



**RECYCLING PROGRAM AND
FACILITIES EVALUATION -
TOWNSHIP OF NORTH DUNDAS
PROJECT 263**

File No. 160930116
October 2010

Prepared for:

Continuous Improvement Fund
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1.0 Introduction

Stantec was retained by the Continuous Improvement Fund (CIF) to conduct a review of the Township of North Dundas current recycling program specifically as it relates to their current recyclable materials processing operation from a cost and efficiency stand-point. As part of the undertaking Stantec conducted a site visit to the Township Materials Recovery Facility (MRF) to assist in the assessment and development of options to both increase program efficiency relative to waste management industry best practices, and to identify opportunities for the Township to access CIF funding for implementation of any identified potential program improvements.

The Township of North Dundas provides waste management services garbage and recycling collection and landfilling and recyclable materials processing to over 12,000 residents, serving 4,398 households. Recyclable materials are collected using blue boxes provided by the Township and collected utilizing the Township's own forces in multi-material sort (5) collection vehicles for OCC, ONP, aluminum and steel cans, plastics and glass. The Township currently collects fifteen (15) different recyclable material commodities.

The North Dundas MRF is located at 12620 Boyne Road in Winchester and was constructed in 1993. The Township's landfill is located at the same site. The MRF has marketed in the range of 580 to 1,200 tonnes per year (from 2000 to 2010) and at one time (2000) also processed materials for the Township of South Dundas. A key component of this report is the consideration of the continued use of the Township's MRF for processing of their own materials (and potentially for others) or as a location for transfer of the Township's recyclable materials (and potentially others) to another MRF for processing.

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2.0 Current MRF Configuration

The existing MRF operation includes a tipping/receiving area with bunker areas for cardboard, paper and plastics within the building. See Figure 2.1. A separate unloading area exists at the back of the building for material conveyance onto the tipping floor or onto a movable chain conveyor which can be fed to either the aluminum/steel sorting area or to the plastics sorting area.



Tipping Floor – Cardboard Bunker



Tipping Floor – Paper Bunker



Rear of Building – Unloading Area



Movable Chain Conveyor

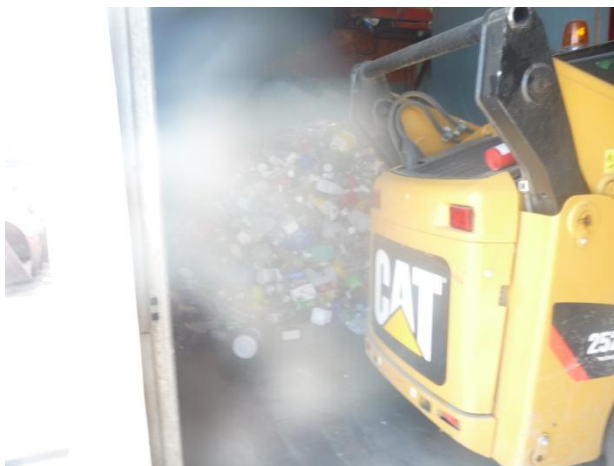


Unloading Area Conveyance to Building



Unloading Area Conveyance to Building

The plastic sorting area consists of a conveyor, a sorting station for PET and HDPE and a storage bunker. The aluminum/steel area consists of a can conveyor and crusher and steel can storage area, an aluminum bin and a sorting platform.



Plastics Storage Bunker



Building – Small Storage Area

Other facility features include a Cover All Building used for storage of aluminum cans, baled OCC and ONP and other materials as well as an outdoor area allocated for plastics storage.

RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Current MRF Configuration

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Storage in Cover All Building



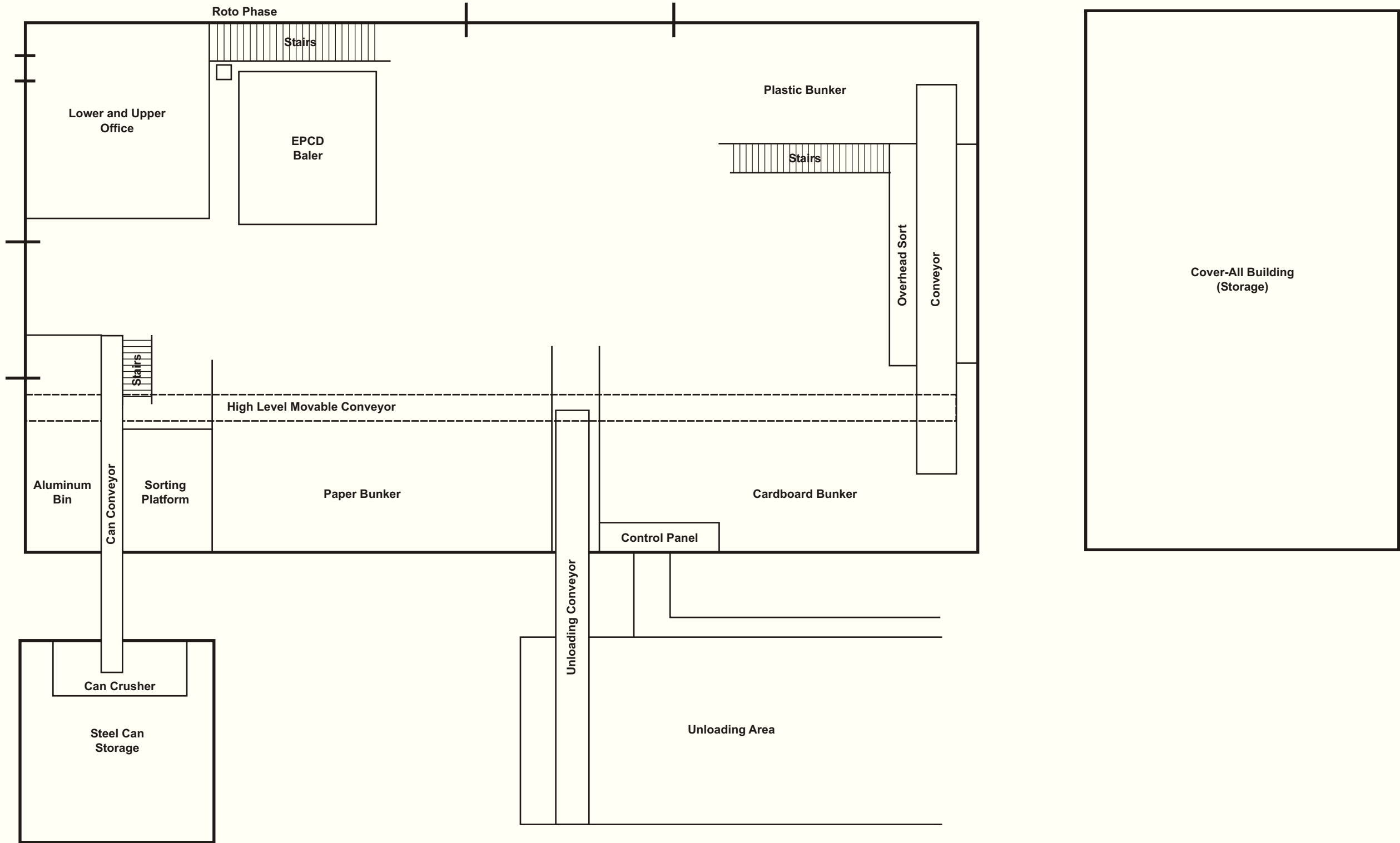
Outdoor Bale Storage Area

Materials are baled with an EPCO Horizontal Baler installed in 1999. Most of the stationary equipment was installed between 1993 and 1999. The Cover All Building was constructed in 2001 and some additional storage and unloading areas were constructed 2002-2005. The Township bought a new loader for the facility in 2009.

The buildings are configured such that the Township's collection vehicles enter the tipping/receiving area to unload both OCC and ONP and utilize the unloading area at the rear of the building to unload aluminum and steel, and plastics respectively. Glass is unloaded outdoors and crushed by the landfill compactor to be utilized for construction of new landfill access roads.

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Not to Scale

July, 2010
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PREPARED FOR:
TOWNSHIP OF NORTH DUNDAS
RECYCLING PROGRAM AND FACILITIES EVALUATION

FIGURE NO.

2.1

TITLE

MRF FACILITY LAYOUT



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Back of figure.

3.0 Materials Recovery Facility Operating Costs & Existing Capital Equipment

The current staffing allocation for the Township's waste management program is as follows:

Manager – 1 – allocated 50% recycling/50% landfill operations
 Collections – 2.5 employees
 Recyclable Materials Processing – 1.5 employees
 Landfill – 1 employee

The Township's operating and capital costs (2009)¹ for blue box recyclable materials processing are provided in Table 3.1.

Table 3.1: Operating & Capital Costs for Blue Box Material Processing	
Blue Box Processing Material Handling Cost	
Direct Processing Cost	\$89,723.72
Equipment Repairs & Maintenance	\$7,044.56
Processing Equipment Fuel	\$4,022.00
Baling Wire	\$2,558.40
Miscellaneous Supplies	\$358.67
Material Handling Operating Cost	\$103,707.35
Blue Box Processing Facility Cost	
Building Repairs & Maintenance	\$691.78
Building Insurance	\$1,695.00
Utilities – Hydro	\$2,394.12
Utilities – Gas	\$1,864.19
Site Security	\$143.35
Taxes	\$10,246.23
Other – Telephone	\$1,168.02
Other – Office Supplies	\$326.38
Other – 2008 Total	\$3,148.90
Processing Facility Operating Cost	\$18,529.07
Blue Box Processing Capital Depreciation Charge	
Annual Cost – Initial MRF Equip/Major Retrofits	\$1,436.36
Annual Cost – Replacement Equip/Minor Retrofits	\$1,966.76
Annual Cost – Rolling Stock	\$13,932.00
Total Processing Capital Cost	\$17,335.12
Total Residential Processing Cost	\$139,571.54

¹ WDO datacall, 2009

RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Materials Recovery Facility Operating Costs & Existing Capital Equipment

October 2010

In 2009 North Dundas marketed approximately 743 tonnes. The Township managed an additional 60 tonnes of glass in 2009 which was not marketed. At an annual cost of \$139,571,54 the cost per tonne for processing was approximately \$187.70. The Township generated \$40,818,00 in revenue the same year from the sale of recyclables, approximately \$70.00/tonne. The net cost of the program when only processing and revenue are concerned is in the order of \$110.70/tonne.

Table 3.2 provides a list of existing MRF stationary and mobile equipment, the age of equipment and the present value of those assets. This data was generated by the Township as part of their present value assessment (2010) of all Township assets.

Table 3.2: MRF Stationary and Mobile Equipment Age and Present Value (2010)

Equipment	Present Value	Installation Date (Age)
Blue Box Building	\$77,469	December 1993
Radiant Heat for Building	\$1,985	January 1995
Conveyor System	\$18,420	December 1993
Steel Can Conveyor	\$1,000	1994
Steel Can Crusher	\$5,000	December 1995
Steel Can Storage Area	\$3,183	August 2005
Recycling Unloading Area	\$5,353	March 2002
Movable Chain Conveyor	\$2,400	October 1999
EPCO Horizontal Baler	\$38,734	February 1999
Roto phase Converter	\$8,549	March 1999
Cover all Building	\$14,656	September 2001
Caterpillar 252B2 Uni loader	\$38,700	June 2009
42 inch Forks for loader	\$600	April 2006
73 inch Utility Bucket	\$560	1994
Utility Grapple Bucket	\$1,075	1994

4.0 Collection Operating Costs & Existing Capital Equipment

Table 4.1 presents the Township's 2009 operating costs (WDO Datacall, 2009) for its blue box collection program.

Table 4.1: Operating & Capital Cost – Curbside Blue Box Collection	
Direct Curbside Collection Cost - Staffing	\$149,539.53
Training	\$497.36
Recycling Vehicle Repair & Maintenance	\$11,536.80
Recycling Vehicle Fuel	\$16,937.78
Recycling Vehicle Radio Air Time	\$2,290.53
Recycling Vehicle Insurance	\$2,625.00
Blue Boxes	\$3,153.60
Other – WSIB	\$353.71
Other – Clothing Allowances/Misc.	\$401.36
Total Operating Costs	\$187,335.67
Blue Box Curbside Collection Capital Depreciation Charge	
Annual Cost – Vehicles	\$21,931.74
Annual Cost – Blue Boxes	\$1,030.18
Annual Cost – Roll-off Bins/Compacted Trailers	\$1,782.00
Annual Cost – Other – Recycling Truck 2005	\$10,003.68
Total Curbside Collection Capital Cost	\$34,747.60
Total Curbside Collection Cost	\$222,083.27

The Township owns a fleet of vehicles used for curbside collection and materials haulage including:

- 1 – 2010 Chevrolet half tonne (allocated 50% to recycling and 50% to landfill operations)
- 1 – 2009 4300 International 4x2 with Shu Pak AMR-38 (Aluminum Manual Load Recycle Body)
- 1 – 2008 Chevrolet 1 tonne with a steel dump box
- 1 – 2005 International 4300 4x2 (Roll off Truck)
 - 7 – 12 cubic yard roll off containers
 - 1 – 18 ft long compartmentalized container for recycling
- 1 – 20' trailer with removable compartments for recycling (used in combination with 2008 Chevrolet 1 Ton)

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5.0 Continued MRF Operations

There are two scenarios/options for the Township that would involve continued operation of the MRF: maintain status-quo operations processing only Township material; or modify the MRF to accommodate a broader regional program. This section considers those options in the context of best practices and relative to the general practicality of either option.

From a materials processing standpoint the *Blue Box Program Enhancement & Best Practices Assessment Project Report*, KPMG, R.W. Beck, 2007 identified a number of best practices that would be applicable to a MRF of this size and which could be considered to improve processing effectiveness, efficiency, and costs in recyclable materials processing as follows:

- Two days storage capacity should exist to allow for second processing shift and a suitable amount of stored materials should there be any equipment failures or other operating interruptions.
- Design flexibility should be maintained through manual sorting mechanism to address material changes, changes in material quantities and the like.
- There should be a balance between manual labour and mechanized labour.
- Installed equipment should be appropriate for the task, for example the use of proper sized balers, moving equipment including loaders etc.
- An area appropriate for pre-sorting should exist to allow for the removal of oversize and problem materials before they can cause damage to processing equipment.
- Feasibility analyses should be undertaken to determine the appropriate amount of capital investment required to maximize benefits.
- Options that will result in the greatest efficiencies first should be pursued.

Some best practices would not apply to the current MRF operations including:

- Using a fluffer or perforator can help increase bale density up to 20%.
- Optical sorting equipment can increase the efficiency of sorting plastics, however this option is only feasible if the amount of recyclables processed is greater than 40,000 tonnes.
- Maintenance provisions should be included in processing contracts to extend the lifespan of equipment and ensure optimum performance.

The Township only processes in the range of 580 to 1200 tonnes per year which prohibits optical sorting equipment and very likely prohibits the cost of a perforator to improve bale density (the capital cost outlay would likely be more than the benefit of additional bale density – the Township sold just under 60 tonnes of plastic in 2009). Maintenance provisions of contract are not required as the Township operates its own MRF. The rest of the best practices identified are generally met by the current program except that there is very little space for

additional sorting to accommodate any additional materials that might be added to the recycling stream.

Another best practice identified in the *Blue Box Program Enhancement & Best Practices Assessment Project Report*, KPMG, R.W. Beck, 2007, is a multi-municipal planning approach to the processing of recyclables. This best practice when applied should realize cost-savings to partnering municipalities through economies of scale, reduced duplication of staffing, management, supervision, opportunities for use of innovative technologies and methods (as more funding is available) and potential pricing advantages through larger quantity sales of materials to end markets.

Using the 2008 Datacall, Stantec identified other municipalities within a reasonable distance (50 kilometres) of Winchester and that may be able to provide additional tonnage to the MRF for processing or for transfer. Those municipal blue box program profiles are provided in **Appendix A**. Within 50 kilometers of Winchester approximately 14,300 tonnes/year of blue box materials are currently being collected for processing. These municipalities collect their blue box materials in two streams: containers and fibres, some weekly and some alternating weekly. The current MRF configuration does not lend itself well to two-stream processing and would require substantial modification to accommodate that material.

In the case of the paper stream (OCC, OBB, ONP, mixed paper), materials in this tonnage range can be managed with an inclined conveyor to a series of manual sorting stations with OCC, OBB, mixed paper, residual waste removal manually (negative sort on ONP). In the case of mixed container processing (at this tonnage range) manual sorting can accommodate a number of materials e.g. HDPE, PET, tubs & Lids, glass, polycoat etc. but processing is usually complimented at minimum with an overhead magnet for steel and by an eddy current separator for aluminum. Neither of which currently exist at the MRF.

Further, and in either case where the existing facility is utilized as a MRF or a transfer station, a much larger unloading area within the MRF building, capable of unloading both fibres and containers would be necessary. This could involve changing the unloading conveyor system from the rear outside unloading area to allow both fibres and containers to enter the facility. It is currently not configured in a way to receive these materials.

A proper indoor unloading area would need to facilitate unloading of a variety of container types. Standard tipping doors are commonly constructed at an approximate 28' in height to accommodated tipping and pull out of roll-off containers. This height accommodates a long box of 26' and with a 50 cubic yard capacity which is the largest roll-off bin typically used. The current MRF configuration does not allow for tipping roll-off bins of this size.

In order for the Township to act as a "regional MRF" not only would there need to be substantial capital investment but significant additional storage for the receipt of materials would be necessary. (This is addressed further in Section 5.0). While the business case for a "regional MRF" is not part of the scope of this report, preliminary consideration of that possibility is not likely a practical option t given the amount of investment required, the existing contract

arrangements in place for proximal municipalities (listed in **Appendix A**), and the fact that there are newer two-stream MRFs within reasonable proximity that have capacity (see Section 5.0).

In the case where the Township maintains its status quo program (without receipt of additional materials from others) there are a number of pieces of equipment that would very likely require replacement in the next five (5) years or so assuming useful life of equipment is approximately fifteen (15) years. This would include but not necessarily be limited to those identified in Table 4.2.

Table 4.2: MRF Stationary and Mobile Equipment Age and Present Value (2010)

Equipment	Present Value	Installation Date (Age)
Conveyor System	\$18,420	December 1993
Steel Can Conveyor	\$1,000	1994
Steel Can Crusher	\$5,000	December 1995
Movable Chain Conveyor	\$2,400	October 1999
EPCO Horizontal Baler	\$38,734	February 1999

Replacement of this capital equipment and installation would likely cost in the order of \$150,000 given existing equipment size, with the baler likely accounting for \$100,000 of that equipment replacement cost. If that investment is amortized over a fifteen year equipment life it equates to approximately \$10,000/year (not including the cost of borrowing). These order of magnitude costs are factored into the final analysis.

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6.0 Option to Transfer to a MRF Outside Township Jurisdiction

In order to assess the option of utilizing the Township's existing MRF as a recyclable materials transfer facility (either for just its own material or also including for transfer for other municipalities) it was necessary to determine whether or not there is any available capacity at other MRFs within a reasonable haul distance of North Dundas. As such Stantec contacted five (5) MRFs deemed to be within a reasonable distance. All the MRFs contacted operate two (2) stream (fibre and commingled containers) processing facilities. The relative distance of each of these MRFs is shown in Figure 6.1.

Tomlinson Environmental Services, Ottawa are interested in receiving additional material, have additional capacity and quoted order of magnitude tipping fees at \$75.00/tonne for fibre and \$250.00/tonne for containers with no revenue share back to North Dundas. Metro Waste Paper Recovery Inc. in Ottawa also indicated that they have additional capacity, are interested in receiving additional material and that pricing would be similar to that charged to the City of Ottawa for the processing of their recyclable materials. The cost per tonne for processing for the City of Ottawa was reported for 2008 as \$94.24/tonne with no cost split between fibre and containers². Further discussion would be required to determine if any revenue sharing arrangement could be reached.

The City of Cornwall is also interested in receiving materials from other municipalities in two streams (fibre and container), charges a tipping fee in the order of \$25-\$30/tonne, provides no revenue share and does not process plastic film or polystyrene which is consistent with the North Dundas program.

Quinte Waste Solutions was contacted and recommended that the Township:

- sort out all glass and retain it for their own purposes (e.g. access roads at the landfill),
- keep and bale their OCC and ship direct to market.

Quinte indicated they could take material after September 1, 2010 and would take the fibre for free and pay in the order of \$60.00 - \$80.00/tonne for containers. Quinte is willing to take OCC, but will not accept glass in the commingled container stream. Certain non-scavenging rules would have to be in place (e.g. aluminum) and Quinte would reserve the right to reduce payment if either fibres or container loads include garbage or there are signs of skimming from the load. Loads would be delivered to Trenton.

The City of Kingston is interested in receiving material from North Dundas and has capacity but no specific tipping fees were determined. The City charges based on the percentage (%) throughput relative to overall annual throughput and operating cost. They add a 15%

² WDO Datacall, 2008 for the City of Ottawa.

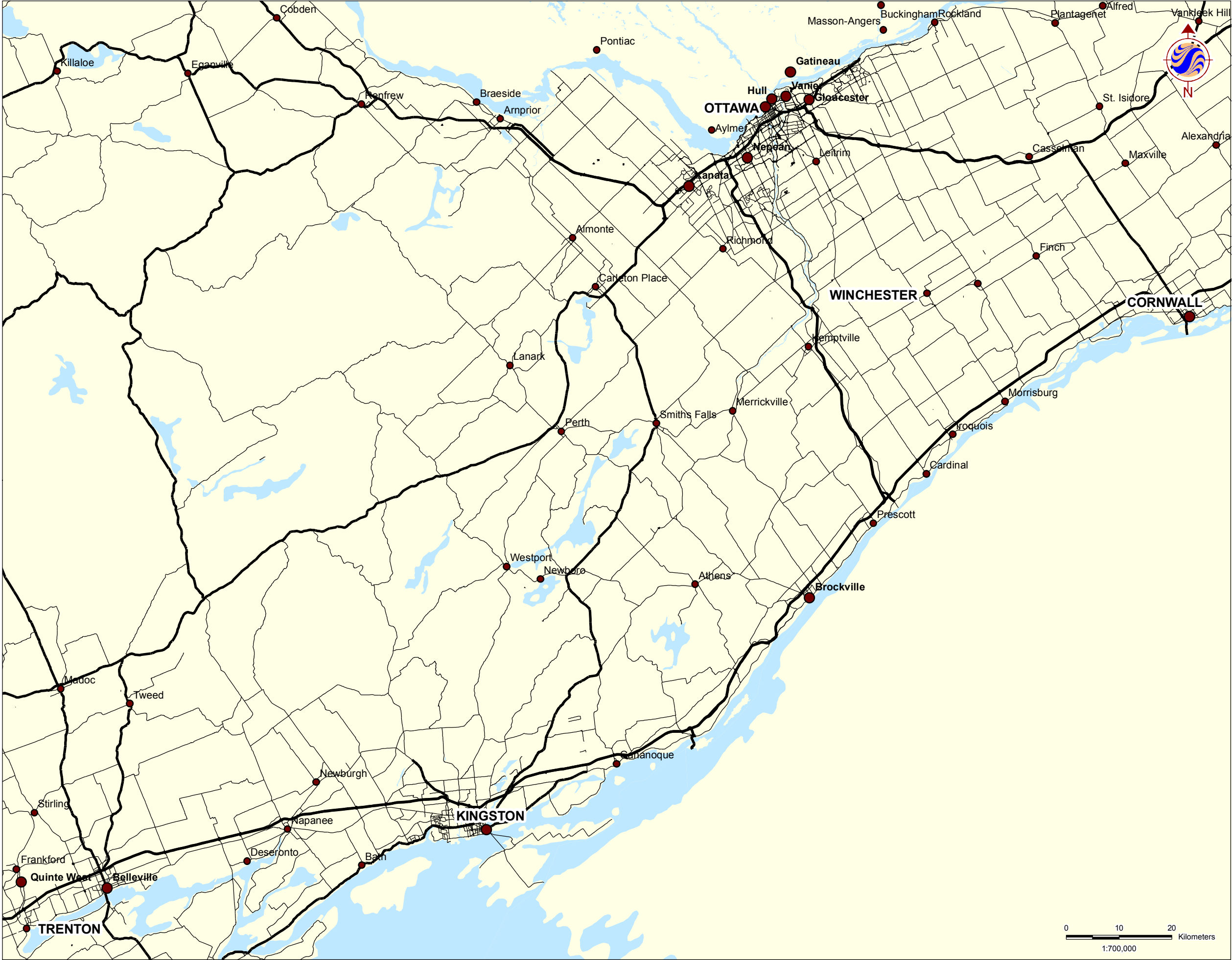
RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Option to Transfer to a MRF Outside Township Jurisdiction

October 2010

administration fee but share revenue from the sale of recyclables. They would have to receive materials in three streams (fibre, containers, glass). Table 6.1 summarizes the tipping fee costs associated with each processing arrangement where tipping fees could be obtained. Note that tonnage to Quinte reflects the continued processing of glass by the Township.

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Notes

- 1. Coordinate System: UTM Zone 18 NAD 83.
- 2. Data Sources: Ontario Ministry of Natural Resources
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July 2010
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Figure No.
6.1

Title
MRF LOCATION
- EASTERN ONTARIO

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Option to Transfer to a MRF Outside Township Jurisdiction

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Table 6.1: Annual Tipping Fee Costs for Processing by Others

	Container Tonnes/Year	Container Tipping Fee	Container Tipping Fee/Year	Fibre Tonnes/Year	Fibre Tipping Fee	Fibre Tipping Fee/Year	Total Tipping Fees/Year
Tomlinson	161	\$250.00	\$40,250.00	643	\$75.00	\$48,225.00	\$88,475.00
Metro Waste	161	\$94.24	\$15,172.64	643	\$94.24	\$60,596.32	\$75,768.96
Cornwall	161	\$30.00	\$4,830.00	643	\$30.00	\$19,290.00	\$24,120.00
Quinte	101	(\$60.00)	(\$6,060.00)	643	\$0.00	\$0.00	(\$6,060.00)

In order to assess what the Township's transfer requirements and costs would be, an assessment of existing facility capacity and an assessment of optimized facility capacity were undertaken. Existing facility capacity was approximated by using typical densities for each of commingled containers (81 kg/m^3) and fibre (284 kg/m^3)³ streams, assuming pyramidal shaped piles and approximating available space in each of the cardboard, newsprint and plastic bunkers as well as the one-half of the Coverall building that would no longer be required for baled material storage.

Based on current inbound tonnage and the balance of the material being fibre and assuming 250 operating days per year the estimated capacity of the Coverall building and the MRF (newspaper bunker) is approximately 8.4 days for approximately 21.6 tonnes. Capacity for commingled containers is estimated at 9.7 days for approximately 6.2 tonnes using both the OCC and the plastic bunkers. The number of transfers (Table 6.2) required under existing facility capacity is based on the need to transfer when at capacity.

The evaluation of optimized storage capacity conversely assumes that transfer occurs when sufficient material is stored to load a 53' trailer. Using the same material densities a 53' trailer can carry approximately 28 tonnes of fibre and approximately 7.8 tonnes of commingled containers. The transfer requirements under this scenario are also shown in Table 6.2.

In the case of Cornwall, their MRF is not configured to receive tractor trailer loads on the tipping floor and nor are they interested in outside unloading that might result in issues with litter and additional handling of materials. As such an A-train hauling arrangement is assumed for this scenario as the most efficient mechanism for transfer. An A-train consists of a truck carrying two (2) roll off bins in a train where the flat bed portions of the truck are connected by an "A" shaped drawbar that joins at a single connection point. The Cornwall scenario assumes an hourly cost of hauling at \$125.00/hour as quoted by local hauling companies for both transfer trailer and roll-off train haulage however it assumes an hour (as opposed to ½ hour) unloading time at the MRF because of the A-train arrangement. Each scenario assumes one hour to load at Winchester. It should be noted however, that the Township owns its own roll-off

³ Residential Waste Materials Density Study (WDO OPT/ORG-R2-02) Town of Markham, City of Guelph, County of Northumberland, ENVIROSRIIS, 2001. Note: Notwithstanding changes in waste composition since the time of the ENVIROSRIIS report that may affect material densities it is felt that these data suffice to enable an order of magnitude estimate for existing facility capacity.

truck and with the acquisition of 40 cubic yard bins they could potentially allocate staff to that end (as they would no longer be either processing their own recyclables or sorting five streams curbside). Based on the same material densities and a 28 m³ capacity of a 40 cubic yard roll off container they can carry almost 8 tonnes of fibre and 2.26 tonnes of containers representing just over 3 days of material. The Quinte scenario was developed based on the delivery of the two streams without glass in order to get the closest 'apples to apples' comparison possible and to avoid as much sorting at the curb as possible.

All of the scenarios are assessed based on the use of top-load transfer trailers and roll-offs. No compaction or acquisition of compactor was assumed.

RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Option to Transfer to a MRF Outside Township Jurisdiction

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Table 6.2: Transfer Costs for Processing by Others

MRF Location	Distance (Km)	Hours to Load & Travel	Cost Per Trip	Trips Per Year (Existing Facility Storage Capacity)		Trips Per Year (Optimized Storage Capacity)		Cost Per Year (Existing Facility Storage Capacity)		Cost Per Year (Optimized Storage Capacity)		Total Cost Per Year (Existing Facility Storage Capacity)	Total Cost Per Year (Optimized Storage Capacity)
				Containers	Fibres	Containers	Fibres	Containers	Fibres	Containers	Fibres		
Tomlinson	57	2.5	\$312.50	34	29	21	23	\$10,625.00	\$9,062.50	\$6,562.50	\$7,187.50	\$19,687.50	\$13,750.00
Metro Waste	57	2.5	\$312.50	34	29	21	23	\$10,625.00	\$9,062.50	\$6,562.50	\$7,187.50	\$19,687.50	\$13,750.00
Cornwall	68	3	\$375.00	36	40	n/a	n/a	\$13,500.00	\$15,000.00	n/a	n/a	\$28,500.00	n/a
Quinte	253	4.5	\$562.50	26	29	13	23	\$14,625.00	\$16,312.50	\$7,312.50	\$12,937.50	\$30,937.50	\$20,250.00

RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Option to Transfer to a MRF Outside Township Jurisdiction

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Table 6.3 shows the combined estimated cost for transfer and processing of the Township's blue box materials to each of the potential receiving facilities. The two most economically viable options appear to be Cornwall and Quinte noting that if North Dundas utilized its own forces to undertake the transfer to Cornwall the fees paid to others is reduced to an estimated \$21,140.00.

Table 6.3: Total Transfer and Processing Costs

MRF Location	Total Transfer & Processing Cost (Existing Facility Storage Capacity)	Total Transfer & Processing Cost (Optimized Facility Storage Capacity)
Tomlinson	\$108,162.50	\$102,225.00
Metro Waste	\$95,456.46	\$89,518.96
Cornwall	\$52,620.00	n/a
Quinte	\$24,877.50	\$14,190.00

In the scenario that North Dundas transfers their blue box materials to others for processing, the MRF operating budget would be as shown in Table 6.4 below.

Table 6.4: Operating & Capital Costs for Blue Box Material Transfer

Blue Box Processing Material Handling Cost	
Direct Processing Cost	\$59,815.81
Equipment Repairs & Maintenance	\$5,000.00
Processing Equipment Fuel	\$3,000.00
Baling Wire	\$0.00
Miscellaneous Supplies	\$358.67
Material Handling Operating Cost	\$65,174.48
Blue Box Processing Facility Cost	
Building Repairs & Maintenance	\$691.78
Building Insurance	\$1,695.00
Utilities – Hydro	\$2,394.12
Utilities – Gas	\$1,864.19
Site Security	\$143.35
Taxes	\$10,246.23
Other – Telephone	\$1,168.02
Other – Office Supplies	\$326.38
Other – 2008 Total	\$3,148.90
Processing Facility Operating Cost	\$18,529.07
Blue Box Processing Capital Depreciation Charge	
Annual Cost – Initial MRF Equip/Major Retrofits	\$1,436.36
Annual Cost – Replacement Equip/Minor Retrofits	\$1,966.76
Annual Cost – Rolling Stock	\$13,932.00
Total Processing Capital Cost	\$17,335.12
Total Residential Processing Cost	\$104,038.67

RECYCLING PROGRAM AND FACILITIES EVALUATION - TOWNSHIP OF NORTH DUNDAS

Option to Transfer to a MRF Outside Township Jurisdiction

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From an operating standpoint where material processing is no longer taking place and materials are being transferred the materials handling costs would be reduced by an estimated \$35,500 per year. Approximately \$20,000 in savings would be realized through reduced labour and materials handling requirements. Although equipment maintenance and fuel for moving equipment is still necessary it is estimated that an additional \$3,000 could be saved and there would be no need for baling wire (except in the Quinte proposed scenario) which would save an additional \$2,600. Other costs like building repair, insurance, gas and the like would see little to no change in a transfer scenario and the same capital depreciation would apply in the longer term for new rolling stock but no new processing equipment would be depreciated in future years.

North Dundas staff has indicated that, from a collection standpoint, the same basic manpower would need to be utilized; however, overtime and part-time staffing could be eliminated. This results in an estimated savings of \$10,000-\$15,000. Staff asserts that collection would also be faster with less idling time that may result in an estimated \$2,000 additional savings for fuel. The program is currently separated two stream at the curb and as such there would be little additional promotion and education associated with a change from five (5) to two (2) streams and no additional costs for containers are anticipated. The collection budget under a transfer scenario is presented in Table 6.4.

Table 6.5: Curbside Blue Box Collection Cost Summary

Operating & Capital Cost – Collection	
Direct Curbside Collection Cost	\$139,539.53
Training	\$497.36
Recycling Vehicle Repair & Maintenance	\$11,536.80
Recycling Vehicle Fuel	\$14,937.78
Recycling Vehicle Radio Air Time	\$2,290.53
Recycling Vehicle Insurance	\$2,625.00
Blue Boxes	\$3,153.60
Other – WSIB	\$353.71
Other – Clothing Allowances/Misc.	\$401.36
Total Operating Costs	\$175,335.67
Blue Box Curbside Collection Capital Depreciation Charge	
Annual Cost – Vehicles	\$21,931.74
Annual Cost – Blue Boxes	\$1,030.18
Annual Cost – Rolloff Bins/Compacted Trailers	\$1,782.00
Annual Cost – Other – Recycling Truck 2005	\$10,003.68
Total Curbside Collection Capital Cost	\$34,747.60
Total Collection Cost	\$210,083.27

In order to act as a regional blue box material transfer station the facility would need to be modified/sized to accommodate additional storage and larger, e.g. 53' tractor trailer loading. The most practical means to address this is with a Transtor style transfer operation. Notwithstanding existing building and storage infrastructure that might be added to, a traditional transfer station configuration would likely prove far more costly than a Transtor system. In a study conducted by AECOM in 2009 for CIF⁴ it was determined that from a best practices standpoint there appeared to be a minimum tonnage limit required to justify construction and operation of a traditional transfer station. This is largely due to the fixed over-head costs as well as the materials handling required (e.g. a loader and an operator).

The Transtor system can be utilized for the Township's own materials and materials received from other municipalities in the context of a regional transfer system. The benefit of the system is that it can be retro-fitted into almost any existing facility layout, material can be directly tipped into the unit (avoided operator and loader costs) and storage capacity is gained in both the trailer(s) and the Transtor unit itself. The Transtor system is likely applicable in the context of a regional facility however with capital costs in the order of magnitude of \$800,000 to \$1,000,000 is not likely suited to North Dundas for shipment of their own materials.

In all likelihood the most cost-effective way for North Dundas to transfer only its own material would be to remove all processing equipment from the MRF to gain storage capacity and consider additional storage (e.g. additional Coverall storage) on site and to configure a grading/elevation change e.g. ramp to safely load a transfer trailer and/or to utilize top load transfer trailer space as additional capacity (outdoor storage).

⁴ City of Timmins Recycling Transfer Facility Evaluation and Recycling System Review – Supplemental Report, Waste Diversion Ontario – Continuous Improvement Fund, AECOM, March, 2009

7.0 Continued MRF Operation Versus Option to Transfer

A comparison of the cost for the Township's existing blue box collection and processing program against the cost of the two 'least-cost' transfer options are presented in Table 7.1.

Table 7.1: Existing System Versus Two Least Cost Collection, Transfer and Processing Options

Processing Scenarios	MRF Operations - Annual Cost	Collections - Annual Cost	Transfer - Annual Cost	Annual Revenue	Annual Equipment Replacement	Total Annual Cost
Continued MRF Operation	\$139,571.00	\$222,083.27	\$0.00	(\$40,000.00)	\$10,000.00	\$331,654.27
Transfer to Cornwall - Contracted Haulage	\$104,038.00	\$210,083.27	\$52,620.00	\$0.00	\$0.00	\$366,741.27
Transfer to Cornwall - Township Forces	\$104,038.00	\$210,083.27	\$24,120.00	\$0.00	\$0.00	\$338,241.27
Transfer to Quinte - No Glass	\$104,038.00	\$210,083.27	\$20,250.00	(\$6,060.00)	\$0.00	\$328,311.27
Alternative Processing Scenarios	MRF Operations - Annual Cost	Collections - Annual Cost	Transfer - Annual Cost	Annual Revenue	Annual Equipment Replacement	Total Annual Cost
Transfer to Cornwall in Transfer Trailer	\$104,038.00	\$210,083.27	\$40,620.00	\$0.00	\$0.00	\$354,741.27
Transfer to Quinte - No Glass and No OCC	\$104,038.00	\$210,083.27	\$6,750.00	(\$36,882.00)	\$6,600	\$290,589.27

**This assumes the use of 40 cubic yard bins for haulage*

The costs presented in Table 7.1 reflect order of magnitude annual equipment replacement costs for each applicable option (continued MRF operation or continuing to bale cardboard in the Quinte scenario) as well as estimated generation of revenue. The alternative processing scenarios represent those that were not included in analysis of the initial four (4) scenarios which were undertaken to provide an "apples to apples" comparison of various dual stream processing options.

The least cost option of the options assessed appears to be to ship to Quinte whether the Township sends all materials (except glass) or continues to bale its own cardboard although shipping all materials (except glass) only presents a marginal difference in cost. Notwithstanding fluctuation in revenues that the Township is currently exposed to they will also, in the transfer scenario be exposed to fluctuations in fuel pricing and potentially tipping fees at receiving facilities. The benefit of transfer needs to be assessed relative to the cost of any upgrades that may be required at the Township site (e.g. a ramp to accommodate loading, additional storage).

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8.0 CIF Funding Support

Notwithstanding the fact that the blue box program in Ontario is undergoing an “uncertain” period as Waste Diversion Ontario, Stewardship Ontario, municipalities and the Minister of the Environment discuss full extended producer responsibility (EPR), CIF’s role is to assist municipalities to invest in program changes and infrastructure improvements that will benefit the blue box program in both the short-term and long-term, regardless of whom is in ultimate control of the system. Implementation of better practices, best practices, innovation and regionalization of services will provide more efficient and effective programs.

Stewardship Ontario and municipalities want to ensure that the CIF contributes to the long-term objectives of controlling costs and improving blue box infrastructure to meet the future program needs and CIF continues to assist stakeholders in meeting their objectives. CIF considers the merits of a project proposal and evaluates it according to the following criteria:

- Does it improve costs?
- Does it increase tonnage?
- Are the results sustainable in a full EPR program where there is a consolidation of programs and facilities?
- Are capital costs recovered in the short-term through project savings?
- Is the project an incremental approach in the event of full EPR?
- Full EPR might not be implemented for 5-7 years. Are short-term problems solved in the meantime that improve effectiveness and efficiency?
- Are long-term solutions developed for plastics and paper packaging?

For 2010 the CIF is focusing on the following project initiatives:

- WDO best practices;
- Multi-residential collection capacity;
- Innovation in energy efficiency, plastics processing and reprocessing, transportation technologies;
- Innovative MRF and transfer station upgrades;
- Managing difficult materials;

- Automated collection; and
- Promotion and education programs.

Those initiatives that are applicable to the scenarios evaluated for North Dundas in 2010 include WDO best practices and innovative MRF and transfer station upgrades. With respect to best practices that may include a multi-municipal planning approach to collection and processing of recyclables and/or optimization of operations in collections and processing. In terms of MRF and transfer station upgrades that may include the development of a blue box transfer station or support for MRF equipment and facility upgrades.

9.0 Observations & Recommendations

- There is little to no room to add any additional materials (above the current 15) to the Township's program with the existing MRF.
- The Township employs only a small number of staff to provide waste management services including landfill – there would be no staff reductions so no cost savings to the overall system in regards to shifting away from recyclables processing at the current MRF, as staff would simply be reallocated to other necessary tasks e.g. the Township's desire to monitor and enforce the OCC ban at the landfill.
- Transition to a two-stream system for transfer and processing elsewhere would require no real additional up front promotion and education activity and no capital investment in additional blue boxes as the curbside set-outs would remain the same. In the Quinte scenario, curbside collection staff would have to further sort glass from the container box into the collection vehicle and continue to sort cardboard at the curb if they continue their own baling operation.
- Preliminary consideration of a 'regional MRF' indicates that given the amount of investment required, existing contract arrangements in place for proximal municipalities and the fact that there are existing newer two-stream MRFs also within reasonable proximity and with capacity this is not likely a practical option.
- A Transtor system is likely applicable in the context of a regional transfer facility however with capital costs in the order of magnitude of \$800,000 to \$1,000,000 it is not likely suited to North Dundas for shipment of their own materials.
- The most cost-effective way for North Dundas to transfer only its own material would be to remove all processing equipment from the MRF to gain storage capacity and consider additional storage on site, to configure a grading/elevation change e.g. ramp to safely load a transfer trailer and/or utilize top load transfer trailer space as additional capacity (outdoor storage) for shipment. A detailed cost assessment of this option should be undertaken.
- In the case of Cornwall the use of transfer trailers is not an existing option however further discussion with Cornwall and with CIF could be undertaken regarding funding to Cornwall to make modifications to allow the receipt of transfer trailers. This may make transfer for North Dundas more attractive economically and would provide infrastructure in Cornwall that would be necessary for the Cornwall facility to function as a regional MRF if that is a practical option for eastern Ontario.
- While the development of a business case for a regional transfer station is not part of the scope of this report it could be assessed in the future in more detail and relative to existing processing arrangements and transfer issues for proximal municipalities.
- Funding requests to CIF in a transfer scenario could include transfer station upgrades that may include grade/elevation modifications and/or a loading ramp(s) for transfer to Quinte. In the case of Cornwall, 40 cubic yard roll off bins, A/B train equipment would be necessary.

- A detailed equipment assessment and replacement cost estimate was not part of the scope of this project but if a transfer scenario is considered further, that assessment along with an estimate for equipment (loading ramp construction) necessary for transfer should be considered. In the case where the Township maintains its status quo program (without receipt of additional materials from others) there are a number of pieces of equipment that would very likely require replacement in the next five (5) years or so assuming that the useful life of equipment is approximately fifteen (15) years.
- The Township could further assess the operating cost-benefit of continuing to bale/market OCC, generate associated revenue and reduce transfer costs to Quinte.
- The Township should most likely issue an REOI or RFP for the provision of recyclable material processing services to secure more accurate cost information for both processing and for transfer. This would permit verification of costs and revenue sharing arrangements and enable information gathering from others who are/may be interested and capable of receiving the Townships recyclable materials (e.g. Kingston and R.A.R.E.) but that were not compared to the other options presented in this report.

STANTEC CONSULTING LTD.

Cathy Smith
Project Manager

Appendix A

Municipalities Within 50 Kilometres of Winchester

2008 Datacall (Latest)				Materials Accepted in Program																			Tonnes		Tonnes by Material Types																			
# of Streams/Frequency	Program Name	WDO Grouping	Toatal Households Served	ONP	Glass	Aluminum Cans	Steel Cans	PET	OCC	OBB	Gable Top Containers	Aseptic Cartons	Aluminum Foil	Empty Aerosol Cans	Empty Paint Cans	HDPE Containers Clear	HDPE Containers Coloured	Other Bottles	LDPE/H DPE Film	Tubs and Lids	Polystyrene Crystal	Polystyrene Foam	# of Materials Collected	Tonnes Collected	Tonnes Marketed	Printed Paper	OCC/OBB	Poly Coat	Aluminum	Steel	Mixed Metal	Flint (Glass)	Coloured (Glass)	Other Eligible Uses (Glass)	PET	HDPE	Plastic Film	Tubs and Lids	Polystyrene	Mixed Plastic	Commingled Blue Box Tonnes			
fibres and containers; alternating weeks	SOUTH DUNDAS, TOWNSHIP OF	Rural Collection - South	4322	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	Y	Y	N	N	N	N	N	10	627.04	587.08	283.98	105.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	197.52	
	NORTH DUNDAS, TOWNSHIP OF	Rural Collection - South	4362	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	15	676.57	633.45	391.80	140.73	0.00	17.12	28.35	0.00	0.00	0.00	0.00	27.77	15.12	4.27	5.11	0.74	2.43	0.00			
fibres and containers; alternating weeks; bulky cardboard separate	CLARENCE-ROCKLAND, CITY OF	Rural Collection - South	8089	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	15	1540.44	1442.27	630.06	234.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	577.98	
containers in box, papers in paper bag, boxboard separate, cardboard separate; weekly	SMITHS FALLS, TOWN OF	Small Urban	4126	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	11	745.54	693.72	389.95	148.70	0.00	14.51	0.00	18.47	63.32	25.37	0.00	28.33	5.07	0.00	0.00	0.00	0.00	0.00	0.00		
weekly; containers in blue box, papers tied or in bag, corrugated bundled, boxboard bundled	CASSELMAN, VILLAGE OF	Small Urban	1398	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	Y	Y	N	N	N	11	302.60	258.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	258.29	
fibres and containers, alternating weeks	BROCKVILLE, CITY OF	Small Urban	9458	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	14	1631.90	1527.90	818.23	304.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	405.48
containers, fibres, corrugated; alternating week collection of all streams	PRESCOTT, TOWN OF	Small Urban	2232	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	N	N	N	Y	N	N	N	11	234.00	199.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	199.73
containers in blue box, corrugated, boxboard, fibres in bags	CARLETON PLACE, TOWN OF	Small Urban	3999	Y	Y	Y	Y	Y	Y	N	N	N	N	N	N	Y	N	N	N	N	N	N	7	625.52	608.24	364.97	139.17	0.00	13.58	0.00	0.00	0.00	59.26	0.00	0.00	26.52	4.74	0.00	0.00	0.00	0.00	0.00	0.00	
containers in blue box, corrugated, box board, fibres in bags	MISSISSIPPI MILLS, TOWN OF	Rural Collection - South	4980	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	N	N	14	767.13	754.31	424.01	161.69	0.00	15.78	20.08	0.00	68.85	27.58	0.00	30.81	5.51	0.00	0.00	0.00	0.00	0.00	0.00		
containers in blue box, fibres in bag, corrugated, boxboard	THE NATION MUNICIPALITY	Rural Collection - South	4107	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	N	N	14	937.78	878.01	495.71	199.98	0.00	10.81	34.00	0.00	0.00	6.76	82.55	27.03	21.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
fibres (black box), containers (blue box), corrugated	SOUTH STORMONT, TOWNSHIP OF	Rural Collection - South	4939	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	16	758.74	647.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	647.63	
biweekly blue box collection??	SOUTH GLENGARRY, TOWNSHIP OF	Rural Collection - South	5605	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	N	N	Y	N	Y	N	N	12	765.62	653.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	653.50
blue box??	RUSSELL, TOWNSHIP OF	Rural Collection - South	5002	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	15	1641.00	1400.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1400.70
paper separate (bags) from containers corrugated, biweekly collection	NORTH STORMONT, TOWNSHIP OF	Rural Collection - South	2638	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	16	446.86	418.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	418.38
fibres one week, containers the next	NORTH GRENVILLE, MUNICIPALITY OF	Rural Collection - South	5790	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	Y	Y	Y	Y	Y	Y	Y	N	13	1142.81	1069.98	513.67	238.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	31.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	286.70
awful website!	NORTH GLENGARRY, TOWNSHIP OF	Rural Collection - South	4693	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	16	1253.49	1222.64	658.53	260.39	0.00	18.44	55.63	0.00	62.93	17.02	0.00	18.42	11.99	32.99	32.98	5.00	27.99	20.33			
containers in box, corrugated separate, boxboard inside eachother, paper in bags	MONTAGUE, TOWNSHIP OF	Rural Collection - South	1367	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	Y	Y	N	Y	N	N	N	10	229.94	215.29	121.01	46.15	0.00	4.50	5.73	0.00	19.65	7.87	0.00	8.79	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
alternate week fibres containers; cardboard with fibres beside box	PERTH, TOWN OF	Small Urban	2873	Y	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	N	N	Y	Y	N	Y	Y	12	0.00	526.41	297.94	109.02	0.00	11.09	14.11	0.00	48.38	19.38	0.00	21.78	3.97	0.05	0.32	0.05	0.33	0.00			