Recycling Facility

MRF Upgrade, Addition of an Optical Sorter for PET Plastic

CIF Project #177

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Project Background:

As a part of the ongoing commitment to recycling, the City Of Guelph has being upgrading their MRF processing equipment at the Dunlop Drive recycling facility with an aim to achieving improved diversion rates and productivity. One of the challenges the MRF faced was the growing quantities of PET bottle in the container stream. Dealing with the increased amount of PET caused increased labour on the sorting lines and there was still too much PET ending up in the residue destined for the landfill.

The Scope of Project # 177 which has been funded by the Continuous Improvement Fund and the City of Guelph was to install an Optical Separator within the Container Sorting process which would automatically separate the PET from the rest of the container stream. The goal of this project was to increase the capture rate of the PET & tetrapak/polycoat thus reducing the residue and to reduce 4 sorters form the container line. The justification for the cost of this project was calculated by offsetting the increased PET revenues, lower disposal costs of residue and saving in labour costs over a period of approximately 4.7 years.

The City Of Guelph entered into a contact with Van Dyk Baler Corporation of Stamford Connecticut to make the necessary plant modifications and install a new TiTech Poly-Sort 2000 DUO optical sorting system at a cost of approximately $ 712,000.00.

Implementation:

As part of the requirement for CIF funding, the city was required to conduct 5 container residue audits before the installation was started to establish a base line to measure the performance of the optical sorter after the installation. These tests were carried out in February of 2010. After completion of the test, the container processing system was modified and the optical sorter was installed. Upon completion of the optical sorter installation, the system was started up and fine tuned by the Van Dyk technicians. The system was then operated for a few months with the TiTech Poly-Sort optical sorter in full operation allowing the management and staff time to get used to the new operating procedures.

Post installation auditing was performed mid August and Late September of 2011. Three residue audit sessions were performed where the operations were monitored for a period of time and the residue of that time period was isolated for auditing. The amount of container sorters was also recorded during the test periods.

Audit Results:

Residue audits were carried out before and after the installation concluding that the installation of the optical sorter was successful in achieving the predicted results. The chart on page 3 summarizes results of the audit. Direct buyers of the PET and Tetrapak/ Polycoat have found the quality of the product satisfactory and are easily able to sell this product to end markets.

Other benefits of this project include higher diversion rates thus lowering landfill costs and increasing the capture of valuable recyclables. Separating the PET from the balance of the container stream on to its own sort conveyor has made it a lot easier to sort the other products which has improved the quality of these other products. The largest financial benefit from this project was the annual labour savings of approximately $177,000.00 which has helped the City of Guelph to lower its operating costs.

The difference between the annual residue reduction of 34.39 tonnes and the total of the increased capture of the PET & tetrapak/polycoat is 19.08 tonnes which consists of a mix of other container recyclables that are showing increased recovery rates. This is due to the removal of the PET from the mixed plastics sorting line which has made it a lot easier to sort from.

Material	Post Installation Total Residue Weight	Annual Weight	Pre Installation %	Post Installation %	Change %	Pounds Difference	Tonnes Difference	Revenue per Tonne	Savings/ Gain
PET	100.77	302316	11.77%	5.00%	6.77%	20,467	9.30	$ 616.00	$ 5,730.70
Poylcoat & Tetrapak	89.24	267729	10.00%	5.06%	4.94%	13,226	6.01	$ 110.00	$ 661.29
Residue	251.93	755790	29.38%	19.82%	10.01%	75,655	34.39	$ 58.00	$ 1,994.53
								Annual Revenue Gain	$ 8,386.52
								Annual Labour Savings	$ 177,500.00
								Annual Maintenance Cost	-$ 15,000.00
								TL Annual Revenue Gain	$ 170,886.52
								System Cost	$ 712,000.00
								Years for Payback	4.2

The TiTech Poly-Sort system has proved to be a reliable technology that has delivered consistent results. Other than routine housekeeping, the system has been trouble free with very low maintenance costs allowing the City to stay well within the projected operating cost estimate. The system was originally set up to positively sort both PET and tetrapak/polycoat however, the respective sorting conveyor was overloaded making it difficult to positively sort the tetrapak/polycoat so the TiTech program was modified to just sort PET. This has worked out well and the tetrapak/polycoat is now being sorted from the mixed plastic sorting line.

Summary:

In summary, it has been determined that this project has been successful in achieving the results that were originally projected. The increased recovery rates of PET and Tetra/Polycoat along with the operational cost savings have come in better than expected along with the additional benefit of increased capture rates on other container products. The City of Guelph would like to thank the CIF for the financial support with this project.