

CIF #280

Township of McKellar Solar Compactors Project



Final Project Report, April 2011

Acknowledgement:

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Executive Summary

Communities in the northern region of Ontario, specifically the Township of McKellar (Township) are confronted with unique waste management issues such as seasonally fluctuating populations, large rural road networks and long distances to recycling material processing facilities and markets. These obstacles present operational and economic challenges for the Township recycling program. The Township of McKellar in association with Waste Diversion Ontario (WDO), The Continuous Improvement Fund (CIF) and Stewardship Ontario entered into an agreement to install equipment to improve efficiency and reduce transportation costs at the Township Transfer Station.

Based on the costs of transporting recyclable materials for processing and the amount of trips required to satisfy the materials generated by the Township the following equipment additions were made at the Transfer Station:

- 2 RJ 225 VL Stationary Solar Compactors
- 4 Forty yard roll-off containers

These new additions dramatically increase the efficiency of the Township's recycling operations regardless of the fluctuating nature of the waste management variables in the Township. The key area of improvement is the reduction of transportation costs which has a desired corollary effect of reducing Green House Gases.

Over a sample three month period during 2009/2010 without the compactors and the same sample period during 2010/2011 with the compactors the benefits of the new equipment has already paid huge dividends. When the two periods are compared, the Township moved significantly more recycling material with fewer lifts with the new equipment installed. During the months without the compactors and new bins the Township's invoices for recycling totaled \$7,757.55, contrasted by the three months with the compactors the Township's recycling invoices totaled \$2,675.81 for a net savings during the period of \$5,081.74.

Background

The Corporation of the Township of McKellar was incorporated in 1873. The Township is a rural, residential and recreational municipality located on Highway 124 approximately 20 km northeast of the Town of Parry Sound with adjacent municipalities of Seguin, Magnetawan, Whitestone, and McDougall, all within the District of Parry Sound. The Township has a year round population of 927 persons with approximately 66% of the 1,526 households in the municipality being seasonal.

The area of the Township is 17,634 hectares and consists of 209.9 lane kilometres of roadways. The entire municipality is serviced by a single Transfer Station located at 13 Lee's Road and is operated by one part-time municipal employee. Current Transfer Station hours are as follows:

Transfer Station Hours	
October 1 st -April30 th	
Saturday	10AM-4PM
Sunday	10AM-4PM
Wednesday	10AM-4PM
May 1 st -September 30 th	
Saturday	10AM-4PM
Sunday	12PM-8PM
Wednesday	12PM-8PM

Prior to installation of the solar powered compaction units and the forty yard roll-off bins the Township, in an open contract with Waste Services Inc. (WSI), hauled its recycling materials in twenty-eight yard loose fill roll-off bins 112 kilometers one way to the nearest recycling centre located in Bracebridge, Ontario. The Township collects two streams of recyclables, Mixed Recycling and Mixed Paper. For the calendar year of 2009 WSI lifts are as follows:

Waste Services Inc Recycling – 2009 Hauling				
	Monthly Lifts		Average Tonnage Per Lift (MT)	
	Mixed Recycling	Mixed Paper	Mixed Recycling	Mixed Paper
January	2	3	0.71	1.37
February	2	2	0.35	1.12
March	2	2	0.51	1.59
April	2	2	0.48	1.52
May	4	4	0.42	1.14
June	4	4	0.58	1.35
July	5	5	0.79	1.29
August	4	4	0.54	1.26
September	4	4	0.47	0.86
October	5	5	0.38	1.01
November	2	2	0.63	1.23
December	3	3	0.49	1.33
Total Monthly Average	3.25	3.33	0.53	1.26

The WSI-2009 table highlights the cause of the expensive transportation costs the Township was dealing with pre-installation of the compactors. The loose fill twenty eight yard roll of containers only held an average of 0.53 metric tonnes of mixed recycling and 1.26 metric tonnes of mixed papers. The low capacity of the loose fill containers in conjunction with the high number of monthly trips to the recycling facility, an average of 3.25 trips/month for mixed recycling and 3.33 trips/month for mixed paper caused, recycling costs at the Transfer Station to come under scrutiny. As a result an analysis for economic and environmental solutions that

would reduce transportation costs and increase the efficiency of the transfer station was conducted.

Monitoring & Reporting

Budget

Upon review of the transportation costs associated with the Township's recycling program a plan was constructed to increase the efficiency of the program and an application was made to the CIF. The Township of McKellar in association with WDO, CIF and Stewardship Ontario entered into an agreement to install two solar powered compactors and four forty yard roll-off bins at the Township Transfer Station. A detailed budget was prepared and a synopsis of budgeted versus real costs is as follows:

CIF#280-McKellar Transfer Station Solar Compactors Project		
	Budgeted Costs	Real Costs
Expenses		
Site Preparation	\$18,900.00	\$14,421.84
2-Two yard stationary solar powered compactors	\$59,000.00	\$58,680.00
4-Forty yard receiver bins	\$35,400.00	\$35,380.00
Delivery, installation and training	\$1,700.00	\$1,650.00
Cost	\$115,000.00	\$110,131.84
GST/HST*	\$5,750.00	\$13,202.77
Total Cost	\$120,750.00	\$123,334.61
Revenue		
Requested Funding (CIF)**	\$80,000	\$77,584.83
GST/HST Rebate	\$5,750.00	\$11,415.16
Township of McKellar	\$35,000.00	\$34,334.62
Total Revenue	\$120,750.00	\$123,334.61

*Project was initially budgeted before implementation of HST

**Real costs include 1.8% in lieu of HST as per CIF#280 agreement

Upon completion and installation of the compactors, the real costs of the project were within 2% of the budgeted costs. The slight departure from budgeted costs was due to the difference between GST and HST. When the project was budgeted it was expected the project would be completed before July 2010 and the introduction of HST. The agreement for this project was made on May 26, 2010. The actual work began in July due to unforeseen staff obligations with a number of other infrastructure projects. The Transfer Station project was completed November 9, 2010.

Maintenance

Upon completion of the installation of the solar powered compactors and forty yard roll off bins a few trouble shooting initiatives took place. The compression rate of the compactors was adjusted to maximize capacity and a transportation tarping issue was resolved. Otherwise the project proceeded and is operating without inefficiencies.

Labour

The compactors do not directly reduce labour time. However, the compression gauges on the compactors allow the Transfer Station attendant to closely monitor the amount of material in the roll-off bins and allows recycling lifts to be scheduled accordingly in a precise manner. Thus, the Transfer station is not interrupted by WSI trucks removing roll-off bins at a high frequency and when the bins are inconsistently filled. The only increase in labour has been at the processing facility in Bracebridge where WSI staff has indicated the compacted material takes a minimal amount of time longer to unload when compared to non-compacted material.

Costs

The installation of the solar powered compactors and forty yard roll off bins have provided immediate positive results and savings. To properly quantify the monetary savings, environmental value and the increase in efficiency at the Transfer Station, a three month period in 2009/2010 without the equipment and the same three month period in 2010/2011 with the equipment have been analyzed:

	Pre CIF#280						
	Mixed Recycling Lifts	Mixed Paper Lifts	Metric Tonnes	Shipping Fees	Container Rental	Fuel Surcharge	Total
December (2009)	3	3	5.74	\$2,154.72	\$195.89	\$504.32	\$3,237.13
January (2010)	3	3	3.81	\$2,219.34	\$201.77	\$522.47	\$3,249.70
February (2010)	1	1	1.62	\$739.78	\$201.77	\$204.30	\$1,270.72
Total	7	7	11.17	\$5,113.84	\$599.43	\$1,231.09	\$7,757.55
	Post CIF#280						
December (2010)	0	1	4.73	\$369.89	\$0.00	\$172.10	\$1052.80
January (2011)	0	0	0	\$0.00	\$0.00	\$0.00	\$0.00
February (2011)	1	1	9.12	\$764.20	\$0.00	\$309.75	\$1623.01
Total	1	2	13.83	\$1,134.09	\$0.00	\$481.85	\$2,675.81

The dramatic reduction in overall costs is exactly the desired outcome when the project was initiated. Since installation of the compactors and roll-off bins the Township has handled a higher tonnage of recycling material while requiring less lifts from WSI. Examination of the Pre CIF#280 table highlights that over the three month period post CIF#280 the Township managed 2.66 metric tonnes more recycling material in 11 less lifts than the facility managed without the compactors. Furthermore, in the three month period post CIF#280 the Township saved \$3,979.75 in shipping fees, \$599.43 in container rental fees and \$749.24 in fuel surcharges. The sum of this three month sample period is an overall monetary savings of \$5,081.74 in addition to the reduction of green house gases and the increase in overall Transfer Station efficiency.

In reviewing a cost analysis of the present and future benefits of the solar compactors and roll off-bins a few important variables must be noted. The costs of shipping fees have increased by \$84.69 per lift since 2009. The cost of a container rental has increased by \$38.09 per month. Lastly, the volatile nature of fuel costs must be considered when measuring the monetary benefits of the new equipment. Regardless of future fuel costs or fee increases by transport contractors the reduction of trips to the processing facility and elimination of bin rentals will benefit the Township financially.

Conclusion

The completion of CIF #280 has produced additional efficiency at the already proficient Township Transfer Station. As was anticipated during the project application, the solar powered compactors and forty yard roll of bins have reduced the number of lifts of recycling materials to the southern market processors. When 2009 recycling totals are re-assessed using amounts reflected post CIF#280 the results are as follows:

	2009 Totals vs. 2009 Totals with CIF#280						
	Lifts	Tipping Fees	Shipping Fees	Container Rental	Fuel Surcharge	Taxes	Total
2009	79	\$2,733.90	\$26,824.76	\$2,197.38	\$5,742.01	\$1,874.94	\$39,372.99
2009 (Post CIF#280)	15	\$2,733.90	\$5093.25	\$0.00	\$1,090.20	\$445.87	\$9,363.22

When the average from the three month span that the Township has used the compactors and roll off bins is applied to the 2009 recycling management totals, a large scale reduction in monetary costs is highlighted. Theoretically, with the compactors installed the Township saves \$30,009.77 over the course of the year. Using the same estimated savings per year of \$30,009.77 the Township will have a project payback period totaling 4.11 years with the CIF portion of funding comprising 2.59 years of that total. The cause of the increased savings and expedited payback period is directly related to the reduction of transportation costs (shipping fees) and container rental which was the main issue addressed by CIF #280. Furthermore, the Township will

contribute a not easily quantified reduction in fossil fuels and green house gasses. Lastly when the compactors are showcased during the Township's new Recycling Promotion and Education campaign a reduction in landfill material will also follow. The installation of the solar powered compactors and forty yard roll of bins at the Township Transfer Station and completion of CIF#280 will provide relief to the environment and recycling management budget for years to come.