

Joint Waste Diversion Strategy

Working Together
Toward a
Sustainable
Residential Waste
Management
System



Aurora
East Gwillimbury
Georgina
King
Markham
Newmarket
Richmond Hill
Vaughan
Whitchurch-Stouffville
York Region



Table of Contents

Executive Summary	5
1. Introduction.....	7
1.1 Background	7
1.2 Development of the Document.....	8
1.2.1 Public Consultation.....	9
2. Overview of the Existing Waste Management System	13
Aurora.....	13
Town of East Gwillimbury	14
Town of Georgina	14
Township of King	14
Town of Markham	15
Town of Newmarket.....	15
Town of Richmond Hill.....	16
City of Vaughan	17
Town of Whitchurch-Stouffville	17
York Region	18
3. Waste Generation and Diversion.....	19
3.1 Population Growth	19
3.2 Waste Generation	19
3.3 Waste Composition.....	20
4. Waste Management Planning Influences.....	23
4.1 Regulatory Requirements for Waste Diversion in Ontario.....	23
4.2 Ontario Waste Diversion Act	23
4.3 Stewardship Ontario.....	24
5. Recommendations for the Implementation of a Waste Diversion Strategy	25
5.1 Diversion Targets.....	25
5.2 Overview of the Preferred Waste Diversion Components	28
5.3 Implementation and Monitoring.....	35
5.4 Further Studies	38
6. Infrastructure	39
7. Cost.....	45
8. Funding Opportunities	49
9. Summary	51

List of Appendices, Tables and Figures

List of Appendices:

- A: Map of York Region and Local Municipalities
- B: Existing Municipal Programs and Frequency of Collection as of May 2006
- C: Ministry of the Environment – Ontario's 60% Waste Diversion Goal
- D: York Region Environmental Assessment Terms of Reference

List of Tables:

- Table 1: Waste Diversion Options
- Table 2: 2005 Estimated Population
- Table 3: 2005 Waste Tonnages
- Table 4: Residual Waste Composition
- Table 5: Implementation Priority
- Table 6: Program Initiative Tonnage and Cost

List of Figures:

- Figure 1: Waste Composition by Weight
- Figure 2: Current System
- Figure 3: Preferred System – Priority Initiatives
- Figure 4: Future Initiatives
- Figure 5: Residential Diversion Tonnage and Infrastructure Requirements
- Figure 6: Public Drop-off Locations for Recyclable Material
- Figure 7: Public Drop-off Locations for Household Hazardous Waste
- Figure 8: Public Drop-off Locations for Household Hazardous Waste
- Figure 9: Total System Cost vs. Diversion Target

Executive Summary

York Region and its 9 local municipalities have developed a strategy to manage the recyclable and organic material that remains in the residential waste stream. The development of the Waste Diversion Strategy (Strategy) was completed by the Inter-municipal Waste Diversion Committee. The Committee consisted of member representatives from each of the 9 local municipalities and York Region.

In 2005 the municipalities in York Region diverted approximately 34% of the residential waste from disposal. The Committee's objectives were to design a waste diversion system that will divert approximately 65% of the residential waste stream from disposal in the short term and increase this rate to over 70% in the 10-year planning horizon of the Strategy. To meet these objectives, the following waste diversion components were proposed for consideration as part of the potential waste diversion system:

Option	Description	Diversion Potential
Source Separated Organics Diversion	Diversion of household compostable wastes excluding yard waste. Requires specialized containers, collection and processing.	30%
Optimized Blue Box Diversion	Weekly collection; addition of new materials; using bags and alternative collection containers; and/or collecting from local schools.	8%
Improved Yard Waste Diversion	Improved collection service across all municipalities to a minimum of biweekly collection (April – November).	5%
Use of Community Environmental Centres	Location of convenient and accessible depots to receive reusable and recyclable materials and waste that cannot be set out for curbside collection.	5%
Use of Mandatory By-laws	Development of by-laws by the Region and local municipalities to mandate recycling and/or restrict collection of waste containing recyclables.	5%
Use of Bag Limits & Financial Incentives	Restriction of the number of bags of garbage set out for collection. Often combined with financial incentives such as bag tags that require payment for any additional amounts set out.	5%
Enhanced Communication and Public Outreach	Expanded and cooperative promotion and education efforts by both levels of government using multi-media and public engagement techniques and tools.	3%
Construction & Demolition Diversion	Diversion of reusable and recyclable waste from residential and/or commercial renovation & construction.	2.5%
Textiles Diversion	Engagement of not-for-profit organizations such as Goodwill Industries to divert clothing and other goods via a collection or drop-off program.	2%
Expansion of Regional Processing Infrastructure	Expansion/upgrading of the Region's Material Recovery Facility (MRF) and development of new Community Environmental Centres (CEC) and/or composting facilities to meet local municipal needs in a timely manner.	N/A
Expanded Advocacy Efforts by the Region	Lobbying of organizations/governments responsible for policy decisions such as "over packaging".	N/A

The Committee evaluated 11 potential waste diversion initiatives based on their waste diversion potential, cost, past performance and reliable end use for material. Once the evaluation was complete, the Committee agreed to 8 priority and 3 future initiatives as follows:

Priority Initiatives:

- Source Separated Organics
- Optimized Blue Box
- Community Environmental Centres
- Bag Limits/Financial Incentives
- Enhanced Communication and Public Outreach
- Diversion of Textiles
- Infrastructure Development
- Advocacy

Future Considerations:

- Bi-weekly Yard Waste Collection
- Mandatory Recycling By-law
- Small Quantity Industrial, Commercial & Institutional (IC&I) Waste Generators

These waste diversion options are inter-connected in a variety of ways to create a potential waste diversion system that could be used to reduce the amount of waste going to disposal. The Committee has also agreed to continued research of new initiatives and technologies that may arise in the future to assist the local municipalities and York Region to maximize the diversion of waste from disposal.

The implementation of the Strategy's initiatives will require the development of new infrastructure and enhancement of existing infrastructure to manage increased tonnages and new materials such as food waste.

Infrastructure enhancements include:

- Increasing capacity of York Region's Material Recovery Facility;
- Siting and construction of Community Environmental Centres;
- Capacity to compost organic food waste; and
- Additional yard waste composting capacity.

The cost of implementing the priority initiatives over the Strategy's 10-year planning period is estimated to be approximately \$13 million to \$23.4 million or \$54.00 to \$97.50 per household annually for operating and \$20-\$35 million for capital costs.

1. Introduction

1.1 Background

In the past, York Region has expended a large amount of time and money attempting to locate new landfill capacity. The most recent effort was the Provincial Interim Waste Authority's Greater Toronto Area (GTA) based Environmental Assessment (EA) process that cost in excess of \$100 million. This caused significant social disruption and was terminated before any new disposal capacity was approved. In response to the closing of the Keele Valley Landfill Site and the inability to develop new local disposal capacity, York Region, along with other GTA municipalities, has chosen to export their residual waste to landfill in the State of Michigan.

The growing opposition by the State of Michigan to the import of waste from Canadian municipalities could lead to the future closure of the Canada-United States border to waste shipments. As a result, the exportation of residual wastes is not considered a viable long-term solution. In response, the Region and its local municipalities want to find a local waste management solution that is economically, environmentally, socially and politically acceptable and sustainable. In April 2005, the Region initiated a joint EA in partnership with Durham Region to identify a long-term solution for the management of residual waste that is not recycled or diverted through waste reduction and diversion programs.

At the October 2005 meeting of Regional Solid Waste Management Committee, concerns were raised that the goal of 60% diversion originally proposed in the EA terms of reference was too conservative and would potentially limit the Region's flexibility in defining the outcome of the EA process. Furthermore, the Region's original waste management strategy is more than eight years old and in many ways no longer reflective of the current situation facing the Region and local municipalities. Recent improvements to the local Blue Box program, and efforts to implement new programs such as the diversion of source separated organics underscore the need to coordinate collection, processing and budgetary planning efforts across both the municipal and regional levels of government. Development of an effective waste diversion strategy, therefore, requires the support and involvement of all ten municipalities and Regional governments.

The development of a municipally supported Waste Diversion Strategy to manage the recyclable and compostable segments of residential waste would help to determine what level of diversion the Region could expect to achieve during the timeframe recommended within the EA. Furthermore, it would also set the context for a long term region-wide waste diversion system.

Therefore, in January 2006, Regional Council requested that staff prepare an updated Waste Diversion Strategy for public consultation and finalize it by the end of summer, 2006. It should be noted that while reduction and reuse are recognized as important components to minimize the disposal of waste, the scope of the Waste Diversion Strategy focuses on recommendations to maximize diversion of the remaining

residential curbside waste. Future work will be completed to address reduction and reuse of waste.

Furthermore, IC&I waste is also an integral part of the wastes handled by the Region and local municipalities. Therefore, while the tonnages and diversion targets discussed in this document refer only to residential waste, it should be noted that IC&I material is also managed through the Region's transfer stations; collection in Business Improvement Areas (BIAs); and through the collection of commercial multi-residential buildings. The management of small quantities of IC&I waste will have to be taken into consideration when the infrastructure required to implement the Waste Diversion Strategy is developed.

1.2 Development of the Document

In January of 2006, the 10 governments, including The Town of Aurora, Town of East Gwillimbury, Town of Georgina, Township of King, Town of Markham, Town of Newmarket, Town of Richmond Hill, City of Vaughan, Town of Whitchurch-Stouffville and York Region, committed to participate in the development of a new residential Waste Diversion Strategy. Waste management representatives from each of the 10 municipalities formed the Inter-municipal Waste Diversion Committee (IMWDC) to participate in and oversee the development of a new Waste Diversion Strategy.

Upon commencement of the project, individual discussions were held with each municipality to assess their current waste diversion activities, community characteristics and priorities. Municipalities were also asked to provide input on options to improve current waste diversion programs and potential waste diversion initiatives including issues and barriers to their implementation. Staff were also asked to provide insight into a diversion target that their local Councils would likely support within the Strategy's 10 year timeframe.

Once the above information was collected and evaluated, the Committee convened a series of 4 workshops to review and evaluate a list of potential diversion initiatives and their associated barriers, costs, and requirements for implementation (Table 1 below outlines the list of diversion initiatives reviewed by the Committee). The list of diversion initiatives was developed based on the knowledge and expertise of the group and successful initiatives and strategies implemented by other municipalities that would build upon existing programs and address specific waste diversion needs of the community. Once the Committee carefully considered the list of waste diversion options, the initiatives were categorized into priority initiatives and future considerations which could be implemented in medium and long term planning horizons. Next, staff assigned diversion potential and general cost estimates to the options. The working group then worked with this list of initiatives and crafted diversion targets and priority and future objectives to create an effective, long-range strategy to decrease the amount of waste York Region manages through disposal.

Section 4 of this document outlines in more detail the initiatives recommended by the Inter-municipal Waste Diversion Committee as part of the proposed Waste Diversion Strategy.

Table 1: Waste Diversion Options

Option	Description	Diversion Potential
Source Separated Organics Diversion	Diversion of household compostable wastes excluding yard waste. Requires specialized containers, collection and processing.	30%
Optimized Blue Box Diversion	Weekly collection; addition of new materials; using bags and alternative collection containers; and/or collecting from local schools.	8%
Improved Yard Waste Diversion	Improved collection service across all municipalities to a minimum of bi-weekly collection (April – November).	5%
Use of Community Environmental Centres	Location of convenient and accessible depots to receive reusable and recyclable materials and waste that cannot be set out for curbside collection.	5%
Use of Mandatory By-laws	Development of by-laws by the Region and local municipalities to mandate recycling and/or restrict collection of waste containing recyclables.	5%
Use of Bag Limits & Financial Incentives	Restriction of the number of bags of garbage set out for collection. Often combined with financial incentives such as bag tags that require payment for any additional amounts set out.	5%
Enhanced Communication and Public Outreach	Expanded and cooperative promotion and education efforts by both levels of government using multi-media and public engagement techniques and tools.	3%
Construction & Demolition Diversion	Diversion of reusable and recyclable waste from residential and/or commercial renovation & construction.	2.5%
Textiles Diversion	Engagement of not-for-profit organizations such as Goodwill Industries to divert clothing and other goods via a collection or drop-off program.	2%
Expansion of Regional Processing Infrastructure	Expansion/upgrading of the Region's MRF and development of new Community Environmental Centres and/or composting facilities to meet local municipal needs in a timely manner.	N/A
Expanded Advocacy Efforts by the Region	Lobbying of organizations/governments responsible for policy decisions such as "over packaging".	N/A

1.2.1 Public Consultation

A draft Waste Diversion Strategy report was submitted to the 10 respective municipal Councils for their consideration and then released for public consultation. Over the months of July to September, 2006 local and regional staff jointly organized and held a number of consultative sessions. Public open houses were held at 4 central locations throughout the local municipalities. Representatives from several local environmental groups attended the sessions. A number of Regional and local councillors also

attended the sessions to lend support and facilitate discussion with residents. Staff also made presentations regarding the Waste Diversion Strategy to each of the local municipal Environmental Advisory Committees.

Furthermore, information about the Strategy, along with an explanation on how to provide comments, was posted on municipal web sites. The Strategy was also brought to the attention of residents at other public events organized by municipalities such as the Region's Environmental Assessment public consultation meetings. The following is a list of the locations and dates of the consultation activities for the Waste Diversion Strategy:

Activity	Location	Date
Public Open House	Oak Ridges Recreation Centre, Richmond Hill	June 21 st
Public Open House	City of Vaughan Civic Centre	June 27 th
Public Open House	York Region Waste Management Centre, East Gwillimbury	July 6 th
Public Open House	Town of Georgina Civic Centre	July 11 th
Newmarket EAC	Town of Newmarket Offices	June 7 th
Aurora EAC	Town of Aurora Civic Centre	June 12 th
Georgina EAC	Town of Georgina Civic Centre	June 13 th
King EAC	King Township Offices	June 22 nd
Markham EAC	Town of Markham Offices	June 29 th
East Gwillimbury EAC	Town of East Gwillimbury Offices	September 12 th
Whitchurch-Stouffville EAC	Town of Whitchurch-Stouffville Offices	September 18 th

Public attendance at the open houses was limited, averaging less than twelve residents per event. This low turnout was not entirely unexpected given that the events were held during the summer months and the budget to promote the open houses was limited. However, informal survey work conducted by Regional staff also revealed that even though residents knew of the open houses, they did not plan on attending as they had no concerns with the proposed Strategy.

In general, public feedback on the proposed Strategy and the various options were overwhelmingly positive and were broadly supported by the attendees. The primary concerns raised by attendees were aimed at enhancing some of the Strategy initiatives as follows:

- Yard Waste - The collection frequency of yard waste should be increased to a bi-weekly level of service as appropriate in each area municipality.
- Source Separated Organics - The implementation of source separated organics will result in an estimated 30% diversion rate increase and is the primary initiative required to achieve the 65% diversion goal. At all public consultation activities, there was overwhelming support for the source separated organics program as well as its immediate implementation in all local municipalities.

- Optimized Blue Box Collection - Need to expand the acceptable type of collection containers which residents can use and address further diversion opportunities within multi-residential buildings.

The public consultations also suggested that greater action by governments be taken to encourage and/or force businesses and industry to do more to divert waste. The majority of public comments regarding government action were centered on three key points including:

- Action by government to encourage manufacturers to reduce over packaging;
- Action by government to encourage manufacturers to make plastic packaging recyclable; and
- Action by government to encourage local businesses to establish recycling programs in stores and multi-residential dwellings.

The environmental groups contacted as part of the consultation process were also very supportive of the draft Strategy. Again, the most common comment was that local and Regional governments should be doing more to advocate for change by industry and businesses. These groups were also supportive of the Strategy as a means to minimize the amount of waste that must be managed through the Region's residual waste Environmental Assessment process.

Other comments received suggesting that the draft Strategy reconsider the recommendation to discontinue further consideration of diverting residential construction and demolition (C&D) waste. C&D waste was initially identified by staff as a possible diversion option. Subsequent discussion led staff to conclude that this option should be dropped as it is not normally handled in significant quantities curbside. Comments from the consultation process suggested that efforts should be made by all local jurisdictions to educate residents about non-municipal diversion (including charitable) opportunities for this material such as Habitat for Humanity.

The results of the public consultation program were incorporated into the final Waste Diversion Strategy. Furthermore, as the Strategy moves through the planning and implementation phases, further public consultation will be incorporated, where appropriate, into planning for new waste diversion initiatives.

2. Overview of the Existing Waste Management System

Waste management services are a shared responsibility between the Region of York and the 9 local municipalities of Aurora, East Gwillimbury, Georgina, King, Markham, Newmarket, Richmond Hill, Vaughan and Whitchurch-Stouffville.

Where applicable, the local municipalities are responsible for the delivery of the following waste management services within their respective communities:

- Collection of garbage
- Collection of Blue Box materials
- Collection of yard waste materials
- Collection of bulky items and white goods
- Collection of Source Separated Organics
- Waste management policies and enforcement
- Promotion and Education
- Recycling depots
- Public space recycling
- Provision of recycling containers

York Region is responsible for the delivery of following waste management services:

- Processing and marketing of Blue Box materials
- Transfer and disposal of residual waste
- Transfer and marketing of yard waste
- Transfer and marketing of Source Separated Organics
- Design, construction and operation of Community Environmental Centres
- Waste management policies and enforcement
- Promotion and Education
- Operation of Household Hazardous Waste depots
- Operation of municipal waste transfer, white goods Blue Box recycling drop-off facilities
- Operation of residential electronics drop-off facilities
- Operation of reusable goods diversion events

The level of waste management collection services and programs vary according to each municipality. Appendix B illustrates the municipal collection programs and the corresponding collection frequencies provided in each of the 10 local municipalities.

The following information provides a brief description of each municipality.

Aurora

The Town of Aurora is currently the fifth largest of the 9 municipalities in York Region with approximately 48,000 residents. Aurora is located in the heart of York Region, approximately 30 minutes north of the City of Toronto. Aurora's most distinctive

features are its charming rolling hills and woodlots, which are formed by the Oak Ridges Moraine.

The Town of Aurora is planning to implement the 3-stream waste collection program in 2007. The Solid Waste Management staff is dedicated to providing superior service to help residents and businesses reduce their production of waste.

Town of East Gwillimbury

The Town of East Gwillimbury is located in the northern part of York Region and spans an area of 238 square kilometres. It is a community balanced with the assets of both an urban and rural area. The Town consists of a number of growing urban areas and villages including Holland Landing, Queensville, Mount Albert, River Drive Park, and Sharon. These urban areas are separated from each other by farms, forests, countryside residences and recreational areas which all add to the overall character of the Town. Early settlement of the area dates back to the late 1700's. The focus of development within East Gwillimbury has continued to be within its 5 major urban centres.

East Gwillimbury's Community Programs and Infrastructure Department administers the Town's waste management program and the curbside collection of materials is carried out by a private contractor. To keep the public informed of the waste management rules and regulations, the department also prepares an annual waste management program schedule that is mailed to each resident.

Town of Georgina

The Town of Georgina has been a leader in waste management in York Region and throughout the GTA. In 1997 Council introduced a user pay system with every bag requiring a garbage tag. As a result there was a tremendous increase in material being diverted to the blue box program. In 2003 the program was altered slightly allowing 1 free bag at the curb with additional bags requiring tags but the revised program of 1 free bag and weekly blue box collection still produces a diversion rate that falls only behind those municipalities which have introduced Source Separated Organics (SSO) in diverting waste. Council have been reserving \$125,000 for the past 3 years to purchase SSO bins in 2007 in anticipation of implementing an SSO program.

In 2005 the Town increased yard waste collection from 5 pick-ups per year (2 in spring and 3 in fall) to 9 collections throughout the year.

Township of King

Internationally recognized for its prized cattle, lush vegetation and equestrian farms, King Township is located approximately 30 minutes north of Toronto, stretching from Bathurst Street to just east of Highway 50. Villages included in the Township are Nobleton, King City, Schomberg, Kettleby, Laskay, Pottageville, Ansnorveldt and

Snowball. Almost 70% of the Township of King is situated in the protected area of the Oak Ridges Moraine.

In 2002, the Council of the Township of King established an Environmental Advisory Committee (KEAC). Comprised of members of the community from diverse backgrounds, the Committee is appointed by Council to act as an advisory body and resource group for Council and staff on protecting and maintaining the environment. One of the areas of interest for KEAC is investigating initiatives to reduce the amount of waste the municipality sends for disposal.

The Environmental Advisory Committee and King staff also organizes an annual environmental education fair open to the public. The event provides a forum for encouraging environmental awareness, education and interest. The event includes key-note speakers, displays from environmental organizations and interactive activities for children, promotion of pesticide free lawn care methods and the sale of composters and blue boxes.

Town of Markham

Markham has been a waste management leader since the opening of its first recycling depot in 1972. The Town rolled out its Blue Box program in 1988, its curbside leaf and yard waste collection in 1990, and its home composting program in 1993. By 1998, Markham was diverting 40% of its waste from landfill.

Markham recently launched "Mission Green"; its plan to divert 70% of its waste from landfill. To reach the 70% goal, Markham has introduced a 3-stream collection system that includes weekly collection of commingled recyclables and organics, and bi-weekly collection of residual waste. Markham's 3-bag limit for garbage has also been reduced from 3 bags per household per week to 3 bags per household every two weeks. The 3-stream collection program was phased in starting in 2004 and was expanded town-wide in July 2005. Markham is now diverting 65% of its waste from landfill and exceeded 74% in November 2005.

Markham's future plans include expanding the 3-stream collection system to all Town facilities, multi-residential buildings, parks and special events with an eventual goal of 'Zero-Waste'.

Town of Newmarket

The Town of Newmarket has received the Bronze Award from the Recycling Council of Ontario Waste Minimization Awards for Municipalities that divert a significant percentage of municipal waste from disposal. The Bronze Award is for Municipalities generating between 216-280 kg per capita, a 20% reduction from the estimated provincial average. The Town of Newmarket has received this award in 1999, 2001, 2002, 2003, 2004 and 2005. These diversion rates reflect a municipality whose citizens have a keen interest in recycling and also reflect the benefits of the initiatives implemented to date including bag limits, rear yard composting and our "CURBSIDE GIVE AWAY DAYS" program, which permits residents to place reusable items at the

curb on the last Saturday of April, June, August and October, for pickup for reuse by other residents.

The Town of Newmarket will continue to promote and educate the public to reduce, reuse and recycle.

Town of Richmond Hill

The Town of Richmond Hill offers a variety of waste management programs to residents. Since January 2004, there has been a 5 item limit for waste. An item consists of a bag or can of garbage, a bundle of material, roll of carpet, piece of furniture or similar large item. Weight and size restrictions apply to all items except furniture. A separate collection for large items is not offered. Options available to residents for the disposal of excess wastes are limited. Residents can purchase municipal "Garbage Tags" at most municipal facilities for \$2 each or deliver their excess materials to the Regional transfer station in Georgina. Untagged wastes in excess of 5 items will not be collected. The contractor affixes a "Courtesy Sticker" to items refused in order to inform the residents of the collection requirements.

Blue boxes are picked up at the curb every other week. In response to the opening of the Regional MRF in July 2005, the program was modified from a curbside 5 sort to fully commingled collection. Residents are provided one free blue box per residence and can purchase additional Super-size (22 gal) boxes for \$7 each. Appliances and other large metal items are collected, by appointment, on a monthly basis and are diverted to a scrap metal dealer. There is no charge to residents for this program. There are 17 collections per year for leaf and yard waste, excluding grass clippings. Collections are scheduled every other week in spring and fall, plus monthly in the drier, summer months.

The Town offers subsidized backyard composters to residents including how-to compost seminars in the spring and fall. A comprehensive waste management calendar has been distributed to residents annually since 1989, which they have come to rely on as a definitive source of information. The Town also distributes 2 newsletters a year to update and inform residents about new programs, collection issues and events.

In the near future, several further programs will come to fruition. Blue box collection will move to a weekly basis in September 2006. This is expected to increase the capture rate of recyclable materials by making collection more convenient for residents. At the same time, the waste collection limit will decrease to 4 items per week. The Green Bin will be introduced in April 2007, for weekly collection. Residual waste, continuing with the 4 item limit per collection will commence on an every other week basis.

The Town is also working with the Region to establish a Community Environmental Centre (CEC) adjacent to the Operations Centre. This will increase options for residents to reduce, reuse, recycle and dispose of small quantities using a one-stop approach. A CEC will also engage residents on a more personal basis, and will provide further opportunities for education on waste management.

City of Vaughan

The City of Vaughan is located in the southwest corner of York Region just above the City of Toronto. Vaughan has experienced significant development over the last 2 decades resulting in rapid growth throughout the City's communities. The communities of Vaughan include, Kleinburg, Maple, Woodbridge, Thornhill, Concord and the former Town of Vaughan.

The City has embarked on a major initiative called "Greening Vaughan" to address the issues of waste disposal and to meet the provincial waste reduction target of 60% by the year 2008. "Greening Vaughan" is a waste management plan that focuses on enhancing and/or introducing opportunities and programs to divert waste from disposal. The 3 phases of this program will be launched over period of two years. The primary components of the plan include an improved recycling collection program and a separate household organic collection program.

"Greening Vaughan was launched in September 2005. Phase 1 focuses on the enhancement of the City's recycling program to increase the collection frequency of Blue Box materials from every other week to weekly and expanding the list of materials that can be collected. The increased recycling opportunities are accompanied by a 4 item garbage limit. Based on the first four months of Phase 1 (September to December 2005), the City has increased the amount of recyclable material collected curbside by 55%.

Phases 2 and 3 of the plan include the introduction of a source separated organics collection program and a reduction in the limit and frequency of garbage/residual waste that will be collected. A paid garbage tag will also be required if more than 3 items are placed out for collection. Implementation of these phases is expected to be completed by the fall of 2007.

Town of Whitchurch-Stouffville

The Town of Whitchurch-Stouffville is located in the east central York Region, 24 kilometres north of Metropolitan Toronto. Comprised of smaller communities, Whitchurch-Stouffville offers a unique country environment in the Greater Toronto Area. The landscape of Whitchurch-Stouffville consists of fertile rolling farmland, scenic ravines, kettle lakes and forested highlands. Complementing this are major equestrian activities, thoroughbred horse farms, century farms and homes, modern subdivisions, golf courses and picturesque conservation areas.

Curbside garbage, recyclable material, yard waste and large article collection is provided by the Town of Whitchurch-Stouffville. The Town also manages a long-time recycling depot that is operated by volunteers of the Whitchurch-Stouffville Recycling Group.

The Town Council has also established an Environmental Advisory Committee comprised of member of Council and the public. The purpose of the Whitchurch-Stouffville Environmental Advisory Committee is to provide advice on how to maintain

and improve the environment for the residents of Whitchurch-Stouffville now and into the future.

York Region

York Region has programs in place for the collection and management of Household Hazardous Waste; electronics; reusable goods; transfer and disposal of residual waste; and the processing and marketing of "Blue Box" recyclables, yard waste and source separated organics. Between 2004 and 2005 York Region secured long term source separated organics and yard waste processing capacity to allow local municipalities to begin implementation of 3 stream collection systems. Full implementation of the household source separated organic programs is expected to be completed by 2008. In July 2005, the Region opened its new state of the art \$39 million Waste Management Centre located in East Gwillimbury. This new facility, which includes a single stream Blue Box material recovery facility, enables local municipalities to collection fully co-mingled Blue Box recyclables and significantly reducing local collection costs. The Region's current Blue Box program allows residents to recycle approximately 25 items, including #1 to #7 rigid, household plastic containers, steel and glass beverage containers, aluminium, empty paint cans, and milk cartons. The Region has also been partnering with Goodwill Industries since 2004 to divert reusable goods and textiles through special collection events.

3. Waste Generation and Diversion

3.1 Population Growth

As of December 31, 2005, York Region's population is estimated to be 918,383¹. The population and number of households by municipality are illustrated below in Table 2.

Table 2: 2005 Estimated Population

Municipality	Estimated Number of Households 2005		Population 2005	Population 2011	Population 2021
	Single Family	Apartments			
Aurora	14,049	1,383	49,097		
East Gwillimbury	6,536	365	22,379		
Georgina	13,842	1,280	45,087		
King	6,191	270	20,181		
Markham	66,587	8,933	268,559		
Newmarket	20,005	4,106	77,114		
Richmond Hill	42,459	8,469	169,299		
Vaughan	62,326	5,681	241,383		
Whitchurch-Stouffville	7,237	1,000	25,284		
York Region	239,232	31,487	918,383	1,060,000	1,300,000

The population in York Region is expected to increase by approximately 150,000 people by the year 2011. This represents an increase of approximately 16% or, 2.5% on an annual basis.

3.2 Waste Generation

According to a Statistics Canada survey in 2002, the residential waste generation rate in Ontario was 363 kg/person/year, of which approximately one fifth was recycled or diverted. The average waste generation rate over the past four years has been on an upward trend increasing at a rate of 2.4% since 2002. In 2005, the 9 local municipalities that make up York Region generated approximately 340 kg/person of waste of which 114 kg/person of waste was managed through recycling programs and

¹ York Region Planning Department

226 kg/person was exported for disposal. The total tonnage collected and received by the Region from each of the local municipalities in 2005 is listed below in Table 3.

Table 3: 2005 Waste Tonnages

2005 Waste Management Tonnages				
Municipality	Collected	Diverted	Total Tonnage	Diversion Rate (%)
Aurora	12,934	6,237	19,171	33%
East Gwillimbury	5,661	3,117	8,778	36%
Georgina	13,074	5,630	18,704	30%
King	5,286	2,129	7,415	29%
Markham	38,895	41,113	80,008	51%
Newmarket	17,715	10,947	28,662	38%
Richmond Hill	38,990	14,838	53,828	28%
Vaughan	66,824	17,026	83,850	20%
Whitchurch-Stouffville	6,618	2,927	9,545	31%
Total	205,997	103,964	309,961	34%

3.3 Waste Composition

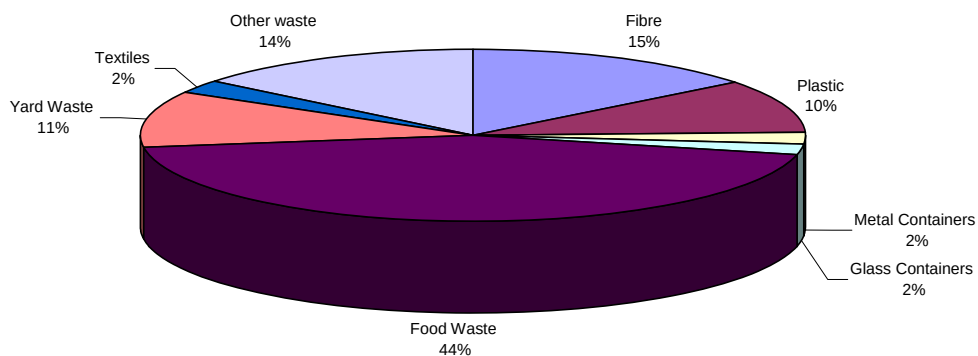
Various municipal waste audits² completed over the last few years in York Region demonstrate a residential waste composition similar to the type and volume of waste generated in the majority of Ontario municipalities. Table 4 below shows the approximate composition by weight of the residential garbage stream based on the waste audits and Figure 1 illustrates the percentage of materials by weight. The Newmarket waste audit was completed outside the yard waste season. Therefore, the yard waste figure reported in the table below may not accurately reflect the amount of material actually set out for collection as part of the garbage stream.

² City of Vaughan, 2002; Town of Newmarket, 2002; Town of Markham, 2004; King Township, 2005

Table 4: Residual Waste Composition

Garbage Waste Stream	Weight	Waste Composition
Category	(kg/hh/yr)	(%)
Fibre	79.39	15%
Plastic	53.83	10%
Metal Containers	11.74	2%
Glass Containers	10.86	2%
Food Waste	241.36	44%
Yard Waste	57.31	11%
Textiles	13.27	2%
Other waste	77.36	14%
Total Recyclables	169.10	31%
Total Organics	298.67	55%
Total Waste	545.13	100%

Figure 1: Waste Composition by Weight



4. Waste Management Planning Influences

Ontario has, in the past, been a leader in waste management policies starting with the introduction of a comprehensive curbside recycling program in the late 1980's, and following the passing of the 3Rs Regulations, the Waste Diversion Act and most recently establishing the Waste Diversion Ontario in 2002. Many of Ontario's innovative approaches to waste diversion were driven by a future landfill capacity crisis which started in the mid 1980's.

In addition to local Council and community pressures, municipal waste management programs in Ontario are governed and influenced by the following provincial regulations, policies and organizations:

4.1 Regulatory Requirements for Waste Diversion in Ontario

The Ontario 3Rs Regulations include 4 regulations of which Regulation 101/94 applies to the recycling and composting of municipal wastes. The 3Rs Regulation require all Ontario municipalities of greater than 5,000 households to recycle 5 core "Blue Box" materials (including newsprint, glass, steel, aluminum and PET) plus an additional two materials from a longer list of recyclables. The recyclables collection service must be at the same service level as garbage collection, but can be at half the frequency (e.g. a weekly curbside garbage collection service can collect recyclables every other week).

Ontario Regulation 101/94 also requires municipalities to implement the following composting programs:

- Municipalities with over 5,000 people must provide residents with a program allowing them to compost household organic waste themselves (e.g., in the backyard). The regulation requires municipalities to provide the composting bins at cost or less, to promote the program and to offer residents information on proper composting procedures.
- Municipalities with over 50,000 people must provide residents a service that allows them to source separate and divert leaf and yard waste from disposal. The municipality must divert the materials received through the system they operate, whether curbside collection or depots.
- Municipalities with 5,000 to 50,000 people whose systems result in source separated leaf and yard waste, for example, as a result of special fall leaf collections, must divert the wastes from disposal.

4.2 Ontario Waste Diversion Act

On June 27, 2003, Bill 90 was proclaimed as the Ontario Waste Diversion Act, an act to promote the reduction, reuse and recycling of waste. It also established Waste Diversion Ontario, a permanent long term organization to develop, implement and fund waste diversion programs.

This legislation sets the framework for the development of cost-effective, sustainable municipal waste diversion programs in Ontario, and will help ease the financial burden for municipalities. The Act allows for the implementation of the “shared responsibility” model that has been recommended through consultation with the public and private sectors. The model accounts for a shared financial responsibility between municipalities and industry stewards in creating a waste diversion system that will help Ontario meet its waste diversion objectives.

The Waste Diversion Ontario (WDO) was created under the Waste Diversion Act (WDA) and is a non-crowned corporation. WDO was established to develop, implement, and operate waste diversion programs for a wide range of materials. On June 10, 2004 the Ministry of the Environment released a discussion paper which advocated a waste diversion rate of 60% by 2008 from the residential, industrial, commercial, institutional, construction and demolition sectors. The paper is currently under consultation.

To date the Minister of the Environment has designated blue box waste, used tires, used oils, waste electronic and electrical equipment and household hazardous waste. Potential future designations include fast food and convenience food packaging, litter, food waste, pharmaceuticals and fluorescent tubes. Once the Minister designates a material through a regulation under the WDA, the Minister requests WDO to work cooperatively with industries that produce and distribute products that result in designated materials to establish diversion programs for these materials.

4.3 Stewardship Ontario

Created in October 2002, Stewardship Ontario is the new Industry Funding Organization for Blue Box materials. The Stewardship Ontario Blue Box Program Plan was developed by Stewardship Ontario and was accepted by the Ontario Minister of Environment in December, 2003. Under this Plan, industry partners representing the grocery, soft drink, packaging, and consumer product industries committed to fund 50% of the net municipal recycling cost. Ninety percent (90%) of this money is to be allocated directly to municipalities based on a funding formula that was developed by the WDO, and the remaining 10% of the funds will be available to support projects to improve recycling system efficiency. The funding applies only to materials collected from the residential sector. There is a single funding formula developed for all municipal recycling programs in the province. The total funding allocation is proportional to each municipality based on the tonnage of each material stream and a series of municipal characteristics which include:

- Types of materials;
- Population density;
- Scale factor; and
- Maximum and minimum capacity.

Municipalities began receiving funding in 2004. In 2004, York Region's 9 local municipalities received \$1,817,792 in funding for the collection and processing of materials diverted through its Blue Box program.

5. Recommendations for the Implementation of a Waste Diversion Strategy

5.1 Diversion Targets

York Region and its 9 local municipalities currently divert approximately 110,160 tonnes³ of waste from disposal which is roughly 34% of the residential waste stream. The Inter-municipal Waste Diversion Committee agreed to implement 7 priority waste diversion initiatives over the next 10 years to divert at a minimum, an additional 97,200 tonnes of waste annually by the end of the 10 year planning period. The group's objective is to reach a short term waste diversion target of 65% and strive to increase the target to 70% or greater over the Strategy's planning horizon.

The group has also identified additional waste diversion initiatives that were not given priority for implementation but have been included in the Strategy for future consideration. Circumstances that will trigger further study and potential implementation of the additional initiatives are as follows:

- 1) The priority initiatives do not reach the waste diversion target of 65% within the 10 year Waste Diversion Strategy implementation period; and/or
- 2) Implementation of the priority initiatives is completed before the 10 year planning horizon is reached.

Figures 2 through 4 below illustrate the diversion rates of the current waste management system, the potential diversion rates for the preferred waste management system and the potential diversion rate of a future waste management system that

³ Figures represent tonnages delivered to Regional Facilities and include curbside and drop off deliveries

include those initiatives designated for future consideration.

Figure 2: Current System

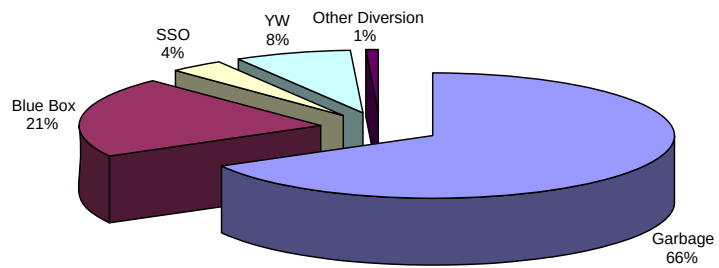


Figure 3: Preferred System – Priority Initiatives

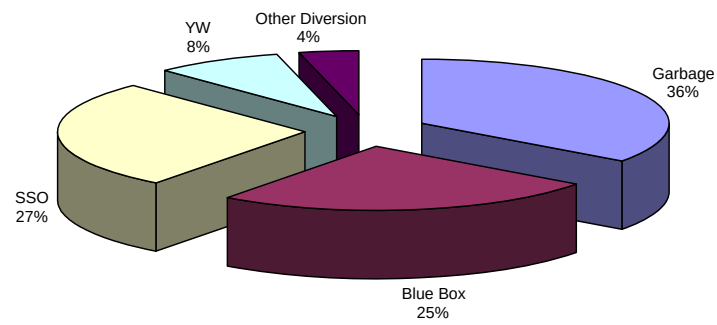
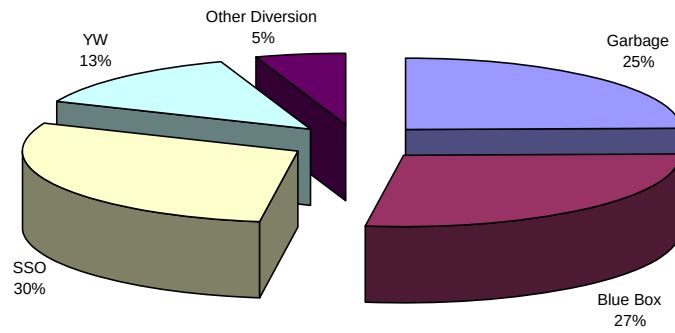


Figure 4: Future Initiatives



5.2 Overview of the Preferred Waste Diversion Components

The Inter-municipal Waste Diversion Committee agreed to and recommended a priority list of waste diversion programs and initiatives for implementation that will increase the amount of waste diverted from disposal to 65%. In addition to the priority initiatives, the group outlined additional waste diversion initiatives that did not achieve group consensus as a priority component of the Waste Diversion Strategy but were added to the list as potential initiatives for future consideration.

A diversion component was not considered to form part of a potential waste diversion system unless it met the following criteria:

- The initiative has the potential to divert at least 1% of the waste stream;
- The initiative has been proven to achieve results;
- There is a reliable market/end use for materials diverted through the initiative;
- The capital and operating cost to implement the program is not prohibitive.

Each of the system components was analyzed individually to develop a list of priority and future initiatives to maximize the diversion of waste from disposal. It should be noted that all of the individual components are interrelated and are evaluated from the perspective of a fully integrated waste management system. The group proposed the following waste diversion components for consideration as part of the preferred waste diversion system to meet the waste diversion target:

Priority Initiatives

- Source Separated Organics
- Optimized Blue Box
- Community Environmental Centres
- Bag limits/financial incentives
- Enhanced Communication and Public Outreach
- Diversion of Textiles
- Infrastructure development
- Advocacy

Future Considerations

- Bi-weekly yard waste collection
- Mandatory Recycling By-law
- Small quantity IC&I waste generators
- Residential construction & demolition waste
- Continued research into new initiatives and technologies to reach beyond the projected 65% diversion target

Source Separated Organics



A source separated organics program includes the collection of household compostable material such as food waste, pet waste, diapers and soiled paper products. Like recyclables, household organics are source separated from regular garbage and put into a special bag or container. The organics are then collected at the curb to be composted at a central composting facility.

Source separated organics diversion has been under discussion for several years within the Region and plans are underway in most municipalities to roll out collection programs. The capital cost to implement the program was identified as a concern for some of the smaller municipalities. It was recommended that the Strategy identify the need for these municipalities and the Region to explore financing options to overcome this barrier.

Waste composition studies show that food waste makes up approximately 30% of the residential waste stream. Based on capturing a minimum 70% of available material, this program would divert approximately 68,040 tonnes of material from disposal. The costs to offer collection of source separated organic waste can range from \$60 to \$100 per tonne and the costs to process or compost the material will range from \$80 to \$150 per tonne depending on the composting technology selected. Implementing a source separated organic program must also consider the initial start up costs coupled with the annualized operating cost of the service. For example, the cost to roll out a source separated organic collection program to 57,000 houses in the Town of Markham was approximately \$1,200,000 for the purchase and delivery of containers and \$260,000 for promotion and education materials for a total of roughly \$26.00/household.

Optimized Blue Box

There are two types of residential recycling programs in the Region to collect Blue Box materials - curbside collection and drop off depots.

All single family residences (e.g. residences receiving curbside garbage collection) within the Region have access to curbside collection of recyclable materials through the municipal Blue Box collection program. Some multi-family buildings also receive a collection program for recyclable materials using large wheeled blue bins for the on-site storage of materials.



Optimization of the existing blue box program includes a number of alternatives ranging from the addition of new materials to the use of alternative collection containers and where applicable, increasing the local collection frequency from every other week to weekly collection. Some of the issues raised regarding implementation of this initiative include the cost to enhance the collection frequency, debagging recyclables, constraints of existing waste collection contracts and the need to ensure new materials

have stable long-term markets before they are added to the recycling program.

It was recommended that prior to future program changes, further consideration and research should be completed to examine the timing of municipal contracts, end markets for new materials, alternative collection methodologies and creative solutions to overcome the cost of providing weekly blue box collection and service multi-residential buildings.

Optimizing the Blue Box program is anticipated to divert an additional 15,600 tonnes of material from disposal and require capital investments of over \$2 million and have an annual operating cost of approximately \$950,000 - \$1,500,000 or \$3.80 - \$6.25 per household.

Community Environmental Centres

The development of a network of strategically located Community Environmental Centres by the Region to provide drop-off recycling and reuse opportunities to residents in addition to those provided by curbside programs was reaffirmed by the group as a priority for implementation. The group also identified the need for these centres to reflect the siting and operational preferences of the local community and to explore creating opportunities to service small commercial waste generators.



The implementation of Community Environmental Centres has been targeted to potentially divert approximately 3,000 tonnes of recyclable materials from disposal. The capital costs to develop the Centres will depend on the location, type and size of facility required. The operating costs of the Centres will also depend on the size and type of facility and could range from \$125 to \$235 per tonne or \$1.50 to \$2.90 per household.

Bag Limits/Financial Incentives

In recent years many communities in Ontario have implemented systems that limit the number of bags/items that can be set out for collection as garbage and/or initiated some type of financial incentive that imposes a fee for each item of garbage placed at the curb. Members of the Committee raised a concern that if a program were to include financial incentives, it would have to be implemented in such a way that residents could not “buy” their way out of participating in diversion programs.



Many of the municipalities in York Region already have some form of user pay and/or bag limit system in place. Consideration was given to working towards a uniform standard across the local municipalities. The group consensus was, however, that

while bag limits have value, they should be implemented as part of a larger initiative such as the introduction of source separated organics collection or bi-weekly garbage collection. The ability to collect large or bulky items, provide temporary relief during specific times of the year (e.g., Christmas or Passover) was also identified as a concern. The group made a further recommendation to convene a sub committee that would consider the most appropriate and effective mix of bag limits and financial incentives that could be coordinated among the local municipalities. Continued discussion by the Committee on this issue in the future was recommended.

The cost of implementing this program may involve additional communication materials and thereafter would mostly be absorbed by existing communications budgets. The program is estimated to divert approximately 16,200 tonnes of material from disposal. One time implementation costs are estimated to be approximately \$2.00/household. Ongoing costs are not, however, significant making this option the lowest cost options to divert significant additional tonnage throughout the Region.

Enhanced Communication and Public Outreach

Communication strategies are an integral component of any successful waste management system. Public education is key to the achievement of waste diversion goals and operation of the waste management system as a whole. Delivering effective education and outreach programs can be expensive. Many of the 9 local municipalities in the Region do not have the resources to develop and launch comprehensive education and community outreach programs. There is also a risk that working in isolation will repeat work that others have already done. In addition, the same work may be occurring in neighbouring regions or elsewhere in the Province. There are likely to be significant advantages from economies of scale if local municipalities work together to develop promotion and education programs for common projects.

Both the local municipalities and York Region produce solid waste management promotion and education materials. The objectives of the Promotion and Education programs are to:

- Promote participation in waste diversion programs;
- Encourage proper participation in recycling collection programs; and
- Encourage compliance with Regional material bans.

The level of promotion and education materials and campaigns vary according to each municipality. Activities include:

- Staffing at public events and speaking engagements;
- Advertisements and articles in newspapers;
- Newsletters;
- School education program;
- A waste management program calendar;
- Brochures for various waste diversion programs (backyard composting, grasscycling, disposal bans, etc.); and
- Web sites featuring program information, tips and facts.

The Inter-municipal Waste Diversion Committee supported increased cooperative efforts amongst the 9 local municipalities and York Region to deliver consistent messaging and initiatives, both in design and implementation while allowing enough flexibility for municipalities to reflect the individuality of their community. The need for the Region to provide continued support to the smaller municipalities with their promotional efforts was also recommended.

As a component of this initiative, the minimum level of promotion and education required to deliver an effective program would be determined for each municipality. This program could include targeted promotion and education material sent to residents advising them of what can be diverted and an outreach component that would provide presentations in schools, local service clubs, displays at malls, identify peer leaders in the community, develop model neighbourhoods, etc. Another component of the program would include social research to assess barriers to participation in waste diversion programs and develop tools to overcome the barriers.



A comprehensive communication and outreach program achieves the following:

- Facilitates progress in achieving the waste diversion target by engaging and encouraging the public to incorporate waste diversion initiatives in daily practices;
- Builds awareness by educating and informing residents and businesses in advance about changes to existing services and new services that will become available;
- Obtains input and feedback from residents and businesses regarding the development of the system and service specific issues;
- Provides the answers to commonly asked questions; and
- Potentially reduces the number of inquiries following implementation of new initiatives.

The cost of an effective communication and public outreach program ranges from approximately \$3.00 - \$5.00 per household a year. A program of this nature can help to increase the diversion of materials from disposal by 3-5%.

Diversion of Textiles

Textiles and reusable goods diversion by not-for-profit charities such as Goodwill Industries was also discussed as a priority initiative. Textiles can include items such as clothing, curtains, towels, blankets, sheets, table cloths, and other fabric items. Promoting existing services offered by not-for-profit organizations and assisting them to implement a region-wide program to capture textiles was identified as a viable and economic solution to capture this portion of the waste stream. It was recommended that municipalities continue to work with these groups to determine how best to deliver an effective program.



The cost to implement this initiative would include staff time to coordinate with not-for-profit organizations regarding logistics and promotion of the program. A comprehensive program will divert approximately 6,000 tonnes of material from disposal.

Infrastructure Development

Staff also considered the implications of population growth in York Region and managing the additional diversion tonnage. It was recognized that the ability of the local municipalities to roll out new collection programs is reliant upon the Region's ability to develop the necessary supporting processing and/or diversion infrastructure in a timely manner. Therefore, it was recommended that the Strategy reflect the need for the Region to examine projected facility needs and coordinate its delivery to meet proposed future program and collection contract changes. Section 5 of this document discusses infrastructure requirements in more detail.



Advocacy

There are some elements of waste management that are outside of the control of municipalities, but have a significant impact on the amount and type of waste that municipalities receive and process. These elements are controlled by other levels of government, and by producers and manufacturers.

Examples of such elements include:

- Beverage container deposit legislation is within the jurisdiction of the Province of Ontario. Ontario is the only province in Canada that does not have a deposit system on beverage containers to encourage recycling.
- Packaging legislation is a provincial responsibility but has been addressed at a national level. The National Packaging Protocol was adopted by the CCME in 1990. It is a voluntary covenant which has been credited with significantly reducing the amount and weight of product packaging.
- Provinces such as British Columbia have implemented Product Stewardship programs based on Extended Producer Responsibility. Their aim of these programs is to place the onus for end of life product management on the producer and consumers of a product and not the general taxpayer or local government.

While municipalities do not have direct control of such elements of waste management, it is within the ability of municipalities to advocate for responsible and effective provincial and federal waste management regulations and policies. To that end, municipalities should be proactive and contact the appropriate departments and

agencies to press for action that will reduce waste and increase waste diversion in both the residential and commercial sectors.

The Committee agreed that a consideration of the Waste Diversion Strategy should direct the Region to take an active role in lobbying manufacturers and senior levels of government on issues such as over packaging and extended producer responsibility.

Waste Diversion Initiatives For Future Consideration

Enhanced Yard Waste Collection

Improving yard waste collection locally to a minimum service standard of bi-weekly collection was also explored. The frequency of yard waste collection differs amongst the municipalities of York Region. Collection frequencies range from weekly to every two weeks during the yard waste season, while others collect on a less regular basis. A typical municipal yard waste program may include grass, leaf and brush materials.

Collection of leaf and yard waste every other week from April to November could divert approximately 10 to 15% of the waste stream. The main issue regarding the implementation of this initiative was the potential cost increase that could be associated with the enhancement of this service, particularly in rural areas. The group recommended that further study is required and that a sub-committee be established to explore the most effective approach to implement this initiative as soon as appropriate.



Waste composition studies show that leaf and yard waste makes up approximately 17% of the residential waste stream. In 2005, approximately 23,000 tonnes of yard waste was collected in York Region and composted. Based on the performance of other municipal yard waste diversion programs that collect material every other week from spring through fall, an improved yard waste collection program in York Region could divert an additional 14,600 tonnes of residential material from disposal. The cost to collect leaf and yard waste ranges from \$70 to \$120 per tonne and the cost to compost the material ranges is approximately \$60 per tonne. The total annual cost per household is approximately \$6.00 to \$10.00.

Mandatory Recycling and Enforcement

The use of mandatory by-laws by the Region and/or local municipalities to require local residents to recycle was discussed briefly. The consensus was that these by-laws are costly and difficult to enforce and research has shown that by-laws have minimal success in improving diversion rates. Further examination of this utility at some point in the future was recommended.

Several municipalities in York Region have policies in place requiring residents to participate in their recycling program. Region-wide enforcement and promotion and education could range from \$200,000 - \$400,000 depending on the level of program

that is developed. While difficult to quantify, a mandatory recycling by-law could divert no more than 6,000 tonnes of material from disposal.

Residential Construction and Demolition Waste

Quantities of construction and demolition (C&D) waste from residential homes are not typically managed by the municipalities. Residents are usually required to manage these materials themselves. The amount of C&D waste generated is approximately 1.5% of the waste stream. This material could be handled through the Region's Community Environmental Centres or not for profit organizations such as Habitat for Humanity. Further research into the possible re-use and cost implications of managing these materials is recommended.

Small Quantity Waste Generators

The Committee identified potential diversion opportunities if the municipalities were to provide a service for recyclable materials to small generators in the industrial, commercial and institutional (IC&I) sectors. Although most IC&I waste is not under the control of the municipalities, some of the Committee members were of the opinion that municipalities should take a lead role and establish opportunities to divert waste from all sectors that generate waste within York Region's borders. The group determined that while a motherhood approach should be taken to maximize diversion from all sectors within its municipal boundaries, further research is required to determine the potential number of facilities, tonnages, types of programs and costs that would be connected to this type of initiative before giving it further consideration.



Continued Research

The aim of the Waste Diversion Strategy is to maximize the amount of waste diverted from disposal today and into the future in an environmental and financially responsible manner. Therefore, the Inter-municipal Waste Diversion Committee recommended that it continue to research new initiatives and technologies that may arise in the future to assist the local municipalities and York Region in maximizing the diversion of waste from disposal.

5.3 Implementation and Monitoring

For the purpose of implementing the Strategy as outlined in this document, it is necessary to consider variable start-dates for the initiatives that were evaluated. Staff applied a phased approach to implementation with two basic stages. It was agreed by the Committee that many initiatives could essentially be started right away, while several others would be better to initiate in 5 to 8 years, after the infrastructure has been developed or intermediate steps and studies have been taken. Table 5 below illustrates the implementation priority for each of the waste diversion initiatives. 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 Strategy initiatives deferred for future implementation will be reviewed again for suitability prior to their launch. Once the Waste Diversion Strategy has been approved by Council, the Inter-municipal Waste Diversion Committee will develop an implementation plan. The implementation schedule will be flexible enough to reflect the:

- Outcome of required studies;
- Financial priorities and available funding;
- Availability of staff and contractors; and
- Availability of infrastructure.

The implementation and performance of the waste diversion programs will be monitored by the Inter-municipal Waste Diversion Committee which is made up of Municipal Waste Management Department representatives from the 9 local municipalities and York Region.

This group's role will be to:

- Review the effectiveness of the Waste Diversion Strategy;
- Recommend changes to the Strategy as required to maximize diversion of waste from disposal;
- Identify potential joint projects that require Regional and/or inter-municipal coordination;
- Report results back to their respective Municipalities.

This group will meet at a minimum of 2 days a year to review progress towards implementation of the Strategy, and receive reports on the effectiveness of the programs delivered. This Strategy will be formally reviewed every three years however, the Inter-municipal Waste Diversion Committee will be expected to report annually to their respective Councils on its achievements for the past year and to recommend actions for the following year.

The waste that cannot be eliminated or diverted through composting or recycling is referred to as "residual waste," and ultimately requires disposal. The current development of the York/Durham Residual Waste Study will address the long-term disposal needs of the Region and aims to minimize social, environmental and financial impacts and risks.

Table 5: Implementation Priority

Option	Comments	Timing
Source Separated Organics Diversion	Most municipalities are committed to implementation within next 3 years. Cost could be prohibitive – funding options may be required for smaller municipalities. Implementation must take into account revising current collection contracts.	Immediate Implementation
Optimized Blue Box Diversion	Cost could be prohibitive – funding options may be required for smaller municipalities. Must consider constraints/timing of current/future collection contracts. Must ensure secure markets before adding material to program. Studies should be undertaken to determine best methods of collection e.g. bags vs. boxes, type of container, etc.	Immediate Implementation
Enhanced Communications and Public Outreach	Requires cooperative effort with similar messages and design but allows for individual municipal character and pride. Smaller municipalities may require assistance.	Immediate Implementation
Textiles Diversion	Could involve coordinating collection by charities or simply promoting existing efforts.	Immediate Implementation
Use of Community Environmental Centres	Design of CEC needs to be flexible to meet site requirements and needs of the community. Locating sites for CECs could be problematic.	Immediate Implementation
Expansion of Regional Processing Infrastructure	Timing must plan 10-15 years out – inline with population growth. Consider Regionally owned SSO facility. Infrastructure development must occur in time for municipalities to roll out collection programs. Infrastructure does not necessarily have to be in York, could utilize other facilities in Ontario. Strategy should recommend further study into types and level of risk regarding York owned vs. others, preferred types of facility, etc.	Immediate Implementation
Use of Bag Limits & Financial Incentives	Could be implemented at the same time as SSO. Consider decreasing frequency of garbage collection to achieve same effect. System should not allow for residents to buy their way out of recycling. Create sub-committee to examine harmonization of bag limits/financial incentives. Initiative must include options for spring cleanup, bulky items, etc.	Immediate Implementation
Expanded Advocacy Efforts by the Region	Region needs to more active in lobbying for extended producer responsibility.	Immediate Implementation

Table 5: Implementation Priority Continued

Option	Comments	Timing
Improved Yard Waste Diversion	Cost could be prohibitive to some municipalities. May not be an issue in rural areas. Establish sub-committee to further examine impacts/issues/opportunities.	For Future Consideration
Use of Mandatory Recycling By-laws	Difficult to enforce and justify costs of enforcement. Represents another tool to drive diversion. Establish a sub-committee to examine.	For Future Consideration
Construction & Demolition Waste	Not a significant part of the municipally collected residential waste stream. Could be managed through CEC's and not for profit organization like Habitat for Humanity.	For Future Consideration

5.4 Further Studies

Once endorsed by the respective Councils, the Region and Local Municipalities will be in a position to review, in more detail, the timing, operational and cost implications of each initiative. Further efforts will be required to examine implementing enhanced communication and outreach strategies, bag limits and financial incentive programs, and processing requirements associated with adding new materials to the Blue Box program. Additional studies will also need to be undertaken regarding the processing of source separated organics to determine the cost and risk assessment of a Region owned composting facility vs. transfer of material to a private or neighbouring municipal facility.

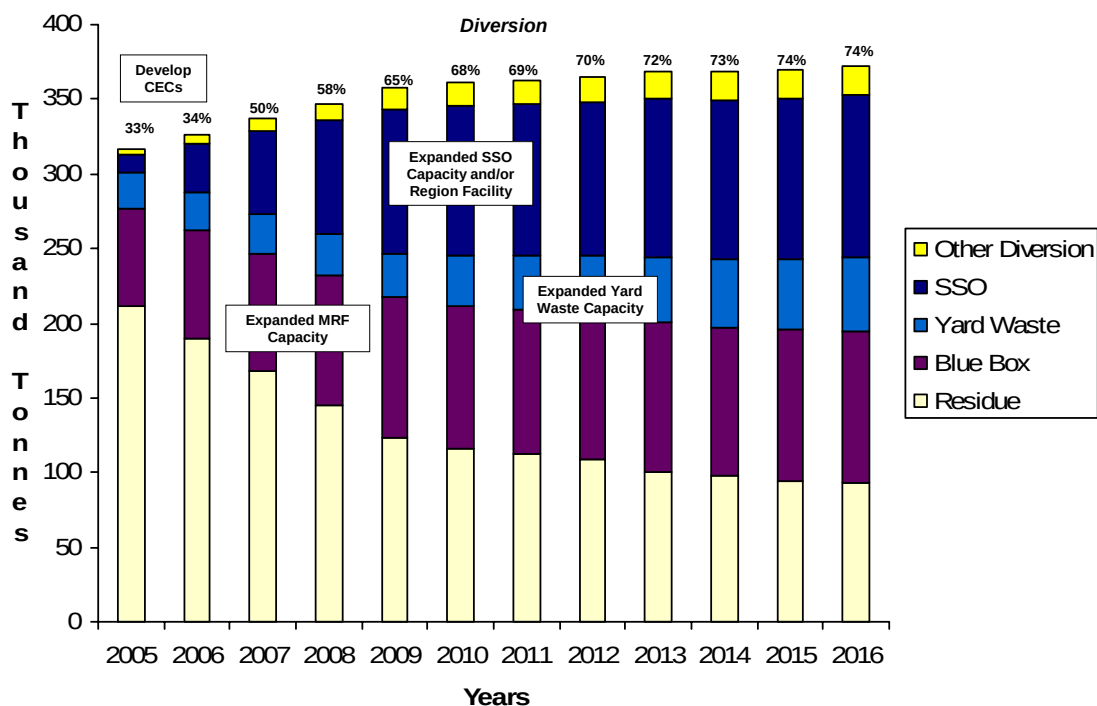
6. Infrastructure

Implementation of the Waste Diversion Strategy will require new infrastructure and enhancement of existing infrastructure as diversion tonnages increase due to increased participation, the addition of new materials and population growth. Development of waste management program infrastructure could take 2 to 10 years depending on the type of facility and the associated planning and environmental requirements. Projected material tonnages and the associated infrastructure requirements are illustrated in Figure 5. The following new infrastructure will be necessary for the Waste Diversion Strategy to reach its full potential:

- Enhancement of York Region's Material Recovery Facility;
- Organic food waste composting facility;
- Yard waste composting facility; and
- Community Environmental Centres

In addition to the infrastructure requirement listed above, it should also be noted that facilities such as Community Environmental Centres could be used to provide waste management services to small businesses. Historically this market segment tends to be ignored by the waste haulers, and therefore does not have access to cost effective private waste diversion services.

Figure 5: Residential Diversion Tonnage and Infrastructure Requirements



Material Recovery Facility



Processing of Blue Box material is managed in York Region's new Material Recovery Facility located in East Gwillimbury. The facility is designed to operate with a maximum of 3 shifts of employees and is estimated to process a maximum of up to 120,000 tonnes of material. Currently, the facility is operating with 2 work shifts and is expecting to add a third work shift by 2008 which will accommodate the additional tonnage estimated to be collected through the optimization of the Blue Box program. Additional studies will have to be completed to determine what additional enhancements to the Facility will be required to manage new types of Blue Box material. Capital cost for additional equipment to manage new materials could range from \$2 million to \$5 million.

Composting Facilities

The Strategy estimates that roughly 90,000 tonnes of organic materials, including food and yard waste will need to be captured from the residential waste stream in order to meet the diversion targets. Currently, the Region has established approximately 60,000 tonnes of capacity to process and compost organic material. Additional capacity will be required by about 2009. In order to secure the future capacity requirements, the Region should assess the benefits, costs and risks associated with contracting out the processing of organics as opposed to developing a Region-owned solution. If an in-house solution is deemed preferable, the capital costs to construct an in-vessel composting facility range from \$18 to \$30 million. The cost to construct an in-vessel composting facility will be dependent on the processing technology selected. While in-vessel composting facilities can also process yard waste, studies will also be required to assess the feasibility of composting yard waste separate from food waste using a less expensive open windrow system. These systems consist of a simple concrete or gravel pad on which the yard waste is left to compost in the open air. These facilities are considerably less expensive to construct than in-vessel systems ranging from \$500,000 to \$1 million. Composting yard waste separate from food waste means that an in-vessel facility to process food waste and other organic material could be designed to handle less tonnage and therefore, will result in decreased cost.

Community Environmental Centres

Public surveys completed in York Region suggest that a network of Community Environmental Centres will provide an effective opportunity for residents to divert waste materials from disposal if centres are located so that travel time to a facility is under 20 minutes. It is anticipated that a minimum of 3 Community Environmental Centres would be required to provide an appropriate level of service. The cost to implement Community Environmental Centres is approximately \$1.4 million for construction and \$125 to \$235 per tonne in annual operating cost per facility. The following figures illustrate the location of current facilities in York Region for the community to drop off recyclable materials, household hazardous waste and yard waste materials.

Figure 6 - Public Drop-off Locations for Recyclable Material

York Region's Blue Box Recyclables Drop-off Locations

LEGEND

1. York Region's Transfer Station and Household Hazardous Waste Depot in Georgina
2. York Region's Household Hazardous Waste and Recycling Depot in East Gwillimbury



Produced by:
Branch
Department Name
© Copyright, The Regional Municipality of York, Month, Year
© Copyright, The Regional Municipalities of Durham and Peel, County of Simcoe, City of Toronto
* Includes © Queen's Printer for Ontario 2003-2006

Distance to Blue Box Recyclables Drop-off Locations

	0 - 10 km
	10 - 20 km
	20 - 30 km
	30 - 40 km

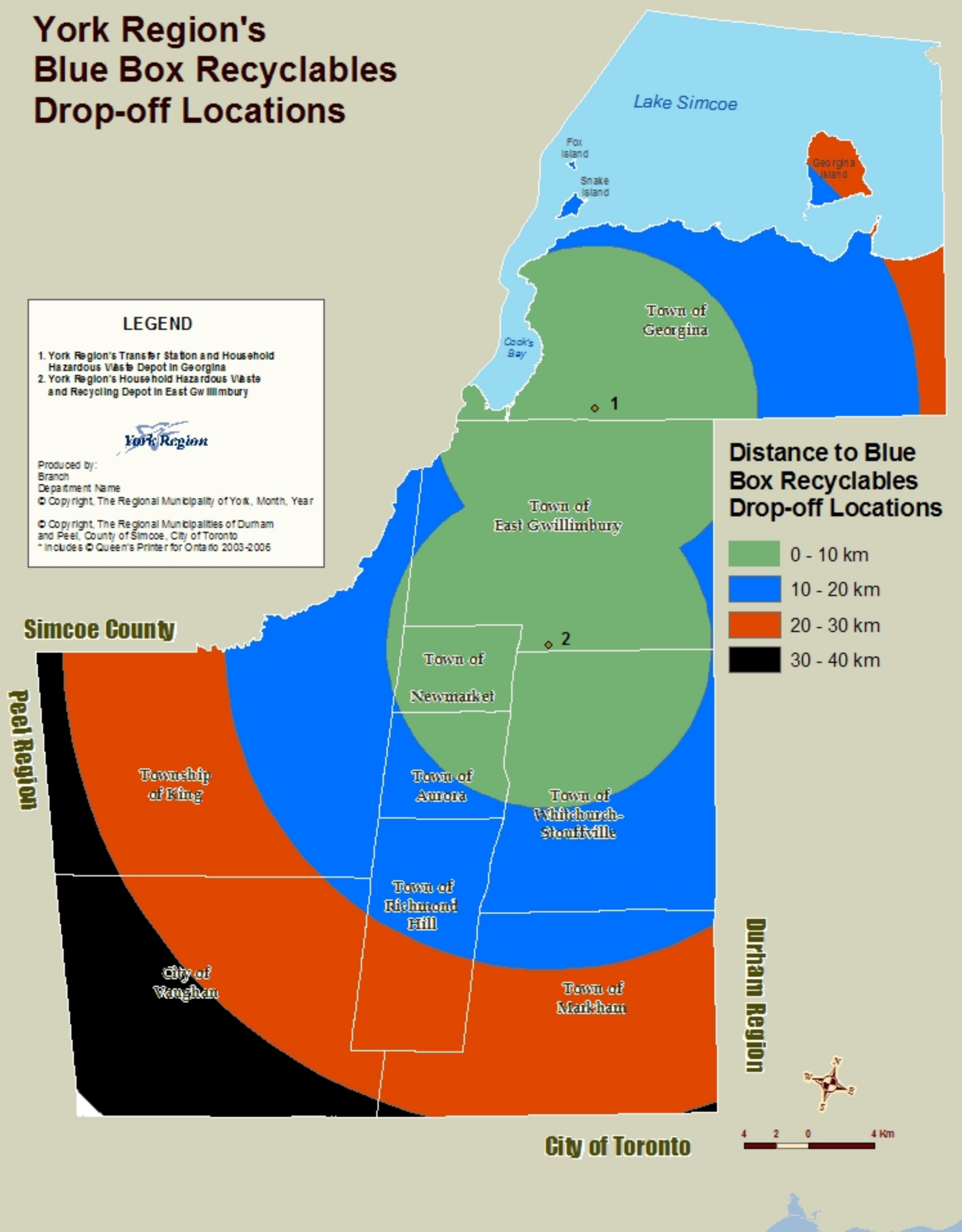


Figure 7 - Public Drop-off Locations for Household Hazardous Waste

York Region's Household Hazardous Waste Depots

LEGEND

1. York Region's Transfer Station and Household Hazardous Waste Depot in Georgina
2. York Region's Household Hazardous Waste and Recycling Depot in East Gwillimbury
3. York Region's Household Hazardous Waste Depot in Markham
4. York Region's Household Hazardous Waste Depot in Vaughan



Produced by:
Branch
Department Name
© Copyright, The Regional Municipality of York, Month, Year
© Copyright, The Regional Municipalities of Durham and Peel, County of Simcoe, City of Toronto
* Includes © Queen's Printer for Ontario 2003-2006

Distance to HHW Depots

- 0 - 10 km
- 10 - 20 km
- 20 - 30 km

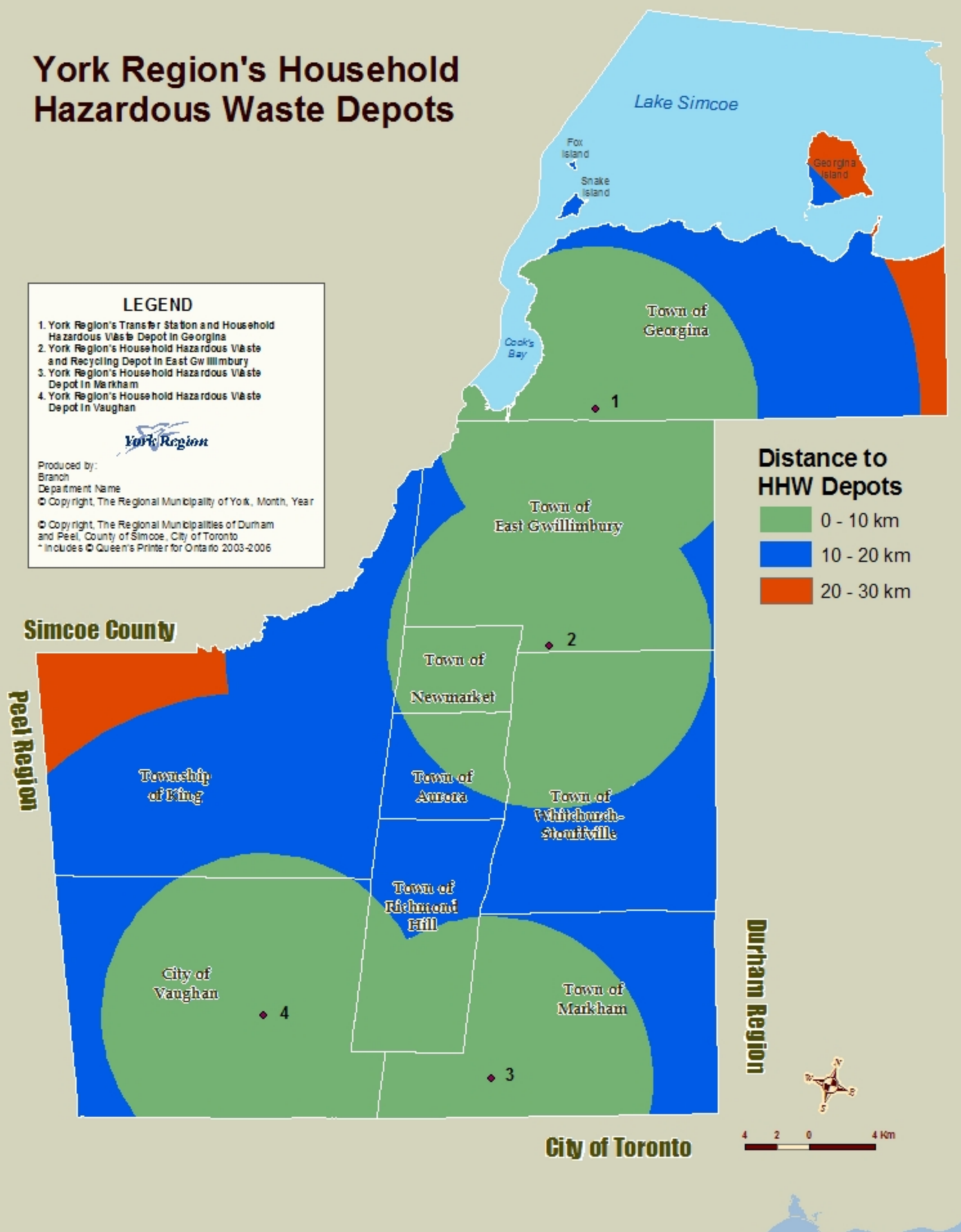
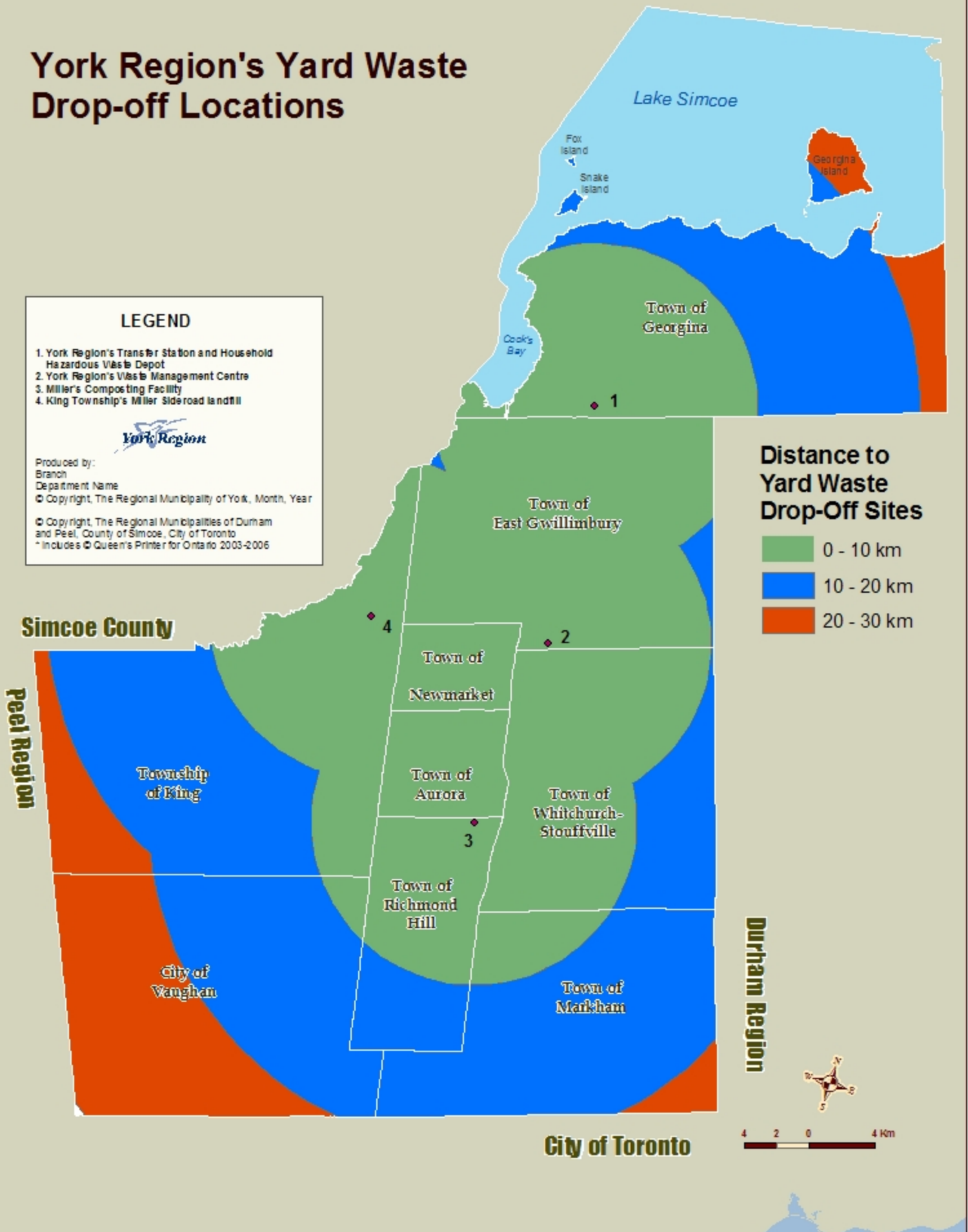


Figure 8 - Public Drop-off Locations for Yard Waste

York Region's Yard Waste Drop-off Locations



7. Cost

Once endorsed by the respective Councils, further work will be required by the various municipal staff to develop detailed cost/benefit analyses, implementation schedules, and budget estimates for each of the approved initiatives. These more detailed evaluations of the various initiatives will, in most instances, need to be submitted to the appropriate municipal Councils for final endorsement before implementation can proceed.

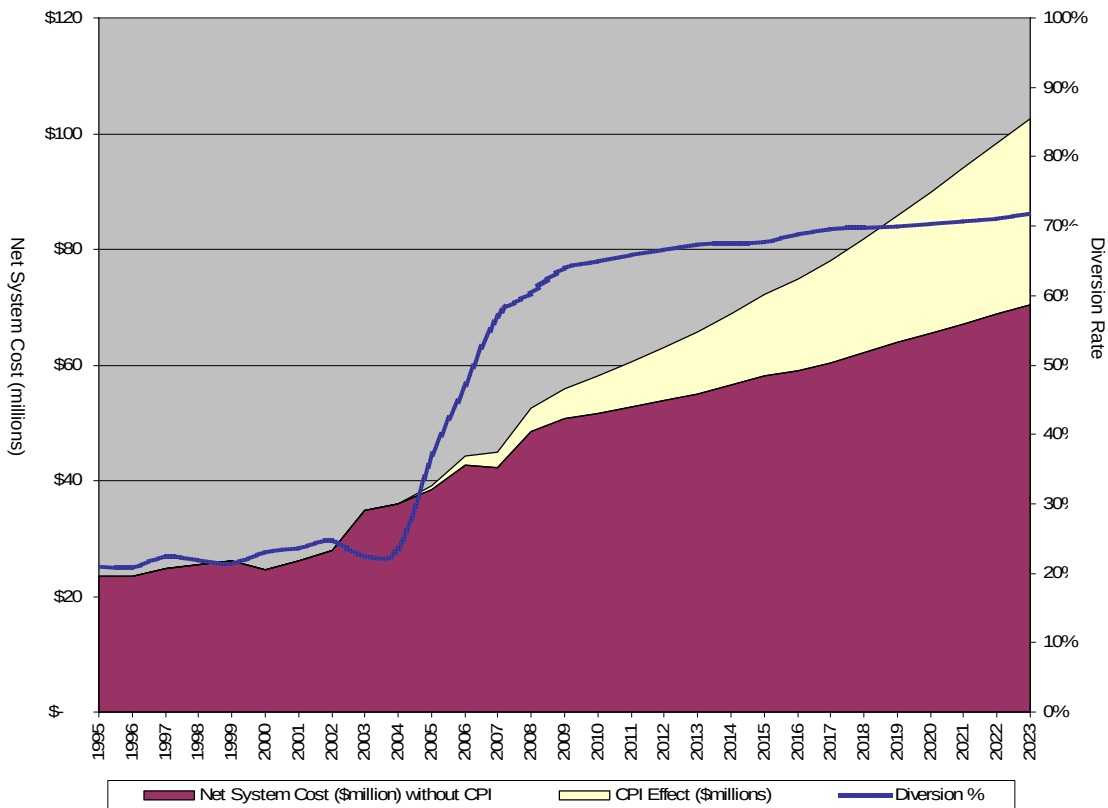
The table below identifies the approximate additional tonnages that can be diverted through each of the waste diversion initiatives and the associated incremental operating costs. The approximate increase of the annual waste diversion program operating cost due to implementation of the priority initiatives is \$13 million to \$23.4 million or \$54.00 to \$97.50 per household. In addition to annual operating costs, the capital cost required to develop Community Environmental Centres and new and additional capacity for recyclable and organic material will be approximately \$20-\$35 million over the Strategy's planning period.

Table 6: Program Initiative Incremental Tonnage and Cost

Option	Timing	Diverted Tonnage	Annual Operating Cost
Source Separated Organics Diversion	Immediate Implementation	68,000	\$9,520,000 - \$17,000,000 \$39-\$70/hh
Optimized Blue Box Diversion	Immediate Implementation	15,600	\$950,000 - \$1,500,000 \$3.80-\$6.25/hh
Enhanced Communication and Public Outreach	Immediate Implementation	3-5% increase in tonnage of operating diversion programs	\$720,000-\$1,200,000 \$3-\$5/hh
Textiles Diversion	Immediate Implementation	5,832	N/A
Use of Community Environmental Centres	Immediate Implementation	3,000	\$375,000-\$705,000 \$1.50-\$2.90/hh
Expansion of Regional Processing Infrastructure	Immediate Implementation	N/A	Included in the cost to optimize Blue Box
Use of Bag Limits & Financial Incentives	Immediate Implementation	16,200	N/A
Expanded Advocacy Efforts by the Region	Immediate Implementation	N/A	N/A
Improved Yard Waste Diversion	For Future Consideration	14,600	\$1,600,000-\$2,600,000 \$6-\$10/hh
Construction & Demolition Waste	For Future Consideration	6,500	NA
Use of Mandatory Recycling By-laws	For Future Consideration	6,000	\$200,000-\$400,000 \$0.40-\$1.60/hh

The following figure illustrates the estimated total waste management system cost including disposal vs. the projected diversion target.

Figure 9: Total System Cost vs. Diversion Target



8. Funding Opportunities

The cost to implement the Waste Diversion Strategy initiatives was identified by many of the small municipalities as a major barrier to implementation. A number of opportunities were suggested to overcome possible financial issues. These included loans from York Region to municipalities and funding from provincial and federal programs. The major government funding programs available to assist regions and municipalities to develop and implement waste diversion programs and infrastructure is listed below:

- **Green Municipal Enabling 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.
- **Canada Strategic Infrastructure Fund:**
The Federal Government has allocated \$4 billion for regions and municipalities seeking to invest in infrastructure projects that promote effective urban development and use innovative technologies and practices to minimize greenhouse gas emissions pollutants.
- **Effectiveness & Efficiency Fund**
The Provincial Government created the Effectiveness & Efficiency Fund (E&E Fund) 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 E&E Fund is expected to be in operation for the next four years. 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. For 2006, approximately \$5.7 million is available to fund projects. In general, approved programs can expect to receive approximately 50% of project funding.

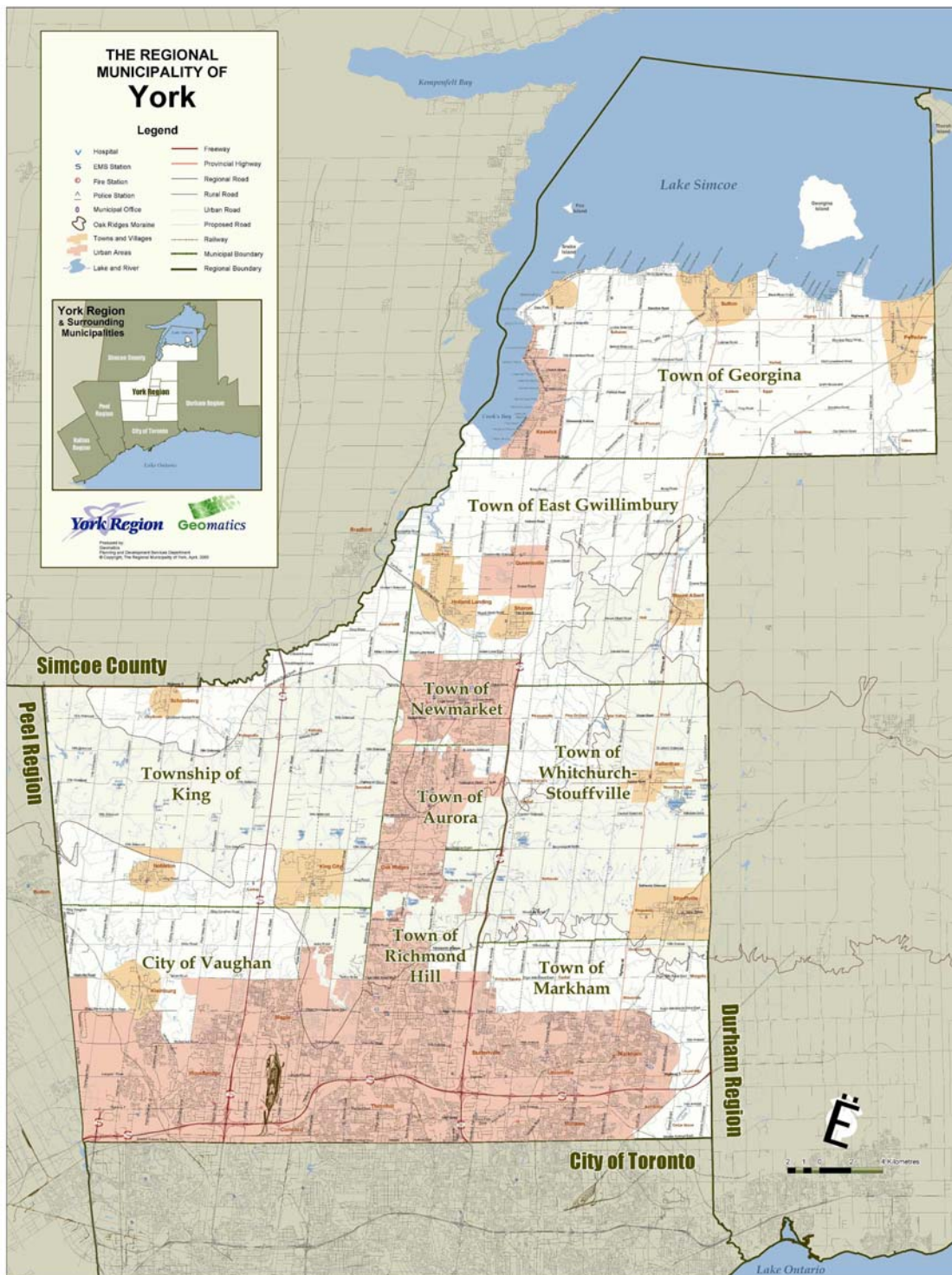
9. Summary

York Region and its 9 local municipalities have initiated a study of waste diversion options. This study examines options to further reduce the waste stream sent to final disposal. The local municipalities and York Region working together, continuously strive to increase the diversion of waste from disposal. Implementation of the various diversion programs and initiatives discussed in this report will meet and exceed the waste diversion target proposed by the Ontario Ministry of the Environment. The new initiatives are designed to increase participation and diversion rates to beyond 60%.

The diversion initiatives identified in this document with the possible exception of Community Environmental Centres, do not require Environmental Assessment Act approval and therefore implementation of the recommendations can begin as soon as staff and financial resources permit. Once the respective Councils have endorsed the Strategy the next step will be to develop detailed costs and diversion estimates for each of the proposed initiatives and develop an implementation plan that will be taken back to Council for consideration.

Appendix A

Map of York Region and Local Municipalities



Appendix B

Existing Municipal Programs and Frequency of Collection as of May, 2006

Existing Municipal Programs and Frequency of Collection as of May 2006

	Aurora	East Gwillimbury	Georgina	King	Richmond Hill	Markham	Newmarket	Vaughan	Whitchurch-Stouffville	York Region
Waste Management										
Garbage	Once/week	Once/week	Once/week	Once/week	Once/week	Every other week	Once/week	Once/week	Once/week	Transfer & disposal
Blue Box	Every other week	Every other week	Once/week	Every other week	Once/week	Once/week	Every other week	Once/week	Every other week	Processes material
Bag limits	3	4	No	3	4 (2006)	3 bags without tags, additional bags must be tagged	3	4	5	NA
Financial Incentives	No	No	1 free bag all others \$1/bag	3 free bags then \$1/bag up to a maximum of 6 bags total	\$1/bag over 3 to max of six total.	No (free bag tags must be affixed to bags in addition to the 3 allowed without tags)	3 free bags, \$2.20 a tag for additional bags, no limit on tags	\$2/item over 4	3 free bags then \$2/bag up to a limit of 5 in total	NA
Yard Waste	Once/month from April to August	Seven collections per year	Once/month from April to November	Three/spring & three/fall	Twice/month during spring & fall and once/month during summer	Every other week April to November	Once a month in Jul, Aug, Sep - twice a month in May, Jun, Oct, Nov.	Once/week in spring & fall, every other week during summer	Once/month May to November	Processes material
Promotion & Education	Waste Calendar; Website; Recycling guide	Waste management calendar; brochure; website	Waste management reference guide; website	Waste collection schedule; website	Engineering and Public Works calendar; website; brochures	Waste collection schedule; Apartment recycling guide; brochures; website; school presentations; newspaper display; articles; branding	Waste & recycling calendar; website; notices and ads in local newspaper	Garbage & recycling calendar; brochures; newsletters; door hangers; website; mobile signs; displays; newspaper articles; branding; door to door outreach	Waste collection schedule; website	Brochures; displays; video; website
Source Separated Organics	No	2007	No	2009	2007	Once/week	2007	2007	2007	Processes material

Appendix C

Ministry of the Environment – Ontario's 60% Waste Diversion Goal

Ontario's 60% Waste Diversion Goal - A Discussion Paper

June 10, 2004

Ontario's 60% Waste Diversion Goal - A Discussion Paper

Ministry of the Environment

June 10, 2004

Copyright: Queen's Printer for Ontario, 2004
This publication may be reproduced for non-commercial
purposes with appropriate attribution.



Printed on recycled paper

PIBS 4651e



Ontario

Table of Contents

1	INTRODUCTION	1
	Ontario's Waste Diversion Goal	1
	Purpose of Discussion Paper	2
	The Waste Management Challenge	2
2	THE WASTE WE PRODUCE	4
	What We Throw Out and What We Recycle	4
	How Ontario Compares	8
3	ONTARIO'S REGULATORY FRAMEWORK	12
	Overview of Current Regulatory Framework for Waste Diversion	12
4	MOVING FORWARD	16
A.	Setting Province-wide Waste Diversion Objectives and Targets	17
B.	Residential Waste Diversion: Accelerating Centralized Composting	20
C.	Developing a Financing Strategy for Increased Waste Diversion, including Centralized Composting for Residential Waste	22
D.	Industrial, Commercial and Institutional Waste Diversion: A Renewed Commitment	24
E.	Feasibility of Phasing-in a Ban on Disposal of Organics and Recyclable Materials	26
F.	Finding New Waste Diversion Technologies	27
G.	Reducing Packaging and Increasing the Recycled Content in Products and Packaging	28
H.	Expanding Public Education and Awareness Activities to Promote the 3Rs	29
I.	Initiating a Province-wide Monitoring System for Waste	30
5	FOR CONSIDERATION	33
	Your Input is Needed	33
	Consultation Questions	34

Ontario's Waste Diversion Goal

An expanding economy and a growing population are placing additional demands on Ontario's natural resources and straining our ability to effectively manage the environmental impact of that growth. That is why the provincial government is proposing to take a new comprehensive approach to waste diversion, one that will *reduce* the amount of waste generated, *increase* the rates of reuse and recycling, and *reduce* the amount of waste going to disposal.

In order to achieve the results Ontarians need in waste management, the provincial government is setting a goal of diverting 60% of Ontario's waste from disposal by the end of 2008, up from the current diversion rate of 28%¹.

Achieving a 60% diversion rate by 2008 is an ambitious goal, but it can be achieved if *everyone* — Ontario residents, businesses, industry, manufacturers and packagers, waste management experts, and environmental experts, as well as municipalities and the provincial government — commits to finding better waste management solutions. And, while the provincial government sets the overall goal and the policy framework, it will be up to municipalities and the business and commercial sectors to determine how best to get there.

Reaching this goal will be determined in large part by finding better ways of dealing with the large portion of solid waste that is made up of organic materials — organics currently make up about 38% of waste generated by households and about 11% of the waste generated by the industrial, commercial, and institutional (IC&I) sectors (e.g., factories, restaurants and schools).

It will also require progress to be made in reducing waste in many other areas such as improving the municipal Blue Box programs, requiring more waste diversion efforts from the IC&I sectors, and increased recycling of items such as electronic waste.

Though the challenges are many, Ontario is well positioned to become a leader in waste diversion, drawing on its existing environmental protection and resource conservation programs and building on the many waste reduction and recycling success stories of its municipalities, businesses and industries.

How Ontario Calculates the Waste Diversion Rate

The diversion rate is the total quantity of waste diverted from disposal as a percentage of the total waste diverted plus disposed.

$$\text{Waste Diversion Rate [\%]} = \frac{\text{Waste Diverted}}{\text{Waste Diverted and Disposed}} \times 100\%$$

Waste disposed includes waste sent to landfill and to thermal energy from waste (EFW) facilities.

¹ Includes only residential and industrial, commercial and institutional (IC&I) sectors for 2002.

Purpose of Discussion Paper

The provincial government is issuing this discussion paper to seek input from stakeholders and the public on ways to help Ontario reach its waste diversion goal – **diverting 60% of waste from disposal by the end of 2008**. The paper is organized into five sections:

1. Introduction – provides an overview of the waste management challenge in Ontario.
2. The Waste We Produce – contains information about how much waste Ontario produces, who generates it, and where our waste ends up.
3. Ontario's Regulatory Framework – describes the current rules and programs for waste diversion that Ontario has now.
4. Moving Forward – outlines the proposed approach to a sound waste diversion strategy for Ontario.
5. For Consideration – asks a series of questions designed to solicit input on waste management.

The Waste Management Challenge

Today, more than 12 million tonnes of solid waste are generated annually in Ontario. The amount of waste continues to increase, much of it destined for landfills both inside and outside the province.

Our reliance on landfill is driven largely by historical economics – currently it is generally less expensive to send waste to landfills than to establish and operate diversion programs. However, long-term environmental costs have not been factored into these cost comparisons. In addition, many large urban centres do not have access to suitable landfills within their boundaries and have to rely on disposal sites in other communities. As the market demand for recyclables increases, and public pressure against locating landfills continues, this economic imbalance may be reduced. A challenge still remains to find acceptable disposal options for the 40% of waste that will *not* be diverted, even if Ontario reaches its 60% goal.

Recent amendments to the State of Michigan's waste laws provide additional motivation for diverting waste that Ontario communities and industries currently send there for disposal. These new Michigan state requirements prohibit the disposal in landfills of certain materials in domestic or imported waste, including tires, beverage containers, yard waste, sewage, and used oil.

Ontario's challenge is to find innovative ways to extend and enhance Ontarians' access to 3Rs programs – reducing, reusing and recycling – at home and in the workplace.

Part of the challenge is to construct an effective and efficient system that connects homes, offices, factories and schools to the industries that need and want waste materials to make new products. We know there is a tremendous amount of valuable recyclable material in our waste stream that could be put to good use. In fact, the demand for some waste materials, especially paper, is so high that some Ontario industries currently import large quantities from other countries. For example, every kilogram of aluminum that could be recovered effectively from the waste stream can be used by industry.

Ontario needs to build on the ability of industry to use recovered materials in the place of precious non-renewable resources. Spurring investment in Ontario recycling and waste management sectors will contribute to economic growth – a 2000 Statistics Canada survey found that Ontario's waste management businesses generated revenues of \$1.55 billion, 45% of all Canadian revenues for waste management.

There are many economic benefits associated with increased waste diversion. By reducing the need for landfilling, waste diversion avoids the accompanying costs of siting, constructing and operating a landfill site, as well as long-term operating and maintenance costs.

By encouraging increased recycling, waste diversion makes a contribution to economic development and job creation, by creating or expanding businesses that collect, process and broker recovered materials, as well as companies that manufacture and distribute products made with recovered materials.

In addition, waste diversion provides manufacturers with many of the raw materials they need to operate more efficiently, helping to improve competitiveness and sustainability. The paper industry, for example, depends on recovered materials. Processing of recovered, recyclable materials into feedstock provides added value in manufacturing sectors that use that feedstock.

By encouraging the reuse of products that still have significant value, waste diversion creates or expands the reuse and remanufacturing sectors. Examples include pallet rebuilders (reuse of wood), tire retreaders, electronic appliance remanufacturers, resale and thrift shops, and repair shops. These businesses focus on refurbishing products.

By encouraging source reduction (i.e. the redesign of products and processes so that less material is used to achieve the same function), waste diversion reduces the cost of doing business. For example, manufacturers can save on the use of packaging for their products.

Ontario has a long history of promoting the 3Rs and residential recycling programs such as the Blue Box and home composting, and waste reduction efforts in office buildings and other industrial, commercial and institutional enterprises have been relatively successful. We must build on that success if we are to reduce our dependence on disposal.

What We Throw Out and What We Recycle

In 2002, Ontario threw out a total of about 9.4 million tonnes of waste. This waste went either to landfills here in Ontario or in the United States, or to incineration. Waste from residential sources, and the industrial, commercial and institutional (IC&I) sectors accounted for about 7.2 million tonnes of the waste thrown out. Waste from construction and demolition (C&D) activities accounted for the remaining 2.2 million tonnes of waste thrown out.

In 2002, about 2.8 million tonnes of solid waste generated by the residential and IC&I sectors was managed through 3Rs activities, equivalent to about 28% of the total. This included 1.2 million tonnes of residential waste and 1.6 million tonnes of IC&I waste. The residential portion of diverted waste was comprised of:

- 400,000 tonnes composted;
- 700,000 tonnes recycled through the Blue Box system;
- 94,000 tonnes of white goods (refrigerators and stoves) and bulky items (furniture) recycled;
- 13,000 tonnes of Household Hazardous Waste and electronics recycled.

Current recycling programs have been relatively effective but, as the above shows, they deal with only a limited portion of the waste stream. For example, much more organic waste from households could be recovered.

The three categories of waste generators and wastes that are the focus of this discussion paper – residential, IC&I and C&D – are described briefly below.

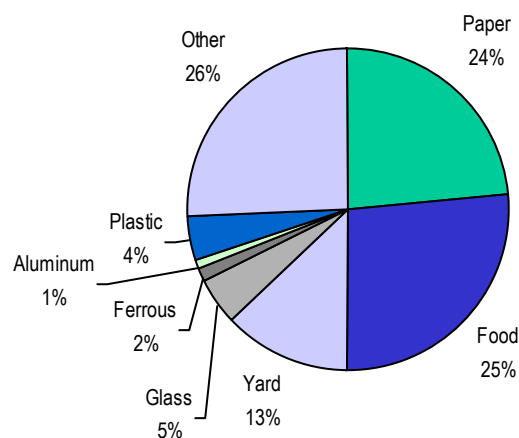
Residential Waste Composition

Paper and organic wastes (food and yard waste) represent about 62% of the total residential waste generated.

The rest is made up of a wide variety of materials, including non-recycled materials such as ceramics, textiles, leather, rubber, batteries, ashes, rubble, fibreglass, and drywall.

A 60% diversion rate is achievable through actions such as maximizing Blue Box recycling, enhancing organics diversion, and pursuing diversion opportunities in the “Other” category.

Figure 1: Residential Waste Composition



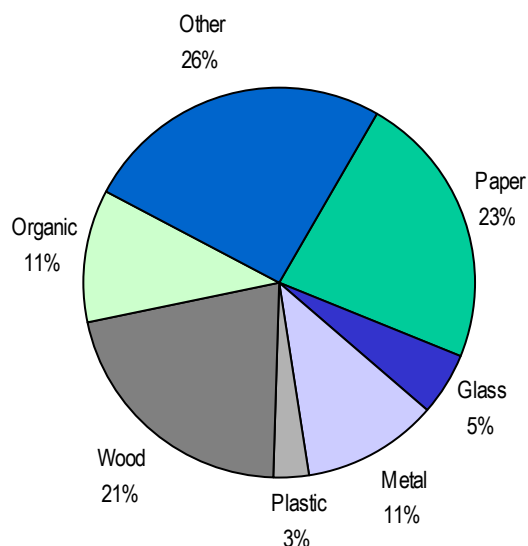
IC&I Waste Composition

The composition of waste varies from one particular industry or commercial sector to another. Within the manufacturing sector, the composition of the waste produced depends to a large extent on the products being made. For example, waste from an electronics manufacturer would have more plastics, metal and paper than waste from a furniture manufacturer, whose waste has more wood. Similarly, waste from different retail establishments may vary. Restaurants and retail food establishments generate more organic materials than office establishments.

However, some materials such as cardboard packaging are in such common use that they appear in the waste stream of virtually all IC&I sectors.

For the IC&I sectors to achieve 60% diversion, actions must be geared toward maximizing recycling under the 3Rs regulations. Greater organics diversion should also be pursued, particularly by restaurants and food retailers. There must also be more proactive investigation of diversion solutions for materials in the “Other” category.

Figure 2: IC&I Waste Composition



C&D Waste Composition

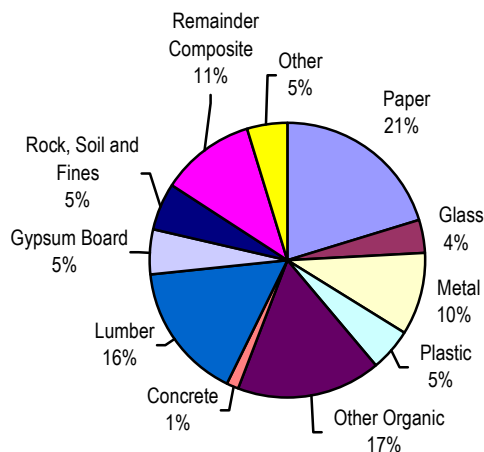
C&D waste is generated from the construction, renovation, repair and demolition of structures such as residential and commercial buildings, roads and bridges. The composition of C&D waste varies for these different activities and structures. Overall, C&D waste is composed mainly of wood products, asphalt, drywall, and masonry. Other components that are often present in significant quantities include metals, plastics, earth, shingles, insulation, and paper and cardboard.

As in many industrial waste streams, C&D debris also contains wastes that can even be hazardous, such as:

- excess construction materials such as adhesives and paint, as well as their containers;
- waste oils, grease and fluids from machinery and equipment;
- batteries, fluorescent bulbs and appliances.

The C&D sector can reach the 60% waste diversion goal by taking appropriate actions to maximize the diversion of wastes covered by the 3Rs regulations. Taking measures to reduce the 17% of total waste that falls into the “Other Organic” category is also likely to be part of the sector’s strategy to meet its waste diversion goal.

Figure 3: Composition of Construction Waste



Municipal Sector Waste Diversion

There are many examples of municipal best practices in waste diversion. For example, the City of Guelph has consistently improved its waste diversion system over the past 20 years, incorporating new technologies as they became available. Its current system requires residents and businesses to separate their waste into three ‘streams’: i) wet (compostable) stream; ii) a dry recyclable stream; and, iii) a dry non-recyclable stream (garbage). When fully implemented, this system is capable of diverting 70% of Guelph’s waste.

The City of Peterborough operates a comprehensive waste diversion system for Blue Box materials, leaf and yard waste, household hazardous waste, and electronics. For 2003, Peterborough is reporting a 50% diversion rate for residential waste from landfill. Plans are underway to expand waste diversion activities by introducing a city-wide source separated organics program in 2005.

Quinte Waste Solutions (QWS) operates waste diversion programs for Centre & South Hastings Waste Services Board, whose members represent Belleville, Quinte West, Tyendinaga, Prince Edward County, Centre Hastings, Tweed and Marmora & Lake. QWS has achieved a 65% diversion rate for Blue Box materials, household hazardous waste, and organics. A ‘pay as you throw’ policy is in effect, supporting the waste diversion efforts of the participating municipalities.

Ontario’s municipal sector continues to make progress in waste diversion. In fact, based on 2002 data collected through the Municipal Performance Measurement Program (MPMP) of the Ministry of Municipal Affairs and Housing, the median waste diversion rate of Ontario’s municipalities was 27%. Table 1 shows the range of diversion rates in Ontario’s larger municipalities and regions. While final

performance figures are not yet available, preliminary results indicate that municipalities achieved significantly better diversion rates in 2003.

Table 1: Diversion Rates in Ontario Municipalities/Corporations Serving Populations > 100,000 (2002 figures)

Municipality/Corporations	Population	Diversion Rate (%)
City of Toronto	2,500,000	27
Regional Municipality of Peel	988,940	35
City of Ottawa	822,600	32
Region of York	634,000	24
Regional Municipality of Durham	551,000	30
City of Hamilton	494,928	20
Regional Municipality of Waterloo	469,800	40
Regional Municipality of Niagara	424,900	39
Regional Municipality of Halton	394,636	38
Essex-Windsor Solid Waste Authority	374,779	31
City of London	355,800	35
County of Simcoe	231,955	32
City of Greater Sudbury	155,601	30
City of Kingston	114,195	42
City of Thunder Bay	113,318	28
Municipality of Chatham-Kent	109,945	32
City of Barrie	109,720	32
City of Guelph	106,170	38

Diversion rates as reported to the Ministry of the Environment in a recent survey
Calculated based on a definition which includes incineration as disposal

Some municipalities are already making significant progress towards 60% diversion:

- Both the Township of Frontenac Islands (population 1,661) and the Town of Hanover (population 6,845) have a waste diversion rate of 58%;
- The County of Wellington (population 81,143) has achieved a 57% diversion rate.

IC&I Sectors' Waste Diversion

Two examples of successful waste diversion in the IC&I sectors are:

- Brewer's Retail has operated a successful deposit-return system for beer containers for many years, achieving a 97% recovery rate for the industry standard bottle. The Beer Store reports that its packaging return system currently removes about 550,000 tonnes of solid waste from municipal landfill and recycling programs. All refillable and non-refillable beer containers (both domestic and imported) sold through *The Beer Store* are subject to a minimum deposit of 10 cents which is redeemed when containers are returned to *The Beer Store*. Other beers, primarily imports, sold only through the LCBO do not carry a deposit but *The Beer Store* accepts and recycles these containers as a customer service. Many municipalities in Ontario that

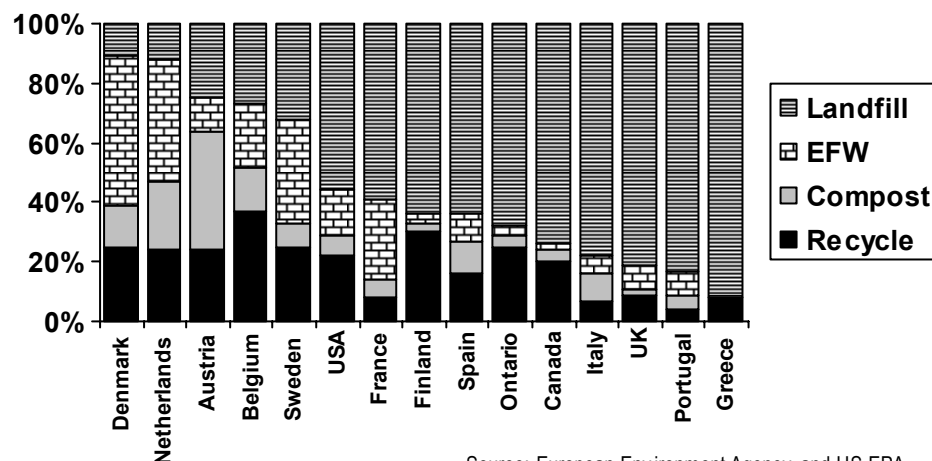
are using the “generally accepted principles” (GAP) protocol for measuring municipal waste flows are already using the recovery rates of the Brewer’s Retail in their own diversion rate calculations.

- The Greater Toronto Airports Authority (GTAA) has worked to advance environmental initiatives at Toronto Pearson International Airport while implementing its Airport Development Plan. During the redevelopment at Pearson Airport, the GTAA has done much to divert its waste from landfill. For example, it recycled all contaminated soil associated with the project on-site and diverted almost 90% of their construction waste for reuse and recycling. In 2004, the GTAA expects to achieve their goal of diverting over 85% of construction waste.

How Ontario Compares

The amount of waste landfilled in Ontario, on a percentage basis, is relatively high compared to many other jurisdictions. The amount of waste diverted in Ontario (compost and recycle) is similar to countries like the U.S.A., but well behind other countries such as Austria and the Netherlands.

Figure 4: Waste Management Methods Internationally



Source: European Environment Agency and US EPA

A scan of practices being used internationally reveals that most jurisdictions use a combination of tools to achieve their waste diversion goals:

- Germany’s strategy is based on the concept of ‘Extended Producer Responsibility’ which is embedded in law and requires industry to take back and recycle packaging used for consumer goods. Specific recycling targets are also established in law, from which companies that are part of a nationwide system for collection, sorting and recycling of packaging are exempt.
- Ireland uses a variety of tools, including targets, government funding, and public policies, to achieve its waste diversion goal. Ultimately, Ireland is planning to have an integrated network of about 20 state-of-the-art facilities incorporating energy recovery and high standards of environmental

protection. In 2001, Ireland placed an environmental levy on plastic shopping bags and a per tonne levy on landfill of waste. The funds collected as a result of this levy are used for environmental initiatives such as waste management, education and awareness.

Ontario's diversion rate of 28% (residential and IC&I waste) is comparable to the United States (including the Great Lakes and area states) which has a 30% diversion rate for what is referred to as Municipal Solid Waste or MSW (residential, commercial and institutional waste). The largest difference between our waste disposal practices is that Ontario sends less than 2% of its waste to incineration, or energy from waste (EFW) systems, whereas the U.S. sends about 15%.

The Great Lakes states in the U.S. have varied waste diversion programs. While there are differences in the definitions used for "diversion", high level comparisons between the current waste diversion rate of Ontario and those of the Great Lakes and area states suggest that, like Ontario, many states are investing in waste diversion.

Jurisdiction	Current Waste Diversion Rate ²
Minnesota	45.6%
Indiana	35%
Illinois	32.5%
New York	29.8%
Ontario	28%
Pennsylvania	26.8%
Wisconsin	24.6%
Ohio	23.5%
Michigan	15.1%

In Canada, Nova Scotia has set an example by banning a number of wastes from disposal in landfill including: compostable organic material; newsprint; beverage containers; used tires; automotive lead-acid batteries; waste paint; and corrugated cardboard. These materials are collected through a widespread curbside recycling program and through depots. Nova Scotia's curbside recycling and composting of organic waste was available to 76% of the population in 2002, resulting in a 46% diversion rate from disposal.

Nova Scotia has also established the Resource Recovery Fund Board (RRFB), a non-profit corporation, to lead provincial waste diversion and industry stewardship activities. It is funded by a portion of the deposit on beverage containers, as well as from fees on tires and paint. The RRFB develops and administers sustainable industry stewardship programs, helps set up new businesses based on the processing of materials diverted, and provides

² Source: State of Garbage in America – 14th Annual Nationwide Survey of Solid Waste Management in the United States – BioCycle Journal, January 2004. Estimated rates using similar categories of materials for comparison.

incentives to residents to reduce, reuse, recycle and compost. Voluntary industry stewardship programs are in operation for paint, dairy containers, beverage containers, newsprint, and used tires.

The City of Edmonton provides a good example of a comprehensive, multi-pronged waste diversion strategy. It has two curbside recycling programs:

- the Blue Bag program provides curbside collection of recyclables for houses, duplexes and fourplexes. It collected 28,588 tonnes of recyclables in 2002 and boasted a participation rate of 84%;
- the Blue Bin program, implemented in 2000, provides service to apartments and condominiums. In its first two years, the program was serving about half of the buildings eligible and had collected 1,000 tonnes of material. At maturity, the Blue Bin program is expected to divert an additional 6,000 tonnes of recyclables per year.

Edmonton also has 20 Recycling Depots, called 'Eco Stations', throughout the city for use by residents and businesses. Eco Stations accept paper, cardboard, and boxboard, plastic, glass and metal containers, as well as household hazardous waste and almost all other waste materials.

The Edmonton Waste Management Centre combines several waste management facilities at one location, including a Materials Recovery Facility for sorting recyclables, a teaching theatre, the Clover Bar Landfill site, and the Edmonton Composting Facility. The latter facility is the largest of its type in North America with a capacity of 200,000 tonnes of municipal solid waste and 22,500 dry tonnes of biosolids each year. In 2002, Edmonton diverted 44% of its waste from landfill through composting.

Summary

For Ontario to reach its 60% diversion goal, action will be required by everyone.

For the residential sector to achieve 60% waste diversion by 2008, Blue Box recycling must be maximized and diversion of organics through composting must be enhanced. Opportunities to divert wastes in the "Other" category such as electronics must be pursued.

Currently, waste generation is almost equally split between the residential and IC&I sectors. However, as Figures 1 and 2 illustrate, the composition of the two waste streams is quite different. In the residential sector, the largest gains are likely to come from increased diversion of organics, both food and yard waste.

For IC&I sectors to achieve 60% diversion, recycling under the 3Rs regulations must be maximized. Certainly, greater organics diversion should be pursued, particularly by restaurants and food retailers. Also, more aggressive investigation of diversion solutions for the "Other" category of waste which make up about 26% of the total should be promoted.

The C&D sector will need to maximize its diversion of wastes currently covered by the 3Rs regulations in reaching the 60% diversion goal. It will also have to investigate diversion options for the 17% of their waste made up of "Other Organic".

Who Plays a Role in the Waste That Ontarians Generate?

- *Provincial Government:* The provincial government, primarily through the Ministry of the Environment, is the regulator, responsible for setting and enforcing standards, issuing approvals, and promoting waste diversion.
- *Municipal Government:* Municipalities are responsible for operating and maintaining recycling and waste management services used by the public, and for planning to meet future waste management needs. The *Municipal Act, 2001*, (Act) provides municipalities with powers to pass by-laws within the scope provided for in the Act and other provincial and federal legislation relating to their waste management systems.
- *Waste Generators (Individuals):* Each member of the public, as a waste generator, is responsible in helping to reduce the amount of waste generated and participating in recycling and reuse programs.
- *Waste Generators (Businesses):* All industrial, manufacturing and commercial enterprises which produce, distribute, or sell products and services are responsible for the waste they generate.
- *Waste Management Industry:* Private sector recycling and waste management companies manage most of the waste generated by the non-residential sector. They are involved in a diverse range of 3Rs activities and often work in partnership with municipalities.
- *Environmental Groups:* Environmental groups have long promoted the need to reduce waste and conserve our natural resources and play an important role in raising public awareness of waste management issues.

Overview of Current Regulatory Framework for Waste Diversion

A focus on recycling began in Ontario in the 1980s with requirements for municipalities to undertake waste management planning and goal setting for waste diversion. Waste diversion strategies, primarily focused on the residential and IC&I sectors, took off in the early 1990s with the "3Rs Regulations", described below. Notwithstanding these regulations, in recent years, more emphasis has been placed on residential diversion through the Blue Box program than on IC&I diversion requirements and deposit-return requirements.

Ontario Regulation 101/94

This regulation requires municipalities with over 5,000 people to implement and operate recycling programs that follow certain minimum standards. Municipal recycling programs must source separate and recycle five specified materials plus two others as shown in the following table.

Municipalities Must:		
Recycle All These Items	Recycle at Least Two of These Materials	
Newsprint	Phone books	Boxboard
Steel FBC ¹	Aluminum foil items	Paper cups and plates
Glass FBC	Magazines	Fine paper
Aluminum FBC	Rigid plastic containers	EPS ³ FBC and packing
PET ² FBC	Cardboard	Textiles
	Plastic film	Polycoat FBC

¹ Food and beverage containers ² Polyethylene terephthalate ³ Expanded polystyrene

Ontario Regulation 101/94 also requires municipalities to implement certain composting programs:

- Municipalities with over 5,000 people must provide residents with a program allowing them to compost household organic waste themselves (e.g., in the backyard). The regulation requires municipalities to provide the composting bins at cost or less, to promote the program and to offer residents information on proper composting procedures.
- Municipalities with over 50,000 people must provide residents a service that allows them to source separate and divert leaf and yard waste from disposal. The municipality must divert the materials received through the system they operate, whether curbside collection or depots.
- Municipalities with 5,000 to 50,000 people whose systems result in source separated leaf and yard waste, for example, as a result of special fall leaf collections, must divert the wastes from disposal.

Ontario Regulation 102/04

Ontario Regulation 102/94 requires owners of the following establishments to conduct waste audits, develop and implement waste reduction plans, and update the audits and plans annually:

- schools with an enrolment of 350 students or more;
- retail complexes where the floor area is 10,000 m² or more;
- construction projects where building floor area is 2,000 m² or more;
- Class A, B, or F hospitals in Ontario Regulation 964 under the *Public Hospital Act*;
- hotels or motels with 75 units or more;
- demolition projects where building floor area is 2,000 m² or more;
- office buildings where office floor area is 10,000 m² or more;
- restaurants whose annual sales are \$3 million or more;
- manufacturers where 16,000 or more hours are worked per month.

Ontario Regulation 103/04

This regulation requires owners of the establishments listed in Ontario Regulation 102/94 and of multi-unit residential (apartment) buildings with six or more units to have source separation programs for specified wastes and to ensure that the wastes are recycled.

	School Over 350 students	Retail* Over 10000 m ²	Construction Over 2000 m ²	Hospital Class A, B, F	Hotel/Motel Over 75 units	Demolition Over 2000 m ²	Office Over 10000 m ²	Restaurant \$3 million+ Sales	Manufacturer Over 16000 hrs worked per month	Apartment 6 units +
Aluminum food & beverage cans										
Cardboard										
Fine paper										
Glass food & beverage bottles/jars										
Newsprint										
Steel food & beverage cans										
Brick & concrete										
Drywall(unpainted)										
Steel										
Wood (untreated)										
PET (#1) plastic food & beverage bottles										
Aluminum										
Glass										
HDPE plastic jugs, crates, totes, drums										
LLDPE film										
Polystyrene expanded foam										
Polystyrene products										
Municipal Blue Box materials										

* Equivalent to a very large retail store or a mall

Ontario Regulation 103/94 only applies to establishments in municipalities with populations over 5,000, except for manufacturers, and construction or demolition projects. The wastes specified for each sector are shown in Table 2. Note that inclusion in the table does not mean that the entire sector is required to participate in recycling. For example, only about 10% of the businesses that could fit into “Manufacturer” are required to recycle under the current regulation.

Ontario Regulation 104/94

Ontario Regulation 104/94 requires manufacturers, packagers and importers of packaged food, beverage, paper or chemical products to conduct a packaging audit and implement a packaging reduction work plan. The requirement applies only to manufacturers and packagers where 16,000 or more hours are worked per month, or importers whose annual cost of goods are \$20 million or more.

A packaging audit must address the:

- type and amount of the packaging;
- amount of reused or recycled materials being used;
- management decisions and policies affecting packaging;
- reusability and recyclability of the packaging after use;
- final destination and its impact on that waste stream.

Ontario Regulation 347

Ontario Regulation 347, under the *Environmental Protection Act*, exempts from waste management approval requirements wastes specified as recyclable materials. The exemption is intended to encourage recycling and waste diversion.

The regulation means that, subject to certain limitations, a waste approval is not required when materials are transported directly from the waste generator to the industrial user or manufacturer that will use it in their operations or in recycling activities.

Ontario Regulations 357 and 340

Ontario Regulation 357 (Refillable Containers for Carbonated Soft Drinks) requires that all carbonated soft drinks be sold in refillable containers. It also requires that retail vendors refund deposits of 15¢-40¢ (depending on container size) to customers who return empty refillable containers for carbonated soft drinks.

Ontario Regulation 340 (Containers) provides an exemption to the refillable requirement for non-refillable containers that are recycled in a multi-material recycling system. The regulation allows the minimum share of sales in refillable containers to drop if the recycling rates for non-refillable containers go up.

Waste Diversion Act (WDA) and Waste Diversion Ontario (WDO)

The *Waste Diversion Act* (WDA), passed in June 2002, created Waste Diversion Ontario (WDO), a multi-stakeholder non-government corporation. The WDO’s mandate is to develop, implement and operate waste diversion programs for specific wastes, as requested by the Minister of the Environment.

One of the key concepts underlying Ontario's *Waste Diversion Act* is Extended Producer Responsibility or EPR. The EPR concept is the foundation for the work that WDO does through the Blue Box Program and other programs under development. It gives producers or 'stewards' incentives to make products that generate less waste and that, consequently, impose fewer costs on the waste management system.

For each waste diversion program, WDO creates a sustainable funding method, based on fees paid by designated industry stewards. An industry funding organization (IFO), set up for each program, helps WDO with this part of the process. Each waste diversion program includes rules for industry fees to be charged, estimated costs for the program, and waste diversion targets. As part of developing a program, WDO engages in a public consultation process.

WDO is actively working with industry in a number of areas:

- **Blue Box Program Plan:** WDO developed a groundbreaking sustainable funding and diversion program for the municipal Blue Box system, now being implemented by WDO and Stewardship Ontario, the industry funding organization for the program. The initial goal was to achieve 50% diversion from disposal by 2006 for Blue Box-eligible materials. The provincial government has requested that this be increased to 60% by 2008, recognizing the importance of diversion through the Blue Box system to the province's overall waste diversion strategy. Municipalities are now receiving funds for their Blue Box programs, ensuring a sustainable base for this important activity.
- **Used Oil and Used Tires:** The provincial government has asked WDO to develop programs for used oil and oil filters, and used tire wastes. WDO, the Ontario Used Oil Management Association and the Ontario Tire Stewardship are currently in the process of developing detailed proposals for implementation of diversion programs for these materials.

Future WDO Opportunities

Any waste can be 'designated' under the *Waste Diversion Act* which would require WDO to develop and implement a waste diversion program. Some areas that could be considered for designation in the near future include: electronic products; household hazardous wastes; batteries; pharmaceuticals; fluorescent tubes.

Electronics Waste

Electronics waste makes up a small but growing portion of the waste stream. Environment Canada estimates that, out of the 31,000,000 tonnes of waste generated in Canada in 2000, about 157,000 tonnes was composed of electronic wastes. While these wastes represent a small fraction of the waste stream in terms of quantity, there are good environmental reasons for diverting them – the toxic nature of some of their components such as metals and other contaminants, can pose serious environmental problems. Each item may contain only a small amount, but when disposed of in landfill, the quantity of these contaminants can become significant. Another potential benefit of diverting them is that some of these materials also contain valuable materials worth recovering.

Household Hazardous Waste

Household Hazardous Wastes (HHW), because they are disposed of by homeowners, are not regulated as hazardous waste under current laws. HHW includes paints, solvents, acids, bases, antifreeze, flammables, oxidizers, pesticides, used crankcase oil, partially-empty aerosol cans, batteries, propane tanks and cylinders, and syringes.

In 2002, there were 76 municipal HHW collection programs in operation in Ontario and about 12,280 tonnes of HHW was diverted from municipal landfills, playing a significant role in reducing the environmental impact of HHW.

Ontario's challenge is to determine how best to manage waste in a way that is sustainable and protective of the health and well being of communities and the environment. Effective ways to increase the waste diversion rate are likely to require new ways of working, new ways of thinking, and new ways for all of us to

participate in finding the solutions to our common problem of waste.

Potential Markets for Compost

The private sector has had some success at creating custom blends for the retail market (mixed with manures, peat etc.)

The value of compost sold in bulk is limited because it has to compete with topsoil and other materials which sell for about \$20/tonne.

Composting can result in less Greenhouse Gas (GHG) emissions than is generated through other waste management options. Less GHG means a potential to benefit from the carbon credits and trading systems that may be available.

Anaerobic digestion has the potential for energy recovery which translates into an additional revenue stream and even more GHG savings.

There may be other uses for the compost such as rehabilitating mine tailings and brownfields.

There are a number of factors that will help determine how successful Ontario will be in reaching its waste diversion goal. Most importantly, we must be able to create a sense of public ownership of the need to manage our wastes differently than we do now.

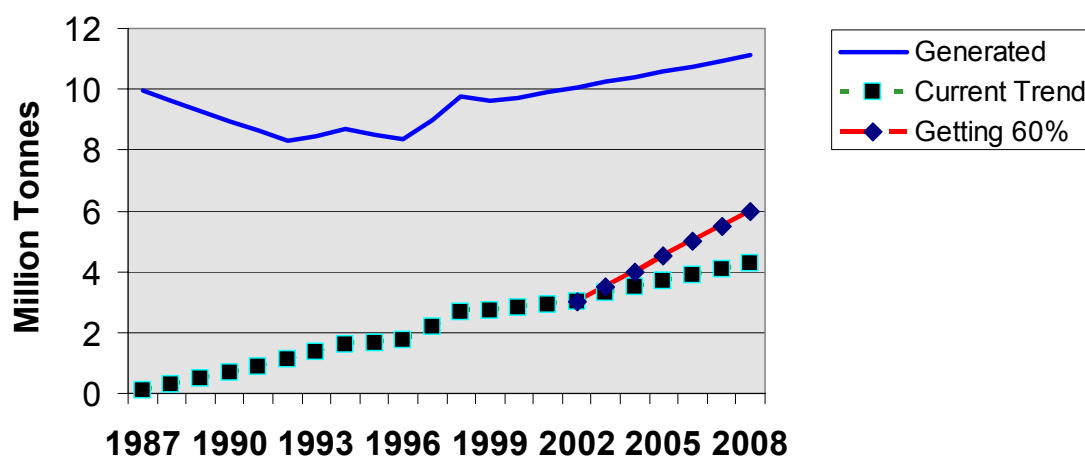
We will also need to effectively address some of the obstacles to waste diversion, including a recognition that landfill is currently cheaper than recycling programs. We must also build our waste diversion solutions on an understanding that *convenience* to the anticipated user of the system is a major determinant of its ultimate success.

There is considerable need to build sustainable markets for recovered materials. In the case of organics diversion, not only are sustainable markets for compost needed, but also new and expanded collection and processing technologies and processes, as well as effective compliance with regulations.

The provincial government also acknowledges that more effective enforcement of regulations as well as greater certainty and timeliness of environmental approvals would assist industry and commercial enterprises in meeting new waste disposal or diversion objectives.

Overall, the provincial government believes that a province-wide strategy for waste diversion is needed to take Ontario to the next level in waste management. Without taking action, Ontario will fall far short of its goal of reaching 60% diversion by the end of 2008 (see Figure 5).

Figure 5: Changing the Waste Diversion Trend
(Excludes waste from construction and demolition activities)



The following discussion outlines a broad framework for better waste management through diversion in Ontario. It focuses on identifying the key areas where action is required if Ontario is to reach its desired waste diversion target in the proposed timeframe.

After considering all comments received from stakeholders and the public on the issues contained in this discussion paper, the provincial government will move forward on a comprehensive, province-wide waste diversion strategy for Ontario.

A. Setting Province-wide Waste Diversion Objectives and Targets

The provincial government has set an overall goal of diverting 60% of Ontario's waste from disposal by the end of 2008. This goal raises the bar for many municipalities and businesses in Ontario and will require significant contributions from all waste generators – individuals, as well as industry. All sectors will be encouraged to look at what and how much waste they generate, where that waste goes now, and how much more can be diverted.

Achieving 60% diversion as a province could require establishing mandatory targets for some and objectives for others.

Setting mandatory targets could be appropriate for some groups where the greatest gains and results can be achieved. But for others, where targets are impractical, the government could seek other ways to encourage and promote further waste diversion, including the provision of incentives. And, even when targets are set, the provincial government plans to ensure municipalities and industries have the flexibility necessary to determine how they mobilize to meet them.

IC&I Sectors

The industrial, commercial and institutional (IC&I) sectors generate a considerable amount of waste. Like municipalities, many companies have already implemented considerable measures to reduce their waste and some

companies divert even more than 60% of the waste they produce. Convincing all companies in this sector to reach a 60% waste diversion rate by 2008 by managing more of their waste through reduction, reuse, recycling and composting would make a major contribution to the province-wide goal.

To ensure full participation in the IC&I sectors, the provincial government would enhance enforcement of the current 3Rs regulations (refer to Section 3: Ontario's Regulatory Framework).

In addition, the Ministry of the Environment would also revisit Ontario Regulation 103/94 to ensure that it meets the government's current waste diversion objectives and is appropriate for Ontario's current business and industrial landscape. This could include consideration of the sectors now covered by the regulation, as well as the specific requirements contained in it.

New requirements could be introduced for waste generators in these regulated sectors to report to the public on their waste diversion rates, starting with the largest enterprises.

Municipal Sector

Residential waste, which is generated by household activities, and managed by municipalities, is a significant part of the waste stream. While there are a number of successful programs dealing with residential waste already in place, we want to build on that success.

To help support municipalities to increase diversion, the provincial government could set mandatory waste diversion targets for municipalities to achieve. The provincial government could set varying targets across the municipal sector to recognize demographic, geographic or technical factors. For example, diversion rates might vary according to the population of a municipality or the level of urbanization.

Mandatory targets for municipalities could be phased in. One option based on this approach could work as follows:

- The largest municipalities with populations over 250,000 could have a waste diversion target rate of 60% by 2008. These municipalities already have limited centralized composting infrastructure in place or have plans to develop centralized composting in the near future.
- Medium-sized municipalities with populations over 50,000 and less than 250,000 could be given a lower interim waste diversion target, achieving 60% diversion over a longer period of time to allow for development of centralized composting systems and other diversion infrastructure needs.
- Small municipalities with less than 50,000 people could be given a lower diversion target in recognition of the fact that it would not always be economically efficient to establish centralized composting.

Progress would be monitored through the current system in which municipalities report their diversion rates on an annual basis to Waste Diversion Ontario, complemented by their reporting to the Municipal Performance and Measurement Program (MPMP), managed by the Ministry of Municipal Affairs and Housing.

Enforcement

To ensure everyone does their part, some degree of enforcement will be required. Municipalities have the authority to regulate compliance through bylaw enforcement. Typically, a municipality will establish standards based on provincial legislation and regulations governing what and how much waste residents are permitted to set out for collection and which materials must be separated for recycling. Some municipalities also establish bag limits and require the purchase of tags for bags that exceed the limit. Moreover, other municipalities require the use of translucent bags to monitor what is being set out. In some cases, multi-family buildings are audited. When compliance is absent, bylaw enforcement may fine the property owner or in some cases, ceases providing services.

In IC&I sectors, waste management is normally managed by the private sector and the contracts will often establish clear limits on what will be handled. For the waste generator, the incentive to reduce waste usually derives from the costs incurred for waste disposal. Quite often, though, recycling programs are associated with increased costs, reducing the incentive. There is a clear need for effective enforcement of compliance in order to ensure a fair playing field for all businesses.

Effective enforcement is the key to compliance. There may be opportunities to obtain greater diversion rates through stricter enforcement of the existing 3Rs regulations. Working within the existing regulatory framework may also allow for additional materials to be added to the amount of waste that is successfully diverted.

Potential Action Items:

- ▶ Set mandatory waste diversion targets for municipalities, varying by size of population.
- ▶ Require public reporting of waste diversion rates by certain businesses.
- ▶ Review and enforce more consistently diversion regulations for IC&I sectors.

Considerations:

- *Setting waste diversion objectives and targets would require IC&I sectors to develop a data management system to monitor and report their waste diversion activities. Businesses with ISO 14001 already have these systems in place.*
- *Although fairness would dictate setting targets for all waste generators, there are unique challenges facing municipalities of different sizes. Preliminary analysis shows that setting a mandatory target for municipalities with populations of more than 250,000 would result in substantial progress towards the 60% diversion goal. The cost effectiveness of additional waste diversion achieved from setting mandatory targets for municipalities of between 100,000 and 250,000 is reduced, though, of course, there would be some increase in the amount of total waste diverted.*
- *Recycling materials from apartments and other multi-dwelling buildings is often difficult due to convenience and storage concerns. Innovation in improving multi-dwelling diversion programs will be the key to improving diversion rates in some municipalities. .*

B. Residential Waste Diversion: Accelerating Centralized Composting

Organic waste materials hold great potential if they are considered as a *resource*, rather than as something simply to be disposed of as they represent about 38% of the current residential waste stream and about 11% of the industrial, commercial and institutional waste stream. Many Ontario households are already dedicated to backyard organics composting. Currently, 1.25 million households are responsible for diverting about 125,000 tonnes of organic waste through backyard composting. Together with the centralized composting capacity developed in a few municipalities, about 485,000 tonnes of organic waste (the majority of which is leaf and yard waste) are now being diverted from disposal.

To achieve a 60% diversion rate, Ontario needs to increase the amount of organic waste that is being diverted from the current 485,000 tonnes to 1.2 million tonnes by 2008 – a significant increase.

Increasing the amount of household backyard composting is essential, though limited in terms of the volumes and kinds of materials involved. Each household composter diverts about 100 kilograms of organic material per year from disposal for a one-time cost of about \$45 to \$60 per composter. It can manage yard wastes, food residues from fruits and vegetables, and ornamental plants, but not other compostable household organics such as pet droppings and bedding, bones and meat scraps, disposable diapers, food wrappings, large quantities of leaf and yard waste.

Theoretically, if each one of the remaining two million single family households started using a composter, another 200,000 tonnes could be diverted. At \$45 - \$60 per composter, this initiative would cost between \$90 million to \$120 million and add 5% to the overall provincial waste diversion rate. This is the maximum diversion the province could achieve through backyard composting.

Clearly, backyard composting, while important, is not enough. To achieve a significant increase in the amount of household organic waste being diverted, centralized composting systems and facilities are necessary.

Fortunately, there is a record of success to build on:

- many municipalities have significant experience in collecting and processing leaf and yard waste;
- some municipalities have already successfully implemented large scale organics diversion programs that require householders to separate organic waste from other materials;
- aerobic and anaerobic composting processes, the most common methods for diverting organic waste, are supported by accessible and reliable technologies;
- private sector businesses have shown an interest in the Province's initiative on an enhanced organics program.

A few municipalities have developed some capacity for centralized composting, but most have limited the materials to yard wastes. Some municipalities such as Guelph and Toronto have started to collect and compost a wide variety of 'wet' kitchen and household wastes such as wet food, coffee grounds, and kitty litter. These 'wet' processing systems differ from yard waste systems in that they are typically, large-scale centralized composting facilities usually housed in a building

operated under controlled conditions. They are able to accelerate decomposition by aeration (fans), continuous turning and controlled moisture, or through the use of anaerobic digestion.

Toronto's success with organics diversion in Scarborough and Etobicoke has led to their intended expansion of the program to an additional 210,000 homes in October, 2004. Similarly, Guelph has achieved a high diversion rate through their wet/dry diversion program.

To be able to divert 1.2 million tonnes of residential organic wastes by 2008 (and reach the 60% diversion target), Ontario must add about 600,000 tonnes of capacity to its current centralized composting capacity. This would require additional infrastructure able to deal with more than 2,000 tonnes of organic wastes per day. While a larger municipality might be served by its own facility with a capacity of up to 100,000 tonnes/year, facilities with a capacity of up to 25,000 tonnes/year could meet the needs of smaller municipalities. There may also be opportunities to maximize economic efficiencies by combining municipal and private sector composting facilities, or building larger regional facilities.

While the capital cost of building new plant capacity to process this amount of material varies based on the specific technology used, the overall capital costs are expected to be significant. A number of estimates have been developed by different organizations for their own purposes:

- Waste Diversion Organization³ considered the costs of a province-wide program capable of diverting 450,000 tonnes and concluded that the capital cost would be about \$350 million.
- The City of Toronto estimated that it spent \$10 million in capital costs to build a 25,000 tonne per year demonstration scale anaerobic digestion facility at the Dufferin Transfer Station property.
- The Region of Peel is building a new centralized composting facility as part of a larger waste management integrated facility that will be able to process 60,000 tonnes of source separated material per year. The capital costs directly attributable to the construction of the composting facility will be approximately \$15 million.

Based on this range of cost estimates, the cost of implementing a province-wide system to handle the additional 600,000 tonnes/year to achieve a 60% diversion rate for organics in 2008 could be significant. On an amortized capital cost basis, these estimates suggest that the costs of backyard composting and centralized composting can be relatively comparable to process the same amount of organics waste. A range of possible financing options for waste diversion infrastructure and ongoing operation is discussed in the next section.

Potential Action Items:

- ▶ Continue to support and encourage backyard composting.
- ▶ Implement increased residential organic waste collection and centralized composting in Ontario's largest municipalities.

³ A former interim group of stakeholders established to assist the Ministry with development of stewardship programs and waste diversion initiatives.

Considerations:

- *Diverting organics from disposal is viewed as a particularly critical component of a province-wide strategy to reach the 60% diversion goal by 2008.*
- *Some municipalities already have source separation programs for food and other household organics or are actively planning for them. For others, time will be required for the necessary organics recycling systems to be put in place.*
- *Successful organics diversion requires sustained markets for compost, collection and processing infrastructure, and effective compliance with regulations.*
- *Innovative approaches will be required to adapt organics collection programs to serve tenants of apartment and condominium buildings.*

C. Developing a Financing Strategy for Increased Waste Diversion, including Centralized Composting for Residential Waste

Diversion of waste from disposal, while it involves additional costs, serves a strategic purpose for the municipalities and industries seeking to better manage their wastes. Based on information submitted to WDO for the year 2002, costs per tonne to operate a Blue Box system, typically range from about \$85 to \$250 per tonne, with higher costs often being associated with travel costs in servicing a large rural area. Thus economies of scale can be assumed for larger municipalities. In addition, some of the costs associated with diverting more waste through the Blue Box system are offset by 50% contributions from industry through Waste Diversion Ontario's Blue Box Program Plan.

Similarly, the range of operating costs for a centralized organics program will range significantly with size of municipality; typical processing facility operating costs are approximately \$100 per tonne.

One major challenge in the development of more waste diversion, including expanded composting capacity in Ontario, is the issue of how to finance the construction and ongoing operation of the necessary infrastructure.

In order to meet the 60% target, the largest municipalities would have to accelerate and expand their residential organic waste collection and centralized composting in the near term. This would require significant up-front capital expenditures and additional resources would be required for ongoing operation. In addition, municipalities would incur ongoing operational costs for collection and processing. A financing strategy that could include financial support from the provincial government could be considered as part of developing this overall strategy.

Self-financing Through User Pay Systems

- User pay systems for household garbage collection (sometimes called "pay-as-you-throw" systems) can help to finance residential waste management services, making householders more directly responsible for the waste they generate. Approximately 137 Ontario communities have adopted user pay systems, some with and some without bag limits for garbage services, covering 3.7 million Ontarians and 1.3 million households. User pay systems

are effective in encouraging recycling and composting – experience shows that they can increase waste diversion rates by 10% - 25%.

Municipal Borrowing

- Municipalities could borrow funds up-front to construct the necessary waste diversion infrastructure. Municipalities could draw on revenues from their property tax base to cover principal and interest payments.
- The provincial government has announced the new Ontario Strategic Infrastructure Financing Authority (OSIFA), replacing the Ontario Municipal Economic Infrastructure Financing Authority (OMEIFA). In 2004-05, OSIFA's infrastructure renewal loan program will be focused on offering affordable infrastructure financing to municipalities for five key priorities: clean water infrastructure, sewage treatment facilities, waste management infrastructure, municipal roads and bridges, and public transit. OSIFA will raise capital from individual and institutional investors to form a pool that provides loans to broader public sector partners. All borrowers will receive the same low interest rate.

Provincial Grants

- The provincial government could provide capital grants for all or a portion of the capital costs of adding composting and other diversion facilities. Grants could be time-limited to encourage early action. Note that there are currently no provincial grant programs available for municipalities to fund waste diversion programs.

Provincial Waste Disposal Surcharge

- The provincial government could impose a surcharge on waste sent for disposal. Such a surcharge could function as both a funding mechanism to finance waste diversion systems and as an incentive to waste generators to reduce the amount of waste. A disposal surcharge could raise significant revenues to help achieve the waste diversion goal.

Encouraging Private Sector Investment in Waste Diversion Facilities

- A wide variety of contractual arrangements are being considered by some municipalities whereby the private sector competes for a contract from a municipality to collect and process organic wastes from households and/or commercial establishments. The composting facility could be financed either by the municipality (or group of municipalities) or the private sector. In the case of the latter option, the contract would likely have to ensure a revenue stream that would provide a return on investment in a relatively short period of time (e.g., five years). These revenues could derive from agreed-to rates or prices for collection and/or disposal of wastes to landfill and through recycling and composting processes.

Revenues from Enhanced Marketing of Compost

- High quality compost produced from a compost facility allows greater flexibility in establishing value-added markets. For example, a marketing strategy that targets 'dollar markets' such as topsoil blenders, landscaper, retail garden centres, sports centres, and nurseries will yield substantially

higher revenues than low grade compost that is limited to 'volume markets' such as agriculture, sod production or mine reclamation.

- The provincial government is proposing to harmonize the metal criteria for compost in Ontario with those of the Canadian Council of Ministers of the Environment (CCME) Guideline. Details of this proposal --"Interim Guidelines for the Production and Use of Aerobic Compost in Ontario" - are available on the Environmental Registry website. This harmonization would support the production of high quality compost and enable easier use and marketing of the end product, while ensuring that public health and the environment are protected.

Financing Options through Waste Diversion Ontario

- WDO could be asked by the province to develop a waste diversion program for a designated material. When a waste is "designated", WDO establishes rules prescribing fees payable by 'industry stewards' (brand owners and first importers of the designated material) for the costs of developing, implementing and operating the particular waste diversion program.

Potential Action Items:

- ▶ Make available and encourage a range of financing options for creating new waste diversion programs and infrastructure that includes consideration of the following components:
 - ▶ user pay;
 - ▶ provincial funding;
 - ▶ municipal financing through borrowing;
 - ▶ a provincial waste disposal surcharge;
 - ▶ private sector investment;
 - ▶ revenues from new markets for recycled materials;
 - ▶ designation of new wastes for which Waste Diversion Ontario must develop waste diversion programs.

Considerations:

- *Low disposal costs are often cited as a barrier to composting.*
- *Sustainable markets will be required for the increased quantities of compost.*
- *Proposed revisions to Ontario's compost guidelines would assist in developing new markets for the end product produced by municipal composting facilities.*

D. Industrial, Commercial and Institutional Waste Diversion: A Renewed Commitment

The IC&I sectors include a wide range of businesses such as manufacturers, banks, retail shops, schools, apartment buildings, construction and demolition companies and many others. Waste generated by these IC&I sectors is an important candidate for waste diversion because it represents half or more of the total waste stream.

The existing regulatory requirements may need to be changed to better reflect a renewed commitment to waste diversion. A limited number of IC&I waste

generators fall under the existing regulation: Ontario Regulation 103/94 covers the largest generators in select sectors. Also, the regulation currently does not include any requirements for organic waste diversion.

To monitor progress on meeting the 60% diversion objective, the provincial government could require the largest waste generators in the IC&I sectors to report their waste diversion rates publicly. This could be phased in on a sector-by-sector basis over a few years beginning with the sector that generates the largest quantity of waste.

Achieving waste diversion in small businesses may be better helped by providing needed training, rather than by regulation. The provincial government could work with different partners, such as industry associations, to provide sector-focused training on waste reduction.

Small businesses would continue to be exempt from Ontario's 3Rs regulations, but would be encouraged to make progress in waste diversion. A 2000 survey completed by the Canadian Federation of Independent Business (CFIB) found that "the high concern that small and medium-sized enterprises (SMEs) have for the environment is also evident in the way they manage their own day-to-day affairs. In 2000, one in two small businesses (47.4% of respondents) threw out less or an equal amount of garbage compared to a household." According to CFIB, this represents a significant improvement from 1990, when only 28.1% met that standard.

Potential Action Items:

- ▶ Review and revise Ontario Regulation 103/94 to reflect a renewed commitment to ICI waste diversion.
- ▶ Require the largest waste generators to publicly report their waste diversion rates.
- ▶ Phase in public reporting of waste diversion rates by other waste generators on a sector-by-sector basis.
- ▶ Provide training to small businesses to help them increase their waste diversion rates.

Industry Successes in Recycling

There are many examples of successful waste reduction programs operated by companies and organizations in the industrial, commercial and institutional sectors. Many have been recognized by the Recycling Council of Ontario in its annual Waste Reduction Awards. For example, in 2002/2003 RCO recognized the following companies, among others, for their achievements in waste minimization:

Platinum Award Winners

- Nemak of Canada – Essex Aluminum Plant: Since 1997, the plant has reduced its total waste disposal by over 10 million kilograms and solid waste disposal has been reduced by 34%. It uses collected scrap materials as its primary input and its products are 100% recyclable at the end of their life cycle.
- Steelcase Canada Ltd: Between 2000 and 2002, Steelcase reduced its aluminum wastes by 48%, corrugated cardboard box by 40%, fabric by 74% and solvents by 76%.
- Toyota Motor Manufacturing Canada Inc: The company recycles excess steel and grinding dust and is implementing an innovative water recycling system that cleans waste water and recycles it back into the production process. In addition, used solvents are collected, sent for recycling, and returned to the company for re-use.

Considerations:

- *A large number of businesses are not currently subject to 3Rs regulations. A cost assessment of new requirement would be required before any new requirements were put in place.*
- *Building Code changes could be considered for new multi-unit residential buildings to require provision of convenient source separation services for residents.*

E. Feasibility of Phasing-in a Ban on Disposal of Organics and Recyclable Materials

This discussion paper has emphasized that diverting organics and recyclables from disposal is a critical component of achieving the 60% diversion goal in the residential sector. Preventing these materials from going to landfills will help preserve our natural resources and reduce the impact on the environment, reducing odours caused by the organics as they decompose and avoiding problems caused by landfill leachate on groundwater.

The provincial government could consider phasing in a ban on the disposal of certain organics (e.g., household organics) and recyclables (e.g., Blue Box materials) from disposal.

Many provinces are targeting organics in their diversion strategies. Both Prince Edward Island and British Columbia have established aggressive diversion targets with an emphasis on organics. Nova Scotia is the only province to have implemented a ban on organics – it banned compostable organic material from landfills in 1998. The ban includes food waste (including meat, fish, bones and dairy products), leaf and yard waste, and non-recyclable paper products. Now, 76% of Nova Scotians have curbside collection and centralized composting of food, leaf and yard waste, and paper products. In addition, 53 of 55 municipalities in the province offer centralized composting to businesses, including supermarkets, restaurants, food processing plants, etc. As a result of its success in waste diversion, Nova Scotia plans to close 15 landfill sites by 2005.

However, it is important to note that a ban on organics in landfill would only be enforceable if it applied to *all* waste generators. This would mean that the industrial, commercial and institutional sectors would also need to be subject to the ban. The greatest success would come from full participation, which would likely require additional efforts in enforcement.

Diverting more of these materials means that adequate alternatives to disposal must be made available. Alternatives could include residential and IC&I source

Case Study: California

For example, California's State Agency Buy Recycled Campaign (SABRC) requires all state agencies to purchase products with recycled content. SABRC complements the *Integrated Waste Management Act* which seeks to reduce the amount of waste going to California's landfills.

Specifically, all state and local government agencies in California must ensure that 50% of their purchases are recycled-content product (RCP) purchases. Suppliers of RCP must certify the recycled content of all products offered or sold to the state. State agencies are required to report their RCP purchases annually to document compliance with the RCP procurement mandates of the SABRC.

separation programs and the provision of recycling containers or depots in public areas. Where adequate alternatives for managing these materials do not exist, time would be needed to put appropriate alternatives in place. This means that any ban would likely have to be phased in over a reasonable period of time.

Potential Action Items:

- ▶ Phasing in a ban on the disposal of key organics and recyclables from disposal.

Considerations:

- *While a ban could be put in place relatively quickly, it could not take full effect until there was reasonable assurance that adequate alternatives to disposal were available.*
- *The development of the necessary infrastructure, especially for organic waste, would take time.*
- *Practical difficulties to enforcing a ban would have to be addressed.*

F. Finding New Waste Diversion Technologies

New technologies may be able to help Ontario increase its waste diversion rate by helping us to recycle and manage materials more easily and at lower cost, and to enable diversion of a broader range of materials.

New technologies will be helpful in areas such as organics diversion. For example, collecting organic material such as food scraps from apartment buildings is difficult because of convenience and storage issues. Innovations may allow garbage chutes to be modified to direct organics, recyclables and garbage into separate containers below. Other innovations may include the use of “deep collection” systems which use in-ground containers to store organic wastes, keeping the collected wastes cool to prevent odours. In municipalities where many residents live in apartments or condominiums, a significant amount of organic material and other recyclables will be missed if new technologies are not developed.

Before a new waste diversion technology can be developed on a large scale, it must demonstrate that it reliably delivers on its promises and effectively protects the environment. Research or demonstration projects may be one way for that to happen.

To encourage the private sector to come forward with innovative technologies and investment, Ontario needs the right climate for research and development. In part, this means ensuring we have the right approvals process – one which protects the environment but also spurs investment, innovation, and economic development.

To help facilitate new technology development, the provincial government could consider streamlining the approvals process under the *Environmental Protection Act* (EPA) for small scale research or demonstration projects for new or emerging waste diversion technologies. Small scale research or demonstration projects are not normally subject to the *Environmental Assessment Act* (EAA) but the existing “research” exemption in Ontario Regulation 334 for municipal projects could be further clarified.

Approval could depend on the scale and length of the project, with approval requirements under the EPA streamlined so that they were proportional to the potential level of environmental effects of a project. All proposals would require clearly defined and documented research objectives and study protocols. Air approvals under the EPA would still be required for any air emissions. Municipal land use approval requirements and bylaws would still apply to all sites.

Potential Action Items:

- ▶ Streamline the approvals process under the *Environmental Protection Act* (EPA).
- ▶ Clarify the 'research' exemption in Ontario Regulation 334, ensuring that small scale research or demonstration projects for new waste diversion technologies are not subject to the *Environmental Assessment Act* (EAA).

Considerations:

- *Clear definitions and criteria of "research" and "demonstration project" would need to be developed.*

G. Reducing Packaging and Increasing the Recycled Content in Products and Packaging

While packaging serves many useful functions, its utility is temporary. Packaging becomes waste as soon as it has fulfilled its intended purpose, regardless of how important and necessary that purpose may have been. In fact, its usefulness has made it a large component of almost all waste streams. Packaging makes up about 25% by weight of the residential waste stream and makes up a considerably higher percentage by volume.

Under Waste Diversion Ontario's (WDO) Blue Box Program Plan, brand owners and importers of printed paper and packaging materials in the residential Blue Box system pay fees to cover half of the net cost incurred by municipalities for the operation of their Blue Box programs. The fees are based on the quantity and type of materials managed by municipalities.

The government expects that WDO's Blue Box Program Plan will help reduce packaging. The Blue Box Program Plan's financial incentives encourage companies to use less packaging, or use recyclable materials in their packaging that are marketable or cost less when they arrive in the Blue Box system. These companies will pay fewer fees when they package products in materials that are easily recycled and when they reduce the amount of materials in their packaging. The list of packaging materials and product stewardship activities will expand over the next few years so that there will be less and less non-recyclable materials used in packaging.

The provincial government could pursue opportunities at the national level to improve programs aimed at reducing packaging, and increasing recycled content of products, building on successful initiatives such as the CCME National Packaging Protocol which achieved a 50% packaging reduction by 1996, well ahead of the 2000 deadline. Additionally, the provincial government could continue development of useful information on how best to promote packaging reduction, reuse and recycling.

Deposit-Return Systems

Under a deposit-return system, the product or product container is subject to a deposit when purchased which is refunded to the purchaser when the used product or product container is returned. The amount of the deposit would need to be enough, relative to the product cost or type of product, to encourage returns to be made. In some situations, deposit-return systems have proven to be a very effective way to ensure that a high percentage of waste is diverted.

Potential Action Items:

- ▶ *Improve programs designed to reduce packaging and increase recycled content of products through working with other levels of government.*
- ▶ *Disseminate information on best practices in packaging reduction, reuse and recycling.*

Considerations:

- *Consumer preferences will help motivate manufacturers towards packaging reduction and increased recycled content in products.*
- *Implementing non-refillable beverage container deposit-return systems in Ontario would have minimal impact on municipal waste diversion rates in Ontario since the majority of beverage containers are already collected in existing recycling programs (e.g., through the Blue Box or The Beer Store).*

H. Expanding Public Education and Awareness Activities to Promote the 3Rs

Most people and businesses want to recycle, buy environmentally friendly products and reduce the amount of waste. Continuing promotion and education is important to help people recycle and to assist municipalities and industry to develop recycling and other waste diversion programs.

A promotion and education plan could meet information and education needs and determine how best to promote waste diversion. The plan should describe the benefits of recycling and waste diversion, give examples of successful and innovative recycling programs and technologies, provide information on how different types of recycling programs work (such as organics source separation programs), and identify what recycling information and reports are available and where to get them.

The provincial government would work in partnership with all stakeholders to develop and distribute information and educational materials to the public, municipalities, and the business community.

Potential Action Items:

- ▶ *Work with stakeholders to deliver effective public education on the 3Rs.*

Considerations:

- *A high level of public participation is essential to achieving the waste diversion objectives and targets. Convenience can be a consideration for users, regardless of the environmental benefits.*

I. Initiating a Province-wide Monitoring System for Waste

Comprehensive data is needed to measure progress towards Ontario's waste diversion goal. We must measure our performance so that we can keep on track, make adjustments where necessary, and keep the public informed.

The provincial government could require all waste generators (municipalities and industry) to monitor and report waste statistics such as waste generated, diverted and disposed in order to monitor progress. Requirements for IC&I sectors would be phased-in, starting with the largest waste generators first. The provincial government could require waste management facilities (e.g., waste transfer stations and landfills) to develop a data monitoring and reporting system to enable the ongoing measurement of the success of waste diversion activities promoted under this strategy.

The data monitoring and reporting system would have to include data on facility capacity, and on waste types and quantities disposed or diverted. The reporting requirement could apply to all sites used for the management of waste including landfills, incinerators, transfer stations, and processing facilities.

Potential Action Items:

- ▶ Require all waste generators in the municipal and IC&I sectors and waste site operators to report waste diversion statistics, including quantities of waste disposed and diverted.

Considerations:

- *Implementing reporting requirements may mean new costs for those required to report and to operate the monitoring system.*

SUMMARY OF POTENTIAL ACTION ITEMS

Note that these are examples of actions that could be part of a provincial waste diversion strategy. They should not be considered as a government commitment, but rather as an area for consideration and discussion.

A. Setting Province-wide Waste Diversion Objectives and Targets

- ▶ Set mandatory waste diversion targets for municipalities, varying by size of population.
- ▶ Require public reporting of waste diversion rates by certain businesses.
- ▶ Review and enforce more consistently diversion regulations for IC&I sectors.

B. Residential Waste Diversion: Accelerating Centralized Composting

- ▶ Continue to support and encourage backyard composting.
- ▶ Implement increased residential organic waste collection and centralized composting in Ontario's largest municipalities.

C. Developing a Financing Strategy for Increased Waste Diversion, including Centralized Composting for Residential Waste

- ▶ Make available a range of financing options for creating new waste diversion programs and infrastructure that includes consideration of the following components:
 - ▶ user pay;
 - ▶ provincial funding;
 - ▶ municipal financing through borrowing;
 - ▶ a provincial waste disposal surcharge;
 - ▶ private sector investment;
 - ▶ revenues from new markets for recycled materials;
 - ▶ designation of new wastes for which Waste Diversion Ontario must develop waste diversion programs.

D. Industrial, Commercial and Institutional Waste Diversion: A Renewed Commitment

- ▶ Review and revise Ontario Regulation 103/94 to reflect a renewed commitment to IC&I waste diversion.
- ▶ Require the largest waste generators to publicly report their waste diversion rates.
- ▶ Phase in public reporting of waste diversion by other waste generators on a sector-by-sector basis.
- ▶ Provide training to small businesses to help them increase their waste diversion rates.

E. Feasibility of Phasing-in a Ban on Disposal of Organics and Recyclable Materials

- ▶ Phasing in a ban on the disposal of key organics and recyclables from disposal

F. Finding New Waste Diversion Technologies

- ▶ Streamline the approvals process under the *Environmental Protection Act* (EPA).
- ▶ Clarify the 'research' exemption in Ontario Regulation 334, ensuring that small scale research or demonstration projects for new waste diversion technologies are not subject to the *Environmental Assessment Act* (EAA).

G. Reducing Packaging and Increasing the Recycled Content in Products and Packaging

- ▶ Improve programs designed to reduce packaging and increase recycled content of products through working with other levels of government.
- ▶ Disseminate information on best practices in packaging reduction, reuse and recycling.

H. Expanding Public Education and Awareness Activities to Promote the 3Rs

- ▶ Work with stakeholders to deliver effective public education on the 3Rs.

I. Initiating a Province-wide Monitoring System for Waste

- ▶ Require all waste generators in the municipal and IC&I sectors and waste site operators to report waste diversion statistics, including quantities of waste disposed and diverted.

Your Input is Needed

All interested individuals and groups including municipalities, industry, environmental groups, the recycling and waste management industry, waste management professionals, and the general public are being asked to participate.

No decisions have been made on the approaches and options described in the paper. All comments received from stakeholders and the public will be considered before any decisions are made.

If you are interested in responding to this paper with your ideas and suggestions, please contact the Ministry of the Environment by sending comments by mail, fax or email to:

Ontario Ministry of the Environment
Waste Management Policy Branch
Ontario's 60% Waste Diversion Goal: A Discussion Paper
135 St. Clair Avenue West, 7th floor
Toronto, Ontario, M4V 1P5

Fax: (416) 325-4437

Email: wastediversion@ene.gov.on.ca

You can also provide comments directly through the Environmental Bill of Rights (EBR) Environmental Registry where you will find a copy of the Discussion Paper at [insert web address].

Please provide your response by August 9, 2004.

In addition to formal written responses, you are encouraged to participate in a series of public and stakeholder consultation sessions being held throughout the Province. Sessions are currently planned in June. For further information about meetings in your area go to the website of the Ministry of the Environment at www.ene.gov.on.ca or call toll-free at 1 800 565-4923 or, in Toronto, 416 325-4000.

Your participation is greatly appreciated.

Consultation Questions

The provincial government welcomes comments on any topic raised in the discussion paper. The provincial government is particularly interested in advice and perspectives on the following:

Waste Diversion versus Waste Disposal

1. Should the provincial government, private sector, institutions and municipalities invest in waste diversion, even if it is more expensive than disposal? Why or why not?

Ontario's Waste Diversion Goal

2. Is a 60% waste diversion rate by 2008 a feasible goal for Ontario?
3. This paper proposes that municipalities meet a mandatory waste diversion target. Should there be different targets (or objectives) for municipalities based on their size, recognizing differing waste management challenges and needs?
 - a. If yes, what should those targets (or objectives) be and what criteria should be used to categorize municipalities according to size?
 - b. Should the targets (or objectives) be immediate or phased in, for all municipalities or by size?
4. Should the province set a waste diversion target or objective for IC&I sectors or for individual groups within this broad category? How should it be applied?
5. What can we learn from other jurisdictions that have a higher average waste diversion rates than Ontario?

IC&I Sectors' Requirements

6. Should source separation for the IC&I sectors be mandatory? Why or why not?
7. What can we learn from other jurisdictions that require their IC&I sectors to source separate?
8. Are the waste diversion regulations that currently apply to the IC&I sectors (e.g., Ontario Regulation 103/94) appropriate and supportive of the waste diversion strategy or should they be revisited (e.g., recycling requirements, types of establishments covered, size thresholds)?
9. If waste diversion programs are mandatory for businesses based on their size, how should the categories of 'large' and 'medium-sized' business be defined?

-
10. Given the potential cost impact, should requirements on medium-sized businesses be phased in and, if so, over what period of time?
 11. Given the costs of source separation, should small businesses and organizations be exempt from such a requirement? If so, what is an appropriate size threshold for such an exemption?
 12. Should the provincial government require reporting of waste diversion data? How should this data be made public?

Organics Diversion

13. What can we learn from other jurisdictions that have already achieved significant organics diversion?
14. What do you see as the best way to finance the development of centralized composting systems?
15. Should the provincial government consider banning organic wastes and recyclables from disposal?
16. What challenges are there related to establishing composting facilities and sustained markets for compost materials?
17. What opportunities are there related to establishing sustained markets for compost materials? Are there synergies between organics composting and other compostable materials (e.g., sewage, agricultural nutrients)?

Financing Options

18. What financing options hold the most promise for the amount of investment required to increase Ontario's waste diversion rate? (The provincial government encourages as much input and detail as possible on appropriate methods of financing the various components of a waste diversion strategy that will achieve the waste diversion objective in an economic and practical manner.)
19. If provincial funding was made available, should it be provided on a performance basis only, meaning that funding is directly tied to meeting clear performance targets? (This would entail making funding contingent on the submission of a waste diversion plan and subsequent payments would depend on the achievement of the performance targets set out in that plan.)
20. Is there public support for a waste disposal surcharge if revenues were used to promote waste diversion?

Promoting Investment and Innovation

21. How can the provincial government promote greater investment in waste diversion and waste diversion technologies?

-
22. What are the potential economic benefits of greater investment in waste diversion in Ontario?
 23. Should the provincial government consider expediting approvals for new and emerging waste diversion technologies that contribute to meeting the province's waste diversion goal?

Reducing and Reusing Waste

24. How can the provincial government encourage packaging reduction? What is the role of the provincial government and consumers?
25. How can the provincial government encourage increased recycled content of products?
26. What role should deposit-return systems play in Ontario's waste diversion strategy?

Public Awareness and Participation

27. How can greater residential/public participation in waste diversion programs be encouraged?
28. What are effective methods to raise awareness of waste reduction, reuse, recycling and composting?

Creating Efficiencies

29. How can private and public generators of organics waste work together to establish composting facilities?
30. What types of waste diversion activities are best pursued on a regional basis, rather than by individual municipalities?
31. Which components of the strategy hold the most promise for short-term improvements in Ontario's waste diversion rate?

Appendix D

York Region Environmental Assessment Terms of Reference



Approved Environmental Assessment Terms of Reference

...prepared in accordance with Sections 6.(1) and 6.(2)(a) of the *Environmental Assessment Act*

March 31, 2006



Ministry
of the
Environment

Office of the Minister

135 St. Clair Ave. West
12th Floor
Toronto ON M4V 1P5
Tel (416) 314-6790
Fax (416) 314-6748

Ministère
de
l'Environnement

Bureau du ministre

135, avenue St. Clair ouest
12^e étage
Toronto ON M4V 1P5
Tél (416) 314-6790
Téléc (416) 314-6748



ENV1283MC-2006-729

MAR 31 2006

Ms. Mirka Januszkiewicz
Director
Waste Management Services
Regional Municipality of Durham
Works Department

c/o Durham/York Residual Waste Study
605 Rossland Road East
Whitby ON L1N 6A3

Dear Ms. Januszkiewicz:

Thank you for submitting your Terms of Reference (ToR) for the Durham/York Residual Waste Study on December 31, 2005, as amended on February 17, 2006. The ministry has completed its review and I wish to inform you that I have approved the amended ToR for the preparation of an environmental assessment with respect to the Durham/York Residual Waste Study.

I congratulate the Regional Municipalities of Durham and York for having the foresight to develop a long-term plan and for seeking local solutions. Furthermore, I commend the Regions' commitments to expand diversion programs to achieve a goal of 60% diversion by 2011. This is a critical component to your long-term waste management plan and I trust that your consideration of residual waste processing systems will not come at the expense of your waste diversion goals.

As required by subsection 6.1(1) of the *Environmental Assessment Act*, the environmental assessment must now be prepared in accordance with the approved ToR. While this approval provides additional certainty to your environmental assessment decision-making process, it does not secure approval of an undertaking. The Regions of Durham and York are responsible for fulfilling the commitments outlined in the ToR and providing the appropriate level of quality in the environmental assessment.

... 2



Ms. Januszkiewicz

Page 2

Should you wish to vary significantly from your approved ToR in preparing your environmental assessment, you will need to submit a (new/amended) ToR for my approval. In the event of any uncertainty, you should consult with the Ministry of the Environment through the Ministry's Environmental Assessment and Approvals Branch.

Should you require further assistance please contact Ms. Samantha Kassel, Project Officer of the Environmental Assessment and Approvals Branch, at telephone 416-314-8214 or by email at samantha.kassel@ene.gov.on.ca.

Yours truly,



Laurel C. Broten
Minister of the Environment

Attachment

c: David Merriman, MacViro Consultants, Inc.
David Walmsley, Jacques Whitford Limited
Jim McKay, Jacques Whitford Limited

Ministry
of the
Environment

Office of the Minister

135 St. Clair Ave. West
12th Floor
Toronto ON M4V 1P5
Tel (416) 314-6790
Fax (416) 314-6748

Ministère
de
l'Environnement

Bureau du ministre

135, avenue St. Clair ouest
12^e étage
Toronto ON M4V 1P5
Tél (416) 314-6790
Télec (416) 314-6748



MAR 3 1 2006

ENV1283MC-2006-729

Mr. Andy Campbell
Director
Solid Waste Management Branch
Regional Municipality of York
Transportation and Works Department

c/o Durham/York Residual Waste Study
605 Rossland Road East
Whitby ON L1N 6A3

Dear Mr. Campbell:

Thank you for submitting your Terms of Reference (ToR) for the Durham/York Residual Waste Study on December 31, 2005, as amended on February 17, 2006. The ministry has completed its review and I wish to inform you that I have approved the amended ToR for the preparation of an environmental assessment with respect to the Durham/York Residual Waste Study.

I congratulate the Regional Municipalities of Durham and York for having the foresight to develop a long-term plan and for seeking local solutions. Furthermore, I commend the Regions' commitments to expand diversion programs to achieve a goal of 60% diversion by 2011. This is a critical component to your long-term waste management plan and I trust that your consideration of residual waste processing systems will not come at the expense of your waste diversion goals.

As required by subsection 6.1(1) of the *Environmental Assessment Act*, the environmental assessment must now be prepared in accordance with the approved ToR. While this approval provides additional certainty to your environmental assessment decision-making process, it does not secure approval of an undertaking. The Regions of Durham and York are responsible for fulfilling the commitments outlined in the ToR and providing the appropriate level of quality in the environmental assessment.



Mr. Campbell

Page 2

Should you wish to vary significantly from your approved ToR in preparing your environmental assessment, you will need to submit a (new/amended) ToR for my approval. In the event of any uncertainty, you should consult with the Ministry of the Environment through the Ministry's Environmental Assessment and Approvals Branch.

Should you require further assistance please contact Ms. Samantha Kassel, Project Officer of the Environmental Assessment and Approvals Branch, at telephone 416-314-8214 or by email at samantha.kassel@ene.gov.on.ca.

Yours truly,



Laurel C. Broten
Minister of the Environment

Attachment

c: David Merriman, MacViro Consultants, Inc.
David Walmsley, Jacques Whitford Limited
Jim McKay, Jacques Whitford Limited

TERMS OF REFERENCE - NOTICE OF APPROVAL

ENVIRONMENTAL ASSESSMENT ACT

SECTION 6.(4)

APPROVAL OF TERMS OF REFERENCE

FOR

THE PREPARATION OF AN ENVIRONMENTAL ASSESSMENT

RE: Proponent: Regional Municipalities of Durham and York

Undertaking: Durham/York Residual Waste Study

EA File No.: EA 02 08

As provided for by section 6.(4) of the *Environmental Assessment Act*, Terms of Reference, as submitted for approval to the Ministry of the Environment on December 31, 2005, and revised through the submission of Terms of Reference dated February 17, 2006, to govern the preparation of an environmental assessment for the above-noted undertaking, are hereby approved.

Pursuant to subsection 6.1(1) of the *Environmental Assessment Act*, any environmental assessment for the above-noted undertaking, submitted to the Ministry of the Environment pursuant to subsection 6.2(1) of the *Environmental Assessment Act*, must be prepared in accordance with the Terms of Reference as hereby approved.

Reasons for approval:

1. The ToR ensures that the EA will be completed using a comprehensive public and government agency consultation process that is open and transparent;
2. The ToR ensures that the completed EA will contain a sufficient level of detail to accurately assess the environmental effects of all alternatives and the proposed undertaking; and,
3. The ToR sets out a planning process that will ensure the completed EA will be consistent with the purpose of the EAA and the public interest.

- 2 -

Dated the 31 day of March, 2006 at TORONTO.

A handwritten signature in cursive script, appearing to read "Raul Brote", written in black ink.

Minister of the Environment
135 St. Clair Avenue West, 12th Floor
Toronto, Ontario
M4V 1P5



Proposed Environmental Assessment Terms of Reference

**...prepared in accordance with Sections 6.(1) and
6.(2)(a) of the *Environmental Assessment Act***

February 17, 2006





Residual Waste Disposal Planning Study

Proposed Environmental Assessment

Terms of Reference

February 17, 2006

prepared by:



MacViro Consultants Inc.
600 Cochrane Drive, Suite 500
Markham, Ontario, Canada
L3R 5K3



Jacques Whitford Limited
7271 Warden Avenue
Markham, Ontario, Canada
L3R 5X5

TABLE OF CONTENTS

1. Introduction	1
1.1. BACKGROUND ON RESIDUAL WASTE STUDY	1
1.2. GLOSSARY OF TERMS.....	3
1.3. SCOPE OF EA TERMS OF REFERENCE	3
1.4. MUNICIPAL ENDORSEMENT OF PROPOSED EA TERMS OF REFERENCE DOCUMENT	6
2. Identification of the Proponents	6
2.1. INTER-MUNICIPAL PARTNERSHIP AGREEMENT	6
2.2. POTENTIAL FOR COOPERATION WITH PRIVATE SECTOR PARTNER(S).....	7
3. Purpose and Description of the Undertaking	7
3.1. PURPOSE OF THE UNDERTAKING	7
3.2. DESCRIPTION OF THE UNDERTAKING.....	8
3.3. POTENTIAL CONSIDERATION OF CONTINGENCY OR SURPLUS DISPOSAL CAPACITY.....	9
4. Range of Alternatives to be Evaluated in EA Study.....	10
4.1. “ALTERNATIVES TO” THE UNDERTAKING (ALTERNATIVE APPROACHES AND TECHNOLOGIES)	10
4.1.1. <i>Consideration of Disposal Systems</i>	10
4.1.2. <i>Component Approaches and Technologies for Alternative Disposal System Development</i> 10	
4.2. “ALTERNATIVE METHODS” OF IMPLEMENTING THE UNDERTAKING (ALTERNATIVE SITES)	14
5. Description of Environment Potentially Affected.....	15
5.1. NATURAL ENVIRONMENT	15
5.2. SOCIO-ECONOMIC	16
5.3. FIRST NATIONS COMMUNITIES	16
5.4. ECONOMIC BASE.....	17
5.4.1. <i>Industry</i>	17
5.4.2. <i>Agriculture</i>	18

5.4.3. Tourism.....	18
5.5. TRANSPORTATION SYSTEMS	18
5.6. POWER GENERATION AND TRANSMISSION CORRIDORS	19
5.7. LEGAL / JURISDICTIONAL CONSIDERATIONS	20
6. Evaluation Methodologies and Criteria	20
6.1. COMPARATIVE EVALUATION OF “ALTERNATIVES To” THE UNDERTAKING	20
6.2. SCREENING AND COMPARATIVE EVALUATION OF ALTERNATIVE METHODS OF IMPLEMENTING THE UNDERTAKING	22
6.3. APPLICATION OF A COMPETITIVE REQUEST FOR PROPOSAL (RFP) PROCESS	24
6.4. ESTIMATED STUDY SCHEDULE	25
6.5. DETAILED SITE SPECIFIC STUDIES	25
6.6. APPLICABILITY OF THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT	26
7. Consultation Plan for the Environmental Assessment.....	26
7.1. PARTIES TO BE CONSULTED DURING EA STUDY.....	27
7.2. SCOPE OF CONSULTATION AT STUDY MILESTONES.....	27
7.3. ISSUES RESOLUTION.....	29
8. Monitoring Strategy	30
9. Flexibility in Application of the Terms of Reference	30

Appendices

Appendix A	Residual Waste Study – Glossary of Frequently Used Terms and Abbreviations
Appendix B	Regional Council Resolutions Endorsing Proposed EA Terms of Reference
Appendix C	Agreement Between The Region of Durham and York Region for Joint Study on Waste Disposal
Appendix D	Study Area Base Map
Appendix E	Preliminary Evaluation Criteria for “Alternatives to the Undertaking” (i.e., Alternative Technologies)

Appendix F

**Preliminary Screening and Evaluation Criteria for “Alternative Methods”
of Implementing the Undertaking (i.e., Alternative Sites)**

1. INTRODUCTION

This introduction provides an overview of waste management within the two Regions as background to the Residual Waste Study, a reference to the appended Glossary of Terms, an outline of the scope of the EA Terms of Reference as required by provincial legislation and a description of the endorsement, by the respective Regional Councils, of the EA Terms of Reference.

1.1. Background on Residual Waste Study

Durham and York Regions have agreed to undertake a joint Residual Waste Planning Study. Both municipalities are in need of a solution to manage the remaining solid waste after diversion (residual or post-diversion waste). The Regions are working to address the social, economic, and environmental concerns of residents through an Environmental Assessment (EA) Study, which will examine potential waste management alternatives.

The Region of Durham has programs in place for the source separation and diversion of both “Blue Box” recyclables and household organics. The Blue Box program is being expanded over the next few years to collect a wider range of materials and the source separated organics collection/composting program is being expanded to service the entire Region. In its December 1999 Solid Waste Master Plan, the Region adopted a diversion target for residential waste of at least 50% by 2007 or earlier. On April 14, 2004, Durham Regional Council adopted the position to increase waste diversion beyond 50%. In light of the province’s recently-announced policy initiative of “60% diversion by 2008” the Region will likely refine its diversion target to align with that proposed by the Province.

York Region has programs in place for the source separation and diversion of “Blue Box” recyclables and household organics. In July 2005, the Region opened a single-stream Blue Box recycling facility located in East Gwillimbury. This facility enables residents to put all recyclables into one Blue Box, eliminating the need for separating containers and fibres. The facility also allows residents to recycle approximately 25 items, including #1 to #7 rigid plastic containers, empty paint cans, and milk containers. Household collection of food waste began, as a pilot project in September of 2004, and is currently provided to approximately 67,000 households. Full implementation of household organics programs is expected to be completed by 2008.

Even with the expanded source separated diversion efforts, Durham and York continue to face the challenges of managing residual waste. Both Regions face a shortage of available landfill capacity over the long term. In response to the closing of existing landfill sites in the GTA and the inability to develop new landfill capacity, Durham and York Regions, along with other GTA municipalities, were forced to enter into contracts for the “export” of their residential waste primarily to Michigan. In response to this situation, the Regions want to implement, as quickly as possible, a Durham/York based solution that is socially and environmentally acceptable to both communities, that maximizes environmental protection and that fosters the wise management of potential resources, such as the recovery of additional recyclable materials from the residual waste which are currently lost by way of landfill in Michigan.

During the later half of 2005, the United States government initiated the process of passing legislation that, if successful, would prevent or severely inhibit Durham’s and York’s current disposal arrangements with sites in the State of Michigan. There is a reasonable likelihood that this legislation will be passed in 2006.

Durham and York recognize that the Province of Ontario doesn’t have sufficient energy to meet its growing needs. Both Regions recognize that there is opportunity associated with the utilization of the waste stream as a fuel source to produce energy and have identified this opportunity as a key part of the subject EA Study.

Since the adoption of the Environmental Assessment Act in the 1970s, the EA process has evolved into a study or decision-making process undertaken in consultation with interested parties including the public and other parties, that evaluates alternatives considering potential effects on the environment, the availability of mitigative measures that address, in whole or in part, these effects and the comparison of the advantages and disadvantages of the remaining or “net” effects. The result of this process is to provide the planning rationale and support for a preferred solution.

The EA Study provides a planning approach where environmental constraints or opportunities are considered in the context of the broadly defined environment (i.e., the natural environment as well as the social, economic and cultural heritage “environments”) and potential effects are understood and addressed before development occurs.

All public sector (i.e., provincial or municipal) undertakings that have the potential for significant effects in terms of their scope are generally subject to the Act and must apply for approval from Ontario's Minister of the Environment. With respect to waste management, certain types of waste management undertakings require approval under the EAA. In general, approval under the EAA is required for the establishment or the expansion of a waste disposal facility.

Under the EA Act, an Environmental Assessment (EA) Terms of Reference must be prepared and submitted to the Minister of the Environment for approval before an EA Study can be undertaken.

1.2. Glossary of Terms

A glossary of terms and abbreviations that are expected to be frequently used over the course of the EA Study is included in Appendix "A".

1.3. Scope of EA Terms of Reference

This EA Terms of Reference has been prepared in accordance with the following sections of the Environmental Assessment Act (EAA):

6.(1) **Terms of Reference.** – *The proponent shall give the Ministry [of the Environment] proposed terms of reference governing the preparation of an environmental assessment for the undertaking*

and,

6.(2) **Same.** – *The proposed terms of reference must,*

(a) *indicate that the environmental assessment will be prepared in accordance with the requirements set out in subsection 6.1(2);...*

The Environmental Assessment will be prepared in accordance with the requirements set out in Subsection 6.1(2) of the EAA with regards to the content of an environmental assessment:

6.1(2) **Contents.** - *...the environmental assessment must consist of,*

(a) *a description of the purpose of the undertaking;*

- (b) *a description of and a statement of the rationale for,*
 - (i) *the undertaking,*
 - (ii) *the alternative methods of implementing the undertaking and*
 - (iii) *the alternatives to the undertaking;*
- (c) *a description of,*
 - (i) *the environment to be affected or that might reasonably be expected to be affected, directly or indirectly,*
 - (ii) *the effects that will be caused or that might reasonably be expected to be caused to the environment, and*
 - (iii) *the actions necessary or that may reasonably be expected to be necessary to prevent, change, mitigate or remedy the effects upon or the effects that might reasonably be expected upon the environment, by the undertaking, the alternative methods of implementing the undertaking and the alternatives to the undertaking;*
- (d) *an evaluation of the advantages and disadvantages to the environment of the undertaking, the alternative methods of implementing the undertaking and the alternatives to the undertaking; and,*
- (e) *a description of any consultation about the undertaking by the proponent and the results of the consultation.*

This EA Terms of Reference has been prepared in accordance with the requirements of the Environmental Assessment Act and with guidance provided by the Ministry of Environment Environmental Assessment and Approvals Branch (EAAB). The EA Terms of Reference document is organized as follows:

Section 1 - introduction that provides some background to the Study and the scope of the EA Terms of Reference document;

- Section 2** - identification of the proponents;
- Section 3** - purpose and description of the proposed undertaking;
- Section 4** - description of the range of alternatives that will be evaluated in the EA Study;
- Section 5** - description of the environment potentially affected by the undertaking;
- Section 6** - description of the evaluation methodologies and criteria to be applied in the evaluation of alternatives;
- Section 7** - consultation plan for the environmental assessment;
- Section 8** - a commitment on the part of Durham and York to prepare a monitoring strategy for performance of the undertaking, once in place; and,
- Section 9** -a discussion regarding flexibility in the application of the EA Terms of Reference.

Included with this EA Terms of Reference as separate documents are the results of public and government agency consultation undertaken as part of the Terms of Reference development and background on the development of the EA Consultation Plan described in Section 7 of this Terms of Reference document. There are ten summary reports that have been prepared for the public consultation events held to date. Summary tables have been prepared of comments received at the events together with responses to these comments. **The Consultation Record (including the Consultation Summary Reports) do not form part of the Terms of Reference submitted for review and approval by the Minister.**

This EA Terms of Reference is also accompanied by a series of *Background Documents*. These background documents contain the rationale supporting the development of this Terms of Reference. **The Background Documents do not form part of the Terms of Reference submitted for review and approval by the Minister.**

The accompanying background documents are as follows:

- 2-1 Purpose and Need for the Undertaking;
- 2-2 Consideration of “Alternatives To” the Undertaking;

2-3 Consideration of “Alternative Methods of Implementing” the Undertaking;

2-4 Description of the Environment Potentially Affected; and,

2-5 Relevant Policies & Approvals Requirements.

The Consultation Record and Background Documents are available at www.durhamyorkwaste.ca or by contacting the Study Coordinator at 1-800-372-1102 ext. 3731 or by email to info@durhamyorkwaste.ca.

1.4. Municipal Endorsement of Proposed EA Terms of Reference Document

This Proposed Terms of Reference addresses comments provided by the public and review agencies in response to the Draft EA Terms of Reference. The proposed EA Terms of Reference were supported by the Durham/York Joint Waste Management Group (JWMG) at their November 22nd, 2005 meeting and forwarded to the respective Committees and Councils for their consideration and approval. The respective Councils in both the Regions of Durham and York approved the Proposed EA Terms of Reference (in Durham on December 14th, 2005 and in York on December 15th, 2005) for the Durham/York Residual Waste Environmental Assessment Study and authorized the submission of the Proposed Terms of Reference to the Minister of the Environment (MOE) for approval. These Council Resolutions are provided in Appendix “B”.

2. IDENTIFICATION OF THE PROPONENTS

The proponents for the Proposed Environmental Assessment Terms of Reference and the corresponding Environmental Assessment Study are ‘**The Regional Municipality of Durham**’ and ‘**The Regional Municipality of York**’. As noted above, the elected Councils of both municipalities must approve the Proposed EA Terms of Reference prior to its submission to the Minister of the Environment for Approval.

2.1. Inter-Municipal Partnership Agreement

The proponents reached an Agreement on June 30, 2005 to undertake the EA Study as a joint effort. Further, the Joint Waste Management Group (JWMG) was formed to oversee completion of the EA Study. A copy of the Agreement and the Terms for the JWMG are attached as Appendix “C”.

2.2. Potential for Cooperation with Private Sector Partner(s)

This EA Study may result in the identification of a preferred undertaking for residual waste processing that would require a competitive process and selection of a vendor(s) to partner with the co-proponents in the development of the facility(ies) for the preferred residuals processing system. The identification of a preferred vendor will likely be necessary, prior to seeking EA Approval, to allow for a sufficiently detailed description of the undertaking (including its design, operation, maintenance, monitoring and contingency measures) and respective net effects. It is expected that the vendor together with other potential public and/or private sector parties, would enter into “partnership” agreements with the co-proponents to implement the undertaking. Following the competitive process and selection of a preferred vendor and/or other partner(s), it may be decided to include these confirmed participants in the EA submission to the Minister as “participants”, along with the co-proponents, in the implementation of the preferred alternative system at the preferred alternative site.

3. PURPOSE AND DESCRIPTION OF THE UNDERTAKING

3.1. Purpose of the Undertaking

The purpose of the undertaking is:

to process - physically, biologically and/or thermally - the waste that remains after the application of both Regions’ at-source waste diversion programs in order to recover resources - both material and energy - and to minimize the amount of material requiring landfill disposal.

In proceeding with this undertaking only those approaches that will meet or exceed all regulatory requirements will be considered.

Specifically, the waste to be managed will be:

- Municipal Solid Waste (MSW) from residential sources generated within Durham and York Regions remaining after at-source diversion;
- A portion of post-diversion Industrial, Commercial and Institutional (IC&I) waste traditionally managed by the respective Regions at Regional waste disposal facilities; and,

- Municipal post-diversion residual waste from neighbouring non-Greater Toronto Area (GTA) municipalities that may provide disposal capacity for processing residues. For example, the City of Peterborough, the County of Peterborough and the County of Northumberland. A condition for including waste from neighbouring non-GTA municipalities in the total amount of material that would be managed by this undertaking, is the ability of these municipalities to provide disposal capacity (landfill space) for processing residues as neither Durham nor York currently have sufficient long-term disposal capacity for such residues.

At-source programs refer to those initiatives undertaken at the source of waste generation (e.g. at home or work/business) to eliminate the generation of waste, manage it at the source, or to divert wastes to an appropriate facility (e.g. separation of recyclable materials from the waste stream by the home owner and placement of the recyclable material in a blue box for curbside collection or backyard composting).

3.2. Description of the Undertaking

The following description of the undertaking is for the purpose of initiating the Environmental Assessment Study only. It may be refined or altered based on public or stakeholder input, and the findings of the various EA steps and studies. The final description of the undertaking will be included in the Environmental Assessment document submitted to the Minister for approval in accordance the requirements of Section 6.1(2)(a) of the EA Act.

The undertaking that would be the subject of an EAA approval in accordance with this EA Terms of Reference would be a residual waste processing facility(ies), which would be capable of managing the minimum annual 316,000 tonnes/year of residual wastes projected to remain after the achievement of the Regions' diversion objectives. This amount includes the receipt of a quantity of additional post-diversion waste from other sources. Over the 35-year planning period (starting in 2011 and ending in 2045) it is projected that a minimum of 13,300,000 tonnes of residual wastes will require management. Background Document 2-1¹ provides additional details on the development of these estimates. Both Durham and York

¹ Background Document 2-1 Purpose and Need for the Undertaking, Durham/York Residual Waste Study, December 2005

support an earlier start for the planning period (i.e. earlier implementation of a preferred alternative), if feasible.

It should be noted that any policies or programs, supporting diversion, that are identified for implementation as a result of the “Alternatives To” evaluation (i.e., identification of the preferred approach or technology) could be implemented without the need for EAA approval and therefore, do not form part of the undertaking described in this EA Terms of Reference.

The agreement between Durham and York recognizes Durham and York would be responsible for the management of their own share of residual waste from the preferred “Alternative To” (e.g. ash, char, or a stabilized disposal waste stream). The agreement also recognizes that the respective Regions would be responsible for arranging for the disposal (likely landfill) for its share of the residue generated from the processing of residual wastes. To date, there have been no alternative processing approaches or technologies identified that would totally eliminate the need for landfill capacity within the subject planning period.

3.3. Potential Consideration of Contingency or Surplus Disposal Capacity

After the evaluation of the “Alternatives To” (alternative technologies) and during development of the minimum site size requirement, the need to include contingency disposal or processing capacity will be reviewed. At that time, a detailed assessment of the potential for at-source diversion will have been completed and both Regions will have a better understanding of the performance of their diversion programs. In this regard, it should be noted that achievement of 60% diversion by only at-source programs requires on average across all parts of the waste stream, that 85% of people participate in diversion programs and that 70% of available material is captured and diverted (i.e., 85% multiplied by 70% equals 60% diversion). This is an average, as some material (for example most snack food packaging) cannot be diverted at all. For certain recyclable materials, such as most paper fibres (newsprint, cardboard etc.), over 90% participation and 90% capture will be required, which is a very optimistic achievement. If, based on an updated review of diversion program performance, it is evident that the performance of these programs will likely not, on their own, achieve 60% diversion, then the addition of some contingency capacity to the proposed undertaking will be considered in consultation with the public.

Similarly, over the course of the Study, it may become evident that opportunities exist to provide capacity beyond that required by Durham and York. This excess capacity could be used to benefit the proponents and the broader environment. Dewatered biosolids, along with residual MSW from neighbouring non-GTA municipalities that may provide disposal capacity for processing residues outside the study area, or additional residual IC&I wastes from Durham or York are examples of potential waste streams that could be managed by surplus capacity identified during the EA process.

4. RANGE OF ALTERNATIVES TO BE EVALUATED IN EA STUDY

4.1. “Alternatives To” the Undertaking (Alternative Approaches and Technologies)

4.1.1. Consideration of Disposal Systems

To ensure that alternatives are considered in the context of cumulative impacts and full life-cycle impact analysis, processing systems will be evaluated rather than independent component approaches or technologies. This approach recognizes that municipal waste management solutions require integrated strategies to effectively manage solid waste. In most cases, the management of residues from a processing facility will entail adding a landfill component to each of the waste management systems. Other examples include the addition of physical processing equipment at the front-end or back-end of the facility(ies) to capture additional recyclable materials.

4.1.2. Component Approaches and Technologies for Alternative Disposal System Development

During development of the EA Terms of Reference potentially available ways to process the waste remaining after diversion, or “Alternatives To”, were screened for reasonableness and applicability to the purpose of the undertaking. Those that passed the screening are identified in the EA Terms of Reference for consideration during the EA. The alternatives identification and screening process were developed and reviewed in consultation with the public. Background Document 2-2² provides the rationale for the

² Background Document 2-2 Consideration of “Alternatives to” the Undertaking, Durham/York Residual Waste Study, December, 2005

components that have been included for consideration in the EA Study and for those that are discounted from consideration.

Role of Additional Diversion

Given the preference of diversion over disposal in both municipalities, it is reasonable to assume that diversion rates may well increase beyond 60% over the final years of the planning period. For planning purposes it has been assumed that the diversion rate would increase to 75% over the final years of the study period. Achievement of a “zero waste” system, however, has not been contemplated over this period. This level of diversion is considered not reasonably available to the Regions within their planning timeframe. Although the Regions recognize that a number of communities in North America and abroad have set ‘zero waste’ targets, there are no jurisdictions achieving this level of diversion and corresponding reduction in waste generation. The Regions also do not have jurisdiction over packaging and other related aspects of commerce, which is a significant policy area required to reduce waste.

Role of Landfill

It has been clearly identified by Durham and York Regions that there is a desire to identify a preferred long term alternative that maximizes the recovery of resources and minimizes the reliance on landfill as a primary method of disposal. Landfill facilities will be assumed to continue to play a role for the disposal of certain materials that cannot be otherwise processed or diverted. A landfill only system, whereby a new landfill site capable of managing all waste that remains after at-source diversion would not meet the proposed purpose of the undertaking, and thus will not be considered in this proposed EA Study. Rationale for the exclusion of this option is provided in Background Document 2-1¹. Furthermore, the results of consultation in both Durham and York (see Consultation Record, Summary of Consultation on

¹ Background Document 2-1 Purpose and Need for the Undertaking, Durham/York Residual Waste Study, December, 2005

“Alternatives To”) indicate public support for minimizing the role of landfill in future disposal systems, and the need or preference to recover resources that remain in the residual waste stream.

Table 4-1 describes components that have been identified for consideration during the EA Study.

TABLE 4.1: STUDY COMPONENTS – “ALTERNATIVES TO”

Components:	Rationale for Inclusion in EA Evaluation:
Mechanical Treatment (Examples: Screens for sorting materials & magnets for recovering ferrous metal)	✓ This equipment has been applied for a long time in different contexts to increase the capture rate of recyclable materials. ✓ May be considered to pre-process wastes to be managed by biological or thermal processing alternatives to capture recyclable content and improve consistency and mixture of materials for processing. ✓ May also be used for the management of the respective process residues to capture recyclable content (e.g. metals) flowing through the processes.
Biological Treatment (Examples: anaerobic digestion & aerobic biodrying of alternative fuel)	✓ This approach is being applied elsewhere including other parts of Canada to process a mixed waste stream. This approach offers the potential for a relatively stable landfill with reduced odours and other nuisance impacts. Considering the proportion of organics remaining in the residual waste stream, this alternative may be applicable to addressing the purpose of the undertaking.
Thermal Treatment (Examples: gasification, pyrolysis and conventional combustion)	✓ Based on recent industry activity in Ontario (e.g. responses to requests for expressions of interest) and facilities operating in other jurisdictions it is evident that this alternative is reasonably available to address the purpose of the undertaking from both a commercial and technical perspective.

Each of the proposed processing alternatives will require landfill disposal capacity for process residues. The landfill component will be identified following the identification of the preferred “Alternative To”. Options to address that landfill component, depending on the amount of capacity required, may include:

- Contracting to use private sector landfill capacity;
- Identification of new capacity; and/or,

- Establishment of Waste Supply/Residuals Supply Agreements with neighbouring municipalities outside the Greater Toronto Area (GTA).

However, the actual identification of existing landfill capacity and/or siting of new landfill capacity to manage these process residues is outside the scope of this EA Study. During the EA Study, Durham and York will decide whether to pursue this capacity jointly or individually.

4.2. “Alternative Methods” of Implementing the Undertaking (Alternative Sites)

Following the identification of the preferred “Alternative To” (i.e., residual processing system), “Alternative Methods” [i.e., facility(ies) site(s)] will be identified and evaluated during the EA Study. Background Document 2-3³ provides the rationale for the process that is proposed for the purpose of locating a residuals processing facility(ies).

The process of identifying siting alternatives for a processing facility(ies) will not seek to consider all lands within the study area but rather, will focus on those lands considered to be generally suitable for the processing of post-diversion residual waste such as existing and/or designated industrial lands. Accordingly, the following types or categories of sites will be considered at the EA evaluation:

- Publicly owned lands that meet the minimum site size and configuration requirements for the type of facility(ies) being pursued and that are located in areas that are considered to be generally suitable for the processing of residual waste; and,
- Lands offered by a “willing seller” property owner that exhibit the minimum site size and configuration requirements for the type of facility(ies) being pursued and that are located in areas that are considered to be generally suitable for the processing of residual waste.

The only circumstances that would lead to the consideration of privately owned lands not being offered by the property owner (i.e., expropriation) would be a determination, in consultation with the public and Ministry of the Environment (MOE), that the first two categories of sites do not present a reasonable range of siting alternatives.

³ Background Document 2-3 Consideration of “Alternative Methods” of Implementing the Undertaking, Durham/York Residual Waste Study, December, 2005

5. DESCRIPTION OF ENVIRONMENT POTENTIALLY AFFECTED

The Durham/York study area, comprised of lands within the geographic boundaries of The Region of Durham and York Region, which could potentially be affected by the proposed undertaking, is generally described in the following sub-sections. A more detailed description of the ‘Environment Potentially Affected’ is provided in Background Report 2-4⁴. Appendix “D” provides a base map of the study area.

5.1. Natural Environment

The study area is bounded by three major bodies of water. These are Lake Ontario to the southeast, Lake Simcoe to the northwest and Lake Scugog to the northeast. The study area shares municipal boundaries with Simcoe County to the northwest, the City of Kawartha Lakes to the northeast, Peterborough and Northumberland Counties to the east, the City of Toronto to the southwest and The Regional Municipality of Peel to the west.

One of the dominant physical characteristics of the study area is the Oak Ridges Moraine. It is one of southern Ontario’s most prominent landforms and traverses the south-central portion of York and Durham Regions. The Oak Ridges Moraine is a ridge of sand and gravel over 160 km long running east-west between Caledon, in the west and Rice Lake in the east. The Moraine serves as the headwater region for most streams draining south through York and Durham to Lake Ontario and north to Lake Simcoe and the Kawartha Lakes. The Lake Iroquois shoreline is another significant feature within the study area that serves as a source area for some watercourses.

The management of the natural environment features within Durham and York Regions are primarily under the jurisdiction of the Ministry of Natural Resources and five conservation authorities – Central Lake Ontario, Toronto and Region, Ganaraska Region, Lake Simcoe Region and the Kawartha Region Conservation Authorities.

⁴ Background Document 2-4 Description of the Environment Potentially Affected, Durham/York Residual Waste Study, December, 2005

5.2. Socio-Economic

Durham and York Regions have strong balances of distinct urban and rural lands. The development plans and strategies for the area focus on preserving the boundaries between urban and rural areas.

The Regional Official Plans for Durham and York Region both identify firm urban boundaries that are intended to prevent urban development from encroaching on rural areas. Within the urban areas, a compact, transit-supportive urban form is supported, as are intensification and mixed-use land uses in appropriate locations. Urban areas are planned to accommodate the vast majority of population growth in Durham and York Regions.

Rural areas are composed of a range of land uses including prime agricultural lands, open space use, aggregate extraction areas, rural settlements, and environmentally sensitive areas. A major focus of the study area's land use planning is to limit rural development and to protect areas of high quality soils for agricultural use. Rural settlements are planned to act as centres for the provision of services and goods to rural communities but are not planned to absorb significant population growth in either Region. Growth in rural areas must address servicing capacity and municipal planning policies.

Industrial development occurs primarily along the major transportation routes in the study area. In particular, highway corridors such as Highway 401 in The Region of Durham and Highways 7, 407 and 404 in York Region play an important role in the location of industrial uses. Other transportation facilities such as the railways and harbours play an important role in the location of industrial lands. Additionally, older industrial areas, such as the Yonge Street Corridor in York Region, are being redeveloped to promote economic revitalisation.

From 1996 to 2001, The Region of Durham experienced a population change of 11%, while York Region experienced a 23% increase in population.

5.3. First Nations Communities

There is one First Nation community in the Region of Durham. The Mississaugas of Scugog Island First Nation is one of the smallest First Nations in Canada. There is one First Nation community in York Region, the Chippewas of Georgina Island First Nation. The Chippewas of Mnjikaning (Rama) First Nation are located just north of the study area in neighbouring Simcoe County,

In addition to the First Nation communities reference above, a number of First Nation communities in Southern Ontario, are also considered in this Study.⁴

5.4. Economic Base

Economic development within the Region of Durham is heavily based on manufacturing and energy industries. These industries have been attracted to the area because of its excellent location, highly skilled workforce, leadership in innovative technologies, superior research and development and a high quality of life.

Economic development within York Region is based on manufacturing and business service industries. These industries are attracted to York based on accessibility, skilled labour force, high quality of life and supporting infrastructure.

5.4.1. Industry

The industrial sector is strong and stable within the Region of Durham. General Motors and Ontario Power Generation are two of Durham's top employers and have been major contributors to the study area's economy. The energy industry benefits from Durham's access to the North American electricity grid and Durham's commitment to workforce development from The University of Ontario Institute of Technology by offering degrees in support of energy related businesses.

York Region's labour force has plenty to offer with over 65% of adults over 20 having post-secondary education. Magna International, manufacturers of automotive components, is York Region's top employer, with over 12,000 employees.

⁴ Background Document 2-4 Description of the Environment Potentially Affected, Durham/York Residual Waste Study, December, 2005

5.4.2. Agriculture

Statistics Canada reported that 44% of all farmland situated in the Greater Toronto Area (GTA) is in the Region of Durham. In 2001, the gross farm receipts for the Region equalled \$234 million. There are approximately 1,709 farms in the study area. Durham's agricultural products consist primarily of fruit, dairy, floriculture, livestock, poultry, and corn products. The majority of farmland in Durham in 2001 was in crop production. The Region is a leader in agriculture, in the GTA, in terms of the number of farms, amount of farmland, and gross farm receipts.

Although employment in the agricultural industry represents only 1% of the working force, agriculture is still significant in York Region. In the Holland Marsh, 10,000 acres of agricultural land are responsible for producing more than 90% of Ontario's celery and Asian vegetables, 80% of Ontario's carrots, and 66% of Ontario's onions. York Region also has the highest horse population in Ontario, with 18,000 horses and 69 commercial stables.

5.4.3. Tourism

Tourism is an integral part of the study area's economy. The Great Blue Heron Charity Casino in Port Perry, is owned by the Mississauga of Scugog Island First Nation and opened in 1994. Lakes Scugog, Simcoe, and Ontario provide year round fishing opportunities and are popular summer destinations for visitors to the area. Durham and York Regions have over 65 golf courses and many conservation areas.

Paramount Canada's Wonderland, located in Vaughan, attracts more than 13 million guests annually. There are numerous museums in the study area, one of the most predominant being the McMichael Canadian Art Collection, which is situated on 100 acres of conservation land in Vaughan.

5.5. Transportation Systems

The study area exhibits an effective and integrated road network that facilitates the safe, convenient and economical movement of people and goods. Highway 401 is the primary highway in the area. The 401 corridor runs east-west and follows the northern shore of Lake Ontario through the Region of Durham. Highway 400 runs north-south from Toronto through the City of Vaughan and the Township of King. Highway 404 also runs north-south from Toronto through the eastern portion of York Region and ends at Green Lane in the Town of East Gwillimbury. Highway 407 runs east-west from Halton Region, through

York Region, to just east of Brock Road in Pickering (Region of Durham) and Highway 427 extends into York Region presently terminating at Highway 7 in the City of Vaughan.

There are plans to extend Highways 404 and 407 through York Region and into the Region of Durham. The future extension of Highway 404 would affect the Township of Brock and would run east near Highway 48 and end at Highway 12. The EA process for the extension of Highway 407, east of Pickering to Highway 35/115, began in the summer of 2002. The EA Terms of Reference was approved in January 2005, and the individual EA is currently underway. The proposed work for Highway 401 includes increasing the number of lanes to ten between Westney Road and Harwood Avenue in Ajax and constructing a new interchange at Stephenson Road in Oshawa.

There are two active commercial airports in the study area: Oshawa Municipal Airport and Buttonville Municipal Airport in Markham. The Pickering lands, owned by the Federal Government, were declared an “airport site” in August 2001. To protect Federal Lands for future aviation needs, the Pickering Airport Site Zoning Regulations (AZR) came into effect on September 2005. The AZR restrict the height of buildings, structures and objects including natural growth on regulated lands and protect aircraft from potential hazards such as bird strikes and electronic signal interference for a distance of up to 15 km off the end of each runway. There is one international airport approximately 50 km from the centre of the study area: Lester B. Pearson International Airport in Toronto.

The two national railroads that run through the study area are the main line of the Canadian National Railway (CNR) and the main line of the Canadian Pacific Railway (CPR).

5.6. Power Generation and Transmission Corridors

The Region of Durham is home to two large nuclear power generating. Darlington Nuclear Generating Station is located in the Municipality of Clarington and has an output of 3,524 MW, enough to provide approximately 18% of Ontario’s electricity needs. Pickering Nuclear Generating Station is located on the northern shore of Lake Ontario in the City of Pickering. Pickering Nuclear is one of the largest nuclear generating facilities in the world and has a total output of 4,120 MW, enough to provide approximately 21% of Ontario’s electricity needs.

There is a hydro corridor (a tract of land containing hydroelectric pylons and cables) that runs north from the Pickering Power Plant. The Corridor is owned by the Province and managed by the Ontario Realty Corporation. Hydro One operates this large electricity distribution system.

5.7. Legal / Jurisdictional Considerations

The Region of Durham and York Region are both two-tier government structures, with differing waste management responsibilities. The Region of Durham shares the responsibility for waste management services with the local area municipalities. The Region of Durham is responsible for managing diversion and disposal of materials, and depending on the area, collection may be provided by the Region or by the lower-tier municipality. In York Region, local area municipalities are responsible for the collection of all waste streams at the curbside. York Region is responsible for all other aspects of waste management with the exception of collection. Both Regional governments are responsible for the management of residual wastes.

6. EVALUATION METHODOLOGIES AND CRITERIA

6.1. Comparative Evaluation of “Alternatives To” the Undertaking

The evaluation of the ways to manage the waste remaining after diversion (“Alternatives To” the undertaking) will be a comparison of the advantages and disadvantages associated with each alternative. Advantages and disadvantages associated with alternative residual processing systems will be defined using a “net” effects analysis. The proposed step-by-step methodology to apply a net effects analysis of “Alternatives To” in the Residual Waste Study is described as follows:

- Step 1** - Prior to initiation of the evaluation of “Alternatives To”, the proposed evaluation methodology and criteria will be reviewed in consultation with the public and agencies. This review will seek additional input on the proposed evaluation steps and evaluation criteria presented in the EA Terms of Reference and will seek to establish and confirm the relative priorities to be considered during the evaluation.
- Step 2** - The component alternatives will be assembled into a range of alternative residuals processing systems with each system being capable of managing the entire projected residual waste stream.

-
- Step 3** - Data collection will be undertaken for the purpose of applying each of the comparative evaluation criteria to each of the alternative disposal systems. The proposed disposal system comparative evaluation criteria are included in Appendix “E” – Table E-1 of this EA Terms of Reference. Suggested indicators and data sources may be adjusted at the initiation of the EA evaluation based on input received from agencies and the public.
- Step 4** - The comparative evaluation criteria will be applied to each of the alternative residual processing systems and potential effects identified.
- Step 5** - Each of the potential effects identified at Step 4 will be considered with respect to the availability of measures to mitigate (i.e., measures that may be applied to reduce or eliminate a negative potential effect) or enhance (measures that may be applied to improve or increase the magnitude of a benefit or positive effect) the effects, and identify the remaining or ‘net effects’.
- Step 6** - The net effects associated with each disposal system under each comparative criterion will be compared and a list of relative advantages and disadvantages associated with each alternative processing system developed.
- Step 7** - The relative advantages and disadvantages of each alternative disposal system will be considered in the context of priorities established in consultation with the public and agencies and the preferred system selected. The preferred system will be the one exhibiting the preferred balance of advantages and disadvantages accounting for the significance of environmental categories and criteria established by the public and agencies.

Background Document 2-2² provides additional information on the development of the proposed “Alternatives To” evaluation methodology.

² Background Document 2-2 “Consideration of “Alternatives to” the Undertaking, Durham/York Residual Waste Study, December, 2005

6.2. Screening and Comparative Evaluation of Alternative Methods of Implementing the Undertaking

The evaluation of “Alternative Methods” of implementing the undertaking will be comprised of a facility(ies) site selection process. Site selection will start with a review of the entire study area to identify those areas considered to be generally suitable for the purpose of locating the preferred disposal system. These generally suitable areas will then be systematically evaluated to identify a long-list of sites followed by additional screening and comparative steps to narrow that list down to a preferred siting option. The following describes the major steps proposed to be used in this evaluation process:

- Step 1** - Prior to initiation of the evaluation of “Alternatives Methods” and after a preferred approach (“Alternative To”) has been identified by the EA Study, the proposed evaluation methodology and criteria will be reviewed in consultation with the public and agencies. This review will seek additional input on the proposed evaluation steps and evaluation criteria presented in the EA Terms of Reference and will seek to establish and confirm the priorities to be considered during the evaluation.
- Step 2** - Apply siting constraints to entire study area and identify those lands considered to be generally suitable the purpose of locating the preferred disposal system. The proposed siting constraints may include, but are not limited to, the criteria listed in Appendix “F” – Table F-1. The criteria would be used to delineate the limits of the broad area considered generally unsuitable for the purpose of locating the preferred disposal system thereby focusing on generally suitable areas.
- Step 3** - Identify a minimum site size requirement for the type of facility(ies) to be sited based on the preferred “Alternative To” and considering the required facility throughput (i.e., processing needs of Durham and York Regions) and, if applicable, any desired contingency or surplus capacity (See Section 3.3 above).

- Step 4** - Identify a “long-list” of siting opportunities in the generally suitable areas through a review of publicly owned lands and, if necessary, the issuance of a request for “willing seller” properties. Review the “long-list” of sites to ensure that a reasonable range of alternatives are included on the list. To be considered, “willing seller” properties must lie within the generally suitable areas identified in Step 2.

- Step 4(b)** - **Optional.** If it is determined that there is not a reasonable range of siting opportunities on the “long-list”, then a review of privately owned lands in the study area would be undertaken to identify additional siting opportunities with the same or better attributes than those publicly owned and, if necessary, “willing seller” sites on the list. The owners of identified properties would be approached to determine if a negotiated acquisition of the property is feasible.

Review the “long-list” of sites to ensure that a reasonable range of alternatives is included on the list.

- Step 4(c)** - **Optional.** If it is still determined that there is not a reasonable range of siting opportunities on the “long-list”, then each of the constraints applied at Step 2 would be reviewed and potentially adjusted in consultation with the public and government agencies. Steps 2 and 4 and, if necessary, 4(b) would then be re-applied. Step 4(c) would be repeated, as required, to arrive at a reasonable “long-list”.

Only if necessary, would the expropriation of privately held lands be considered. This would be the approach of last resort for the purpose of siting a facility(ies).

- Step 5** - As a rule-of-thumb, a “long-list” site evaluation will be carried out if there are more than three (3) sites remaining after the application of siting constraints and consideration of available siting opportunities. The purpose of this level of evaluation is to eliminate less preferred sites from the list of sites under consideration using broad-based technical, economic and social criteria. The proposed “long-list” evaluation criteria are included in Appendix “F” – Table F-2. Their application would result in the identification of a “short-list” of alternative sites.

- Step 6** - Prospective vendors of the technology(ies) comprising the preferred disposal system, will be requested to submit their qualifications and may be invited to submit their own alternative site(s) for consideration. Prospective vendor site(s), if submitted, must clear minimum compliance requirements, such as being located in Ontario, to be included on the short list of sites. Public and agency consultation will be undertaken when the short list of alternative sites has been finalized.
- Step 7** - A Request for Proposals (RFP) will be issued to prospective technology(ies) Vendors with the intent of identifying a Preferred Vendor. This will be done concurrently with the evaluation of the short list of sites. The short list of alternative sites from Step 6 will be evaluated using the same net effects analysis methodology described in Section 6.1 (Steps 4, 5, 6, and 7) resulting in the identification of a Durham/York siting preference. The comparative evaluation criteria will be applied on the basis of sufficiently detailed data and analyses. These criteria are included in Appendix “F” – Table F-3. Public and agency consultation will be undertaken when a Preferred Vendor and site have been identified.

Background Document 2-3³ provides additional information on the proposed “Alternative Methods” evaluation methodology.

6.3. Application of a Competitive Request for Proposal (RFP) Process

A Request for Qualifications (RFQ) followed by an RFP process will be used to ultimately select a vendor of the preferred technology (“Alternative To”) concurrently with the selection of a preferred Durham/York Site. The RFP will request price proposals for a facility(s) to be developed on a prospective site described using generic characteristics. Following this comparison an overall preferred vendor and site would be selected.

³ Background Document 2-3 Consideration of “Alternative Methods” of Implementing the Undertaking, Durham/York Residual Waste Study, December, 2005

6.4. Estimated Study Schedule

The following presents an estimated Study schedule from preparation of this EA Terms of Reference to implementation of a proposed undertaking. This schedule will be updated as Study steps and implementation activities are completed.

TABLE 6.1: ESTIMATED SCHEDULE

Project Milestone	Estimated Timeframe
➤ Prepare EA Terms of Reference	2005
➤ Submit EA Terms of Reference to Minister for Approval	December 2005
➤ EA Terms of Reference Approved	March 2006
➤ Initiate EA Study	March 2006
➤ Evaluate “Alternatives To” the Undertaking (i.e. Technologies)	2006
➤ Select Preferred Approach to Manage Residual Wastes	2006
➤ Evaluate “Alternative Methods” of Implementing the Undertaking (i.e. Siting) and competitive process to Identify a Preferred Technology Vendor	2006/early 2007
➤ Select Preferred Site and Select Preferred Vendor	End of 2007
➤ Complete Site Specific Studies to Confirm Suitability and Documentation to Support Approvals and Submit Applications	2008
➤ EA Review and Approval by Minister	2009
➤ Implementation of Undertaking	Mid 2009 to 2010

6.5. Detailed Site Specific Studies

To establish and operate a solid waste management facility(ies), the Environmental Protection Act (EPA) requires that a Provisional Certificate of Approval be obtained. Detailed investigations will be completed at the preferred site, once selected, to satisfy the requirements of the EPA, to obtain a Certificate of Approval, and to confirm the suitability of the proposed facility(ies) on the proposed site.

The scope of detailed studies to be undertaken will depend on the type of facility(ies) being established and the nature of the site location and its conditions. A detailed work program will be developed once the preferred site is selected and will be prepared in consultation with the public and relevant government agencies. Background Document 2-3³ identifies a preliminary scope of studies that could be completed at the preferred site.

6.6. Applicability of the Canadian Environmental Assessment Act

This undertaking is subject to the requirements of the *Ontario Environmental Assessment Act*. However, the requirements of the *Canadian Environmental Assessment Act* (CEAA) may also apply. Should the CEAA be triggered, the proponent intends to work in a coordinated way with provincial and federal governments, with both governments having formally agreed to coordinate their respective EA processes established by the applicable environmental assessment legislation. The exact relationship between the proponents, the provincial government and the Federal government will be determined upon identification of a potential CEAA trigger.

7. CONSULTATION PLAN FOR THE ENVIRONMENTAL ASSESSMENT

This section describes a general consultation plan, which is intended to guide the consultation process over the course of the EA Study. It includes reference to the types of parties to be consulted over the course of the Study and the scope of consultation to be undertaken at various milestones during the Study. Provision is also made for issues resolution, which could be applied during the Study.

³ Background Document 2-3 Consideration of “Alternative Methods” of Implementing the Undertaking, Durham/York Residual Waste Study, December, 2005

7.1. Parties to be Consulted During EA Study

In general, there are four types or categories of parties to be consulted over the course of the EA Study. These categories, together, are considered to cover the full range of stakeholders, which may have an interest in the EA Study and include:

- **Public Liaison or Advisory Committees** which are committees designated by the proponent to represent a broad range of interests across the study area community and to focus public input to the EA Study.
- **First Nations Groups** as identified by Durham and York in consultation with the Ontario Native Affairs Secretariat that may be potentially affected by the outcome of the EA Study.
- **Government and Agencies**, which represent the interests and mandate of various governmental departments, ministries and agencies potentially affected by the outcome of the EA Study.
- **General Public**, which includes all residents and businesses within the study area, which may have a broad or general interest in the Study or that, may be directly affected by the Study outcome. Over the course of the EA Terms of Reference development, a contact list of those individuals and groups expressing interest in the Study has been compiled and will be updated as the Study proceeds. The current contact list is included in the Consultation Record supporting this EA Terms of Reference.

By way of a Communications Strategy developed for the Study (see Section 7.2 below) and future Study consultation events, the lists of parties to be consulted will be continually updated over the course of the EA Study.

7.2. Scope of Consultation at Study Milestones

Over the course of the EA Study, a range of notices, updates, etc. will be prepared and issued in accordance with the Study's Communications Strategy. It is anticipated that the scope of consultation events will move from initiatives and events addressing and seeking input from the larger community to a program that is more focused on the individuals and community with the greatest potential to be impacted by the proposed undertaking. Table 7.1 outlines the minimum scope of consultation associated with the various Study milestones. Additional consultation activities that may arise will be developed and

implemented as required as part of the EA Study in accordance with the principles outlined in the Residual Waste Study Communications Strategy.

TABLE 7-1: CONSULTATION PLAN OVERVIEW

Study Milestones	Minimum Scope of Consultation Activities
➤ Initiate EA Study and review of Evaluation Methodology and Criteria for “Alternatives To” (Alternative technologies)	General Public Notices possibly followed by events such as open houses intended to obtain input on finalizing the evaluation methodology and criteria.
➤ Evaluate “Alternatives To” the Undertaking ➤ Select Preferred Approach to Manage Residual Wastes	Open House / Public Meeting type events open to the general public and intended to notify and receive input on selection of the preferred “Alternative To”.
➤ Review of Evaluation Methodology and Criteria for “Alternative Methods” (alternative sites)	Events such as open houses intended to obtain input on finalizing the evaluation methodology and criteria.
➤ Evaluate “Alternative Methods” of Implementing the Undertaking, RFP to Identify a Preferred Technology Vendor and Identification of a Preferred Site	<u>At Identification of Short List:</u> Open House type events open to the general public and intended to notify and receive input on the process leading to selection of the short list sites (i.e., study area to suitable areas to long list to short list). <u>At Identification of Preferred Site:</u> One-on-one meetings, such as kitchen table meetings, and focused information sessions with community / residents potentially impacted by site to inform and exchange information regarding site specific issues, next steps in process, and opportunities to discuss / resolve concerns. General public notice of selected preferred site.

Study Milestones	Minimum Scope of Consultation Activities
➤ Complete Site Specific Studies to Confirm Suitability and Documentation to Support Approvals	Provision of opportunity to form a Site Liaison Committee consisting of resident, agency and other interest representatives to review and provide input on site-specific studies. One-on-one meetings, such as kitchen table meetings, and focused information sessions with community / residents potentially impacted by site to obtain input on Study methodologies and to inform and exchange information regarding Study results, design and operational implications, and supporting documentation.

Feedback Mechanism for Responding to and Incorporating Public Comment

Following each public consultation event, comments received will be tabulated and addressed following the same process as utilized in the development of the EA Terms of Reference. Comments will be summarized in a table format outlining the comment, the response to the comment, and any changes to the EA Study that may be required to address the issues raised. These response tables will then be made available to interested parties through the Study website at www.durhamyorkwaste.ca, and provided in hard copy by request to the Study Coordinator at 1-800-372-1102 ext. 3731 or by email to info@durhamyorkwaste.ca.

Communications Strategy

To effectively disseminate information on the Study and to provide opportunities for the public and agencies to provide specific or general input to the Study, Durham and York have developed a communications strategy. Elements of the Communications Strategy include maintenance of a Study website (www.durhamyorkwaste.ca); the development and issuance of public advisories, notices and news; and the provision of a range of avenues for communication between the public and Study representatives. This strategy will be maintained and updated, as required, for the entirety of the Study.

7.3. Issues Resolution

Over the course of the Study it is expected that issues will arise that require resolution either before moving from one step to the next or prior to the issuance of approvals. It will be Durham and York's

preference to resolve issues as they arise and without the assistance of an outside party. However, should this approach not work, the use of a facilitator to negotiate a resolution or use of the EAA's mediation provisions would be considered. It is recognized that unresolved issues could be referred to the Province's Environmental Review Tribunal which would make a decision on approval of the undertaking and that unresolved issues could have a bearing on that decision and that conditions of approval could be imposed to deal with certain issues.

8. MONITORING STRATEGY

Over the course of the Study and the application of evaluation criteria, potential effects and mitigative requirements will be identified for the proposed undertaking. It is noted that these considerations will be defined based on predictive studies and modeling and in the absence of the actual programs and/or facilities. Accordingly, over the course of completing the EA Study, Durham and York will develop a monitoring strategy and schedule for the purpose of confirming assumed or predicted impacts and the performance of mitigative measures once the undertaking is in place and operational.

9. FLEXIBILITY IN APPLICATION OF THE TERMS OF REFERENCE

In the course of implementing the work proposed in this Terms of Reference, Durham and York may determine that minor adjustments to the approaches and methodologies described herein are necessary and/or appropriate. Minor adjustments may include:

- Provision and/or identification of additional information requirements;
- Studies or consultation methods/events to address concerns expressed by the public as Study results become available; or,
- Adjustments to the sequence of Study events which may be required depending on Study results and circumstances.

Where there is a likelihood that information or circumstances will change in the coming years as the EA is completed, this EA Terms of Reference makes reference to the intent or purpose of the consideration. Details with regards to the methods or steps to be followed to achieve the intent or purpose of the consideration are included in the background documentation that is not approved by the Minister. For

example, data sources and specific indicators for the evaluation criteria are not included in the Terms of Reference but may be reviewed in the background documents if a party is interested in the types of considerations for application of the evaluation criteria.

Where minor adjustments are contemplated, such adjustments will be undertaken at the direction of the Durham-York Joint Waste Management Group, which functions as a steering committee for the Study, and in consultation with the MOE.

Appendix A

Residual Waste Study – Glossary of Frequently Used Terms and Abbreviations

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Aerobic Treatment:	Biological treatment of organic waste by bacteria that require oxygen. (e.g. windrow composting – see Composting)
Air Emissions:	For stationary sources, the release or discharge of a pollutant from a facility or operation into the ambient air either by means of a stack or as a fugitive dust, mist or vapour.
Alternative Disposal Technology (ADT):	Technologies, other than landfill, capable of disposing municipal waste (e.g. incineration, EFW, gasification, pyrolysis, etc.).
Alternative Fuel:	Fuel, that is obtained via various mechanical and biological processes that recover materials such as plastics, fibre, wood and dried organic matter from the residual waste stream for input to a thermal process.
Anaerobic Treatment:	See Anaerobic Digestion
Anaerobic Decomposition:	See Anaerobic Digestion
Anaerobic Digestion (AD):	The controlled biological conversion of organic material, by bacteria, in the absence of oxygen, to produce biogas, liquid effluent and a solid, partially stabilized organic material.
Approved Site or Facility:	A landfill site or waste management facility with a current valid Certificate of Approval
Ash:	The non-combustible fraction that remains after combustion of waste.
‘At-Source’:	Referring to a waste minimization or management activity occurring at the source of waste generation (e.g. at the household, at the business, etc.).
Baghouse Residue:	Leftover material that is captured by an air pollution control / filtering device that removes dust and particles from the exhaust gas stream.
Baling:	Compacting solid waste into blocks to reduce volume and simplify handling.
Biocell:	A cell in which organic waste is decomposed biologically in an aerobic process and landfill gas is extracted.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Biodegradable:	Capable of decomposing under natural conditions.
Biogas:	Gas formed during the anaerobic decomposition of organic material, mainly consisting of methane and carbon dioxide.
Biological Treatment:	A treatment technology that uses bacteria to process organic waste.
Biomass:	Plant material, vegetation, or agricultural waste used as a fuel or as an energy source.
Bottom Ash:	The non-airborne ash resulting from burning waste in an incinerator. The material, which falls to the bottom of the combustion grate and is removed mechanically in an EFW facility.
Briquetting:	The compaction of waste into small bricks to be burned in an incinerator. Bricks are easier to manage and have a higher calorific value than regular uncompacted waste.
British Thermal Unit (BTU):	Unit of heat energy equal to the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit at sea level.
Buffer Area:	That part of a disposal site or facility that is not a waste fill area (in the case of a landfill) or is not occupied by a building. (i.e., area between actual facility and the property boundary)
Bulky Waste:	Large items of waste materials, such as appliances, furniture, large auto parts, trees, stumps.
Calorific Value:	The amount of heat produced by a specific material type when combusted under specific conditions. Calorific Value is usually expressed in Calories or Joules per kilogram (i.e. Cal/Kg or J/Kg).
Canadian Council of Ministers of the Environment (CCME):	A council made up of environmental ministers from provincial and federal levels of government that proposes nationally consistent environmental standards and objectives to achieve high levels of environmental quality for waste management, air pollution, and toxic chemicals across Canada.
Candidate Site:	Property identified as suitable for consideration as a potential site for a waste management facility.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Carbon Monoxide (CO):	A colourless, odourless, poisonous gas produced by incomplete fossil fuel combustion.
Carcinogenic:	Capable, in sufficient quantities, of causing the cells of an organism to change in such a way as to produce cancer.
Catalyst:	A substance that changes the speed or yield of a chemical reaction without being consumed or chemically changed by the chemical reaction.
Cells:	In landfill sites, areas where waste is placed, compacted, and covered with layers of cover material on a daily basis.
Cellulose:	A complex carbohydrate that is composed of glucose units and makes up the cell walls in plants. Naturally occurs in wood and other fibrous products such as cotton and is the raw material of many manufactured goods, such as paper, rayon, and cellophane.
Certificate of Approval:	A license or permit issued by the Ministry of the Environment for the operation of a waste management site/facility.
Class Environmental Assessment (EA):	A planning and approvals process for a group of projects which are routine, similar in nature, limited in scale, and possess predictable environmental effects.
Cogeneration:	The consecutive generation of useful thermal and electric energy from the same fuel source.
Combustion:	1. Burning, or rapid oxidation, accompanied by the release of energy in the form of heat and light. 2. Refers to controlled burning of waste, in which heat chemically alters organic compounds, converting into stable inorganics such as carbon dioxide and water.
Combustion Chamber:	The actual compartment where waste is burned in an incinerator.
Combustion Product:	Substance produced during the burning or oxidation of a material.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Commercial Waste:	All solid waste emanating from business establishments such as stores, markets, office buildings, restaurants, shopping centers, and theatres.
Community Recycling Centre (CRC):	A waste management facility that offers waste management services to small businesses and residents. A CRC is a place to drop off items such as electronics, white goods, household hazardous waste, leaf and yard waste, and blue box recyclables items.
Compactor:	Equipment used to crush and compact waste, to reduce volume.
Completely Mixed Reactor:	When liquid enters the completely mixed reactor, it quickly mixes completely with the liquid already in the reactor, making the contents of the reactor homogenous. Also, commonly referred to as a continuously stirred tank reactor.
Compost:	The relatively stable humus material that is produced from the aerobic decomposition or composting process in which bacteria in soil mixed with degradable organic materials break down the mixture into an organic soil amendment.
Composting Facilities:	1. A facility where the organic component of municipal solid waste is decomposed under controlled conditions; 2. An aerobic process in which organic materials are ground or shredded and then decomposed to humus in windrow piles or in mechanical digesters, drums, or similar enclosures.
Composting:	The controlled biological decomposition of organic material in the presence of air to form a humus-like material. Controlled methods of composting include mechanical mixing and aerating, ventilating the materials in a vessel or placing the compost in piles out in the open air and mixing it or turning it periodically.
Contingency Plan:	A plan developed to be implemented should some aspect of the project need to be altered or some aspect of the operation fail (i.e. "Plan B").
Corporations Supporting Recycling (CSR):	A Canadian, not-for-profit, private sector organization that works with municipalities and industries to aid in developing sustainable municipal recycling and waste diversion systems.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Cover Material:	Soil, or other approved (by MOE) materials, used to cover compacted solid waste in a sanitary landfill. Alternatives to soil include non-hazardous ash from incinerator facilities, tarps, and other materials.
Cyclone:	A cone-shaped air-cleaning device that collects and separates particles of different densities, from the air/gas stream, by using a rapid rotational effects and gravity.
Design and Operation (D&O) Plan/Report:	A document (plan/report), required for obtaining a Certificate of Approval, which describes in detail the function, elements or features of a landfill site/facility or waste management facility, and how a landfill site/facility or waste management facility would function including its monitoring, and control/management systems.
Digestion:	The biochemical decomposition of organic matter
Disposal:	Final placement or destruction of wastes. Disposal is typically accomplished through use of approved sanitary landfills or incineration with or without energy recovery.
Disposal Facilities:	Facilities for disposing of solid waste, including landfills and incinerators, intended for permanent containment or destruction of waste materials.
Diversion:	The management of materials by reduction, reuse, recycling, and composting.
Diversion Rate:	The percentage of waste materials diverted from traditional disposal such as landfilling or incineration to be recycled, composted, or re-used.
Dump:	A site used to dispose of solid waste without environmental controls.
Durham/York Residual Waste Study	The Durham/York Residual Waste Study is a joint initiative between the Region of Durham and York Region to work together to find a way to manage solid waste remaining after at-source diversion.
Ecological/Environmental Risk Assessment (ERA):	A scientific method used to examine the nature and magnitude of risks from the exposure of plants and animals to contaminants in the environment.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Economies of Scale:	The theory that constructing a larger facilities can be less expensive to construct and operate, on a per unit basis, than several smaller facilities having the same capacity, or throughput.
Eddy Current:	Circular electric currents in metals that create repulsive forces, similar to magnetic forces, in non ferrous electrical conductors such as Aluminum. (e.g., eddy current separator used to separate aluminum and other non ferrous metals).
Electrostatic Precipitator (ESP):	A device that removes particles from a gas stream after combustion occurs. The ESP imparts an electrical charge to the particles, causing them to adhere to charged metal plates inside the precipitator. Rapping on the plates causes the captured particles to fall into a hopper for disposal.
Emission Factor:	A representative value that relates the quantity of pollutant release to the atmosphere with an activity or input associated with the release of that pollutant.
Emissions:	Technically, all solid, liquid, or gaseous discharges from a processing facility, but normally referring to Air Emissions (with solids referred to as residue and liquids as effluent).
Emissions Trading:	The creation of surplus emission reductions at certain stacks, vents or similar emissions sources and the use of this surplus to meet or redefine pollution requirements applicable to other emissions sources. This allows one source to increase emissions when another source reduces them, maintaining an overall constant emission level. Facilities that reduce emissions substantially may "bank" their "credits" or sell them to other facilities or industries.
Endothermic:	A chemical reaction that requires (takes in) heat.
Energy-from-Waste (EFW):	The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.
Energy Recovery:	The recovery of energy in the form of heat and/or power from the thermal treatment of waste. Generally applied to incineration, pyrolysis, gasification but can also include the combustion of landfill gas and gas produced from anaerobic digestion of organic materials.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Environment (as it relates to the Environmental Assessment Act):	Environment is broadly defined under the Environmental Assessment Act as follows: (a) air, land or water, (b) plant and animal life, including human life, (c) the social, economic and cultural conditions that influence the life of humans or a community, (d) any building, structure, machine or other device or thing made by humans, (e) any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting directly or indirectly from human activities, or (f) any part or combination of the foregoing and the interrelationships between any two or more of them.
Environmental Assessment (EA):	A systematic process that is conducted in accordance with applicable laws or regulations aimed at assessing the effects of a proposed undertaking on the environment. Includes evaluation of need, alternatives, impacts, and mitigative, remedial, monitoring and/or compensatory measures.
Environmental Assessment Act (EAA):	Provincial (Ontario) legislation (Act), the purpose of which is to provide for the: protection; conservation; and, wise management of Ontario's environment. To achieve this, the EAA ensures that environmental problems or opportunities are considered and their effects are planned for before development or building takes place.
Environment and Plastics Industry Council (EPIC):	A council of the Canadian Plastics Industry Association (CPIA) dedicated to sustainable plastics recycling and to minimizing plastic waste sent to landfill.
Environmental Protection Act (EPA):	An Ontario Act to provide for the protection and conservation of the natural environment.
Environmental Assessment Terms of Reference: (EA) Terms of Reference	An Environmental Assessment Terms of Reference outlines the steps to be taken for an Environmental Assessment.
Exothermic:	A chemical reaction that gives off heat.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Exports :	In solid waste programs, municipal solid waste and recyclables transported outside the municipal jurisdiction or locality where they originated.
Expression of Interest (EOI):	A preliminary document prepared by an outside source documenting their interest in a proposed project and a very general set of qualifications they possess that would make them eligible to participate further in the project.
Extended Producer Responsibility (EPR):	A policy to shift the responsibility of a product's life cycle away from the municipality to the producers and to provide incentives for producers to consider the environmental impacts into the selection of materials and the design of the product.
Feedstock:	The input material to be processed at a waste management facility.
Extended Producer Responsibility (EPR):	A policy to shift the responsibility of a product's life cycle away from the municipality to the producers and to provide incentives for producers to consider the environmental impacts into the selection of materials and the design of the product.
Ferrous Metals:	Metals derived from iron or steel; products made from ferrous metals include appliances, furniture, containers, and packaging like steel drums and barrels. Recycled products include processing tin/steel cans, strapping, and metals from appliances into new products.
Flares:	A controlled open flame device used to burn off unwanted or unusable natural gas, biogas, or landfill gas.
Flue Gas:	The air coming out of a stack or a chimney after combustion in the burner it is venting. It can include carbon oxides, water vapour, nitrogen oxides, sulphur oxides, particles and other chemical pollutants.
Fluidized Bed Incinerator:	An incinerator that uses a suspended bed of hot sand or other granular material to transfer heat directly to waste. Used mainly for destroying municipal sludge or other materials of uniform particle size.
Fly Ash:	The airborne ash resulting from burning waste in an incinerator removed by air pollution control receptor.
Fugitive Emissions:	Emissions not caught by a capture system.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Gasification:	Conversion of solid material such as coal or waste into a gas for use as a fuel.
Gigajoule (GJ):	A measurement of energy. A typical single family household (approx. 2000 sq. ft.) uses approximately 60 to 90 GJ annually for heating (NRCan).
Grapple:	A mechanical device used to grasp materials (e.g., waste). A bucket, with several hooks to grasp, hold and release material.
Grapple Feeding:	A process in which material is fed by a grapple into the processing system. Usually involves grasping a planned amount of the material from a large pile.
Greenhouse Effect:	The warming of the Earth's atmosphere attributed to a build-up of carbon dioxide or other gases; some scientists think that this build-up allows the sun's rays to heat the Earth, while making the infra-red radiation atmosphere opaque to infra-red radiation, thereby preventing a counterbalancing loss of heat.
Hazardous Waste:	Materials that can pose a substantial or potential hazard to human health or to the environment when improperly managed. Possesses at least one of four characteristics (ignitability, corrosivity, reactivity, or toxicity), or appears on special MOE or EPA lists.
High Density Polyethylene (HDPE):	A material used to make plastic rigid containers, milk and juice jugs, margarine tubs, and detergent bottles. The plastic is translucent or opaque and does not crack when bent. Referred to as No. 2 Plastic.
Household Hazardous Waste (HHW):	Hazardous products used and disposed of by residential as opposed to industrial consumers. Includes paints, stains, varnishes, solvents, pesticides, and other materials or products containing volatile chemicals that can catch fire, react or explode, or that are corrosive or toxic.
Household Waste (Domestic Waste):	Solid waste, composed of garbage and rubbish, which normally originates in a private home or apartment house
Hydrolysis:	Decomposition of a chemical compound by reaction with water, such as the dissociation of a dissolved salt or the catalytic conversion of starch to glucose.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Impact Studies:	Studies that predict negative consequences (if any) of a proposed undertaking. Air, visual, natural environmental, traffic, hydrogeological, Noise, Health Risk, Land Use and Hydrological Impact Studies are required under the Environmental Protection Act.
Imports:	Municipal solid waste and recyclables that have been transported to a jurisdiction or locality for processing or final disposition (but that did not originate in that jurisdiction or locality).
Incineration:	A thermal treatment technology involving destruction of waste by controlled burning at high temperatures with the overall aim of reducing the volume of waste.
Incinerator:	A furnace for burning waste under controlled conditions.
Individual Environmental Assessment:	An Individual Environmental Assessment requires the following steps to fully address the requirements of the EAA: 1) Preparation of the Proposed EA Terms of Reference; 2) Submission of the EA Terms of reference to Minister of Environment for Approval; 3) Completion of the EA Study in accordance with approved EA Terms of Reference, and; 4) Submission of the EA Study to Minister of Environment for Approval.
Industrial, Commercial & Institutional (IC&I) Waste:	Combination of wastes generated by industrial, commercial and institutional sectors that are not typically picked up at the curb or accepted at public drop-off facilities as part of the municipal waste collection process. These wastes are primarily managed by way of contract with private waste management service providers.
Industrial Waste:	Unwanted materials from an industrial operation; may be liquid, sludge, solid, or hazardous waste.
Institutional Waste:	Waste generated at institutions such as schools, libraries, hospitals, prisons, etc. (part of the IC&I waste stream).
In-Feed:	Material that is fed into the front-end of a process.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Integrated Waste Management System:	The combination of diversion and disposal alternatives comprising one waste management system. For example - blue box recycling, source-separated organics composting, incineration, and landfilling of ash and residuals could all form part of an integrated waste management system.
Landfills:	Sanitary landfills are outdoor disposal sites for non-hazardous solid wastes. Waste is spread in layers, compacted to the smallest practical volume, and covered by material applied at the end of each operating day.
Leachate:	Liquid that collects contaminants as it trickles through wastes, or other materials. Leaching may occur in landfills and may result in hazardous substances entering surface water, ground water, or soil.
Leachate Collection System:	A system that gathers leachate and pumps it to the surface for treatment
Lift:	In a sanitary landfill, a compacted layer of solid waste placed on top of a lower level of compacted solid waste including appropriate cover material.
Limestone Scrubbing:	Use of a limestone and water solution to remove gaseous stack-pipe sulphur before it reaches the atmosphere.
Liner:	A relatively impermeable barrier designed to keep leachate inside a landfill. Liner materials include plastic and/or dense clay.
Magnetic Separation:	Use of magnets to separate ferrous materials from mixed municipal waste stream.
Mass Burn Incineration:	The incineration of waste with minimal initial pre-treatment or separation of wastes.
Materials Recovery (or Recycling) Facility (MRF):	A facility that processes (separates, bales) residentially collected mixed recyclables individual recyclable product streams, for shipment to market.
Mechanical Separation:	The physical separation of wastes by material type, size or density using trommels, cyclones, and various screens.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Mechanical Treatment:	Involves the physical treatment of waste materials to recover recyclable materials and to prepare waste for further treatment or disposal.
Mediation:	An attempt to bring about a peaceful settlement or compromise between disputants through the objective intervention of a neutral party.
Ministry of the Environment (MOE) Ontario:	The MOE monitors pollution and restoration trends in Ontario and uses that information to develop environmental laws, regulations, standards, policies, programs, and guidelines. The MOE works to provide cleaner air, land, and water for Ontarians.
Mitigation:	Measures taken to reduce adverse impacts on the environment.
Mixed Municipal Waste:	Solid waste that has not been sorted into specific categories (such as plastic, glass, yard trimmings, etc.)
Modular Facility:	A facility of several parallel units designed to allow for an expansion by adding additional units in parallel.
Moisture Content:	The percentage of a material that is water.
Monitoring:	Periodic or continuous surveillance or testing to determine the characteristics of a substance or the level of compliance with statutory requirements and/or pollutant levels in various media or in humans, plants, and animals.
Municipal Solid Waste (MSW):	Common garbage or trash generated by industries, businesses, institutions, and homes.
National Pollutant Release Inventory (NPRI):	The only legislated, nation-wide, publicly accessible inventory of information on annual releases to air, water, land, and disposal or recycling from all sectors in Canada.
Non-combustible waste:	Waste, which cannot be combusted (burned) even if energy is added. (e.g. stone, glass and metals).
Non-Ferrous Metals:	Nonmagnetic metals such as aluminum, lead, and copper. Products made all or in part from such metals include containers, packaging, appliances, furniture, electronic equipment and aluminum foil.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Old Corrugated Cardboard (OCC):	Bulky cardboard that is typically found in boxes used for shipping and packaging. It is made from 2 strips of cardboard with a wavy, or “corrugated” strip running through the centre.
Old Newspaper (ONP):	Old news papers set out, collected and processed for recycling.
Ontario Guideline A-7:	Air emission guidelines developed by the Ministry of the Environment (MOE) to govern combustion and air pollution control requirements for new municipal waste incinerators and gasifiers in the Province of Ontario.
Ontario Regulation 347 (O. Reg. 347):	A regulation under the Environmental Protection Act that specifies standards and approval requirements for waste management sites and systems in Ontario.
Operating and Maintenance Costs:	Usually expressed annually, operation and maintenance costs are a sum of money to operate and maintain the facility in operating order (i.e., labour, utilities, equipment repairs, materials, supplies, disposal fees, etc.)
Open Burning:	Uncontrolled fires in a dump.
Organic:	Referring to or derived from living organisms. In chemistry, any compound containing carbon except carbon dioxide.
Organic Matter:	Carbonaceous waste contained in plant or animal matter and originating from domestic or industrial sources.
Package Plant:	Small wastewater treatment systems designed to treat limited sewage flow at the facility site.
Particulate:	A particle of a solid or liquid that is suspended in air.
Pelletizing:	The compaction of waste into small pellets to be thermally processed in an incinerator or gasifier. Pellets are easier to manage and have a higher calorific value than regular uncompacted waste.
Pilot Tests:	Small-scale testing of a waste management technology under actual site conditions to identify potential problems prior to full-scale implementation.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Plasma-Arc Reactor:	A thermal waste treatment technology that operates at extremely high temperatures and can produce a synthetic gas.
Plug Flow Reactor:	When a high solid slurry enters a plug flow reactor, its flow is unidirectional with minimal to no mixing in the axial direction, making the contents of the reactor heterogeneous.
Point of Impingement (POI):	A defined point or points set at a defined distance from a facility (usually between the facility and sensitive community receptors) at which a specific limit for air pollutants must be met.
Pollutant:	Generally, any substance introduced into the environment that adversely affects the usefulness of a resource or the health of humans, animals, or ecosystems.
Pollution:	Generally, the presence of a substance in the environment that because of its chemical composition or quantity prevents the functioning of natural processes and produces undesirable environmental and health effects
Polyethylene Terephthalate (PET):	A type of plastic that is clear or coloured transparent with high gloss. It is used for carbonated beverage bottles, peanut butter jars, and some household cleanser cleaners. Bottles have a raised dot on the base and is referred to as No. 1 Plastic.
Positive Displacement Pumps:	A pump that forces fluid from one chamber to another by reducing the volume of the first chamber while increasing the volume in the second chamber.
Post-Closure:	The time period, following the shutdown of a landfill, waste management or manufacturing facility; established for monitoring purposes.
Potable Water:	Water that is safe for drinking and cooking.
Powdered Activated Carbon (PAC):	Used in air pollution control systems to control mercury and dioxins/furans. PAC has a large surface area, which allows the carbon to adsorb (stick to) and react with contaminants.
Precipitator:	Pollution control device that collects particles from an air stream.
Proponent:	Proponent means a person/persons who: 1) carries out or proposes to carry out an undertaking, or 2) is the owner or person having charge, management or control of an undertaking.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Proprietary Devices:	A device that is either used, produced, or marketed under exclusive legal right of the maker.
Putrescible:	Able to rot quickly enough to cause odours and attract flies.
Pyrolysis:	Decomposition of waste and its constituent chemicals by heat in the absence of oxygen.
Quench:	A method to cool a substance quickly and suddenly after heating. Often performed by placing the hot material in water.
Receptor:	The person, plant or wildlife species that may be affected due to exposure to a contaminant.
Recycle/Reuse:	Minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste (i.e. recycling of aluminum cans, paper, and bottles, etc.).
Refuse Derived Fuel (RDF):	Waste that has been processed to remove non-combustible materials. RDF can be compacted or compressed through processes such as pelletizing or briquetting. Pelletized or Bricked RDF is easy to manage and handle, and also usually has a higher calorific value because of the increased density and reduced moisture content.
Refuse Reclamation:	Conversion of solid waste into useful products; e.g., composting organic wastes to make soil conditioners or separating aluminum and other metals from waste for recycling.
Reserve Capacity:	Extra treatment capacity built into infrastructure such as solid waste and wastewater treatment plants and interceptor sewers to accommodate flow increases due to future population growth.
Residential Waste:	Waste generated in single and multi-family homes, including newspapers, clothing, disposable tableware, food packaging, cans, bottles, food scraps, and yard trimmings other than those that are diverted to backyard composting.
Residual:	Amount of a pollutant remaining in the environment after a natural or technological process has taken place; e.g., the sludge remaining after initial wastewater treatment, or particulates remaining in air after it passes through a scrubbing or other process.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Residual Municipal Solid Waste (RMSW):	Common garbage or trash generated by industries, businesses, institutions, and homes that remains after diversion programs have been used to remove recoverable materials.
Resource Recovery:	The process of obtaining matter or energy from materials formerly discarded.
Rotary Lobe Pumps:	Type of rotary pump where two or more rotating lobes are put in a chamber between suction and discharge nozzles. Fluid that enters the suction nozzle is trapped in the pockets formed by the lobes. The fluid is then carried around and eventually forced out through the discharge nozzle.
Scrubber:	An air pollution device that uses a spray of water or reactant or a dry process to trap pollutants in emissions.
Selective Catalytic Reactor (SCR):	An air pollution control device that reduces the nitrogen oxide emissions, with a catalyst, to water vapour and elemental nitrogen by injecting ammonia into the flue gases. The catalyst is required because SCR systems occur at much lower temperatures than SNCR (see below) systems.
Selective Non-Catalytic Reduction (SNCR):	An air pollution control device that converts nitrogen oxide emissions into elemental nitrogen and water by injecting a chemical reagent typically urea, or another ammonia-based solution into the flue gas.
Self Hauled Wastes:	Wastes that are delivered to a waste management facility by the waste generator.
Shrouded Flares:	Flares that are enclosed in order to control combustion and monitor emissions more reliably, as opposed to an open flame where there is a lack of control.
Siting:	The process of choosing a location for a facility.
Source Reduction:	Reducing the amount of materials entering the waste stream from a specific source by redesigning products or patterns of production or consumption (e.g., using returnable beverage containers). Synonymous with waste reduction.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Source Separated Organics (SSO):	Organics separated by the household or business that include food wastes and leaf and yard wastes. Source separated organics are collected by a separate collection vehicle and sent for processing/composting.
Source Separation:	Segregating various wastes at the point of generation (e.g., separation of paper, metal and glass from other wastes to make recycling simpler and more efficient).
Spent Media:	Odour control equipment that can no longer be used as a result of trapping solid residue.
Stabilized Organic Material:	Organic material that has converted to a form that resists any further change. Bacteria stabilizes organic material and converts the material to gases and other more inert materials.
Stack:	A chimney, smokestack, or vertical pipe that discharges flue gas or used air.
Stakeholder:	Any organization, governmental entity, or individual that has a stake in or may be impacted by a given approach to environmental regulation, pollution prevention, energy conservation, etc.
Stoichiometric:	A chemical condition where by there exists a mixture of chemicals having the exact proportions required for complete chemical combination, applied especially to combustion of materials. (e.g. stoichiometric conditions occur in an incinerator when there is sufficient oxygen present to completely combust the waste material)
Stratigraphy:	The order of rock or soil layers in a geological formation.
Syngas:	A gas product (primarily hydrogen and carbon monoxide) resulting from gasification processes and can be used as a fuel or feedstock chemical.
Terms of Reference:	A terms of reference is a document that sets out detailed requirements for the preparation of an Environmental Assessment.
Thermal Treatment:	Use of elevated temperatures to treat wastes (e.g., combustion or gasification)
Tipping Fee:	A monetary fee paid to process a dispose of waste at a facility.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Toxic Equivalents (TEQs):	Used to report toxicity-weighted masses of mixtures of dioxins. The dioxin toxicity equivalent value is compared to 2, 3, 7, 8, tetrachlorodibenzo- <i>p</i> -dioxin, and determined by adding the products of the measured concentration of each dioxin and furan congener multiplied by the toxicity equivalent factor.
Toxic Waste:	A waste that can produce injury if inhaled, swallowed, or absorbed through the skin.
Transfer Station:	Facility where material is transferred from collection vehicles to larger trucks or rail cars for longer distance transport.
Trommel:	A rotary cylindrical screen, typically inclined at a downward angle that separates materials of different physical size. Trommel screens are used to separate mixed recyclables, municipal solid waste components, or to screen finished compost from windrow and aerated static pile systems.
Undertaking:	A project or facility that is subject to an environmental assessment. It is defined in the Environmental Assessment Act as follows: 1. an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity by or on behalf of Her Majesty in right of Ontario, by a public body or public bodies or by a municipality or municipalities, 2. a major commercial or business enterprise or activity or a proposal, plan or program in respect of a major commercial or business enterprise or activity of a person or persons other than a person or persons referred to in clause (1) that is designated by the regulations, or 3. an enterprise or activity or a proposal, plan or program in respect of an enterprise or activity of a person or persons, other than a person or persons referred to in clause (a), if an agreement is entered into under section 3.0.1 in respect of the enterprise, activity, proposal, plan or program; ("entreprise")
United States Environmental Protection Agency AP-42 (US-EPA AP-42):	US-EPA document <i>Compilation of Air Emission Factors, Volume 1: Stationary Point and Area Sources</i> .
Urea:	A form of nitrogen that converts readily to ammonium.
User Fee:	Fee collected from only those persons who use a particular service, as compared to one collected from the public in general.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Venturi Scrubbers:	Air pollution control devices that use water to remove particulate matter from emissions.
Volume Reduction:	Processing waste materials to decrease the amount of space they occupy, usually by compacting, shredding, incineration, or composting.
Waste:	1. Refuse from places of human or animal habitation. 2. Unwanted materials left over from a manufacturing process.
Waste Characterization:	The process of identifying the various components, including quantities, and materials found within a waste stream.
Waste Exchange:	Arrangement in which individuals or companies exchange their wastes for the benefit of both parties.
Waste Feed:	The continuous or intermittent flow of wastes into an incinerator or other device.
Waste Generation:	The weight or volume of materials and products that enter the waste stream before recycling, composting, landfilling, or combustion takes place. Also can represent the amount of waste generated by a given source or category of sources.
Waste Generator:	The individual, household, establishment or business engaged in an activity that generates a specific waste or wastes.
Waste Management System:	A set of facilities or equipment used in, and any operations carried out for, the management of waste including the collection, handling, transportation, storage, processing or disposal of waste, and may include diversion programs and facilities and one or more waste disposal sites.
Waste Minimization:	Measures or techniques that reduce the amount of wastes generated during industrial production processes; term is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.
Waste Reduction:	Using at-source reduction, reuse, or composting to prevent or reduce waste generation.

GLOSSARY OF FREQUENTLY USED TERMS AND ABBREVIATIONS

Durham/York Residual Waste Study

Waste Stream:	The total flow of solid waste from homes, businesses, institutions, and manufacturing plants that is recycled, burned, or disposed of in landfills, or segments thereof such as the "residential waste stream" or the "recyclable waste stream."
Waste-to-Energy (WTE) Facility/Municipal-Waste Combustor:	Facility where recovered municipal solid waste is converted into a usable form of energy, usually via combustion.
White Goods:	Usually large household appliances such as washing machines, dishwashers, and refrigerators/freezers.
Yard Waste:	The part of solid waste generated at the household in the yard composed of grass clippings, leaves, twigs, branches, and other garden refuse.
Zero Waste:	Refers to efforts to reduce solid waste disposal to zero, or as close to zero as possible, by minimizing excess consumption and maximizing the recovery of wastes through recycling and composting.

UNITS OF MEASUREMENT

Area

m³ cubic metre

scf standard cubic feet 35.3 m³

Mass/Weight

Re. Orders of Magnitude: $\times 10^2 = \times 100$, $\times 10^3 = \times 1000$, etc.

g gram

mg milligrams 1×10^{-3} grams

µg microgram 1×10^{-6} grams

ng nanogram 1×10^{-9} grams

kg kilogram 1×10^3 g

pg picogram 1×10^{12} grams

t metric tonne 1×10^3 kg

kt kilotonne 1×10^6 kg

lb pound 1 lb = 453.592 grams

Power

W watt

kW kilowatt 1×10^3 W

MW megawatt 1×10^6 W

Volume

L litre

mL millilitre $1 \text{ L} = 1 \times 10^3 \text{ mL}$

m³ cubic metre $1 \text{ m}^3 = 1 \times 10^3 \text{ L}$

Rm³ and DS m³ dry cubic metre of flue gas corrected to standard conditions (25°C, 101.3 kPa, 11% O₂) as defined by MOE APC on Incinerators Policy 01-03-02

Time

s second

min minute

hr hour

wk week

y year

ELEMENTS

Cd - Cadmium

Hg - Mercury

Pb - Lead

COMPOUNDS

CO - Carbon Monoxide

CO₂ - Carbon Dioxide

CH₄ - Methane

HCl - Hydrogen Chloride

TPM - Total Particulate Matter

PM_{2.5} - Particulate Matter Diameter $\leq 2.5 \mu\text{m}$

NO_x - Nitrogen Oxides

N₂O - Nitrous Oxide

PCDDs - Polychlorinated Dibenzodioxins

PCDFs - Polychlorinated Dibenzofurans

SO₂ - Sulphur Dioxide

VOCs - Volatile organic compounds

MISCELLANEOUS

BTU - British Thermal Unit

°C - temperature in degrees Celsius

N/A - not available

% - percent

cfm - cubic feet per minute

ppmdv - part per million by dry volume

ppmv - part per million by volume

ppm - part per million

min - minimum

max - maximum

Appendix B

Regional Council Resolutions Endorsing Proposed EA Terms of Reference



Clerk's Department

DIRECTION MEMORANDUM

TO: C. Curtis, Commissioner of Works
FROM: P.M. Madill, Regional Clerk
DATE: December 14, 2005
RE: Direction as per minutes of the Regional Council meeting held on December 14, 2005

REPORT OF: Works Committee

ITEM # 1

**DURHAM/YORK RESIDUAL WASTE ENVIRONMENTAL STUDY
PROPOSED TERMS OF REFERENCE (2005-WR-29)**

THAT Council approve the Proposed Terms of Reference for the Durham/York Residual Waste Environmental Assessment and authorize staff to submit the Proposed Terms of Reference (ToR) to the Minister of the Environment (MOE) for their approval.

A handwritten signature in dark ink, appearing to read 'P.M. Madill', written over a horizontal line.

P.M. Madill, A.M.C.T., CMM I
Regional Clerk



*Regional Clerk's Office
Corporate Services Department*

December 15, 2005

The Honourable Laurel C. Broten
Minister of the Environment
135 St. Clair Avenue West
12th Floor
Toronto, ON M4V 1P5

Dear Minister:

**Re: Proposed Terms of Reference
Durham/York Residual Waste Environmental Assessment**

Regional Council, at its meeting held on Thursday, December 15, 2005, adopted the following recommendations of the Solid Waste Management Committee regarding the report entitled "Proposed Terms of Reference, Durham/York Residual Waste Environmental Assessment":

1. Council approve the Proposed Terms of Reference for the Durham/York Residual Waste Environmental Assessment.
2. The Regional Clerk forward the proposed Terms of Reference to the Minister of the Environment for approval.

Accordingly, enclosed for your approval are the Proposed Terms of Reference for the Durham/York Residual Waste Environmental Assessment, prepared in accordance with Sections 6.(1) and 6.(2)(a) of the Environmental Assessment Act. A copy of Clause 1, Report No. 8 of the Solid Waste Management Committee is also enclosed for your information.

Please contact Andrew Campbell, Director, Solid Waste Management, at 905-830-4444, ext. 5711, if you have any questions with respect to this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Denis Kelly".

Denis Kelly
Regional Clerk

K.Price

Attachment

Copy to: A. Campbell, Director

B. Boffey, MacViro Consultants Inc.

196285 P27 Dec 7/05

Appendix C

Agreement Between The Region of Durham and York Region for Joint Study on Waste Disposal



RESIDUAL WASTE MANAGEMENT EA STUDY AGREEMENT

This Agreement dated June 30, 2005 is made



B E T W E E N:

THE REGIONAL MUNICIPALITY OF DURHAM
("Durham")

-and-

THE REGIONAL MUNICIPALITY OF YORK
("York")

RECITALS

WHEREAS:

- (a) Durham and York are each responsible within their respective geographic limits for the disposal of solid waste; and
- (b) Durham and York wish to examine and identify a preferred method or methods of processing – physically, biologically and/or thermally - the waste that remains after the application of Durham's and York's at-source waste diversion programs in order to recover resources – both material and energy – and to minimize the amount of waste requiring landfill.

NOW THEREFORE Durham and York agree as follows:

INTERPRETATION

Definitions

- 1. In this Agreement and in the recitals above,
 - (a) **"Agreement"** means this Residual Waste Management Environmental Assessment Study Agreement;
 - (b) **"Durham"** means The Regional Municipality of Durham acting as a body corporate and, where the context requires, includes all employees, officers, servants and agents of The Regional Municipality of Durham;

- (c) “**JMG**” means the Joint Management Group described in Section 12;
- (d) “**Milestone**” means a milestone set out in Section 9;
- (e) “**Study**” means the study described in Section 5; and
- (f) “**York**” means The Regional Municipality of York acting as a body corporate and, where the context requires, includes all employees, officers, servants and agents of The Regional Municipality of York.

Schedules

- 2. The following Schedules are attached to and form part of this Agreement:

Schedule “A” Joint Management Group Terms of Reference
Schedule “B” Study Budget

References

- 3. Unless otherwise specified, references in this Agreement to Sections and Schedules are to Sections and Schedules in this Agreement.
- 4. Reference to any statute or statutory provision includes reference to that statute or statutory provision as from time to time amended, extended or re-enacted.

SCOPE OF THE STUDY

- 5. Durham and York shall jointly undertake an environmental assessment study (the “Study”) to examine and identify a preferred method or methods of processing – physically, biologically and/or thermally - the waste that remains after the application of Durham’s and York’s at-source waste diversion programs in order to recover resources – both material and energy – and to minimize the amount of waste requiring landfill.
- 6. The Study shall satisfy all of the applicable requirements for an environmental assessment under the *Environmental Assessment Act*, R.S.O. 1990, c. E18.
- 7. Only those physical, biological or thermal technologies/systems that meet or exceed current regulatory requirements shall be considered in the Study.
- 8. The Study shall establish an annual processing capacity for alternative technologies/systems based on the projected quantity of solid residual wastes generated over a 35-year planning period (2013 to 2045).
- 9. Following are the significant milestones contemplated for the Study:
 - (1) Approval by the Minister of the Environment of the Environmental Assessment Terms of Reference (Fall 2005);

- (2) Selection of the preferred technologies/systems for processing the post-diversion waste following an assessment of the alternatives to the undertaking (2006); and
 - (3) Selection of the preferred site(s) for implementation of the preferred technologies/systems following an assessment of alternative methods of carrying out the undertaking (2007).
- 10. The Study shall include the development of a policy designed to compensate property owners (including road authorities) impacted by the selection of the preferred site(s).
- 11. The Study shall assume that each party shall be responsible for arranging for the landfill disposal of its own share of residue generated from the processing of residual wastes by the preferred technologies/systems.
- 12. Upon completion of the Study, the parties may enter into a new agreement governing (a) the preparation of a request for proposals designed to select a technology provider to implement the preferred technologies/systems and (b) the processing of all necessary legislative approvals.

STUDY MANAGEMENT

- 13. The Study shall be managed by a Joint Management Group ("JMG") comprised of elected officials and citizens from Durham and York as well as an observer from the City/County of Peterborough Waste Management Steering Committee. The terms of reference for the JMG shall be as set out in Schedule "A".

FINANCIAL

- 14. Prior to March 31 in each year, the JMG shall review, and submit to the appropriate Committees and the Regional Councils for their approval, a detailed budget for the following calendar year of the Study. The Councils of both Durham and York must approve such budgets. The projected overall budget for the entire Study is set out in Schedule "B".
- 15. During 2005, each party shall pay its own costs associated with its own public information sessions. All other costs incurred in relation to the Study shall be shared between the parties. Such costs shall include, but not be limited to,
 - (a) preparation of Study documents;
 - (b) consulting fees;
 - (c) public notices and out-of-pocket expenses associated with public meetings in either Region;

- (d) *intervener funding (if any)*; and
 - (e) any hearing before the Environmental Review Tribunal.
16. Durham and York staff time and in-house resources spent on the Study shall not be a shared cost.
 17. If the parties should obtain funding from some source, such as from senior levels of government, other than the parties themselves, such funding shall be used to reduce the financial contributions of both parties equally.
 18. Each party shall indemnify the other against and save it harmless from and against all claims, demands or proceedings for loss, damage or injury, including death and from and against all costs and expenses which it may sustain, suffer or incur, resulting from or arising directly or indirectly out of the actions or omissions of such party pursuant, or purportedly pursuant to this Agreement or resulting therefrom in any way whatsoever.

GENERAL MATTERS

Term

19. The Agreement shall commence on June 30, 2005.
20. This Agreement shall terminate upon the completion of the environmental assessment, provided that either party may terminate earlier upon written notice to the other party given within 60 days after the achievement of a Milestone. Each party shall be responsible for its respective share of all costs incurred prior to termination. In addition, the terminating party shall be responsible for all costs of amending the Terms of Reference to permit the environmental assessment to continue. Neither party shall be liable to the other party for any other costs or damages resulting from the termination.

Successors and Assigns

21. This Agreement shall not be assigned by either party without the prior approval of the other.
22. This Agreement enures to the benefit of and binds the parties and their respective successors and permitted assigns.

Amendments

23. No amendment to this Agreement shall be effective unless it is in writing and signed by both parties.

Arbitration

24. Any dispute, difference, issue or question arising between the parties or between which concerns or touches upon the validity, construction, meaning, performance or effect of this Agreement, shall be referred to and resolved by arbitration in accordance with the *Arbitration Act, 1991*, S.O. 1991, c.17. The arbitration decision shall be final and binding and shall not be subject to appeal under any circumstances (whether with respect to a question of law, a question of fact, a question of mixed fact and law, or otherwise).

Further Assurances

25. The parties shall promptly and duly execute and deliver such further documents and assurances, and take such further action may be necessary from time to time in order to more effectively carry out the intent and purpose of this Agreement and to establish and protect the rights, interests and remedies intended to be created.

Notices

26. (1) Any notice under Section 19 shall be in writing and shall be delivered to the following addresses:

The Regional Municipality of Durham
605 Rossland Road East
Whitby, Ontario
L1N 6A3

The Regional Municipality of York
17250 Yonge St.
Newmarket, Ontario
L3Y 6Z1

Attention: Regional Clerk
Fax No. (905) 668-9963

Attention: Regional Clerk
Fax No. (905) 895-3031

- (2) Notice shall be sufficiently given if,

- (a) delivered in person;
- (b) sent by registered mail; or
- (c) sent by facsimile transmission during normal business hours on a business day.

- (3) Each notice sent shall be deemed to have been received,

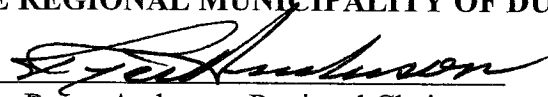
- (a) on the day it was delivered;
- (b) on the third business day after it was mailed; or

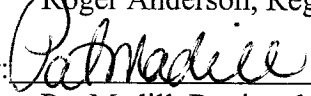
- (c) on the same day that it was sent by facsimile transmission or on the first business day thereafter if the day on which it was sent by facsimile transmission was not a business day.

- (4) Either party may change its address for notice by giving notice to the other in the manner provided in this Section.

IN WITNESS WHEREOF Durham and York have executed this Agreement.

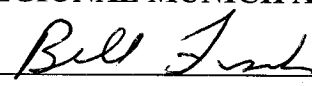
THE REGIONAL MUNICIPALITY OF DURHAM

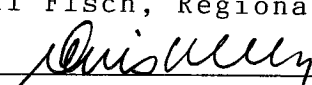
Per: 
Roger Anderson, Regional Chair

Per: 
Pat Madill, Regional Clerk

Authorized by Clause 1
of Report 4 of the
Transportation and Works
Committee, adopted by **Regional Council**
at its meeting on June 23, 2005

THE REGIONAL MUNICIPALITY OF YORK

Per: 
Bill Fisch, Regional Chair

Per: 
Denis Kelly, Regional Clerk

Approved
by Solicitor: 

Schedule “A”**JOINT MANAGEMENT COMMITTEE****TERMS OF REFERENCE****1. Mandate**

- 1.1 The JMG is a sub-committee of Durham’s Works Committee and York’s Waste Management Committee whose composition and activities shall be in accordance with these Terms of Reference.
- 1.2 The JMG shall provide advice and make recommendations to Durham’s Works Committee and York’s Waste Management Committee on all matters relating to (a) the Residual Waste Management Environmental Assessment Study Agreement between Durham and York dated June 30th, 2005 (the “Agreement”), (a) the environmental assessment study described in the Agreement (the “Study”); and (c) any other agreement between the parties regarding the processing of waste that remains after the application of Durham’s and York’s at-source waste diversion programs.

2. Scope of Activities

- 2.1 The JMG shall,
- (a) examine the composition and quantity of the post-diversion residual wastes to be managed;
 - (b) establish the limits of the area to be serviced by a facility, or facilities, established as a result of the Committee’s work;
 - (c) research available energy and recyclable resource markets and their operating requirements;
 - (d) review and make recommendations regarding the Study’s preferred post-diversion residual waste processing technologies and systems;
 - (e) review and make recommendations regarding the Study’s preferred site location(s) for the required facility or facilities;
 - (f) secure meaningful public input through public information protocols such as workshops and open houses;
 - (g) report and make recommendations to the Durham’s Works Committee and to York’s Waste Management Committee respecting all other matters set out in Section 1.2 of these Terms of Reference, as required.

3. **Composition**

3.1 The JMG shall be comprised as follows:

a) *8 Voting members*

Four (4) current members of Durham's Works Committee.

Four (4) current members of York's Waste Management Committee.

The Chairs and Vice Chairs of each Committee, or their designate, shall sit as members of the JMG. These members shall select the remaining two (2) members from their respective Committee to sit on the JMG.

b) *6 Non-voting members*

Three (3) interested residents from the Region of Durham[M1].

Three (3) interested residents from the Region of York.

c) The Chair of the City & County of Peterborough's Waste Management Steering Committee, or a designate, shall sit as an observer.

3.2 Membership in the JMG shall be for a 3-year term corresponding with the terms of Regional Councils.

3.3 The JMG may establish project teams and/or working groups as deemed necessary to address specific issues. The Chair of any project team or working group shall be a voting member of the JMG.

4. **Officers**

4.1 The Chairs of Durham's Works Committee and York's Waste Management Committee shall be Co-Chairs of the JMG and shall preside over JMG meetings in an alternating fashion. If either Co-Chair is absent, the Vice-Chair of the respective Regional Committee shall serve as Chair for that JMG meeting.

5. **Support Services**

5.1 Durham's Commissioner of Works and York's Commissioner of Transportation & Works and their designates shall serve as staff liaison to the JMG.

5.2 Staff support from both Durham and York shall be provided to the JMG as required.

5.3 The staff liaisons shall co-ordinate all requests for advice from the JMG through meeting agendas and addenda to meeting agendas. JMG responses to such requests shall be co-ordinated by the staff liaison to the respective Regional Committees.

- 5.4 Both Regions shall provide secretarial and other administrative support services to the JMG in an alternating fashion. When, for example, the JMG meeting is in Durham Region, administrative support shall be provided by Durham Region staff. The respective Regional Departments shall be responsible for these administrative expenses.

6. **Meetings**

- 6.1 The JMG shall coordinate its meetings with the Durham's Works Committee and the York's Waste Management Committee meetings. Special meetings may be held at the call of the both of the Co-chairs of the JMG.
- 6.2 The location of JMG meetings shall alternate between the Region of Durham and Region of York offices.
- 6.3 Unless otherwise determined, all JMG meetings shall be open to the public. As a formal advisory Committee within both Durham and York, procedures at the JMG meetings shall be governed by the procedural by-law of the Region hosting the meeting unless specified otherwise in this Terms of Reference.

7. **Delegations at Committee Meetings**

- 7.1 Any person wishing to appear before the JMG as a delegate must submit a request to both staff liaisons advising of the topic or item to which they wish to speak. All such requests must be received at least one week prior to a JMG meeting to ensure that the delegation is included in the meeting's agenda. Any person wishing to address the JMG as a delegate, who has not previously arranged to do so, may be granted permission to do so only by resolution of the JMG.

8. **Minutes and Agenda**

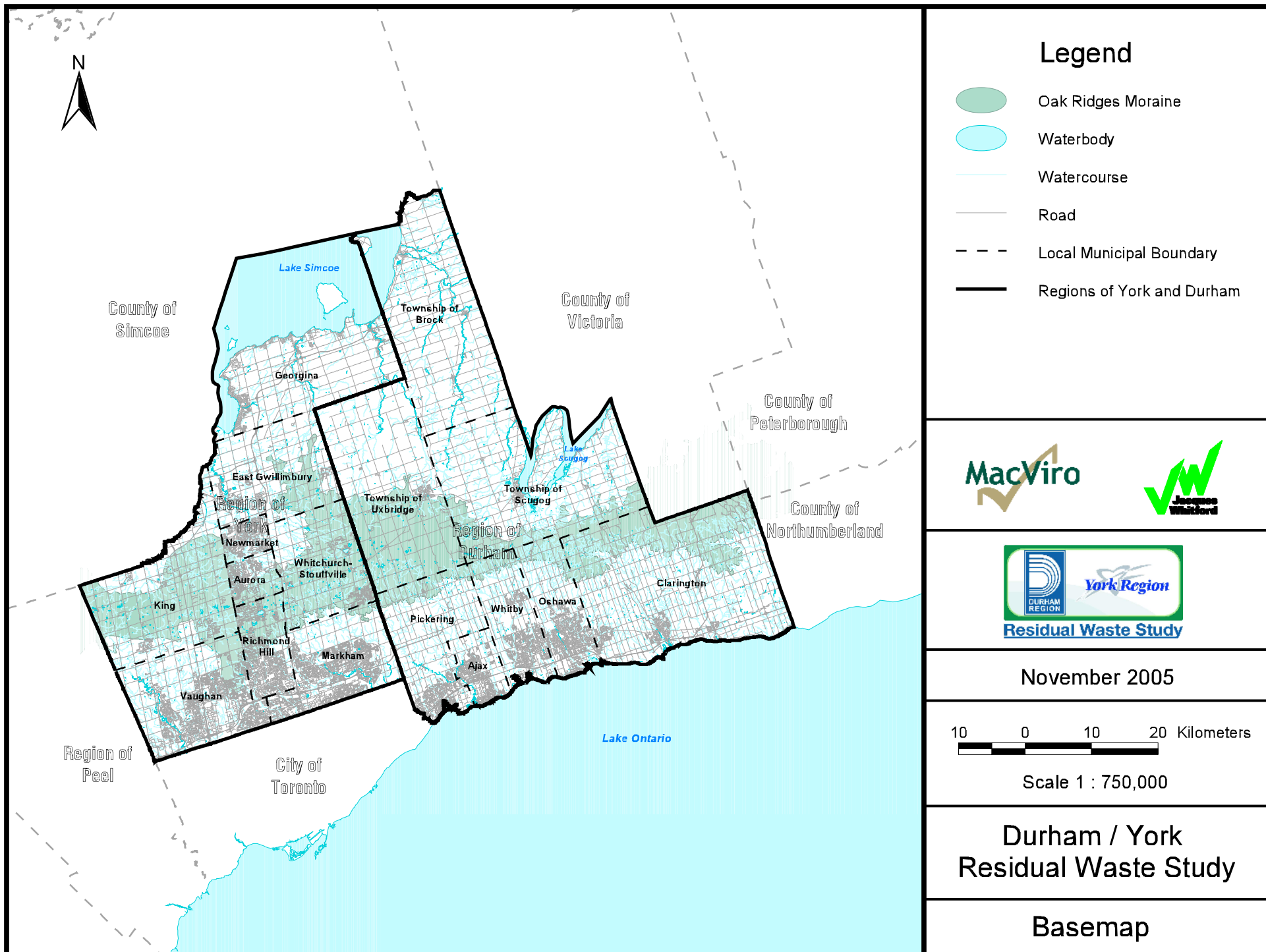
- 8.1 All minutes of meetings of the JMG shall be submitted to both Durham's Works Committee and York's Waste Management Committee.

9. **Committee Resolutions**

- 9.1 JMG shall seek to achieve consensus on decisions. Recommendations are 'carried' if supported by a majority of voting members. Only resolutions as they appear in the adopted Minutes may be considered as officially representing the position of the JMG.

Appendix D

Study Area Base Map



Legend

-  Oak Ridges Moraine
-  Waterbody
-  Watercourse
-  Road
-  Local Municipal Boundary
-  Regions of York and Durham



November 2005

10 0 10 20 Kilometers

Scale 1 : 750,000

Durham / York
Residual Waste Study

Basemap

Appendix E

Preliminary Evaluation Criteria for “Alternatives to the Undertaking” (i.e., Alternative Technologies)

TABLE E-1: Preliminary Comparative Evaluation Criteria for “Alternatives to” the Undertaking (Step 4)

Environmental Considerations	Preliminary Evaluation Criteria
Natural Environmental Considerations	◆ Environmental burden at a global or macro-environmental scale, including impacts to air, land and water. ◆ Consumption /preservation of non-renewable environmental resources. ◆ Potential for destruction or disruption of sensitive terrestrial and/or aquatic habitats at an eventual site. ◆ Potential to increase waste diversion rate and/or make best use of residual (post-diversion) waste materials.
Social Cultural Considerations	◆ Potential for land use conflicts from siting of facilities required for alternative.
Economic/Financial Considerations	◆ Net system costs per tonne of waste managed – in a systems context. ◆ Sensitivity of system costs and affordability to external financial influences.
Legal/Technical Considerations	◆ Legal/Contractual risks associated with waste management alternative. ◆ Technical risks associated with waste management alternative.

Appendix F

Preliminary Screening and Evaluation Criteria for “Alternative Methods” of Implementing the Undertaking (i.e., Alternative Sites)

TABLE F-1: Preliminary Exclusionary Criteria for the Identification of Suitable Areas where a long-term waste management facility could be sited. (Step 2)

◆ Exclude designated¹ lands located within areas protected by Provincial/ Federal legislation and Provincial land use plans and policies including the Oak Ridges Moraine Conservation Plan, the Green Belt Plan, and the Provincial Policy Statement 2005. ◆ Exclude designated residential areas and areas within an appropriate separation distance² of these designations. ◆ Exclude designated Natural Heritage Features and Areas and areas within an appropriate separation distance of these designations. Examples include: • Significant Habitat of Endangered and Threatened Species and Species at Risk; • Significant Areas of Natural and Scientific Interest; • Significant Wetlands, Woodlands, etc.; • Ground water Discharge/Recharge Areas; • Wellhead Protection Areas and Infiltration Areas; • Designated Hazard Land; and, • Conservation Areas. ◆ Exclude Prime Agricultural Lands. ◆ Exclude designated Park / Recreational Lands and areas within an appropriate separation distance of these designations. ◆ Exclude Institutional facilities and areas within an appropriate separation distance of these facilities or lands (e.g. schools, hospitals). ◆ Exclude areas around federally regulated airports as per Transport Canada Guidelines.

¹Designated refers to land uses and related policies as set out in Federal/Provincial Statutes and Regulations and applicable Municipal Official Plans/Municipal Policy Plans. These designations will be clearly defined at the outset of the evaluation of “Alternative Methods”

²Appropriate Separation Distances will be defined following the identification of the preferred “Alternative to” and in consultation with the public, agencies and the MOE. Consideration will also be given to existing land use compatibility guidelines including, for example, the MOE’s “D-Series” Guidelines for Land Use Compatibility, and B-7 Series Guidelines for Reasonable Use Concept.



TABLE F-2: Preliminary Factors to be used in the Evaluation of the “Long-List” of Alternative Sites. (Step 5)

Factor	Constraint
Proximity to required infrastructure (dependent on technology selected)	• Example: Maximum distance (to be specified) from electrical grid interconnection point or heat load if an EFW facility was part of the preferred “Alternative To” • Distance to required sewer and water services
Site accessibility	• Maximum distance (to be specified) from major highway, rail line and/or transit system
Potential impact of the haul route (i.e., traffic, noise, land use, cost)	• Length of haul route (distance to main waste generation source(s)) • Land use along haul route • Road type, width and traffic volumes along haul route
Property size	• Minimum size (determined in Step 3) in comparison with the actual site size (ie. amount of surplus land available beyond the minimum site size requirement)
Land use compatibility	• Designated industrial or industrial type land use adjacent to the site
Availability of site	• Requirement to acquire site through expropriation
Potential impacts on unregulated airport operation	• Proximity to unregulated airports

TABLE F-3: Preliminary Comparative Evaluation Criteria to be used in the Evaluation of the “Short-List” of Alternative Sites. (Step 6)

Environmental Considerations	Preliminary Evaluation Criteria
Public Health & Safety and Natural Environment Considerations	◆ Potential Air Quality Impacts <i>Note: The preferred technology must at least meet all applicable air quality regulations.</i> ◆ Potential Water Quality Impacts (Surface Water and Groundwater) ◆ Potential Environmentally Sensitive Areas and Species Impacts ◆ Potential Aquatic and Terrestrial Ecology Impacts
Social and Cultural Considerations	◆ Compatibility with Existing and/or Proposed Land Uses ◆ Potential Impact on Residential Areas ◆ Potential Impact on Parks and Recreational Areas ◆ Potential Impact on Institutional Facilities or Areas ◆ Potential Impact on Archaeological Resources, Built Heritage and Cultural Heritage Landscapes ◆ Potential Traffic Impacts
Economic / Financial Considerations	◆ Operation and Maintenance Costs for Facility(ies) ◆ Capital Costs to develop Facility(ies)
Technical Considerations	◆ Compatibility with Existing Infrastructure ◆ Design/operational flexibility provided by site
Legal Considerations	◆ Complexity of Required Approvals ◆ Complexity of Required Agreements