

## Document 2

# Use of Private Landfills – Explanatory Note for Distance, GHG and Asset Value Calculations

### 1.0 Background

The City of Ottawa is looking to use private landfills to divert up to 60,000 tonnes, or approximately one-third of residential garbage, to private landfills.

The City of Ottawa has two viable options for use starting in 2026 – Waste Management’s West Carleton Environmental Center and Transfer station located at 2301 Carp Road, in the west end, and GFL’s Transfer Station located at 211 Corduroy Road in the east end in conjunction with the Moose Creek Landfill located at 17125 Lafleche Rd, Moose Creek.

### 2.0 The Potential for Avoided Distances Travelled

#### 2.1 West End Distance Comparison

From 2018 to 2021, an average of 35,000 tonnes of residential garbage was collected every two weeks from Zones 1 and 2 in the west end of the city and hauled to the Trail Waste Facility. Under the current collection contract, residential garbage is collected bi-weekly on Monday, Tuesday and Wednesday in these zones. To quantify the impact of diverting garbage to the West Carleton Environmental Center from Trail Waste Facility, a midpoint was selected for each of the collection days based on current collection routes. The distance from the midpoint to WCEC and to the Trail Waste Landfill Facility was calculated to determine potential distances avoided. Note this is a very conservative estimate as it does not take into consideration the return trip of the truck to the next collection route, as this is not yet known.

*Table 1 - West End Potential for Avoided Kilometers Traveled*

Day	Distance to Trail Waste Facility (km/week)	Distance to WCEC (km/week)	Avoided Distance (km/week)
Monday	57	24.9	32.1
Tuesday	46.7	20.7	26

Wednesday	30	4	26
Total	133.7	49.6	84.1

There is the potential to avoid conservatively at least 2,200 km per year by transporting 30,000 tonnes of garbage to the West Carleton Environmental Center instead of to the Trail Road Facility Landfill.

## 2.2 East End Distance Comparison

From 2018 to 2021, an average of 33,000 tonnes of residential garbage was collected every two weeks from Zones 4 and 5 in the east end of the city and hauled to Trail Waste Facility. Under the current contract, residential garbage is collected bi-weekly in these two zones on Wednesday, Thursday and Friday. To quantify the impact of diverting garbage to the GFL Transfer Station from Trail, a midpoint was selected for each of the collection days based on current collection routes. The distance from the midpoint to the GFL Transfer Station and to the Trail Waste Landfill Facility was calculated to determine potential distances avoided.

*Table 2: East End Diversion Potential*

Day	Distance to TWFL (km)	Distance to GFL Transfer (km)	Savings (km)
Monday	47.1	25.3	21.8
Tuesday	47.2	24.1	23.1
Wednesday	62.2	16.9	45.3
Total	156.5	66.3	90.2

Different from the west end scenario above, the garbage from the GFL Transfer Station must be taken by transfer trailer to GFL's Moose Creek Landfill. Transfer trailers typically hold between 40,000 and 50,000 tonnes of residential waste. The distance from the GFL Transfer Station to the Moose Creek Landfill is 35.4 kilometers. By diverting 30,000 tonnes from the Trail Waste Facility Landfill by transporting it to the GFL Transfer Station and then onto the Moose Creek Landfill - there is a potential to

reduce the truck traveling distance by 54.8 kilometers per collection week to Trail and over 1,400 kilometers per year over the term of the contract. To reiterate, this is a conservative estimate as it does not take into consideration the return trip of the truck to the next collection route, as this is not yet known.

### 2.3 Summary

In diverting 60,000 tonnes per year of garbage from Trail Waste Facility Landfill by using the WCEC and the GFL facilities there is the conservative potential to avoid a full garbage truck traveling 3,600 kms per year. To put this into perspective, to divert one-third of the garbage sent to the Trail Waste Facility Landfill, there is the potential to reduce trucks traveling the distance it would take to get to Calgary from Ottawa, each year.

### 3.0 Potential GHG Emission Reductions from Transportation

GHG Emissions were calculated using the Government of Canada's [Greenhouse Gas Calculator for Organic Waste Management](#). From the accompanying [Methodology Report](#):

“2.4.2. Transportation-Related GHG Emissions GHGs are emitted through the combustion of fossil fuels during the collection and transportation of waste from source locations to management facilities, and through transportation of waste management products (e.g. compost, digestate) to final end use (e.g. land application). The fuel efficiency of an average diesel-powered waste transportation vehicle was assumed to be 0.0358 L of diesel per tonne of waste transported over one kilometer (0.0358 L/ tonne-km) (EarthShift, 2020, p. 119). The carbon intensity of diesel vehicle fuel was assumed to be 3.663 kg CO<sub>2</sub>eq/L of diesel (calculated above). The emission factor associated with the transportation of all waste types was calculated as follows:

$$\begin{aligned} \text{Transportation emission factor} &= \text{Fuel efficiency (L/tonne-km)} \times \text{GHG emission factor for diesel (kg CO}_2\text{ eq/L)} \\ &= 0.0358 \text{ L/ tonne-km} \times 3.663 \text{ kg CO}_2\text{eq/L} \\ &= 0.131 \text{ kg CO}_2\text{eq/tonne-km} \end{aligned}$$

Users have the option to enter their own travel distance to calculate total emissions for each scenario.”

### 3.1 West and East End Potential GHG Emissions Reductions

The Government of Canada's [Greenhouse Gas Calculator for Organic Waste Management](#) was used to calculate the potential GHG emissions impact of diverting

30,000 tonnes of waste from the Trail Waste Facility Landfill to WCEC over the seven-year life of the contract.

*Table 3: Potential GHG Impact using WCEC over seven years (in tonnes of CO2 eq)*

<b>GHG emissions to TWFL</b>	<b>GHG emissions to WCEC</b>	<b>Reduction in GHG emissions</b>
2097	118	-1319

The GHG impact of using both the transfer station and the Moose Creek Landfill were calculated using the same methodology as above.

*Table 4: Potential GHG Impact Using GFL over seven years (in tonnes of CO2 eq)*

GHG emissions to TWFL	GHG emissions to WCEC	Reduction in GHG emissions
2454	1595	-859

There is the potential to reduce GHG from the transportation of the garbage by a minimum of 2,178 CO2 Equivalents.

### **3.2 Summary**

By using the two private landfills the City could reduce GHG emissions from transportation by a total of 2,178 tonnes of CO2 equivalent over the 7-year life of the contract. The [Natural Resources Canada Greenhouse Gas Equivalencies Calculator](#) equates this reduction to the equivalent of 667 passenger vehicles or the same as the electricity to power 1,456 homes.

### **4.0 Asset Value**

In addition, diverting waste away from the Trail Waste Facility Landfill preserves airspace. Quantifying airspace is complex as the asset value is an estimate based on a snapshot in time. It would not be accurate to assume or account for variables in the future such as waste composition, settling, rate of decomposition, soil cover usage, or operational constraints reducing optimization which will introduce variability into any number in future estimations.

However, the most direct way to calculate it is as follows:

$(X \text{ m}^3 \text{ airspace}) * (Y \text{ tonnes/m}^3 \text{ density}) * (\$130/\text{tonne}^*)$

Where  $x = 60,000 \text{ m}^3$ ,  $y = 0.75 \text{ tonnes/m}^3$

\*- \$130 is the rate for tipping garbage and the Trail Waste Facility Landfill

Based on this calculation, the City would preserve an estimated \$5,850,000 in asset value each year of the contract.