DILLON CONSULTING

Ridge Landfill Expansion Environmental Assessment

Supporting Document #1

Purpose/Opportunity Assessment

Ridge Landfill Expansion Terms of Reference

December 2017

WASTE CONNECTIONS OF CANADA

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1.0 Introduction

The Ridge Landfill (the Ridge) has been serving Ontario since 1966. The site is located near Blenheim, Ontario and is owned and operated by Waste Connections of Canada Inc. (Waste Connections). An Environmental Assessment (EA) was completed in 1997 by the previous owner (BFI Canada Inc.) to expand the Ridge to provide additional waste disposal capacity over a 20-year period. The EA was approved in 1998 and the fill area was expanded in 2000. An Environmental Screening Process was completed in 2012 to allow an increase to the annual tonnage received at the Ridge from 899,000 to 1,300,000 tonnes (to meet the demand for Industrial, Commercial and Institutional (IC&I) waste disposal services from Waste Connections' customers), but the approved site capacity remained the same. As discussed herein, the Ridge is an integral part of the IC&I waste management infrastructure for southern and central Ontario.

The Ridge currently has a service area consisting of all Ontario for IC&I waste. The Ridge service area for residential waste includes five municipal jurisdictions: the Municipality of Chatham-Kent (Chatham-Kent) as well as the Counties of Essex, Lambton, Middlesex and Elgin.

While the Ridge is approved to receive IC&I waste from anywhere in Ontario, almost all (approximately 98%) of the 1.3 million tonnes of residual waste disposed of annually at the site comes from IC&I generators in southern and central Ontario. The remaining 2% is residential waste from the landfill's host municipality of Chatham-Kent. Given that the Ridge is accepting waste at its maximum permitted annual fill rate, the site is expected to reach its approved capacity in 2021.

The purpose of this Supporting Document #1 (SD #1) is to illustrate the opportunity for Waste Connections to continue operating the Ridge Landfill beyond 2021. If the Ridge were able to expand, it would be able to support the increased demand from a growing population and economy. If the Ridge were not able to expand, it would create a problem for Waste Connections' customers, both public and private.

Waste Connections, in this proposed expansion of the Ridge, is prepared to reduce the service area to a more regional approach to include IC&I waste from central and southern Ontario (***Figure 1***) and residential waste from the Chatham-Kent (herein referred to as the "service area"). IC&I waste generators in this area are located within an economically competitive transportation distance of the Ridge. Waste Connections is and has been Chatham-Kent's primary solid waste service provider for many years. Waste Connections currently provides all residential waste collection and disposal services to Chatham-Kent. Residential residual waste disposal volumes from Chatham-Kent at the Ridge are in the range of 30,000 tonnes annually.

RIDGE LANDFILL

FIGURE 1
IC&I SERVICE AREA OF THE RIDGE

Service Area

1:2,100,000

0 25 50 100 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: BV
MAP PROJECTION: NAD 1983 CSRS Ontario MNR Lambert

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FILE LOCATION: I:\GIS\141382 - Ridge Landfill\Mapping\Figure 1 Proposed Service Areas of the Ridge.mxd

This purpose/opportunity assessment was completed in four steps:

- ***Step 1*** (***Section 1.0***) – Analyse and describe Waste Connections' waste management business and operations tied to the Ridge.
- ***Step 2 (Section 2.0)*** – Project future potential quantities of IC&I waste to be generated, diverted and disposed respectively over a 20-year planning period in southern and central Ontario – the service area for the Ridge post 2021. The base projections in this SD #1 assume that diversion of IC&I waste will significantly increase to meet the Ministry of Environment and Climate Change (MOECC's) ambitious new diversion targets for the province (30% by 2020, 50% by 2030 and 80% by 2050) as proposed in the *Strategy for a Waste-Free Ontario* (2017).
- ***Step 3*** (***Section 3.0***) – Estimate remaining approved disposal capacity at the existing major disposal facilities in the service area that currently service the IC&I waste sector based on their approved annual waste disposal rates. Then estimate the additional disposal capacity for major IC&I disposal facilities (existing and potential new) in the service area that are currently in various stages of seeking approval under the Ontario EA Act.
- ***Step 4*** (***Section 4.0***) – Identify and outline the opportunity for the Ridge and Waste Connections to continue to provide residual waste disposal capacity for IC&I waste generators over the 20-year planning period (2022 – 2041) and illustrate the problem that would be created if the Ridge capacity is not expanded post 2021.

In June 2016, the Ontario government passed Bill 151, *Waste-Free Ontario Act.* As noted above, in March 2017 the MOECC released the final *Strategy for a Waste-Free Ontario* which outlines actions to be implemented from 2017 to 2025. The *Waste-Free Ontario Act* seeks to change the way in which products are created and managed at end of life. Key elements include an increased focus on reducing the quantity of organic waste disposed, the banning of some materials from disposal (e.g., food waste, recyclables), amending the 3Rs Regulations (3Rs stands for Reduce, Reuse, Recycle) to increase resource recovery across all sectors, and ensuring landfills are planned and managed in terms of need and greenhouse gas (GHG) emissions. As noted above, the analysis in this SD #1 has assumed that the diversion goals in the *Strategy for a Waste-Free Ontario* are in fact met.

Currently, there is a reliance on the export of several million tonnes per year of waste across an international border for disposal. Ontario has relied on this practice for many years and given past potential United States (U.S.) state actions and current North American Free Trade Agreement (NAFTA) negotiations, it might be risky to expect this option to exist in perpetuity. Ontario has already been forced in 2010 to curb the export of residential waste to Michigan from the Greater Toronto Area (GTA) as a result of political pressure in Michigan and the border was temporarily shut down entirely in the aftermath of the September 11, 2001 U.S. terrorist attacks. There can be no assurance that the landfills in Michigan and New York State will continue to be available in the future for Ontario waste. In addition, long distance transportation of over 3 million tonnes of Ontario IC&I waste to Michigan and New York State disposal facilities each year does not align with the Climate Change Action Plan contributing additional GHG emissions to the atmosphere.

1.1 Waste Connections' Waste Collection, Recycling, Transfer and Disposal Business in Southern and Central Ontario

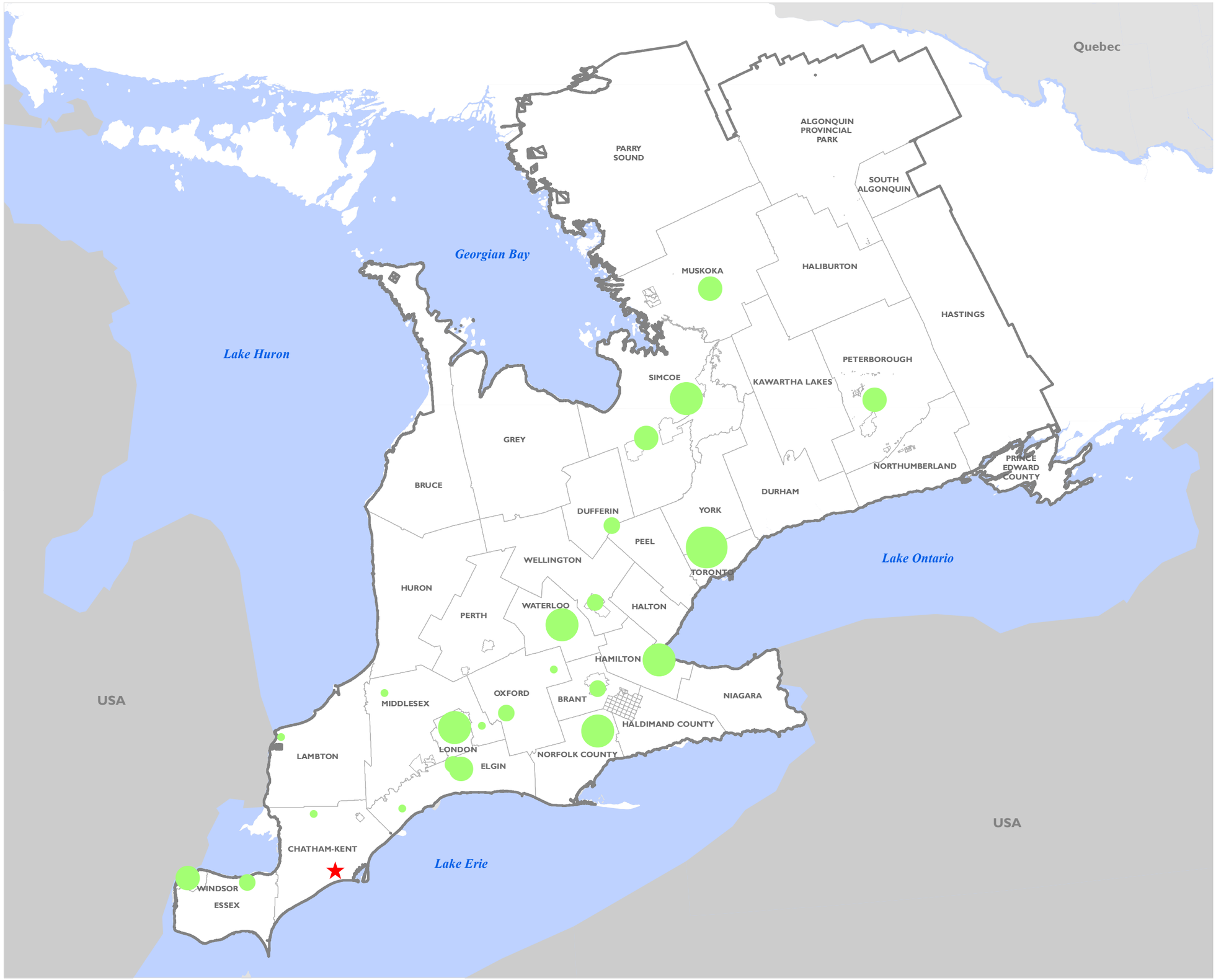
Waste Connections operates the largest integrated IC&I waste collection, recycling, transfer and disposal business in Ontario. Our collection fleet of almost 800 vehicles (many of them running on compressed natural gas) currently service almost 50,000 waste and recycling collection containers and more than 30,000 IC&I customers in the service area. Volumes of IC&I recycling and residual waste collected by our fleet have been growing every year in the service area.

Figure 2 depicts the typical distribution within the service area of IC&I waste delivered to the Ridge in a given year. It is noted that the waste centroids are generally consolidated along the Highway 400/401/Golden Horseshoe corridors, which would be expected given the concentration of population and associated commercial enterprises along those corridors.

Figure 3 depicts the Waste Connections collection, processing and transfer station network serviced by the Ridge in the service area. As depicted, Waste Connections currently owns and operates 17 collection, processing and transfer facilities servicing IC&I generators in the service area. Detailed discussion on Waste Connections' existing waste diversion programs can be found in **Attachment A** of **Supporting Document #2** (SD #2) to this Terms of Reference (ToR).

It should be noted, when referring to the Waste Connections – Ridge network, that its core service area, Central and Southwest Ontario region, including the GTA, is forecast by the Ministry of Finance to grow in population by over 3.8 million people by 2041. According to the Ontario Economic Outlook and Fiscal Review, the Ontario economy has grown faster than that of Canada and those of all other G7 nations for the past three years. With these two factors combined, the Ridge is well positioned to maintain its annual waste intake rate of 1.3 million tonnes and continue to support the growing Ontario population and economy.

Figure 4 depicts the locations of the current major disposal facilities (both municipal and private sites) within the service area that are permitted to manage IC&I waste. The major competitors to the Ridge are private sector disposal sites including the Walker South Landfill, Waste Management (WM) Twin Creeks, Terrapure Stoney Creek and the Emerald Energy from Waste (EfW) facility. It is noted that the Emerald EfW facility in Brampton specializes in a somewhat different and sometimes higher disposal fee market where customers require assured destruction of special waste streams such as international waste from Toronto Pearson International Airport rather than regular IC&I waste streams, which are the core business of the other private sector disposal sites. In addition, municipally-owned landfills are typically reserved or focused on residential waste from their own municipal jurisdiction.



RIDGE LANDFILL

FIGURE 2
CURRENT WASTE GENERATION CENTROIDS FOR THE RIDGE

Relative Quantity of Waste Received at Ridge Landfill

Ridge Landfill

Service Area

1:2,000,000

0 25 50 100 km

MAP DRAWING INFORMATION:
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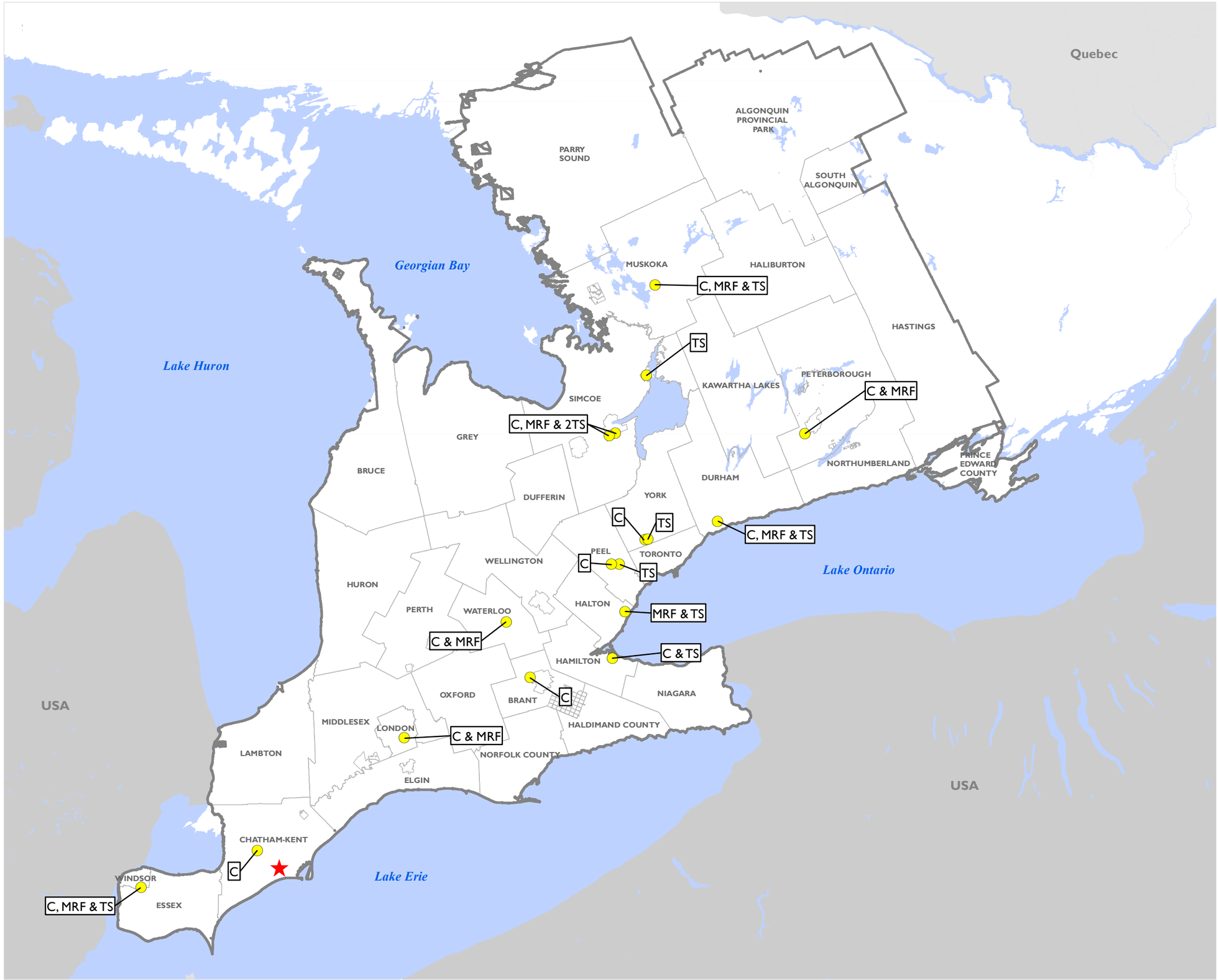
FILE LOCATION: I:\GIS\141382 - Ridge Landfill\Mapping\Figure 2 Current Waste Generation Centroids for the Ridge.mxd



RIDGE LANDFILL

FIGURE 3
WASTE CONNECTIONS COLLECTION, PROCESSING AND TRANSFER STATION NETWORK FOR THE RIDGE

- Waste Connection Facility
- Ridge Landfill
- Service Area

C: Collection
TS: Transfer Station
MRF: Materials Recovery Facility

1:2,000,000
0 25 50 100 km

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

MAP CREATED BY: GM
MAP CHECKED BY: BV
MAP PROJECTION: NAD 1983 CSRS Ontario MNR Lambert

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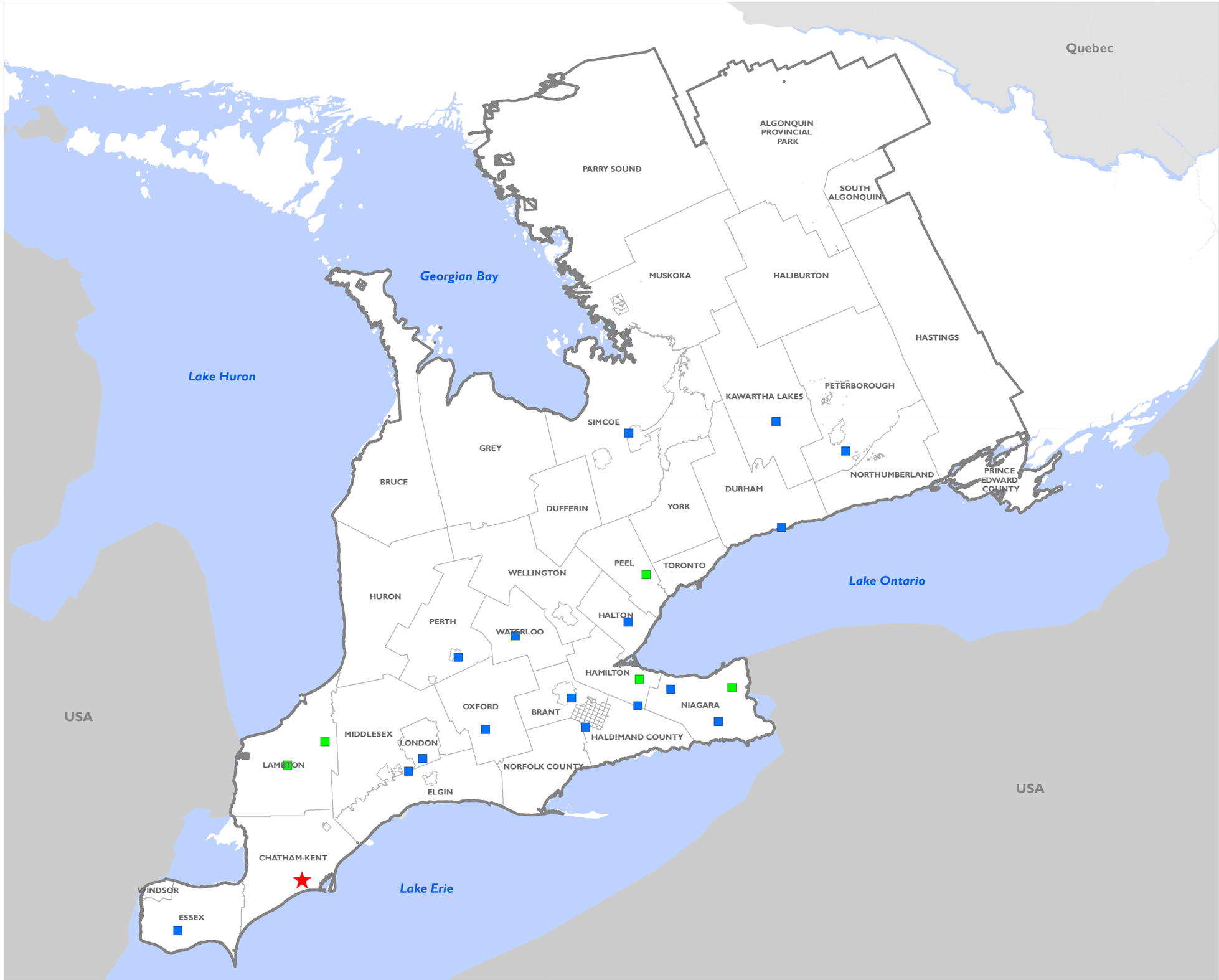
DATE: 2017-12-15

FILE LOCATION: I:\GIS\141382 - Ridge Landfill\Mapping\Figure 3 Waste Connections Collection, Processing and Transfer Station Network for the Ridge.mxd



RIDGE LANDFILL

FIGURE 4
MAJOR DISPOSAL FACILITIES
WITHIN THE RIDGE SERVICE AREA

- Ridge Landfill
- Private Sector Site
- Municipal Sector Site
- Service Area

1:2,000,000

0 25 50 100 km

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR

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FILE LOCATION: I:\GIS\141382 - Ridge Landfill\Mapping\Figure 4 Major Disposal Facilities Within the Ridge Service Area.mxd

While Waste Connections currently utilizes third party transfer stations for efficiency reasons (i.e., proximity to collection points) for some IC&I waste collected in the service area, the MOECC approved throughput capacity of our transfer stations in the service area is approximately 2,000,000 tonnes per year. Waste Connections is thus able to receive and transfer significantly more than the approved annual waste disposal rate of the Ridge through its own processing/transfer station network alone.

These processing/transfer stations are also utilized to support Waste Connections' waste diversion efforts. In the last five (5) years Waste Connections has been directly involved in the diversion of over 1,300,000 tonnes of materials from disposal in Ontario, of which just over 900,000 tonnes were diverted from within the service area (see SD #2, Attachment A). This tonnage is collected and bulked at Waste Connections' transfer stations and taken to processing facilities, or in the event that processing facilities are located in close proximity to a collection area, these materials are taken direct from the customer to the processor. Waste Connections also re-purposes in the order of 160,000 tonnes per year of auto fluff, wood chips, glass and asphalt for beneficial reuse in road and pad construction/maintenance applications at both the Ridge and the Navan landfills.

All waste received at these transfer stations is taken to the Ridge Landfill. In addition to waste transferred to the Ridge, Waste Connections collects some additional 396,000 tonnes per year in the service area. This waste goes to third-party transfer stations or other landfills that are closer and so more efficient to use in some collection areas.

As Waste Connections' business and the Ontario economy continued to expand, the Ridge was increasingly being forced to turn away waste on account of the annual waste disposal rate in its approval. As a result, an Environmental Screening Process was completed in 2012 to increase the annual waste disposal rate at the Ridge from 899,000 to 1.3 million tonnes per year. Since receiving approval, the Ridge has essentially been operating at this increased rate ever since. Even with an annual waste disposal rate of 1.3 million tonnes, Waste Connections typically finds itself having to reduce intake at the site towards the end of the year and redirect waste to other disposal facilities to ensure that the approved annual waste disposal rate is not exceeded. For example, in 2017, some 375,000 tonnes of Ontario IC&I waste will be disposed of at the Brent Run Landfill in Michigan.

The Ridge is a key and essential component of the integrated IC&I waste collection, recycling, transfer and residuals disposal business developed by Waste Connections over decades in the service area. More than 30,000 IC&I waste generators in southern and central Ontario rely each year on Waste Connections to provide turnkey service (collection, recycling, transportation and disposal) for their residual waste with the Ridge providing safe and proper disposal of that waste. Waste Connections is also committed to increasing waste diversion efforts consistent with the *Strategy for a Waste-Free Ontario* as discussed in SD #2, Attachment A.

At 1.3 million tonnes per year, the Ridge currently disposes of approximately 25% of the IC&I waste generated in southern and central Ontario each year. This makes the Ridge a critical component of the Ontario IC&I waste management system and a vital piece of infrastructure to the over 100,000 people living in Chatham-Kent.

Waste Connections' operations in the service area have a total annual economic impact in Ontario of well over $200 million per year, including third party suppliers of various goods and services to Waste Connections and direct employment income for its over 1000 employees in the service area alone.

The Ridge has also provided and continues to provide significant benefits to its host municipality of Chatham-Kent. These include:

- An annual royalty payment to Chatham-Kent. In 2016, this amounted to $2.6 million; since 2000 Waste Connections has contributed over $22.1 million to the municipality pursuant to its host community agreement.
- Significant financial contributions to the Ridge Landfill Trust based on the volume of waste the Ridge receives each year. In 2016, this was approximately $1.1 million. These monies are allocated by a group of community leaders to projects and organizations that benefit the local community. In the past, the Trust has provided funding for the building of a Community Centre Park with the splash pad for children, the development of a new senior's centre and a youth drop in centre in downtown Blenheim. The Trust has also supported a handi-bus for seniors' mobility and the development and operation of a baseball field in Charing Cross, among other programs.
- Waste Connections provides a significant incentive for the Chatham-Kent to reduce the amount of waste residuals delivered to the Ridge. The greater the tonnage diverted the more the municipality receives in additional funding. On average, Chatham-Kent receives over $1.2 million per year in waste reduction incentives.
- In total, these benefits to the Chatham-Kent currently amount to almost $5 million per year.
- The Ridge also generates direct and indirect benefits; salaries, goods and services, services purchased, local roads maintenance etc., which accounts for a minimum $9 million per year.

2.0 IC&I Waste Forecasts

The second step in the purpose/opportunity assessment involved predicting the amount of IC&I residual waste that would be generated in the service area over the 20-year planning period assuming the diversion targets in the *Strategy for a Waste Free Ontario* are in fact met. By extension, this work determined what the annual waste disposal rates would need to be from 2022 to 2041.

2.1 Quantities of Provincial Waste Generation, Diversion and Disposal

Current estimates of the quantity of waste generated, diverted and sent to disposal by the IC&I sector in Ontario were based on Statistics Canada's *Waste Management Industry Survey* which presents data every two years up to the most recent data set in 2014. ***Table 1*** below provides the total and per-capita amounts of waste generated, disposed, and diverted from disposal in Ontario between 2006 and 2014, broken down between the residential and non-residential sectors (the non-residential (IC&I) sector is highlighted in **red**). IC&I waste diverted increased slightly and waste residuals disposed decreased slightly, however total waste generated stayed relatively the same.

TABLE 1: WASTE QUANTITY ESTIMATES IN ONTARIO, 2006-2014 (STATISTICS CANADA)[1]

Ontario	2006	2008	2010	2012	2014
Total Waste Generated (tonnes)	**12,107,315**	**12,413,389**	**11,996,462**	**12,038,044**	**12,209,956**
Total waste generation per capita (kg)	956	960	907	898	892
Total Waste Disposed (tonnes)	**9,710,459**	**9,631,559**	**9,247,415**	**9,208,839**	**9,165,299**
Waste disposal per capita (kg)	767	745	699	687	670
Non-residential waste disposed (tonnes)	**6,298,818**	**6,400,160**	**6,043,151**	**5,820,338**	**5,674,507**
Residential waste disposed (tonnes)	3,411,642	3,231,399	3,204,263	3,388,501	3,490,792
Total Waste Diverted (tonnes)	**2,396,856**	**2,781,830**	**2,749,047**	**2,829,205**	**3,044,657**
Waste diverted per capita (kg)	189	215	208	211	222
Non-residential waste diverted (tonnes)	**885,389**	**932,001**	**752,990**	**882,434**	**993,582**
Non-residential diversion rate	**12%**	**13%**	**11%**	**13%**	**15%**
Residential waste diverted (tonnes)	1,511,467	1,849,828	1,996,057	1,946,771	2,051,075
Residential diversion rate	31%	36%	38%	37%	37%
Total Diversion Rate	**20%**	**22%**	**23%**	**24%**	**25%**

[1] Statistics Canada Website, Pollution and Waste CANSIM Tables 153-0041 and 153-0042. Accessed August 2017.

Waste Generation

Per-employee waste generation rates from the Statistics Canada work were applied to employment projectiop11ns to predict future IC&I waste generation rates prior to estimating diversion rates over the planning period (1,029 kg in 2010).

Waste Diversion

Statistics Canada data shows that IC&I diversion rates have increased from 12% in 2006 to 15% in 2014. The projections in this SD #1used the Statistics Canada diversion rates for IC&I as a starting point, increasing the diversion rates in line with the MOECC 2017 Strategy for a Waste-Free Ontario provincial diversion targets.

Waste Disposal

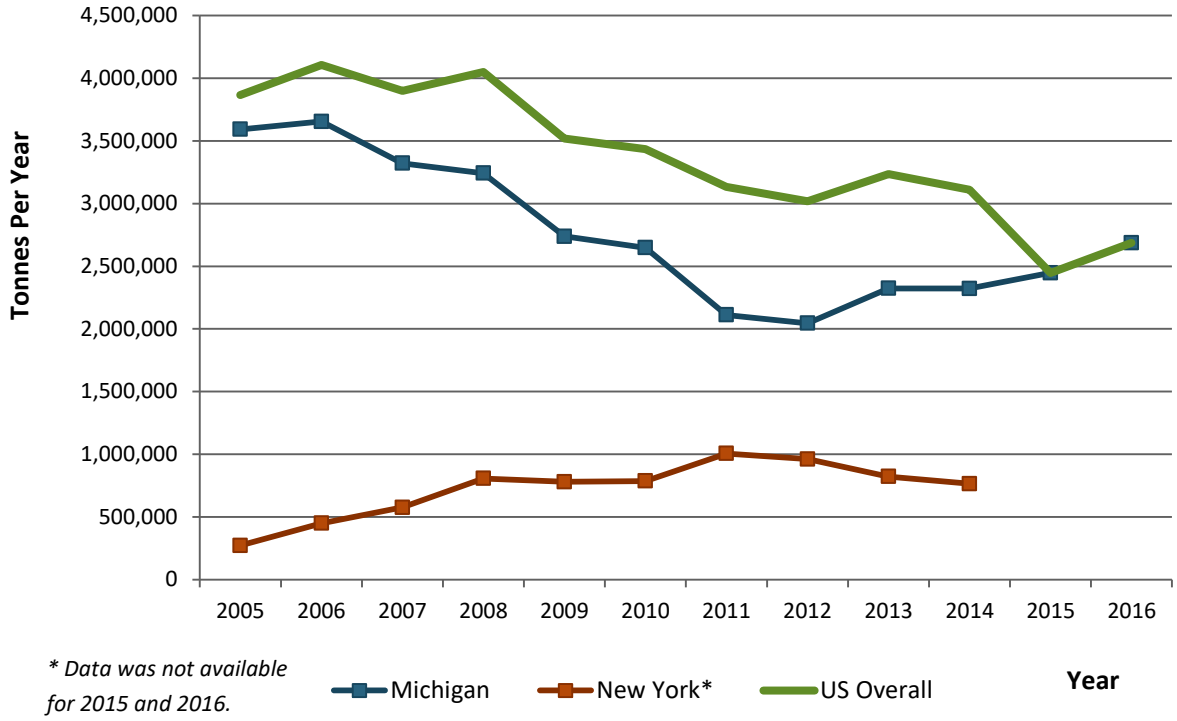
As discussed above, Ontario IC&I waste from the service area is currently sent primarily to three private sector landfills in Ontario as well as exported to the U.S. Smaller amounts of IC&I waste are also disposed at municipal sites, although these amounts are minor when compared to the amounts of residential waste disposed at these municipal sites. While there has been an understanding between Ontario and Michigan since 2010 to halt the export of residential waste from the GTA to that state, IC&I waste was not included. Over 3 million tonnes of Ontario IC&I waste continues to be sent for disposal to Michigan and New York State each year.

It is estimated that Ontario waste exports accounted for 16.5% of all waste sent to landfill in Michigan in 2014[2]. In 2014, Ontario exported approximately 2.4 million tonnes of waste to 11 landfills in Michigan; this represents approximately 26% of the waste sent to landfill in the province. In comparison, Ontario exported approximately one million tonnes of waste to disposal facilities in New York in the same year (approximately 9% of the waste sent to disposal in Ontario)[3]. In other words, a quantity equal to over one third of the waste disposed in Ontario that year was exported for disposal to those two states.

Figure 5 shows the consolidated quantities of waste exported from Ontario to Michigan and New York State for disposal between 2005 and 2016. It is noted that data from New York State has not been released for 2015 and 2016 at the time of this report.

[2] Department of Environmental Quality, Michigan website. Annual Reports of Solid Waste Landfilled in Michigan (FY 2016). Accessed on November 2017.
[3] Information received via email through Ontario Waste Management Association from the Department of Environmental Conservation, New York State.

FIGURE 5: WASTE EXPORTED FROM ONTARIO TO MICHIGAN AND NEW YORK (2005 - 2016*)



2.2 Waste Generation, Diversion and Disposal Projections for Planning Period

For the IC&I waste generation projections in this analysis, recent employment data (2010 to 2014) for Ontario was obtained from Statistics Canada. Projected annual growth rates for employment were taken from the Ontario Ministry of Finance report titled *Ontario's Long-Term Report on the Economy*[4]. With respect to the service area for the Ridge (i.e., southern and central Ontario), the population projection data identified that almost 83% of Ontario's population will live in this area by the end of the planning period. This allocation was also applied to the employment data, with the result that over the planning period employment will grow from 81% to 83% of the Ontario total in the service area.

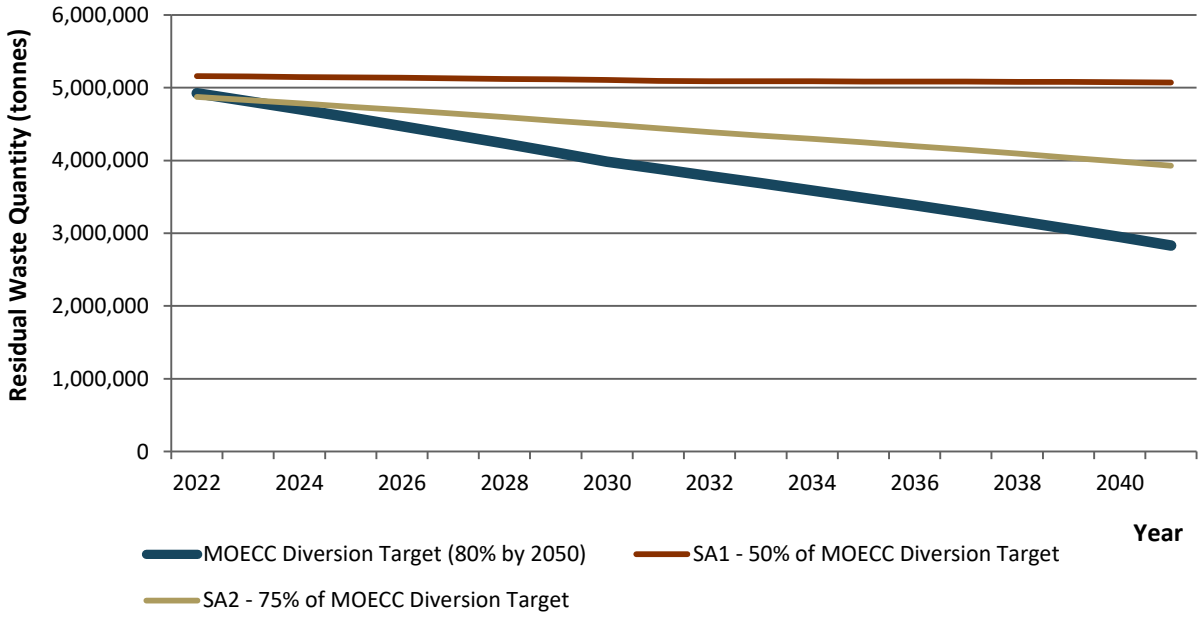
In order to forecast the residual IC&I waste disposal requirement/opportunity in the service area, the new Waste-Free Ontario Strategy diversion targets of 30% by 2020, 50% by 2030 and 80% by 2050 for both residential and IC&I waste were used as a base case. The population and employment projections were completed initially for all of Ontario in order to estimate the necessary diversion rates for the residential and IC&I sectors to achieve the province-wide diversion targets. The diversion rates were then applied to the employment projections to estimate the quantity of IC&I residual waste remaining in

[4] Employment data was obtained from the Ministry of Finance's report *Ontario's Long-Term Report on the Economy (2014-2035)*, 2014.

the service area. Under this scenario, the quantity of residual IC&I waste requiring disposal would decrease from 4.9 million tonnes in 2022 to 2.8 million tonnes in 2041 as diversion rates increase.

In order to provide a complete picture given the many unknowns associated with implementation of the 2017 MOECC Waste-Free Strategy, a sensitivity analysis (SA) was also completed to estimate the IC&I residual waste remaining under two other scenarios: SA 1) the IC&I sector achieves 50% of the MOECC's diversion targets (i.e., 40% by 2050) and SA 2) the IC&I sector achieves 75% of the MOECC's diversion targets (i.e., 60% by 2050). ***Figure 6*** shows the projected amount of residual IC&I waste requiring disposal under the three scenarios during the 20 year planning period with supporting data provided in ***Attachment A***. The base case scenario was carried forward in the analysis.

FIGURE 6: RESIDUAL IC&I WASTE REMAINING FOR DISPOSAL IN THE SERVICE AREA (2022-2041)



3.0 Major IC&I Disposal Facilities

3.1 Existing Waste Disposal Facilities

The disposal facilities in the service area that service the IC&I sector in southern and central Ontario were identified and their combined remaining site capacity estimated. The information on approved annual fill rates, last reporting year (2014, 2015) and remaining capacity in the last reporting year was obtained from the MOECC in December 2017[5]. Using this information, the number of years of capacity remaining, based on the approved annual fill rates, was estimated. ***Attachment B*** contains the data provided by the MOECC and the approach taken to estimate the number of years of remaining capacity for the existing waste disposal facilities. The disposal facilities that are estimated to have capacity available during the 20-year planning period and are included in the analysis are shown in ***Table 2***.

TABLE 2: DISPOSAL FACILITIES WITHIN THE SERVICE AREA

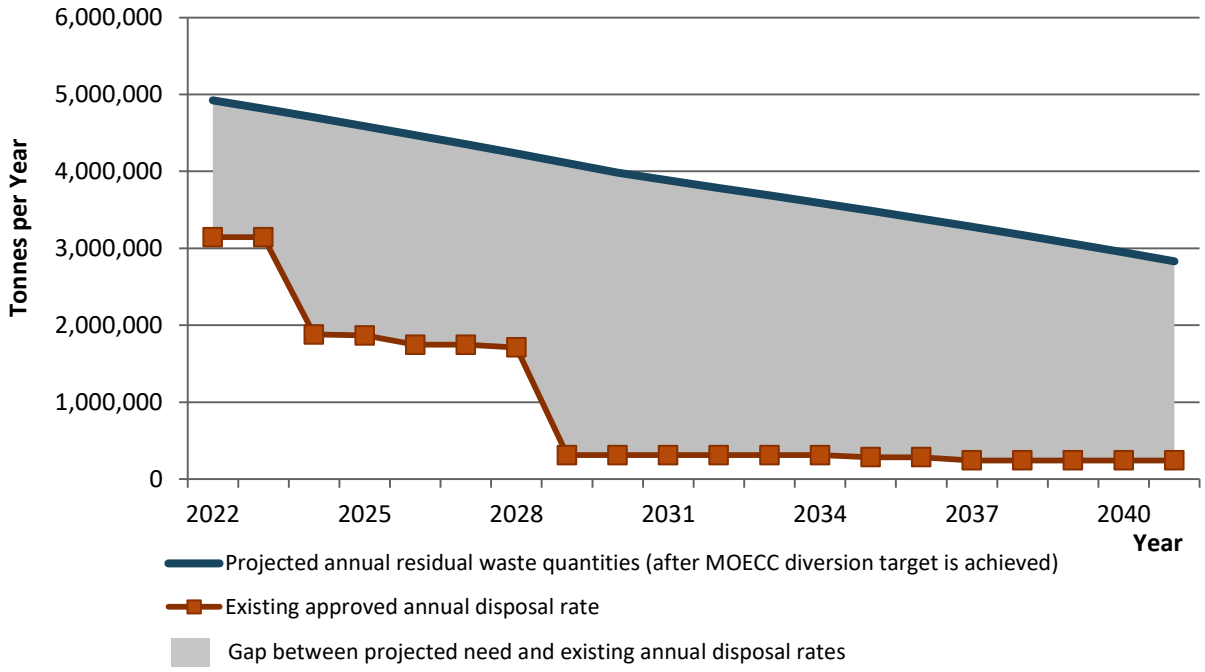
Private Sector	Municipal Sector
Emerald Energy from Waste Inc.	Barrie Landfill (Sandy Hollow)
Terrapure – Stoney Creek Landfill	Bensfort Road – Peterborough
Walker Environmental – South Landfill	Durham York Energy Centre
Waste Management – Twin Creeks	Essex-Windsor Solid Waste Authority Regional Landfill
Waste Connections – Ridge Landfill	Glanbrook – Hamilton
	Green Lane Landfill – Toronto
	Halton Regional Landfill
	Humberstone – Niagara Region
	Lindsay-Ops Landfill
	Mohawk Street – Brantford
	Regional Road 12 – Niagara
	Salford – Oxford County
	Stratford
	W12A – London
	Waterloo Landfill

Municipal disposal facilities typically reserve capacity to meet future residential waste disposal needs and discourage IC&I sector waste through disincentives such as higher tipping fees. Several of the large municipal landfill sites were contacted to ask what proportion of IC&I waste was landfilled at their sites. Using a weighted average based on reported fill rates, an average percentage of IC&I waste landfilled at municipal sites was estimated to be 15%. This percentage was applied to the approved fill rates for all

[5] C. Lee (personal communication, December 6, 2017; attached as "DisposalFacilities-SouthCentral.xlsx").

municipal sites and included in the available capacity during the planning period. It was assumed that all private sector disposal sites would reserve 100% of their capacity for IC&I waste to be conservative although it is known that some of these sites do in fact receive residential waste. ***Figure 7*** illustrates the currently approved annual disposal rates for existing facilities (combined) that receive IC&I waste in the service area along with the projected residual waste quantities that will be generated by the IC&I sector from 2022 to 2041. It is noted that the residual waste quantities assume that the IC&I sector has fully achieved the MOECC's diversion targets as outlined in the *Strategy for a Waste-Free Ontario*.

FIGURE 7: PROJECTED POST-DIVERSION RESIDUAL WASTE DISPOSAL NEED AND EXISTING APPROVED ANNUAL DISPOSAL RATES (2022-2041)



Using approved annual waste disposal rates to project future available waste disposal rates, it is estimated that the currently approved available disposal rate for IC&I waste will decrease from approximately 3.1 million tonnes per year in 2022 to under 311,000 tonnes per year in 2029 and continue at that rate to the end of the planning period.

3.2 Proposed Waste Disposal Facilities (New and Expanded)

There are three EAs currently in process for new or expanded landfill capacity that can receive IC&I waste (in addition to the Ridge Landfill expansion) in the service area as listed in ***Table 3*** below.

TABLE 3: PROPOSED ANNUAL DISPOSAL RATE AND SITE LIFE IN SOUTHERN AND CENTRAL ONTARIO

Name of Facility	Type	Tonnes per Year (if approved)	Assumed Start Year	Assumed End Year
Walker Environmental – Southwestern Landfill	Greenfield site	850,000	2022	2042
Terrapure – Stoney Creek	Expansion	750,000	2022	2035
W12A – City of London	Expansion	650,000*	2026	2040

*The 5-year average of IC&I waste landfilled at W12A was 16% which equates to approximately 105,000 tonnes of the total approved annual waste disposal rate.

4.0 IC&I Waste Disposal Purpose/Opportunity

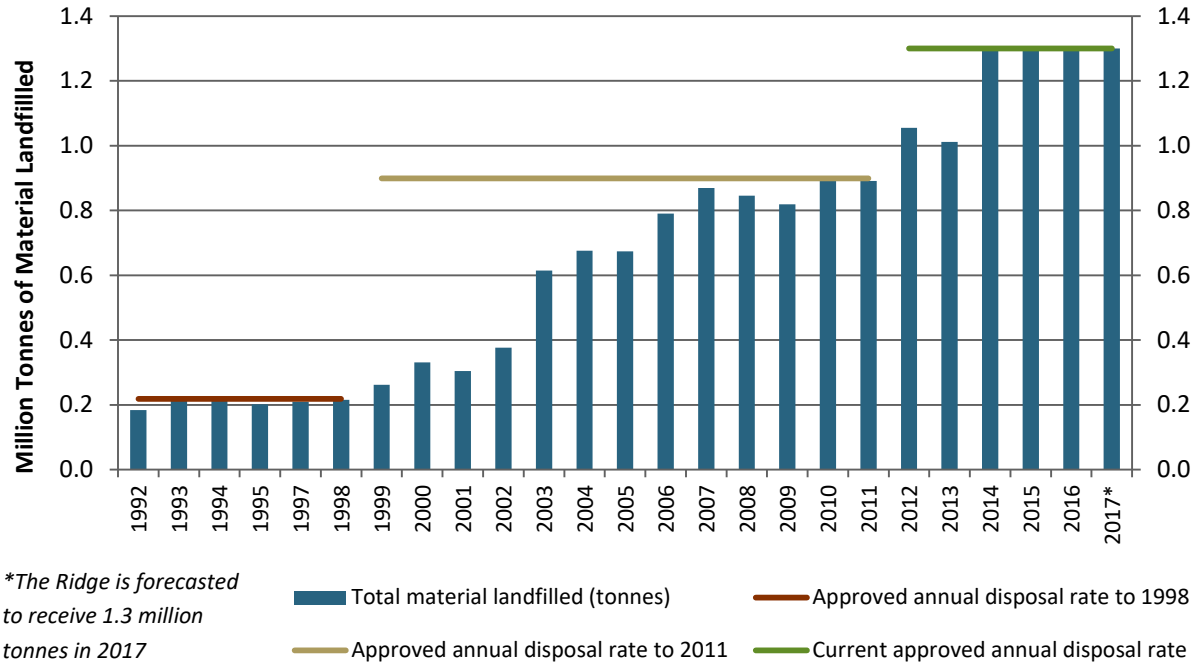
4.1 Rationale for Maintaining Approved Fill Rate

The Ridge has been in operation for over 50 years. For the first part of its life, the site was under the control of an individual owner. During that period, the Ridge functioned as a local disposal site for municipal and commercial waste.

In the early 1980s, the Ridge was acquired by Browning-Ferris Industries (BFI), whose primary business was providing integrated waste management services for IC&I waste. The Ridge began its transition at that time to what it is today - a site providing disposal services for residual IC&I waste collected and processed by an integrated waste management business, one that is now owned and operated by Waste Connections while retaining its long-standing history of providing vital waste disposal services for the host municipality of Chatham-Kent.

Figure 8 below sets out the history of annual waste receipts at the Ridge from 1992 to present. Up until 1999, the site operated on a relatively small scale, with annual waste limits of approximately 220,000 tonnes under the site's Certificate of Approval at that time. The Ridge was filled to its then-approved annual waste disposal rate throughout the 1990s.

FIGURE 8: HISTORICAL QUANTITIES LANDFILLED AT THE RIDGE (1992 – 2017*)



Following a successful EA approval in the late 1990s, the approved annual waste disposal rate of the site was increased to 899,000 tonnes per year. Annual waste receipts at the site grew steadily through the early 2000s so that the Ridge was again accepting waste at or about its approved annual waste disposal

rate each year by the end of the decade. By 2010, the Ridge was hitting its annual waste disposal rate and it became evident that a further increase in annual waste disposal rate at the site was required. In 2012, an Environmental Screening Process was completed to increase the annual waste disposal rate at the Ridge to 1.3 million tonnes per year. As ***Figure 8*** shows, in each year since 2013, the Ridge has effectively operated at its current approved annual disposal rate. The site is anticipated to again hit its annual waste disposal rate in 2017 for the fourth year in a row since receiving approval to operate at that fill rate.

In each year since 2013, Waste Connections has had to re-direct IC&I waste away from the Ridge in the fourth quarter of the year in order to avoid exceeding the site's annual waste disposal rate limit. Much of this waste is typically redirected across the border to Michigan and forms part of the over 2 million tonnes of Ontario IC&I waste disposed of in that state each year. As noted elsewhere in this SD #1, there is no assurance that the export of Ontario waste to the U.S. will continue as it does today during the 20-year planning period. The analysis in ***Section 4.0*** of this SD #1 demonstrates that even if the province achieves the new diversion targets set out in the MOECC's *Strategy for a Waste-Free Ontario,* the Ridge expansion will be required in order to manage the projected volume of residual IC&I wastes generated in the Ridge's service area during the 2022-2041 planning period examined in this EA.

Figure 8 shows that the Ridge has a consistent history of receiving all of the waste it is permitted to accept on an annual basis. On each of the two occasions in the last 20 years when its approved annual capacity has been increased after the EA Act Approval and completion of the Environmental Screening Process, annual waste receipts at the Ridge have quickly increased to the newly approved limits which demonstrates the competitive nature of the Ridge. As noted above and discussed further below, in recent years the company in fact has had to redirect waste that could otherwise have been disposed of at the Ridge in order to maintain compliance with the site's permitted annual capacity limits. With a growing population and economy, this will only continue.

Much of this waste is redirected across the US border to the Waste Connections facility, Brent Run Landfill in Michigan. In 2017, for example, some 375,000 tonnes of Ontario IC&I waste will be disposed of at the Brent Run Landfill. This waste could have been disposed of at the Ridge if it weren't for the current annual waste disposal rate restrictions at that site.

As discussed elsewhere in this SD#1, the Ridge disposes of a significant proportion (over 25%) of the IC&I waste generated annually in southern and central Ontario. The company has established a large and complex integrated collection, processing, transfer and disposal business in this area comprising some 18 separate facilities (including the Ridge) and over 50,000 containers.

The IC&I waste collection, processing and disposal business in Ontario typically operates on relatively short term contracts and is intensely competitive, to the benefit of the IC&I waste generators and the Ontario economy. Waste Connections employs a dedicated team of sales and marketing specialists, whose job it is to identify and secure new customers and retain existing ones. Service provider decisions by IC&I waste generator customers are typically and primarily price and service driven. Indicative of the fact that Waste Connections is highly service driven is its disposal of over 25% of waste in the service

area. Given that Waste Connections has already made the capital investments to build out its integrated facility network in the service area, the marginal cost in competing for customers' IC&I waste business is very low. If a service contract is lost, the company's sales force is generally easily able to replace that contract with a new customer using simple price competition. In this way, Waste Connections is able to maintain its market share in the service area. The mechanism of price competition, combined with the low marginal cost for the company to add new/replacement customers, results in a highly predictable share of the IC&I waste market in southern and central Ontario.

Waste Connections is therefore quite confident that there is a sustainable market opportunity to continue to dispose of 1.3 million tonnes of residual waste at the Ridge during the 2022-2041 planning period. The company has repeatedly over many years demonstrated its ability to maintain market share using its sales and marketing expertise and the extensive integrated network of facilities, equipment and personnel in the southern and central Ontario service area. In addition, there is a "flex" of some 375,000 tonnes of Ontario IC&I waste currently crossing the border to the Brent Run Landfill that could be repatriated to the Ridge as the success of commercial waste diversion initiatives ramps up over time in accordance with the *Strategy for a Waste-Free Ontario*.

While Waste Connections maintains this position they have also undertaken a third party, independent economic analysis to refute or support the position. This *Economic Analysis of the Market for IC&I Waste in Central and Southwestern Ontario* is provided in **Attachment C.**

4.2 Opportunity for the Ridge Landfill

Figure 9 illustrates the projected quantities of IC&I residual waste from the service area that will need to be managed through disposal under three scenarios: 1) assuming the new MOECC *Strategy for a Waste-Free Ontario* targets are achieved, 2) assuming that 75% of the MOECC diversion targets are achieved and 3) assuming that 50% of the MOECC diversion targets are achieved. The residual waste quantities are compared to the remaining annual waste disposal rate in the service area, the remaining plus planned facilities (as listed in ***Table 3***) excluding the Ridge and the remaining plus all planned facilities including the Ridge. With the addition of all proposed expanded or new facilities and MOECC's diversion targets are achieved, the estimated annual waste disposal rate rises to approximately 6 million tonnes in 2022, decreasing to 2.5 million tonnes in 2036 until the end of the planning period. Supporting data for ***Figure 9*** is provided in ***Attachment D***.

FIGURE 9: PROJECTED POST-DIVERSION IC&I RESIDUAL WASTE AND AVAILABLE PLUS PLANNED DISPOSAL RATES (2022-2041)

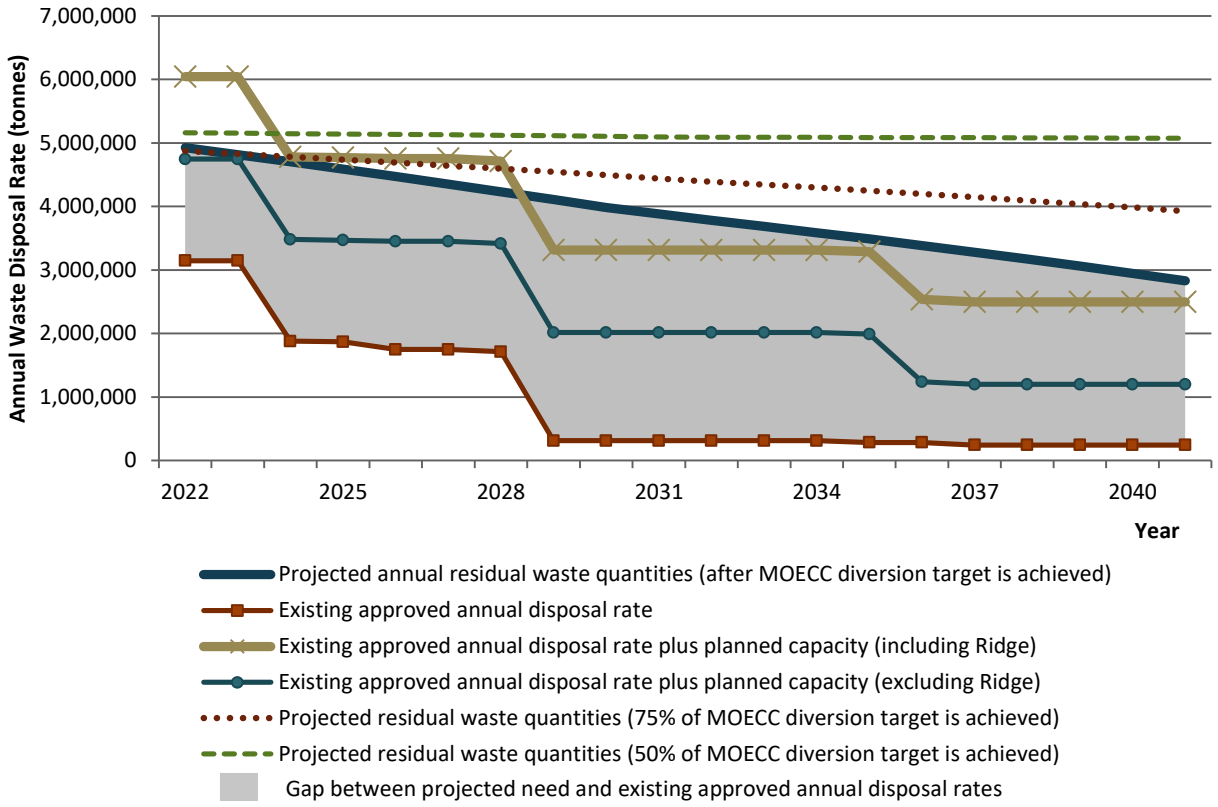


Figure 9 illustrates that with the Province meeting its diversion targets and all proposed facilities (including the Ridge) are approved and operational, there is an opportunity for the Ridge Landfill to continue to provide disposal capacity for IC&I waste for the service area over the 20-year planning period. It is noted that there is a surplus of capacity for the first two years of the 20-year planning period but that after 2024, the need closely matches the combined existing and proposed capacities in the service area. The need will only increase if the province is not successful in achieving the new diversion targets in the Strategy for a *Waste-Free Ontario*.

As outlined in ***Section 1.0*** of this SD #1, the Ridge is the endpoint of a large and complex network of almost 800 Waste Connections collection trucks, over 50,000 waste collection containers and 17 collection, processing and/or transfer facilities owned and operated by Waste Connections servicing over 30,000 customers and approximately 25% of the IC&I residual waste disposal market in southern and central Ontario. As noted, this is the largest integrated IC&I waste management business in southern and central Ontario.

Waste Connections (and its predecessors) has made very significant investments (in excess of a billion dollars) over many years in developing this integrated business. From a Waste Connections company-specific perspective, there is a clear opportunity as well as a desire, given the company's fiduciary

responsibilities to its stakeholders including its employees and shareholders, to continue to utilize these significant investments after 2021 to continue to service the IC&I waste market in southern and central Ontario. The company's assets and business, including the Ridge, have been carefully developed over decades and are, we submit, critical pieces of infrastructure for the Ontario economy.

Conversely, should the Ridge no longer be available to Waste Connections and its many thousands of IC&I waste customers in the service area, the company would be at a competitive disadvantage to Waste Management, the other company that operates an integrated commercial waste collection, recycling, transfer and disposal business in the service area, as Waste Management would be the sole company able to offer this integrated service. Collection and disposal prices would likely rise for those generators Waste Connections is able to maintain as Waste Connections would no longer be able to provide the same integrated collection, recycling and disposal service. In addition, the elimination of a facility (the Ridge) that supplies roughly 25% of Ontario IC&I waste disposal needs would also likely significantly lessen competition in the Ontario disposal market, with adverse disposal price consequences for Ontario generators and the Ontario economy.

The Ridge is also an existing operating site with a long history of excellent environmental performance and does not carry the risks and social controversy associated with attempting to establish a greenfield landfill.

Based on the analysis in this SD #1 it is demonstrated that there is a business opportunity for the Ridge landfill to continue to provide an annual waste disposal rate of 1.3 million tonnes for the management of residual IC&I waste during the planning period for this EA.

5.0 Residential Waste

Waste Connections is committed to continue to provide residential recycling and residual waste collection and disposal services to the host municipality of Chatham-Kent. Historical waste quantity data is provided in ***Table 4***.

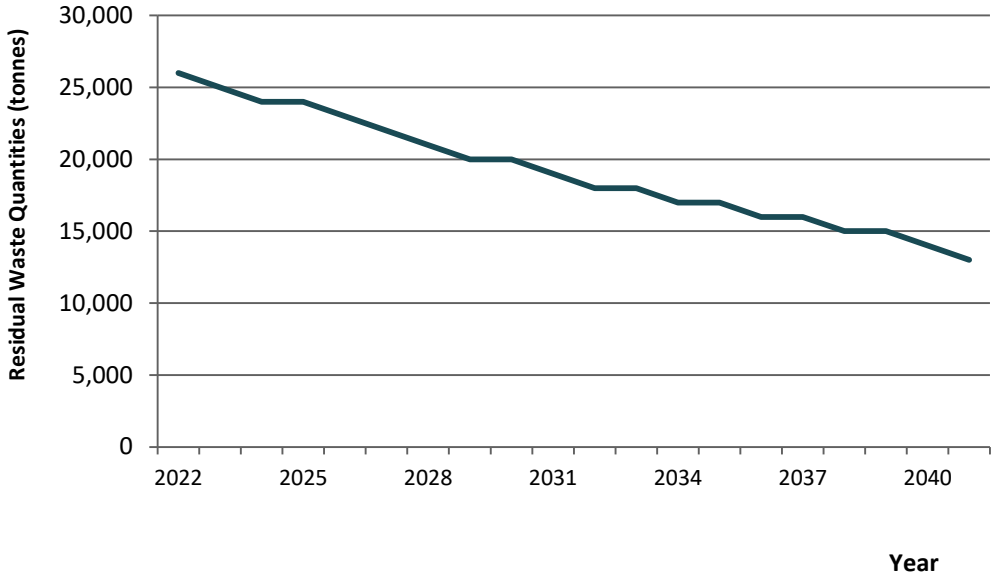
TABLE 4: HISTORICAL QUANTITIES OF RESIDENTIAL WASTE IN CHATHAM-KENT

Year	Reported Population	Total Residential Waste Generated (tonnes)	Total Residential Waste Diverted (tonnes)	Total Residential Waste Disposed (tonnes)	Total Residential Waste Diversion Rate (%)	Total Residential Waste Disposal Rate (%)
2015	103,671	45,241	16,046	29,195	35.5%	64.5%
2014	103,671	45,703	15,064	30,639	33.0%	67.0%
2013	103,671	47,389	16,640	30,749	35.1%	64.9%
2012	103,671	48,531	16,059	32,472	33.1%	66.9%
2011	108,192	48,981	15,728	33,253	32.1%	67.9%
2010	108,192	47,701	15,072	32,629	31.6%	68.4%
2009	108,192	50,736	16,502	34,234	32.5%	67.5%
2008	108,192	55,567	19,491	36,075	35.1%	64.9%
2007	109,554	54,124	15,597	38,527	28.8%	71.2%
2006	108,492	52,446	15,352	37,094	29.3%	70.7%

Source: RPRA Datacall.

Projections were completed to estimate the quantity of residual waste that would be generated by Chatham-Kent during the planning period. Using Ministry of Finance's population projections, Statistics Canada per capita waste disposal rate and MOECC's new diversion targets, the Ridge can expect to receive between 26,000 tonnes of residual waste in 2021 down to 13,000 tonnes of residual waste in 2041 from Chatham-Kent. This is illustrated in ***Figure 10*** with supporting data provided in ***Attachment E***.

FIGURE 10: RESIDUAL WASTE PROJECTION ESTIMATES FOR CHATHAM-KENT (2022 – 2041)



Attachment A

Data to Support IC&I Residual Waste Projections in Service Area

Waste Connections of Canada

Table A-1: Ontario-Wide Waste Projections Using MOECC Diversion Targets

(used to determine diversion rates to apply to service area of southern and central Ontario IC&I and Chatham-Kent)

Year No.	Year	Population and Employment		TOTAL WASTE GENERATED (tonnes)		DIVERSION RATE (%)			TOTAL WASTE DIVERTED (tonnes)		TOTAL RESIDUAL WASTE REQUIRING DISPOSAL (tonnes)		
		IC&I	Residential	IC&I	Residential	IC&I	Residential	Weighted Average	IC&I	Residential	IC&I	Residential	Total
	2010	**6,602,000**	**13,144,000**	**6,796,000**	**5,200,000**	**11%**	**38%**	**23%**	**753,000**	**1,996,000**	**6,043,000**	**3,204,000**	**9,247,000**
	2010 Average per Capita (kg)			**1,029**	**396**				**114**	**152**	**915**	**244**	
	2011	6,683,000	13,264,000	6,879,000	5,247,000	12%	39%	24%	817,000	2,035,000	6,062,000	3,212,000	9,274,000
	2012	6,769,000	13,401,000	6,968,000	5,302,000	13%	39%	24%	882,000	2,078,000	6,086,000	3,224,000	9,310,000
	2013	6,847,000	13,538,000	7,048,000	5,356,000	13%	40%	25%	948,000	2,120,000	6,100,000	3,236,000	9,336,000
	2014	6,885,000	13,661,000	7,087,000	5,405,000	14%	40%	25%	1,010,000	2,161,000	6,077,000	3,244,000	9,321,000
	2015	6,981,000	13,798,000	7,186,000	5,459,000	15%	40%	26%	1,081,000	2,205,000	6,105,000	3,254,000	9,359,000
	2016	7,079,000	13,949,000	7,287,000	5,518,000	16%	41%	27%	1,154,000	2,251,000	6,133,000	3,267,000	9,400,000
	2017	7,178,000	14,100,000	7,389,000	5,578,000	17%	41%	27%	1,228,000	2,298,000	6,161,000	3,280,000	9,441,000
	2018	7,250,000	14,233,000	7,463,000	5,631,000	17%	42%	28%	1,300,000	2,342,000	6,163,000	3,289,000	9,452,000
	2019	7,323,000	14,366,000	7,538,000	5,683,000	18%	42%	28%	1,373,000	2,387,000	6,165,000	3,296,000	9,461,000
	2020	7,396,000	14,499,000	7,613,000	5,736,000	**19%**	44%	**30%**	1,446,000	2,524,000	6,167,000	3,212,000	9,379,000
	2021	7,470,000	14,703,000	7,690,000	5,817,000	21%	46%	32%	1,638,000	2,653,000	6,052,000	3,164,000	9,216,000
1	2022	7,545,000	14,863,000	7,767,000	5,880,000	24%	47%	34%	1,833,000	2,775,000	5,934,000	3,105,000	9,039,000
2	2023	7,605,000	15,023,000	7,828,000	5,943,000	26%	49%	36%	2,027,000	2,900,000	5,801,000	3,043,000	8,844,000
3	2024	7,666,000	15,183,000	7,891,000	6,007,000	28%	50%	38%	2,225,000	3,028,000	5,666,000	2,979,000	8,645,000
4	2025	7,727,000	15,343,000	7,954,000	6,070,000	31%	52%	40%	2,426,000	3,156,000	5,528,000	2,914,000	8,442,000
5	2026	7,789,000	15,503,000	8,018,000	6,133,000	33%	54%	42%	2,630,000	3,287,000	5,388,000	2,846,000	8,234,000
6	2027	7,851,000	15,662,000	8,082,000	6,196,000	35%	55%	44%	2,837,000	3,420,000	5,245,000	2,776,000	8,021,000
7	2028	7,914,000	15,821,000	8,147,000	6,259,000	37%	57%	46%	3,047,000	3,555,000	5,100,000	2,704,000	7,804,000
8	2029	7,977,000	15,980,000	8,211,000	6,322,000	40%	58%	48%	3,260,000	3,692,000	4,951,000	2,630,000	7,581,000
9	2030	8,041,000	16,139,000	8,277,000	6,385,000	**42%**	**60%**	**50%**	3,476,000	3,831,000	4,801,000	2,554,000	7,355,000
10	2031	8,105,000	16,296,000	8,343,000	6,447,000	44%	61%	51%	3,663,000	3,933,000	4,680,000	2,514,000	7,194,000
11	2032	8,170,000	16,448,000	8,410,000	6,507,000	46%	62%	53%	3,852,000	4,034,000	4,558,000	2,473,000	7,031,000
12	2033	8,252,000	16,600,000	8,494,000	6,567,000	48%	63%	54%	4,052,000	4,137,000	4,442,000	2,430,000	6,872,000
13	2034	8,335,000	16,752,000	8,580,000	6,627,000	50%	64%	56%	4,256,000	4,241,000	4,324,000	2,386,000	6,710,000
14	2035	8,418,000	16,904,000	8,665,000	6,688,000	52%	65%	57%	4,462,000	4,347,000	4,203,000	2,341,000	6,544,000
15	2036	8,502,000	17,054,000	8,752,000	6,747,000	53%	66%	59%	4,674,000	4,453,000	4,078,000	2,294,000	6,372,000
16	2037	8,587,000	17,199,000	8,839,000	6,804,000	55%	67%	60%	4,888,000	4,559,000	3,951,000	2,245,000	6,196,000
17	2038	8,673,000	17,344,000	8,928,000	6,862,000	57%	68%	62%	5,107,000	4,666,000	3,821,000	2,196,000	6,017,000
18	2039	8,760,000	17,489,000	9,017,000	6,919,000	59%	69%	63%	5,329,000	4,774,000	3,688,000	2,145,000	5,833,000
19	2040	8,848,000	17,634,000	9,108,000	6,976,000	61%	70%	65%	5,556,000	4,883,000	3,552,000	2,093,000	5,645,000
20	2041	8,936,000	17,780,000	9,199,000	7,034,000	63%	71%	66%	5,786,000	4,994,000	3,413,000	2,040,000	5,453,000
	2042	9,025,000	17,953,000	9,290,000	7,103,000	65%	72%	68%	6,020,000	5,114,000	3,270,000	1,989,000	5,259,000
	2043	9,115,000	18,127,000	9,383,000	7,171,000	67%	73%	69%	6,258,000	5,235,000	3,125,000	1,936,000	5,061,000
	2044	9,206,000	18,303,000	9,477,000	7,241,000	69%	74%	71%	6,501,000	5,358,000	2,976,000	1,883,000	4,859,000
	2045	9,298,000	18,481,000	9,571,000	7,311,000	71%	75%	72%	6,748,000	5,483,000	2,823,000	1,828,000	4,651,000
	2046	9,391,000	18,661,000	9,667,000	7,383,000	72%	76%	74%	6,999,000	5,611,000	2,668,000	1,772,000	4,440,000
	2047	9,485,000	18,842,000	9,764,000	7,454,000	74%	77%	75%	7,255,000	5,740,000	2,509,000	1,714,000	4,223,000
	2048	9,580,000	19,025,000	9,862,000	7,527,000	76%	78%	77%	7,515,000	5,871,000	2,347,000	1,656,000	4,003,000
	2049	9,676,000	19,210,000	9,960,000	7,600,000	78%	79%	78%	7,779,000	6,004,000	2,181,000	1,596,000	3,777,000
	2050	9,773,000	19,397,000	10,060,000	7,674,000	**80%**	**80%**	**80%**	8,048,000	6,139,000	2,012,000	1,535,000	3,547,000

NOTES:

Generated #'s *: Based on 2010 Statistics Canada Waste Management Survey data.*

Diverted #'s *: The Strategy for a Waste-Free Ontario (Feb. 2017) sets overall diversion goals of 30% by 2020, 50% by 2030 and 80% by 2050*

Statistics Canada diversion rates to 2014

Disposal #'s *: Generated minus Diverted*

Table A-2: Projection Estimates for Primary Service Area (2010 to 2041)

Year No.	Year	Employment	TOTAL WASTE GENERATED (tonnes)	DIVERSION RATE (%)	TOTAL WASTE DIVERTED (tonnes)	TOTAL RESIDUAL WASTE REQUIRING DISPOSAL (tonnes)
	2010	**5,480,000**	**5,641,000**	**11%**	**625,000**	**5,016,000**
2010 Average per Capita (kg)			**1,029**		**114**	**915**
	2011	5,547,000	5,710,000	12%	678,000	5,032,000
	2012	5,618,000	5,783,000	13%	732,000	5,051,000
	2013	5,683,000	5,850,000	13%	787,000	5,063,000
	2014	5,715,000	5,883,000	14%	838,000	5,045,000
	2015	5,795,000	5,965,000	15%	897,000	5,068,000
	2016	5,876,000	6,048,000	16%	958,000	5,090,000
	2017	5,958,000	6,133,000	17%	1,020,000	5,113,000
	2018	6,018,000	6,195,000	17%	1,079,000	5,116,000
	2019	6,078,000	6,256,000	18%	1,139,000	5,117,000
	2020	6,139,000	6,319,000	19%	1,201,000	5,118,000
	2021	6,200,000	6,382,000	21%	1,359,000	5,023,000
1	2022	6,262,000	6,446,000	24%	1,521,000	4,925,000
2	2023	6,312,000	6,497,000	26%	1,683,000	4,814,000
3	2024	6,362,000	6,549,000	28%	1,847,000	4,702,000
4	2025	6,413,000	6,601,000	31%	2,013,000	4,588,000
5	2026	6,464,000	6,654,000	33%	2,183,000	4,471,000
6	2027	6,516,000	6,707,000	35%	2,354,000	4,353,000
7	2028	6,568,000	6,761,000	37%	2,529,000	4,232,000
8	2029	6,621,000	6,815,000	40%	2,706,000	4,109,000
9	2030	6,674,000	6,870,000	42%	2,885,000	3,985,000
10	2031	6,727,000	6,924,000	44%	3,040,000	3,884,000
11	2032	6,781,000	6,980,000	46%	3,197,000	3,783,000
12	2033	6,849,000	7,050,000	48%	3,363,000	3,687,000
13	2034	6,917,000	7,120,000	50%	3,532,000	3,588,000
14	2035	6,986,000	7,191,000	52%	3,703,000	3,488,000
15	2036	7,056,000	7,263,000	53%	3,878,000	3,385,000
16	2037	7,127,000	7,336,000	55%	4,057,000	3,279,000
17	2038	7,198,000	7,409,000	57%	4,238,000	3,171,000
18	2039	7,270,000	7,483,000	59%	4,422,000	3,061,000
19	2040	7,343,000	7,558,000	61%	4,610,000	2,948,000
20	2041	7,416,000	7,634,000	63%	4,802,000	2,832,000

NOTES:

Generated #'s *: Based on 2010 Statistics Canada Waste Management Survey data.*

Diverted #'s *: The Strategy for a Waste-Free Ontario (Feb. 2017) sets overall diversion goals of 30% by 2020, 50% by 2030 and 80% by 2050. Statistics Canada diversion rates to 2014*

Disposal #'s *: Generated minus Diverted*

Table A-3: Projection Estimates for Primary Service Area (2010 to 2041)
Sensitivity Analysis #1: Achieving 50% of MOECC's Diversion Target (40% by 2050)

Year No.	Year	IC&I Employment	TOTAL WASTE GENERATED (tonnes)	DIVERSION RATE (%)	TOTAL WASTE DIVERTED (tonnes)	TOTAL RESIDUAL WASTE REQUIRING DISPOSAL (tonnes)
	2010	**5,480,000**	**5,641,000**	**11%**	**625,000**	**5,016,000**
2010 Average per Capita (kg)			**1,029**		**114**	**915**
	2011	5,547,000	5,710,000	12%	678,000	5,032,000
	2012	5,618,000	5,783,000	13%	732,000	5,051,000
	2013	5,683,000	5,850,000	13%	787,000	5,063,000
	2014	5,715,000	5,883,000	14%	838,000	5,045,000
	2015	5,795,000	5,965,000	15%	893,000	5,072,000
	2016	5,876,000	6,048,000	16%	948,000	5,100,000
	2017	5,958,000	6,133,000	16%	1,005,000	5,128,000
	2018	6,018,000	6,195,000	17%	1,060,000	5,135,000
	2019	6,078,000	6,256,000	18%	1,115,000	5,141,000
	2020	6,139,000	6,319,000	19%	1,172,000	5,147,000
	2021	6,200,000	6,382,000	19%	1,229,000	5,153,000
1	2022	6,262,000	6,446,000	20%	1,287,000	5,159,000
2	2023	6,312,000	6,497,000	21%	1,344,000	5,153,000
3	2024	6,362,000	6,549,000	21%	1,402,000	5,147,000
4	2025	6,413,000	6,601,000	22%	1,460,000	5,141,000
5	2026	6,464,000	6,654,000	23%	1,519,000	5,135,000
6	2027	6,516,000	6,707,000	24%	1,579,000	5,128,000
7	2028	6,568,000	6,761,000	24%	1,640,000	5,121,000
8	2029	6,621,000	6,815,000	25%	1,702,000	5,113,000
9	2030	6,674,000	6,870,000	26%	1,765,000	5,105,000
10	2031	6,727,000	6,924,000	26%	1,829,000	5,095,000
11	2032	6,781,000	6,980,000	27%	1,893,000	5,087,000
12	2033	6,849,000	7,050,000	28%	1,963,000	5,087,000
13	2034	6,917,000	7,120,000	29%	2,033,000	5,087,000
14	2035	6,986,000	7,191,000	29%	2,105,000	5,086,000
15	2036	7,056,000	7,263,000	30%	2,178,000	5,085,000
16	2037	7,127,000	7,336,000	31%	2,252,000	5,084,000
17	2038	7,198,000	7,409,000	31%	2,328,000	5,081,000
18	2039	7,270,000	7,483,000	32%	2,404,000	5,079,000
19	2040	7,343,000	7,558,000	33%	2,483,000	5,075,000
20	2041	7,416,000	7,634,000	34%	2,562,000	5,072,000

NOTES:
Generated #'s *: Based on 2010 Statistics Canada Waste Management Survey data.*
Diverted #'s *: Based on achieving 50% of the diversion targets set out in The Strategy for a Waste-Free Ontario. Statistics Canada diversion rates to 2014*
Disposal #'s *: Generated minus Diverted*

Table A-4: Projection Estimates for Primary Service Area (2010 to 2041)
Sensitivity Analysis #2: Achieving 75% of MOECC's Diversion Target (60% by 2050)

Year No.	Year	IC&I Employment	TOTAL WASTE GENERATED (tonnes)	DIVERSION RATE (%)	TOTAL WASTE DIVERTED (tonnes)	TOTAL RESIDUAL WASTE REQUIRING DISPOSAL (tonnes)
	2010	**5,480,000**	**5,641,000**	**11%**	**625,000**	**5,016,000**
2010 Average per Capita (kg)			**1,029**		**114**	**915**
	2011	5,547,000	5,710,000	12%	678,000	5,032,000
	2012	5,618,000	5,783,000	13%	732,000	5,051,000
	2013	5,683,000	5,850,000	13%	787,000	5,063,000
	2014	5,715,000	5,883,000	14%	838,000	5,045,000
	2015	5,795,000	5,965,000	16%	926,000	5,039,000
	2016	5,876,000	6,048,000	17%	1,015,000	5,033,000
	2017	5,958,000	6,133,000	18%	1,108,000	5,025,000
	2018	6,018,000	6,195,000	19%	1,198,000	4,997,000
	2019	6,078,000	6,256,000	21%	1,289,000	4,967,000
	2020	6,139,000	6,319,000	22%	1,382,000	4,937,000
	2021	6,200,000	6,382,000	23%	1,477,000	4,905,000
1	2022	6,262,000	6,446,000	24%	1,574,000	4,872,000
2	2023	6,312,000	6,497,000	26%	1,669,000	4,828,000
3	2024	6,362,000	6,549,000	27%	1,765,000	4,784,000
4	2025	6,413,000	6,601,000	28%	1,863,000	4,738,000
5	2026	6,464,000	6,654,000	29%	1,963,000	4,691,000
6	2027	6,516,000	6,707,000	31%	2,064,000	4,643,000
7	2028	6,568,000	6,761,000	32%	2,166,000	4,595,000
8	2029	6,621,000	6,815,000	33%	2,270,000	4,545,000
9	2030	6,674,000	6,870,000	35%	2,376,000	4,494,000
10	2031	6,727,000	6,924,000	36%	2,482,000	4,442,000
11	2032	6,781,000	6,980,000	37%	2,591,000	4,389,000
12	2033	6,849,000	7,050,000	38%	2,707,000	4,343,000
13	2034	6,917,000	7,120,000	40%	2,824,000	4,296,000
14	2035	6,986,000	7,191,000	41%	2,944,000	4,247,000
15	2036	7,056,000	7,263,000	42%	3,066,000	4,197,000
16	2037	7,127,000	7,336,000	43%	3,190,000	4,146,000
17	2038	7,198,000	7,409,000	45%	3,315,000	4,094,000
18	2039	7,270,000	7,483,000	46%	3,444,000	4,039,000
19	2040	7,343,000	7,558,000	47%	3,574,000	3,984,000
20	2041	7,416,000	7,634,000	49%	3,707,000	3,927,000

NOTES:
Generated #'s *: Based on 2010 Statistics Canada Waste Management Survey data.*
Diverted #'s *: Based on achieving 75% of the diversion targets set out in The Strategy for a Waste-Free Ontari Statistics Canada diversion rates to 2014*
Disposal #'s *: Generated minus Diverted*

Attachment B

Data to Support Remaining Capacities of Existing Disposal Sites

WASTE CONNECTIONS OF CANADA

Table B-1: Data Provided by MOECC in December 2017

CLIENT_NAME	SITE_NAME	SITE_MUNICIPALITY	TOTAL_APPROVED_CAPACITY (CUBIC METERS)	APPROVED_ FILL_RATE	ERC_DATE_LAST_DETERMINED	ERC_ESTIMATED_VOLUME (CUBIC METERS)
Waste Management of Canada	Twin Creeks Landfill Site	Warwick	26,508,000	1400000 Tonnes Per Year	2014-07-07	21,805,237
Waste Connections of Canada	Ridge Landfill	Chatham-Kent	21,000,000	1300000 Tonnes Per Year	2015-12-31	8,979,525
The Corporation of the City of Brantford	Mohawk Street - Brantford	Brantford	19,000,000		2016-04-01	8,484,975
Niagara Waste Systems Limited	Niagara Waste Systems Limited Walker South Landfill	Niagara Falls	17,700,000	1100000 Tonnes Per Year	2015-12-31	12,432,121
City of Toronto	Green Lane - St. Thomas	Southwold	16,750,000	1100000 Tonnes Per Year	2015-03-01	11,147,064
The Regional Municipality of Waterloo	Waterloo Landfill Site	Waterloo	14,772,120	1350 Tonnes Per Day	2014-12-31	6,626,855
Corporation of the City of London	W12A - London	London	13,800,000	600000 Tonnes Per Year	2015-03-24	3,467,000
City of Hamilton	Glanbrook - Hamilton	Hamilton	13,258,000	1814 Tonnes Per Week	2014-12-31	6,262,935
Essex - Windsor Solid Waste Authority	EWSWA Regional Landfill - Essex	Essex	12,800,000	275000 Tonnes Per Year	2014-12-31	7,600,000
Regional Municipality of Halton	Halton Waste Management Site	Milton	7,960,000	900 Tonnes Per Day	2015-01-01	4,891,146
Terrapure	Stoney Creek Landfill	Hamilton	6,320,000	750000 Tonnes Per Year	2015-01-01	1,200,000
The County of Oxford	Salford Landfill; Oxford County Waste Management Facility	South-West Oxford	5,905,200		2014-12-31	3,124,868
City of Stratford	Stratford - Stratford	Perth	5,282,900		2015-05-01	1,802,956
Waste Management of Canada	Petrolia Landfill	Petrolia	4,749,000	365000 Tonnes Per Year	2014-06-04	528,879
The Corporation of the City of Peterborough	Bensfort Road - Peterborough	Otonabee-South Monaghan	4,445,000	85000 Tonnes Per Year	2015-01-05	1,350,402
The Corporation of the City of Barrie	Sandy Hollow Landfill	Barrie	3,924,746		2014-12-22	1,135,476
City of Kawartha Lakes	Lindsay-Ops - Kawartha Lakes	Kawartha Lakes	2,340,000	58200 Tonnes Per Year	2015-04-29	917,063
Walker Environmental Group Inc. (Formerly IMS Inc)	Atlas Landfill	Welland	2,207,000	5000 Tonnes Per Day	2016-03-30	547,385
The Regional Municipality of Niagara	Niagara Road 12 - Niagara Region	West Lincoln	1,851,000		2016-02-23	1,059,118
Regional Municipality of Niagara	Humberstone - Niagara Region	Welland	2,400,000	700 Tonnes Per Day		2,400,000

Table B-2: Estimated Capacity Remaining Based on Approved Waste Disposal Rates in Last Reporting Year

% IC&I landfilled at municipal sites (weighted average) 15.0%

Waste Disposal Facility	Estimated Remaining Capacity in Reporting Year (m^3)	Reporting Year	Approved Annual Waste Disposal Rate (tonnes / year)	Assumed Density (tonnes / m^3)*	Estimated Year of Closure	Estimated Years of Capacity Remaining	Comments	Municipal Approved Capacity for ICI Waste
Durham York Energy Centre	-	-	140,000	N/A	-	-	Assumed to be operational throughout planning period	21,000
Emerald Energy from Waste inc.	-	-	182,500	N/A	-	-	Assumed to be operational throughout planning period	
Halton Regional Landfill	4,891,146	2014	234,000	0.7	**2029**	15		35,100
Waterloo Landfill	6,626,855	2014	421,200	0.7	**2025**	11	ICI accounts for 48% of annual airspace consumed.	63,200
Niagara - South Landfill	12,432,121	2015	1,100,000	0.7	**2023**	8		
Terrapure Stoney Creek Landfill	1,200,000	2014	750,000	0.7	2015	1		
Glanbrook - Hamilton	6,262,935	2014	94,328	0.8	**2067**	53		14,100
Humberstone - Niagara Region	2,400,000	2018	182,000	0.8	**2029**	*11*	Received expansion approval in 2016. Assumed start in expansion area will be in 2018.	27,300
Mohawk Street - Brantford	8,484,975	2015	176,059	0.7	**2049**	34		26,400
Tom Howe- Haldiman	205,000	2011	130,000	0.7	2012	1	Source for remaining capacity taken from MOECC large landfill database.	
Salford - Oxford County	3,124,868	2014	116,000	0.75	**2034**	20		17,400
W12A - London	3,467,000	2014	600,000	0.8	2019	5	W12A 5-year average of ICI waste landfilled is 16%.	
Green Lane Landfill	11,147,064	2014	1,100,000	0.9	**2023**	9	Proporation of ICI received in 2016 was 8%.	165,000
Twin Creeks - Lambton	21,805,237	2014	1,400,000	0.85	**2028**	13	Assumed 750,000 tpy from 2014 through 2017 and 1.4 million from 2018 on.	
Petrolia - Lambton	528,879	2014	365,000	0.7	2015	1		
Ridge Landfill	6,534,758	2016	1,300,000	0.9	**2021**	5		

Table B-2: Estimated Capacity Remaining Based on Approved Waste Disposal Rates in Last Reporting Year

% IC&I landfilled at municipal sites (weighted average) 15.0%

Waste Disposal Facility	Estimated Remaining Capacity in Reporting Year (m^3)	Reporting Year	Approved Annual Waste Disposal Rate (tonnes / year)	Assumed Density (tonnes / m^3)*	Estimated Year of Closure	Estimated Years of Capacity Remaining	Comments	Municipal Approved Capacity for ICI Waste
Barrie Landfill (Sandy Hollow)	1,135,476	2014	81,000	0.7	**2024**	10		12,200
Bensfort Road - Peterborough	1,350,402	2014	85,000	0.7	**2025**	11		12,800
Stratford	1,802,956	2014	60,000	0.7	**2035**	21	No data available on Approved Annual Fill Rate so assumption made.	9,000
Lindsay-Ops	917,063	2014	58,200	0.7	**2025**	11		8,700
Niagara - Regional Road 12	1,059,118	2015	60,000	0.7	**2027**	12	No data available on Approved Annual Fill Rate so assumption made.	9,000
EWSWA Regional Landfill	7,600,000	2014	275,000	0.8	**2036**	22		41,300

**Densities taken from publically available sources, directly from contacted operators or a default conservative density was used when site-specific data was not available.*

Attachment C

Economic Analysis of the Market for IC&I Waste in Central and Southwestern Ontario

Waste Connections of Canada

AN ECONOMIC ANALYSIS OF THE MARKET FOR IC&I WASTE IN CENTRAL AND SOUTHWESTERN ONTARIO

By:
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December 14, 2017

***Professor Emeritus of Economics, University of Toronto**

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TABLES

1. INTRODUCTION

Waste Connections is proposing to maintain the current annual fill rate of 1.3 million tonnes over a 20-year planning period for Ridge Landfill (the Ridge). This study examines the supply and demand for IC&I waste for the market in Central and South Western Ontario and also examines the economic impact on the Ontario economy of maintaining this annual fill rate of 1.3 million tonnes. This study relies on the results of a previous study of the Ridge: *BFI Ridge Landfill Expansion EA Impact Assessment -Appendix Q -The Waste Management Opportunity* dated December 1996. It should be noted that any forecast over the next 20 or 25 years is bound to be speculative.

2. DEMAND FOR WASTE DISPOSAL SERVICES FOR NEXT 20 OR 25 YEARS

Waste generation is a by-product of economic activity, and as the Ontario economy grows faster than Canada's and those of all other G7 nations for the past three years according to the 2017 Ontario Outlook and Fiscal Review, so will Ontario's waste generation. Before taking into account diversion, I assume waste volumes will grow in line with the Ontario's economy, and for simplicity, I assume that the growth in real GDP in Central and Southwestern Ontario will be equal to the growth in real GDP for the entire Ontario economy. The waste generated for the IC&I sector for Southern and Central Ontario was 5.641 million tonnes in 2010.[1] In Table 1, I start with the actual waste generated in 2010 and assume that the waste generated will increase to 2016 at the same rate of increase as the actual rate of increase of real GDP in the Ontario economy from 2010 to 2016 of 11.6%. For 2016, I assume a diversion rate of 15%. The Ministry of Finance of the Ontario Government forecasts an annual real GDP growth of 2.1 percent between 2016 and 2040. I use this estimate of future growth to project the volume of waste generated for 2030 and 2040.

TABLE 1: FORECAST OF WASTE GENERATED IN THE IC&I SECTOR OF CENTRAL AND SOUTHWESTERN ONTARIO (MILLIONS OF TONNES)

YEAR	WASTE	DIVERSION RATE SCENARIO 1	DIVERSION RATE SCENARIO 2	RESIDUAL WASTE SCENARIO 1	RESIDUAL WASTE SCENARIO 2
2010	5.641				
2016	6.295			5.351	5.351
2030	8.421	25%	50%	6.316	4.211
2040	10.366	32.5%	65%	6.997	3.628

The most difficult variable to estimate for the next 25 years is the diversion rate for the IC&I sector. The diversion rate for the IC&I sector is about 15% for 2014. Given the proprietary nature of data for the IC&I sector, it is difficult for Statistics Canada to obtain reliable estimates of diversion rates in the IC&I sector. Statistics Canada estimates for 2014, a 37% residential diversion rate and a 15% non-residual diversion rates; for a total diversion rate of 25%. The

[1]This number is derived from Statistics Canada, *2010 Waste Management Industry Survey: Business and Government Sectors*.

Strategy for a Waste-Free Ontario diversion targets are 50% for 2030 and 80% for 2050. From these targets, I would estimate a *Waste-Free Ontario* target of 65% (½ x (50% +80%) for 2040. I consider two diversion rate scenarios.

2.1 Scenario 1 - Achievement of 50% of Strategy for a Waste-Free Ontario Targets

In this Scenario, I assume a target diversion rate of 25% (50%x 50%) for 2030 and 32.5% (50%x 65%) for 2040. Given the much higher actual diversion rates for the residential sector over the IC&I sector, it will be more difficult for the IC&I sector to reach the Strategy for a Waste Free Ontario goals. Based on the performance of various past programs aimed at the sector, Appendix Q of the 1996 EA study noted various government programs and forces which would lead to an increase in diversion rates. On page 14 of Appendix Q it is stated that "…[b]oth these factors leading to reductions in the IC&I waste being produced were identified and discussed in detail in the GTA Reports. Therefore for the purposes of this study, a 40% diversion rate is believed to be a reasonable estimate for planning purposes. As with the disposable opportunity analysis, the 40% diversion rate is estimated for the year 2011". The actual diversion rate for the IC&I sector for 2011 was 12%. In 1996, Appendix Q overestimated the future diversion rates and by extension underestimated the future disposal rates at the time. The results of Appendix Q would have changed dramatically if a lower (12%) diversion rate were used instead of a 40% diversion rate.

With the diversion rate of 25% for 2030 (which is more than double the actual diversion rate in 2012), the total residual IC&I waste market is 6.316 million tonnes for 2030 and with a diversion rate of 32.5% for 2040, the total residual IC&I waste market is 6.997 million tonnes. Given the 2016 residual IC&I waste landfill disposal rate to handle 5.351 million tonnes a year (see Table 1), under Scenario 1, there is an excess demand for disposal capacity in the IC&I sector. It should be noted that the 5.351 figure is a status quo figure. It assumes no reduction and no additions to available landfill capacities.

2.2 Scenario 2 - 100% Achievement of Strategy for a Waste- Free Ontario Targets

In this scenario, I assume a target diversion rate of 50% for 2030 and 65% for 2040. This scenario assumes that the Strategy for a Waste Free Ontario targets are fully achieved. In this scenario, there will be a demand for residual IC&I waste landfill services of 4.211 million tonnes per year in 2030 and 3.628 million tonnes per year in 2040. With the addition of all proposed expanded or new facilities and MOECC's diversion targets are achieved, the estimated annual waste disposal rate rises to approximately 6 million tonnes in 2022, decreasing to 2.5 million tonnes in 2036 until the end of the planning period.[1]

Taking into account the estimated changes in supply of landfill facilities, also under Scenario 2 there is still an excess demand for disposal facilities. In Scenario 2, there is still an excess demand for disposal facilities even with 100% achievement in *Waste-Free Ontario* diversion

[1] *Data as of 2015 was obtained from MOECC received through email to Waste Connections in December 2017. It should be noted that there are three landfills in the service area that are undergoing an EA process (W12A London, Southwestern Landfill - Walker, Terrapure Stoney Creek). My estimates were based on the MOECC 2015 data plus the 3 expansions/new sites underway.*

targets.

3. DEMAND FOR DISPOSAL SERVICES AT THE RIDGE

The previous section provided the macro analysis, which showed that over the next 20 or 25 years there will be a situation where total demand for waste disposal services will exceed the total supply of landfill services to dispose of the available waste. This section examines the microeconomic situation of whether the Ridge is sufficiently competitive to be able to supply its ask of 1.3 million tonnes per year. I believe that there is overwhelming evidence that the Ridge will be able to successfully compete in the IC&I waste market of Central and Southwestern Ontario and fulfill and maintain its annual waste disposal rate of 1.3 million tonnes.

3.1 Results of Appendix Q in the 1996 Study

The question of the ability of the Ridge to compete in the waste market by fulfilling and maintaining all of its permitted annual waste disposal rate was first addressed in the 1996 study. This comprehensive study completed a "least cost" approach and estimated "the tonnage of waste that should be attracted to the Ridge site based solely on the estimated costs to existing and potential IC&I customers from Southern Ontario of hauling and disposing of their waste at Ridge, versus hauling and disposing of their waste at Ridge's competitors." On page 31 of the report it is concluded that ...[b]ased on least cost analysis alone, it appears approximately 1,215,000 tonnes of IC&I waste will be the maximum reasonable amount available for disposal at the Ridge Landfill site."

In my opinion, the data shows that the relative cost of hauling and disposing of waste at the Ridge versus the cost of hauling and disposing of waste at Ridge's competitor is approximately the same today and it was when the 1996 study was completed. [2] As such, in my opinion, the data shows that the 'least cost approach' in Appendix Q is valid today. Of the 16 sites listed in Appendix Q, 7 are now closed leaving 9 sites from the Appendix Q's list. Currently the Ridge competes successfully with the disposal sites in its market area, and does so at an intake of 1.3 million tonnes annually.

When Appendix Q was written the Ridge operated on a relatively small scale of approximately 220,000 tonnes. Today the Ridge has an annual waste disposal rate of 1.3 million tonnes and almost 98% of these 1.3 million tonnes of residual waste disposed of annually comes from the IC&I sector. The relevant market for the Ridge is residual waste from the IC&I sector. Today there are only five landfill sites with an annual fill rate of 100,000 tonnes or more that compete in the market for IC&I waste and these landfill sites are Walker Environmental-South Landfill, Terrapure-Stoney Creek Landfill, Waste Management-Petrolia, Waste Management-Twin

[2] *I assume in my analysis that the relative costs of operating the landfill site at the Ridge versus operating the landfill sites at the competitors of the Ridge has not changed since 1996. Given the substantial increase in capacity at the Ridge that has taken place since 1996 and given the economies of scale in operating landfill sites, then it is likely that the competitiveness of the Ridge may have increased since 1996. This increase in competitiveness will only apply with respect to competitors who have not experienced a similar increase in annual capacity.*

Creeks and the Ridge. All five sites existed when Appendix Q was written. Of the five sites, two are estimated to be near or at currently approved capacity; Terrapure-Stoney Creek and Petrolia.

From the original sites that competed with the Ridge in 1996, there are now only two private sector sites other than the Ridge permitted to accept putrescible waste from the IC&I sector; Walker South Landfill and Twin Creeks operated by Waste Management.[3]

These two major competitors to the Ridge existed in 1996 when Appendix Q was written. The prime cost of hauling waste is the cost of trucks/transportation, the cost of labour and the cost of fuel. Since the competitors of today existed in 1996, then the basic geographical distances from the collection from these waste sites to the disposal at the major landfills has not significantly changed. The major change is the price of fuel. Statistics Canada shows a price of gasoline of 56.1 cents a litre in Toronto in 1996.[4] Today the price of fuel is about 105 cents a litre in Toronto. After adjusting for inflation the real price of fuel has increased by about 27.5%. Counteracting this increase in the price of fuel, has been an increase in fuel efficiency for motor vehicles. It is difficult to get fuel efficiency data for the type of trucks used in the waste disposal industry however the U.S. Department of Transportation estimated that fuel efficiency of light trucks increased by 26.4% from 1996 to 2014. [5] With fuel efficiency increasing by approximately the same rate as the increase in the price of gasoline, the real fuel cost per kilometre of hauling waste is approximately the same today as it was in 1996. This analysis indicates that the main results of the least cost analysis in Appendix Q are as valid today as it was in 1996.

The main results of this comprehensive analysis are valid today. As such, the maximum reasonable amount of 1.215 million tonnes will simply have to be adjusted by the growth in the size of the market that has taken place since 2011.[6] The growth of the market from 2011 to 2030 (the mid-point of the planning period) will take this 1.215 million tonnes figures well over the 1.3 million tonnes figure that Waste Connections is proposing for the Ridge.

The 1996 study showed that the Ridge was in a favorable geographical location to successfully compete with the competitors of the Ridge. The 1996 study supports the proposition that the Ridge will in the planning period be able to fulfill and maintain all of its proposed intake waste disposal rate of 1.3 million tonnes per year.

3.2 Implications of Current Data

In 2012 the permitted annual waste disposal rate of the Ridge was increased to 1.3 million tonnes. In 2014, 2015 and 2016 the Ridge was successful in accepting 1.3 million tonnes in each year and is on target to do the same in 2017. During my research it was revealed that in the fourth quarter of each year since 2014, Waste Connections has had to re-direct IC&I waste away from the Ridge in order to avoid exceeding the site's annual waste fill limits. The 1996 study by its very nature had to be speculative in forecasting the future. That study was done for a business

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[3] *It is estimated that about 15% of waste received by public sector sites is from the IC&I sector.*
[4] *See Statistics Canada, CANSIM TABLE #326-0009.*
[5] *See US Department of Transportation, Highway Statistics*
[6] *It should be noted that this 1.215 million tonnes figure was estimated assuming a diversion rate of 40%.*

that did not exist at the time. To a large extent we know what happened in that future. The actual historical data shows that the Ridge was a very successful competitor and could have supplied even more than the 1.3 million tonnes annual waste disposal rate.

In 2017 about 375,000 tonnes of Ontario's IC&I waste will be disposed of at the Brent Run facility in Michigan operated by Waste Connections. This waste could and would likely have been disposed of at the Ridge but for the current annual waste disposal rate restrictions at that site. In addition to Brent Run there are approximately 2.625 million tonnes of Ontario waste being disposed of at other US landfills annually (for a total of about 3 million tonnes annually). This waste should/would also be disposed of in Ontario if sufficient capacity existed. It also should be noted that it has become more costly to get across the Canada-US border. In addition, the actual experience for the last four years shows that there is an excess demand for waste disposal at the Ridge and that but for the current annual waste disposal rate restrictions, the Ridge could have disposed of IC&I waste significantly above the current annual waste disposal rate of 1.3 million tonnes.

If the commercial waste diversion initiatives of the *Strategy for a Waste-Free Ontario* becomes more successful over time then there is the possibility of the repatriation of some or all of the approximate 3 million tonnes of Ontario IC&I waste currently going to the US. This fact alone almost guarantees that the Ridge will be able to fulfill and maintain all of the 1.3 million tonnes annual waste disposal rate.

The geographical advantage and management efficiency at the Ridge shows that the Ridge has been a successful competitor and will continue to be a successful competitor over the planning period and will be able to supply all of its 1.3 million tonnes of the annual waste disposal rate.

4. ECONOMIC BENEFITS OF MAINTAINING THE RIDGE AT ITS CURRENT PERMITTED WASTE DISPOSAL RATE

Waste Connections employs 1400 people in Ontario and currently spends about $84 million dollars in labour expenses and about $154 million in other vendor expenses annually. Additionally, Waste Connections reinvests substantial amounts of capital into its business on an annual basis to purchase trucks and other investment equipment to construct and expand facilities it owns and operates in the Province. The Ridge is an important landfill site for Waste Connections representing about 25% of the market in Central and Southwestern Ontario with over 200 trucks per day are inbound to the Ridge site. These trucks use local restaurants, purchase fuel locally, employ Ontarians and the facility contributes significantly in taxes and royalties to local governments and communities.

If the Ridge's annual waste disposal rate is maintained at the current level of 1.3 million tonnes, the Ridge's contribution to the Ontario economy will continue. If the Ridge's annual waste disposal rate is maintained Waste Connections has plans to build a gas plant and become a reliable source of renewable gas for decades to come. The gas plant also plays an important role in meeting the objectives of the Province's *Climate Change Action Plan* in the generation of renewable natural gas at the Ridge. The gas plant will cost about $40 million dollars to build. If the Ridge's capacity is eliminated, this gas plant could possibly be built but it would have to be

built on a smaller scale. With economies of scale in the operation of gas plants, a smaller scale plant will have higher per unit costs. Elimination of the Ridge's annual capacity will change the economics of building a gas plant and as such, decrease the likelihood that this gas plant will be built.

Waste Connections has experience in building and operating gas plants. Waste Connections invested over $40 million at the Lachenaie landfill site in Quebec, creating Canada's largest biogas-to-vehicle-fuel-quality project. That site produces enough renewable natural gas to fuel 1,500 trucks over 20 years, offsetting nearly 100,000 tonnes CO2e annually. The site has a similar annual waste disposal rate as the Ridge receiving over 1.2 million tonnes of waste, including food waste, from MSW and IC&I sources. To capture the methane produced from this waste Lachenaie invests over $2 million per year, and has achieved an impressive landfill gas capture efficiency rate above 93%. Lachenaie's 50 or more employees also oversee a variety of yard waste recovery operations while having a positive effect on the local economy. If the Ridge's capacity is maintained and if the gas plant is built, there should be additional positive economic effects on the local Southwestern and Central Ontario.

A gas plant at the Ridge will pay an additional $85,000 a year in local taxes. Currently the Ridge pays just under $350,000 in local taxes. The Ridge paid an annual royalty payment to Chatham-Kent of $2.6 million in 2016 in addition to significant contributions that are made to the Ridge Landfill Trust, which in 2016 were approximately $1.1 million dollars. Waste Connections also provides incentives to Chatham-Kent to reduce the amount of waste residuals delivered to the Ridge with payments averaging over $1.2 million per year. In total, the Ridge contributes over $5 million a year to the local government.

In addition to the above payments, The Ridge also generates direct and indirect benefits to the local community; salaries, goods and services, purchased services, local roads maintenance etc., which amounts to $9 million per year. Furthermore, the expansion of the Ridge capacity and the building of a gas plant will help stimulate the local economy and provide additional environmental benefits to Ontario by recapturing of gas that is currently flared off.

The Ridge services 25% of the disposal capacity of the Southwestern and Central Ontario market. If the Ridge is closed then competition in this market will be significantly reduced. The only other fully integrated provider is Waste Management and if Waste Connections no longer accepted waste at the Ridge, Waste Management will become a monopolist in this market.[7] Monopoly almost always results in higher prices and eliminating the competition from the Ridge will increase the costs of waste disposal in the IC&I sector in Central and Southwestern Ontario. Increasing the cost of doing business will result in a reduction in economic activity in the IC&I sector throughout Central and Southwestern Ontario.

[7] *Even if competition from Walker South Landfill is considered the elimination of the Ridge will leave only two competitors for IC&I waste resulting in a duopoly. Reduction in the number of competitors from 3 to 2 also represents a substantial reduction in competition.*

5. CONCLUSIONS

The data shows that if all of the *Strategy for a Waste Free Ontario* diversion rates for the Ontario IC&I sector are achieved then the Ridge will still be able to successfully supply all of its annual waste disposal rate (i.e., 1.3 million tonnes). If any of the assumptions used in this report turn out to be incorrect, I believe the main conclusions of this report will still hold. Due to the fact that currently around 375,000 tonnes of waste go annually from Ontario to the Brent Run facility in Michigan, as well as about 2.625 million tonnes of Ontario waste being disposed annually at other US landfills (for a total of about 3 million tonnes annually), this provides robustness to the conclusion. For example, if the government is even more successful in diverting IC&I waste, the Ridge will still be able to fulfill and maintain its annual waste disposal rate of 1.3 million tonnes by the diversion to the Ridge, of waste that now goes to the US. This would result in a reduction of trucks to the US further reducing GHG emissions.

If the annual waste disposal rate of the Ridge is renewed the Ridge will continue to be a positive influence on the Ontario economy and if the gas plant is built at the Ridge, this landfill site will have an even more stimulating impact on the Ontario economy.

Attachment D

Data to Support Remaining and Planned Capacities over the Planning Period

Table D-1: Data to Support Remaining and Planned Annual Disposal Rates over the Planning Period

Year	Projected Post-Diversion Residual Waste Quantities* (tonnes)	Existing Approved Annual Waste Disposal Rate (tonnes)	Proposed Annual Waste Disposal Rate for Planned Facilities** (tonnes)	Existing Approved Plus Planned Annual Waste Disposal Rates (excluding Ridge) (tonnes)	Existing Approved Plus Planned Annual Waste Disposal Rates (including Ridge) (tonnes)
2022	4,925,000	3,145,000	2,900,000	4,745,000	6,045,000
2023	4,814,000	3,145,000	2,900,000	4,745,000	6,045,000
2024	4,702,000	1,880,000	2,900,000	3,480,000	4,780,000
2025	4,588,000	1,867,800	2,900,000	3,467,800	4,767,800
2026	4,471,000	1,748,000	3,004,000	3,452,000	4,752,000
2027	4,353,000	1,748,000	3,004,000	3,452,000	4,752,000
2028	4,232,000	1,711,700	3,004,000	3,415,700	4,715,700
2029	4,109,000	311,700	3,004,000	2,015,700	3,315,700
2030	3,985,000	311,700	3,004,000	2,015,700	3,315,700
2031	3,884,000	311,700	3,004,000	2,015,700	3,315,700
2032	3,783,000	311,700	3,004,000	2,015,700	3,315,700
2033	3,687,000	311,700	3,004,000	2,015,700	3,315,700
2034	3,588,000	311,700	3,004,000	2,015,700	3,315,700
2035	3,488,000	285,300	3,004,000	1,989,300	3,289,300
2036	3,385,000	285,300	2,254,000	1,239,300	2,539,300
2037	3,279,000	244,000	2,254,000	1,198,000	2,498,000
2038	3,171,000	244,000	2,254,000	1,198,000	2,498,000
2039	3,061,000	244,000	2,254,000	1,198,000	2,498,000
2040	2,948,000	244,000	2,254,000	1,198,000	2,498,000
2041	2,832,000	244,000	2,254,000	1,198,000	2,498,000

Notes:

* Assumes that the diversion targets set out in the MOECC's Strategy for a Waste-Free Ontario are achieved.

**Includes Walker Environmental - Southwestern Landfill, Ridge Landfill, Terrapure - Stoney Creek and W12A Landfill

Attachment E

Residential Residual Waste Quantity Projections for Chatham-Kent

WASTE CONNECTIONS OF CANADA

Table E-1: Residential Residual Waste Projections with MOECC Diversion Targets for Chatham-Kent

Year No.	Year	Population	TOTAL WASTE GENERATED (tonnes)	DIVERSION RATE (%)	TOTAL WASTE DIVERTED (tonnes)	TOTAL RESIDUAL WASTE REQUIRING DISPOSAL (tonnes)
	2010	**108,000**	**52,000**	**38%**	**20,000**	**32,000**
2010 Average per Capita (kg)			**481**		**185**	**296**
	2011	107,000	52,000	39%	20,000	32,000
	2012	107,000	52,000	39%	20,000	32,000
	2013	106,000	51,000	40%	20,000	31,000
	2014	105,000	51,000	40%	20,000	31,000
	2015	104,000	50,000	40%	20,000	30,000
	2016	104,000	50,000	41%	20,000	30,000
	2017	104,000	50,000	41%	21,000	29,000
	2018	104,000	50,000	42%	21,000	29,000
	2019	104,000	50,000	42%	21,000	29,000
	2020	104,000	50,000	44%	22,000	28,000
	2021	102,000	49,000	46%	22,000	27,000
1	2022	102,000	49,000	47%	23,000	26,000
2	2023	102,000	49,000	49%	24,000	25,000
3	2024	102,000	49,000	50%	25,000	24,000
4	2025	102,000	49,000	52%	25,000	24,000
5	2026	101,000	49,000	54%	26,000	23,000
6	2027	101,000	49,000	55%	27,000	22,000
7	2028	101,000	49,000	57%	28,000	21,000
8	2029	101,000	49,000	58%	29,000	20,000
9	2030	101,000	49,000	60%	29,000	20,000
10	2031	99,000	48,000	61%	29,000	19,000
11	2032	99,000	48,000	62%	30,000	18,000
12	2033	99,000	48,000	63%	30,000	18,000
13	2034	99,000	48,000	64%	31,000	17,000
14	2035	99,000	48,000	65%	31,000	17,000
15	2036	98,000	47,000	66%	31,000	16,000
16	2037	98,000	47,000	67%	31,000	16,000
17	2038	98,000	47,000	68%	32,000	15,000
18	2039	98,000	47,000	69%	32,000	15,000
19	2040	98,000	47,000	70%	33,000	14,000
20	2041	96,000	46,000	71%	33,000	13,000

NOTES:

Generated #'s *: Based on 2010 Statistics Canada Waste Management Survey data.*

Diverted #'s *: Waste Free Ontario Act Strategy (Feb. 2017) sets overall diversion goals of 30% by 2020, 50% by 2030 and 80% by 2050. RPRA residential diversion rates from 2009*

Disposal #'s *: Generated minus Diverted*

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