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THE TOWNSHIP of CARLING

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Carling Transfer Station Solar Powered Recycling Compaction Container Project

CIF #283

Final Report, May 2011



Acknowledgment:

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Executive Summary

Communities in the northern region of Ontario, specifically the Township of Carling 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 Carling 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 Stations.

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 Stations:

- 4 RJ 225 VL Stationary Solar Compactors
- 6 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 without the compactors and the same sample period during 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 \$25,524.12, contrasted by the three months with the compactors the Township's recycling invoices totaled \$4,784.30 for a net savings during the period of \$20,739.82.

Background

The Township of Carling is situated on the Eastern shores of Georgian Bay with some of the most pristine shoreline and Islands in Canada. Permanent population is 1000 with seasonal rising to 4500 during the peak season. The township operates two Waste Transfer Stations to include full two stream recycling services. Included with 1 transfer station is a landfill site which accepts dry material only. The township also supports a reuse centre and electronic waste drop off area which are both very effective. The Township also has an agreement with the Township of Parry Sound to allow ratepayers to use their HHW Depot. To further promote keeping HHW material from the landfill and bins the Township has hosted a HHW day for the past 4 years which is also very effective. In 2008 the township passed a by-law deeming recycling mandatory which increased recycling. In 2009 the township inured \$59,995.46 for transporting recycled material to a MERF in Bracebridge Ontario operated by Muskoka Containerized

Services. Each transfer station consists of 3- 40 yard recycling containers which when full are only hold 20 to 30% capacity due to the side load configuration of the bins and no way to effectively compact material. In 2011 with the new compactions container in operation the Township incurred \$10,843.69 in transportation costs.

April 30, 2011 to June 30, 2011

Carling Transfer Station

Mon, Thurs, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

Killbear Transfer Station

Mon, Tues, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

July 1, 2011 to September 5, 2011

Carling Transfer Station

Mon, Tues, Wed, Thurs, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

Killbear Transfer Station

Mon, Tues, Wed, Thurs, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

September 6, 2011 to October 30, 2011

Carling Transfer Station

Mon, Thurs, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

Killbear Transfer Station

Mon, Tues, Fri & Sat
Sunday

8:00 a.m. to 4:00 p.m.
10:00 a.m. to 6:00 p.m.

WINTER HOURS

October 31, 2011 to April 28, 2012

Carling Transfer Station

Monday
Saturday

8:00 a.m. to 4:00 p.m.
8:00 a.m. to 4:00 p.m.

Killbear Transfer Station

Friday
Sunday

8:00 a.m. to 4:00 p.m.
8:00 a.m. to 4:00 p.m.

BOTH WASTE SITES WILL BE CLOSED between December 24th and January 1st, Good Friday, Easter Monday, Remembrance Day and Family Day.
All Mondays of long weekends, Sunday hours are in effect.

Recycling, Household Waste – Killbear and Carling Sites
Second Chance Centre and items listed on reverse – Killbear Site

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 40 yard loose fill roll-off bins 100 kilometers one way to the nearest recycling centre located in Bracebridge, Ontario. The Township collects two streams of recyclables, Mixed Recycling and Mixed Paper. **Please find attached the total cost for recycling for 2009**

Monitoring & Reporting

Budget

The following is a cost breakdown of what the township spends on transportation and the cost benefits of compaction.

Transportation Costs and Savings

Total transportation cost for recyclables 2009:	\$71,084.84
Estimated cost savings for compaction 75%	\$51,313.63
Estimated annual transportation costs:	\$19,771.21

Cost of Compaction Bins (Solar Powered)

Hydraulic Compactor each:	\$29,340.00	
Units required (4)		\$117,360.00
40 Yard receiver Boxes each:	\$8,845.00	
Units required (6)		\$53,070.00
Delivery and installation		\$8,250.00
Concrete pads (4) required:		\$2,400.00
	Total	\$181,080.00
	Less 60% Funding	\$108,648.00
	Total purchase	\$72,432.00

Total Payback time: 1.41 years.

A leasing option is also available at \$1,548 per month which includes the 60% funding. Actual lease costs are; per compactor \$646.00 per month and per receiver \$195.00 per month plus delivery and installation.

Maintenance

Upon Completion of the solar powered compactors a few trouble shooting initiatives took place. The units placed at the Killbear Landfill Site relied on solar power only as there is no 110 supply at the site. There were adjustments made to the powering system however it appeared that the batteries were not being charged properly.

To assist with the powering the containers when the batteries were low a portable generator had to be hooked up to each of the containers when it was time to cycle. However the generators powered the compactor only and did not charge the batteries.

This did not affect the operation of the compactors due the supply of the generator. However the system was unable to operate on solar at times when the batteries did not charge.

To combat this issue a 6kw is being installed together with a revised solar system. The generator is propane fired and is stationary. The solar system will be one large unit facilitating 10 batteries. A master switch is being installed that when switched from one container to the other when cycling is required will supply the container with the full power of the solar charge. When the batteries drop to a certain voltage the generator will start automatically and charge the batteries. In accents the generator will be a 110 supply keeping the batteries charged when required.

It is our opinion that the revised solar system with larger panels and increased batteries will power the containers with little assistance from the backup. Efficient Waste has provided the funding for this change over.

Labour

Labour times have also been reduced due to the fact that there is no need to make room in the bins. When the side load bins were in place the attendants had to keep pushing material back to make more room.

Costs

For complete costs comparisons I have attached a 2009 spread sheet before the solar powered bins were in place and a 2011 spreadsheet with the new bins in full operation.

Conclusion

This funding resources has produce huge dividends for the Township as clearly noted. The inclusion of the solar powered compaction container provided the results that were anticipated. Although there were a few challenges Efficient Waste was paramount in backing up their product. Due the challenges noted and the revisions being made to the compaction system at the Killbear Landfill the Township is confident that the desired goals will be reached.

2009 Recycling Totals

LIFT CHARGES WSI 2009	170475 Jan-09	171031 Feb-09	171609 Mar-09	172204 Apr-09	172877 May-09	173622 Jun-09	174714 Jul-09	175693 Aug-09	177599 Sep-09	178855 Oct-09	180044 Nov-09	181139 Dec-09	TOTAL \$\$\$
Carling Transfer Station Dumping													
40 yd Blue Box	810.82	405.41	0.00	810.82	810.82	810.82	2331.10	1864.88	1398.66	932.44	466.22	466.22	\$11,108.21
40 yd Cardboard	405.41	405.41	0.00	405.41	810.82	0.00	1864.88	466.22	0.00	0.00	466.22	0.00	\$4,824.37
40 yd Paper	405.41	405.41	810.82	405.41	810.82	810.82	1398.66	1398.66	932.44	932.44	466.22	932.44	\$9,709.55
Glass Bin													\$0.00
Cardboard credit													\$0.00
Killbear Site Dumping													
40 yd Blue Box (cans)	1013.53	0.00	405.41	810.82	810.82	1216.23	2797.32	1864.88	1864.88	932.44	932.44	466.22	\$13,114.99
40 yd Cardboard	405.41	405.41	405.41	405.41	810.82	1216.23	932.44	0.00	0.00	0.00	466.22	0.00	\$5,047.35
40 yd Paper	405.41	405.41	0.00	810.82	810.82	810.82	1864.88	2331.10	2331.10	1398.66	466.22	932.44	\$12,567.68
Glass Bin													\$0.00
Cardboard credit													\$0.00
Taxes													
GST	221.49	127.85	103.72	233.26	307.66	315.95	712.21	516.02	421.00	269.44	211.32	183.39	\$3,623.31
PST	0	0	0	0	0	0	0	0	0	0	0	0	\$0.00
Total Lift	3,667.48	2,154.90	1,725.36	3,881.95	5,172.58	5,180.87	11,901.49	8,441.76	6,948.08	4,465.42	3,474.86	2,980.71	\$59,995.46

Recycling Totals 2011

**LIFT CHARGES WSI
2011**

	170475 Jan-11	171031 Feb-11	171609 Mar-11	172204 Apr-11	172877 May-11	173622 Jun-11	174714 Jul-11	175693 Aug-11	177599 Sep-11	178855 Oct-11	180044 Nov-11	181139 Dec-11	TOTAL \$\$\$
Carling Transfer Station Dumping													
40 yd Blue Box	182.50		126.50		116.00								\$425.00
40 yd Cardboard													\$0.00
40 yd Paper	287.20		200.40			224.00	273.20	258.00		294.80		898.07	\$2,435.67
Glass Bin													\$0.00
Cardboard credit													\$0.00
Comingled - regular bin						204.50	259.50	230.50	210.50				\$905.00
Killbear Site Dumping													
40 yd Blue Box (cans)			193.50		153.50								\$347.00
40 yd Cardboard													\$0.00
40 yd Paper	312.00		138.00		146.80	150.40	273.20	247.60		265.20			\$1,533.20
Contaminated Mix													
Glass Bin													\$0.00
Cardboard credit													\$0.00
Comingled - regular bin						254.50	258.00	286.00		223.50	224.50		\$1,246.50
Taxes													
GST													\$0.00
PST	445.61		605.22	0	309.43	541.16	665.36	658.38	116.10	373.85	119.46	116.75	\$3,951.32
Total Lift	1,227.31	0.00	1,263.62	0.00	725.73	1,374.56	1,729.26	1,680.48	326.60	1,157.35	343.96	1,014.82	\$10,843.69