Table of Contents

List of Figures

List of Tables

3. Overview of the Undertaking

This chapter of the EA describes the project, otherwise known as the Undertaking, and discusses the purpose, alternatives and benefits of the project.

3.1 Description of the Undertaking

The undertaking proposed by WM is a new landfill footprint that will provide residual waste disposal capacity of approximately 6.5 million cubic metres (m^3). It will be located at the proposed WCEC on lands that WM currently owns or has options to purchase. It will meet the requirements set out within Ontario Regulation (O. Reg.) 232/98 Landfilling Sites, including a double-liner design, leachate and gas collection systems, and monitoring to ensure long-term protection of air, groundwater, and surface water.

3.2 Purpose of the Undertaking

The purpose of the undertaking proposed by WM is to provide residual waste disposal capacity for solid non-hazardous waste from the residential and IC&I sectors in the form of a new landfill footprint. This will enable WM to continue commercial operations and support its business in Ottawa following the closure of the company's Ottawa WMF in September 2011. The new landfill footprint will primarily serve residential and IC&I waste generators from the City of Ottawa and the Good Neighbour Zone (GNZ), which includes surrounding communities mainly within Lanark County.

The existing Ottawa WMF is located on Lots 3 and 4, Concession 3 in the former Township of Huntley, formerly in the Township of West Carleton, now the City of Ottawa near the intersection of Carp Road and Highway 417. The landfill at the Ottawa WMF occupies 35 hectares (ha) within a 104 ha site bordered by City of Ottawa Road 5 (Carp Road) to the east, Highway 417 to the south, William Mooney Road to the west, and Richardson Side Road to the north.

The new landfill footprint is located immediately adjacent the existing landfill site on parts of Lots 4 and 5. The southern half of the footprint is on WM-owned lands and the northern half is on lands that WM has options to purchase. Buffers of 100 metres (m) or greater are maintained between the limits of the footprint and the surrounding property boundaries. An approximate 45 to 50 m buffer is maintained between the toe of slope of the existing and new landfills. This allows sufficient area for a new waste haul road to the new footprint and for maintenance and monitoring access. The landfill footprint provides 6,500,000 m^3 of disposal capacity within a rectangular landform and a maximum elevation (top of final cover) of 156 metres above sea

level (mASL). This elevation is approximately 31 m above the surrounding existing grade. By comparison, the maximum elevation of the existing Ottawa WMF landfill is approximately 172 mASL or approximately 47 m above the surrounding existing grade. The total footprint area of the new landfill is 37.8 ha.

The site entrance for the new landfill will be located off Carp Road approximately 640 m south of Richardson Side Road. The length of the entrance roadway leading to the scale facility is approximately 400 m and will incorporate several inbound lanes. This configuration will provide ample truck queuing thus eliminating potential for queuing on Carp Road. A left hand turn lane from the northbound Carp Road will be developed at the site entrance to minimize any traffic impacts on Carp Road.

Leachate collected from the landfill will be pretreated and discharged to the City of Ottawa sanitary sewer system in conjunction with disposal through irrigation of trees onsite.

The new landfill will also include the development of three new stormwater management ponds.

3.2.1 Opportunity Addressed

The opportunity addressed by the undertaking proposed by WM is guided by various factors, including population growth, waste generation, public policy, market conditions and business considerations.

Accounting for future growth, diversion, and the current role of Ottawa waste disposal facilities including the Ottawa WMF, WM has concluded that there is an ongoing need for residual waste disposal capacity services for generators within the City of Ottawa and neighbouring municipalities.

Given the role of the Ottawa WMF within WM's business operations and its importance to waste generators within the City of Ottawa, WM wishes to maintain an ongoing operating role of this facility. However, WM is aware of the uncertainty associated with a number of factors that may affect the volume of disposal capacity required. As a result, WM proposes to consider the residual waste disposal requirements over a shorter ten year timeframe.

WM believes that there is a sustainable market opportunity for the company to provide an average of 400,000 tonnes of landfill disposal capacity annually. When converted to volume over a ten year period, including cover material, it is estimated that the proposed WCEC will be required to provide up to 6.5 million m^3 of landfill disposal capacity air space.

Each of these factors is described in the following subsections.

3.2.1.1 Population Growth

The Official Plan of the City of Ottawa projects its population to grow from 870,000 in 2006 to 1,136,000 in 2031 with an annual growth rate of approximately 1.2%. The Community Vision and County Strategic Plan for Lanark County projects its population to grow from 68,700 in 2006 to 85,550 in 2031.

3.2.1.2 Waste Generation

Statistical data on waste management activities within Canada are collected by Statistics Canada through a survey of businesses and local governments that provide waste management services. The data are presented biennially at a provincial level. The survey includes data on waste recycling and disposal quantities and rates. **Table 3-1** provides a summary of the Ontario waste generation, recycling and disposal per capita data for 2000, 2002, 2004, 2006, and 2008. The most current year of data is 2008.

Table 3-1 Ontario Per Capita Waste Data

Year	Recycling Rate (kg/capita/year)	Disposal Rate (kg/capita/year)	Waste Generation Rate (kg/capita/year)
2000[1]	209	787	996
2002[2]	187	797	984
2004[3, 4]	194	790	984
2006[3]	189	822	1011
2008[5]	217	745	962

Note: 1. Waste Management Industry Survey: Business and Government Sectors 2002, Statistics Canada, September 2004. Catalogue No. 16F0023XIE

2. Waste Management Industry Survey: Business and Government Sectors 2004, Statistics Canada, February 2007. Catalogue No. 16F0023XIE.

3. Waste Management Industry Survey: Business and Government Sectors 2006, Statistics Canada, June 2008. Catalogue No. 16F0023X.

4. The data shown for 2004 was originally presented in the February 2007 Statistics Canada report. However, the data was subsequently revised in the June 2008 report and the revised data are presented in Table 1.

5. Waste Management Industry Survey: Business and Government Sectors 2008, Statistics Canada, December 2010. Catalogue No. 16F0023X

The Statistics Canada report also provides data on tonnes of waste disposed by generator source, including waste exported for disposal outside Ontario. These data are recorded as being from residential and non-residential sources. The percentage of wastes by generator

source is consistent from the 2002 to the 2008 data, with residential wastes accounting for approximately 35% and non-residential (i.e., IC&I plus construction and demolition (C&D)) wastes representing approximately 65%.

IC&I and C&D waste quantities were identified separately in the 2000, 2002 and 2004 survey data. These waste types were combined in the 2006 and 2008 surveys.

There is a strong opinion among waste management professionals that the Statistics Canada survey data significantly under-reports some IC&I waste diversion activity. Consequently, the reported diversion or recycling rates for IC&I waste could be considerably lower than what is actually occurring. Materials sent directly from business to business for recycling are not recorded in the Statistics Canada survey. This means that the IC&I waste volumes reported represent waste that has already undergone some amount of diversion. As a result, it is anticipated that fewer diversion opportunities actually exist for these remaining wastes or considerably more effort will be required to divert additional materials from this waste stream.

Residential Waste Generation

The November 5, 2007 staff report from the Deputy City Manager to the City of Ottawa Planning and Environment Committee and Council[1] on *Waste Disposal Issues Related to the Carp and Trail Road Landfills* outlines that the City's residential waste stream is comprised of approximately 310,000 tonnes of material. These data and the 2006 City population can be used to calculate a residential waste generation rate of 356 kg/capita/year.

IC&I Waste Generation

The City of Ottawa's July 2007 "IC&I and C&D Management Options Report - IC&I 3Rs Strategy Project"[2] identifies IC&I waste generation of 730,000 tonnes in 2005. These data and the 2006 City population translate to an IC&I waste generation rate of 838 kg/capita/year in Ottawa.

3.2.1.3 Waste Diversion

While future population growth may result in an increase in the quantity of waste generated, depending on the degree of source reduction and reuse achieved over time, the rate of waste diversion is also expected to increase.

1. *http://www.ottawa.ca/calendar/ottawa/citycouncil/pec/2007/11-13/ACS2007-PWS-UTL-0023_revised.htm*
2. *http://www.ottawa.ca/residents/public_consult/ici/documents/discussion_paper_en.pdf*

Waste diversion refers to the practice of redirecting waste away from disposal through programs and activities that may include waste reduction, reuse, recycling and organic waste diversion through composting/digestion.

The *Waste Diversion Act* (WDA) came into effect in 2002 with the purpose of supporting reducing, reusing and recycling waste. Certain wastes are considered designated waste materials under the WDA and require diversion programs. Diversion programs currently exist for:

- Blue Box materials including glass, metal, paper, plastic and textile;
- Used tires;
- Waste Electrical and Electronic Equipment (WEEE); and
- Municipal hazardous or special waste.

The WDA was supported by the MOE's June 2004 "Ontario's 60% Waste Diversion Goal – A Discussion Paper," which described various options for achieving the goal of diverting 60% of waste from disposal by the end of 2008. MOE noted that the goal of increasing the overall provincial diversion rate from 28 per cent in 2002 to 60 per cent in 2008 was ambitious, but that it was achievable if everyone commits to finding solutions. MOE's waste diversion goal applies to non-hazardous solid waste produced by the municipal sector, primarily residential waste such as Blue Box materials and organic waste. The goal also applies to non-hazardous solid waste produced by the C&D sector, and by the IC&I sectors.

Ontario recently completed a review of the WDA and the Blue Box Program Plan. These review processes identified a number of recommendations to the Minister of the Environment on management of both residential and IC&I waste over the longer term. In conjunction with these efforts, in October 2008 the Ontario MOE released a discussion paper titled "Toward a Zero Waste Future: Review of Ontario's Waste Diversion Act, 2002". The discussion paper outlines how the concepts of zero waste and extended producer responsibility (EPR) can jointly be utilized to eliminate waste. The zero waste approach is based on all materials having a value that can be recovered and used in another form as opposed to being disposed. The extended producer responsibility model requires producers to assume the responsibility of managing the end of life of the materials they produced. There are a number of approaches that can be taken for extended producer responsibility and achieving zero waste, which was the focus of the MOE's consultation.

The province of Ontario oversees three EPR programs aimed at maximizing waste diversion and moving towards achieving zero waste. These programs are managed by manufacturers and importers through individual stewardship groups (i.e., Stewardship Ontario - diversion of blue box, and special and household hazardous waste; Ontario Electronics Stewardship - collection and recycling of waste electronic material; Ontario Tires Stewardship - collects and manages

waste tires). Given the current level of waste diversion observed in Ontario, experience suggests this type of approach will be essential to assist Ontario in meeting the 60% waste diversion objective for both residential and IC&I waste streams.

Subsequently, in October 2009 the Minister of the Environment released his report on the WDA review titled “From Waste to Worth: The Role of Waste Diversion in the Green Economy”. The report outlines the findings of the WDA review and presents a number of proposals for changes to the existing waste diversion framework. The proposed changes include:

- Individual producer responsibility;
- Clarifying the concept of diversion;
- Developing a schedule for waste diversion achievements;
- Improving oversight; and
- Programs to support producer responsibility (e.g., material disposal bans, levies).

The WDA review report is intended to form the basis of further public discussion on potential changes to the WDA. These policy changes are ongoing and not at a point to be transformed into operational changes.

Since the long term impacts of these processes will not be known for some time, applying a 60% diversion rate (the stated Provincial objective as outlined in the MOE’s June 2004 discussion paper) to current waste generation rates is considered an appropriate planning approach. However, the time period to achieve this level is uncertain, particularly for the IC&I waste stream.

The City of Ottawa is responsible for the management of the residential waste stream only. The Provincial government has jurisdiction over the IC&I waste stream and regulates it accordingly.

WM as a contract service provider supports and works within Provincial and City policies to develop and implement programs to increase the diversion of waste from disposal. Some examples include participating in the City’s IC&I waste diversion strategy consultations, assisting the Scotia Place Sustainability Council in minimizing waste disposal requirements and developing waste diversion plans with Mattamy Homes. WM intends to develop waste diversion infrastructure and programs as part of the proposed WCEC to support the City’s waste diversion objectives and to provide the appropriate opportunities and programs for waste generators within Ottawa.

Residential Waste Diversion

The City initiated an Integrated Waste Management Master Plan (IWMMP) in 2002. The IWMMP included a number of strategic directions including waste diversion. The IWMMP identified a minimum target of 40% residential waste diversion through existing programs. Options to increase diversion beyond this level would be considered in a future phase of the IWMMP. An April 2005 staff report provided an update on the IWMMP outlining the 40% diversion target would be achieved by the end of 2006 and that the City endorse a target of 60% residential waste diversion by the end of 2008. The achievement of a 60% residential waste diversion rate is linked to the City's implementation of a household organics program.

Based on the City's data, Ottawa currently diverts approximately 35 to 40% of the residential waste stream away from disposal. It is assumed by the City that residential waste diversion in Ottawa will reach 60% through enhancement of current residential waste diversion programs and the implementation of their source separated organics program. For planning purposes, WM has assumed that a 60% residential waste diversion rate will be achieved prior to the start of the planning period for the proposed undertaking (i.e., before 2014). The City commenced development of a 30-year waste plan in Fall 2011.

IC&I Waste Diversion

In 2006, Ottawa Council directed City staff to conduct a study of IC&I waste management within the City. The intent of this study was to develop a strategy for the minimization, diversion and disposal of IC&I and C&D waste and to extend the life of local landfills. The study involved the completion of four tasks, with the development of a strategy being the final task. In April 2009, the City of Ottawa released "Diversion 2015: An IC&I 3R Waste Diversion Strategy for Ottawa". The strategy outlines the goal of increasing IC&I waste diversion from the current 17% to achieving 60% by 2015. Specific programs to achieve this increased diversion have not been identified. The Diversion 2015 initiative is the City's contribution to assist the IC&I sector in achieving the Province's 60% waste diversion target.

Moving from 17% to 60% diversion (i.e., 43% increase, or more than tripling the 17% rate) in under six years would be a significant achievement which would require a fundamental change in the way businesses in Ottawa manage their wastes. It was previously highlighted in the discussion on the Statistics Canada data that IC&I diversion is believed to be higher than reported and that further diversion may require a substantial effort. In the event 60% of current IC&I waste quantities are diverted, it would also create significant amounts of recyclables and organic materials which will need to be diverted and absorbed through existing and new processing facilities and markets. Absorbing this additional tonnage would be a challenge for

existing infrastructure and markets, requiring a comprehensive market development strategy and a substantial planning effort.

Other factors influencing future levels of IC&I waste diversion include the Provincial WDA reforms and other provincial initiatives, pricing and markets for recyclable commodities and any restrictions on the flow of wastes from Ontario into the United States.

Based on the uncertainties associated with predicting waste diversion rates, for planning purposes, WM has identified an average increase of 2% annually in the IC&I diversion rate. WM's experience with IC&I sector waste diversion in jurisdictions across North America indicates that an annual average increase in diversion of 2% is reasonable given changes in policies, regulations and markets. This would mean reaching a 60% IC&I waste diversion rate by the end of 2033. The City of Ottawa in its November 2011, Discussion Paper: Goals and Target Setting for Ottawa's 30 Year Waste Plan, Appendix A, Note 1, has also assumed a yearly increase of 2% per year in the IC&I sector waste diversion rate from the current rate up to 50% diversion.

WM provides waste collection, diversion and disposal services to IC&I customers within Ottawa, and understands the service requirements of those individual customers. The company does not have any independent data, nor is it aware of the Province developing any specific data, regarding levels of waste diversion being achieved within the IC&I sector as a whole.

3.2.1.4 Waste Disposal Need

Projected future waste quantities generated in the City of Ottawa were developed by WM based on population and per capita waste generation. The projected annual quantities of waste generated within Ottawa are shown in **Figure 3-1**, for both residential and IC&I wastes, assuming no change in the per capita waste generation rate applied to population increases. Using the base year of 2006, projections are shown for a typical 20 year planning period from 2014 to 2033. WM is planning on the assumption that it will take until at least 2014 to obtain approval and develop new disposal capacity.

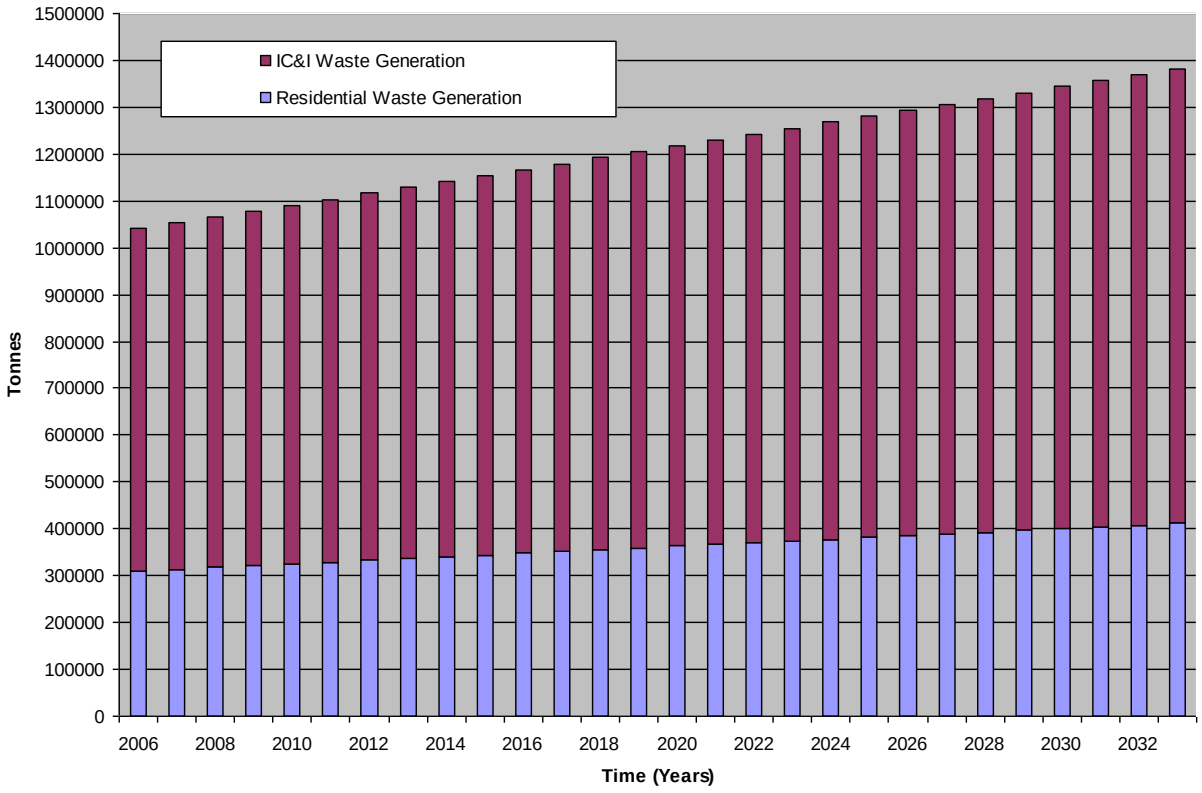

Figure 3-1 Residential and IC&I Waste Generation Projections (2006-2033)

Based on the projections developed by WM from available data, it is estimated that, in total, approximately 13.5 million tonnes of waste generated within Ottawa will require disposal over the 20 year period from 2014 to 2033.

The projected impact of waste diversion on both residential and IC&I waste streams generated in Ottawa and the residual quantity of waste still requiring disposal is shown in **Figure 3-2**. The quantity of waste requiring disposal is assumed to continue to decrease over time.

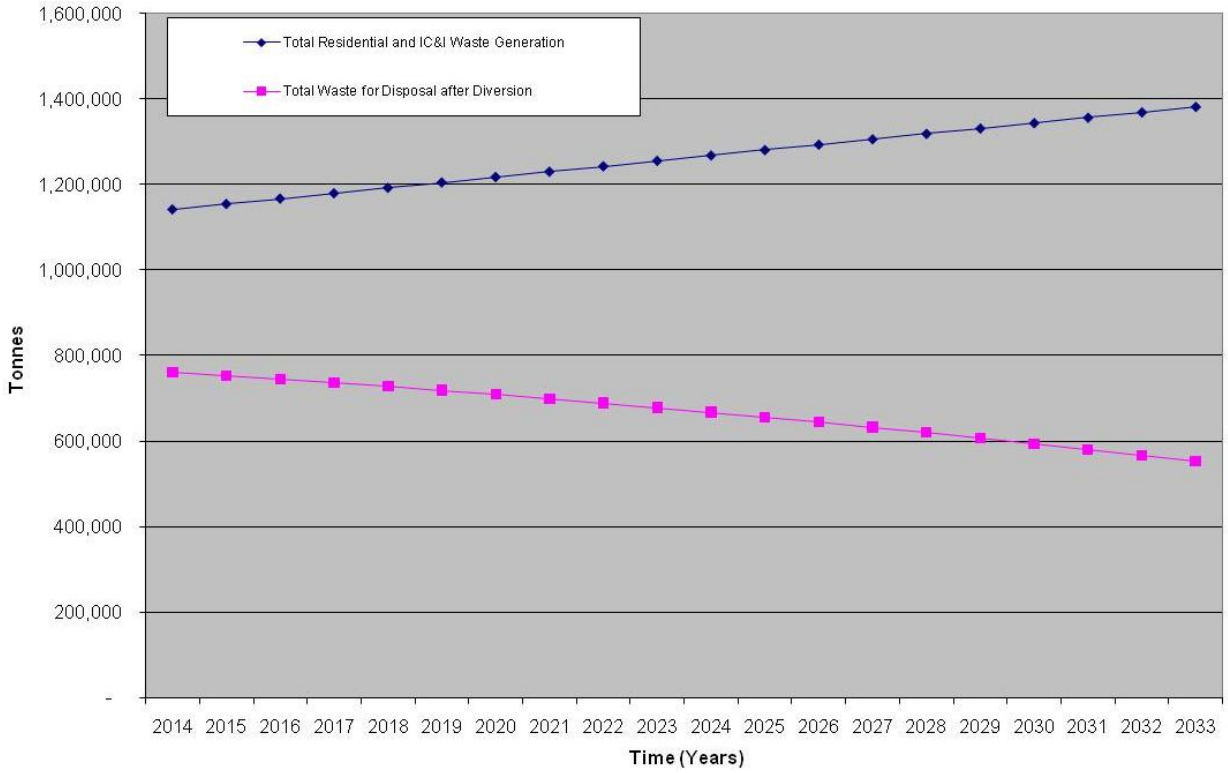

Figure 3-2 Total Residential and IC&I Waste Generation vs. Total Waste for Disposal after Diversion

3.2.1.5 Business Continuance

WM has historically made provisions with the City of Ottawa to reserve between 75% to 90% of their Ottawa WMF disposal capacity for wastes generated within the City of Ottawa. The actual percentage of the capacity reserved was dependent upon the percentage of the City's residential waste disposed at the WMF. Historically, WM has received up to 30% of the City's residential wastes for disposal, requiring that 90% of the landfill capacity be reserved for wastes generated within the City of Ottawa.

While most of the post-diversion wastes historically received at the Ottawa WMF were generated within the City of Ottawa, the site has also received post-diversion wastes from waste generators outside of the City of Ottawa, including from the GNZ, which is comprised mainly of communities from within Lanark County.

Based upon estimates of waste diversion and disposal within the City of Ottawa, approximately 840,000 tonnes of waste generated within the City were disposed of in 2006. Using estimates

developed by the City, the Ottawa WMF has historically received approximately 30% of the residential residual wastes and 50% of the residual IC&I wastes generated within the City of Ottawa. The demand for disposal capacity at the Ottawa WMF increased since 2001. From 2003 to 2006, the Ottawa WMF received an average of 400,000 tonnes of waste per year, with a peak of over 430,000 tonnes.

It is evident that there is an ongoing need to provide disposal capacity for residual wastes remaining after diversion programs within the City of Ottawa. The Ottawa WMF has played a significant role in meeting the needs for both residential and IC&I waste disposal capacity for the City of Ottawa and neighbouring municipalities. Given that the Ottawa WMF reached its approved capacity in September 2011, the future generation of residential and IC&I waste within the area serviced by the Ottawa WMF, and the intention of WM to continue its business operations in the City, there is a need to develop additional waste disposal capacity.

The average annual tonnes of waste over a ten year period to be disposed at the WCEC are estimated to be 400,000 tonnes. The cumulative annual tonnes of disposal capacity required are estimated to be 4.0 million tonnes. The cumulative annual volume of disposal capacity required, including daily cover material, is estimated to be 6.5 million m^3.

3.3 Alternatives to the Undertaking

The alternatives to the undertaking proposed by WM include existing and planned facilities (i.e., public landfills, private landfills, out-of-province landfills, and other facilities) and other options considered by WM (i.e., “Alternatives To” the undertaking) to provide residual waste disposal capacity for solid non-hazardous waste from the municipal residential and IC&I sectors. As part of the approved ToR for this EA, WM identified and assessed those alternatives to the undertaking that are appropriate and reasonable for WM to implement. The screening assessment of these alternatives has been completed and identified the establishment of a new landfill footprint at the WCEC as preferred. No further consideration is given to these alternatives. A summary of the consideration of alternatives to the undertaking is provided in this section of the EA.

3.3.1 Existing and Planned Facilities

Existing and planned facilities considered by WM in its assessment of alternatives to the undertaking included public landfills, private landfills, out-of-province landfills, and other facilities.

3.3.1.1 Public Landfills

Trail Road Waste Facility

Historically, the City of Ottawa's residential waste has primarily been disposed at the Trail Road Waste Facility. The City has indicated that the landfill received approximately 168,000 tonnes of waste for disposal in 2006, increasing to 258,000 tonnes in both 2008 and 2009. The recent increase in waste tonnages at the Trail Facility is attributable to the WM Ottawa WMF significantly decreasing the quantity of waste it received. The Trail Road Facility is owned and operated by the City of Ottawa. An EA for expansion of the landfill capacity was approved in June 2005. This approval provided the City with an additional 8.2 million m^3 of disposal capacity. The October 2011 City document entitled *Goals and Target Setting for Ottawa's 30-Year Waste Plan*[3] indicates that at current disposal rates the Trail Road facility will reach capacity by 2035. It should be noted that the City's 30 year plan does not consider the proposed WCEC landfill capacity.

Springhill Landfill

The Springhill Landfill is owned by the City of Ottawa and operated by Tomlinson Environmental Services. The landfill mainly accepts a small amount of residential wastes from the local area and recyclable C&D waste. Based on City of Ottawa information, 91,430 tonnes of waste were landfilled at the site in 2006, approximately 105,000 tonnes in 2007 and 102,000 tonnes in 2008. The October 2011 *Goals and Target Setting for Ottawa's 30-Year Waste Plan* indicates that at current disposal rates the Springhill Landfill will reach capacity by 2018.

3.3.1.2 Private Landfills

Progressive Waste Solutions

Progressive Waste Solutions landfill, formerly WSI Navan Landfill, accepts mainly IC&I and C&D waste from within the City of Ottawa. In 2008 an expansion of the landfill was approved to provide a further 3.6 million m^3 of disposal capacity with an operating level of approximately 180,000 tonnes annually. The MOE website reports that the company received 121,000 tonnes of waste in 2009 with a total remaining site capacity of 4.05 million m^3[4].

3. *http://www.ottawa.ca/residents/public_consult/wasteplan/discussion_en.html*
4. *http://www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/landfills/report?site=A460702*

Lafleche Environmental Landfill

The Lafleche Environmental Landfill is a privately owned and operated landfill located outside the City of Ottawa near Moose Creek, Ontario. The landfill received approval in 1999 for an identified total landfill capacity of 7.4 million m^3. The November 16, 2007 City staff report to PEC and Council (PEC Report 20) outlines that the City had previously approved the export of 30,000 tonnes of residential waste to the Lafleche landfill for disposal. It is believed that some quantity of IC&I waste generated in Ottawa is being disposed at this location. The MOE website reports that the company received 270,000 tonnes of waste in 2009 with a total remaining site capacity of 4.16 million m^3[5].

3.3.1.3 Out-of-Province Landfills

Out-of-province landfills, including facilities in New York and Michigan, are potential destinations for some of the solid non-hazardous waste generated within the City of Ottawa and Eastern Ontario. The estimated quantity of waste being exported to out-of-province landfills varies on an annual basis and is very difficult to determine. However, the practice of exporting waste from Ontario to landfill sites in the United States, particularly New York and Michigan, has been occurring since the early 1990s and continues to this day. WM does not have any independent data, nor is it aware of the Province collecting any specific data, that estimates the volume of waste being exported from eastern Ontario into the state of New York for disposal

3.3.1.4 Other Facilities

Plasco Energy Group Facility

The Plasco Energy Group received approval from the MOE for the ongoing operation of their existing thermal waste treatment facility at the City's Trail Road Waste Facility in October 2011. This facility is permitted to process up to 85 tonnes per day for management of solid waste generated within Ottawa.

Taggart Miller Capital Region Resource Recovery Centre

Taggart Miller Environmental Services, a partnership between Taggart Group of Companies and Miller Waste, announced in November 2010 the commencement of a ToR process to pursue an EA for their proposed Capital Region Resource Recovery Centre (CRRRC) in Russell, Ontario. The proposed CRRRC is envisaged as an integrated waste management facility intended to offer an option for commercial waste processing and recovery in the Capital Region plus provide residual waste disposal capacity. Taggart Miller Environmental Services has not yet submitted a ToR for their facility.

---

5. http://www.ene.gov.on.ca/environment/en/monitoring_and_reporting/limo/landfills/report?site=A420018

3.3.2 Other Options Considered

In addition to the consideration of existing and planned facilities, WM also considered other options available to it as a private company to provide residual waste disposal capacity for solid non-hazardous waste from the municipal residential and IC&I sectors.

Other options considered by WM, also known as "Alternatives To" the proposed undertaking, included the following:

Alternative #1 .... Do Nothing

Alternative #2 .... Develop a Thermal Destruction Waste-to-Energy Facility at the WCEC

Alternative #3 .... Close the Current Landfill and Establish a New Engineered Landfill at the WCEC

Alternative #4 .... Establish a New Landfill Elsewhere

Alternative #5 .... Export Waste to Other Facilities

WM applied the following methodology to assess and evaluate the "Alternatives To" the proposed undertaking:

Step 1..... Identify and prepare detailed descriptions of reasonable alternatives to meet the need for residual waste disposal capacity within Ottawa and neighbouring municipalities, incorporating public input to reflect the community's interests and comments.

Step 2..... Apply screening questions to determine if the alternatives are feasible, reasonable and practicable.

Step 3..... Select preferred alternative(s) based on the screening analysis.

In Step 2, an assessment of the five alternatives was undertaken to confirm their feasibility with respect to addressing the need/rationale established. A series of screening questions were applied to each of the alternatives to determine if they were feasible, achievable and reasonable for WM to implement. The questions applied to each of the alternatives include:

- Will the alternative address the need/rationale for additional waste disposal capacity within the City of Ottawa?
- Is the alterative economically viable and acceptable?
- Is the alternative technically feasible?
- Is the alternative consistent with the principles of responsible waste management?

The description prepared for each alternative incorporated a response to each of the screening questions. The screening questions and the assessment of alternatives were presented to stakeholders as part of the public workshops.

In Step 3, an analysis of the five alternatives after the screening questions were applied is summarized below.

Alternative #1 Do Nothing

The "do nothing" alternative does not satisfy the economic goals for WM within Ottawa and the eastern Ontario region. The closure of the existing Ottawa WMF operations would create a significant gap in the company's services for the City of Ottawa as it has historically provided approximately 50% of the annual disposal capacity for residual wastes generated within the City. Further, the "do nothing" alternative would not address the current local waste disposal needs of the City of Ottawa, which would force waste generators within the City to look outside of the municipal boundaries to dispose of locally generated waste.

Alternative #2 Develop a Thermal Destruction Waste-to-Energy Facility at the WCEC

WM would need to be guaranteed that a certain quantity of waste would be devoted to this alternative technology, to ensure the economic viability. WM understands that the City of Ottawa proposes to enter into an agreement with Plasco Energy. Assuming this venture proceeds on a commercial scale, all residual residential wastes are expected to be managed through a Plasco facility based on their thermal technology.

Alternative #3 Close the Current Landfill and Establish New Landfill Disposal Capacity at the WCEC

This alternative would meet WM's stated goal by continuing to provide waste disposal services to its customers and would be constructed and operated as an environmentally sound landfill. WM owns or has options to purchase the necessary contiguous property to construct new landfill capacity and the required infrastructure for the new landfill is already in place or can be put in place in a cost-effective manner. Further, this alternative is consistent with responsible waste management strategies as it provides a local solution to waste management (no exporting) and will incorporate enhanced waste diversion activities to reduce the overall volume of waste disposal capacity required.

Alternative #4 Establish a New Landfill Elsewhere

In order to achieve this alternative, a site selection process would be undertaken in order to identify a suitable site within the City of Ottawa, as well as obtaining all necessary regulatory approvals and agreements. WM does not own, nor is it aware of, other lands within the City of Ottawa that have been identified as suitable for new waste disposal capacity. As a private corporation, WM does not have the powers of expropriation if such a location existed. The development of a new landfill at a site elsewhere in the City of Ottawa is also not an economically attractive option.

Alternative #5 Export Waste to Other Facilities

This alternative would see wastes delivered to the Ottawa WMF site or another location, processed (if necessary) and then transferred to other waste disposal facilities. It is anticipated that the waste would be transferred to other facilities in Ottawa (i.e. Trail Road, Springhill, WSI, Navan), eastern Ontario (Lafleche) or New York State. Reliance on a third party disposal facility would put WM at a significant disadvantage competitively. Further, it is no longer acceptable to assume that waste may be exported to the United States because of the gradual restrictions on the seamless transfer of waste across the border.

Based upon the screening of the "Alternatives To" (Supporting Document #2 of the Approved ToR – see **Appendix A**), WM concluded that *Alternative #3 – Close the Current Landfill and Establish New Landfill Disposal Capacity at the WCEC* was the only reasonable alternative that may be implemented for the following reasons:

a) Under this alternative, the existing landfill would be closed once it reaches its approved capacity and a new landfill footprint would be established on contiguous WM property north or west of the current landfill as part of the WCEC. Given the role of the existing Ottawa WMF within WM's business operations and for waste generators within the City of Ottawa, developing new landfill disposal capacity will allow WM to continue to provide disposal services and cost effective diversion services. The disposal capacity will be provided for those residual wastes remaining after both residential and IC&I diversion.

b) This alternative would meet WM's stated goal by continuing to provide waste disposal services to its customers and would be constructed and operated as an environmentally sound landfill. WM owns or has options to purchase the necessary contiguous property to construct new landfill disposal capacity and the required infrastructure for the new landfill is already in place or can be put in place in a cost-effective manner.

c) This alternative is consistent with responsible waste management strategies as it provides a local solution to waste management (no exporting).

3.4 Benefits of the Undertaking

The development of the new landfill footprint and other facilities at the WCEC addresses a variety of issues, including legislative and environmental considerations, and presents a range of benefits. The details associated with each of these issues and benefits are outlined in the following subsections.

3.4.1 Legislative Considerations

The practice of exporting waste from Ontario to other jurisdictions, namely the United States, and in particular the States of Michigan and New York, has become increasingly challenging over the past several years. For example, in reaction to strong public opposition to the cross-border shipment of waste, both the State of Michigan and the U.S. federal government have passed several bills making it more difficult to export waste from Ontario into Michigan (i.e., waste can be refused if it contains beverage containers, yard waste, tires, or other prohibited materials)[6,7]. The State of Michigan also has emergency powers to close its border to waste in

6. *In March 2006, the State of Michigan passed House Bill 5176 that would ban the disposal of Canadian waste in Michigan landfills, providing that federal enabling legislation was passed. The House Bill (2491) that would enable Michigan to ban Canadian waste and another Bill (5441) that would levy a fee on waste trucks crossing the border were before the U.S. House of Representatives when the Ontario Minister of the Environment entered into an agreement with two Michigan Senators that defused the issue.*
7. *In August 2006, the Ontario Minister of Environment made a commitment to the Michigan senators promoting House Bills 2491 and 5441, that Ontario municipalities would reduce the amount of waste that they ship to Michigan by 20% by the end of 2007, with a further 20% reduction by the end of 2008, and that municipalities would eliminate altogether the cross-border shipments of municipally managed wastes by the end of 2010. In return, the Senators agreed not to pursue passage of the legislation that would allow Michigan to ban all Canadian waste. In order to meet the Minister's commitment to eliminate these cross-border shipments, the affected municipalities have taken a range of actions, including significant efforts to maximize waste diversion and minimize their disposal requirements. Some specific waste disposal actions taken include the City of Toronto purchasing the privately owned Green Lane Landfill, Region of Durham proceeding with plans to develop a waste to energy facility and the Region of Peel entering into a long term agreement for private waste disposal capacity in Ontario. It is not known if all Ontario municipalities are in compliance with the commitment. It should be noted that IC&I generated wastes were not included as part of this commitment.*

the event of imminent health, safety, security or environmental threats (i.e., waste from Ontario is subject to inspections and fines for violations have increased).

The cross border shipment of waste from Canada into the U.S. for disposal continues to be an issue. In April 2011, the 'Stop Canadian Trash Act' was introduced in the United States Senate. The purpose of the Bill is to establish customs user fees for commercial trucks transporting foreign municipal solid waste, including IC&I waste. A fee of $500 per truck fee would be applied to cover the Department of Homeland Security inspection costs and would apply to border crossings for all U.S. states. On May 18, 2011 the Act was referred to Senate Committee on Finance by Unanimous Contest.

In April 2011, a second bill was introduced in the U.S. Senate aimed at guaranteeing the efficacy of equipment and procedures employed by the Department of Homeland Security's Customs and Border Protection branch for identifying chemical, biological, radiological and nuclear weapons in municipal solid waste. This Bill would require that the methods and technology used to inspect waste vehicles are as effective as the methods and technology used to inspect other commercial vehicles. Both of these Bills would result in additional costs and delay associated with cross border waste shipments, thus deterring the disposal of Canadian waste in the U.S and enforcing the need for local disposal capacity.

Environment Canada, under the Canadian Environmental Protection Act (CEPA), has long proposed a process for the control of transboundary movements of non-hazardous waste. This process would include prior informed consent involving a notification and permitting mechanism through which the receiving country agrees in advance to any shipments. While the timing of any regulation under CEPA is unknown, it is believed that waste exports to the U.S. may be limited or restricted to some extent as a result of this consent process.

It is apparent that the shipment of waste for disposal outside of Ontario is fraught with uncertainty and risk. WM believes that the public interest is best served by providing local and secure disposal capacity for waste generators in Ottawa and surrounding communities.

3.4.2 Environmental Considerations

Waste management systems that involve long distance hauling are typically viewed as environmentally unsustainable since they deplete non-renewable resources and generate large quantities of Greenhouse Gases (GHG) that contribute to climate change. To assess the implication of this issue on the proposed undertaking, WM evaluated the potential impact on non-renewable resource consumption and GHG emissions of long-distance hauling relative to local disposal within the City of Ottawa.

WM assumed that a new landfill footprint at the WCEC facility would accept approximately 400,000 tonnes per year of solid non-hazardous waste from generators from within the City of Ottawa and the GNZ and that this would off-set a comparable volume of waste being hauled from the City of Ottawa and the GNZ to another landfill site located in New York.

WM estimated that the approximate distance from Ottawa to potential receiving landfills in New York is 400 kilometres (km) one way, or 800 km round-trip.

WM considered the GHG engine emissions to be carbon dioxide (CO_2); methane (CH_4); and, nitrous oxide (N_2O). Although CO_2 is the primary GHG emitted from truck engines, the contribution of CH_4 and N_2O can be more significant due to their high global warming potential.

WM assumed that long haul trucks used for cross-border waste hauling into New York have a 27 tonne carrying capacity. These trucks are defined by the U.S. Environmental Protection Agency and Environment Canada as Heavy Duty Diesel Vehicles, Class 8 (HDDV8B).

Based on this information, approximately 15,000 trips per year are required to haul 400,000 tonnes of waste, with a total travel distance of approximately 12 million km. Based upon a fuel economy of 2.6 km per litre (L), a total of 4.6 million L of fuel would be consumed in hauling this waste.

For this analysis, emission factors for trucks were adopted from the National Inventory Report 1990 to 2009 – Greenhouse Gas Sources and Sinks in Canada (2011). In order to determine the equivalent CO_2 emissions, it is important to take into account the Global Warming Potential (GWP) for CO_2, CH_4, and N_2O. **Table 3-3** presents the total equivalent CO_2 emissions based on using 4.6 million L of fuel to haul 400,000 tonnes of waste per year from the Ottawa area to New York State.

Table 3-2 GHG Emissions from Long Haul of Waste

	Emissions (g/L)	Total Emissions (tonnes)	Global Warming Potential (GWP)	GHG (tonnes/year)
CO_2	2663	12,250	1	12,250
CH_4	0.14	0.64	21	13
N_2O	0.082	0.38	310	117
Equivalent CO_2				12,380

Based upon the above, WM predicted that disposal of approximately 400,000 tonnes per year of solid non-hazardous waste at a new landfill footprint located within the City of Ottawa would generate roughly 12,380 tonnes of GHGs (CO_2 equivalent) less than disposal of the same amount at a landfill in New York, assuming a round-trip hauling distance of approximately

800 km. By comparison, this would be equivalent to the emissions from over 2,400 passenger vehicles on the road annually or the generation of electricity consumed by over 1,500 homes annually.

3.4.3 Diversion Considerations

The Province of Ontario and the City of Ottawa have taken specific policy positions in support of waste diversion. The attainment of these policies is dependent upon government and industry actions and the development of necessary diversion infrastructure and sustainable markets for diverted materials. As mentioned previously, the City of Ottawa released "Diversion 2015: An IC&I 3R Waste Diversion Strategy for Ottawa" in 2009, which outlines the goal of increasing IC&I waste diversion from the current 17% to achieving 60% by 2015. Achieving this in under six years would be a significant achievement which would require a fundamental change in the way businesses in Ottawa manage their wastes. Also mentioned previously, the MOE's October 2008 "Toward a Zero Waste Future: Review of Ontario's Waste Diversion Act, 2002" discussion paper outlines how the concepts of zero waste and EPR can be jointly utilized to eliminate waste. Currently three EPR programs are overseen by the Provincial government, each with the goal of maximizing waste diversion and moving towards a zero waste future. Given the current level of waste diversion in Ontario, experience suggests an EPR type of approach will be essential to achieving Ontario's 60% waste diversion.

Many waste generators have, with WM's assistance, implemented diversion programs at their places of business where the volume of potentially recyclable materials justifies the separate collection and recycling of commodities such as cardboard, metals, plastics, aggregate, wood, etc. As the Province and City implement new regulations and programs in the coming years to increase the diversion rates to meet their stated target of 60%, WM will continue to provide the services necessary to enable its customers to meet these new challenges. WM's existing Ottawa WMF received only residual waste streams (i.e., post diversion at the source). WM envisions that the proposed WCEC facility will play an important role in supporting the Province's and City's waste diversion initiatives by providing diversion as well as disposal facilities. The waste diversion facilities proposed for the WCEC, directed to general commercial recyclables and C&D materials, will be built at the same time as the other project components (as indicated in commitments made in the ToR) and will be able to process more than 75,000 tonnes of material available for processing.

3.4.4 Socio-Economic Considerations

The WCEC builds on WM's long-standing commitment of being an engaged and responsible corporate citizen to create significant community and economic benefits. These benefits include:

Economic Development..... The WCEC will create up to 75 new green jobs in waste diversion, disposal and green energy facilities. Economic benefits will also extend to the larger community through community host agreements, as well as a community trust fund or similar device to support local projects. In addition, revenue opportunities will be created from waste diversion activities for local processors and downstream activities related to recycling and re-use;

Price Stability..... The WCEC will provide disposal capacity for local waste generators that is less influenced by factors beyond the control of WM, for example the cost factors associated with long-haul disposal options, such as fluctuations in fuel cost, variations in fleet infrastructure, and interruptions to service provision related to border security;

Wildlife Habitat ..... An on-site wildlife habitat centre has been opened to the public and will continue to serve as an education centre for the community. The current Ottawa WMF has received international recognition for its contribution to wildlife habitat conservation in the form of a wildlife habitat council (WHC) certification in 2006; and,

Host Community Agreement .... WM has committed to a Property Value Protection Plan and an Odour Enforcement Plan, and has also committed to provide additional benefits to the community, whether through the use of a community trust fund, an agreement with the City or otherwise.

3.5 Conclusion

Accounting for future population growth, waste generation, waste diversion, and its business continuance in the City of Ottawa and surrounding area, including the Ottawa WMF, WM has concluded that there is an ongoing need for residual waste disposal capacity to serve for generators within the City of Ottawa and the surrounding municipalities, including the GNZ.

While WM is aware of the uncertainty associated with a number of factors that may affect the volume of disposal capacity required, as described above, WM believes that there is a sustainable market opportunity for the company to provide up to 6.5 million m^3 of landfill disposal capacity at the WCEC.