Material Recovery Facility Optimization Study
In the Counties of
Haldimand and Norfolk

Final Report

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Prepared by:

451 Ferndale Avenue, London ON
Mary Little Tel: 905-372-4994,
Email: mary@2cg.ca

Executive Summary

The Counties of Haldimand and Norfolk have jointly shared the ownership and responsibilities associated with the MRF operations at the Simcoe facility since 1994. The partnership between the two rural municipalities provided a larger source of available tonnages to originally justify the establishment of the Simcoe MRF.

The Simcoe MRF is an aging facility requiring component replacements over the next five years (2009-2014). The two Counties are faced with the decision to upgrade the existing MRF in yearly increments or as one-time capital investment or abandon the MRF operations and consider transferring material to a third party processor.

Historically, Haldimand and Norfolk arranged to apportion the costs associated with the MRF based on the blue box tonnes entering the facility from each County. Norfolk representing the more populated County, shares 57% of the MRF operational and capital costs and Haldimand's share is 43%.

Although both Counties share the processing side of the blue box program, administration of curbside collection remains independently managed by each County. The differing collection contracts result in variances in curbside collection costs. The less populated County of Haldimand (19,199 households) pays $415/tonne for curbside collection whereas Norfolk (26,668 households) pays $280/tonne for the same weekly collection service. When examining the option to upgrade the MRF or transfer blue box material to a third party processor, both Counties responded to the preference of a two stream (fibres and containers) collection program to offer greater opportunities for future collection efficiencies when their collection contracts expire.

Converting the existing MRF to a Traditional Transfer Station represents the lowest capital investment for the two Counties. The one-time capital conversion of the MRF to a transfer station is estimated to be less than $500,000. It is anticipated that this facility conversion can be conducted within a three month turnaround time and would not require any major re-construction of the facility.

The average net operating costs for the MRF conversion to a transfer station depicts Haldimand at approximately $40 to $50 per tonne and Norfolk at approximately $50 to $60 per tonne. The small capital investment represents a payback period of less than two years for Haldimand and approximately three years for Norfolk.

Comparatively, establishing a V-Quip Transtor system at the Simcoe Transfer Station for the shared tonnages represents a much higher capital investment but has a similar payback period of approximately 3 years when shared between the two Counties. Further, the operational costs to manage a V-Quip Transtor system at the Simcoe site shows significantly less annual operational costs than the MRF

conversion indicating a much longer-term operational savings realized by both Counties.

It is important to note that all capital costs do not incorporate potential funding opportunities from the Continuous Improvement Fund (CIF). CIF provides funding for recycling implementation projects that hold promise to improve the blue box recycling system for the longer term and result in greater efficiencies.

Referencing the potential for capital funding from CIF for systems promising to improve the blue box recycling system for the longer term suggests investment in the V-Quip Transtor system at the Simcoe site for the shared tonnages. The payback period for this system is compelling.

To summarize, the MRF requires immediate (2009) capital expenditures to maintain current operations. The processing contract has been extended until October 2, 2010. If the Counties choose to continue processing operations at the MRF, a decision to upgrade the MRF to a two stream operation should occur in September 2009, to allow sufficient time for preparing processing and equipment RFP's, and to install replacement equipment (allowing for a minimum of six to eight months) prior to contract extension expiry. If the decision is to maintain status quo of the MRF operations, an RFP for the baler is required immediately to reduce potential downtime and improve facility capacity.

Based on the Study findings, the following recommendations are put forward to the two Counties to review and consider as part of the next steps for the current MRF operations;

- Investigate funding availability from CIF for the installation of a V-Quip Transtor system at the Simcoe Transfer Station;
- After confirming funding from CIF, consider opportunities to invest in a V-Quip Transtor system at the Simcoe Transfer Station to manage the shared tonnages from both Counties;
- Consider reducing the collection streams from six to two streams (fibres and containers);
- Consider opportunities to optimize curbside collection contracts (minimum 7 year term lengths);
- Conduct formal price inquiries from the surrounding third party vendors to achieve long-term contract rates; and
- Implement an aggressive education campaign to launch the new program.

	Haldimand 2942 Tonnes				Norfolk 4345 Tonnes			
System	**Est. One-Time Captial Investment ($)**	**Est. Annual Net Operating Cost ($/Tonnes)**	**Est. Annual Net Operating Cost**	**Approx. Pay Back Period (Years)**	**Est. One-Time Capital Investment ($)**	**Est. Annual Net Operating Cost ($/Tonnes)**	**Est. Annual Net Operating Cost**	**Approx. Pay Back Period (Years)**
Status Quo-Baseline (Annually Averaged)		**$ 90.00**	**$ 264,780.00**			**$ 75.00**	**$ 325,875.00**	
Option1								
Partial MRF Upgrade	$ 399,990.00	$ 76.00	$ 225,000.00	10.06	$ 530,100.00	$ 60.00	$ 260,700.00	8.13
Full MRF Upgrade	$ 574,480.00	$ 73.00	$ 215,000.00	11.54	$ 761,520.00	$ 55.00	$ 235,000.00	8.38
Option 2-Traditional Transfer Station								
MRF Conversion to Transfer Station (Shared)	$ 195,650.00	$ 44.00	$ 130,000.00	1.45	$ 259,350.00	$ 57.00	$ 250,000.00	3.42
MRF Conversion to Transfer Station (Norfolk Only)					$ 455,000.00	$ 100.00	$ 434,500.00	
Simcoe Transfer Station (Shared)	$ 419,000.00	$ 58.00	$ 171,000.00	4.47	$ 555,750.00	$ 48.00	$ 209,000.00	4.76
Simcoe Transfer Station (Norfolk Only)					$ 700,000.00	$ 52.00	$ 226,000.00	7.01
Canborough Transfer Station (Haldimand Only)	$ 700,000.00	$ 33.00	$ 97,000.00	4.17			$ -	
Option 2-Vquip Transfer Station							$ -	
Simcoe Transfer Station (Shared)	$ 715,000.00	$ 13.00	$ 56,000.00	3.42	$ 945,000.00	$ 8.00	$ 34,760.00	3.25
Simcoe Transfer Station (Norfolk Only)					$ 1,473,000.00	$ 10.00	$ 43,450.00	5.22
Canborough Transfer Station (Haldimand Only)	$ 1,311,000.00	$ 17.00	$ 50,000.00	6.10			$ -	

Table of Contents

1.0 Introduction

The County of Haldimand (Haldimand) retained 2cg Inc. (2cg) to undertake an Optimization Study (Study) of the jointly owned Haldimand-Norfolk Material Recovery Facility (MRF). This Study was funded in part by the Continuous Improvement Fund (CIF), Project #103.

The Simcoe MRF was built in 1994 and has maintained operations within the original facility and location. To date, all of the essential components of processing equipment that were purchased in 1994 require either upgrades or full replacement based on overall equipment wear. The efficiency related challenges caused by aging equipment impacts the overall processing capacity and long term cost per tonne to process blue box material from Haldimand and Norfolk Counties.

Due to the limitations of the size of the MRF and processing equipment, Haldimand and Norfolk's blue box materials require a six stream curbside sort. The high level of curbside sort adds to the overall collection costs associated with the two blue box recycling programs. As a result, The County of Haldimand and Norfolk County have requested funding from CIF for a MRF Optimization Study.

2.0 Study Objectives

The objectives of the Study were designed to jointly assist the County's of Haldimand and Norfolk with the decision to implement one of the two following options:

Option No. 1- Haldimand and Norfolk County continue to jointly own the MRF and Norfolk continues to operate the MRF on behalf of both Counties, based on the costs to upgrade the facility to maintain efficient operations.

Option No. 2 –Haldimand and or Norfolk County divest from the jointly owned MRF and seek processing capacity from third party processors located outside their municipal boundaries.

The Study included the following objectives/tasks:

- Describe program background;
- Establish a benchmark of the current state of the recycling programs for both Counties (collection and processing);
- Research viable market and merchant capacity for blue box tonnages and third party blue box processing;
- Analyze processing options to upgrade existing MRF including capital and processing costs
- Analyze transfer options to haul blue box material outside the municipal boundaries to a third party processor including capital and processing costs;

and

- Provide recommendations to the municipalities for consideration (next steps) based on the Study findings.

Information was gathered by 2cg from County staff, the MRF processing contractor, Genor Recycling Services Limited (Genor), the collection contractor HGC Management Inc., (HGC) and third party blue box processors and transfer haulers. Supporting information was obtained during on-site evaluations of the existing MRF operations.

This report presents the results of the Study.

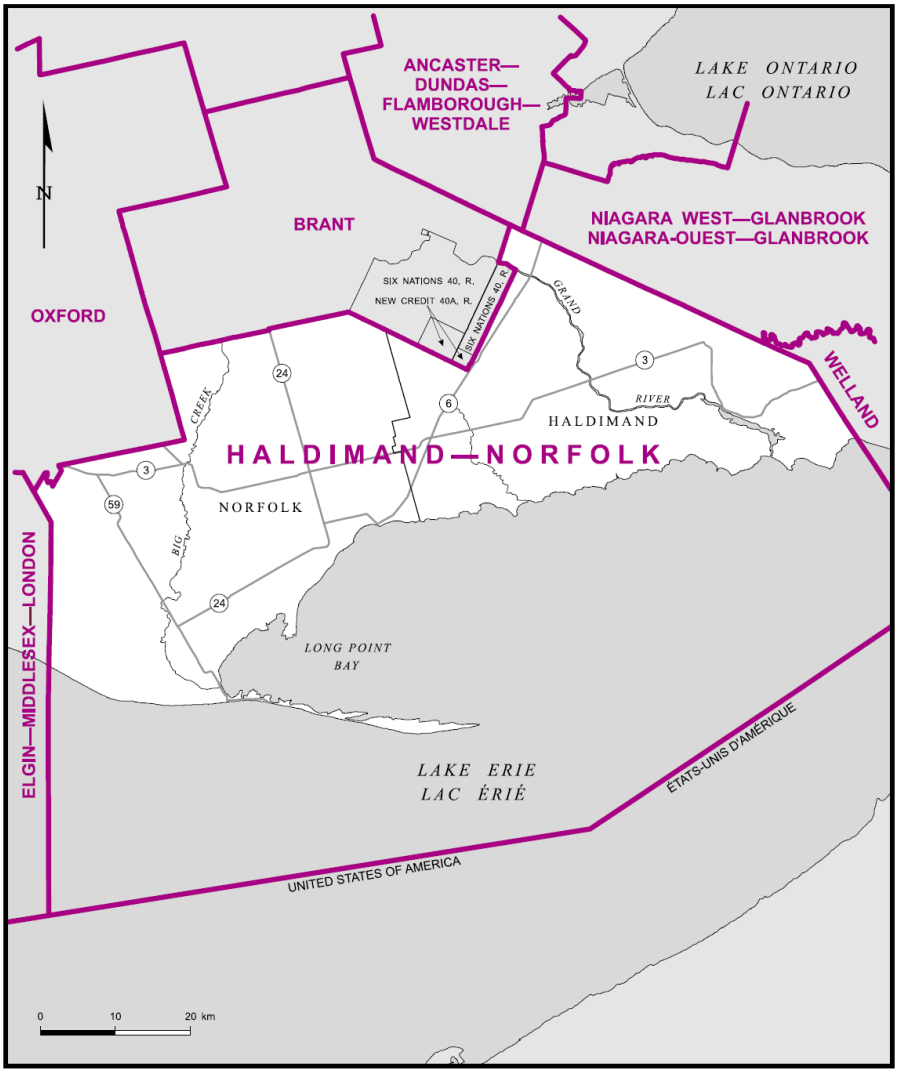
3.0 Program Background

Geographic and Demographic Information

The Counties of Haldimand and Norfolk are located on the north side of Lake Erie approximately 70 km south of the City of Hamilton. Haldimand County forms the eastern portion of the two Counties and includes the municipalities of Dunnville, Caledonia, Hagersville, Cayuga, Jarvis and Townsend. Norfolk County forms the western portion of the two Counties and includes the municipalities of Delhi, Simcoe, Port Dover, Port Rowan and Courtland. Both Counties are predominately rural. The County of Haldimand has a population of 45,212 (19,199 households). Norfolk County has a population of 62,563 (27,668 households). Combined the two Counties have a population of 107,775 (46,867 households).

Figure 1 is a map depicting the two Counties of Haldimand and Norfolk and the surrounding municipalities.

Figure 1- Map Depicting Haldimand and Norfolk Counties and Surrounding Areas



Organization of Waste Management

It should be noted that prior to 2001, Haldimand and Norfolk County operated with an upper tier structure, as the Region of Haldimand-Norfolk. Within this regional structure all waste management responsibilities were shared. Effective January 1, 2001, the Region of Haldimand-Norfolk was sub-divided into two single tier municipalities.

All waste management administration and delivery of program services were split between the two municipalities. Although functioning as two separate municipalities, some joint activities continue to exist including the co-ownership and processing services of the MRF as well as co-ownership of two disposal sites located in Haldimand County (Tom Howe and Canborough Landfill Site). The Tom Howe Site is set to close December 31, 2011 and all waste will be managed at the Canborough Site at that time.

Both Counties provide its residents (single and multi-residential) with a number of waste management services that include:

- Weekly residential garbage with a 3 bag limit for Haldimand and Norfolk;
- Weekly curbside blue box collection of 15 materials, segregated into a six stream curbside sort;
    - Fibres and bagged plastic bags are place outside the blue box in bundles or in plastic bags. Material collected include corrugated cardboard, boxboard, polycoat (milk and juice) plastic bags, recyclable paper (newspapers, glossy magazines, catalogues, flyers, coloured and white paper, books (with cover removed), telephone books;
    - Mixed container are placed inside the blue box and include #1,#2, #4,#5,and #6 plastics (including expanded polystyrene foam), steel & aluminum food and beverage cans and foil, clear and coloured glass bottles and jars;
- Limited leaf and yard waste collection;
- Bulky items are accepted at the municipal landfill for a fee;
- Household hazardous waste event days are scheduled in the spring and fall (May and September) at municipal yards, recycling or disposal sites; and

Current Recycling Program

The MRF is located within the Town limits of Simcoe in an industrial park. The MRF processing equipment and building (Photos 1 and 2) is jointly owned by the two municipalities with administration responsibilities managed by Norfolk County and processing responsibilities provided by a private contractor, (Genor) based out of Brantford, Ontario. Genor is responsible for material marketing and maintenance of the MRF. The MRF does not process glass within the facility allowing the processing inside the facility to operate as a four stream system; containers

(plastics, polystyrene, polycoat and metals), cardboard, newspapers/boxboard and bagged plastic bags, with glass tipped in outside bunkers.

Although administration of recycling services is separate, both Counties offer similar curbside collection programs to support the requirements of the jointly owned MRF located in Simcoe (Norfolk County). Curbside collection is provided by a private contractor for both municipalities. County of Haldimand has a four year contract with (HGC) also of Brantford Ontario to provide weekly curbside collection service for 19,199 households covering approximately 6,600 kilometers per week for Haldimand. The contract is in effect from January 1, 2008 to December 31, 2012.

Norfolk County has an eight year contract with (HGC) to provide weekly curbside collection service to 27,668 households covering approximately 5,550 kilometers per week. This contract is in effect from October 22, 2006 to September 27, 2014.

Photos 1 and 2 depict the Simcoe Material Recycling Facility (MRF).

Photos 1 and 2 Entrance to Simcoe MRF

Table 3.1 depicts population and residential blue box diversion rates based on current program participation for Haldimand and Norfolk County (2008). Population growth rates and waste generation data was extrapolated from the most recent waste management master plans from each County (UEM Solid Waste Master Plan Update May 2007 for Haldimand County and Jacques Whitford Waste Management Master Plan Study February 2009 for Norfolk County).

Specific to the residential blue box diversion rate, the calculation consider only the residential blue box material that was collected in 2008 (refer to table 3.2 for further details). To clarify, the residential blue box material does not include material that not marketed as residential blue box material (i.e.: compost, commercial material, Household hazardous waste). The residential blue box

tonnages was calculated as a percentage of the total residential waste generated referencing the available waste data from the year 2007 for Haldimand and available waste data from the year 2008 for Norfolk.

Table 3.1 Population and Residential Blue Box Diversion Rates for Haldimand and Norfolk County

Year	Norfolk Population	Population Growth Rate (SWMMP 08)	Haldimand Population	Hadliman dPopulati on Growth Rate (MP 07)	Total Population	Residential Waste Generation Norfolk (.292tpy)	Residential Waste Generation Haldimand (.276tpy)	Norfolk Blue Box Diversion Rate (4345 t)	Haldimand Blue Box Diversion Rate (2942 t)
						(tonnes)	(tonnes)	(%)	(%)
2008	62,563	1.44	45,212.00	0.80	107,775.00	18,272.00	12,496.00	23.78	23.54

To date, both Counties have reached an estimated residential blue box diversion rate from disposal of approximately 24 % based on residential collected tonnes.

Table 3.2 depicts the 2008 residential blue box composition of the marketed residential blue box tonnages generated by the two Counties. Composition estimates for the combined tonnages of Haldimand and Norfolk was calculated from the outbound loads sent to market as referenced in the 2008 WDO Datacall.

The establishment of material composition provides baseline information when considering projected estimates for varying processing scenarios

Table 3.2 2008 Residential Blue Box Composition (Based on Marketed Material)

2008 Materials	Norfolk (tonnes)	Norfolk Composition %	Haldimand (tonnes)	Haldimand Composition %	Total (tonnes)
#8 ONP	1,291.00	33.07	971.00	33.04	2,262.00
OCC/ OBB	1,530.00	39.19	1,151.00	39.16	2,681.00
Aluminium	77.00	1.97	58.00	1.97	135.00
Steel	204.00	5.23	157.00	5.34	361.00
PET	173.00	4.43	130.00	4.42	303.00
HDPE	76.00	1.95	57.00	1.94	133.00
Film	34.00	0.87	25.00	0.85	59.00
Polystrene	3.00	0.08	2.00	0.07	5.00
Mixed Plastics	126.00	3.23	95.00	3.23	221.00
Clear Glass	230.00	5.89	172.00	5.85	402.00
Coloured Glass	160.00	4.10	121.00	4.12	281.00
Total Tonnes	3,904.00	100.00	2,939.00	100.00	6,843.00

The Datacall information depicts the year from January to December in 2008 and reflects Norfolk County collecting 4,345 tonnes and Haldimand County collecting 2,942 tonnes, representing a total residential collected tonnage of 7,287 tonnes

Marketed blue box material data was extrapolated from the 2008 WDO Datacall. The total residential blue box tonnages (7,287 tonnes) and the total marketed tonnages (6,843 tonnes) depict an estimated residual rate of approximately 6 % (441 tonnes). The 6% residual rate is high for a multi-stream curbside sort. . It is anticipated that a few outbound loads were sent to market in January 2009 that were collected in 2008 which would reflect some variations in the actual tonnages for both municipalities. For consistency, this Study will reference the collected tonnage data generated from the 2008 Datacall.

Comparatively, other multi-stream curbside sort programs within central and eastern Ontario experience a lower residual rate (Quinte Waste Solutions in 2007 = 3% residual for a four stream sort and Peterborough County in 2007 = 4% residual for a five stream sort).

To verify the residual rate, discussions with the MRF operator indicate that residual may be partially impacted by un-processed material remaining on the tipping floor at year end. Further, the MRF is not structured to process glass although glass container enters the MRF on a regular basis due to inbound contamination. Sorters divert as much glass as possible by manual sortation although portions of glass will still become residual. Glass entering the residual stream represents low volume and higher weight per commodity. Visual observations at the MRF at the time of this Study support the instance of glass entering residual along with other blue box material that were missed by manual sorts due to current configuration of the facility.

The majority of the industrial, commercial, and institutional sector (IC&I) tonnages are generated in and around the Town of Simcoe. IC&I recyclable material (cardboard) is delivered to the MRF by local hauling contractors and not tacked by individual businesses. In 2008 it was estimated by Norfolk County that approximately 800 -1,000 tonnes of additional material from the commercial sector was processed at the MRF representing 10%-13% of the total blue box material entering the MRF. Further, it is anticipated by the MRF contractor that approximately 70% of this tonnage is generated in and around the Simcoe area (Norfolk County). Referencing the estimated commercial tonnages entering the MRF for processing, it is estimated that a minimum of approximately 8,300 tonnes of recyclable material is managed at the Simcoe MRF.

4.0 Baseline Data

Baseline cost information was collected on the Simcoe MRF and the two curbside collection programs to establish status quo operational activities and costs to compare to alternative system costs. MRF costs were extrapolated from the 2008 WDO Datacall for both municipalities and verified with County staff. Blue box collection costs were also taken from the WDO Datacall and confirmed with County staff.

4.1 MRF Baseline Data

The MRF sits on approximately 1 hectare of industrial land just inside the Simcoe town limits. Currently, collection vehicles unload at four separate unloading doors;

- Door 1 - Corrugated Cardboard,
- Door 2 – Boxboard,
- Door 3 - Newspaper and Bagged Film plastic,
- Door 4 - Comingled Containers.

Photo 3 depicts the four separate tipping entrances for the four stream sorting operation within the Simcoe MRF.

Photo 3 Rear Entrance to Simcoe Material Recycling Facility

The fifth and sixth sort is conducted behind the MRF (Photo 4) in designated bunkers for clear and coloured glass.

Photo 4 Tipping into Glass Bunkers

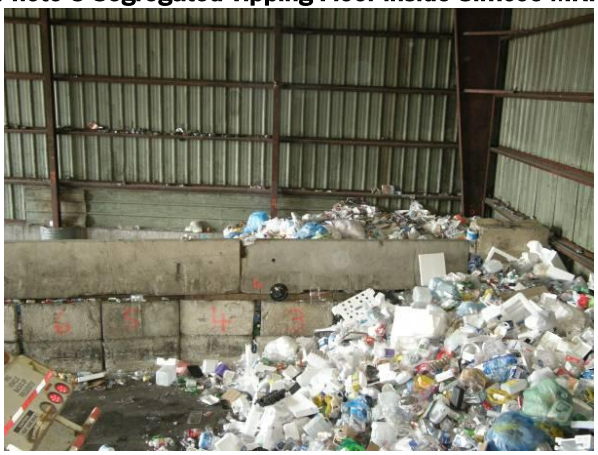
Vehicle congestion is common at this site and tipping floor space is at a premium due to the sorting requirements of the facility. The majority of the MRF is comprised of segregated tipping floor areas with minimal space for expanding existing equipment configurations or inside bale storage.

Tonnages are either the same or somewhat less than previous years as a result of a few factors:

- Deposit return on LCBO glass,
- less paper generation from daily newspapers/flyers
- Light weighting of plastic packaging.

MRF processing staff indicated that the comingled container material (cans, plastic and polystyrene) consume more space on the inbound tipping floor than fibre material particularly in the summer months (May to October).

Photo 5 Segregated Tipping Floor inside Simcoe MRF



Inbound material is fed by hopper and incline conveyor to an elevated platform

(Photo 6) where 3 staff segregates fibre materials from a fibre conveyor and 4 staff segregates container material from a container conveyor. Production shifts run from 7:00am to 3:30 pm.

Photo 6 Elevated Sorting Deck-Fibre Line and Container Line

Container material passes under an overhead magnet at the beginning of the line where steel is diverted into a movable wire mesh cage. Typically, this cage fills 3-4 times per day. A sort staff positively pulls polystyrene from the container stream and throws material into another wire mesh cage (Photo 7). All container sorting staff undertake quality control for glass entering the MRF as a contamination item.

Any glass showing up on the sort line is manually sorted into blue boxes and dumped into roll-out carts. Floor staff are responsible for emptying the carts in the outside glass bunkers on an hourly basis. An eddy current captures aluminum cans and sort staff segregates #1 PET, #2 HDPE and mixed plastic into separate permanent bunkers under the sorting platform. Plastics are perforated using a fabricated perforator (snowmobile cleats) prior to entering bunkers.

Photo 7 Movable Wire Mesh Cages

Fibre material is sorted into bunkers below the platform (Photo 8). Plastic bags are removed from this sort line, along with any contamination.

Photo 8 Permanent Bunkers under Sorting Platform

All material processed inside the MRF is baled using the original Selco baler (Photo 9) purchased in 1994. Typically, the life expectancy of a baler averages 12-15 years depending on throughput and preventative maintenance. Baling material is time consuming as a result of the current processing configuration of the facility. Floor staff manually move full cages to the baler infeed belt for processing.

Photo 9 Selco Baler

During the summer months, tipping floor capacity is exceeded daily therefore additional material remaining on the floor near the baler area (Photo 10) must either be baled or moved by a loader prior to moving a cage of material to the baler belt.

Photo 10 Baler Tipping Floor Area

Baling time (from the point of material entering the baler infeed belt) averages about 30-40 minutes per bale, with polystyrene averaging 1 hour per bale and corrugated cardboard and newspapers averaging 15-20 minutes per bale. To manage baling requirements, a baling shift of two staff operates after the daily production shift to bale material from 3:30pm to 6:00pm.

Bale storage (Photo 11) is limited. Processing staff try to keep frequent outbound loads stored inside the MRF to reduce handling costs and windblown litter debris (Photo 12).

Photo 11 Baler Storage Inside the MRF

Photo 12 Tipping Floor Litter Outside the MRF

A storage building (Photo 13) was built in 2001 to house baled material requiring lengthier storage prior to establishing a full trailer load.

Photo 13 Bale Storage Building behind the MRF

The location of the bale storage building is behind the MRF restricting opportunities to further widen the facility to accommodate additional capacity. Although the bale storage facility was built to relieve the pressure of storage capacity, the contractor also used other alternative storage mechanisms to reduce handling time of baled material and windblown litter. Photo 14 depicts a roll-off box turned over to use as storage. The roll-off box is no longer road worthy but can be used for temporary storage close to the MRF loading doors.

Photo 14 Alternative Storage

The majority of the inbound tonnages are generated by the residential sector. To maintain consistency throughout this Study, when comparing alternative processing operating costs, all costs will be reported as averaged residential costs based on 2008 residential collected tonnes as reported in the 2008 WDO Datacall. When examining capital infrastructures, buildings and retrofits will be sized to accommodate anticipated tonnages from the commercial sector and future residential tonnage increases based on population growth.

Currently, the six stream operation has a relatively low processing cost per tonne. The municipality receives all material revenue. The 2008 processing rates from Genor are:

- Glass $21/tonne
- Cardboard $32.50/tonne
- Containers $87.10/tonne

The MRF processing costs paid by the two Counties reflect a percentage calculation based on total inbound tonnages. Norfolk is responsible for 57% of the costs and Haldimand's share represents 43%. In 2008, the total MRF processing costs to manage combined tonnages from Haldimand and Norfolk represented an approximate total cost of $ 720,000.

Averaging the gross processing contract costs over the 7,284 residential collected tonnes equals approximately $96/tonne. Dispersing the costs over residential and commercial tonnes (~8,300 tonnes) represents approximately $85/tonne.

Splitting the residential gross costs between the two municipalities, the contract costs for Norfolk represents ~$392,000 ($90/tonne) and for Haldimand County it represents ~$303,000 ($103/tonne).

Added to the annual contract costs (Genor) to process material at the Simcoe MRF, are the municipal administration costs supporting the MRF operations. Municipal administration costs from each municipality include operational and capital cost incurred by the two municipalities as they directly relate to the MRF operations. Costs include items such as property taxes, municipal staffing, purchase of blue boxes, equipment repairs, replacement and/or maintenance, residual disposal costs, recyclable shipping costs, insurance and building depreciation costs.

Throughout this Study, residential costs will be calculated using the following:

- **Haldimand share in residential costs** **= 43%**
- **Haldimand collected residential tonnages** **= 2,942 tonnes**
- **Haldimand residential households/stops** **= 19,199 households**
- **Haldimand residential population** **= 45,212 population**

- **Norfolk share in residential costs** **=57%**
- **Norfolk collected residential tonnages** **=4,345 tonnes**
- **Norfolk residential households/stops** **=27,668 households**
- **Norfolk residential population** **=62,563 population**

- **Combined residential tonnages** **=7,287 tonnes**
- **Combined residential households/stops** **=46,867 households**
- **Combined residential population** **=107,775 population**

In 2008, the total revenue received from the sale of blue box material was $1,065,951. To calculate the Net residential processing costs for each program, the total revenue is apportioned into the two municipal shares;

- **Haldimand at 43%** **=$461,748 revenue**
- **Norfolk at 57%** **=$604,203 revenue**

Table 4.1 depicts blue box cost structure for Haldimand County specific to the MRF operations. Information gathered is using the reported (2008 WDO Datacall) tonnes collected from the 2008 residential blue box program (2,942 tonnes). The municipal administration costs were extrapolated directly from the 2008 WDO Datacall; the contract costs represent 43% of the total cost share for Haldimand County. The Net costs are calculated by subtracting the revenue received (43% share) from the sale of blue box material.

Table 4.1 2008 Haldimand County Residential Blue Box Processing Costs

Year	Haldimand Blue Box Tonnes	Municipal Administration Costs	MRF Contract Costs	MRF Contract Cost per Tonne	Contract Cost Per Household (19,199)	Gross Processing Costs (Admin + Contract)	Gross Process Cost Per Tonne	Gross Cost per Household	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/tonne	$/household	$	$/tonne	$/household	$	$	$/household
2008	2,942	$ 173,835.00	$ 303,593.71	$ 103.19	$ 15.88	$ 477,428.71	$ 162.28	$ 24.87	$ 461,748.00	$ 5.33	$ 0.82

- ***The 2008 gross residential costs for Haldimand County represent $162/tonne or ~$24/household;***

- ***The 2008 Net residential costs (after revenues) for Haldimand County represent $5/tonne or ~$.82/household; and,***

- ***The 2008 Net costs reflect the majority of material sale revenues prior to the down turn in the end market prices that occurred in the fall of 2008.***

Table 4.2 depicts blue box cost structure for Norfolk County specific to the MRF operations.

Table 4.2 2008 Norfolk County Residential Blue Box Processing Costs

Year	Norfolk County Blue Box Tonnage	Municipal Adminstration Costs	MRF Contract Costs	Contract Cost per Tonne	Contract Cost Per Household (27,668)	Gross Processing Costs	Gross Processing Cost Per Tonne	Gross Cost per Household	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/tonne	$/household	$	$/tonne	$/household	$	$	$/household
2008	4,345	$ 226,224.00	$ 391,332.00	$ 90.06	$ 14.14	$ 617,556.00	$ 142.13	$ 22.32	$ 604,203.00	$ 3.07	$ 0.48

Using the reported tonnes collected from the 2008 residential blue box program (4,345 tonnes). The municipal administration costs were extrapolated directly from the 2008 WDO Datacall; the contract costs represent 57% of the total cost share for Norfolk County. . The Net costs are calculated by subtracting the revenue received (57% share) from the sale of blue box material.

- **The 2008 Gross residential costs for Norfolk County represent $142/tonne or ~$22/household;**

- **The 2008 Net residential costs for Norfolk County represent $3/tonne or ~$.48/household; and,**

- **The 2008 Net costs reflect the majority of material sale revenues prior to the down turn in the end market prices that occurred in the fall of 2008.**

At the time of this Study (June 2009) the basket of goods pricing dropped from an average of $165/tonne in November 2008, to approximately $45/tonne in January 2009. The recent six month average (January to June 2009) indicate average revenue pricing of approximately $55-$65/tonne.

For the purposes of this Study, projected revenue pricing has been estimated at $60/tonne for 2009.

Based on the six month average of the lower revenue pricing ($60/tonne) it is anticipated that total revenues for 2009 could range from $ 500,000 to $ 550,000.

As a point of reference, in July (2009), Stewardedge, formally Stewardship Ontario released a monthly Price Sheet (formally CSR Price Sheet) depicting the Ontario market price trends for the year. The average Ontario pricing depicts the composite index for 2009 at $66/tonne.

Specific to the month end of July 2009, pricing is starting to increase with average basket of goods pricing closer to $80/tonne. If this revenue trend continues, revenues have the potential to range from $650,000-$700,000 for 2009.

Referencing the municipal percentage shares of 43% and 57% respectively, the Table 4.3 and 4.4 projects anticipated 2009 MRF processing costs inclusive of the six month average revenue rate ($60/tonne). Additionally, a 3% cost of living increase for the processing contract and municipal administration costs was applied to the MRF contract costs and municipal administration costs for budgeting purposes.

Table 4.3 projects the County of Haldimand net processing costs. Reflecting the $60/tonne average revenue, net costs are anticipated to be closer to $98/tonne ($15/household).

Table 4.3 2009 Haldimand County Projected Residential Blue Box Processing Costs

Year	Haldimand Blue Box Tonnes	Municipal Administration Costs	MRF Contract Costs	MRF Contract $/Tonne	Contract Cost Per Household (19,199)	Gross Processing Costs (Admin + Contract)	Gross Process $/ Tonne	Gross $/HH	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/tonne	$/household	$	$/tonne	$/household	$	$	$/household
2008	2,942	$ 173,835.00	$ 303,593.71	$ 103.19	$ 15.88	$ 477,428.71	$ 162.28	$ 24.87	$ 461,748.00	$ 5.33	$ 0.82
2009	3,019	$ 179,050.05	$ 312,701.52	$ 103.58	$ 16.36	$ 491,751.57	$ 162.90	$ 25.61	$ 196,222.11	$ 97.90	$ 15.39

Table 4.4 projects Norfolk County net processing costs for 2009. Reflecting the average revenue of $60/tonne, net costs are anticipated to be closer to $78/tonne ($12/household).

Table 4.4 2009 Norfolk County Projected Residential Blue Box Processing Costs

Year	Norfolk County Blue Box Tonnage	Municipal Adminstration Costs	MRF Contract Costs	Contract $/ Tonne	Contract Cost Per Household (27,668)	Gross Processing Costs	Gross Processing $/ Tonne	Gross $/ HH	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/tonne	$/household	$	$/tonne	$/household	$	$	$/household
2008	4,345	$ 226,224.00	$ 391,332.00	$ 90.06	$ 14.14	$ 617,556.00	$ 142.13	$ 22.32	$ 604,203.00	$ 3.07	$ 0.48
2009	4,448	$ 233,010.72	$ 403,071.96	$ 90.63	$ 14.57	$ 636,082.68	$ 143.02	$ 22.99	$ 289,090.79	$ 78.02	$ 12.54

The Simcoe MRF has been operating at capacity for approximately 2 years on a single sorting shift, with a partial baling shift (3 hours/day) to clear the tipping floor to manage approximately 8,300 tonnes per year (residential and commercial). It is anticipated that the existing baler will require full replacement in early 2010. Finally, the MRF processing contract with Genor expires in October 2009. The two Counties recently negotiated a one year extension (October 2, 2010). It is anticipated that the one year extended contract costs could represent a higher processing fee than the current contract rate. Further, a new processing contract has a potential to increase by as much as 25% based on the current multi-stream sort, lack of capacity and aging equipment. Further, the maintenance and equipment replacement costs are expected to increase annually.

Details of these cost factors are depicted in **Section 6.1** of this report outlining Status Quo cost projections.

4.2 Curbside Collection Baseline Data

Both municipal programs tender independently for a third party vendor to provide collection vehicles and curbside collection services for their blue box programs. The Norfolk County collection contract is based on a cost per tonne and the Haldimand County contract reflects a cost per stop/household.

Tables 4.5 and 4.6 depict the costs associated with the curbside recycling program for the County of Haldimand and Norfolk County.

Table 4.5 depicts the costs for the County of Haldimand's curbside collection program. Data is extrapolated directly from the 2008 WDO Datacall under curbside collection contract. The municipal administration costs are also taken from the Datacall and reflect the costs associated municipal staffing, summer students, etc.

Table 4.5 2007-2008 Haldimand Blue Box Residential Collection Cost

Year	Haldimand Tonnes	Haldimand Households	Haldimand Municipal Costs	Municipal Cost Per Tonne	Haldimand Contract Costs	Contract Cost Per Tonne	Total Collection Costs	Total Cost Per Tonne	Total Cost Per HH
2007	2,961.00	19,199.00	$ 38,329.00	$ 12.94	$ 869,604.00	$ 293.69	$ 907,933.00	$ 306.63	$ 47.29
2008	2,942.00	19,199.00	$ 44,219.00	$ 15.03	$ 1,179,170.00	$ 400.81	$ 1,223,389.00	$ 415.84	$ 63.72

Haldimand County entered into a new collection contract agreement with HCG effective January 2008, reflecting an increase in contract costs ($400/tonne).

Table 4.6 depicts the costs for Norfolk County's curbside collection program. Data is extrapolated directly from the 2008 WDO Datacall (Section 6.2) under curbside collection contract. The municipal administration costs are also taken from the Datacall and reflect the costs associated municipal staffing, summer students, etc.

Table 4.6 2007-2008 Norfolk Blue Box Residential Collection Cost

Year	Norfolk Tonnes	Norfolk Households	Norfolk Municipal Costs	Municipal Cost Per Tonne	Norfolk Contract Costs	Contract Cost Per Tonne	Total Collection Costs	Total Cost Per Tonne	Total Cost Per HH
2007	4,129.00	27,668.00	$ 35,541.00	$ 8.61	$ 1,045,798.00	$ 253.28	$ 1,081,339.00	$ 261.89	$ 39.08
2008	4,345.00	27,668.00	$ 40,005.00	$ 9.21	$ 1,178,777.00	$ 271.30	$ 1,218,782.00	$ 280.50	$ 44.05

Collection costs vary from $280/tonne for Norfolk County to as high as $415/tonne for County of Haldimand.

Refer to Table 4.7 depicting average curbside travel distances per week for the two Counties.

Table 4.7 2008 Curbside Collection Distances (Km) Per Week

Jun-08	Norfolk (Km)	Haldimand (Km)	Difference (Km)
Monday	883	1144	261
Tuesday	1100	1328	228
Wednesday	1155	1242	87
Thursday	1130	1298	168
Fri	1277	1568	291
Average Weekly Curbside Travel (km)	**1109**	**1316**	**207**
Total Weekly Curbside Travel (Km)	**5545**	**6580**	**1035**

Curbside collection costs are impacted by the following factors:

- Total distance travelled between stops;
- The number of stops on a route;
- Total distance travelled to central processor;
- Number of curbside sorts (co-collection waste and recyclables vs. varying curbside recyclable sorts);
- Frequency of collection periods (weekly vs. bi-weekly);
- Style of trucks (one or two person operator, and size of vehicle);
- Level of compaction;
- Composition and tonnage of material collected; and
- Method of curbside set-out (all on same side of road vs. collection on both side of the road or box vs. bag or cart).

When examining the two collection programs of Haldimand and Norfolk, there are many similarities and differences that impact disparities in collection costs.

Considering the similarities between the two programs;

- Both programs have a six stream curbside sort of material which includes colour separation of glass, separation of cardboard, separation of newspapers, separation of plastics, separation of boxboard and film plastics;
- Both programs have weekly curbside collection;
- Both programs collect the same materials;
- Both programs receive collection services from the same contractor and the same style of collection vehicles; and
- Both programs have similar rural geography.

Considering the differences between the two programs it is anticipated that reason the County of Haldimand is experiencing a higher cost per tonne than Norfolk County's cost is based, in part, on the following factors;

- Norfolk entered into a longer term contract to offer opportunities for the collection contractor to provide competitive pricing;
- Norfolk has approximately 8,500 more households/stops than Haldimand;
- Norfolk has more urban collection routes than Haldimand representing shorter distances between stops;
- Norfolk collection routes average 1000 km per week less than Haldimand; and,
- Collection costs for Haldimand are dispersed over fewer tonnages (2,942 tonnes) compared to 4,345 tonnes from Norfolk County.

Currently, both collection contracts represent an annual contract cost of ~$1,179,000. Both Counties experience similar municipal administration cost of approximately $40,000. Both Counties have a total collection cost of approximately ~$1,220,000 (contract + municipal administration.) Both Counties are under contractual obligations (Haldimand 2012) and (Norfolk 2014) therefore collection costs will remain constant based on the contract structure unless opportunities exist within the contracts to change the collection program (two streams).

Specific to Haldimand County where higher curbside collection costs are experienced, potential cost reductions may be available for a two stream collection program. The current collection contract offers allowances for a curbside program change from multi-stream to a two stream program without penalties.

HGC provided curbside rates for two stream collection service to deliver blue box material to either the Simcoe MRF or the HGC MRF in Brantford, ON. Based on the proximity of the Brantford MRF, the costs provided in the 2007 tender to either MRF were identical for a two stream collection program to service Haldimand County.

The cost for HGC to collect two stream material for Haldimand County (based on 2007 tender quotations (for ~18,600 households) was $1,095,500. The tender indicated that the County of Haldimand had the option to haul two stream material to either the Simcoe MRF or the Brantford MRF for the quoted rate. As part of this Study, HGC was contacted in July 2009 to discuss the rates depicted in the 2007 tender. HGC indicated that further negotiation would be required between the municipality and the contractor but permission to use these rates was granted for budgetary purposes for this Study. Further, HGC offered budget pricing of $100/tonne to process fibre and container material at the Brantford facility for Haldimand material. Revenues would be based on the Stewardedge pricing sheet.

Discussions with HGC (July 2009) indicated that the Brantford MRF has capacity to manage ~7,300 residential tonnes of blue box material and is willing to work with both municipalities to negotiate a combined processing and curbside collection agreement using curbside trucks to direct haul curbside material from both Counties to the Brantford MRF. The cost to direct haul material from both municipalities would require further negotiations with HGC and the two Counties. The costs do not reflect curbside service for the commercial sector or provide allowances for central drop off points for the public.

For comparison purposes, information from another two stream program in a rural environment is the County of Peterborough. The County of Peterborough recently switched from a five stream curbside sort to a two stream sort. The curbside program services 24,541 households in a rural regional demographic to collect 3,300 tonnes in 2008. The curbside collection contract (WSI) represents ~$652,000 per year and the County maintenance/administrations costs represent ~$105,350 per year representing a total curbside cost of approximately $230/tonne. It is important to note that unlike Haldimand County, Peterborough County does not provide curbside collection to the full County. Rural depot service is provided to a further 9,738 households located in remote locations in an effort to reduce overall collection costs in a rural environment.

Inquiries were also made with staff from Woodstock where a recent conversion of a MRF to a transfer station was conducted, and the program changed from a multi-stream sort to a two stream curbside. Staff indicated that preliminary curbside costs do not reflect as great a savings as originally anticipated. Although costs do not represent a full program year, comments from staff suggest that it is important to consider the type of collection trucks (compaction vs. non-compaction) and the number of rural areas selected for curbside collection (curbside vs. depot).

5.0 Projected Blue Box Tonnages

The predominately rural nature of the two municipalities results in greater distances (kilometers) between curbside stops and populated areas. Geographically, both municipalities are situated approximately 1 hour from large urban city centres (Brantford, Hamilton and Niagara) where consistent growth and blue box tonnage generation exists.

When considering forecasted requirements for blue box processing capacity and capital infrastructures, projections of future blue box tonnages were estimated by accounting for population growth and current waste diversion rates. As noted in the County's municipal diversion plans the annual population growth rate for County of Haldimand is about 0.8% and Norfolk County is approximately 1.4%. Both of the Counties are reviewing their current waste diversion program and considering various options to increase overall blue box diversion rates. Aggressive diversion programs (e.g. bag tags and organics collection) are not anticipated as part of the waste diversion planning in the near future therefore projected future blue box

tonnages for this area was based on the current 24% diversion rate.

Table 5.1 (Appendix 1) depicts projected blue box tonnages over a 10 year period. Based on these projections it is anticipated that within 10 years, the total combined **residential** tonnages could reach a minimum of **8,300 tonnes**. Taking into consideration the commercial sector tonnages, it is anticipated that the total projected tonnages (based on 24% diversion rate) and approximately 13% commercial sector contribution, could reach approximately **9,500 tonnes**.

The current 4 tipping floor sort within the Simcoe MRF has already reached its inbound floor capacity based on their current production rate of approximately 4 tonnes per hour to manage 7,285 residential tonnes and ~1,000 tonnes of commercial material If the diversion initiative (Blue Box Program Plan) is placed into action within the next 3-5 years, further capture of plastic materials will be required impacting available tipping floor and processing capacity at the already congested facility.

As outlined in Section 2.0, this Study has been structured to examine two options. The following section (Section 6.0) examines Option No. 1 which involves a review of current MRF operations (Status-Quo) and the anticipated capital replacement costs associated with maintaining MRF operations at the Simcoe facility. Comparatively, capital and annual operational costs are projected for a partial MRF upgrade and a full MRF upgrade.

6.0 Option 1 - MRF Upgrade

Option No. 1- Haldimand and Norfolk County continue to jointly own the MRF and Norfolk continues to operate the MRF on behalf of both Counties, based on the costs to upgrade the facility to maintain efficient operations.

It is anticipated that the 10 year projected total (residential and IC&I) blue box materials (9,500 tonnes/year) will have a negative impact on MRF operations. The MRF has already reached its inbound floor capacity based on the current production rate of approximately 4 tonnes per hour with an above average residual rate.

Currently, the MRF configuration has limited processing capabilities for comingled fibres and is not structured to manage container glass. If the MRF were to manage the comingling of glass material with the container stream, further equipment modifications would be required in the form of trommel screens and heavier gauge conveyor belting to manage this material. Existing space restrictions would determine the feasibility of upgrading to manage glass or to maintain status quo of facility design and the current four stream processing structure. Staff are aware that the current processing restrictions result in the requirement for multi-stream (6) curbside sorts.

When considering the MRF upgrade, there are three sub-options that were examined including:

- **Status Quo**- Operate MRF making only required upgrades due to equipment failure/replacement and maintaining the 6 stream curbside collection;
- **Partial MRF Upgrade**- Upgrade MRF to transfer fibre to a third party processor and process containers including glass, supported by a three or four stream curbside collection program; and
- **Full MRF Upgrade** –Upgrade the entire MRF to accommodate a two stream processing operation, supported by a two stream curbside collection program.

Reference to gross costs will be provided based on current capital and operational pricing reflecting the area (June 2009). Reference to revenue and net costs will be based on the six month averaged price of $60/tonne for budget purposes.

For consistency when comparing to baseline residential costs (2008 WDO Datacall tonnages), cost per tonne calculations will reflect the current residential tonnes that are being collected from the two Counties (Norfolk=4,345 tonnes and Haldimand 2,942 tonnes) and the costs associated with managing the residential tonnages as outlined in the 2008 WDO Datacall.

6.1 Status Quo

Projected costs were prepared on the current MRF operations based on the status-quo six stream collection processing operation. The current MRF is an aging MRF that will incur costs annually. To better reflect the anticipated capital replacement costs over the next seven years for the Status Quo System, capital and operational costs are structured in a seven year forecast to illustrate how costs will vary during this timeframe due to equipment replacements. Depicting average forecasted costs for a Status Quo system helps reflect the current County practice of replacing components on a gradual bases (or when components fail), instead of a one-time full capital replacement.

Projected costs are displayed starting from the base year (2008), depicting residential tonnages and forecasting tonnage increases (24% diversion rates) for Norfolk County and the County of Haldimand over a seven year period (similar to a processing contract).

The projections assume the current municipal split of 43% and 57% remains unchanged, conservative average revenue projections based on current basket of goods pricing ($60/tonne for 2009) and incorporating modest increases of revenue based on 5 year averages depicted in the Stewardedge Pricing Sheets over the seven year forecast. The existing processing contract expires in September 2009 and it is anticipated there will be increases in overall processing costs (20%-25%) of

a new processing contract, based on the capacity issues currently facing the existing operation. Municipal administration costs are expected to remain relatively constant with the cost of living rates for the processing contract and administration costs expected to represent an annual 3% increase.

County staff are aware of the requirement of a new baler and have indicated that the current baler is budgeted for replacement in 2009 with anticipated installation for either late 2009 or early 2010. Considering the costs of a new baler (~$250,000-$300,000) plus costs to remove the old baler, re-furbish the floor, upgrade electrical panel to support the newer technology and refurbish or replace infeed belts in preparation for the new baler, it is anticipated that costs will be approximately $400,000-$450,000 for this retrofit. This capital replacement and upgrade cost is reflected in year 2010. Additionally, regular maintenance costs will be incurred each year to maintain program operations. It is also anticipated that by 2014, further retrofit of the existing eddy current and overhead magnet and supporting belting infrastructures will be required, representing another capital cost for 2014 of approximately $400,000-$450,000 (including removal of old structures and upgrading system to manage new structures).

Table 6.1 depicts the seven year projected costs to operate the MRF in its current configuration (Status Quo) with replacing components when they fail. Table 6.1 reflects Haldimand County's share of 43% of the Gross residential blue box processing costs are expected to increase from $162/tonne (2008) to $240/tonne by 2010 and then reduce to approximately $190/tonne for three years until other components require replacement in 2014, resulting in an increase to reflect $260/tonne in 2014.

Increases to the net costs are anticipated. Projected costs in Table 6.1 reflect revenue fluctuations, capital replacements, and cost of living increases.

Table 6.1 Haldimand County Projected (2014) Residential Processing Cost Forecast-Status Quo

Year	Haldimand Blue Box Tonnes	Municipal Administration Costs	MRF Contract Costs	MRF Contract $/ Tonne	Contract Cost Per Household (19,199)	Gross Processing Costs (Admin + Contract)	Gross Process $/ Tonne	Gross $/ HH	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/ tonne	$/ household	$	$/ tonne	$/ household	$	$	$/ household
2008	2,942	$ 173,835.00	$ 303,593.71	$ 103.19	$ 15.88	$ 477,428.71	$ 162.28	$ 24.87	$ 461,748.00	$ 5.33	$ 0.82
2009	3,019	$ 179,050.05	$ 312,701.52	$ 103.58	$ 16.36	$ 491,751.57	$ 162.90	$ 25.61	$ 196,222.11	$ 97.90	$ 15.39
2010*	3,043	$ 356,421.55	$ 375,241.83	$ 123.32	$ 19.63	$ 731,663.38	$ 240.45	$ 38.11	$ 258,650.92	$ 155.45	$ 24.64
2011	3,067	$ 189,742.70	$ 386,499.08	$ 126.01	$ 20.22	$ 576,241.78	$ 187.87	$ 30.01	$ 306,729.57	$ 87.87	$ 14.04
2012	3,092	$ 195,434.98	$ 398,094.05	$ 128.76	$ 20.82	$ 593,529.03	$ 191.97	$ 30.91	$ 371,020.08	$ 71.97	$ 11.59
2013	3,117	$ 201,298.03	$ 410,036.87	$ 131.57	$ 21.45	$ 611,334.90	$ 196.16	$ 31.84	$ 373,988.24	$ 76.16	$ 12.36
2014*	3,142	$ 401,336.97	$ 422,337.98	$ 134.44	$ 22.09	$ 823,674.95	$ 262.19	$ 42.90	$ 376,980.15	$ 142.19	$ 23.27

- *2010 -reflects the drop in revenue and the increase in capital replacement costs and a change in the processing contact*
- *2010 to 2013-reflects costs remaining steady, depicting 3% cost of living and gradual revenue increases*
- *2014- reflects replacement of the magnets and conveyor structures and estimated revenue of $120/tonne and a projected residential tonnage of approximately 3,140 tonnes*

These costs are for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Based on these estimated costs, the average residential net cost per tonne for Haldimand to manage blue box tonnages in the current Status Quo System over seven years is averaged at ~$90/tonne.

Table 6.2 reflects Norfolk County's share of 57% of the Gross residential blue box processing costs are expected to increase from $142/tonne (2008) to $210/tonne by 2010 and then reduce to approximately $165/tonne for three years until other components require replacement in 2014, resulting in an increase to reflect $225/tonne in 2014 and a projected residential tonnage of approximately 4,777 tonnes.

The Net costs are anticipated to increase from the current $3.07/tonne (2008) to $145/tonne in 2010, and then remain constant for three years between $55-$75/tonne, then increase in 2014 to $105/tonne reflecting the replacement of the magnets and conveyor structures.

Table 6.2 Norfolk County Projected (2014) Residential Processing Cost Forecast-Status Quo

Year	Norfolk County Blue Box Tonnage	Municipal Adminstration Costs	MRF Contract Costs	Contract $/ Tonne	Contract Cost Per Household (27,668)	Gross Processing Costs	Gross Processing $/ Tonne	Gross $/ HH	Revenue	Net Cost Per tonne	Net Cost Per Household
	tonnes	$	$	$/tonne	$/household	$	$/tonne	$/household	$	$	$/household
2008	4,345	$ 226,224.00	$ 391,332.00	$ 90.06	$ 14.14	$ 617,556.00	$ 142.13	$ 22.32	$ 604,203.00	$ 3.07	$ 0.48
2009	4,448	$ 233,010.72	$ 403,071.96	$ 90.63	$ 14.57	$ 636,082.68	$ 143.02	$ 22.99	$ 289,090.79	$ 78.02	$ 12.54
2010*	4,512	$ 468,001.04	$ 483,686.35	$ 107.21	$ 17.48	$ 951,687.39	$ 210.94	$ 34.40	$ 293,253.70	$ 145.94	$ 23.80
2011	4,577	$ 247,050.75	$ 498,196.94	$ 108.86	$ 18.01	$ 745,247.69	$ 162.84	$ 26.94	$ 389,007.80	$ 77.84	$ 12.88
2012	4,642	$ 254,462.27	$ 513,142.85	$ 110.53	$ 18.55	$ 767,605.12	$ 165.34	$ 27.74	$ 464,246.48	$ 65.34	$ 10.96
2013	4,709	$ 262,096.14	$ 528,537.14	$ 112.23	$ 19.10	$ 790,633.28	$ 167.89	$ 28.58	$ 565,117.96	$ 47.89	$ 8.15
2014*	4,777	$ 525,959.03	$ 544,393.25	$ 113.96	$ 19.68	$ 1,070,352.28	$ 224.06	$ 38.69	$ 573,255.66	$ 104.06	$ 17.97

These costs are for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Based on these estimated costs, the average net processing cost per tonne to manage Norfolk residential tonnage over seven years is averaged at~$75/tonne.

The status quo system supports a multi-stream curbside sort therefore it is anticipated that curbside system and costs would remain the same with annual cost of living increases and possible fuel surcharges.

Section 6.2 and Section 6.3 are not intended to depict long range cost forecasts as these options examine the impact of a one-time capital upgrade costs on two new scenarios: **Partial MRF Upgrade and Full MRF Upgrade**.

The one-time capital costs are generated based on current purchase and installation prices of similar pieces of equipment to assist the Counties with decision making. Further opportunities for capital funding or amortization periods and interest rates can be determined by the Counties at their discretion.

6.2 Partial MRF Upgrade

The review of a partial MRF upgrade (capital and operational costs) was made from the basis of discussions with staff on the impact a large capital upgrade (i.e. retrofitting a MRF to accommodate a two stream collection program) would have on the overall costs of the current blue box program (Section 5.3).

It is proposed in this sub-option that all blue box materials would be collected from the curb in a 3 or 4 stream sort. All fibre would be commingled into one stream and containers would be segregated into 2-3 streams (cans/plastic and glass). The glass stream could include clear and coloured glass or mixing of clear and coloured glass

in one compartment. There would be minimal impact to the general public for the partial upgrade and there may be opportunities to gain some curbside collection savings with partial reduction in curbside sorts.

Blue box materials would be delivered to the Simcoe MRF. The fibre would be loaded into compactor trailers and transferred out of the MRF to a third party fibre mill or MRF. Containers would be manually sorted and processed by staff.

Figure 6.2 (Appendix 1) illustrates a conceptual layout of the partially upgraded MRF.

Fibre material could be tipped either on the tipping floor or directly into a compacting transfer trailer with the larger front end loader eliminating the need to establish costly grade separations in the concrete floor.

A new baler and magnetic components would still be required based on baling requirements of container material. Further, the Counties have the flexibility to manage commercial cardboard separately as a potential to increase overall revenue.

To manage costs, glass would not be processed within the partially upgraded MRF. Glass would continue to be tipped into outside bunkers (either comingled or separated by colour).

The capital and operational costs are depicted in real time as the capital cost would occur as a one-time investment.

Table 6.3 depicts estimated one-time capital costs for this sub-option.

Table 6.3 Projected Partial MRF One-Time Capital Costs

Capital Items	Estimated Costs
Weigh scale and Computer	$5,000
New Baler including installation	$425,000
Replace existing Magnet, Eddy Current and belting	$450,000
Contingency/Engineering	$50,000
Total	**$ 930,000**

Other considerations could be to purchase a stationary compactor with trailer attachment (depending on contract arrangement the municipality makes with a transfer hauler or fibre mill). A stationary compactor and supporting feed hopper system is estimated at an additional cost of $250,000 (new) $150,000 (used).

These items are considered optional and are not factored into the overall capital estimate.

Table 6.4 depicts estimated operating costs for this sub-option. Costs reflect the reduction in processing staff for fibre sorting.

Table 6.4 Projected Annual Operational Costs for Partial MRF Upgrade

Items	Estimated Unit Costs (260 days per year)	Units	Est.Total Operational Costs (7287 Residential Tonnes)	Haldimand 2,942 Tonnes (43%)	Norfolk 4,345 Tonnes (57%)
sorting staff (with overhead)	$ 30,000.00	4	$ 120,000.00		
equipment operator	$ 40,000.00	3	$ 120,000.00		
supervisor	$ 60,000.00	1	$ 60,000.00		
Office Admin	$ 40,000.00	1			
Utilities (fuel,heat,hydro, baling wire,taxes)	$ 150,000.00	1	$ 150,000.00		
Total			$ 450,000.00	$193,500.00	$256,500.00
Residential Cost Per Tonne			**$ 61.75**	**$ 65.77**	**$ 59.03**

This system proposes that revenues for container material would be managed by the two Counties and revenues from the fibre material would be managed by the processing mill.

The costs for transferring material would be approximately $800-$900/round trip based on 250 trips for the combined fibre tonnages, representing an estimated annual hauling cost of ~$215,000. Revenues from sale of fibres at $60/tonne for 5,000 tonnes of fibre are ~$300,000 and revenue from the containers is estimated to be ~$180,000 (for 3,000 tonnes at $60/tonne). Processing fee for the fibre from a fibre mill (Canada Fibres at $35/tonne) is estimated at $175,000 per year.

For further comparison, the HGC MRF in Brantford is closer to the two Counties than Canada Fibres but would require contract negotiations prior to delivery of material and there is an estimated processing fee of $100/tonne to manage the fibre material. Transfer costs via tractor trailer are estimated to be $250/trip based on 250 trips representing ~$60,000 for hauling and $~500,000 processing fee. Revenues are anticipated to be ~$60/tonne for fibre material from HGC ($300,000) and revenue from containers would continue to be $180,000.

Table 6.5 depicts a cost summary of the Gross costs associated with the partial MRF upgrade based on the 43% municipal share for Haldimand County. The cost per tonne reflects the residential costs to manage 2,942 collected tonnes (2008 WDO Datacall).The annual municipal administration costs are taken from the 2008 WDO Datacall to reflect costs to manage residential material for Haldimand County as it pertains to staffing, insurance, etc. Revenues are based on the current (June

2009) average basket of goods pricing of $60/tonne.

Transfer costs reflect costs to haul to Canada Fibres due to immediate capacity and confirmed processing fees at the time of this Study. Transfer costs were based on material delivered to the Canada Fibres fibre mill in Toronto as this facility had immediate processing and trucking capacity at the time of this Study and represented a low processing fee for fibres

Table 6.5 Cost Summary for Partial MRF Upgrade-Haldimand Share

Haldimand Share (43%)	Estimated Residential Cost
One-Time Capital Cost	$ 399,900
Partial MRF Operating Costs	$193,500/year
Annual Municipal Admin Costs	$ 44,200/year
Annual Fibre Transfer Costs	$92,000/year
Annual 3rd Party Processing Fee	$75,000/year
Estimated Gross Operating Costs	**$ 405,000/year**
Projected Revenue ($60/tonne)	~ $180,000/year
Estimated Net Operating Costs	~$ 225,000/year
Estimated Net Cost Per Tonne	**~$76/tonne**

These costs are for rounded for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Capital costs are not annualized into the estimated operating costs. Based on these estimated costs, the average net processing cost per tonne to manage 2,942 residential tonnages for Haldimand County is estimated at being in the range of~$76/tonne for year one (excluding capital investment).

Table 6.6 depicts a cost summary of the gross costs associated with the partial MRF upgrade based on the 57% municipal share for Norfolk County. The cost per tonne reflects the residential costs to manage 4,345 collected tonnes (2008 WDO Datacall). The annual municipal administration costs are taken from the 2008 WDO Datacall to reflect costs to manage residential material for Norfolk County as it pertains to staffing, insurance, etc. Revenues are based on the current (June 2009) average basket of goods pricing of $60/tonne. Average gross costs are reflected in the following tables due to fluctuating revenue pricings.

Table 6.6 Cost Summary for Partial MRF Upgrade-Norfolk Share

Norfolk Share (57%)	Estimated Residential Cost
One-Time Capital Cost	$ 530,100
Partial MRF Operating Costs	$256,000/year
Annual Municipal Admin Costs	$ 40,000/year
Annual Fibre Transfer Costs	$123,000/year
Annual 3rd Party Processing Fee	$100,000/year
Estimated Gross Operating Costs	**~$ 520,000/year**
Projected Revenue ($60/tonne)	~ $260,000/year
Estimated Net Operating Costs	~$ 260,000/year
Estimated Net Cost Per Tonne	**$60/tonne**

These costs are for rounded for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Capital costs are not annualized in the estimated operational costs. Based on these estimated costs, the average net processing cost per tonne to manage 4,345 residential tonnages for Norfolk County is estimated at being the range of~$60/tonne for year one (excluding capital investment).

It is anticipated that there would be no change to the curbside costs as curbside sorting of glass would still continue at the curb for both programs with similar collection vehicles.

6.3 Full MRF Upgrade -Two Stream

Both Counties requested cost information to upgrade the Simcoe MRF to reflect a two stream processing facility. As a result, it is proposed in this sub-option that all blue box materials would be collected from the curb in a two-stream sort. All fibre would be commingled into one steam and all containers would be comingled into another stream, including glass containers. This processing system will simplify the current curbside collection program and will require an extensive promotion and education to reflect the new sorting requirements within the fully upgraded MRF.

Reducing the collection streams provides opportunities to gain curbside collection savings particularly if the two Counties offer longer term collection contracts or flexibility for co-collection (waste and recycling) or possibly submit one tender to service both Counties (one collection contract). Referencing the price submission from HGC in the Haldimand 2007 tender for two stream collection, the following collection costs were estimated based on the number of households for both Counties ;

- Using 2007 Rate of .991/stop/week;
- Current fuel costs of .86/Litre representing ~($135,000 for Haldimand and $125,000 for Norfolk based on current number of collection vehicles);and,
- Serving 27,668 households per week in Norfolk and 19,199 households per

week in Haldimand.

Possible two stream collection cost can be estimated:

- Haldimand =$1,125,000/year ($382/tonne)
- Norfolk = $1,500,000/year ($345/tonne)

Specific to this option, the two stream blue box material would be delivered to the Simcoe MRF. Fibres would be tipped on one tipping floor and containers on another tipping floor. Given the likely increase in plastic volumes that will occur, additional tipping floor capacity is recommended. Expansion opportunities are limited on this property. It has been proposed that expansion on the west end of the facility is possible to increase the overall length of the building and to add an additional 3,000 square foot capacity. All inbound material would be directed to the expanded portion of the facility allowing room for additional reconfiguration of the processing equipment inside the MRF.

The comingling of glass into the container stream requires glass removal equipment (trommel screens) and heavier gauge conveyor belting. The baler and eddy current/magnet will require replacements and new infeed conveyor systems will be required to support the reconfiguration.

Table 6.7 depicts estimated capital costs for this sub-option.

Table 6.7 Estimated One- Time Capital Costs for Full MRF Upgrade

Capital Items	Estimated Unit Costs	Units	Estimated Total Capital Costs
Weigh Scale Software and Computer	$ 5,000.00	1	$ 5,000.00
Building Expansion 3,000 ft (concrete,metal, electrical,sprinker,overhead doors	$ 250,000.00	1	$ 250,000.00
Infloor Conveyor for Fibre Line	$ 50,000.00	1	$ 50,000.00
Infloor Conveyor for Container Line	$ 50,000.00	1	$ 50,000.00
Repositioning Sort Lines(adding longer coveyors/ belts)	$ 100,000.00	2	$ 200,000.00
Bunker Rebuilds and Additions	$ 25,000.00	6	$ 150,000.00
New Baler & Installation(floor leveling,removal of old baler,electrical panel upgrade)	$ 425,000.00	1	$ 425,000.00
Radiant Heaters (over sorting area)	$ 3,000.00	2	$ 6,000.00
Install/ engineering	$ 200,000.00	1	$ 200,000.00
Total			**$ 1,336,000.00**

Pricing does not include contingency costs for unforeseen construction delays. Price does not reflect rolling stock (forklifts, loaders) based on current contract configuration with the contractor providing these components. Costs do not consider used equipment or trade-in value of existing equipment. The existing building shell appears to be in good repair and property on the west side of the building appears to be free of overhead wires, and underground cabling /pipes.

Table 6.6 depicts estimated operational costs for a full two stream upgrade. Additional staffing has been proposed to accommodate the additional sorting requirements of the comingled material. Further, it can be anticipated that residual will remain at 6% for a two stream operation, dependent on the effectiveness of the promotion and education program. A 6% residual rate is a reasonable estimate for a two stream operation. Again, operational costs are for budget purposes and cost savings could be potentially realized through a formal tendering process.

Table 6.6 Estimated Operational Costs for Full MRF Upgrade

Items	Estimated Unit Costs (260 days per year-1 shift)	Units	Estimated Total Operational Costs
Sorting staff (with overhead)	$ 30,000.00	11	$ 330,000.00
Equipment operator (baler/ fork, loader, skidsteer)	$ 40,000.00	3	$ 120,000.00
Supervisor	$ 60,000.00	1	$ 60,000.00
Office Admin	$ 50,000.00	1	
Utilities (fuel,heat,hydro, baling wire,taxes)	$ 300,000.00	1	$ 300,000.00
Total			**$ 810,000.00**
Est. Cost Per Tonne (7,287 tonnes)			**$ 111.16**

This option reflects higher processing costs than the partial MRF upgrade to reflect sorting at the MRF instead of curbside. It is anticipated that this option will have a minimum annual processing costs in the range of~ $800,000.

Table 6.7 depicts a cost summary of the gross costs associated with the Full MRF upgrade based on the 43% municipal share for Haldimand County. The cost per tonne reflects the residential costs to manage 2,942 collected tonnes (2008 WDO Datacall).The annual municipal administration costs are taken from the 2008 WDO Datacall to reflect costs to manage residential material for Haldimand County as it pertains to staffing, insurance, etc. Revenues are based on the current (June 2009) average basket of goods pricing of $60/tonne.

Table 6.7 Cost Summary for Full MRF Upgrade-Haldimand Share

Haldimand Share (43%)	Estimated Residential Cost
One-Time Capital Cost	$ 574,480
Partial MRF Operating Costs	$350,000/year
Annual Municipal Admin Costs	$ 44,200/year
Estimated Gross Operating Costs	**~$ 395,000/year**
Projected Revenue ($60/tonne)	~$ 180,000/year
Estimated Net Operating Costs	~$ 215,000/year
Estimated Net Cost Per Tonne	**$73/tonne**

These costs are rounded for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Capital costs are not annualized into the estimated operating costs. Based on these estimated costs, the average net processing cost per tonne to manage 2,942 residential tonnages for Haldimand County is estimated at being in the range of~$73/tonne for year one (excluding capital investment).

Table 6.8 depicts a cost summary of the Gross costs associated with the Full MRF upgrade based on the 57% municipal share for Norfolk County. The cost per tonne reflects the residential costs to manage 4,345 collected tonnes (2008 WDO Datacall). The annual municipal administration costs are taken from the 2008 WDO Datacall to reflect costs to manage residential material for Norfolk County as it pertains to staffing, insurance, etc. Revenues are based on the current (June 2009) average basket of goods pricing of $60/tonne. Average Gross costs are reflected in the following tables due to fluctuating revenue pricings.

Table 6.8 Cost Summary for Full MRF Upgrade-Norfolk Share

Norfolk Share (43%)	Estimated Residential Cost
One-Time Capital Cost	$ 761,520
Partial MRF Operating Costs	$460,000/year
Annual Municipal Admin Costs	$ 40,000/year
Estimated Gross Operating Costs	**$ 500,000/year**
Projected Revenue ($60/tonne)	~$260,000/year
Estimated Net Operating Costs	~$ 235,000/year
Estimated Net Cost Per Tonne	**$55/tonne**

These costs are for budgetary purposes and reflect both known (capital) and unknown (revenues, contracts) price averages. Based on these estimated costs, the average net processing cost per tonne to manage 4,345 residential tonnages for Norfolk County is estimated at being in the range of~$55/tonne for year one (excluding capital investment).

7.0 Option 2 Third Party Processing Capacity to Transfer Recyclables

As part of this Study, a review of surrounding processing capacity was conducted of facilities ~125km from the Simcoe MRF. Consideration was given to the following:

- Long term processing capacity to manage a minimum of 9,500 tonnes per year,
- Certificate of Approval service area restrictions,
- Opportunities for revenue rebates; and,
- Two stream processing capabilities.

Both municipalities are fortunate to have several larger scale blue box processing facilities within 1.5 hours travel distance (by truck). Six private and publically owned facilities were contacted. All processing facilities have processing capacity and are willing to receive material from the two Counties.

Table 7.1 identifies the facilities that provided processing fees and commitment for long-term processing capacity (min. 5 years). Facility representatives indicated that prices were approximate and based on current processing contracts.

Table 7.1 2009 Blue Box Processing Capacity for Combined Projected Tonnages (9,500 tonnes)

Processor	Distance from Simcoe (Km)	One Way Travel Time (Hrs)	Distance From Canborough (Km)	One Way Travel Time (Hrs)	Processing System	Gross Processing Fee Per Tonne	Available Revenue Rebate
City of Hamilton MRF	70	1.00	55	1.00	Two Stream	All Material = $55 Per Tonne	√
City of Niagara MRF	135	1.50	50	1.00	Two Stream	Containers = $75 per tonne Fibres=$25 per tonne	√
Canada Fibres Fibre Plant (Toronto)	125	1.50	70	1.00	Fibres	Fibres Only =$35 Per Tonne	√
Canada Fibres Container Plant (Hamilton MRF)	70	1.00	55	1.00	Containers	Containers Only =$90 Per Tonne	√
City of London Future MRF	100	1.50	160	2.00	Two Stream	All Material =$60-$65 per Tonne	√
HGC Management Brantford MRF	50	45 min	60	50 min	Two Stream	All Material = $100	√

As this Study is on behalf of the two Counties, all processing facilities were given the combined blue box tonnages and projected tonnage ranges. Genor was not

considered based on their current lack of available processing capacity for the combined projected tonnages (9,500 tonnes). All facilities were keen on receiving the combined tonnages from the two Counties and indicated further negotiations would be required once a decision was made by both Counties to haul material to their facilities.

The City of London is beginning construction of a new regional MRF slated for opening in the spring of 2011. The City indicated that processing fees reflect their contract arrangements whereby the contractor charges rates on a tonnage range (10,000 tonne increments). When the threshold of a tonnage range is achieved, a lower processing rate is charged to the City. Currently, the processing rate of $60-$65/tonne is offered to municipalities based on anticipated tonnages managed directly from the City. Additional tonnages from third party municipalities could reduce the processing rate to $50-$55 tonne at the time of the facility opening (2011). The City also indicated that an additional surcharge to manage film plastic and polystyrene would be applied. At the time of the Study, a surcharge of $20 per tonne for these two items was proposed ($65 + $20=$85/tonne for the two materials). Further details of the MRF processing costs will require negotiations with the City closer to the facility operation timeframe.

Revenue rebate information was requested from the six facilities based on the composition information as outlined in Section 3 (Table 3.2). All facilities indicated that rebate rates represented an average price based on their understanding of the blue box composition for the combined tonnages of County of Haldimand and Norfolk County and current processing contract arrangements (May 2009).

To clarify the calculation method conducted by the third party processors, Table 7.2 outlines the methods for revenue rebate calculations. All facilities require semi-annual to annual inbound blue box material audits to determine revenue rebate formulas.

Table 7.2 2009 Blue Box Rebate Calculations for County of Haldimand and Norfolk County

Processor	Processing System	Revenue Rebate Calculation
City of Hamilton MRF	Two Stream	To be determined at time of negotiation with municipality based on material composition.
City of Niagara MRF	Two Stream	80% of basket of goods pricing from CSR Pricing Sheet for containers and fibres based on blue box composition (minus residual %).
Canada Fibres Fibre Plant (Toronto)	Fibres	100% revenue price paid based on CSR Price Sheet and blue box material composition (minus residual).
Canada Fibres Container Plant (Hamilton MRF)	Containers	100% revenue price paid based on CSR Price Sheet and blue box material composition (minus residual).
City of London Future MRF	Two Stream	Rebates 100% revenue back to municipality (based on processed tonnes). Additional surcharge processing fees occur for film and polystrene at extra $20 per tonne.
HGC Managment Brantford MRF	Two Stream	Rebates 100% revenue back to municipality (based on processed tonnes).

8.0 Transfer and Processing Costs

To establish comparative system costs between upgrading the existing MRF and transferring blue box tonnages to a third party processor, several components were considered;

- Point of transfer,
- Method of transfer,
- Current tonnages to transfer for operational cost estimates;
- Projected tonnages for facility footprint and structure requirements; and,
- Processing fees for third party processor.

Using information gathered from the two Counties, three points of transfer were determine;

- Simcoe MRF, located in Norfolk County
- Simcoe Transfer Site, located adjacent to MRF, in Norfolk County
- Canborough Transfer Site, located in Haldimand County

Two methods of transfer were considered;

- Transfer Station with a building and stationary compactors and transferring material in walking floor trailers
- Transtors (V-Quip) without a building and transferring material in compacting trailers

2008 Residential Blue box tonnages to transfer were examined:

- Norfolk County blue box tonnages (~4,345 tonnes),
- County of Haldimand blue box tonnages(~2,942 tonnes); and,
- Combined blue box tonnages from both Counties (~7,280 tonnes).

Third party processors provided cost ranges with the understanding that firm pricing would be confirmed through a formal request for proposal process. For budget purposes, calculations for revenue from the varying third party processors were estimated at $60/tonne.

Hauling costs vary depending on fuel pricing and distance traveled. Hauling rates were averaged using May 2009 trucking rates. Firm pricing can be achieved through formal tendering process.

Section 8.1 provides capital costs for a traditional transfer station with a building to house blue box material based on footprint requirement to manage the projected residential and commercial tonnages (9,500 tonnes).

8.1 Traditional Transfer Station with Building –Capital Costs

When considering the three points of transfer, estimated capital costs were based on the following:

- All sites have on-site scales,
- Only the Simcoe MRF site does not have computer software,
- All sites are fenced,
- All sites have hydro and truck traffic access; and
- All sites are licensed to receive blue box material.

Greenfield siting exercise was not part of this Study.

Capital Costs – Conversion of Simcoe MRF Site

The one-time capital costs to convert the Simcoe MRF to a blue box transfer site is estimated to be in the range of $455,000. Using the existing infrastructure of the weigh scales, building, concrete push walls and concrete blocks, reduces overall conversion costs.

Table 8.1 depicts the estimated costs to convert the Simcoe MRF into a transfer station. Costs include the decommissioning of the existing sort line and installing hopper mechanisms to load stationary compactors. Costs do not reflect opportunities for trade-in value of older equipment (baler).

Table 8.1 Estimated Capital Costs for Simcoe MRF Conversion (Combined Tonnages)

Equipment	Unit	Cost	Total
Weigh Software	1	$5,000	$5,000
Compactor	2	$150,000	$300,000
Hopper/ conveyor	2	$25,000	$50,000
Engineering/ Decommission	1	$100,000	$100,000
Total			**$455,000**

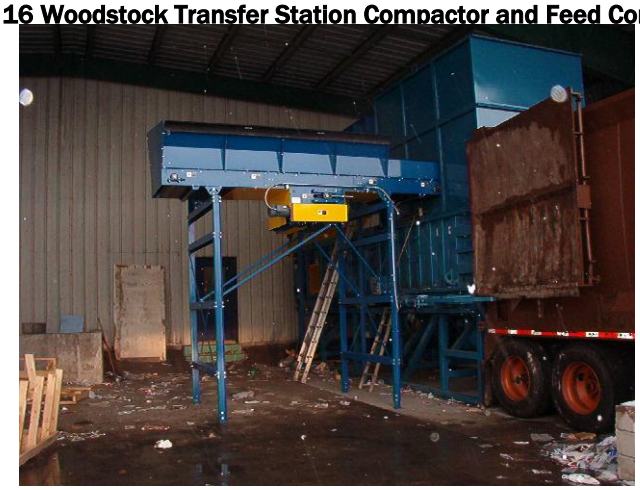
- **Haldimand Share (43%) = ~$195,650**
- **Norfolk Share (57%) = ~ $259,350**

Comparatively, the recent conversion of the Woodstock MRF to a transfer station (2008) was approximately $480,000.

Photos 15 and 16 depict operations at the Woodstock transfer station.

Photo 15 Woodstock Transfer Station 3 Sided Building

Photo 16 Woodstock Transfer Station Compactor and Feed Conveyor



Capital Costs – Establish New Simcoe Transfer Site (Combined Tonnages)

An established transfer station in close proximity to the MRF (Simcoe Transfer Site) operates with supporting infrastructure of a weigh scale and fencing. Further, this site is in the process of a redesign to improve traffic and material flow. It is anticipated that additional grading and site preparations will be required to accommodate a three sided enclosure for this site. Capital costs include a 5,000 square foot three sided building, similar in design to the Woodstock transfer station. The size of the building has been estimated based on the long-term projected combined annual tonnages (9,500 tonnes). The one-time capital costs to establish a new blue box transfer station at the Simcoe Transfer Site is estimated to be approximately $975,000.

Table 8.2 depicts anticipated capital costs to establish a blue box transfer operation at the existing Simcoe Transfer Site. Costs reflect existing infrastructure of a weigh scale and weigh scale operator.

Table 8.2 Estimated Capital Costs for Simcoe Transfer Site Conversion (Combined Tonnages)

Equipment	Unit	Cost	Total
Metal Bulding ($75/ ft2)	1	$375,000.00	$ 375,000.00
Compactor	2	$150,000	$ 300,000.00
Hopper/ conveyor	2	$25,000	$ 50,000.00
Concrete Blocks	50	$1,000	$ 50,000.00
Engineering/ Site Work(hydro,fill,grading,)	1	$200,000	$ 200,000.00
Total			**$ 975,000.00**

- **Haldimand Share (43%) = $419,250**
- **Norfolk Share (57%) = $ 555,750**

Capital Costs –New Simcoe Transfer Site (Norfolk Tonnages Only)

Capital costs include a smaller three sided building (3,000 square feet). The size of the building has been estimated based on the project Norfolk County tonnages of ~5,000 tonnes in 2014. A full size loader has been suggested for this site to reduce handling time of material. The one-time capital costs to establish a blue box transfer station at the Simcoe Transfer Site is estimated to be approximately $700,000.

Table 8.3 depicts anticipated capital costs to establish a blue box transfer operation at the existing Simcoe Transfer Site to manage Norfolk tonnages. Costs reflect existing infrastructure of a weigh scale and weigh scale operator.

Table 8.3 Estimated Capital Costs for Simcoe Transfer Site Conversion (Norfolk)

Metal Bulding ($75/ ft2)	1	$225,000.00	$ 225,000.00
Compactor	1	$150,000	$ 150,000.00
Hopper/ conveyor	1	$25,000	$ 25,000.00
Concrete Blocks	50	$1,000	$ 50,000.00
Engineering/ Site Work(hydro,fill, grading)	1	$250,000	$ 250,000.00
Total			**$ 700,000.00**

Capital Costs – New Canborough Transfer Site (Haldimand Tonnages Only)

The Canborough Site located near Dunnville, western portion of the County of Haldimand (closer to Niagara Region) is also has an established transfer station with supporting infrastructure of a weigh scale and fencing. It is anticipated that additional grading and site preparations will be required to accommodate an enclosure for this site. Capital costs include a 3,000 square foot three sided building, large enough to support projected tonnages for Haldimand County. Similar to the Simcoe transfer site, the one-time capital costs to establish a blue box transfer station at the Canborough Transfer Site is estimated to be in the range of approximately $700,000.

Table 8.4 depicts the anticipated capital costs to establish a blue box transfer operation at the existing Canborough Site to manage Haldimand tonnages. Costs reflect existing infrastructure of a weigh scale and weigh scale operator.

Table 7.4 Estimated Capital Costs for Canborough Transfer Site Conversion

Metal Bulding ($75/ ft2)	1	$225,000.00	$ 225,000.00
Compactor	1	$150,000	$ 150,000.00
Hopper/ conveyor	1	$25,000	$ 25,000.00
Concrete Blocks	50	$1,000	$ 50,000.00
Engineering/ Site Work(hydro,fill, grading)	1	$250,000	$ 250,000.00
Total			**$ 700,000.00**

8.2 Traditional Transfer Station with Building –Operating Costs

To generate realistic hauling rates, information was collected from varying trucking firms in the area. Rates reflect driver and trailer and fuel pricing for May 2009. Estimated hauling rates to transfer material from the two Counties are averaged to assist with budgeting purposes. Average rates are as follows:

- Simcoe to Hamilton area =$700 return
- Simcoe to Niagara area =$800 return
- Simcoe to Toronto area =$900 return
- Simcoe to London area = $900 return
- Simcoe to Brantford area =$300 return
- Canborough to Hamilton area = $550 return
- Canborough to Niagara area = $550 return
- Canborough to Toronto area = $850 return
- Canborough to London area = $950 return
- Canborough to Brantford area =$300 return

To determine frequency of trips for two stream material, the following assumptions were made;

- Using a 53 ft compacting trailer or stationary compactor loaded into 53 trailer,
- Allowing for useable trailer volume of 75m3 for fibres and container material
- Allowing for approximately 20 tonnes per load of fibres (reflecting corrugated cardboard composition and allowance for `air pockets.' when using a walking floor trailer),
- Allowing for approximately 10 tonnes per load (reflecting glass composition and when using a walking floor trailer),
- Transferring fibres separate from container material; and

For comparison purposes, recent trailer weights generated from the City of Woodstock (May 2009), resulted in 28 tonnes per load for fibres and 12 tonnes per load for containers. Third party processor destination for the City of Woodstock

loads is Canada Fibres. Canada Fibres was contacted to gather a monthly average of weights coming from the City to determined average weights over time. Fibre loads ranged from 23 -25 tonnes in the winter and increased to 25-28 tonnes the end of May 2009. Similarly, container loads ranged from 8-10 tonnes in the winter months and have increased to 10-12 tonnes in May.

Table 8.5 depicts the estimated frequency of trailer loads for fibres and container material generated by the two Counties. It is important to note that the frequency of trips will vary based on loading methods, moisture, season, and tonnage fluctuations. To determine anticipated trailer requirements, calculations were generated referencing blue box composition data (Table 3.2 on page 6) and collected tonnes. Fibre material can tolerate maximum compaction rates (4:1) whereas container material will have minimal compaction (2:1). Trailer weights reflect modest weights for estimating purposes. Fibre trailers are estimated at 20 tonnes per load and container trailers are estimated at 10 tonnes per load.

Table 8.5 Estimated Frequencies of Trailer Trips

2008 Blue Box Composition (Based on WDO Datacall Marketted Materials)	Norfolk (tonnes)	Haldimand (tonnes)	Total Residential Tonnes
OCC/ OBB	1,530	1,151	2,681
Aluminium	77	58	135
Steel	204	157	361
PET	173	130	303
HDPE	76	57	133
Film	34	25	59
Polystrene	3	2	5
Mixed Plastics	126	95	221
Clear Glass	230	172	402
Coloured Glass	160	121	281
Total Tonnes	3,904	2,939	6,843
Collected Material	4345	2942	7287
Monthly (t)	325	245	570
Weekly (t)	81	61	143
Daily (260 days)	15	11	26
Trailer Loads	**Norfolk**	**Haldimand**	**Combined**
Daily Fibres	13.0	8.3	19.2
Daily Containers	4.0	3.0	7.1
Est. Daily Trailer Equivalent -Compacting Fibre	0.65	0.41	0.96
Est. Daily Trailer Equivalent-Compacting Containers	0.40	0.30	0.71
Weekly Trips-Fibre Trailers (min 20T/ Load)	3.25	2.06	4.81
Weekly Trips-Container Trailers (min 10T/ Load)	2.02	1.52	3.54
Averaged Yearly Trips-Fibre Trailers	169.00	107.35	250.10
Averaged Yearly Trips-Container Trailers	104.90	79.20	184.10

For estimating purposes, the blue box composition indicates an average of approximately 13 tonnes of fibre and 4 tonnes of containers per day (5 days per week) for Norfolk and 8 tonnes of fibre and 3 tonnes of containers per day (5 days per week) for Haldimand. These tonnages represent less than one trailer load per day from both Counties when considering compacting material using stationary compactors.

Using the estimate of 20 tonnes per load for fibres, and 10 tonnes per load for containers, Norfolk is anticipated to average between 150 to 180 trailers per year for fibres and 90 to 120 trailers per year for containers. For budget purposes, a yearly average of 169 trips per year for fibres and 104 trips (104.90 in Table 8.5)

per year for containers has been referenced. Similar for Haldimand County, it is anticipated that an average of 90 to 120 trips per year for fibres and 60 to 90 trips per year for containers. For budget purposes, a yearly average of 107 trips (107.35 in Table 8.5) for fibres and 79 trips (79.20 in Table 8.5) for containers has been selected.

Referencing frequency of trip information, the following three transfer scenarios have been generated:

- Transferring Norfolk County residential collected blue box tonnages (~4,345 tonnes) from a Simcoe Site,
- Transferring County of Haldimand residential collected blue box tonnages (~2,942 tonnes) from a Simcoe Site and Canborough Site; and,
- Transferring combined residential collected blue box tonnages (~7,287) from a Simcoe Site

8.3 Norfolk County Transfer and Third Party Processing Costs

Considering tonnages generated from Norfolk County, average costs were generated for transferring fibres and containers to the five processing locations. Hauling costs were added to the third party processing fees to establish an annual transfer cost to transport and process Norfolk County blue box tonnages. Costs are based on average residential tonnages for comparison to other system costs within this Study.

Both the Simcoe Transfer Station and the Simcoe MRF are in close proximity therefore reference to a Simcoe Site represents both sites when calculating distances and hauling costs.

Table 8.6 depicts the hauling and processing fees to manage Norfolk residential blue box tonnages.

Table 8.6 Norfolk Residential Hauling and Processing Costs

Third Party Processor Site	Average Hauling Rate (May 2009)	Average Processing Fee (May 2009)	Norfolk Fibre Tonnes	Norfolk Container Tonnes	Norfolk Fibre Costs (haul + process)	Norfolk Container Costs (haul+process)	Norfolk Total Costs
City of Hamilton MRF	$ 700.00	$ 55.00	3,040.00	1,305.00	$285,500.00	$ 144,575.00	$430,075.00
Niagara MRF - Fibres	$ 800.00	$ 25.00	3,040.00	1,305.00	$211,200.00	$ -	$211,200.00
Niagara MRF-Containers	$ 800.00	$ 75.00	3,040.00	1,305.00	$ -	$ 181,075.00	$181,075.00
Canada Fibres - Fibre	$ 900.00	$ 35.00	3,040.00	1,305.00	$258,500.00	$ -	$258,500.00
Canada Fibres -Containers	$ 700.00	$ 90.00	3,040.00	1,305.00	$ -	$ 190,250.00	$190,250.00
London Future MRF	$ 900.00	$ 65.00	3,040.00	1,305.00	$349,700.00	$ 178,425.00	$528,125.00
HGC MRF-Brantford	$ 300.00	$ 100.00	3,040.00	1,305.00	$354,700.00	$ 161,700.00	$516,400.00
No. Trips = 169 Fibre & 104 Containers							

Using the Simcoe Site as the point of generation, the following transfer and gross processing costs have been estimated for Norfolk County blue box tonnages. Where there are two different processing rates for fibre and containers for a facility, the two processing rates were added together to establish a total transfer and processing fee for the destination.

For example, Niagara charges $25/tonne for processing 3040 tonnes of fibres and $75/tonne for processing 1305 tonnes of containers, representing a combined total of $174,000. The processing fee is added to the transfer costs to make ~170 trips of fibre material and 104 trips of container material, based on the current tonnages and trucking rates of $800/trip, generating a total annual transfer and processing cost in the range of approximately $463,000/year.

- Simcoe to City of Hamilton MRF =$430,075/annum
- Simcoe to Niagara MRF =$392,275/annum
- Simcoe to Canada Fibres =$448,750/annum
- Simcoe to London MRF =$528,125/annum
- Simcoe to HGC MRF =$516,400/annum

Average hauling and processing costs to transfer Norfolk tonnages from a Simcoe site to third party processors is approximately $463,000/annum.

Revenue is estimated at $60/tonne representing a revenue rebate of approximately $250,000/year for Norfolk residential blue box material for a **net cost of $200,000-$215,000/annum.**

For comparison purposes, operational costs can be referenced from the Woodstock MRF conversion. The Woodstock facility does not have a full year of operating costs as the transition was phased over 2008. The Woodstock operation reduced all sorting staff from the MRF and maintained 1 staff person to receive and load trailers. Materials are transferred to Canada Fibres at a transfer rate of ~$700/round trip. Processing fees are $35/tonne for fibre and $90/tonne for containers. Approximately 70% of material is fibre (2,100 tonnes) representing a processing fee of $73,500/year. Containers (900 tonnes) represent a processing fee of $81,000/year. Estimated revenue from material sales is approximately $180,000/year. Hauling (105 trips for fibre and 90 trips for containers) is averaged at $140,000/year. More details will become available at the end of 2009.

8.4 County of Haldimand Transfer and Third Party Processing Costs

Considering tonnages generated from the County of Haldimand, average costs were generated for transferring fibres and containers to the six processing locations from two points of generation. Simcoe site is the current point of central consolidation of the County of Haldimand's tonnages based on the existing collection contract. A second point of generation, the Canborough Site, (55km from Simcoe Site) has

been selected to represent a proximity to populations living in the eastern areas of the County.

Hauling costs were added to the six third party processing fees to establish an annual transfer cost to transport and process County of Haldimand residential blue box tonnages from either the Simcoe Site or the Canborough Site. Costs are reflected as Gross costs for comparison of other system costs within this Study.

For comparative purposes, the tonnages depicted to transfer material represent 2008 collected tonnages. It is important to note that the transfer costs are based on estimates to assist with decision making. Trucking costs were established using recent hauling rates (May 2009) and processing fees were established using May 2009 processing fee averages, based on the current composition of the two municipalities (Refer to Table 7.1 for Processing Fees). All processing facilities have indicated that direct negotiations will be required (RFP) to establish a processing contract rate.

Table 8.7 Haldimand Residential Hauling and Processing Costs

Third Party Processor Site	Average Hauling Rate (May 2009)	Average Processing Fee (May 2009)	Haldimand Fibre Tonnes	Haldimand Container Tonnes	Haldimand Fibre Costs	Haldimand Container Costs	Haldimand Processing Costs
City of Hamilton MRF	$ 700.00	$ 55.00	2,150.00	800.00	$ 193,150.00	$ 99,300.00	$ 292,450.00
Niagara MRF - Fibres	$ 800.00	$ 25.00	2,150.00	800.00	$ 139,350.00	$ -	$ 139,350.00
Niagara MRF-Containers	$ 800.00	$ 75.00	2,150.00	800.00	$ -	$ 123,200.00	$ 123,200.00
Canada Fibres - Fibre	$ 900.00	$ 35.00	2,150.00	800.00	$ 171,550.00	$ -	$ 171,550.00
Canada Fibres -Containers	$ 700.00	$ 90.00	2,150.00	800.00	$ -	$ 127,300.00	$ 127,300.00
London Future MRF	$ 900.00	$ 65.00	2,150.00	800.00	$ 236,050.00	$ 123,100.00	$ 359,150.00
HGC MRF	$ 300.00	$ 100.00	2,150.00	800.00	$ 247,100.00	$ 103,700.00	$ 350,800.00
City of Hamilton MRF	$ 550.00	$ 55.00	2,150.00	800.00	$ 177,100.00	$ 87,450.00	$ 264,550.00
Niagara MRF - Fibres	$ 550.00	$ 25.00	2,150.00	800.00	$ 112,600.00	$ -	$ 112,600.00
Niagara MRF - Containers	$ 550.00	$ 75.00	2,150.00	800.00	$ -	$ 103,450.00	$ 103,450.00
Canada Fibres Fibre Plant	$ 850.00	$ 35.00	2,150.00	800.00	$ 166,200.00	$ -	$ 166,200.00
Canada Fibres Container	$ 550.00	$ 90.00	2,150.00	800.00	$ -	$ 115,450.00	$ 115,450.00
London Future MRF	$ 950.00	$ 65.00	2,150.00	800.00	$ 241,400.00	$ 127,050.00	$ 368,450.00
HGC MRF	$ 300.00	$ 100.00	2,150.00	800.00	$ 247,100.00	$ 103,700.00	$ 350,800.00
No. Trips=107 Fibres &79 Containers							

Extrapolating the information in Table 8.7, with Simcoe and Canborough as the two points of generation, transfer and Gross processing costs have been estimated for the County of Haldimand residential collected blue box tonnages. Where there are two different processing rates for fibre and containers for a facility, the two processing rates were added together to establish a total transfer and processing fee for the destination.

For example, Niagara charges $25/tonne for processing approximately 2,150 tonnes of fibres and $75/tonne for processing approximately 800 tonnes of containers, representing a combined total in the range of $114,000. The processing fee is added to the transfer costs to make 105 trips of fibre material and 80 trips of container material, based on the current trucking rates of $800/trip,

generating a total annual transfer and processing cost of approximately $263,000/year.

- Simcoe to City of Hamilton MRF =$292,450/annum
- Simcoe to Niagara MRF =$262,550/annum
- Simcoe to Canada Fibres =$298,850/annum
- Simcoe to London MRF =$359,150/annum
- Simcoe to HGC MRF =$350,800/annum

Average hauling and processing costs to transfer Haldimand tonnages from a Simcoe site to third party processors is approximately $313,000 per year. Projected revenue at $60/tonne is $180,000 per year representing a net cost of $130,000 to $133,000 per year.

- Canborough to City of Hamilton MRF =$264,500/annum
- Canborough to Niagara MRF =$216,050/annum
- Canborough to Canada Fibres =$281,650/annum
- Canborough to London MRF =$368,450/annum
- Canborough to HGC MRF =$350,800/annum

Average hauling and processing costs to transfer Haldimand tonnages from a Canborough site to third party processors is approximately $296,000/annum. Using the same revenue of $180,000/year, the net cost is estimated of $110,000 to $116,000 per year.

Hauling costs are reduced by approximately $17,000/year when Haldimand transfers from the Canborough site providing Haldimand invests in the capital infrastructure to establish a transfer station in Canborough.

8.5 Combined Blue Box Tonnages Transfer and Third Party Processing Costs

Considering tonnages generated from the two Counties, average costs were generated for transferring fibres and containers to the five processing locations. Hauling costs were added to the third party processing fees to establish an annual transfer cost to transport and process the combined residential blue box tonnages. Costs are reflected as gross costs for comparison of other system costs within this Study.

Table 8.8 Combined Residential Hauling and Processing Costs

County Site	Third Party Processor Site	Average Hauling Rate (May 2009)	Average Processing Fee (May 2009)	Combined Fibre Tonnes	Combined Container Tonnes	Fibre Costs	Container Costs	Combined Total Costs
Simcoe	City of Hamilton MRF	$ 700.00	$ 55.00	5,000.00	2,000.00	$ 450,000.00	$ 239,500.00	$ 689,500.00
Simcoe	Niagara MRF - Fibres	$ 800.00	$ 25.00	5,000.00	2,000.00	$ 325,000.00	$ -	$ 325,000.00
Simcoe	Niagara MRF-Containers	$ 800.00	$ 75.00	5,000.00	2,000.00	$ -	$ 298,000.00	$ 298,000.00
Simcoe	Canada Fibres - Fibre	$ 900.00	$ 35.00	5,000.00	2,000.00	$ 400,000.00	$ -	$ 400,000.00
Simcoe	Canada Fibres -Containers	$ 700.00	$ 90.00	5,000.00	2,000.00	$ -	$ 309,500.00	$ 309,500.00
Simcoe	London Future MRF	$ 900.00	$ 65.00	5,000.00	2,000.00	$ 550,000.00	$ 296,500.00	$ 846,500.00
Simcoe	HGC MRF	$ 300.00	$ 100.00	5,000.00	2,000.00	$ 500,000.00	$ 255,500.00	$ 755,500.00

Using Simcoe as the point of generation, the following transfer and gross processing costs, have been estimated for the combined blue box tonnages from the two Counties:

- Simcoe to City of Hamilton MRF =$689,500/annum
- Simcoe to Niagara MRF =$623,000/annum
- Simcoe to Canada Fibres =$709,500/annum
- Simcoe to London MRF =$846,500/annum
- Simcoe to HGC MRF =$755,000/annum

Average gross hauling and processing costs to transfer combined tonnages from a Simcoe site to third party processors is approximately $725,000/annum with one transfer site.

- Haldimand Share (43%) =$311,750/annum
- Norfolk Share (57%) =$413,250/annum

Net hauling costs are estimated based on revenue rebate of approximately $437,220 ($188,005 for Haldimand and $249,215 for Norfolk).

Net hauling and processing costs for the combined tonnages transferred from a Simcoe site to a third party processor are estimated to be:

- ***Haldimand Share(43%)*** ***= $120,000 to $125,000/annum***
- ***Norfolk Share (57%)*** ***=$160,000 to $165,000/annum***

8.4 Site Operational Costs

Operations at each of the transfer stations require additional labour costs based on the system design of using a loader and stationary compactor. The two existing transfer stations have a weigh scale operator allowing for the costs of the operator to potentially be shared between the municipal recycling and waste budgets.

The Simcoe MRF site would no longer operate as a MRF but would continue to have the ability to receive material from public and the commercial sector. It is

anticipated that the Simcoe MRF site would require a weigh scale operator/front administration person to weigh material and to attend to the public (blue box sales, drop off, etc.). As an option, the old baler could remain on-site and be used for baling commercial corrugated cardboard or office paper when market revenues are favourable (an additional forklift will be required).

Further, a loader operator is necessary to load material into the compactor and to assist with spotting inbound loads. It can be anticipated that the Simcoe MRF site would have one full time equipment operator to manage the baler, loader/compactor and forklift. Additionally, a part-time scale operator would be needed to manage public inquiries and the scales.

The Simcoe and Canborough transfer station can use the current weigh scale operator but will need a part-time loader operator at either site to load the compactor and to spot trucks (based on individual tonnages).

Table 8.9 depicts annual site operating costs of the three transfer stations.

Table 8.9 Estimated Site Operations for the Transfer Locations

Item	Simcoe MRF-Combined Tonnages	Simcoe TS-Combined Tonnages	Simcoe TS-Norfolk Tonnages	Canborough TS-Haldimand Tonnages
Equipment Operator/ Spotter	$50,000	$50,000	$25,000	$25,000
Scale Operator	$25,000			
Fuel, Utilities, Baling Wire	$30,000	$ 15,000	$10,000	$ 10,000
Total Costs	$105,000/annum	$65,000/annum	$35,000/annum	$35,000/annum

Similar to MRF processing costs, it can be anticipated that operating costs would experience an annual 3% cost of living increase.

9.0 Transtor (V-Quip) Transfer Station Costs

Transtor systems are designed to be self contained operating units that do not require additional operational infrastructure such as truck spotters or loader operators. Instead of material being tipping onto a tipping floor or loaded into a stationary compactor, this system is designed for material to be directly tipped into a semi-automated container. The container is equipped with a lid that retracts when the truck driver pushes a button on the side mounting of the container. When

the container is full, another button can be manually operated to hydraulically lift and tip the container directly inside an on-site compacting trailer. The collection container is designed for maximum loading of the compacting trailer and minimal windblown litter.

To determine frequency of trips for two stream material collected in a Transtor System, the following assumptions were made;

- Using a 53 ft compacting trailer,
- Allowing for useable trailer volume of 75m3 for fibres and container material
- Allowing for full compaction for of fibre materials for minimum load of 21 tonnes per trailer (reflecting corrugated cardboard composition and dispersion of material using the Transtor hopper and transferring in a on-site adjustable `Auto-Pak' compaction trailer),
- Allowing for moderate compaction of containers using 14 tonnes per load (reflecting glass composition and dispersion of material using the Transtor hopper and on-site adjustable compaction trailer `Auto-Pak');and,
- Transferring fibres separate from container material.

For comparison purposes, recent trailer weights generated from the City of Dryden (May 2009), resulted in single stream blue box material (no glass) reaching weights of 23-24 tonnes per trailer load. Currently, blue box material from the City is transferred to a MRF in Manitoba where provincial road restrictions requested trailer weights do not exceed 18 tonnes per load. As a result, average trailer loads of single stream blue box material generated at the City site do not exceed 18 tonnes per load.

Photo 17 depicts the central collection container at the City of Dryden Transfer Station in the closed position. The container does not require protective covering (building) and has functioned properly during the winter months in northern Ontario.

Photo 17 City of Dryden Transfer Station Depicting Outside Transtor Unit

Photo 18 depicts the central collection Transtor Unit at the City Transfer Station in the open position. The curbside collection driver activates the hydraulic lid by

pushing a button adjacent to the container. Once the truck has tipped the material, the driver is responsible for closing the lid.

Photo 18 City of Dryden Transfer Station-Open Transtor Unit

Photo 19 depicts the side view of the Transtor unit and supporting power pack system to maintain hydraulics of the dumping mechanism. Specific to the City of Dryden, (500 tonnes/year) the Transtor unit was tipped into the compacting trailer approximately once per day.

Photo 19 City of Dryden Transtor Unit

Photo 20 depicts the tipping of the central collection container into the compacting trailer.

Photo 20 City of Dryden Transtor Tipping into Trailer

Photo 21 depicts the proposed on-site compacting trailer equipped with hydraulic lid.

Photo 21 City of Dryden Transtor Tipping into Trailer

Capital Costs - Simcoe MRF Site-Combined Blue Box Tonnages (V-Quip)

Site investigation by representatives from V-quip determined that the Simcoe MRF property was not a suitable site for the Transtor system due associated costs to remove existing structures and generate suitable grade separation. As a result, capital costs were established based on combined tonnages from County of Haldimand and Norfolk County for a Transtor system at the existing Simcoe Transfer Site instead of the Simcoe MRF.

All capital costs for the Transtore system include the anticipated site development costs, including engineering, bin walls, concrete footings, grading, ramps, lighting, and safety barriers. In addition to detailed site preparation costs, it is suggested that the capital costs incorporate municipal ownership of the compaction trailer and back-up trailer (switch trailer) to maintain efficient site operations. The trailer costs

include 4 axle compaction trailer (53' with Engine), upgraded tires, hydraulic lid lock system, battery operated remote control with trailer mounted receiver, trailer mounted oil tank and oil heater, hydraulic pumps and trailer air compressor and a trailer `Auto-pack' program to adjust compaction rate to various commodities.

The number of Transtors was based on current blue box tonnage generation and composition with flexibility to accommodate additional tonnages in the future (15 years).

Capital Costs - Simcoe Transfer Site-Combined Blue Box Tonnages

The projected capital costs for combined blue box tonnages at the Simcoe Transfer Site represent 4 Transtor units and 3 compaction trailers at the Simcoe Transfer Station. Cost estimates are depicted in Table 9.1

Table 9.1 Simcoe Transfer Site-Managing Combined Tonnages

Item	Units	Unit Cost	Total Cost
53 Cubic Yard Transtor unit	4	~$113,000	$452,000
1,000 Cubic Yard Compaction trailer	3	~$188,000	$564,000
Bin walls, concrete, ramps, hydro, installation, delivery.			~$644,000
Total			**~$ 1,660,000**

If the municipality contracts out the compaction trailers and does not include them as part of the capital infrastructure, the system costs are anticipated to be $1,097,000.

- Haldimand Share (43%) =~$715,000/annum
- Norfolk Share (57%) =~$945,000/annum

Capital Costs - Simcoe Site- Norfolk Tonnage Only

The projected capital costs at the Simcoe Transfer Station to manage only Norfolk County blue box tonnages include the costs of 4 Transtor units and 2 compaction trailers.

Table 9.2 depicts estimated capital costs at the Simcoe Transfer Station for Norfolk County blue box tonnages.

Table 9.2 Simcoe Transfer Site-Managing Simcoe Tonnages

Item	Units	Unit Cost	Total Cost
53 Cubic Yard Transtor unit	4	~$113,000	$452,000
1,000 Cubic Yard Compaction trailer	2	~$188,000	$377,000
Bin walls, concrete, ramps, hydro, installation, delivery.			$644,000
Total			**~$ 1,473,000**

If the County chooses not to incorporate ownership of the trailers at this site, the capital costs is estimated to be $1,097,000.

Capital Costs – Canborough Site- Haldimand Tonnage Only

The projected capital costs to establish a blue box transfer at the existing Canborough Waste Transfer Station to manage only the County of Haldimand blue box tonnages include the costs of 3 Transtor units and 2 compaction trailers.

Table 9.3 depicts estimated capital costs at the Canborough Transfer Station for County of Haldimand blue box tonnages.

9.3 Canborough Transfer Site-Managing Haldimand Tonnages

Item	Units	Unit Cost	Total Cost
53 Cubic Yard Transtor unit	3	~$113,000	$339,000
1,000 Cubic Yard Compaction trailer	2	~$188,000	$377,000
Bin walls, concrete, ramps, hydro, installation, delivery.			$595,300
Total			**~$ 1,311,000**

If Haldimand County chooses not to incorporate ownership of the trailers at this site, the capital costs is estimated to be $935,000.

9.1 Norfolk County Transfer and Third Party Processing Cost

Using projected trailer weights of 21 tonnes for fibres and 14 tonnes for containers, estimated trip frequencies were generated. Tipping fees that were applied in Section 8 were used for these calculations. Detailed hauling/operating calculations were prepared by V-Quip with supporting tables submitted to staff for review.

Using Simcoe as the point of generation and V-quip transfer/operating costs (averaged ~$78,000) plus gross tipping fees, the following estimates have been generated for Norfolk blue box tonnages. Net processing costs are summarized in Table 10.1;

- Simcoe to City of Hamilton MRF =$300,000/annum
- Simcoe to Niagara MRF =$250,000/annum
- Simcoe to Canada Fibres =$290,000/annum
- Simcoe to London MRF =$360,000/annum
- Simcoe to HGC MRF =$400,000/annum

Average annual hauling and processing fees are estimated at $320,000 and annual revenue is projected at ~$260,000 per year representing an estimated annual net operating cost of approximately $60,000 (~$13 to ~$15/tonne).

9.2 County of Haldimand Transfer and Third Party Processing Cost

Using Canborough as the point of generation, and V-Quip transfer/operating costs (~averaged at $61,000) plus gross tipping fees, the following estimates have been generated for County of Haldimand blue box tonnages;

- Canborough to City of Hamilton MRF =$223,000/annum
- Canborough to Niagara MRF =$240,000/annum
- Canborough to Canada Fibres =$174,000/annum
- Canborough to London MRF =$250,000/annum
- Canborough to HGC MRF =$355,000/annum

Average annual hauling and processing fees are estimated at $250,000 and annual revenue is projected at ~$180,000 per year representing an estimated annual net operating cost of approximately $50,000 to $70,000 per year (~$17 to ~$23/tonne depending on choice of third party destination).

9.3 Combined Blue Box Tonnage Transfer and Operating Costs

Using Simcoe as the point of generation, transfer and gross processing costs, have been estimated for the combined blue box tonnages. Net processing costs are summarized in Table 10.1;

- Simcoe to City of Hamilton MRF =$520,000/annum
- Simcoe to Niagara MRF =$450,000/annum
- Simcoe to Canada Fibres =$525,000/annum
- Simcoe to London MRF =$600,000/annum
- Simcoe to HGC MRF =$500,000/annum

Average annual hauling and processing fees are estimated at $525,000 and annual revenue is projected at ~$450,000 per year representing an estimated annual net operating cost of approximately $ 65,000 to $75,000 (~$10 /tonne).

10.0 Overall System Cost Summary

This Study examined estimated capital and operational costs of;

- Option 1 – MRF Upgrades
- Option 2-Transfer

Capital costs are not annualized into the operating costs to reflect funding opportunities (CIF) for capital investments. Capital costs are reflected as one-time investments for comparison purposes.

Table 10.1 depicts a summary of the total system costs of each processing and transfer option.

The averaged payback period for all systems was calculated by referencing the projected operational costs of the status quo system for each County (**Section 6.1 Status Quo Tables 6.1 and 6.2).** Using the averaged operating cost of $90/tonne for Haldimand and $75/tonne for Norfolk as baseline operating costs of the multi-stream MRF operations, Table 10.1 summarizes anticipated averaged payback periods of the various processing options that were reviewed in this Study. The table reflects rounded tonnage data for budget purposes to assist with overall system comparisons. Detail costs can be further determined based on formal tendering processes.

10.1 System Summary Table

	Haldimand 2942 Tonnes				Norfolk 4345 Tonnes			
System	**Est. One-Time Captial Investment ($)**	**Est. Annual Net Operating Cost ($/Tonnes)**	**Est. Annual Net Operating Cost**	**Approx. Pay Back Period (Years)**	**Est. One-Time Capital Investment ($)**	**Est. Annual Net Operating Cost ($/Tonnes)**	**Est. Annual Net Operating Cost**	**Approx. Pay Back Period (Years)**
Status Quo-Baseline (Annually Averaged)		**$ 90.00**	**$ 264,780.00**			**$ 75.00**	**$ 325,875.00**	
Option1								
Partial MRF Upgrade	$ 399,990.00	$ 76.00	$ 225,000.00	10.06	$ 530,100.00	$ 60.00	$ 260,700.00	8.13
Full MRF Upgrade	$ 574,480.00	$ 73.00	$ 215,000.00	11.54	$ 761,520.00	$ 55.00	$ 235,000.00	8.38
Option 2-Traditional Transfer Station								
MRF Conversion to Transfer Station (Shared)	$ 195,650.00	$ 44.00	$ 130,000.00	1.45	$ 259,350.00	$ 57.00	$ 250,000.00	3.42
MRF Conversion to Transfer Station (Norfolk Only)					$ 455,000.00	$ 100.00	$ 434,500.00	
Simcoe Transfer Station (Shared)	$ 419,000.00	$ 58.00	$ 171,000.00	4.47	$ 555,750.00	$ 48.00	$ 209,000.00	4.76
Simcoe Transfer Station (Norfolk Only)					$ 700,000.00	$ 52.00	$ 226,000.00	7.01
Canborough Transfer Station (Haldimand Only)	$ 700,000.00	$ 33.00	$ 97,000.00	4.17			$ -	
Option 2-Vquip Transfer Station							$ -	
Simcoe Transfer Station (Shared)	$ 715,000.00	$ 13.00	$ 56,000.00	3.42	$ 945,000.00	$ 8.00	$ 34,760.00	3.25
Simcoe Transfer Station (Norfolk Only)					$ 1,473,000.00	$ 10.00	$ 43,450.00	5.22
Canborough Transfer Station (Haldimand Only)	$ 1,311,000.00	$ 17.00	$ 50,000.00	6.10			$ -	

10.0 Summary of Findings

The multi-stream operation at the Simcoe MRF has provided a good level of service for both Counties since 1994. Average processing costs have been reasonably offset by material sales. To date, all of the essential components of processing equipment that was purchased in 1994 require either upgrades or full replacement.

The efficiency related challenges caused by aging equipment and increased replacement costs will impact the overall cost per tonne to process the Counties blue box tonnages over the long-term. Further, the facility is at capacity with the current inbound tonnages and cannot process additional tonnages with the present configuration without significant renovation and upgrading.

The MRF requires immediate (2009) capital expenditures to maintain current operations. The processing contract has been extended until October 2, 2010. If the Counties choose to continue processing operations at the MRF, a decision to upgrade the MRF to two stream operation should occur soon to allow sufficient time for preparing RFP's and installations of replacement equipment (minimum 6-8 months for equipment installation). If the decision is to maintain status quo of the MRF operations, an RFP for the baler is required immediately.

When reviewing potential costs of the Status Quo system over time, costs will fluctuate based on equipment replacement timeframes. To average the net costs, it is anticipated that Haldimand's share will average $90/tonne and Norfolk's share will average $75/tonne to manage a six stream processing operation at the Simcoe MRF. The curbside collection program would need to support the multi-stream processing operation thereby limiting the flexibility for potential curbside collection efficiencies.

The average net processing costs for a Partial MRF Upgrade for Haldimand average $76/tonne and for Norfolk it averages $60/tonne. The average net operating cost for a Full MRF Upgrade for Haldimand is approximately $73/tonne and $55/tonne for Norfolk. Both systems maintain operations of the jointly owned Simcoe MRF with combined tonnages being managed from both Counties.

Comparatively, when examining the varying options to transfer Haldimand and Norfolk tonnages, average operating costs are considerably less than the proposed MRF systems.

Converting the existing MRF to a Traditional Transfer Station represents the lowest capital cost investment for the two Counties. The one-time capital conversion of the MRF can be conducted within a three month time frame and will not require any major construction of a new facility. The average net operating costs between the two Counties reflect Haldimand at approximately $44/tonne and Norfolk at

approximately $57/tonne. Commercial sector private haulers are familiar with the Simcoe MRF site and use of the site to purchase blue boxes or to drop off recyclable material will remain constant.

The installation of a V-Quip Transtor system at the Simcoe Transfer Site, to manage the tonnages from Haldimand and Norfolk represents a one-time capital investment of $ 1,660,000. This cost can be shared between the two Counties with Haldimand's portion being $715,000 and Norfolk's portion being $945,000. Splitting the capital costs between the two Counties reduces the burden of the overall investment. Further, the operational payback represents 3 years based on the low annual net operating costs to transfer material (~$10- $14/tonne). It is also important to consider that the current Simcoe Transfer Station is undergoing a redesign of the entire site.

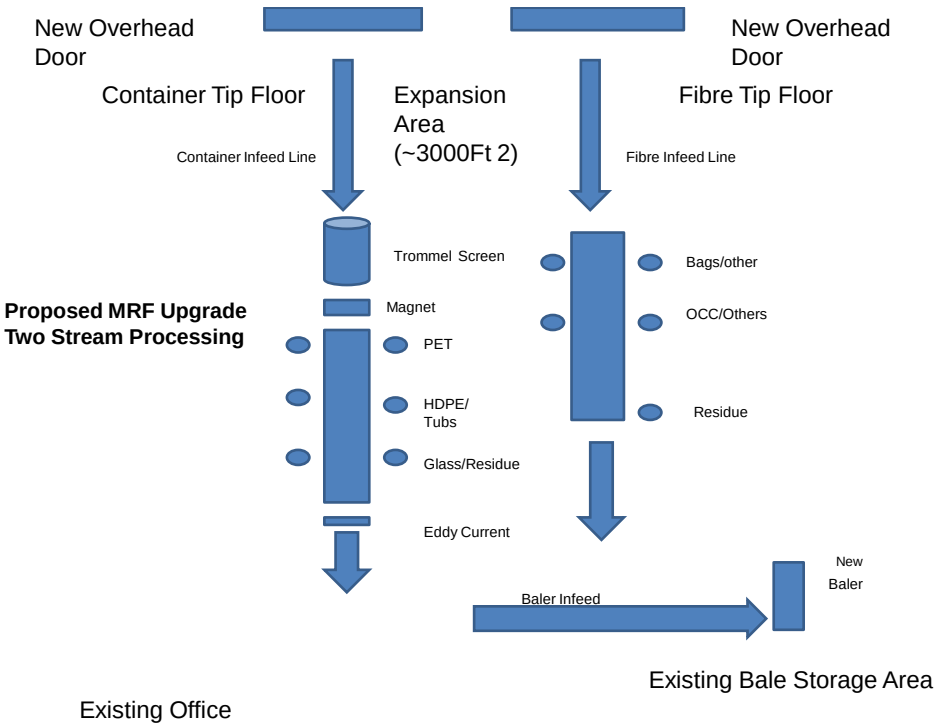
With the potential funding from CIF, capital burden of an equipment investment can be further reduced. The CIF fund started with $13M for 2008 and continues through 2009 with a budget of approximately $25M. CIF aims to direct 70% of this money to projects that promote efficiency and the remainder to those that promote effectiveness.

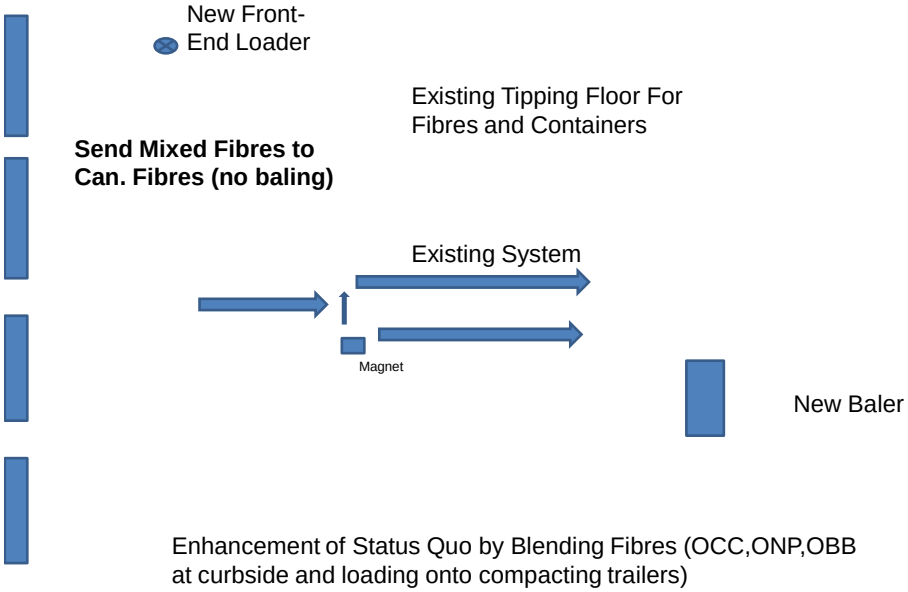
Appendix 1
Population and Tonnage Generation Data Table

Table 4.1 Population and Blue Box Tonnage Projections for Norfolk and Haldimand Counties (2008-2018)

10 Year Projection	Norfolk County Population Growth Rate (SWMMP 08)	Norfolk County Population	Haldimand County Population Growth Rate (MP 07)	Haldimand County Population	Waste Generation Norfolk County (0.292 tonnes/ capita/ year)	Waste Generation Haldimand (0.276 tonnes/ capita/ year)	Haldimand County Residential Blue Box Diversion Rate	Haldimand County Residential Blue Box Tonnage	Norfolk County Residential Blue Box Diversion Rate	Norfolk Residential Blue Box Tonnage	Combined Blue Box Tonnages	Residual Rate @ 6%	Blue Box Materials Marketed	IC&I Materials (13% of Gross Blue Box Tonnage)	Total Blue Box Materials Requiring Processing
	%		%		tonnes	tonnes	%	tonnes	%	tonnes	tonnes	tonnes	tonnes	tonnes	tonnes
2008	1.44	62,563	0.80	45,212.00	18,272.00	12,496.00	23.54	2,942	24	4,345	7,287	437	6,850	947	8,234
2009	1.44	63,464	0.80	45,573.70	18,531.46	12,578.34	24.00	3,019	24	4,448	7,466	448	7,018	971	8,437
2010	1.44	64,378	0.80	45,938.29	18,798.31	12,678.97	24.00	3,043	24	4,512	7,555	453	7,101	982	8,537
2011	1.44	65,305	0.80	46,305.79	19,069.01	12,780.40	24.00	3,067	24	4,577	7,644	459	7,185	994	8,638
2012	1.44	66,245	0.80	46,676.24	19,343.60	12,882.64	24.00	3,092	24	4,642	7,734	464	7,270	1005	8,740
2013	1.44	67,199	0.80	47,049.65	19,622.15	12,985.70	24.00	3,117	24	4,709	7,826	470	7,356	1017	8,843
2014	1.44	68,167	0.80	47,426.05	19,904.71	13,089.59	24.00	3,142	24	4,777	7,919	475	7,444	1029	8,948
2015	1.44	69,148	0.80	47,805.45	20,191.34	13,194.31	24.00	3,167	24	4,846	8,013	481	7,532	1042	9,054
2016	1.44	70,144	0.80	48,187.90	20,482.09	13,299.86	24.00	3,192	24	4,916	8,108	486	7,621	1054	9,162
2017	1.44	71,154	0.80	48,573.40	20,777.04	13,406.26	24.00	3,218	24	4,986	8,204	492	7,712	1067	9,271
2018	**1.44**	**72,179**	**0.80**	**48,961.99**	**21,076.22**	**13,513.51**	**24.00**	**3,243**	24	**5,058**	**8,302**	**498**	**7,718**	**1079**	**9,381**

Appendix 2
Conceptual MRF Drawings


New Overhead Door
New Overhead Door
Container Tip Floor
Expansion Area (~3000Ft 2)
Fibre Tip Floor
Container Infeed Line
Fibre Infeed Line
Trommel Screen
Bags/other
Proposed MRF Upgrade
Two Stream Processing
Magnet
OCC/Others
PET
HDPE/ Tubs
Residue
Glass/Residue
Eddy Current
New Baler
Baler Infeed
Existing Bale Storage Area
Existing Office



Enhancement of Status Quo by Blending Fibres (OCC,ONP,OBB at curbside and loading onto compacting trailers)