

### Options Analysis

The organic waste collected by the City is generally distributed to three main processing facilities at the Edmonton Waste Management Centre (EWMC) based on the type of waste. Grass, leaf and yard waste is sent to the Compost Cure Site, food scraps are sent to third-party processors, and organic waste separated from garbage is sent to the High Solids Anaerobic Processing Facility (HSADF). Separating organic waste from garbage is limited to apartment and condo collection service, and will be phased out entirely in 2027 after three-stream sorting is available in all apartment and condo buildings.

Combinations of different waste processing facilities, methods and volumes were assessed and coordinated into program options designed to process 121,000 tonnes of source-separated organic waste by 2027. Categories of program options initially assessed by Administration explored building new composting sites, contracting out organics processing to third-parties and investing into the HSADF to improve its performance. After internal analysis, Administration hired a third-party consultant to review the options analysis and provide further guidance, narrowing the viable options to two:

#### Program Option 1 - Constructing a new City-owned organics processing site

Option 1 moves away from active anaerobic digestion at the HSADF and builds a new outdoor composting site at the EWMC, similar to the existing static aerated concrete pad operating at the Compost Cure Site. The current concrete pad at the Compost Cure Site breaks down organic waste on an aerated, temperature-monitored platform using tarps to cover organic waste, controlling odour and speeding up its decomposition. However, these tarps freeze to the surface in colder temperatures and this 20-year-old facility can only be used in warmer months. A new composting site would use similar technology, but include concrete bunkers with elevated walls. In these sites, tarps slide on rails on the walls, allowing the tarps to move freely over organic waste and compost waste year-round. This type of facility is the most common type of composting facility in North America, and has been used successfully in colder climates and other Canadian municipalities for many years.

Option 1 maintains an existing balance with third-party processors. Eight new composting bunkers would be constructed on the former site of the Edmonton Composting Facility (ECF) Aeration Hall, located next to the HSADF. Construction of these new composting sites is modular and scalable to future operational and financial needs.

The earliest projected completion date of these facilities is 2028. Demolition and detailed design would last until 2026, after which construction could begin. However, this timeline would lead to a gap where organic waste collected would not be processed due to a lack of processing capacity, so medium-term processing contracts must be procured to bridge organics processing until a new composting site is built. Construction of a new composting site in this scenario would be deferred to coincide with the end of processing contracts.

In Option 1, Waste Services would likely repurpose most of the HSADF infrastructure (including the main Mixing Hall and Scrubber Building structures) to support operations at the new composting site. The procurement of medium-term third-party processing contracts will provide Administration time to research all potential alternative uses for the HSADF assets in order to maximize their value.

### Program Option 2 - Increasing reliance on third-party organic waste processing

Option 2 shifts the balance of organics processing to third-party processors and moves away from active anaerobic digestion at the HSADF. Existing facilities at the Compost Cure Site would continue being used, but no new City-owned infrastructure would be constructed. Instead, long-term agreements would be needed to encourage third-party processors to develop new capital projects and increase the organics processing capacity in northern Alberta.

In Option 2, the transfer of organics processing responsibility to third-party processors would reduce the amount of capacity required and the need for facilities at the EWMC. In this scenario, Waste Services would explore making HSADF infrastructure available to the private sector on an as-is basis and seek a long-term, revenue-generating agreement in return.

### **Program Evaluation Methodology**

All of the program options meet the requirement of processing 121,000 tonnes of source-separated organic waste by 2027 and have the same primary environmental impact of diverting organic waste from landfill. The evaluated variables relate to impacts beyond standard waste diversion metrics.

- Program Outcomes (45 per cent)
  - Accommodation (10 per cent)
    - Overall balance between City and third-party owned processing facilities

- Overall increase in number and types of organics processing facilities added to the Edmonton region
- Risk (15 per cent)
  - Construction risks associated with building facilities before 2028
  - Initial and long-term regulatory risks associated with constructing and operating organics processing facilities
- Environmental Outcomes (20 per cent)
  - Environmental releases generated through organics processing, including GHG, odour and other emissions impacting air quality
  - Contribution to the City's carbon budget goals
- Financial Impact (55 per cent)
  - Calculated as a net present value (NPV) of all operating and capital costs associated with processing the waste through any combination of in-house or third-party processors for each option.

### Program Outcomes

#### Accommodation

##### Balance between City and contractor-owned processing

Prior to 2019, the ECF was the primary processing facility for organic waste in the City of Edmonton, with a yearly capacity of 130,000 tonnes. When the ECF was decommissioned, the amount of organic waste needing to be processed significantly exceeded the available capacity at the EWMC. While procuring temporary organics processing capacity, and before building what would have been a replacement anaerobic digestion facility, Administration learned that long-term and lower-cost processing capacity was available from third-parties. This led to the approval and operation of an organics processing program that distributes tonnage to both City and third-party facilities.

Implementing a program that balances City and third-party operations has several benefits. Having access to several different processing facilities at multiple locations minimizes the risk of any single facility failure to the overall program, as was experienced with the sudden closure of the ECF. The City is also able to compare its operations and facilities with third-party processors to improve efficiency and reduce costs. This division between City and third-party processing also prevents third-parties from obtaining too much influence over the regional organics processing market, and helps manage future contract costs to ratepayers.

All program options include both City and third-party facilities, but lower scores assigned to each option reflect an over-reliance on either City or third-party processing. Option 1 most closely approaches an equal division of processing responsibility and scores higher.

### Overall increase in the number and types of organic processing facilities added to the Edmonton region

The 25-year Waste Strategy has changed the composition of organic waste arriving at the EWMC, with multiple program changes increasing the quality and reducing contamination of food scraps and yard waste. By 2027, most organic waste will be sorted by residents into food scraps containers at home and set out for collection or dropped off at an Eco Station. If paired appropriately, waste from residential collection or waste drop-off services can be transported to a processing facility that is most suited to the particular characteristics of that waste stream. Some processing facilities may be better suited to certain types of organic waste like grass, leaf and yard waste, or food scraps, and having a variety of facilities available can improve the efficiency and operating cost of the overall program.

A lack of regional processing capacity for Industrial, Commercial and Institutional (ICI) organic waste was identified as a barrier by the Edmonton Metropolitan Region Board in their January 2024 *Current State Analysis of Regional Organics Report*<sup>1</sup>. Due to the size of Edmonton's population, the City is positioned to serve as an anchor tenant for third-party facilities, providing a minimum level of guaranteed tonnage (about half of any facility's capacity), facilitating new construction and long-term financial viability for third-party processors. A co-benefit of this criterion is that additional capacity resulting from these new facilities could provide new diversion opportunities for ICI organic waste.

Option 2 scores higher in this area, as the City's reduced internal organics processing capacity would promote more third-party construction of new facilities, building and distributing new capacity across Northern Alberta.

### **Implementation Risk**

#### Construction Risk

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<sup>1</sup> Edmonton Metropolitan Region Board. [Current State Analysis of Regional Organics Report](#). February 9, 2024.

## Attachment 1

In Option 1, Waste Services would build a new composting site. Acquiring new interim third-party processing contracts before 2027 means a new composting site would not need to be designed and constructed immediately. The proposed design of these composting facilities is well-established, and would be constructed on existing brownfield land owned by the City. The additional time before construction would begin means design would not have to be rushed and reduces risk.

Option 2 does not require the City to construct or upgrade any new facilities and has no construction risk.

### Regulatory Risk

All organic waste processing facilities in Alberta need permits from Alberta Environment and Protected Areas (AEPA), the provincial regulator. Each facility has specific requirements to meet depending on the type of processing occurring at the location (e.g. aerobic vs. anaerobic processing) and other secondary aspects. If a processing facility is not meeting its permit, the regulator has the option of requiring improvements, procedural changes or revoking its permit to operate.

Program options that shift processing responsibility from the City to third-parties minimize direct regulatory risk to the City. Options 1 and 2 both use established organics processing technology in Alberta, and there are fewer regulatory requirements and risks to these simpler organics processing methods. However, Option 2 scores the highest, as more tonnage is transported off City-owned property reducing direct regulatory compliance risk to the City.

## **Environment**

### Air quality and odour impact

Both options would result in similar new outdoor composting facilities being constructed, with comparable odours and emissions. Option 2 scores slightly better as more waste would be processed outside the City's boundaries, reducing odour impacts to Edmontonians.

### Carbon budgeting impact

All program options have an equal amount of organic waste being processed and stabilized by controlled methods, leading to similar amounts of carbon emissions between options. However, program options that include additional long-haul transport of organic waste create significant additional carbon emissions. The

options were assessed scores based on the amount of organic waste that needs to be delivered to third-party processors (and its corresponding carbon footprint) versus being processed at the EWMC. Option 1 scores higher, as concentrating organic waste processing at City facilities reduces the environmental impact of transporting waste to third-party facilities.

**Summary**

The assessed outcome (and associated score on a scale from 1 to 5, with 1 being poor and 5 being excellent) of each program option is shown below. The overall categories retain the weightings used in previous organics processing analyses, as the overall approach and methodology used to evaluate organics processing options has remained consistent in the 25-year Waste Strategy.

Category	Weight	Impact/risk	Option 1	Option 2
<b>Accommodation</b>	<b>10%</b>	City/contractor processing balance	5	3
		Increase in number and type of facilities	4	5
<b>Implementation Risk</b>	<b>15%</b>	Construction risk	3	5
		Regulatory risk	4	5
<b>Environment</b>	<b>20%</b>	Air quality and odour impact	3	4
		Carbon budgeting impact	4	1
<b>Weighted Subtotal</b>	<b>45%</b>		33.5	33

**Financial Impact**

The financial impact (55 per cent of the overall analysis) of each program option was conducted using a net present value (NPV) calculation over a 20-year timeline. 20 years was chosen based on the average lifetime of composting facilities using both aerobic and anaerobic technology. This analysis included any capital investments, and operating, contracting, labour and staffing, and transportation costs in each option, as well as GHG credits. Some components included in the financial analysis are:

- Capital investments
  - New capital investments required to achieve program option outcomes (i.e. new composting facilities, HSADF upgrades)
  - Approved capital investments to maintain current service levels (i.e. Compost Cure Site resurfacing)
  - New mobile equipment to replace aging assets
- Operational costs
  - Cost to operate and maintain City-owned facilities (HSADF, Compost Cure Site), including utilities
  - Mobile equipment fleet operating costs
- Contracting costs
  - Using current cost per tonne rates paid by the City, extrapolated to future years
- Labour and staffing
  - Full Time Equivalent positions (FTEs) required to support the day-to-day organics processing operations of each program option
  - Overhead FTEs required to support general processing operations within Waste Services
- Transportation
  - Costs to move organic waste from the EWMC to third-party processors, including fuel, fleet maintenance and long-haul trucks, calculated using 2022 actuals reflecting the current combination of processing facilities
- Credits/Revenues
  - Credits will be realized annually for GHG credits related to emission offset values
  - Salvage value realized on the sale of the HSADF combined heat and power units

Option 1 reduces the financial burden of the HSADF on the organics processing program by transitioning waste processing to lower-cost Waste Services composting facilities. Option 2 also reduces costs to the organics processing program by transitioning processing to lower-cost, third-party processors, but incurs higher operational costs through transporting more organic waste. However, both options significantly reduce the operating costs of the organics processing program over a 20-year lifecycle.

When the NPVs were adapted in the scoring analysis, the results were as follows:

## Attachment 1

Category	Weight	Modified Status Quo	Option 1	Option 2
<b>Net Present Value (cost over 20 years)</b>	n/a	-\$261.91 million	\$-185.59 million	-\$190.47 million
<b>Net Present Value (score)</b>	<b>55%</b>	39	55	53.6

### Analysis Summary

Both organics processing program options represent an improvement on the current status quo program, aligning with the 25-year Waste Strategy, corporate climate goals and encouraging long-term financial sustainability for both the City and ratepayers. Option 1 uses established technology constructed on City-owned land to compost increasing amounts of organic waste. The preservation of the current City and third-party organics processing balance carries slightly greater operational risk to the City, but this risk is outweighed by the long-term environmental and financial benefits of providing internal organics processing capacity to the City and Edmontonians.

Category	Weight	Modified Status Quo	Option 1	Option 2
<b>Program Outcomes</b>	<b>45%</b>	27.5	33.5	33
<b>Financial Impact</b>	<b>55%</b>	39	55	53.6
<b>Total</b>	<b>100%</b>	66.5	88.5	86.6