Town of Mississippi Mills

Solid Waste Management Strategy

Final Report

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1 Introduction and Study Purpose

On January 1, 1998, the Town of Mississippi Mills was created when the Town of Almonte and the Townships of Ramsay and Pakenham merged. The community is located roughly 40km west of Ottawa and encompasses 523 sq km within Lanark County. It has a population of 12,143 and in 2011 was comprised of 5,417 rural and small town dwellings[1].

The Town is developing a Municipal Solid Waste Management Plan to guide its waste management services for the next 20 years. The Town is facing pressures on a couple of fronts, with the most pressing issue being the closure of Carp Landfill in May 2011. The Town owns and operates an active landfill and transfer station at the Howie Road site, but capacity is limited and lacks proper equipment to adequately deal with the waste generated by the Town. In addition, the Town currently benefited from a relatively low cost per tonne disposal rate at the Carp Landfill and should expect cost increases with new disposal and diversion options. Since the closure of the Carp landfill, the Town has been exporting its curbside garbage to Lafleche Environmental's landfill facility in Moose Creek, while waste dropped off at the Howie Road Landfill site is collected for disposal by Glenview Iron and Metal.

Furthermore, the current operations of the Howie Road landfill site need to be addressed. A comprehensive review of the Town's existing system in light of these pressures will help to plan a recommended direction for the sustainable short and long term management of the Town's solid waste.

2 Planning and Consultation Process Overview

This report provides background information on the Town's existing solid waste management system, documents the process followed and describes the results of the gap analysis. Section 1 introduces the project, while Section 2 outlines the project's planning process. Section 3 describes the local waste management pressures and goals for the long term management of the Town's waste. Section 4 describes the Town's current waste management system and presents an analysis of the Town's potential for waste diversion. Public consultation has been injected throughout the process consisting of targeted interviews with stakeholders during phases 1 and 2 and a public meeting that was held at the beginning of phase 4 (see figure 1). Section 5 presents a number of waste diversion and disposal options.

[1] Town of Mississippi Mills.

Figure 1: Project Process

Public Consultation Process

Prior to the state of this planning process, the Town of Mississippi Mills conducted an online survey with residents to assess their recycling practices, attitudes, and barriers to recycling. The results of this survey were considered in the development of this Solid Waste Management Strategy.

Interviews were also conducted with municipal councillors as well as key members of Mississippi Mills' municipal waste partners to identify key issues and opportunities for waste management in the Town. The project team also discussed the Town's waste management options with the local Ministry of the Environment office. A comprehensive list of input from the interviews and public commentary will be submitted in a separate report to the Director of Public Works.

Issues that were identified in the survey and in the interviews included:

- Finding a suitable disposal solution for the Town;
- More material needs to be diverted from disposal;
- The amount of material that are accepted in the Town's diversion program (i.e., should be more materials accepted, such as mixed plastic in curbside blue box or household organics);
- The challenges of working with other municipalities;
- Cost of diversion programs and availability of funds;
- Ever-changing waste management technologies;
- Motivation of public to participate in diversion programs;
- Public awareness of diversion programs and how to participate (e.g., what can or cannot be recycled); and

- Lack of staff available to operate the waste management system.

Opportunities for overcoming these barriers noted in the survey and in the interviews included:

- Improving the Town's waste diversion programs and targeting more materials;
- Raising awareness, understanding and motivation for the Town's waste diversion programs; and
- Working cooperatively with other municipalities to find cost effective waste diversion and disposal solutions.

An interview was also held with Project Manager for the City of Ottawa's Environmental Program. The City of Ottawa is preparing its own Solid Waste Management Plan. As part of its process, the City is conducting a high level study to identify potential opportunities to regionalize waste management initiatives, which could result in savings for the area municipalities including Mississippi Mills by increasing economies of scale. The City is currently contacting area municipalities to identify their programs, contracting timelines, and what infrastructure the municipalities have. The City hopes to meet with the surrounding municipalities by the summer of 2012 to discuss the results of their investigation and potential regionalization opportunities for waste management..

On December 13, 2011, an open house was held at the old Town Hall in Almonte. The open house was advertised in the Town's newsletter, Canadian Gazette (local newspaper), Town's website, and through the Town's social networking activities. The open house materials were also made available on the Town's website.

The purpose of the open house was to:

- Update residents on the status of the project;
- Provide an overview of the Town's current waste management system;
- Review and obtain feedback on the various waste diversion and disposal options being considered; and
- Review and obtain feedback on the criteria against which the options would be evaluated.

About 11 people attended the open house. The local media also attended and reported on the public open house. Feedback received at the open house and submitted afterwards included:

- Support for measures such as backyard composting, grasscycling, improved recycling services, increased promotion and education, a zero waste policy at municipal buildings and events, bi-weekly garage collection in conjunction with other diversion programs (e.g., organic collection).
- Mixed feedback on measures such as mandating the use of clear garbage bags.
- Suggestions included:
  - Providing recycling depots in more central locations to improve their accessibility to residents;
  - Adding recyclable plastics to curbside collection;

- Improving access to information, including not just the Town's programs but also retail take-back opportunities;
- Provide incentives for waste diversion;
- Make recycling easy and more convenient;
- Increase frequency of large item day collections;
- Distribute fewer free bag tags;
- Provide more convenient opportunities to safely get rid of household special wastes and other materials.

3 Goals and Objectives

There are several factors driving the management of how the Town's waste will be managed, including:

- Carp landfill reached operational capacity and is now closed. The current ownership (Waste Management Inc.) is in the process of developing a new landfill adjacent to the existing one and in the interim will be opening a transfer station at the existing site, Due to the closure, the Town has stopped shipping its waste as of May 2011 to the Carp landfill and needs to consider other alternative disposal options.
- The Province of Ontario has set a goal for municipalities to divert 60% of their residential waste from disposal. The Town is currently diverting 27% of its waste from disposal and is willing to reach the provincial goal.
- The Howie Road Landfill has a Provincial Certificate of Approval which allows the facility to operate as a landfill site in addition to its current operation as a transfer site. However, the site does not currently have all of the required landfill equipment (compactor/loader) or staff. In order for the landfill to be reopened, the appropriate equipment and staff would have to be put in place by either the Town or by a contractor, which would require time to implement.

Based on these driving factors, the following goals have been suggested for the long term management of the Town's waste:

- Maximize waste diversion;
- Meet the Provincial target of 60% diversion of waste from disposal;
- Find effective waste management solutions that balance the Town's fiscal, social and environmental responsibilities.

4 Current Solid Waste Trends and Practices

4.1 Overview

In 2010, the Town of Mississippi Mills generated approximately 4,607 tonnes of residential solid waste. Of this, 1,225 tonnes, or 27 percent, was diverted through the Town's various waste diversion programs, while 3,382 tonnes were disposed. The Town's disposal and diversion programs are described below.

4.2 Waste Disposal Operations

4.2.1 Carp Landfill Site

Since 2002, the Carp landfill site, owned and operated by Waste Management Inc and located at 2301 Carp Road, Carp, Ontario, had been accepting the Town's municipal waste for a tipping fee of $61.59 per tonne. The site reached capacity in May 2011. At this time, Waste Management Inc is seeking to develop a new landfill immediately adjacent to the existing Carp landfill site. In February 2012, the Carp Landfill obtained approval to operate a transfer station which can accept 400 tonnes/day.

Since the closure of Carp landfill, the Town of Mississippi Mills has been exporting curbside collected waste to Lafleche Environmental's landfill facility in Moose Creek, Ontario, for a fee (including transport) of $89 per tonne. It is understood that Lafleche is currently applying to expand the Moose Creek facility to increase its disposal capacity to 2,500 tonnes/day. The waste collected at the Howie Road site is transferred by Glenview Iron and Metal, which also has a transfer facility in Smith Falls, ON. They collect the waste from the Howie Road site for $135 per lift (using either 20 or 30 yard bins) and charge a tipping fee of $103.10 per tonne. The wastes are exported to a landfill site in New York State.

4.2.2 Howie Road Landfill Site

Since 1971, the Town has owned and operated the Howie Road Landfill site and is licensed to accept municipal waste from the Town of Mississippi Mills, West Carleton Township, and the Town of Carleton Place[2]. It is located at 1470 Howie Road. Although the Carp landfill has been accepting waste from the study area since 2002, the Howie Road landfill site has been accepting small amounts of "Owner" generated waste and accommodates excess waste during abnormally high volume periods, such as holidays. On average, the site accepts roughly 100 tonnes of waste per year.

A survey by Trow Associates Inc. in 2008 estimated that there is approximately 97,150 to 97,857 cubic meters of capacity left at the landfill. Allocating 25% of the remaining capacity for cover material, the estimated current capacity for waste disposal is approximately 46,000 tonnes. At current waste disposal rates, this site has an estimated lifespan of 8 to 10 years. The Town has also investigated the option of mining the existing waste to provide additional landfill capacity, although the landfill's high water table and the cost associated with landfill mining create significant barriers.

2

Residents and businesses from Mississippi Mills, West Carleton, and Carleton Place can drop off waste for disposal at the Howie Road landfill site for a fee. The following are the 2011 user fees:

Mississippi Mills Residents

- $110 per tonne
- $50 minimum charge for truck or trailer up to 500kg
- $15 minimum charge for cars

Commercial and non-Mississippi Mills residents

- $130 per tonne
- $55 minimum charge for truck or trailer up to 500kg
- $20 minimum charge for cars

The following is a chronology of the Howie Road landfill site history:

1972

- The Ministry of Environment (MOE) issues a Certificate of Approval (CofA) for the operation of the Howie Road landfill site, No. 461001. The C of A does not specify the allowed capacity for the site but discusses the formation of cells and the basic operations. The landfill was under an agreement with the Township of Huntley at the time and followed their zoning by-laws.

1980 (April)

- A provisional certificate of approval for a waste disposal site is provided. The area of the landfill at this time is approved at 4.8 hectare for landfilling and the current site boundary is 10 hectares. The waste at the time is specified as being domestic and commercial waste, 5% solid agricultural waste, construction debris. This is the first time that this appears in the CofA and it is unknown if this was determined with the Township of Huntley or the MOE.

1983

- The first topographic mapping of the site was conducted to provide a base for changes in topography and waste rates moving forward.

1984 (March)

- Oliver, Mangione, McCalla & Associates Limited (OMM) provides a letter to the MOE on behalf of the Town explaining that they have been hired by the Town to advise on the operation of the landfill and investigate the possible expansion of the landfill. It again talks about the uncertainty of the original CofA and the lack of numbers pertaining to allowed capacities.

1985

- According to the waste disposal history, it appears that the waste disposal access to the site was unsupervised until this time. The Town begins to start keeping track of the waste received by documenting the type of waste received from each truck entering the site.

1986

- The Town purchases 10 hectares of land to the east of the landfill.

1988

- An engineered drainage ditch is constructed to re-directed water around the landfill.

1990

- The Town purchases additional lands to the north and west of the site and now has a total of 36.5 hectares.

1993

- Council votes to end the search for a new landfill and increases usage of the Howie Road landfill site.

1995

- The Town installs a weigh scale in 1995. From 1984 to 1994, the estimated increase in volume was determined to be 81,284 m^3 from topographic information change between that time period based on average waste of 2475 tonnes per year received (0.56 tonnes/capita/year). Compaction density is estimated to be 0.35 tonnes/m^3 for waste disposed between 1984 to 1994. Volume change/year is 7100 m^3. Population using landfill is reportedly equivalent to the population of the Town of Almonte at the time.

1996

- OMM prepares an Operation and Design report for the Howie Road landfill site. New information includes:

- Remaining available volume at landfill is 149,000 m^3.
- Cover material is estimated to be about 10% of the landfilled material.
- Historical waste generation estimated to be 0.56 tonnes/year/capita based on volume change from 84 to 94, and is close to rates predicted from Lanark County WMMP
- It is proposed that the landfill expand to Stage 2 and Stage 3. The total remaining capacity of the landfill was determined to have been 400,000 m^3 if expansion is provided. They refer to a lifespan of 40 years if expansion is provided. It is stated that re-zoning would be required as well as a full EA. A specific request is not presented to move forward with the expansion. A more detailed review would have to be conducted to assess the expansion and changes to Stage 2 and 3 landfill capacity based on potential zoning changes since 1996 that would impact the capacity and feasibility of expansion.
- There are zoning concerns regarding potential expansion (i.e. can they extend to 30 m buffer zones as per Town of Huntley by-laws or 75 m as per West Carleton by-laws)
- The in-place compacted density is assumed to be 0.45 tonnes/m^3.

1998

- Letter provided to town estimating that the available remaining volume at the landfill is determined to be 124,500 m^3.

2000

- Trow prepares an updated Operation and Design report due to the amalgamation of Town of Almonte, Ramsay and Pakenham which all utilize the site now. Some commercial waste disposed also comes from Carleton Place.
- It is determined that the current amount of waste landfilled at the site is 167,000 m3 (92,300 above and 74,700 underground).
- The change in volume between June 1998 to September 2000 is 18,241 m3 whereas the total waste delivered to the site was recorded to be 8000 tonnes. The waste to cover ratio is determined to be 2.5/1. The density in place from the 1998 to 2000 waste number is 0.61 tonnes/m^3.
- The remaining capacity is determined to be 40,570 m^3. This appears to be an error.
- The Town continues to discuss the Stage 2 and Stage 3 expansion towards Howie Road. However, the capacity from stage 2 is 51,300 m^3 and for Stage 3 is 49,400 m^3. This may be an error.

Sept 19, 2001

- MOE submits letter to the Town stating that discussion regarding expansion within the Operation and Design reports be withdrawn unless the Town confirms that they want to move forward with the expansion. No decision or official application appears to have been made for the expansion.

2002

- The Town stops sending waste to the Howie Road landfill and then begins sending the waste to Carp Landfill. The landfill operates now generally as a waste transfer facility.

2004

- Operation Design report is prepared to reflect the operational changes to the landfill (i.e. disposal to transfer):

- Waste received at site is 6,655 tonnes between July 2000 to December 2002, equivalent to 11,000 m^3 using the 0.61 tonnes/m^3 compaction. Then starts as transfer starting in 2003.
- It is stated that the remaining capacity is 25,400 m^3 based on the numbers from the 2000 report. It is suspected that this is an error.
- Landfill lifespan predicted to extend to year 2300 if the site continues to operate as transfer facility and only disposes low level waste on a yearly basis.
- The Operation and Design report states that the Town plans only to proceed with Stage 1 and once complete, decide to either proceed with Stage 2 and/or cap and close the landfill.

2008

- Comments are received from the MOE regarding the 2004 O&D report. The MOE letter refers to the 1993 Landfill Capacity Determination box method and refers to an approved volume of 277,578 m^3. This appears to fall back in line with the previously referred volumes in the 1996 O&D and the 1998 capacity volume letter prepared.
- Trow then provided a revised O&D report.

- Trow estimates that the remaining capacity at this stage is 99,150 m^3. The lifespan is 300 to 400 years if the site remains a transfer site.
- Trow no longer refers to stage 2 and 3 as it is our understanding that expansion is no longer being considered.
- Trow submits a confirmation letter to the Town regarding the remaining site volume.

2009

- Trow files an amendment to the 2008 Operation and Design report under the assumption that the landfill is to re-open shortly. If not, it is requested by the MOE that the landfill be capped.
- A topographic survey of the site was conducted to confirm the landfill volume. The variation between the topographic survey and the estimates based on waste generation/compaction/soil cover ratio is in the order of 3,000 to 4,000 m^3.
- The report refers to remaining lifespan if the site re-opened, to be in the area of 8 to 14 years. Waste generation rates from 2000 to 2002 were in the order of 0.24 tonnes/capita/year likely due to improved recycling and the population at the time was 11,000 people. The organic diversion and recycling programs reportedly began in the year 2000. The landfill lifespan was reported to extend to 2022.

In summary, the confusion regarding the landfill capacity appears to stem from two issues as follows:

1. Continued discussion with the expansion of the site by way of expanding to Stage 2 and 3. The lifespan and remaining capacity of the landfill was at times reported based on the potential expansion. This would result in substantially high remaining capacities.

2. An error appeared to have been made in calculating the volume during the preparation of the remaining volume. The cause for the error is unknown and it resulted in a reduction of capacity for the landfill in 2000 until corrected in 2008. A survey by Trow Associates Inc. in 2008 estimated that there is approximately 97,150 to 97,857 cubic meters of remaining disposal capacity at the Howie Road landfill.

4.3 Current Waste Collection and Diversion Programs

4.3.1 Waste System Costs

In 2010, the Town's waste management program's gross cost was $1,248,312, or $271/tonne. The most significant of the system costs included:

- Garbage collection and disposal ($544,220, or $167/tonne);
- Collection and processing of recyclables ($327,124, or $421/tonne); and
- Landfill operations and disposal ($310,823, or $92/tonne).

The Town is able to offset its gross operating costs by approximately $204,500 through revenues from the sale of recyclables, tipping fees and other sources. After revenues, the net system cost is $1,067,956, or $232 per tonne of waste generated[3]. These costs do not include

[3] Based on 4,605.87 total tonnes of waste generated in 2010.

the time spent on waste management by senior staff (i.e., the Town's Public Works Technologist or the Director of Roads and Public Works). These costs are presented in Table 1.

Table 1: Waste System Costs (2010)

Waste Management System Cost Summary			
Program	**Cost**	**Tonnes Managed**	**Cost/Tonne**
Expenditure			
Administration	$8,479	-	
Garbage Collection and disposal	$544,220	3,267 [a]	$167 [a]
Recycling Collection and Processing	$327,124	778	$421
Leaf and Yard Waste Collection	$2,600	44	$59
MHSW	$11,873	16	$766
Large Items	$27,236	100	$272
Pakenham Waste Depot Operations	$7,251	297 [b]	$25
Reuse Centre Grant	$7,500	-	-
Howie Road Landfill Operations/Disposal	$310,823	3,367 [c]	$92 [c]
Promotion and Education	$1,207	-	-
Net Expenditure	***$1,248,313***	***4,606***	***$271*** [d]
Revenue			
Tipping Fees	($30,000)	-	-
Blue Box Sales	($500)	-	-
Bag Tag Sales	($13,000)	-	-
Composter Sales	($1,000)	-	-
Recycling Revenue	($135,857)	778	-$175
Net Revenue	***($180,357)***	***4606***	***-$39*** [d]
Net Waste Management Costs	***$1,067,956***	***4,606***	***$232*** [d]

Notes:
a) Based on total garbage exported for disposal. Does not included estimated 100 tonnes of large bulky items disposed of at Howie Road Landfill Site.
b) Includes leaf and yard waste and scrap metal dropped off at depot.
c) Cost per tonne based on total garbage disposed, including both garbage exported and garbage disposed at Howie Road. Cost per tonne included for comparison purposes.
d) Cost per tonne based on total amount of waste managed in system.

4.3.2 Garbage Collection

The Town of Mississippi Mills has adopted a 'bag tag' user pay system that partially funds its waste manage program. Each year, the Town mails out bag tags and a free dump pass to each household and business. The dump pass allows residents and businesses to dispose of one load per year (up to 500kg) at the Howie Road landfill site. The passes are issued in August/September and expire on December 31 of the following year. In addition to the dump pass, each residential unit receives 60 garbage bag tags per year and each business receives 200 garbage bag tags a year. Residents and businesses must affix a bag tag to each bag or container of garbage set out for collection. If residents or businesses require additional garbage tags, they can be purchased from the Town for $2 each. In addition, businesses and residents pay a municipal tax of $219 (2010 rate) per year for waste management services. This includes garbage collection, garbage disposal, recycling collection and landfill site maintenance.

Owners, households or occupants of any building are allowed to "Opt Out", as permitted by the rules set out in By-law No. 99-03, and seek their own waste management services as long as they provide proof of alternative services. Churches are not charged an annual rate and receive 25 bag tags per year and upon request receive tags free of charge. It is important to note that bag tags do not have an expiration date and are honoured at all times, regardless of when they were issued or bought.

Garbage collection is currently provided by Topps Environmental Solutions, which holds the contract until May 2013. At this point, no extension of the contract has been discussed.

The Town of Mississippi Mills is divided into three wards: Almonte Ward, Pakenham Ward and Ramsay Ward. Each ward is further divided into sectors for weekly garbage collection.

The Town has imposed a curbside disposal ban for certain types of material, including:

- Recyclables i.e. cans, plastics #1, #2, boxboard, paper egg cartons, brown paper bags, phone books, magazines, catalogues, flyers, clothing, newspaper, clear and coloured glass, corrugated cardboard.
- Animal carcasses and animal waste.
- Large construction materials resulting from building and building alterations.
- Infectious biomedical wastes.
- Auto parts and bodies, lead acid batteries.
- Explosive, combustible materials and paint cans.
- Radio-active waste.
- Any materials defined by the Ministry of Environment or Environment Canada as hazardous waste.
- Stones, earth, stumps, etc.
- Leaf and yard waste material.
- Iron, steel or other scrap metals.
- Tires.
- Medical wastes.
- Liquid waste.
- White goods.
- Any large items i.e. couch, chair, TV.

4.3.3 Recycling Collection and Processing

In June 2010, the Town extended an existing multi-municipality recycling collection and processing contract with Waste Management Inc by three years. Other partners include: the Town of Carleton Place, Beckwith Township, the Township of Drummond North Elmsley and Montague Township. The contract provides terms for payment for services based on the number of households requiring curbside pick-up, tonnes of processed materials, collection of roll off bins and fuel costs.

Recyclable material is collected weekly, on the same day as garbage, except in the following areas:

- The rural areas of the Pakenham ward, where collection is bi-weekly, and
- The area south of County Road 49/east of County Road 29, where recycling collection is every Tuesday and garbage collection is every Thursday.

The Town has decided to limit recycling pick up in the rural areas of Pakenham ward due to a large road network and a relatively low residential density compared to other wards.

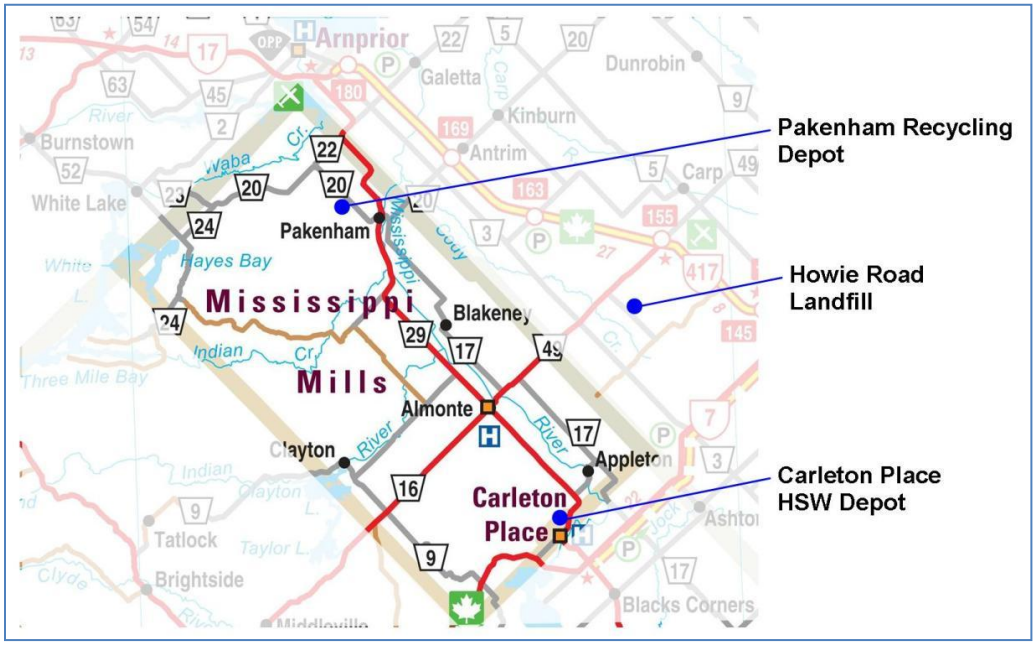
There is no limit on the amount of recyclable material that can be set out for collection, as long as materials are set out in a container that is convenient for collection by the contractor. One blue box is provided free of charge to each residential unit and additional boxes can be purchased at the Municipal Office for $7.30 (plus HST). Damaged boxes are replaced free of charge.

The following items are accepted in the Town's recycling program:

- **Boxboard:** Cereal, detergent & shoe boxes (etc.), paper egg cartons & paper tubes (etc.).
- **Corrugated Cardboard** (Households Only).
- **Newspaper, Magazines & Mixed Household Paper:** Newspapers & flyers, magazines & catalogues, phone books & soft cover books, junk mail, office paper & envelopes.
- **HDPE #1 & #2 Plastics**
- **Empty Aerosol & Paint Cans:** Metal ones only - plastic ones not recycled by the curbside collection.
- **Aluminum Trays & Foil:** Aluminum pie plates & aluminum trays, aluminum foil (clean).
- **Metal Cans:** Metal food & beverage cans.
- **Glass Bottles & Jars:** Food & beverage bottles & jars.

The Town also has a recycling depot in Pakenham. The Pakenham Recycling Depot is located at 580 Barr Side Road. Residents can drop off clean brush, scrap metal, white goods, tires, plastics and clean cardboard. Figure 2 presents a map of Mississippi Mills and indicates the location of the Pakenham recycling depot, the Howie Road landfill site, and the Carleton Place Household Special Waste depot (discussed in 4.3.5). A cardboard bin for commercial business' is also located at 3131 Old Perth Road.

Figure 2: Locations of Municipal Waste Management Facilities



4.3.4 Leaf and Yard Waste

Since 2007, the Town provides curbside leaf and yard waste collection twice a year, once in the spring and fall, to Almonte, Villages of Pakenham, Blakeney, Clayton and Appleton. The Town also collects Christmas Trees. Information regarding specific collection days appears in newsprint and on the Town's website. Residents who are not serviced are encouraged to take leaves to the Howie Road landfill site on Saturdays (year round) and Wednesdays (April-October). A local resident, Mr. Al Potvin, from the Town of Almonte also provides a compost pile for leaves. Leaves can be dropped off at 38 Carss Street and must be free of any debris and emptied from bags.

Leaf and yard waste collected by the Town, as well as materials dropped off at the depots, are chipped and periodically composted by Town staff at Pakenham and Howie Road.

4.3.5 Household Special Waste and Electronics

The Municipal Waste Partners currently operate a Household Special Waste[4] (HSW) Depot in Carleton Place, which Mississippi Mills residents can use. There are bans on these materials from entering the garbage and recycling streams, as well as the landfill.

The Town entered into a contract with the Municipal Waste Partners to provide this service on a year by year basis. In 2010, the Town spent $11,873 for their share in running the service.

The depot is open to residents of the participating municipalities every Saturday from June until mid-September. The hours of operation are 8:00am until noon.

[4] Also commonly referred to as Household Hazardous Waste, or HHW.

The following items are accepted at the depot:

- Motor oils, antifreeze, oil filters.
- Flammable liquids (gasoline, solvents, strippers, turpentine).
- Latex paints, oil paints & stains.
- Organic flammables (adhesives, driveway sealant, calk, resin).
- Propane cylinders.
- Lead acid vehicle batteries or dry cell batteries.
- Aerosol cans.
- Acid or base corrosives (cleaners, drain openers, rust remover).
- Pesticides
- Oxidizers (pool chemicals, fertilizer).

The following items are not accepted at the depot:

- Mercury (mercury filled thermometers, thermostats).
- P.C.B. contaminated waste (fluorescent light ballasts).
- Pathological waste (syringes).
- Pharmaceuticals (prescription drugs & non prescription drugs for human or veterinary use).
- Oxygen, Freon or acetylene gas.
- Radioactive waste (smoke detectors).
- Ammunition or explosives.

In addition to the Carleton Place depot, residents are also able to take materials back to local retailers such as Canadian Tire, Rona, and Home Depot for items such as automotive products, paint and batteries, while pharmacies accept pharmaceuticals and sharps (e.g., needles, lancets, etc).

While the Town does not offer collection of waste electronics, these materials can be dropped off at local retailers (e.g., Staples location in Carleton Place) and at the Waste Management Inc. facility located at on Highway 15.

4.3.6 Large Items

Bulk goods include items such as mattresses and box springs, couches, long pieces of carpet, manufactured wood wastes and other items that are too large for garbage trucks. For these items, residents are encouraged to try and reuse the items, donate them or recycle them. If this is not possible and the items must be disposed, the Town provides a “Large Item Day” to help ensure the materials are disposed properly and not illegally dumped. Residents of Mississippi Mills are able to dispose of items free of charge at the Howie Road landfill, Pakenham Recycling Depot and the Union Hall Yard. Appliances and tires are also accepted free of charge during this event, as long as rims have been remove from tires and Freon has been removed from appliances. Appliances that do not have Freon previously removed are levied a $40 charge.

Scrap metal and brush (Pakenham and Howie sites only) are also accepted during these events. In 2010, this program collected about 100 tonnes and cost a total of $27,236 (including $16,236 in equipment, labour and contracting costs and $11,000 in lost revenue due to the waived tip fees), or about $272 per tonne.

While Large Item Day is meant to be for the drop-off disposal of large items, some residents also take advantage of the waived tip fee to drop off other quantities of waste (e.g., shingles), which otherwise would be charged a tip fee or use a purchased bag tag.

4.3.7 Exchange Days

Prior to a Large Item Day, the Town organizes an Exchange Day. Residents of the Town are encouraged to place items at the curb and offer them to other residents for pick up. Any items not recycled or reused during this day are still the responsibility of the home owner or occupier, as the Town does not pick these items up once the exchange day is over.

4.3.8 Re-Use Centre

Residents are encouraged to use the local Rebound Re-use Centre when disposing of any useful items. The store was established by Hub in November, 2004 with the assistance of an Ontario Trillium Foundation fund and has since grown into a larger store located in Ramsay. The store uses volunteers to help staff the operation. In addition to accepting items, the store provides educational programs and sells blue boxes, canvas shopping bags and compost bins for the Town. The store is open Tuesday to Saturday and accepts the following items:

- Furniture;
- Beds and Mattresses;
- Working Appliances;
- Some Building Supplies;
- Tools and Hardware;
- Sporting Goods;
- Large Toys;
- Exercise Equipment; and
- Musical Instruments.

4.3.9 Backyard Composting

In addition to leaf and yard waste composting, residents are also encouraged to compost their own organics on their property. To provide an incentive to residents, the Town offers discounts on composters. The first composter purchased by a resident is charged 50% of the cost and every additional composter is charged at cost. This is in compliance with Section 11 of O.Reg. 101/94, which requires municipalities that have populations of at least 5,000 to provide home composters to residents at cost or less. The Town supports this initiative by providing educational material on backyard composting through their website and the re-use centre.

4.3.10 Take Back Programs

There are a number of take-back programs available to residents in addition to the various municipal and municipally sponsored programs described above. For example, many hardware or home building supply stores have take-back programs for materials such as batteries, compact fluorescent light (CFL) bulbs, and paint[5]. There are also stewardship take-back programs for materials such tires, electronics, and pharmaceuticals. Residents can find drop-off locations closest to them through the following websites:

- Waste electronics: www.recycleyourelectronics.ca;
- Household hazardous waste "Orange Drop" program: www.makethedrop.ca; [6]
- Tires: www.ontariots.ca; and
- Rideau Environmental Action League's Take it Back "recyclopedia" list: http://rideau.reuses.com/?content=recyclopedia.list

[5] All Home Depot stores in Ontario have recycling programs for paint, CFL's and batteries. www.homedepot.ca/eco-options/initiatives/recycling-programs

[6] Ontario's Orange Drop Program includes the following materials: paints, coatings and their containers; solvents and their containers; single-use dry cell batteries; pressurized containers; lawn fertilizers, pesticides and their containers; antifreeze and its containers; and empty lubricating oil containers 30l in size or less.

4.3.11 Current Waste Collection Schedule

The table below presents the collection schedules for garbage, recycling and leaf and yard waste for the three wards of Mississippi Mills.

Table 2: Collection Schedule

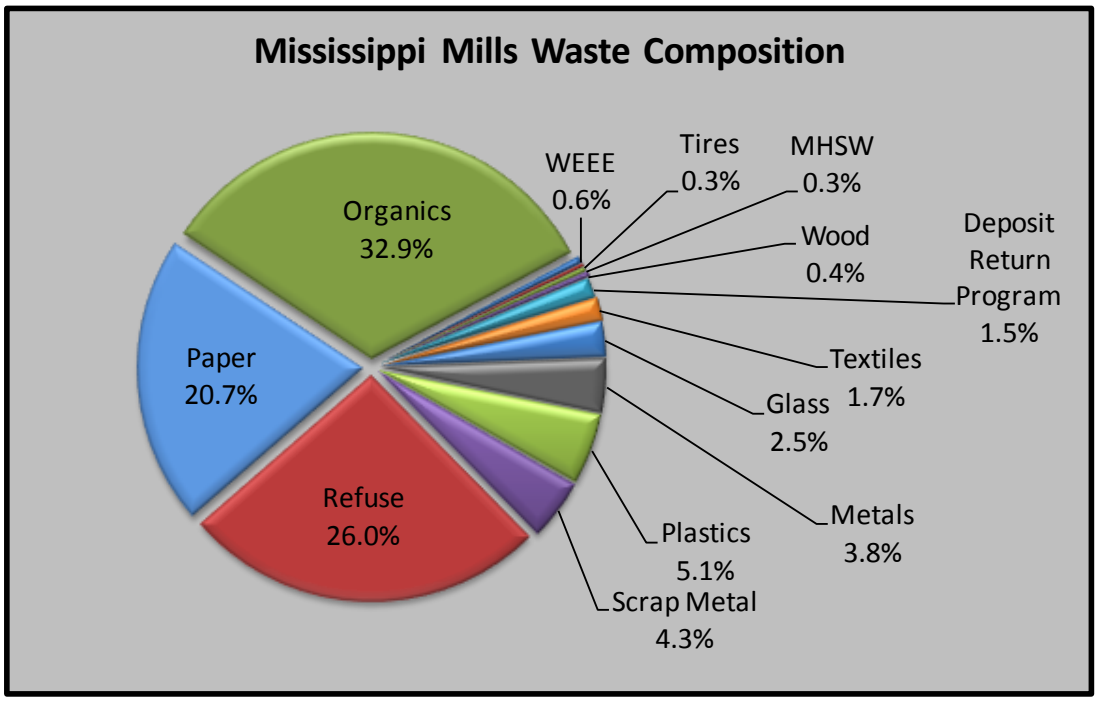
	Garbage (Curbside Collection)	Recycling (Curbside Collection)	Leaf and Yard Waste (Curbside Collection)	HSW (Drop-off service)
Almonte Ward	West of River: Wednesday East of River: Friday	West of River: Wednesday East of River: Friday	Twice a year TBD	Town of Carleton Place Household Waste Depot
Pakenham Ward	Village of Pakenham: Friday North or West of County Rd 29: Tuesday South or East of County Rd 29: Friday	Village of Pakenham: Friday (bi-weekly) North or West of County Rd 29: Tuesday (bi-weekly) South or East of County Rd 29: Friday (bi-weekly)	Twice a year TBD	Town of Carleton Place Household Waste Depot
Ramsay Ward	North of County Rd 16: Wednesday North of County Rd 49: Wednesday South of County Rd 16 & West of County Rd 29: Thursday South of County Rd 49 & East of County Rd 29: Thursday	North of County Rd 16: Wednesday North of County Rd 49: Wednesday South of County Rd 16 & West of County Rd 29: Thursday South of County Rd 49 & East of County Road 29: Thursday	Twice a year TBD	Town of Carleton Place Household Waste Depot

4.4 Waste Composition

As noted previously, the Town of Mississippi Mills generated 4,607 tonnes of waste in 2010 and diverted 30% of it. As illustrated in Figure 3, the largest component of the Town's waste is organics, followed by non-recyclable refuse and then recyclable paper (based on a waste audit conducted by the Town in 2011[7] and on the Town's reported waste management tonnages). Figure 4 illustrates the Town's current diversion practices and shows that paper and scrap metal recycling divert the greatest amount of waste from disposal, followed by leaf and yard waste.

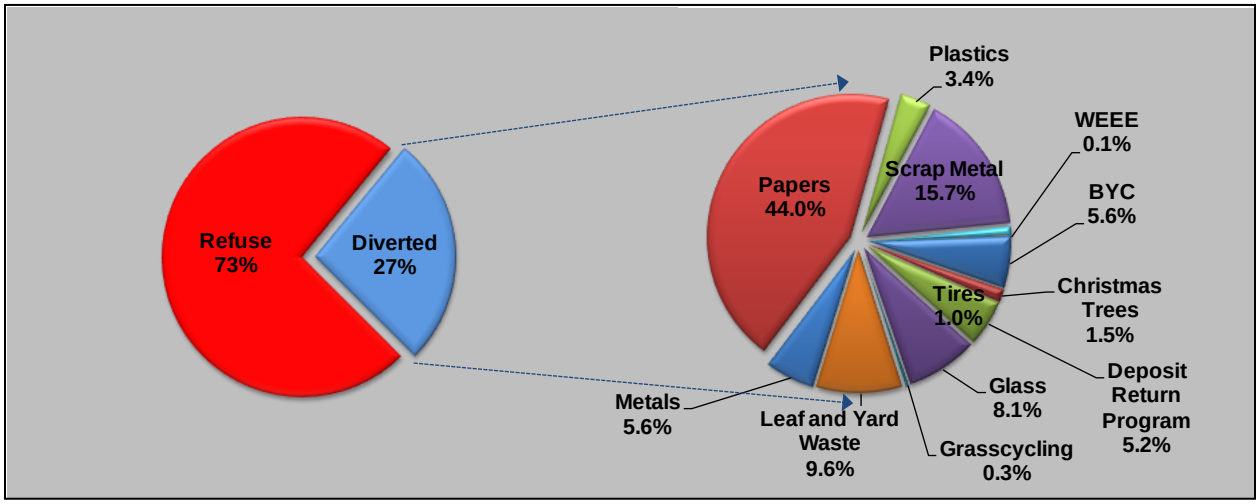
[7] Waste Management Inc. Green Squad. *Sustainability Solutions: Waste to Resource Assessment ™ Report:, Township of Mississippi Mills*. March 7 – 11, 2011.

Figure 3: Composition of Total Waste Stream



Source data: 2010 Mississippi Mills waste tonnage data, WM Green Squad 2011 Waste Audit Report

Figure 4: Composition of the Material Currently Diverted from Disposal

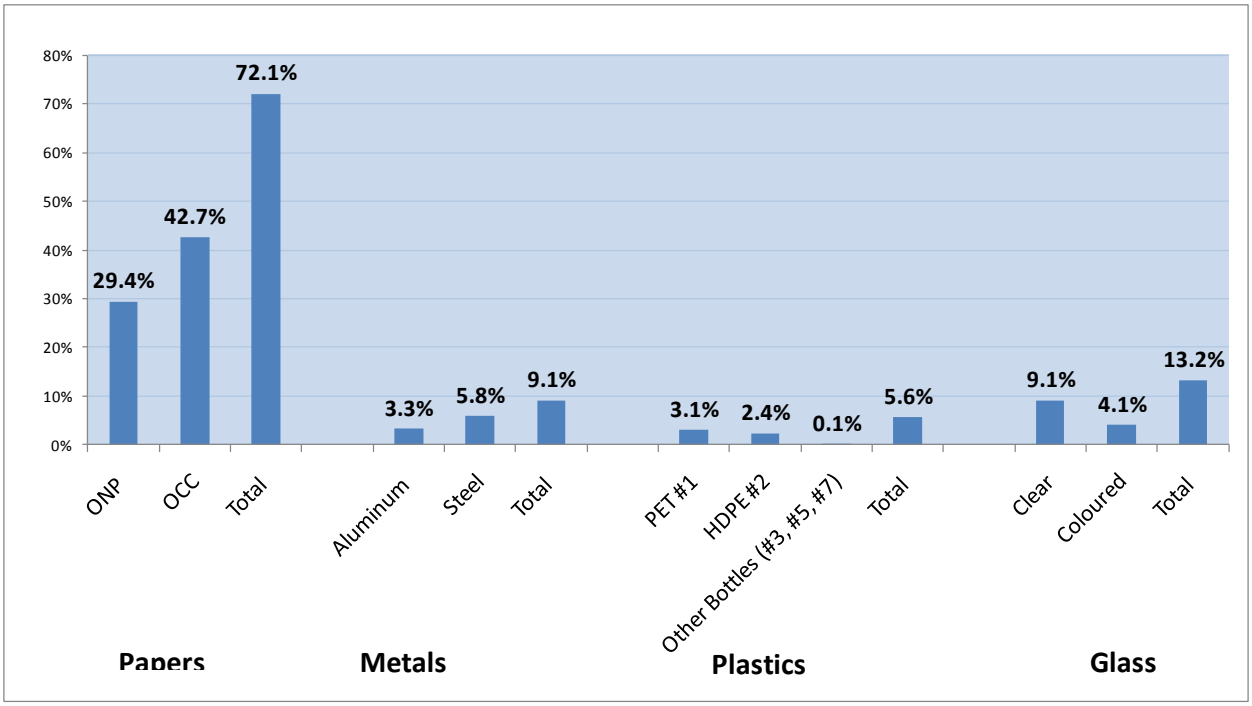


Source data: 2010 Mississippi Mills waste tonnage data, WM Green Squad 2011 Waste Audit Report

4.4.1 Recyclable Material (Blue Box) Stream

Based on waste management tonnage data provided by the Town, in 2010 Mississippi Mills diverted 778 tonnes of recyclable ("Blue Box") material from landfill. Paper accounts for the largest portion of the recycled stream, making up 72% of the total waste diverted from disposal. Plastics are the smallest portion, at 5.6%. A more detailed breakdown is illustrated below in Figure 5.

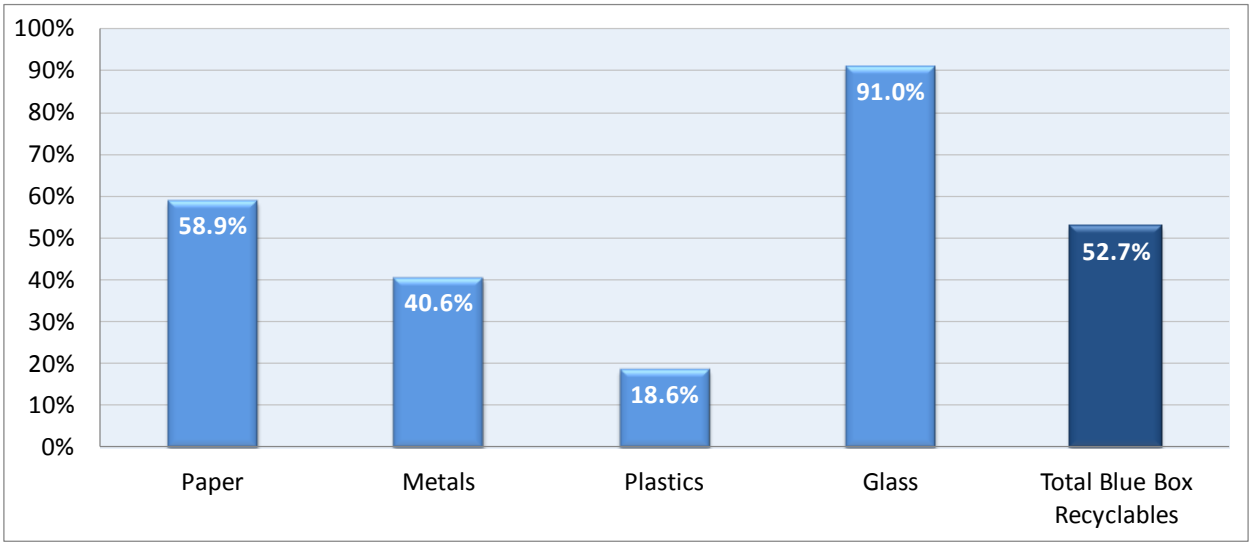
Figure 5: Composition of Diverted Blue Box Materials



Source data: Waste Diversion Ontario 2010

Based on waste audits conducted by Waste Management Inc in 2011 and the Town's reported waste management tonnages, the total amount of recyclables that were available for diversion in the waste stream was 1,476 tonnes. The overall recovery rate of these materials was approximately 53%. This falls below the target capture rate of 70% for Ontario municipalities as set out by the Waste Diversion Organization (WDO). As illustrated below in Figure 6, of the recyclable materials captured through the its program the Town has the highest capture rate for recyclable glass and the lowest capture rate for recyclable plastic containers.

Figure 6: Recyclable Material Capture Rates



Source data: Waste Diversion Ontario 2010

4.4.2 Organics Stream

Based on the waste audit and the WDO data, the Town generates approximately 1515 tonnes of organic waste annually (this includes about 1,273 tonnes of food and kitchen waste and leaf and yard waste and about 242 tonnes of non-recyclable paper). As noted earlier, the Town has leaf and yard waste collection twice a year and a collection for Christmas trees once per year. In 2010, approximately 140 tonnes of yard waste was diverted through the Town's programs yard waste programs, while an estimated 76 tonnes have been diverted through home practices (i.e., 71.3 tonnes through backyard composting and 4.4 tonnes through grasscycling[8]). In total, this diverted about 218 tonnes of waste from disposal, or nearly 5% of the entire waste stream[9]. This provides the Town of a capture rate for organics of about 15%.

4.4.3 Garbage Stream

In 2010, the Town sent 3,315 tonnes of materials to landfill[10]. The 2011 waste audit indicates that 32% of this material was organics, including both food and leaf and yard waste. Another 21% of the material sent for disposal consisted of recyclable material that could be included in the Town's Blue Box program, including paper, metals, plastics and glass. Non-recyclable paper that could be composted made up about 7% of the material being sent to landfill. The balance of the garbage stream was comprised of textiles (rags, clothing, cloth gloves, diapers, mop heads, pillows, shoes), wood (pallets, scrap wood, wooden crates, wood shavings), and other residue (floor sweepings, ceramics, air filters, insulation, paint, carpet, household sanitary products, construction and renovation, vacuum bags, pet waste and ash). A detailed breakdown is illustrated below in Figure 7.

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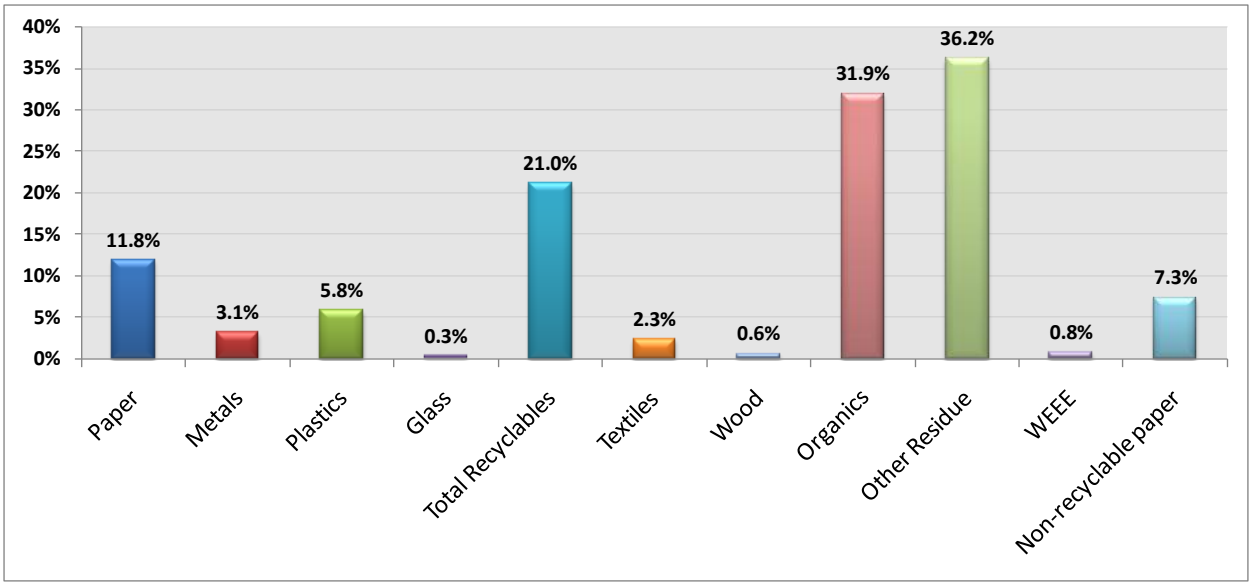
[8] Backyard composting and grasscycling tonnage estimates based on the Town's WDO 2010 datacall submission.
[9] Of this material, about 21% is disposed as residue from processing.
[10] Collected curbside and via depot. This does not include processing residuals or HSW that was collected through the Carleton Place HSW depot and safely disposed.

Figure 7: Garbage Stream Composition



Source: WM Green Squad 2011

4.5 Gap Analysis

Using the information described above, a gap analysis was conducted to identify opportunities for additional diversion. Table 3 presents the results of the gap analysis. The analysis considered the amount of additional material available for diversion assuming a capture rate of 80%,[11] which would be required for the Town to achieve the target waste diversion rate of 60%.

The gap analysis shows that the greatest opportunities for increasing overall waste diversion is through diverting more paper and organics (kitchen and food waste, including non-recyclable paper, and leaf and yard waste). Increasing the capture rate for recyclable paper to 80% would increase the amount of paper diverted by 202 tonnes, which would increase the Town's diversion rate by more than 4 percentage points. If 80% of organics were captured, the Town would be able to divert an additional 995 tonnes of waste from disposal, and increase the Town's diversion rate by 22 percentage points. Combined, this would increase the Town's diversion rate from 27% to 53%.

In addition to paper and organics, the gap analysis indicates that gains can be made through additional diversion of metals, plastics and WEEE. This would add an additional of 5 percentage points. Diverting these materials in addition to those noted previously would increase the Town's diversion rate to 58%, bringing the Town's waste diversion rate of 60% in reach.

In the case of glass, the Town is currently collecting more than 80% of the glass included in its waste stream (based on the waste audit data). Therefore, while the Town could possibly divert more glass from its waste stream, this is a very limited amount as the Town is already capturing most of it.

[11] A capture rate compares how much of a material is in the waste stream against how much of it could be diverted by a program. For example, if a bag of garbage contained 10 pop cans, then a capture rate of 80% would see 8 of those pop cans diverted for recycling.

Table 3: Gap Analysis: Materials Available for Diversion

Waste/ Resource Material	Estimated Composition (%)	Total Divertible Material in Waste Stream* (tonnes)	80% Capture Rate of Divertible Material (tonnes)**	Material Currently Diverted through Existing Programs in 2010 (tonnes)	Potential Additional Diversion ** (tonnes)	Potential Additional Diversion ** (% of total waste stream)
Paper	20.7%	953.7	763.0	561.4	201.6	4.4%
Metals	3.8%	174.9	139.9	71.1	68.9	1.5%
Plastics	5.1%	234.8	187.9	43.7	144.2	3.1%
Glass	2.2%	101.5	81.2	102.8	0.0	0.0%
Food Waste	23.0%	1,060.7	848.5	71.3	777.2	16.9%
Yard Waste	9.9%	454.6	363.7	145.4	218.2	4.7%
Tires	0.3%	12.5	10.0	12.5	0.0	0.0%
MHSW	0.3%	15.6	12.4	15.6***	0.0	0.0%
WEEE	0.6%	26.0	20.8	0.7	20.1	0.4%
Deposit Return Materials	1.5%	66.9	53.5	66.9	0.0	0.0%
Scrap Metal	4.3%	200.0	160.0	200.0	0.0	0.0%
Total Divertible Materials	71.7%	3,301.2	2,640.9	1,240.1	1,430.3	31.0%

* Based on 4,606 tonnes of solid waste generated.
** Additional tonnes of material could be diverted if the actual capture rate ends up exceeding the target capture rate.
*** HSW captured for safe disposal.

As the gap analysis is based on the Town's waste audit data, there are some limitations and assumptions that should be considered in the analysis:

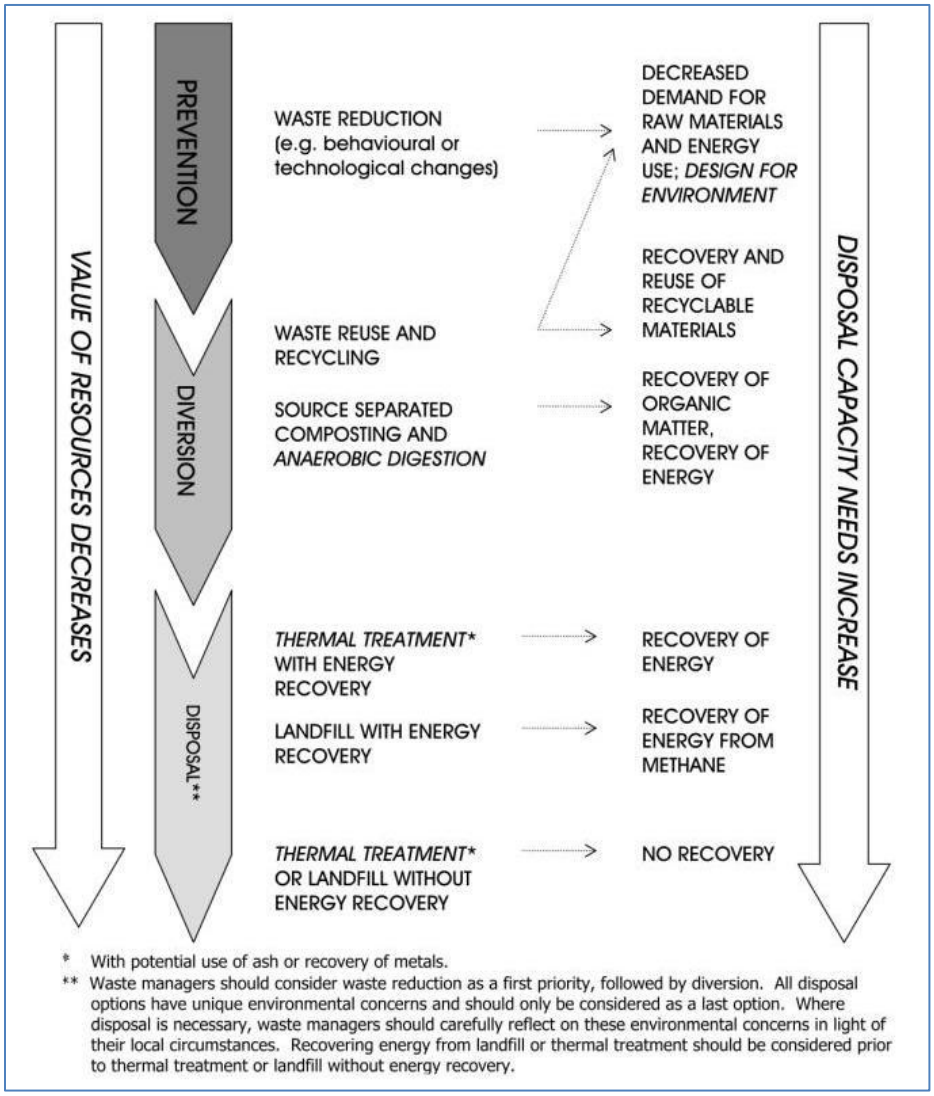
- The Town's waste audit collected garbage and recyclables from curbside. The audit took place during a single season (end of winter in mid-March) and over a two-week period. As a result, the audit would not have captured seasonal changes or those materials disposed of infrequently.
- Materials that are diverted by the Town but were not identified in the waste audit have been incorporated into the Town's estimated waste composition (using the WDO datacall data). As a result, the gap analysis appears to indicate that items such as tires, MHSW, deposit return materials and scrap metal are almost entirely diverted. It is assumed for this analysis that the Town is collecting most of the those materials available.
- As the waste audit was completed at end of winter, yard waste may be under-represented. To provide an estimate for yard waste in the Town's waste composition, the proportion of the waste stream attributed to organics was divided into yard waste and food waste categories, based on a national US EPA waste audit data.
- As the Pakenham depot does not have a weigh scale, the tonnage of yard waste collected at that site is an estimate provided by Town staff, which is incorporated into the yard waste tonnage used in this assessment.

5 Waste Management Options

Based on the gap analysis, a number of options have been identified to help the Town raise its waste diversion rate and manage the remaining waste requiring disposal. These are listed below, along with their potential impact on the Town's overall waste diversion rate. These options range from improvements of current programs to the introduction of new services.

The options reviewed follow the waste value chain as described in the Ministry of the Environment's *Policy Statement on Waste Management Planning: Best Practices for Waste Managers*. The waste value chain describes how waste managers should consider waste reduction and reuse as a first priority, followed by diversion, and then disposal. The waste value chain is illustrated in Figure 8.

Figure 8: Ministry of the Environment's Waste Value Chain



Source: Ministry of the Environment. *Policy Statement on Waste Management Planning: Best Practices for Waste Managers*. June 12, 2007.

5.1 Diversion Options

5.1.1 Expanded Yard Waste Collection and Curbside Collection of Household Organics

According to gap analysis, the Town diverts approximately 18% of its organic waste stream through its current programs (e.g., leaf and yard waste, backyard composting, etc). This provides a significant opportunity for the Town to increase its overall diversion rate through increased organics diversion. For example, while the Town offers some collection of leaf and yard waste and encourages backyard composting, a significant amount of organics remains in the Town's waste stream. Diverting leaf and yard waste and household organics (e.g., food and kitchen wastes, including paper towels and tissues) could raise the Town's diversion rate by about 22 percentage points, bringing it significantly closer to the waste diversion target of 60%. Without the diversion of household organics, the Town will be unable to achieve the 60% waste diversion target.

Currently, the Town provides leaf and yard waste collection twice a year (once in the spring and in the fall) and offers a depot drop-off service in two locations. The Town also has a Christmas Tree pick-up. The Town could increase its capture of leaf and yard waste by extending its seasonal leaf and yard waste collection in urban areas. This material could then be composted and possibly used in public projects, act as landfill cover or be included in community compost give-away events. In addition to increasing collection of leaf and yard waste materials, the Town could further promote backyard composting using promotion and education programs.

Table 4 lists a number of municipalities with curbside and/or depot drop-off collection for leaf and yard waste materials and the amount of material they collected in 2010 (based on WDO datacall information). The general trend is that more frequent yard waste collection leads to more leaf and yard waste collected on average per household, although there is no positive correlation between yard waste tonnage and the number of drop off sites. Local conditions in the municipalities likely play a factor in the amount of material collected at curbside or at depots, such as the urban/rural split of the community, the geographic size of the municipality, and the location of available depots, among other things.

Another opportunity for capturing additional organics is through a curbside household organics (i.e. Green Cart) program[12]. Residents would be provided with a green cart and a smaller kitchen-counter bin (also known as a mini-bin). Residents would place their food and kitchen wastes into to the mini-bin instead of their garbage. The mini-bin would then be emptied into the green cart, and the contents would be collected by the Town for composting.

Such a program could be focused on the urban and village areas of Mississippi Mills. In an online survey the Town conducted in 2010, some respondents indicated that, because they live in a rural setting, they would not need a green cart program because they backyard compost. Additionally, collection of household organics is more cost-efficient in urban and village areas compared to rural areas because the homes are placed more closely together and haulers can make more stops per unit time and per kilometre. However, once separate organics collection is well established in urban/village areas of the Town, expansion of the program could be considered for the Town's rural areas. If the additional backyard composting promotion and education for rural areas is successful in increasing organic waste diversion to numbers

[12] The Town of Perth has a Green Cart program, which Mississippi Mills is monitoring for information.

comparable to the urban curbside collection service, establishing a separate organics curbside collection service for rural areas would be unnecessary.

Table 4: Municipal Leaf and Yard Waste Curbside and Depot Collections

Municipal Grouping/ Municipality	Curbside Collection of Yard Waste, Leaves and Bulky Yard Waste			Depot Collection of Yard Waste, Leaves and Bulky Yard Waste		
	Tonnes/ year	Kg/hhld/ year	Number of Curbside Collection per Year	Tonnes/ year	Kg/hhld/ year	Number of Depot Sites
Medium Urban						
Barrie	8,593	194	34	565	13	1
Guelph	2,331	63	3	3,727	101	1
Sarnia	5,659	187	33	0	0	1
Brantford	4,316	164	32	0	0	0
Peterborough (City)	4,407	168	32	709	27	1
Rural Regional						
Northumberland	0	0	0	1,753	46	3
Norfolk	422	18	9	600	25	2
Quinte Waste	412	7	1	2,359	39	8
Greater Sudbury	5,804	100	52	5,249	91	4
Kingston	4,925	127	1	6,345	164	2
Small Urban						
Stratford	686	67	13	304	30	1
Owen Sound	0	0	0	1,480	238	1
Orillia	2,101	241	36	1,795	206	1
Brockville	196	24	2	722	87	1
Orangeville	1,992	197	16	0	0	1
Prescott	218	115	7	0	0	1
Gananoque	250	112	2	0	0	1
Arnprior	82	29	2	423	151	1
Carleton Place	17	4	3	410	111	1
Perth	363	229	1	303	191	1
Smiths Falls	230	97	3	99	42	1
Rural Collection - South						
Thames Centre	24	5	1	353	75	1
West Elgin	57	20	3	0	0	0
Mono	670	241	18	0	0	0
Ottawa Valley WRC	4,472	290	5	257	10	5
Athens	0	0	0	115	82	1
Russell	1,440	275	2	0	0	1
Clarence-Rockland	0	0	1	767	110	2
Greater Napanee	435	65	2	0	0	1
Mississippi Mills	28	5	2	95	19	2

Source: Waste Diversion Ontario Datacall, 2010

The cost to collect additional household organics through a curbside collection program (e.g. a green cart program) is approximately $100 per tonne, while the cost to collect leaf and yard waste is approximately $60 per tonne. Processing household organics into compost costs between $100 to $150 per tonne, depending on the technology used or which third party organics processing facility contracted. For example, Orgaworld Canada Ltd, which accepts all

of the City of Ottawa's organic material, accepts organic materials for processing at a rate of $100 per tonne. Composting leaf and yard waste is a simpler process and costs approximately $50 per tonne to process. It is important to note that these costs do not include start up costs and operational costs (e.g., RFPs, contract development, purchase of bins or extra truck leases, educational materials, MOE approvals, or in-house monitoring). For example, the cost to roll out an organic curbside collection program to homes in the 6 northern municipalities of York Region was approximately $20/hh for the purchase and delivery of containers and $5/hh for promotion and education materials for a total of roughly $25.00/household. Therefore, the capital cost to purchase and initiate curbside organics collection for the Town would be approximately $135,000.

Many municipalities pilot test their organics curbside collection programs before implementing them fully. The pilot test allows the municipality to test out the program's logistics (e.g., collection and processing logistics) and communications prior to rolling out the program in full. While the cost of a curbside organics pilot test can vary depending on the size, duration and scope of the pilot, it can range from about $70 to $130 (see Table 5). This typically includes the cost of the carts and mini-bins, communications materials, collection and processing, and pilot planning.

Table 5: Examples of Curbside Household Organics Pilot Programs

Municipality	Description of Pilot	Costs
Brant County	383 homes 6 months	$40,000 $104/hhld
London	750 homes	$100,000 $133/hhld
Capital Region District (Vancouver)	4,000 homes Duration: Oct '06 – Dec '08	$421,018 $105/hhld
Dufferin	1927 homes	$215,448 $112/hhld
Belleville & Quinte West	1400 homes 16 weeks	$100,000 $71/hhld
Halton	6300 homes Over 1 year	$450,000 $71/hhld

5.1.2 Increased Education and Promotion

In order for any diversion option to reach its maximum efficiency and participation, a well established and clear communication strategy needs to be in place. A good educational and promotional program will allow residents and businesses to clearly understand the Town's objective and how to properly participate in programs to reach it. An enhanced promotion and education program would go beyond the static use of brochures and online information by establishing a dialogue with residents to assess those barriers to participation and determine opportunities for improvement. Such a program may include:

- Backyard compost (BYC) workshops at community events and encouraging their use through the Almonte Horticulture Society and Pakenham Horticulture Society.

- Using summer students to provide personal, in home waste audits to help residents understand their waste composition and appropriate diversion methods.
- Setting up educational and promotional booths at community events such as the Almonte Fair, Pakenham Fair, Pakenham Home Show, and Handmade Harvest.
- Using summer students (post secondary) to provide educational programs to students at the seven local elementary and high schools.
- Promotion of available provincial programs and information resources:
  - Waste electronics: www.recycleyourelectronics.ca
  - Household hazardous waste "Orange Drop" program: www.makethedrop.ca
  - Tires: www.ontariots.ca
- Promotion of community-based reuse options, such as:
  - Rideau Reuses Online Exchange (www.rideau.reuses.com); and
  - Freecycle: http://groups.freecycle.org/mm-freecycle/description.

The communication activities should have specific strategic targets. Possible targets may include (but are not limited to):

- Promotion of specific programs at key points of the year (e.g., promotion of leaf and yard waste pick-up in the fall and spring, backyard composting in late winter/early spring);
- Reminders about specific recyclable materials or topics of concern to achieve identified problem areas (e.g., to reduce contamination levels, to clarify how to recycle problematic or confusion materials, etc); or
- Encouraging the adoption of waste reduction/prevention behaviours (e.g., encouraging wasteless gifts by purchasing 'experiences', such as concert tickets or a spa visit, or consciously avoiding the purchase of products with excessive packaging).

Examples of costs for typical promotion and education items include:

- Design for signage/brochure: $1,500 - $2,500
- Printing:
  - Full colour newsletter: $0.50 to $1.00 each
  - Reminder fridge magnet: $1.50 - $2.00 each
  - Depot sign (4' x 6'): $800 - $1,000
- Summer student (April – August): $10,000 - $12,000 (could be cost shared with other departments)

The waste diversion communication strategy should include a monitoring and evaluation component, which will allow program managers to adjust programming in response to program

performance or other identified needs, such as changes in materials collected, common contamination issues, feedback from residents, or new priority issues.

The amount of additional waste diversion and cost would depend on the amount and type of educational and promotional material used. If the Town budgeted $1.20 per household (identified as a best practice in the KPMG *Blue Box Program Enhancement and Best Practices Assessment Project Final Report*), the Town's promotion and education budget would increase to about $6,200.

5.1.3 Enhancing Recycling Services

The Town's public drop off depot program accepts plastics #'s 3 to #7 which are not currently included in the curbside Blue Box collection program. The Town could include these plastics in their curbside Blue Box program in order to increase their capture.

During the stakeholder scan process and reviewing an opinion survey performed by the Town, the issue of the Town not accepting all recyclable plastics through its curbside collection program came up regularly. Accepting these plastics through the curbside collection program could increase participation and their capture rates since less sorting and effort is required of residents. Accepting the same list of materials through both programs would also clear up confusion amongst community members.

According to waste audit data, recyclable plastics represent approximately 5% of the total waste stream. Within the category, recyclable plastics numbered #3 to #7 represent nearly 50% of the plastics waste stream. Therefore, including these plastics in the curbside collection program could divert in the order of 90 tonnes of material per year from disposal which would increase the overall diversion rate by nearly 2 percentage points.

In addition to adding materials to the blue box stream, capture rates could be improved by increasing blue box collection to weekly for all wards. Currently, Pakenham is the only ward receiving bi-weekly recycling collection and weekly garbage collection, while every other ward receives both services on a weekly basis. Although collection costs could increase if Pakenham is included in weekly recycling collection, there are ways to offset these costs using other options (see reduction in garbage collection frequency below). The costs associated with increased collection frequency in the ward could be determined by including an option in the collection tender for both the price of weekly collection and bi-weekly collection.

These modifications to the Town's blue box collection program may require adjustments to the Town's blue box collection contracts, as well as equipment upgrades at the Materials Recycling Facility. These could either be negotiated with the Town's current contractor or included in the Town's next collection tender.

The Town could also consider alternative locations for drop-off depots for recyclable (particularly mixed plastics) and other divertible materials. Currently, the Town's drop-off depots are not located in central locations. The Howie Road depot is located approximately 9 km outside of the Town's border (in Ottawa), or about 12 km from the urban settlement area of Almonte. The depot in Pakenham is about 3 km from the Pakenham urban settlement. While the Pakenham depot is not far from the urban settlement, both the Pakenham and the Howie Road depots do not seem to be en route to other services (e.g., shopping), and so would require a special trip for residents wishing to drop materials off. This may discourage residents from participating in diversion programs that are not available through curbside collection (e.g., certain recyclable

plastics, leaf and yard waste, etc). Adding additional depots in more central, urban locations or in an outlying population cluster (e.g., Appleton) could help to increase participation by reducing the barrier of inconvenience. While full-service depots are often located on municipal waste management sites, O.Reg. 101/94 does permit blue box recycling depots to be sited in other areas. This could include other municipal facilities (e.g., arenas, municipal offices) or private sector sites, such as in a parking lot of a grocery store or mall. Such a depot would not be able to be used for garbage.

5.1.4 Using Clear Bags for Garbage Collection

A 'clear bag' program refers to the use of a garbage bag that is transparent or see-through. Use of clear bags for garbage encourages waste diversion in a number of ways. Knowing that their neighbours will be able to observe that there are recyclable or hazardous materials in their garbage acts as a form of peer pressure to recycle. Secondly, clear bags can serve as a reminder if people forget to separate out these materials from their garbage, as the clear bag allows residents to see what has been thrown out. Clear bags also prompt people to reflect on their waste disposal habits and encourage them to consider waste diversion options. Lastly, clear bags can also assist in enforcing the Town's current material disposal ban by allowing waste collectors to monitor for compliance and reject any bags containing those items.

A Stewardship Ontario study that examined 22 municipalities with clear bag programs concluded that this option could have a considerable increase on diversion rates. For example, 13 Nova Scotia municipalities reportedly experienced, on average, a 41% decrease in residential waste, a 35% increase in residential recycling and a 38% increase in residential organics collection. One region from Nova Scotia experienced a 71% increase in tonnes of material collected for recycling. It is important to note that these averages were based on programs with existing recycling and organics diversion programs and therefore most of the gains can be directly attributed to clear bags.

In some programs, residents are allowed to include a 'privacy bag' inside their clear bag. A 'privacy bag' is any small opaque plastic bag into which residents can place materials they wish to keep private.

The costs associated with implementing a clear bag policy are minimal. Most of the cost would be for promotion and education of the program. This could be managed through the Town's existing promotion and education budget.

5.1.5 Reduction in Garbage Collection Frequency

If curbside recycling collection occurs weekly across all wards and the Town adopts a separate urban/sub-urban organics collection program for food waste and other compostable items apart from leaf and yard waste, the frequency of garbage collection could be reduced from weekly to bi-weekly in those areas with a curbside organics program. This would encourage residents to make greater use of available diversion programs.

While costs for collection of refuse will go down, the expected increase in recycling and organics diversion will drive up their associated collection costs. In addition, additional staff may be required for promotion, education and enforcement.

Reductions in the collection frequency of garbage have resulted in increases in recycling and organics diversion in other municipalities in southern Ontario. For example, York and Halton

region reported a 4-6% increase in diversion from landfill. Therefore, the Town should expect to see a comparable increase in diversion if this option is implemented. A pilot project in selected areas could be used to help assess cost savings and increased diversion through bi-weekly collection of garbage.

5.1.6 Diverting Construction and Demolition (C&D) Waste from Landfill

The Howie Road landfill site/transfer station is located outside of the Town's limits and has limited hours it is open to the public. As a result, it receives little C&D waste from the private sector. However, some renovation waste is dropped off by residents. The Town could require that such any C&D and renovation wastes dropped off are segregated so that divertible materials (e.g., clean wood, shingles) are able to be recycled or reused.

5.1.7 Adopting a Zero Waste Policy at Municipal Events and Buildings

This option would have to be used in conjunction with a dedicated organics diversion program. At community events and locations, the Town should limit the amount of refuse accepted and display recycling and organics containers prominently. This option would set a good example for residents and businesses in the Town and help them adopt a minimal waste attitude, which is essential for reaching any waste diversion goal.

A zero-waste policy could be established and enforced at municipal events and buildings, including:

- Libraries
- Town hall
- Fire stations
- The Almonte Fair
- Celtfest
- Pakenham Fair
- North Lanark Highland Games
- Pakenham Fiddle and Stepdance Competition
- Light up the Night

As an example of the potential effect on diversion, the Town of Markham started a "zero waste" policy at all municipal locations and diverted the equivalent of 6 14-yard bins of garbage per week. Cleaning contracts were re-negotiated at municipal buildings to reduce garbage collection and as a result over 500 garbage containers were reduced to 25. The decrease in garbage containers resulted in an increase of recycling and organics receptacles. In addition, all food and catering services at the Town were required to use suppliers that shipped materials in recyclable products, offered biodegradable cups and plates, and supplied silverware. All eating areas were supplied with blue and green carts only.

Renegotiating collection services and cleaning contracts could result in savings for the Town, with less material needing disposal at the landfill. New recycling and organics receptacles for community events and buildings range between $150 and $250 per station. Additional promotion and education would be required to ensure residents and businesses comply with the option.

5.1.8 Promoting the Use of Environmentally Friendly Alternatives to Chemical Cleaners and Promoting MHSW Events

Although MHSW represents only 0.34% of the total waste stream, these items pose the highest danger in harming the environment. The Town currently cost-shares MHSW drop-off opportunities with the neighbouring community of Carleton Place, which the Town should continue to promote.

Another option for reducing the amount of MHSW material used is to promote safe alternatives to household cleaning products, such as the use of baking soda, pure soap, white vinegar, borax and washing soda. For example, alternative cleaning recopies include:

- **All Purpose Cleaner:** 60 ml (1/4 cup) of baking soda, 120 ml (1/2 cup) of white vinegar, and two litres (8 cups) of warm water.
- **Window and Glass Cleaner:** Mix 1 part white vinegar to 5 parts water and store in a spray bottle. Wash with soap and water, rinse with the vinegar and water mixture.
- **Disinfectants:** Wash items with soap and water or a solution of 120 ml (1/2 cup) of borax and 4 litres (1 gallon) of water.

Alternatives to pesticides, herbicides and insecticides also exist and should be promoted through the Town's education and promotion program. Examples of alternatives include:

- **Pesticides:** When planting, mix in pest-resistant plants such as yarrow, thyme and marigolds. Chop garlic cloves and sprinkle around the base of flowers and garden plants.
- **Herbicides:** Each spring, spread a light layer of topsoil and/or compost across your lawn as evenly as possible. This introduces nutrients and organic matter to the existing soil. Let your grass grow longer. This shades the soil and inhibits weed germination. Pull weeds instead of using chemical control. Aerating your turf will relieve soil compaction and allows the lawn to breathe.
- **Plant Insecticides:** Use a non-chemical compound such as a solution of 15 ml (3 teaspoons) of pure soap per 4 litres (1 gallon) of water. Store the mixture in a spray bottle, clean leaves with it and spray directly on any insects.

5.2 Waste Disposal Options

Three options for waste disposal have been put forward for consideration in developing the Town's waste strategy:

- Reopen and expand the Howie Road landfill site;
- Export waste to a private or municipal owned waste disposal site; and
- Build a new waste transfer station in a centralized location[13].

[13] The Town currently owns property located on the outskirts of Almonte on Wolfgrove Road that is zoned for Waste Management use. This site could potentially be considered for use as a centralized transfer station.

These options are reviewed below, followed by a table presenting their advantages and disadvantages.

Thermal treatment technologies such as incineration, gasification and pyrolysis were not considered as a viable disposal option for the Town, as it would not be cost-effective to either build a facility or ship to an existing one. For instance, thermal treatment facilities have high capital costs that range from $50 million or more, depending on the type of technology. Furthermore, thermal treatment generates 10 to 30% residue as a final product that must be disposed in a sanitary landfill. Regulatory approval for a thermal treatment facility requires a comprehensive process that can cost $100,000 to $300,000 and includes a timeframe of 2 to 5 years. Additionally, there are no operating facilities in close proximity to the Town. The closest incineration facility would be the proposed Durham/York Energy from Waste site, which will be located in Clarington, Ontario approximately 230 km away and is expected to begin operating in 2015. However, Plasco Energy Group has currently received a commercial license to construct and operate a thermal waste facility in Ottawa. This facility could potentially be a viable EFW option if it becomes operational in the near future.

5.2.1 Reopen and Expand Howie Road Landfill Site

Up to 2002, the Howie Road landfill was operated as full time landfill and generally averaged in the order of 3000 to 5000 tonnes being disposed of at the site with rates between 2000 to 2002 in the order of 3000 tonnes. From 2002 until 2011, the majority of the waste collected has been directed to the Carp Landfill and recently to the Lafleche landfill in Moose Creek. As a result, the Howie Road landfill has operated primarily as a waste transfer facility. The waste landfilled on site is generally limited to approximately 100 tonnes a year, of which more than 50% comes from the waste collected during Large Item Day.

A disposal option for the Town would be to re-instate the Howie Road landfill to accept all Town solid waste for disposal. Considering the most recent MOE documentation issued on March 14, 2008 under Provisional Certificate of Approval No. A461001, the current site is officially approved as a 4.8 hectare landfill area and waste transfer station, with a total site area of 31 hectares. Since then, other revisions are being conducted with respect to the Operations and Development plan to reflect the purchase of additional buffer zone, MOE questions, and changes in operation since 2004. Additional lands were purchased around the Howie Road landfill site in 2008/2009 to serve as additional buffer lands to allow for natural attenuation treatment of leachate. The additional buffer lands are not intended to serve as waste disposal zones.

Since the existing C of A reflects the site as a landfill area and waste transfer facility, it is not anticipated that any significant regulatory issues with the site would need to be resolved prior to accepting waste on a full time basis. It is understood that the O&D report would have to be revised to reflect the change in operation, if it was to occur. The lifespan for the landfill is determined as such:

- The remaining capacity at the Howie Road site was most recently determined to be in the order of 94,755(reported) to 98,000 m^3 (surveyed) as per the 2008 Amendment to the Operations and Development report prepared on April 29, 2009.
- Proposed MOE waste to cover ratio is in the order of 4:1.

- Therefore, the remaining amount of waste that can be accepted to the site is approximately 75,804 m^3 and the associated cover is in the order of 18,951 m^3.
- Based on an anticipated compaction ratio of 0.61 tonnes/m^3, the remaining waste capacity can also be reported as approximately 46,240 tonnes.

Using the 1995 to 1999 waste generation rates of 0.4 tonnes/capita/year and previous estimates for cover fill and for compaction, the lifespan of the current landfill would be approximately 8 years. Currently, the Town generates approximately 3,400 tonnes of waste per year (0.3 tonnes/capita/year), which would equate to an approximate 10 year lifespan. As a result, it is estimated that a lifespan of 8 to 10 years remains for the landfill, assuming no major changes to the waste generation rates to the landfill. This lifespan can increase if appropriate waste diversion (i.e. recycling, composting, waste reduction) programs are adhered to by the public and the waste diversion approaches the provincial goals.

Furthermore, additional operating equipment and procedures would be required to operate the Howie Road site as a disposal facility for the Town's solid waste. While an operational weigh scale, storage building and small weigh scale office is already in place at the site, the Town would need to purchase a garbage compactor/loader. The cost for a used landfill compactor of adequate size and quality ranges from $350,000 to $500,000. The scale house would also require some repair. Access roads to the landfill area, the site perimeter and environmental monitoring of the site have all been maintained since the site began operating primarily as a transfer facility. The existing C of A also allows for the site to be open throughout the week and no existing restrictions are present. With the exception of the purchase of some additional equipment and a full time staff (two to three people) on site to operate the scale and loader, no additional changes to the site and Operation and Design reports are anticipated if the site were to commence operation again. However, prior to operation, a revised Operation and Design report would have to be submitted and approved by the MOE.

Mining the Howie Road Landfill

Previous discussions have occurred regarding mining the existing landfill in hopes of increasing the availability capacity within the 4.8 hectare fill area at Howie Road. In-depth studies have not been conducted on the feasibility of this initiative but remain as preliminary discussions. The exercise of mining a landfill consists excavating the landfill and sieving out potential recoverable materials, cover material and/or other materials that can be salvaged. Secondly, the remaining waste material is then be re-instated into the landfill at a higher compaction rate and improved waste to cover ratios. Landfills of similar characteristics of the Howie Road site can generally gain 15% to 25% of additional capacity. The equipment and labour required to complete such a task could be in the order of $500,000 to $2,000,000, depending on the extent the landfill is mined. These costs are based on experience from similar programs in North America.

However, there are a number of uncertainties with respect to mining the Howie Road landfill, including:

- Unknown content of waste within the landfill and the amount of materials that can be recovered;
- The quality of the materials, as most of the recyclables have been in the ground for more than 10 years and may have degraded over time and therefore, may not be of value ;

- Potential for hazardous materials in the landfill, which would not be allowed to be re-instated once discovered and would be required to be sent for disposal at a licensed hazardous waste facility;
- High water table within site would restrict the depth of waste recovery and poses concern regarding the potential environmental impacts associated with excavating the waste;.
- Public concerns regarding excavating the landfill and potential odour issues; and
- Uncertainty regarding the value if any, of the recoverable material.

Expansion of the Howie Road Landfill

Prior Operations and Development reports have explored the potential for expanding the landfill towards Howie Road in several phases. These preliminary discussions / suggestions of expansion were completed in the 1990's up to the 2000 O&D report, at a time when the regulations were not as stringent. Since that time, requirements for expansion now include an engineered landfill at a minimum and no current environmental exceedences. An engineered landfill requires the installation of a liner system and a leachate collection system, designed to prevent the natural attenuation scenario which is currently used at the landfill site. These engineered systems can add $1m to $2m to the construction of a landfill the size of the Howie Road landfill site. .

In 1996, it was determined that the additional capacity that would be acquired through expansion would be in the order of 150,000 m3. The exact method for determining this capacity is unknown but is suspected to have been derived using the 1993 MOE Landfill Capacity Determination guideline. Moving forward, Trow re-determined the remaining capacity that would be gained through expansion in 2000 using 4:1 side slopes, 20:1 crown sloped and a fill elevation of 137 m.a.s.l. The fill was allowed to extend to within 30 m of Howie Road. The additional volume that was calculated assuming previous zoning and approval requirements would be in the order of 100,700 m3, or approximately 47,000 tonnes of waste. However, it is not clear if the 1993 MOE document was referenced in the calculation.

Conversely, if the 1993 MOE Protocol is used to determine landfill capacity (for the site, an average cumulative height of 19 ft over the approved landfill area) while also adhering to a 4:1 slope, the volume would change from what was previously calculated. The MOE has referenced the use of this 1993 MOE document for determining the capacity of the Howie Road report in a letter provided in January, 2008. Nevertheless, it is also worth noting that the volume can be altered depending on the application/approval process. Some of the potential zoning/environmental issues that can impact capacity numbers include, but are not limited to, the following:

- Understanding that provincially significant wetlands exist opposite Howie Road, it assumed that the landfill fill area would only extend to 50 m from Howie Road in order to maintain an acceptable distance from the wetland (150 m). As a result, the assumed fill area could be in the order of 120 m (perpendicular to Howie Road) by 250 m (parallel to road). Using the 1993 MOE protocol combined with the use of 4:1 slopes on the site, a conservative estimate of the additional that could be gained would be in the order of 120,000 m^3 to 140,000 m^3 (approximately 52,000 to 65,000 tonnes of waste).

- Another concern raised regarding the potential for expansion is the likely changes required to the zoning. Some previous documentation references that the landfill expansion would not be able to approach within 75 m of Howie Road. As a result, the assumed fill area could be in the order of 95 m (perpendicular to Howie Road) by 250 m (parallel to road). Following the same principles of the 1993 MOE protocol and the 4:1 slopes, the calculated volume would be in the order of 85,000 to 110,000,000 m^3 (approximately 40,000 to 50,000 tonnes of waste).

It should also be noted that the ranges in volumes can vary based on:

- The potential engineering characteristics of the landfill;
- Distances between the landfill access road and the landfill fill area;
- More accurate sloping calculations that would be completed at the design or more detailed assessment stages; and
- Potential future locations of waste segregation piles that would have to be moved if the landfill is expanded.

In summary, the landfill expansion could at a maximum provide an additional 8 to 16 years, assuming maximum capacities could be approved and waste collection rates remain the same. This also assumes that appropriate approvals can be granted under the above capacity assumptions. Expanding the site would require an Environmental Assessment, amendment of the current CofA, and may require changes to the site zoning. The cost of the approval process to expand the site would be approximately $50,000 - $100,000 and would likely require co-operation from the City of Ottawa for the purpose of re-zoning. The actual cost to expand the site would exceed a million dollars as any new and/or expanded landfills require engineered solutions.

Based on the currents requirements to construct a landfill under the new regulations, some very preliminary estimates can be provided based on anticipated construction practices:

- Provide engineered liner - \$10 to \$15/m^2 ($300,000 to $500,000)
- Provide the sand and gravel cover above the liner ($15 to $25/m2)– $500,000 to $800,000
- Alterations to roadways – $50,000 to $100,000
- Potential requirements to include new fencing
- Potential requirement for more sophisticated leachate collection system - $200,000 to $300,000
- Engineer design / construction - $100,000 to $200,000
- Additional equipment (as accounted for in re-opening the landfill) - $300,000 to $400,000

Based on the information above, the cost to expand the landfill could range between $1.45 million to $2.3 million. The estimated operating cost would be $139/tonne (based on existing landfill costs, additional staff time, and operation/maintenance of a dozer). This cost does not include added capital costs for the design and construction of new landfill cells.

5.2.2 Export of Waste

The Town of Mississippi Mills is currently exporting the majority of its garbage to private sector disposal facilities outside its municipal borders. Compacted curbside waste is being transported to Lafleche Environmental's landfill facility in Moose Creek, Ontario, with a tip fee charge (including transport) of $89 per tonne. It is understood that Lafleche is currently applying to expand the Moose Creek facility to increase its disposal capacity to 2,500 tonnes/day. Conversely, waste collected at the Howie Road site is performed by Glenview Iron and Metal, which also has a transfer facility in Smith Falls, ON. They collect the waste from the Howie Road site for $135 per lift (using either 20 or 30 yard bins) and charge a tipping fee of $103.10 per tonne. The wastes are exported to a landfill site in New York State. In summary, there are two separate waste exporting practices/contracts within the Town of Mississippi Mills.

Examples of other typical tip fees (not including haulage fee, and for volumes of waste greater than generated by Mississippi Mills) at landfill sites in Southern Ontario include:

- Greenlane Landfill, London: $77 per tonne;
- Essex-Windsor Waste Management Authority, Essex County: $28 - $55 per tonne;
- Walkers Landfill, Niagara Falls: $50 per tonne; and
- Twin Creeks Landfill, Watford: $38 per tonne.

The estimated annual cost for the Town to continue to export its waste (based on current disposal rates and pricing) is $305,581 (or about $92 a tonne) plus lift fees (see Table 6).

Table 6: Estimated disposal costs

Garbage Collection Method	Tonnes Collected (2010)	Disposal Fee	Total Disposal Cost
Curbside Collection	2,570.70	$89 per tonne(Lafleche)	$228,792 (plus pickup)
Howie Road Depot Collection	744.80	Tip fee: $103.10 per tonne Lift fee: $135 per 20 or 30 yard bin (Glenview Iron and Metal)	$66,479 (+ lift fee) [a]
Total			**$295,271**

(a) Does not factor in the 100 tonnes of large item waste disposed at Howie Road Landfill.

Currently, the Howie Road site is being used for the disposal of the large items dropped off at the site on Large Item day. This amounted to approximately 100 tonnes in 2010. If the Town were to export this waste instead of landfilling it at the Howie Road landfill site, it would cost in the range of $11,000 to $15,000. Exporting the large item waste instead of landfilling it could be advantageous for the Town as it may reduce equipment and staffing needs at the site. A detailed business plan would be required to assess the feasibility and logistics of discontinuing any landfilling at the Howie Road site and exporting the large item waste for disposal.

It is also worth noting that there are sites in other municipalities that currently do not have operating landfills but could be presented as options in the future for potential landfill partnerships and/or exporting waste. These include Site ED19 in Leeds & Grenville, Lanark N5, and the Plasco Ottawa Gasification Facility.

Leeds & Grenville – ED19

This site, located in the county of Leeds & Grenville, was proposed as a landfill in 1996. The environmental assessment and Section 5 of the Environmental Protection Act were approved at the time. Subsequently, the detailed engineering plans were not completed and the project stalled. It is understood that the County is currently requesting an expression of interest for a public / private partnership to proceed with obtaining approval and eventually operating the site as a landfill. However, it is also understood that the approval submission was to only accept waste within the host municipal boundaries and therefore, would not be able to accept waste from the Town of Mississippi Mills.

Lanark N5

This site was proposed by a consortium of local Counties and received environmental assessment approval more than 10 years ago. However, Section V of the Environmental Protection Act was either not approved or submitted for the construction and operation of the landfill site. It is our understanding that a council decision was made in the past to not proceed with the development of this proposed landfill site. As a result, the site currently sits stagnant. Given that no progress, in terms of applications has occurred in the past years, there is the potential that any application moving forward may have to be re-started (i.e. re-do the environmental assessment and all legislative processes)and it could take several years.

Several small scale landfills are located within the County of Lanark, however, the majority of them are restricted to receiving waste only from within their municipal boundaries and likely would not be interested in accepting waste from outside their municipality due to low remaining capacities.

It is our understanding that the current Township has not shown a recent interest and/or have put efforts forward to re-open the application process for the Lanark N5 landfill. However, the County of Lanark still owns the site.

Plasco Ottawa Gasification Facility

Plasco Energy Group is an Ottawa-based company that has a technology to convert waste into energy through a process called gasification. In this process, waste is converted into a gas, which is burned to produce energy. The company had been operating a trial facility in Ottawa. In December 2011, the City of Ottawa agreed to a 20-year deal with Plasco Energy Group for Plasco to process 300 tonnes per day of residential garbage waste at a cost of $83.25 per tonne. The deal is contingent on Plasco securing financing by 2013 and completing construction of its facility by 2016. If the facility successfully becomes operational, it could be a potential disposal option for the Town of Mississippi Mills.

Other Potential Transfer Stations

There are some preliminary discussions regarding the opening of a waste transfer station near the boundary of Beckwith Township and Highway 7. This was posted on the EBR and has also

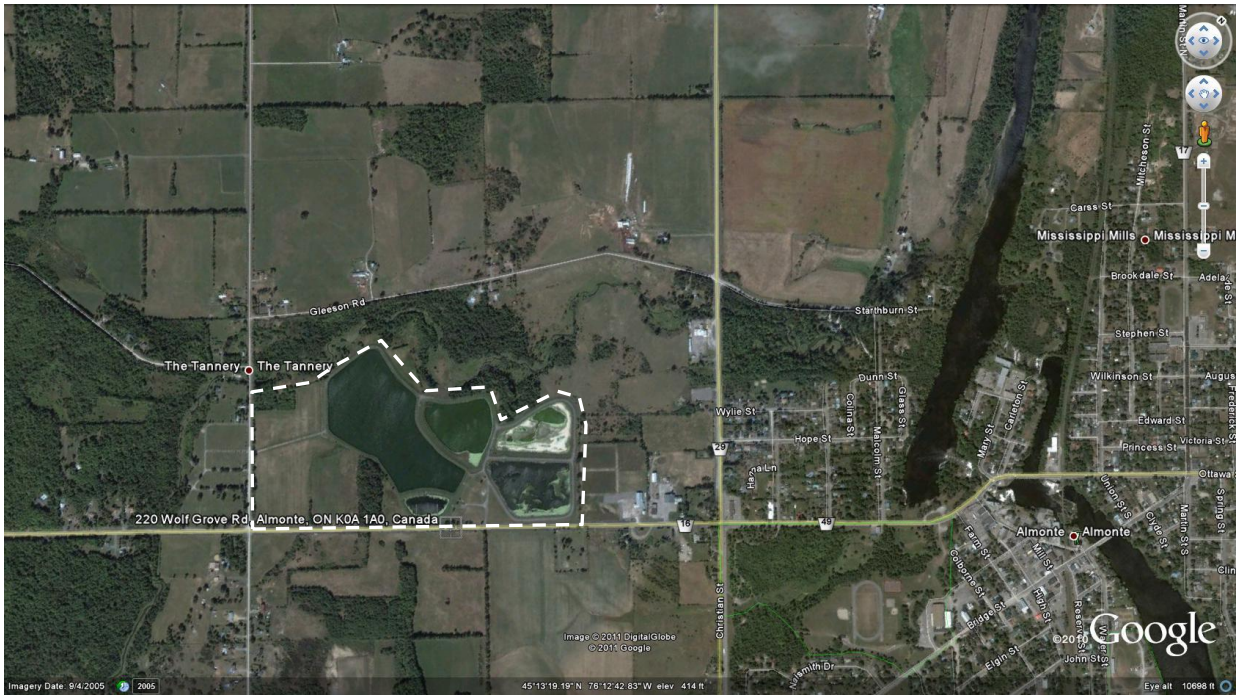
recently been made public via local news agencies. In its preliminary stages of discussion, we understand that the facility (if put forward) would propose to accept less than 1000 tonnes/day, which would not require an Environmental Assessment. Some obstacles with the facility include provincial significant wetlands in the area, potential zoning changes. However, it appears at this time that these resolutions can be met.

As part of Waste Management Inc's application to expand the Carp Landfill, they have secured approvals to operated a transfer facility that would allow for the acceptance of 400 tonnes/day of waste to be transferred through that facility. With the transfer facility approved, Waste Management is finalizing the public consultation portion of the application process to expand their landfill. If approved, it is anticipated that it would still be another 3 years before Carp would begin accepting waste as part of any expansion program.

5.2.3 Constructing A Transfer Facility

The Town of Mississippi Mills owns property located on the outskirts of Almonte that is zoned as Waste Disposal Open Space (see Figure 9). The property, located on Wolfgrove Road, is the current location for the Town's sewage treatment lagoons. The Town has plans to open a new sewage treatment plant, which will result in the closure of some lagoons. As this site is currently designated for waste management activities, it could be used for a waste transfer facility. The Town could apply for a transfer facility at this location to accommodate less than 1000 tonnes/day which would then avoid any requirement for a full environmental assessment. This would centralize the location of a transfer facility for the Town as the current facility is located within City of Ottawa boundaries.

Figure 9: Location of 212/220 Wolfgrove Road



Furthermore, the Town also owns 4.68 hectares of property zoned for waste management located on Concession Road 5 in the Township of Ramsay, which is currently occupied by the Former Ramsay landfill. The Ramsay landfill site is currently closed and the licensed fill area measured approximately 1.6 hectare in size which leaves approximately 3 hectares that could be used for waste management. However, the site consists primarily of wetland/hazard land and is not practical for development and therefore, is not considered a current option as a transfer facility. It is anticipated that any request to develop the site into a transfer facility would have to go through an MOE approval processes and potentially fill in one of the existing wetlands. It is our understanding that notices exist to prevent new development within 500 m radius of the closed landfill site[14].

5.2.4 Summary of Advantages and Disadvantages

Each of the disposal options have a variety of issues that have been considered as part of the options evaluation in section 6. The issues are reviewed in Table 7 below.

Table 7: Advantages and Disadvantages of Disposal Options

Option	Advantage	Disadvantage
Re-open Howie Road Site	• Full control of waste disposal operations and associated tipping fees • Site is approved as an existing landfill and has a lifespan of 8 to 10 years under the current waste disposal practices. Lifespan can expand in the event that waste diversion practices are adhered to. • Lots of landfill infrastructure (fencing, buffer zones, trees, monitoring well networks, weigh scale) is already in place • There is limited potential for expansion on the site • Can potentially accept waste from other Townships and generate revenue. This would consequently decrease the site's life expectancy. • Site has buffer from roadway/houses and has no downgradient well users	• Potential neighbourhood complaints regarding operating a landfill • Town would have to purchase compactor and loader and hire some site attendants, which can be costly • There is some information suggesting that the Town may not be able to accept waste from other Townships without some objection from the public/City based on By-Law 234 • Potential for increased leachate generation on site associated with additional wastes. • Additional environmental monitoring and risk

[14] Another closed landfill site - the Almonte Waste Disposal Site, CofA Number A451703 – is located off Martin Street and has been closed since 1984.

Option	Advantage	Disadvantage
Expand Howie Road Site	• Can increase lifespan by 10 years, if approved • Can operate as a transfer and waste disposal facility during the expansion approval process	• The site is located within the City of Ottawa and would require their planning approval for expansion • The expanded part of the site, under current requirements, now requires an engineered landfill solution (membranes, leachate collection) which is considered to be costly • The approval process for landfill expansion can extend to between 5 to 7 years and is costly • There is the potential that expansion can be refused by the approval authorities or by the City with regards to zoning changes • The anticipated additional volume is somewhat unknown based on potential zoning issues and proximity to the provincial significant wetlands • Additional environmental monitoring and risk
Export Waste to externally owned site	• Town contracts the waste handling operations • Minimizes potential complaints regarding operation of landfill site • Minimizes Environmental Risk associated with landfill.	• Town has little control over increased tipping fees • Risk of service delivery (i.e. scenario of Carp providing little notice of the end to waste disposal contract) • The Town would have to close or cap the Howie Road landfill at an estimated cost of $740,000 (based on the 2009 O&D report) and continue monitoring
Build a new transfer facility in a centralized location	• Would allow for a centralized transfer facility within the Town • Potential for public/private partnership	• Operating two transfer facilities will increase the Town's operating cost • MOE approval not guaranteed and process could take over a year

6 Recommendation of Preferred Program

6.1 Evaluation of Diversion Options

The waste diversion options were evaluated using the following criteria:

- Affect on waste diversion (how much additional waste diversion the option will provide);
- Social impact and acceptability (whether the option would be accepted or used by the public);
- Track record of technology/program (if the option has worked in this or other municipalities);
- Cost effectiveness (the added cost or savings of the option); and
- Ease of implementation (how easy or difficult it would be to implement the option).

The options were scored on a scale of 1 to 5. Table 8 describes the rating system for scoring the options. The results of the evaluation are provided in Table 9.

Table 8: Evaluation criteria scoring

Criteria	**Score (range: 1 – 5)**		
	1	**3**	**5**
Affect on waste diversion	Reduces waste diversion	No or little increase on waste diversion rate	Large increase in waste diversion rate
Social impact and acceptability	Disliked by public	Public would have little or no opinion on option	Public in favour of option
Track record of technology/program	No track record, has not been done before	Option has had some success in a few municipalities	Option is commonly used
Cost effectiveness	High cost or low cost-effectiveness	Little to no additional cost to current program	Option will result in cost savings
Ease of implementation	Difficult to implement	Some effort required to implement	Easy to implement

Table 9: Results of Diversion Options Evaluation

Diversion Option	Criteria					
	Affect on Waste Diversion	**Social Impact and Acceptability**	**Track Record of Technology/ Program**	**Cost Effectiveness**	**Ease of Implementation**	**Total**
Expanded Yard Waste Collection	4 *Large potential for diversion*	5 *Should be accepted by public, easy to use*	5 *Common in many municipalities*	2 *Will have some increase in collection/ processing costs*	4 *Should be straight-forward to implement*	**21**
Increased Promotion and Education (P&E)	4 *P&E required to support other programs, increase participation*	5 *Public generally in favour of increased education*	5 *Strong correlation between effective P&E and diversion rates*	2 *Will have some increase costs*	5 *Should be straight-forward to implement*	**21**
Promotion of MHSW Alternatives/ Events	3 *Little increase in diversion rate, although will divert potentially hazardous materials*	5 *Public generally in favour of opportunities to divert MHSW*	5 *Common in many municipalities*	3 *Will have negligible cost increases (can be tied into increased P&E)*	5 *Should be straight-forward to promote options for MHSW recycling*	**21**
Enhancing Recycling (adding plastics to curbside)	4 *Will raise waste diversion rate slightly*	5 *Public feedback has indicated desire for curbside plastics*	5 *Common in many municipalities*	2 *Will have some increase in collection/ processing costs*	3 *Will require adjustments to collection contract, promotion to public*	**19**
Enhancing Recycling (weekly collection in Pakenham)	4 *Will encourage greater participation in program, likely increasing diversion from that area*	5 *Public feedback has expressed desire for weekly recycling collection in Pakenham*	5 *Weekly collection available in other parts of Mississippi Mills*	2 *Will have some increase in collection/ processing costs*	3 *Will require adjustments to collection contract, promotion to public*	**19**
Curbside Organics Collection	5 *Large potential for diversion*	4 *In conjunction with education, program easy to use*	5 *Common in many municipalities, significant contributor to diversion*	2 *Will have costs for collection and processing (either locally or export)*	2 *Will require planning for contracting, cart purchase and roll-out, public education*	**18**

Diversion Option	Criteria					
	Affect on Waste Diversion	**Social Impact and Acceptability**	**Track Record of Technology/ Program**	**Cost Effectiveness**	**Ease of Implementation**	**Total**
Bi-weekly Garbage Collection	4 *Will encourage participation in other diversion programs*	2 *May be viewed as a service cut or as potentially inconvenient*	5 *Common in many municipalities, generally leads to increased diversion*	4 *Reduces garbage collection costs*	3 *Will require adjustments to collection contract & scheduling, promotion to public*	**18**
C&D/Renovation Waste Diversion	4 *Will increase diversion of C&D/renovation waste*	3 *Little opinion expressed on this topic by public*	4 *C&D/renovation waste segregation occurs in some municipalities*	3 *Will have negligible net cost increases*	2 *Will require adjusting how waste is received and sorted at Howie Road landfill, educating customers*	**16**
Zero Waste Policy	4 *Will encourage diversion at municipal facilities*	4 *Public generally in favour of when municipalities lead by example*	3 *Option in place in some municipalities*	3 *Will have negligible net cost increases*	2 *Will require policies to be put in place, operational procedures updated, education of staff/facility users*	**16**
Additional Diversion Depots	4 *Will provide additional opportunity for diversion*	4 *Public generally in favour of increased diversion opportunities*	4 *Depots commonly used by municipalities for diversion*	2 *Will have some increase in collection/ processing costs*	2 *Will require identification /establishment of depot sites, collection of material, public education*	**16**
Clear garbage bags	4 *Will encourage participation in other diversion programs*	1 *Public can have privacy concerns. Little support expressed at open house.*	4 *Experience in other municipalities shows it encourages participation in diversion programs.*	3 *Will have negligible net cost increases*	2 *Will require education of public and collection staff, tie-in with enforcement*	**14**

6.2 Evaluation of Disposal Options

The waste disposal options were evaluated with the same criteria, with the exception of "effect on waste diversion," which was replaced with "environmental effects". The options were scored against the criteria on a scale of 1 to 5. Table 10 describes the rating system for scoring the disposal options. The results of the evaluation are provided in Table 11.

Table 10: Evaluation criteria scoring (disposal options)

Criteria	**Score (range: 1 – 5)**		
	1	**3**	**5**
Environmental effects	Greater environmental risk	No environmental risk	Improves environment
Social impact and acceptability	Disliked by public	Public would have little or no opinion on option	Public in favour of option
Track record of technology/program	No track record, has not been done before	Option has had some success in a few municipalities	Option is commonly used
Cost effectiveness	High cost or low cost-effectiveness	Little to no additional cost to current program	Option will result in cost savings
Ease of implementation	Difficult to implement	Some effort required to implement	Easy to implement

Table 11: Results of Disposal Options Evaluation

Disposal Option	Criteria					
	Environmental Effects	**Social Impact and Acceptability**	**Track Record of Technology/ Program**	**Cost Effectiveness**	**Ease of Implementation**	**Total**
Export waste	2 *Increase shipping distance will contribute transportation-related GHG emissions*	4 *Current practice of exporting waste generally accepted*	5 *Current practice; many municipalities export waste for disposal*	3 *Current practice (no cost increase over regular annual increases)*	5 *Continue with current practice*	**19**
Build transfer facility	2 *Impacts of resource use to build facility*	4 *Could be potential recycling/re-use facility*	5 *Common waste management practice*	2 *Costs associated with building of transfer station.*	4 *Should be straight-forward to implement*	**17**
Expand Howie Road landfill	1 *Location near sensitive wetland, site has high water table*	1 *General public and local area residents not in favour of expansion*	2 *Approvals process could be difficult. No guarantee that expansion would be approved*	1 *Costs associated with approvals process, required studies and engineering solutions*	2 *Site plan approval from City of Ottawa and MOE approvals process could be onerous; environmental risks would need to be managed*	**7**

6.3 Recommended Diversion and Disposal Options

Based on the evaluation of options in section 6.2, the Strategy recommends a number of waste diversion and disposal programs and initiatives described below. The recommended future waste management system will divert approximately 2,640 tonnes and will help the Town reach its waste diversion target of 60%. In particular, these options will help to increase the diversion of food waste, yard waste, paper and plastics, which will be needed for the Town to achieve its waste diversion target. These items provide the Town with the greatest opportunities for waste diversion: diverting available kitchen and food waste alone could raise the Town's diversion rate by as much as 17 percentage points.

The waste diversion options range in cost and complexity to implement; therefore, initiatives that require few resources and are relatively easy to implement have been recommended in the short term, and those initiatives that require more planning and resources for implementation have been recommended over the long term.

6.3.1 Short Term

Based on the results of the evaluation process, the following waste diversion options are recommended for implementation in the short term (1 – 3 years):

1. Expand the current yard waste collection program from twice per year to include a total of at least two to three collections each spring and fall for composting.
2. Develop and implement a multi-year waste management communications strategy. The communication strategy should examine barriers to participation in the Town's waste diversion programs and identify opportunities for overcoming them. Structuring the strategy over 2 to 3 years will help the public works department better coordinate its resources, identify cost-sharing opportunities with other departments, and coordinate promotion and education activities with planned waste management improvements. The strategy should address all waste management streams, including disposal, recycling, organics (e.g., backyard composting), MHSW, and other streams. It should also look to capitalize on provincial programs, such as generic education and promotion materials provided by the Continuous Improvement Fund, provincial stewardship programs, and available retail take-back programs.
3. Assess the feasibility of adding the mixed plastics that are currently collected via the depot to the current curbside collection program. If deemed feasible, these materials should be added to the next contract tender for the collection and processing of recyclables.
4. In the next contract tender for the collection and processing of recyclables, instruct bidders to provide pricing for both weekly and bi-weekly collection of recyclables in Pakenham to assess the feasibility of implementing weekly service.
5. Create a full-time waste management coordinator or equivalent through other methods, i.e. consultant or contracted. Currently, waste management operations are being primarily managed part time by the Town's Public Works Technologist and the Director of Roads and Public Works. In the near future, the Town's waste management staff-time demands are expected to increase, particularly through addressing the Town's waste disposal issues and implementation of this strategy. Adding a full-time waste management coordinator position would help to ensure that the Town has sufficient staff resources to address the Town's current and future waste management responsibilities.
6. A curbside household organics collection program is needed in order for the Town to achieve its waste diversion target of 60%. In preparation for the program's implementation, the Town should:
    - Confirm whether the program will only include urban areas of Mississippi Mills, or be implemented Town-wide;
    - Assess whether the Town should develop its own household organics composting facility or export to an existing facility; and
    - Pilot test the program and its communication materials prior to the program's roll-out. Potential details of the pilot include:
        - Coverage of about 250 homes;
        - Duration of at least six months;

- Separate measurement of organics waste, garbage and blue box materials collected, to assess the amount of organics diverted;
- Periodic measurements of setout rates to gauge participation in the pilot;
- A survey shortly after the pilot's rollout and at the end of the pilot to measure the participant's level of satisfaction and to identify opportunities for improvement; and
- Development of pilot communication materials, including a brochure, fridge magnet/reminder card, and a website.

The following waste disposal options are recommended for implementation in the short-term:

1. Continue exporting the Town's residential waste for disposal. Additional disposal and transfer opportunities (e.g., Plasco, Lafleche Environmental, etc) should be evaluated as they arise.
2. Continue using Howie Road as a transfer facility and for the disposal of large items, and enhancing its use as a recycling depot for shingles, drywall, and other divertible materials.
3. Complete a business case detailing the economic and logistic feasibility of discontinuing the landfilling of waste at the Howie Road Landfill site and exporting the waste usually landfilled there.

It is not recommended that the Howie Road landfill site be reopened for the purpose of full-time landfilling and/or be expanded for disposal at this time. Continuing to export the Town's waste for disposal ensures that the existing disposal capacity at the Howie Road landfill site is protected for future emergency use. Expansion of the landfill site is not recommended as the site has limited capacity, the approvals process would be costly, and there is no guarantee that expansion of the site would be approved. For example, the landfill has provincially significant wetlands to its south and west (opposite Howie Road), surface water bodies to its north, would require City of Ottawa site plan approval and there are residential communities in close proximity to its west and northeast, all of which may put such an expansion under close scrutiny by the regulatory agencies.

6.3.2 Mid to Long Term

The following waste diversion and disposal options are recommended for the mid to long term (greater than 3 years):

1. Once new recycling and organics diversion programs are in place and the Town's waste management education strategy has had time to work, the Town should consider implementing bi-weekly collection of garbage.
2. Assess the feasibility of developing a waste transfer/community recycling facility at the current municipal site in a central location, such as the Town of Almonte. Design of any future transfer facility should include segregated drop-off areas for:
   - General garbage;
   - Large or bulk load waste items;
   - Recyclable materials, including blue box materials and scrap metal;

- Appliances;
- Construction or renovation waste, such as wood waste, shingles, drywall, etc;
- Household special waste, including hazardous wastes;
- Leaf and yard waste; and
- Reusable household items.

3. Based on the waste diversion results of the short-term recommendations and a reassessment of residents' level of satisfaction with the Town's waste diversion services, assess the need for providing additional public recycling depots at strategic locations. In addition to the centralized site and the site in Pakenham, placing a depot in Appleton for example, would extend additional recycling opportunities to residents in the southern portion of Mississippi Mills.
4. Implement a zero waste policy at municipal buildings and facilities.

The Strategy does not recommend implementing the clear bag option at this time due to lack of public support. However, the municipality may wish to reassess this option in the future if it requires additional waste diversion measures to meet its target.

Table 12: Summary of Waste Diversion Recommendations

	Recommendation	Estimated Operating and Capital Cost	Estimated Diversion Increase (%)	Estimated Diversion Increase (tonnes)
Waste Diversion Options				
1.	Expand yard waste program	Operating: $19,000 - $20,000	5%	200 - 250
2.	Enhanced promotion and education	Operating: $6,500	5% - 10% (in support of other programs)	230 - 460
3.	Mixed plastics	To be confirmed in assessment	2%	90
4.	Weekly Collection of Recyclables in Pakenham	To be determined through tender process	1% - 3%	40 - 140
5.	Waste Management Coordinator	Operating: $70,000	Supports overall diversion efforts	
6.	Household Organics Collection and Processing	Feasibility assessment/ pilot:$25,000 Capital: Program implementation (including purchase of carts, not including facility costs): $135,000 Annual operating: $144,000 (assumes County-wide; offset by potential garbage collection and disposal savings)	15% - 17%	680 - 780
7.	Consider reducing garbage collection frequency	Savings to be determined through tender process	2% - 3%	90 – 140
8.	Additional recycling depots	Capital: $20,000	2% – 3%	90 – 140
9.	Zero Waste Policy	Capital: $1,000	1%	40 - 50

7 System Financing

7.1 Cost of Preferred System

The net cost of the current (2010) solid waste management collection, processing and disposal system is approximately $1.068M annually (presented in Table 1 in section 4.3.1). The net operating cost of the preferred waste management system is approximately $1.149M, or about $81,000 more than the existing system. While the curbside household organics program, additional collection and processing of recyclables, and the waste management coordinator position are new costs, they are offset by the reduced collection and disposal costs associated with the tonnage of material now diverted.

It is important to note that these are gradual costs that would be incurred as the waste management system matures. For instance, the net overall cost of recycling will increase as more recyclables are diverted from disposal and processed. However, it will take time for the Town to foster this increase in recycling using the options recommended in this strategy.

The options will have capital budget considerations, primarily through the implementation of a curbside green cart organics collection program. The capital budget considerations include:

- Feasibility assessment and pilot of organics green cart curbside collection program: $25,000[15], including:
  - Project planning and logistics: $11,000
  - Carts and other capital materials: $10,000
  - Communications: $4,000
- Implementation of the curbside organics program: $135,000, including:
  - Purchase and delivery of containers: $108,000
  - Promotion and education: 27,000
- Establishing new waste diversion depot: $20,000; including
  - $12,00 for bins (assumes up to 7 bins @ ~$1,700 each);
  - $2,500 for depot signage and installation; and
  - $5,500 for planning and siting.

It should be noted that the costs associated with the implementation of the curbside organics program and its annual operating costs assume implementation of the program Town-wide. If the program is implemented only in the urban/sub-urban areas, the implementation costs would be lower (due to fewer households) and the total collection and processing costs would also be lower (due to fewer stops and less organics tonnage collected).

[15] Based on typical cost of $100 per household in pilot.

Table 13: Annual Operating Cost of Preferred Waste Management System

Summary of Preferred Waste Management System Costs

Program	Net Cost	Tonnes Managed [a]	Net Cost/Tonne
Administration	$8,479	-	
Curbside Garbage Collection and Disposal	$302,127	1,427	$212
Landfill Operations and Disposal	$251,471	358	$702
Recycling Collection and Processing [b] ***enhanced***	$285,935	1,172	$244
Leaf and Yard Waste Collection ***enhanced***	$15,496	262	$59
Municipal Household Special Waste (MHSW)	$11,873	16	$766
Large Items	$27,236	100	$272
Waste Depot Operations	$7,251	286	$25
Reuse Centre Grant	$7,500	-	-
Promotion and Education ***enhanced***	$6,200	-	-
Full time WM Coordinator (or equivalent) ***new***	$70,000	4,606	$15
Household Organics Curbside Collection and Processing [c] ***new***	$155,439	777	$200
Net Waste Management Costs	***$1,148,800***	***4607***	***$247***

Notes:
a) Tonnage is not necessarily cumulative. Diversion from non-municipal programs (e.g., take back programs) is not listed.
b) Costs based on net cost per tonne of for recycling (collection and processing) of Town's 2010 blue box program.
c) Household organics refers to kitchen and food waste. Tonnage assumes program implemented across jurisdiction.

7.2 Financing Alternatives

The proposed solid waste management system is not expected to significantly change the Town's existing waste management costs, primarily due to avoided costs from the collection and disposal of material in the garbage stream.

Currently, the Town funds its solid waste management services through:

- Bag tag revenue[16];
- Tip fees;
- The sale of recyclable materials;
- The municipal tax base; and

[16] As noted in 4.3.1 and 4.3.2, the Town distributes 60 free bag tags to households and 200 free bag tags to businesses, while additional bag tags cost $2 each. In 2010, bag tag sales provided $13,000 in revenue.

- Other incidental items (e.g., sale of blue boxes and backyard composters).

Additional revenue options Mississippi Mills could initiate to increase funds for the new solid waste management system could be to:

- Eliminate the distribution of free bag tags, or reduce the amount distributed; i.e. 1 free bag/week
- Increase tip fees at the landfill site; and/or
- Consider imposing a two-tier garbage fee that would charge the IC&I sector a higher fee for disposing their garbage at the Howie Road facility than the residential sector.

Table 14 below presents four possible alternative scenarios and their resulting amount of revenue. While the amount of garbage set out for collection will vary from household to household, and average amount of 2 bags per household have been used[17] to demonstrate the potential effect of each scenario.

Table 14: Alternative Bag Tag Scenarios

Scenario	Cost of Bag Tag	Number of Bags requiring Tag each Week	Total Revenue
No free bag tags, $2 per bag tag	$2	2	$1,067,248
No free bag tags, $1 per bag tag	$1	2	$533,624
No free bag tags, 1 free bag with $2 per extra bag tag	$2	1	$533,624
No free bag tags, 1 free bag with $1 per extra bag tag	$1	1	$266,812

Note: Assumes 52 weekly collections from 5,131 households.

The Town could also increase tip fee charges for waste dropped off at Howie Road. This could include eliminating the free pass distributed by the Town. For example, a report from the Environmental Advisory Committee to the Roads and Public Works Committee estimated that eliminating the free dump pass would raise the tip fee revenue by about $30,000[18].

Beyond increasing the cost of bag tags and raising tip fees, the Town's options to generate additional revenue through its waste management system are limited. The Town could consider imposing a two tier garbage fee that would charge the IC&I sector a higher fee for their garbage than the residential sector. A more detailed study would have to be completed to assess the full impact of a two tier fee.

[17] While the Lanark County Recycling Strategy waste audit report indicates an average of 1.4 bags of garbage, for the purposes of this study, the average has been rolled up to 2, as a partial bag would still be considered a bag requiring a tag.
[18] Based on the number of free passes used and assuming they used on average half of the maximum weight.

The cost to implement new waste management initiatives can be a barrier for many small municipalities. A number of funding opportunities exist to overcome possible financial issues. These include low interest loans and grants from provincial and federal programs. Government funding programs available to assist municipalities develop and implement waste diversion programs and infrastructure include:

- **Continuous Improvement Fund:** The Provincial Government created the Continuous Improvement Fund (CIF) as part of the Blue Box Program Plan created as a result of Ontario's Waste Diversion Act (2002). The objective is to help achieve the provincial government's goal of diverting Blue Box materials from the waste stream through an efficient and effective system. The Fund offers financial support to Ontario municipalities for residential "Blue Box" recycling projects and seeks to help municipalities reduce costs and increase tonnes recovered. Applications for the next round of funding will be accepted in the summer of 2012. Funding categories include:
  - Best Practices;
  - Innovation;
  - Emerging Technologies; and
  - Communication & Education.

- **Green Municipal Funds:** The Federation of Canadian Municipalities has established the $100 million Green Municipal Investment Fund (GMIF) and the $25 million Green Municipal Enabling Fund (GMEF), which are designed to encourage advances in environmental technology and innovation. The expectation is that knowledge and experience gained with support from GMIF/GMEF in best practice and innovative environmental projects will be applied nationally to program and infrastructure projects. For example, the fund could provide funding for capital and operating expenditures having to do with the study and implementation of new waste diversion initiatives.

8 Implementation and Monitoring

For the purpose of implementing the SWMS as outlined in this report, it is necessary to consider variable start-dates for the initiatives outlined in the recommended waste management system. While many initiatives could essentially be started right away, considerations such as alignment with waste collection contracts, infrastructure requirements, capital investments and other intermediate steps and studies determine the need for staggered implementation.

It is important to plan for a highly flexible implementation schedule in order to respond to changes over time such as adjusted market conditions or innovations in technology. Due to the constant change of circumstances and priorities, the SWMS initiatives deferred for future implementation should be reviewed again for suitability prior to their launch. Once the SWMS has been approved by Council, Town staff will develop an implementation plan. The implementation plan should be flexible enough to reflect the:

- Outcome of any required assessments;
- Financial priorities and available funding;
- Availability of staff and contractors; and,
- Availability of infrastructure.

The proposed implementation schedule for the preferred waste management options are presented in Table 15.

Table 15: Implementation Schedule

Option	Implementation Timeline
Short Term (2012 – 2014)	
Expand yard waste program	2013
Develop and implement multi-year communications strategy	Design: 2012 Implementation: 2012 – 2014
Assess feasibility of mixed plastics at depot	Assessment: 2012 or 2013 Implementation (if feasible): 2013
Pricing of bi-weekly/weekly collection of recyclables in Pakenham in next recycling collection tender	During next recycling tender
Create full-time waste management coordinator position or equivalent	2013
Curbside organics collection program	Confirm scope of program: 2012 Assess approach to processing: 2012 Design and implement pilot: 2012-2013 Implement program: 2014
Continue with export of waste	2012
Continue using Howie Road as transfer facility site	2012
Mid to Long Term (2015 and later)	
Reconsider bi-weekly garbage collection (if organics program in place)	2016
Zero waste policy at municipal buildings and facilities	2016
Waste transfer facility in central location	Assess feasibility: 2017 Design/build: 2018-2019
Community recycling depots	Assess requirement: 2017 Establish, if necessary: 2017-2018

The implementation and performance of the waste diversion programs must be monitored on a regular basis to:

- Review the effectiveness of the SWMS;
- Recommend changes to the SWMS as required to maximize diversion of waste from disposal; and,
- Report results back to Council and the public.

The SWMS should be formally reviewed at a minimum of every five years to evaluate achievements, assess new programs and technologies, and recommend future actions to ensure the SWMS performs to maximum efficiency and effectiveness.