase the pH of biosolids to 11 for pathogen control. Typically, this process also includes mechanical turning, drying and storage of the final product. N-Viro is a proprietary process now under the ownership of Walker Environmental. Staff met with N-Viro to discuss the possibility of partnering to handle Colchester's biosolids at an existing or new N-Viro facility. They indicated a new facility would be required, but unfortunately, colchester's biosolid product would have to be at 20% solids before N-Viro would be willing to enter into a contract to accept the material. In the event Colchester was able to improve solids content above the current 17%, it is estimated the construction of an N-Viro facility to service Colchester would cost $3.5-Million and an annual operating cost of $785,000. Under this arrangement, N-Viro would be responsible for securing long term disposal contracts for the Class A biosolid product. The estimated operating costs for the N-Viro facility far exceed our current disposal costs with Envirem.

Lime Stabilization - RDP technologies: Colchester staff reviewed the approach taken by the East River plant in Trenton, which services New Glasgow and surrounding areas. The alkaline stabilization process at the East River plant was constructed in 2005, utilizing equipment supplied by RDP technologies. The process is non-proprietary and is fully operated and maintained by the contributing Municipalities. Colchester could consider building the same type of facility at the Lower Truro treatment plant. A new building would be required to house equipment, lime storage, and biosolids storage areas. The estimated capital cost of a new building and equipment is $4.5M, with annual operating costs estimated at $450,000 per year. If utilizing this technology, the Municipality would also need to secure long term disposal contracts with area farmers for the finished product. Annual operating cost alone is roughly the same as the current expenses with Envirem, therefore this option is not deemed feasible.

Batch Drying Process: The option of utilizing large batch dryers to meet provincial requirements for pasteurization and to improve solids content from 17% to 90% was reviewed. This process would require the construction of a new building to house large vessels filled with biosolids and be heated under a vacuum to improve solids content. The estimated capital cost for a new building and equipment is $9.3M, with annual operating costs in the range of $320,000 per year. Utilizing this process would also require the Municipality to secure long term disposal contracts with local businesses.

Green house Drying Technology: Greenhouse technology that could be used to heat the biosolids and improve solids content from 17% to 90% was also reviewed. The technology would be supplied by Huber, however the capital cost of construction is estimated at $10.5M, with operating costs in the range

of $870,000 per year. The technology was not deemed financially feasible.

In-House Composting: The existing composting facility in Kemptown would need to be expanded in order to accommodate biosolids from the wastewater treatment plants. Capital investment would include a new covered building, new equipment, and a curing pad, with a total estimated capital cost of $1.7M. Annual tipping costs, based on $40 per tonne at 4,300 tonnes per year, would be $172,000, and shipping costs are estimated at $110,000 per year. Based on feedback from composting staff, a solids content of 20% would be required before our Kemptown facility could accept the product for processing.