



Sioux Narrows Compaction Bins  
CIF Project Number #867

Final Report  
January 6, 2017

Prepared for:  
Waste Diversion Ontario  
Continuous Improvement Fund Office  
Barrie, Ontario

## **Acknowledgement**

*This Project has been delivered with the assistance of Waste Diversion Ontario's Continuous Improvement Fund, a fund financed by Ontario municipalities and stewards of Blue Box waste in Ontario. Notwithstanding this support, the views expressed are the views of the author(s), and Waste Diversion Ontario and Stewardship Ontario accept no responsibility for these views.*

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## Table of Contents

1	Introduction .....	1
2	Background .....	2
2.1	Community Profile .....	2
2.2	Waste Management System .....	2
2.2.1	Landfill and recycling depot hours of operation .....	2
2.2.2	Recycling program .....	2
2.2.3	Waste electronics recycling .....	3
2.3	Program Challenges .....	4
3	Approach .....	4
3.1	Scope of work .....	4
3.2	Monitoring and Measurement Methodology .....	4
4	Project Results and Analysis .....	5
4.1	Project Results .....	5
4.2	Analysis of Results .....	5
4.3	Lessons Learned .....	6
5	Project Budget .....	6
6	Conclusions .....	7

## List of Figures

Figure 1: Map of Township (red outlined area) relative to Winnipeg, MB .....	1
Figure 2: Accepted recycling materials in the Township’s program .....	3

## List of Tables

Table 1: Landfill and recycling depot hours of operation .....	2
Table 2: Comparison of Blue Box recycling annual costs .....	5
Table 3: Project budget vs actual costs .....	6

## Executive Summary

The Township of Sioux Narrows – Nestor Falls is a municipality in Northwestern Ontario. Blue Box recyclables are managed through depot programs located at the two municipal landfills. Recyclables are transported to a distant material recovery facility (MRF) located in Winnipeg Manitoba. Hauling costs represent a significant portion of program costs. This project work involved the purchase and installation of compaction units to reduce hauling costs. The Township received financial and technical assistance in completing this project work from the Continuous Improvement Fund (CIF) through CIF project 867.

The Township purchased and installed two Marathon TC 220 compaction units; one for each of the municipal landfills. The compaction units have gasoline engines to supply the hydraulic power to cycle the ram and compact recycling materials. The compaction units also came equipped with solar backup kits which are meant to provide the energy to prime and start the engines; as opposed to using a pull cord to fire up the engine. Site preparations were completed in the spring of 2015 and the compaction units were installed and operational in August 2015.

Ty-Gr Construction was contracted to complete the site prep work at the Sioux Narrows landfill site and the Township used in-house staff to complete the work at the Nestor Falls site as no contractor was available. The Township assisted the compaction unit supplier with unloading and placement of the compactors on delivery.

This project was completed on time at a total cost of \$137,234, below the budgeted project costs of \$166,884.

2014 versus 2016 full calendar year operations were used as the basis for comparison between the previous and new compaction system. Recycling has increased from 16.5 tonnes in 2014 to 17.2 tonnes in 2016, while the number of lifts has decreased from 42 lifts in 2014 to 6 lifts in 2016. The reduction in lifts is directly attributable to the compaction of recyclables. Reducing the number of lifts has significantly reduced annual haul costs, the savings of which are estimated at \$30,000 per year. The resulting return on investment or payback period for this project is estimated at 4.6 years.

The recycling program is definitely improving. However, since the compaction systems were installed, there have been issues with the solar units. These issues have to date not been resolved, resulting in staff manually starting the compaction process and reduced efficiencies. This is a wrinkle in the otherwise very positive changes to our program over the past couple of years.

Regionalization efforts in Northwestern Ontario have provided long term, dependable and cost efficient processing and hauling services for the Township. The installation of the compaction system has further improved the efficiency of our program by reducing hauling costs. Tonnes are increasing and costs are decreasing, which has improved the long-term sustainability of our program.

For more information on this project, please contact:

Wanda Kabel | Chief Administrative Officer | Township of Sioux Narrows – Nestor Falls  
o: 807.226.5241 | e: wkabel@snnf.ca

# 1 Introduction

Our goal is waste diversion from our landfills, with the ultimate purpose of extending the landfill life and controlling associated costs. Of course, this relies on reusing and recycling materials. Having these programs operate efficiently and affordably lessens the fiscal burden on our small, rural community enabling us to continue our efforts and meet our goal. Unsustainable costs could result in our community abandoning recycling which would cause the quantity of waste deposited in our landfill to increase. This of course is not ideal.

In 2014, hauling and processing costs for Blue Box recycling materials collected at the depot locations was extremely expensive. Additionally, the MRF contractor accepted only a small suite of recyclable materials and required these be pre-sorted. At this time, the Township worked with the CIF and municipal neighbours in a Northwestern Ontario regionalization effort which secured a new MRF contractor and hauler. The new MRF allowed the Township to expand the list of acceptable recycling materials and effectively divert more plastic materials from the landfill through the recycling program.

The change to the new processor, which accepted single stream comingled materials, provided another opportunity for the Township – compaction. Compacting recycling reduces the number of lifts required to transport the same amount of materials as you get more into the same volume.

This project work included purchasing and installing compaction units at the Township’s two recycling depot locations. The Township contracted Metro Compactor to provide and install the compaction units in addition to providing training to staff in their operation. The Township contracted local construction and supply companies to complete some of the site preparation and provide materials in addition to utilizing our staffing resources to complete the work.



Figure 1: Map of Township (red outlined area) relative to Winnipeg, MB

## 2 Background

### 2.1 Community Profile

The Township of Sioux Narrows – Nestor Falls is a small, rural community located in Northwestern Ontario approximately 290 km east of Winnipeg, MB. Our municipality encompasses a large geographic boundary, 156,000 Hectares, and contains two communities, Sioux Narrows and Nestor Falls, approximately 50 kilometers apart.

We are a popular visitor and cottager destination, due to our proximity to Lake of the Woods, and our population exponentially increases in the summer months

### 2.2 Waste Management System

As we service two communities, we essentially have two of all essential public service facilities, including two landfill sites; each landfill site contains a recycling depot.

#### 2.2.1 Landfill and recycling depot hours of operation

The landfill and recycling depot locations are staffed during open hours of operation and the sites are closed off to the public outside of these hours. The hours of operation vary seasonally as presented in table 1 below.

**Table 1: Landfill and recycling depot hours of operation**

	Sioux Narrows	Nestor Falls
Summer hours (May – September)	8:00 a.m. To 11:30 a.m.	1:30 p.m. To 5:00 p.m.
Summer days	Tues, Thurs, Fri, Sat, and Sun	Tues, Thurs, Fri, Sat, and Sun
Winter hours (October to April)	9:00 a.m. To 11:30 a.m.	1:30 p.m. To 4:00 p.m.
Winter days	Tues, Thurs, and Sat	Tues, Thurs, and Sat

#### 2.2.2 Recycling program

Our new recycling compactor is different than in the past, as items must be deposited loose into the bins, NOT bagged as they were previously.

The Township comingles all recycling materials in the compactor for shipment to the MRF processor. The list of accepted recycling materials is presented in the promotion and education flyer pictured in figure 2 on the following page.

Residents are asked to place materials next to the compaction units, in bins maintained by the Township, so that the landfill attendant may deposit the material into the compactor and cycle the unit.

# Recycling Collection

Don't sort them... Don't bag them  
Just empty them and toss them in loose.

## Accepted:

### PAPER



- All household and office paper: newspaper, inserts, flyers, catalogues, magazines, telephone books, paper gift wrap, greeting cards
- Paper bags with single & multiple paper layers, e.g., pet food bags
- Corrugated cardboard and cardboard boxes
- Hot and cold beverage cups

*Place shredded paper in a clear, full-size (79 litre) plastic bag.*

### CONTAINERS



All food, beverage and household plastic containers, plastic packaging: bottles, jugs, tubs, pails, clamshells, cold drink cups

- look for arrow triangle 
- empty containers only
- remove caps and lids

**Metal:** steel and aluminum cans, foil and trays

- for food and beverages
- empty containers only

**TetraPak and gable top cartons:**

- juice boxes and cartons
- soup boxes
- milk cartons

**Glass Food & Beverage Containers**

## Not Accepted:



Please rinse containers.

- Plastic bags
- Styrofoam packaging and trays
- Non-paper gift wrap, e.g. foil gift wrap
- Cardboard boxes with wax coating
- Foil-lined boxes or bags
- Paper towels, napkins or tissues
- Used motor oil containers & batteries
- Bioplastic or compostable plastic
- Liquid-absorbing pads, e.g., in trays of meat, poultry, fish, etc.
- Plastic wrap and shrink wrap for meat, poultry, fish or cheese
- Plastic blister packs, e.g. plastic/paper packaging for batteries, toothbrushes, etc. or plastic/foil protective packaging for chewing gum and pills
- Ceramic plant pots
- Plastics that are not containers, e.g. toys, laundry baskets, plastic cutlery
- Mirrors, window glass, broken glass





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Figure 2: Accepted recycling materials in the Township's program

### 2.2.3 Waste electronics recycling

We are now officially accepting electronic waste at the landfill sites! Acceptable items include: Computer Monitors, Desktop Computers, Portable Computers, Computer Peripherals, Printing, Coping & Multifunction Devices, Telephone & Telephone Answering Machines, Cellular Devices & Pagers, Home Theatre in a box, Aftermarket vehicle Electronics, Video Players & Projectors, Video Recorders & Cameras.

## **2.3 Program Challenges**

Recycling is a costly business at best and our geographic location and distance from any large center reduces our access to services, nearly eliminates competition and, of course, increases the rate at which we pay for what limited services are (if) available to us. We were lucky to have had a regional hybrid multiple stream recycling pickup and processing service provider for many years. Though costly, with our former hauler/processor our costs were \$2,600.00 per/tonne, it was the only service available to us at the time.

The Township began working with CIF and local municipalities on a regional effort to secure sustainable recycling hauling and processing services. As a result of the regionalization efforts, the new MRF/hauling contractor accepted single stream comingled recycling. This provided the Township the opportunity to compact recyclables and reduce hauling costs.

## **3 Approach**

After securing new collection and processing services with Emterra Environmental Inc. in Winnipeg, the Township worked to scope out a compaction system for the recycling depots. The Township contacted Efficient Waste Management (now Metro Compactor) to spec compactor equipment, site preparation requirements, and price the proposed compaction collection system.

As the new units require installation on concrete bases, and our winters prohibit concrete work, we were forced to wait until the frost left the ground this spring to install the concrete; all the while without recycling collection. Though we had notified the supplier of the compactor units that we would be installing the concrete slabs early in Spring, and maintained regular communication with the company, our units were not delivered until mid-Summer 2015.

### **3.1 Scope of work**

To prepare the depot site, the Township was required to install two concrete slabs for bases for the compactor units. We were able to find a contractor to perform the works at the Sioux Narrows Site, but were unable to find a contractor to complete the work at the Nestor Falls Site. Therefore, we were required to use in-house staff. Sites were filled up to grade with aggregate and the slabs were formed.

Metro compactor delivered and installed the compaction units to the Township in the summer of 2015. The Township assisted the supplier of the units with unloading and placement of the compactors on delivery.

### **3.2 Monitoring and Measurement Methodology**

For reporting purposes, the Township monitored the number of load sent to the MRF, the costs to haul and process material, as well as site management costs which differed between the current compaction and previous systems (site attendant time spent operating the compaction units). The baseline costs for the previous program use statistics from the 2014 full calendar year versus the full calendar year of 2016 for the new compaction system. 2015 was not used as the previous system ceased operation in the winter and the new compaction program did not take effect until mid-summer.



## 4 Project Results and Analysis

### 4.1 Project Results

In 2016, our first full year of operations, we diverted 17.19 tonnes and shipped this material to the MRF in 6 trips at an average of 2.87 tonnes per lift.

In 2014, our last full year of operations with our former system, we diverted 16.50 tons and shipped this material over 42 lifts for an average of 0.4 tonnes per lift.

### 4.2 Analysis of Results

Though it is early to predict a trend, our diversion rate is increasing and our costs are decreasing. However, our hauling/processing costs were significantly reduced; in 2016, \$360 per/tonne versus 2014 with our former hauler/processor our costs were \$2,500 per/tonne.

Table 2 below compares the costs between the previous program and the new compaction program. The costs listed do not include elements which remained unchanged in transitioning between collection programs (i.e., administration, promotion & education, etc.). The previous program had a single price for processing and hauling recyclables whereas the new contract splits out the costs for these two elements. Additionally, the new program includes more staff involvement estimated at 0.75 & 1.50 hours per day for the winter and summer seasons, respectively. Fuel (unleaded gasoline) costs are an additional element to the new program, however these costs are not tracked separately and were unavailable for analysis.

**Table 2: Comparison of Blue Box recycling annual costs**

	2016	2014
hauling*	\$ 4,950.00	\$ 41,118.00
processing	\$ 1,203.30	
staffing	\$ 5,307.25	
fuel for compactors	tbd.	
clear bag purchases		\$ 500.00
<b>total</b>	<b>\$ 11,460.55</b>	<b>\$ 41,618.00</b>
<b>cost per tonne</b>	<b>\$ 666.70</b>	<b>\$ 2,522.30</b>
project costs		\$ 137,234.03
cost savings		\$ 30,157.45
payback period		4.6 yr.

\*includes hauling and processing costs under prior program

The annual cost savings achieved from this project work amount to approximately \$30,000. The estimated payback period on the compaction system investment is estimated at 4.6 years.

### 4.3 Lessons Learned

Initial purchase of the new system was extremely costly, but the funding provided by CIF made it easier to get buy-in from council and CIF staff have been extremely informative and helpful throughout the process. The program allows more material to be recycled, single stream is easier, and not using bags also simplifies the process. These factors have led to greater participation from residents and more material being diverted from landfill than the previous program. Compaction of the recyclables has decreased program costs significantly. The net result of the new program is that diversion rates are increasing and costs are decreasing. Wonderful!

Compactors systems should have auto-load function, but have been without since delivery. We have had a problem with customer service from compactor system supplier in resolving this issue. Distance from compactor supplier may be the cause of poor customer service and inability to have the auto-load functionality repaired. As the units are currently without auto-load functionality, municipal staff must operate the units manually which costs staffing resources.

## 5 Project Budget

The project budget versus actual costs are presented below in Table 3. Overall the project was under budget more than \$29,000 thanks largely to the compaction system coming in under budget. Site preparation was slightly more expensive than anticipated as the Township was unable to contract out the second site’s work and had to complete this internally. The contingency portion of the budget included the costs of signage at the depots, coordination of site preparation, training, and trouble-shooting of the new system, and project reporting.

**Table 3: Project budget vs actual costs**

Item	Budget	Actual
Compactor bins, with software, power packs, solar kits	\$ 143,843	\$ 117,066
Site prep work, cement slabs	\$ 9,030	\$ 11,553
10% Contingency	\$ 14,011	
Coordination, training, & trouble shooting		\$ 5,640
Signage		\$ 875
Measuring, monitoring, and reporting		\$ 2,100
<b>total</b>	<b>\$ 166,884</b>	<b>\$ 137,234</b>

## 6 Conclusions

Recycling for a small municipality takes a significant commitment, not only financially, but also ideologically. Recycling isn't easy and it certainly isn't cheap. Council must be committed, staff must buy-in to the programming, it must be promoted, led by example, resources must be allocated, resident cooperation is difficult to gain and constant public education and marketing of the program is necessary.

For the Township of Sioux Narrows – Nestor Falls, with the challenges we already face as a 156,000 Hectare community, with a small population and two communities that have very differing dynamics and cultures, choosing to recycle is extraordinary.

Our budget is limited and most programming, if not mandated by legislation, is 'high needs' and 'high public demand' based. On an organizational level, it is the commitment of our council and administration to reduce the waste deposited to landfills for the future sustainability of waste management that drives the initiative.

We did learn something anecdotal in the gap between recycling services, there is public demand, albeit difficult to measure. We received countless and repeated inquiries from our residents about 'when' recycling service would resume. As well, with the installation of the new solar compactor units, their appearance has drawn attention, and with the diligence and persuasion of our staff, we have recruited more residents to recycle.

Many of the hurdles that the Township of Sioux Narrows – Nestor Falls had to overcome were not preventable, such as the sudden withdrawal of service from our former contractor. A suggestion to other communities purchasing new units could be to include a penalty clause in a purchase agreement for late delivery by a supplier. As well, if possible, find a supplier in closer proximity to your community, in order to obtain better customer and warranty service.

Overall, we are most pleased with the results. We remain positive and hopeful that the New Year, 2017, will reflect greater positive outcomes for the transition we made to the solar compactor units and single stream program.