

COMPACTOR COST SAVINGS

MUNICIPAL CORPORATION OF THE TOWNSHIP OF ARMOUR

CIF PROJECT # 1040

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Prepared for:

Resource Productivity and Recovery Authority
Continuous Improvement Fund

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EXECUTIVE SUMMARY

Communities in the northern region of Ontario are confronted with unique waste management issues such as small populations and long distances to recyclable material processing facilities and markets. These issues present operational and economic challenges for the management of recycling programs. The Continuous Improvement Fund (CIF), and the Municipal Corporation of the Township of Armour conducted a review of operations to increase the effectiveness of the current system of transport for comingled container recycling.

The Municipality entered into an agreement with the CIF, SO and RPRA to install equipment to improve efficiency and reduce transportation costs. This objective was achieved by installing a Stationary Recycling Compactor and 2 - 40 yard bins at the TRI Communal Landfill & Recycling Centre. The unit will increase the amount of mixed container tonnage being hauled from Burks Falls in each bin lift. The project was completed on budget and it is anticipated it will meet the target goal of reducing freight costs.

1. INTRODUCTION

1.1. Introduction

The Municipalities of Armour, Burks Falls and Ryerson have jointly managed the financial obligations associated with the TRI R Landfill and Recycling Centre since 1988. The Recycling Centre consists of a depot drop-off program for blue box recyclables as well as a material recovery facility in which materials are processed and baled for marketing.

The TRI R MRF is situated in rural Northern Ontario in the District of Parry Sound. Small populations and long distances to the recycling markets in the south present operational and economic challenges for managing the recycling program. The ever changing plastic commodities market presented many issues for the TRI R and a review of the process was undertaken in 2012 that led to the decision to stop processing plastics, and start shipping to a private company for processing. This change also allowed for less sorting at the depot and directly increased the volume of material as it was easier for residents to participate.

Further improvements to the diversion rate were obtained when the decision was made to stop processing glass, steel and aluminum containers in 2014. A single stream of container recycling reduced the sorting required by residents and increased the volume collected again.

As the volume of container recycling increased, the freight cost for shipping to the processor also increased and by 2016 the steady rise led the municipalities to investigate options for effectively shipping materials to the processor. The Continuous Improvement Fund (CIF), and the Municipal Corporation of the Township of Armour conducted a review of operations for comingled container recycling costs.

1.2. Project Goals and Objectives

The bins used for shipping mixed container recycling were a 40 yard open top bin for material received from the Village curbside collection as well as a 30 yard side loading depot for residents dropping off at the site. Tonnage for each bin ship was reported from the processor and it was determined that neither the side loading depot nor the 40 yard open top could be filled effectively without any way to compress the materials into the bins.

It was determined that the purchase of a Stationary Recycling Compactor and 2 - 40 yard bins would increase the amount of mixed container tonnage (3:1) being hauled from Burks Falls in each bin lift and effectively reduce the overall freight cost.

2. BACKGROUND

Located on the edge of the Village of Burk's Falls, the site operates as a landfill, recycling and reuse centre. As residents enter the site, they stop at the reuse centre and report to the attendant. The municipalities have jointly managed the obligations associated with the TRI R Landfill, Recycling and Reuse Centre since 1988, with Armour Township as the administrating body.

For the 1747 households in Armour and Ryerson an onsite depot service is provided and another 579 are served by curbside collection in the Village of Burk's Falls. The costs associated with the curbside collection are managed solely by the Village with the material collected being processed at the TRI R Facility.

2.1. Community Profile

The TRI R Landfill is a shared service of the three neighbouring municipalities. Owned by the Village of Burk's Falls, and operating under a shared service agreement, the site is staffed with 3 full time employees. Armour and Ryerson Townships surround the Village of Burks Falls.

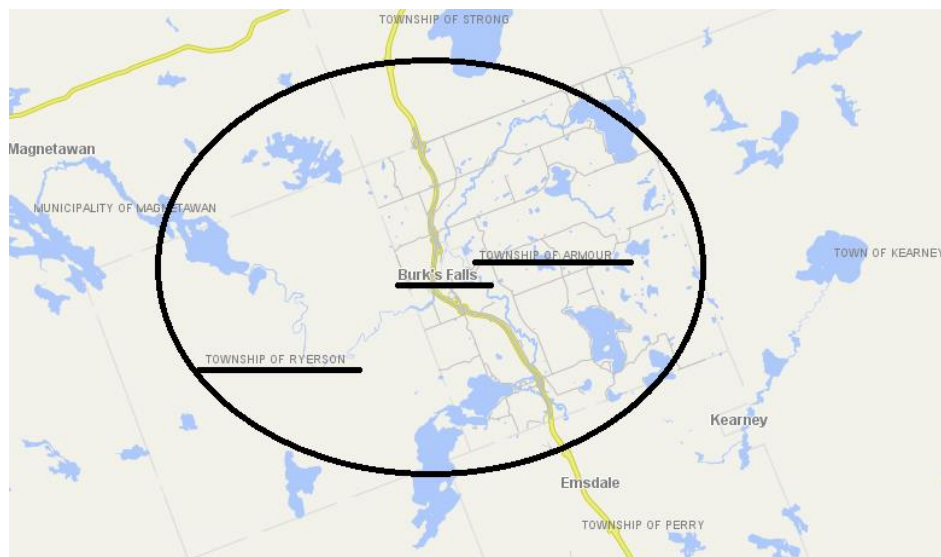


Table 1 ... Number of households in TRI R Communities 2017

Municipality	Population	Single Family Households	Multi Family Households	Total Households
Armour	1241	1132	10	1142
Burk's Falls	967	512	57	579
Ryerson	597	605	0	634
Total	2805	2249	67	2292

Table 2 ... Waste Management System Overview for TRI R Communities 2017

Single Family Service	Service Description (curbside/Depot wkly/bi-wkly single/two/multi stream)	Collection Provider	Processing Provider
Garbage – Armour & Ryerson	Drop off	TRI Communal Landfill & Recycling	Armour Township
Recycling – Armour & Ryerson	Depot – multi stream	TRI Communal Landfill & Recycling	Armour Township
Garbage – Village of Burk's Falls	Curbside – weekly	Smiths Mobile	TRI Communal Landfill & Recycling
Recycling – Village of Burk's Falls	Curbside – weekly Multi stream	Village of Burks Falls Public Works	TRI Communal Landfill & Recycling

2.2. Current Waste Management Performance

Information contained in Table 3 was gathered from the 2016 WDO Historical Residential Gap Diversion Rates as this information was not generated in 2017 as the short form data call was used for reporting in 2016.

Table 3 ... Waste Management System Overview for TRI R Communities 2015

	Units	Blue Box Recycling		Total Waste Diversion		Disposal		Generation (Total)	
		rate	% of total	rate	% of total	rate	% of total	rate	%
GAP Reported	tonnes	293	24%	407	33.6%	799	66.3%	1205	100%
	Kg/hhld	97	24%	135	33.6%	266	66.3%	401	100%

2.3. Program Challenges

For the 1747 households in Armour and Ryerson an onsite depot service is provided and another 579 are served by curbside collection in the Village of Burk's Falls. The costs associated with the curbside collection are managed solely by the Village with the material collected being processed at the TRI R Facility.

A single stream of container recycling reduced the sorting required by residents and increased the volume collected. As the volume of container recycling increased, the freight cost for shipping to the processor also increased and by 2016 the steady rise led the municipalities to investigate options for effectively shipping materials to the processor.

A staff report was presented to the three councils demonstrating the opportunity to increase efficiency and reduce the cost of shipping. A review of completed CIF projects with regard to Stationary Compactor Installations were evaluated and based on the success of those projects, the three councils redirected the previously approved capital to the purchase and installation of a recycling compactor at the TRI R facility.

3. APPROACH

3.1. Set Up and Implementation

The installation of a compaction unit for container recycling would reduce the freight cost by 75%; however the capital cost to purchase new equipment and bins would be a burden to the three municipalities. During the review and discussion, it came to light that the Village of Burks Falls was giving consideration to a privatized collection which may result in the material collected at the curb being sent to another facility for processing.

Although all three municipalities understood the projected savings, it was difficult to justify the purchase of new equipment when the future of the shared service was unknown. The TRI Council gave direction to purchase and install refurbished equipment.

An estimate of the total cost for the purchase and installation arrived at \$50,424 and the project was approved for funding up to 37% by the CIF. The estimate included:

- Refurbished compactor unit
- 2 refurbished compaction containers
- Single phase inverter (3 phase unit on a single phase site)
- Electrical Installation and hookup
- Delivery to facility; and
- Concrete pad

The tender for the refurbished compactor and containers was awarded to Metro Compactor Incorporated and the concrete and electrical work were awarded based on quotes received. The project was delayed in early August as members of council fought with the idea of purchasing infrastructure if the legislation moved forward to full producer responsibility. This brief delay in the project start resulted in the concrete contractor withdrawing from the project. Quotes were reviewed and contractors were contacted however everyone had moved on to other projects and were not interested in the work. Other options were pursued and a contractor was obtained to install the pad in late October 2017.

3.2. Monitoring and Measurement Methodology

The increase in volume began in 2012, when the three municipalities reviewed the cost of baling plastic and the volatility of the markets. Residents, both at the curb and at the depot were sorting 8 streams of recycling to reduce the labour of sorting prior to baling and processing. Prior to 2012, plastic was sorted and graded for PETE 1, HDPE 2 & 5 and everything with a recycling mobius (3, 4, 6, and 7). Glass was also separated by residents for clear and coloured and stored on site for shipping. The table below demonstrates the increase in volume as the number of streams were reduced.

Table 4 ... Recycling Streams & Volumes for the TRI R Communities 2011 – 2017

Product	2012 Metric Tons	2013 Metric tons	2014 Metric tons	2015 Metric tons	2016 Metric tons	2017 Metric tons
Mixed Plastic	26.93	39.04	39.09	39.48	125.69	149.69
Film Plastic	7.48	0.00	10.45	10.45	0.00	0.00
Aluminum	5.32	6.04	5.16	5.77	0.00	7.62
Steel	11.87	12.70	10.24	14.64	0.00	2.22
Glass	32.22	30.00	20.26	25.26	0.00	0.00
TOTAL	83.82	87.78	85.20	95.60	125.69	159.53
FREIGHT COST	\$5,000	\$8,436	\$9,197	\$10,222	\$22,837	\$30,551

In the fall of 2015 a review of labour cost versus revenue for baled steel and aluminum lead to the decision to cease processing and an agreement was reached with BFI to begin shipping all mixed containers to their Bracebridge facility. Collection and separation of glass also ceased and were include in the shipment to Bracebridge.

The bins used for shipping mixed container recycling were a 40 yard open top bin for material received from the Village curbside collection as well as a 30 yard side loading depot for residents dropping off at the site. Tonnage for each bin shipped was reported from the processor. A review in 2016 justified the intention to submit an application for funding the purchase of a stationary recycling compactor.

3.2.1. Monitoring Challenges, Limitations and Solutions

The project was delayed when information from AMO was misinterpreted as well as the contractor who was awarded the job for the concrete pad withdrew. If the project had been completed as scheduled more information would be available for the project analysis. However, the 2 (two) compacted bins shipped to the processor have already proved the savings.

As of January 2018 the Village of Burk's Falls has been shipping the blue box materials collected at the curb, directly to Waste Connections (formerly BFI); however, the material from the curb was shipped in a 40 yard open top, whereas the materials collected at the depot were shipped in a 30 yard side loading container. Only the volumes of the 30 yard side loading container will be used in the comparison below.

3.3. Project Results

Waste Connections Inc. invoicing and weigh bills have been used to review the outcome as projected. As we have only shipped two bins since completion of the installation, the months of December and January are used to demonstrate the outcome.

Table 5 ... Weights and Invoicing December & January 2016 – 2018

	December 2016	December 2017	January 2017	January 2018
	Loose	Compacted	Loose	Compacted
# of bins shipped	3	1	4	1
Total Weight (MT)	4.57	3.80	4.95	4.19
Total Lift Cost	\$825	\$275	\$1,100	\$275

3.4. Analysis of Results

The project proved to be successful by allowing the TRI R Communities to reduce the number of bins shipped for processing. Prior to installation, the communities were averaging 1.35 metric ton of mixed containers per lift. With the compactor, the average will be closer to 4 metric ton per lift. This will directly reduce freight cost by 70%.

The direct cost is easily measured, however labour, fuel and health & safety costs will also be reduced as the site attendant will not be manually pushing material into the corners of a depot to ensure efficient loads in an inefficient side loading container as well as moving overflow from a hopper to the 40 yard open top container. Residents are no longer required to dump mixed containers out of a bag as long as it is a clear bag, which will reduce the bottle neck of vehicles around the sorting area.

3.5. Lessons Learned

As the project was completed in late November, there was very little time to work out the bugs in the system. Within the first month we encountered a cold spell that saw temperatures plummet to -37 degrees for a 5 day period. Although others were consulted, no one had brought up the issues with the hydraulics in extreme cold temperatures. Metro Compactor Inc. was well aware of the fact that this unit would be outside in the elements however they made no attempt to address this during installation. Along with the delays due to the concrete contractor, it is unclear why there is not a company that could be awarded the tender as a total package. Maintenance has since installed an in-line heater for the hydraulic fluid.

4. PROJECT BUDGET

Table 6 depicts the financial planning behind the Compactor Cost Savings Project. Quotes used for the initial application varied due to the delays. Savings were found in the electrical installation and converting single phase on site to the three phase required to operate the compactor. Overall, the project was under budget by \$5,799, however an additional \$1,063 was spent on the in-line heater as it was not included in the initial quote from Metro Compactor Inc.

Table 6 ... Project Budget, Approved and Actual

Description	Budget	Actual	Scheduled Date	Completion Date
Concrete Pad	\$6,000.00	\$7930.00	August 15, 2017	November 25, 2017
Electrical Installation Hook up	\$10,000.00	\$9,511.74	September 1, 2017	November 30, 2017
Single Phase Invertor	\$6,500.00	\$0.00	Electrician had solution for single phase conversion which was included above	
Refurbished Stationary Compactor & Install	\$15,558.00	\$16,120.00	September 15, 2017	November 27, 2017
Delivery to Facility	\$2,000.00	\$2,064.00	September 15, 2017	November 27, 2017
Refurbished 40 Yard Container (2 units)	\$10,366.00	\$9,000.00	September 15, 2017	November 27, 2017
Total Project Cost	\$50,424.00	\$44,625.74		
1.7% Lieu of tax	\$857.21	\$758.64		
	\$51,281.21	\$45,384.38		
Township's Portion (63%)		\$28,592.16		
CIF Funding (37%)		\$16,792.22		

5. CONCLUSIONS

In closing, the compactor installation project will be successful at reducing the cost of freight with regard to mixed container recycling. It is also anticipated that the volume of material diverted will also increase as the process makes participating in the program a lot easier for residents. The site staff will also reap the benefits as there will be less manual labour as the machine does the work for them.