

Essex-Windsor Solid Waste Authority

Logistics and Transfer of Regional Solid Waste and Source Separated Organics: Review and Strategic Plan

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Glossary

There are numerous organizational bodies and geographic locations referred to throughout this document. The following terms are specifically noted for clarity. A list of terms and acronyms are provided below.

- **The Authority** refers to the Essex-Windsor Solid Waste Authority;
- **The City** refers to the Corporation of the City of Windsor;
- **The County** refers to the Corporation of the County of Essex;
- **The County Municipalities** refers to the seven municipalities that comprise the County;
- **Essex-Windsor** refers to the geographic area of the City and the County.

Acronym or Term	Definition
<i>Organizations and Locations</i>	
The Authority	Essex-Windsor Solid Waste Authority
The County	County of Essex
The County Municipalities	The seven municipalities that comprise the County and include Essex, Kingsville, Amherstburg, Tecumseh, Leamington, LaSalle and Lakeshore.
The City	City of Windsor
Essex	Town of Essex
Kingsville	Town of Kingsville
Amherstburg	Town of Amherstburg
Tecumseh	Town of Tecumseh
Leamington	Municipality of Leamington
LaSalle	Town of LaSalle
Lakeshore	Municipality of Lakeshore
Essex-Windsor	The geographic region of Essex-Windsor
Seacliff	Seacliff Energy Corporation
Seacliff Facility	The SSO processing facility owned and operated by Seacliff
Transfer Station 1	The garbage transfer station located at Transfer Station Site #1 in Windsor.
Transfer Station Site #1	The waste management site located at 3540 North Service Road, City of Windsor. The site includes several different waste management facilities and other buildings.
Transfer Station 2	The garbage transfer station located at Transfer Station Site #2 in Kingsville.
Transfer Station Site #2	The waste management site located at 2021 County Road 31, Town of Kingsville.

Acronym or Term	Definition
<i>Technical and Other Terms</i>	
Bi-weekly	Refers to waste collection that occurs every other week; typically used in this report for describing frequency of recycling collection.
EOW	Refers to every-other-week garbage collection.
GHG	Greenhouse Gas. Greenhouse gases refer to gases in the atmosphere that absorb heat radiated from earth. Key contributors to greenhouse gasses are the combustion of fossil fuels (such as in garbage trucks or by electricity-generating stations) and the release of methane from decomposing organics in landfills.
Hauling	Transporting waste to or from transfer stations or other points of waste aggregation to another location, such as the landfill or composting facility
MTCO2E	Metric tons of carbon dioxide equivalent. The unit "CO2e" represents an amount of a Greenhouse Gasses (GHG) whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas.
SSO	Source Separated Organics
Transfer	The receiving, consolidating and handling of waste at transfer stations.

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1. Introduction

The Essex-Windsor Solid Waste Authority (the Authority) was established in 1994 by the County of Essex (the County) and City of Windsor (the City). It is the municipal agency responsible for providing integrated waste management services for the City and the County, which includes the County Municipalities (i.e., the Town of Essex, Town of Kingsville, Town of Amherstburg, Town of Tecumseh, Municipality of Leamington, Town of LaSalle and Municipality of Lakeshore).

Starting in 2025, new provincial policy will require several municipalities in the geographic region of Essex County and the City of Windsor (Essex-Windsor) to implement organic waste diversion programs and achieve specific reduction and recovery goals. In response, Essex County Council resolved on March 16, 2022, that all County municipalities participate in a regional solution for the collection and processing of organic waste. In anticipation of this new program, the Authority Board, on August 10, 2022, authorized the Chair and General Manager to execute a contract with Seaclyff Energy Corp (Seaclyff) to provide organic waste processing services for Essex-Windsor starting in 2025.

Additionally, on June 15, 2022, Essex County Council directed their administrative staff to work with the Authority to prepare a report on potential cost savings that might be realized by transferring the management of residential garbage collection from the County Municipalities to the Authority.

This report provides recommendations for the development of an organic waste collection program and a potential regional garbage collection system. It includes a review of the existing waste management logistics and transfer infrastructure operated by the Authority and its member municipalities and identifies the optimal scenario to maximize efficiencies and minimize long-term operating costs related to collection and transfer of organic and solid non-hazardous waste within Essex-Windsor. The report has been structured to provide the necessary contextual information to support a guided discussion on the regulatory frameworks, policy practices and operational considerations of managing source-separated organics and garbage.

2. Current Collection System

The following section describes the current collection system and transfer infrastructure operated by the Authority and the municipalities within Essex-Windsor.

2.1. System Infrastructure

The Authority operates several key assets located strategically at three sites across Essex-Windsor. The three sites are summarized below in Table 1 and discussed in the paragraphs that follow.

Table 1: Authority Waste Management Sites and their Facilities

Site and Available Facilities	Address	Curbside Garbage Collection Areas	Activities
Transfer Station Site #1 <ul style="list-style-type: none"> • Transfer Station 1 • Material Recovery Facility (MRF)- Fibre • Material Recovery Facility (MRF)-Container • Public Drop-off Depot • Municipal Hazardous and Special Waste (MHSW) Depot 	3540 North Service Road East, Windsor 3560 North Service Road East	Windsor, Tecumseh and Lakeshore	<ul style="list-style-type: none"> • Post-collection Blue Box processing • Post-collection garbage consolidation and transfer • Small business and residential solid waste drop-off facilities
Transfer Station Site #2 <ul style="list-style-type: none"> • Transfer Station 2 • Compost Facility • Public Drop-off Depot • MHSW Depot 	2021 County Road 31, Town of Kingsville	Leamington and Kingsville	<ul style="list-style-type: none"> • Compost processing facility • Small business and residential solid waste drop-off depot
Regional Landfill <ul style="list-style-type: none"> • Essex-Windsor Regional Landfill • Regional Compost Facility • Regional Recycling Depot • MHSW Depot 	7700 County Road 18, Essex	Essex, Amherstburg and LaSalle	<ul style="list-style-type: none"> • Regional compost processing facility; Public Drop-off Depot to divert waste materials from Regional Landfill

2.1.1. Transfer Station Site #1 in Windsor

Transfer Station Site #1 covers an area of 8.8 hectares and is located at 3540 and 3560 North Service Road East, Windsor. There are five waste management facilities located at Transfer Station Site #1 (see Figure 1), and they include:

- Transfer Station 1;
- Fibre Material Recovery Facility (MRF);

- Container MRF;
- Public Drop-off Depot; and
- Municipal Hazardous and Special Waste (MHSW) Depot.

The site also includes a leaf and yard waste receiving area, the City's Public Works offices and a salt dome.

Of these facilities, the Authority owns the two MRF buildings. One MRF processes fibre materials and the other processes container recyclables. These MRF's are located adjacent to each other at the northeastern part of the property. They are situated on a 'mixed use' property that is owned by the City. The south portion of the Fiber MRF houses the Authority's Waste Diversion staff, who oversee most of this site's operations.

Several other waste diversion programs are also provided on site, including:

- The Public Drop-off Depot includes an elevated saw tooth bunker system that is used for the residential and small business drop-off of garbage, blue box recyclables, metals, white goods, textiles, bikes and tires.
- The MHSW Depot is located along the north side of the public drop-off area.
- The yard waste pad is located along the south end of the property, where materials such as yard waste, electronics, railroad ties, and plastic flowerpots can be dropped off. Customers can also purchase the Authority's 'Garden Gold Compost' at this location.



Figure 1: Transfer Station Site #1

2.1.2. Transfer Station Site #2 in Kingsville

Transfer Station Site #2 is located at 2021 County Road 31, Town of Kingsville. There are four waste management facilities located at Transfer Station Site #2 (see Figure 2), and they include:

- Transfer Station 2;
- Compost facility (with yard waste drop-off pad);
- Public Drop-off Depot; and
- Municipal Hazardous and Special Waste (MHSW) Depot.

The site operates as a staffed, self-serve public facility where residents and small businesses can drop-off garbage, MHSW, electronics, yard waste, scrap metal, white goods, tires, bikes and Blue Box recyclables.

Curbside-collected waste from Leamington and Kingsville are delivered here to Transfer Station 2, where the waste is consolidated and then delivered to the Regional Landfill. The site also includes the compost facility, which processes the organics delivered to the site and produces Garden Gold Compost.



Figure 2: Transfer Station Site #2

2.1.3. Regional Landfill Site in Essex

The Regional Landfill site is located at 7700 County Road 18 in Essex and was opened on July 2, 1997. It is owned by the Authority and operated by Authority staff. The Regional Landfill is 123 hectares in size with a waste footprint of 58 hectares. The Regional Landfill site includes the following waste management facilities:

- Essex-Windsor Regional Landfill;
- Regional Compost Facility;
- Regional Recycling Depot; and
- MHSW Depot.

The landfill receives garbage from the residential and the industrial, commercial and institutional (ICI) sectors. The site is licensed by the Ontario Ministry of Environment, Conservation and Parks (MECP) and operates under Approval No. A-011101 (September 28, 1995).

The Authority also operates a Regional Recycling Depot on this site to divert materials such as white goods, blue box recyclables, electronics, MHSW, scrap metal, tires, and yard waste from the landfill.

The Regional Landfill site also includes the Regional Compost Facility, which processes yard waste delivered to the Regional Landfill from the City and the County Municipalities and other

customers, to produce a saleable end-product (i.e., Garden Gold Compost).

The Regional Landfill site is depicted in the following figure.



Figure 3: Regional Landfill Site

2.2. Curbside Collection

Currently, each of Essex-Windsor's eight local municipalities are responsible for providing curbside garbage collection services to its residents, and each municipality contracts Green for Life Inc (GFL) to provide these services. The City has also contracted with GFL to provide curbside recycling services to its residents, while the Authority has contracted with the City to provide curbside recycling services to the County Municipalities. GFL also provides yard waste and special pickups for the City and the County Municipalities through direct contract with each municipality. Table 2 summarizes the waste collection frequency for each municipality and their respective contract dates.

Collected garbage is received by the Authority at its existing garbage transfer stations and/or directly at the Regional Landfill. Garbage delivered to the Authority's transfer stations is consolidated and then hauled to the Regional Landfill for disposal. Transfer hauling is done by a private contractor, under contract with the Authority. Blue Box recyclable materials, collected at the curb or at the Authority's Public Drop-off sites, are delivered to the Authority's MRFs at 3560 and 3580 North Service Road in Windsor, where they are processed and sold to market from this site.

In addition, the County Municipalities and the City collect yard waste; the yard waste is either hauled direct to the Regional Landfill or it is delivered to the Transfer Station Site #1 (Windsor), where it is later ground and hauled to the Regional Landfill for composting. The Authority expects this system to continue and yard waste collection to remain as-is, regardless of the implementation of a Source Separated Organics (SSO) collection program. The annual yard waste quantities managed from the County Municipalities and the City is presented in Table 3.

Table 2: Municipalities – Residential Waste Collection Frequency and Contract Dates

Municipality	Pop.	Waste Collection System	Garbage	Recyclables	Yard Waste	Contract dates
City of Windsor	229,660	9 zones	Weekly	Bi-weekly	3 spring collections 4 summer collections 5 fall collections 1 winter collection.	18 Nov 2017 to Nov 30, 2024
Lakeshore	40,410	3 zones	Weekly – 1 zone per day	Bi-weekly – 2 separate days	Bi-weekly (April – Dec.)	19 Jan 2021- 31 Dec 2021 extended Dec 2023
LaSalle	37,721	2 zones	Weekly – 1 zone per day	Bi-weekly - 2 separate days	Bi-weekly (April – Nov.)	1 Jan 2023 - 31 Dec 2027
Leamington	29,680	4 zones	Weekly – 4 separate days, 1 zone per day	Bi-weekly- 2 separate days	Bi-weekly, 2 separate days, 2 zones per day (April – Nov.)	1 Jan 2022 - 31 Dec 2026
Amherstburg	23,524	4 zones	Weekly – 4 separate days, 1 zone per day	Bi-weekly	Bi-weekly (April – Nov.)	1 Apr 2017 - 31 Mar 2027
Tecumseh	23,300	1 zone	Weekly	Bi-weekly	Bi-weekly (April – Nov.)	1 Feb 2017 - 31 Jan 2022 extended
Kingsville	22,119	2 zones	Weekly – 1 zone per day	Bi-weekly	Bi-weekly (April – Nov.)	1 Jan 2021 - 31 Dec 2026
Essex	21,216	2 zones	Weekly – 1 zone per day	Bi-weekly	Bi-weekly (April – Nov.)	2 May 2022 - 1 May 2024

Table 3: Curbside Yard Waste Collection (2022)

Municipality	Drop Off Location	Yard Waste Collected (2022) (annual tonnes)
City of Windsor	• Transfer Station Site #1	6,323
	• Regional Landfill	
Lakeshore	• Transfer Station Site #1	1,567
LaSalle	• Regional Landfill	1,365
Leamington	• Transfer Station Site #2	1,250
Amherstburg	• Regional Landfill	1,298
Tecumseh	• Transfer Station Site #1	2,225
Kingsville	• Transfer Station Site #2	961
	• Regional Landfill	
Essex	• Regional Landfill	885

2.3. Residential Garbage Quantities

Table 4 presents a summary of the amount of residential garbage collected by the Authority in 2021. Based on the table below, Transfer Station 1 initially received about 67% of the residential garbage in 2021, with the remaining 9% and 23% received at Transfer Station 2 and the Regional Landfill, respectively.

Table 4: Residential Garbage Collection and Transfer Location (2021)

Municipality	Garbage Received at Transfer Station 1 (annual tonnes)	Garbage Received at Transfer Station 2 (annual tonnes)	Garbage Received at Regional Landfill (annual tonnes)	Total Garbage Collected (annual tonnes)
Windsor	57,887	-	-	57,887
Tecumseh	5,559	-	537	6,096
Lakeshore	11,961	-	77	12,038
Kingsville	-	3,456	2,750	6,206
Leamington	-	6,928	-	6,928
Amherstburg	-	-	7,418	7,418
LaSalle	-	-	9,210	9,210
Essex	-	-	6,270	6,270
Total	75,407	10,384	26,262	112,053
Percent of Total Collected	67%	9%	23%	100%

3. Provincial Policy Considerations

Ontario's regulatory environment associated with waste management has changed significantly in recent years due to a range of Provincial environmental policies. The introduction of the Food and Organic Waste Framework and new 'Blue Box' regulation will have a significant impact on the Authority and its municipalities' integrated waste management system.

3.1. Food and Organic Waste Framework

Ontario's Food and Organic Waste Framework (the Framework) was developed as a key component of the Province's Strategy for a Waste Free Ontario. The associated Policy Statement, issued pursuant to Section 11 of the RRCEA (2016), sets out specific obligations and targets for the diversion of food and organic waste from various persons or entities including certain municipalities, industrial and commercial facilities, multi-unit residential buildings, educational institutions and hospitals. These policy requirements have varying impacts on the eight local municipalities with respect to the collection of organics, including:

- The City of Windsor will be required to:
 - Provide curbside collection of food and organic waste to single family dwellings in urban settlement areas; and,
 - Achieve a target rate of 70% waste reduction and resource recovery of food and organic waste generated by single-family dwellings in urban settlement areas by 2025.
- Amherstburg, LaSalle, Leamington and Tecumseh will be required to:
 - Provide collection of food and organic waste to single family dwellings in an urban settlement area (the required collection services can be provided either through provision of a public drop-off depot, community composting area or curbside collection); and,
 - Achieve a target rate of 50% waste reduction and resource recovery of food and organic waste generated by single-family dwellings in urban settlement areas by 2025.
- Essex, Kingsville and Lakeshore:
 - At this time, are not required to achieve target rates of reduction for food and organic waste, as their population and population densities do not meet the thresholds for inclusion in the relevant Framework policies.

In response, Essex County Council resolved, on March 16, 2022, that all County Municipalities participate in a regional solution for the collection and processing of organic waste. The resolution included collection - at a minimum - from urban settlement areas, with start of the program intended to be timed with the end date of each individual municipality's waste collection contract. In anticipation of this new program, on August 10, 2022, the Authority Board authorized the Chair and General Manager to execute a contract with Seaclyff Energy Corp (Seaclyff) to provide organic waste processing services for Essex-Windsor starting in early 2025.

It should also be noted that framework includes a commitment by the Province to ban food and organic waste from landfill. The ban was originally scheduled to be implemented in 2025, but the Province's *A Made-in-Ontario Environment Plan* includes a target date of 2030¹.

About Urban Settlement Areas

The use of the term "urban settlement areas" is used in both the Province's Framework and in the County's March 16, 2022 Council resolution. However, the County's Official Plan (OP) does not include a definition for urban settlement areas.

The Province's Framework defines "urban settlement areas" as "urban areas within municipalities (such as cities, towns, and villages) that are built up areas where development is concentrated and which have a mix of land uses."

While the County's OP does not use that same term, it does include the following related definitions:

- **Settlement area(s)** means Primary Settlement Areas and Secondary Settlement Areas as depicted on Schedules "A1" and "A2" of the OP (such as cities, towns, villages and hamlets) that are:
 - a) Built-up areas where development is concentrated and which have a mix of land uses; and
 - b) Lands which have been designated in an Official Plan for development over the long-term planning horizon. In cases where land in designated growth areas is not available, the "Settlement Area" may be no larger than the area where development is concentrated.
- **Primary Settlement Area** means "Settlement Areas" identified on Schedule "A2" of the OP that are focal areas of public investment as well as a concentration of commercial, recreational, cultural and entertainment uses that accommodate a significant share of population and employment growth. Urban growth centres have compact built form, transit infrastructure and serve as high density major employment centres.
- **Secondary Settlement Area** means "Settlement Areas" identified on Schedule "A2" of the OP that are intended to develop within their existing boundaries as of the date of approval of the OP.

For the purpose of this discussion, it is assumed that the term "urban settlement areas" as used in the Province's Framework and in the County resolution is synonymous with the OP's term "Primary Settlement Area." Figure 4 depicts the location of Primary Settlement Areas and Secondary Settlement Areas across the County.

¹ Ministry of the Environment, Conservation and Parks. *A Made-in-Ontario Environment Plan*. <https://www.ontario.ca/page/made-in-ontario-environment-plan#section-1>. September 20, 2022.

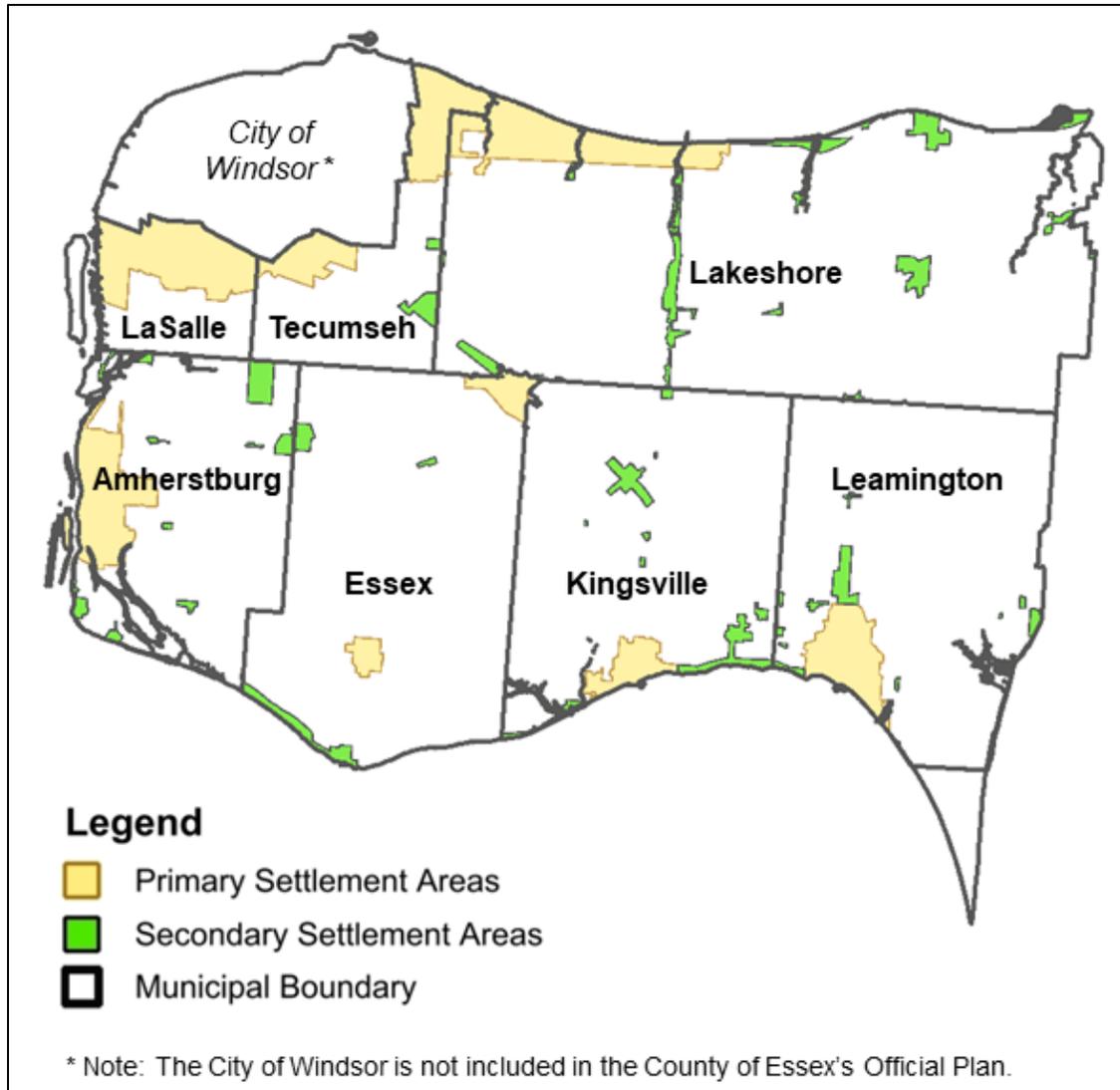


Figure 4: County Primary and Secondary Settlement Areas

3.2. Blue Box Transition

On June 3, 2021, the Province announced that it had finalized O. Reg. 391/21 “Blue Box” (gazette June 19, 2021). This new regulation has triggered the transition of Ontario’s Blue Box Program to an Extended Producer Responsibility (EPR) scheme for the management of printed paper and ‘packaging-like’ products. As of August 28, 2024, the Authority and its members will no longer be obligated to provide Blue Box recycling services to residents. Thereafter, “Producers” of residential printed paper and packaging will be responsible for providing residential Blue Box recycling services to residents.

This change means the Authority will no longer have a direct need for its MRFs and processing equipment. Therefore, the facility - or a portion thereof - could be repurposed as an organic waste transfer site, if appropriate.

4. Organic Waste Diversion Considerations

The Province's Framework is intended to maximize diversion of residential organic waste, supported by a regulatory backdrop and a future landfill ban on organics (planned implementation of 2030). This material can be broadly categorized as yard waste and household organic waste. The Framework specifically refers to "Food and Organic Waste," which it defines as:

- Food and organic waste: has the same meaning of *food waste* and *organic waste* when used together.
- Food waste: means the edible parts of plants and animals that are produced or harvested but that are not ultimately consumed.
- Organic waste: means inedible parts of plants and animals, as well as other organic material that may be processed along with food waste. Examples of organic waste can include but are not limited to leaf and yard waste, compostable products and packaging, soiled paper, diapers and pet waste².

Household organic waste programs, or Source Separate Organics (SSO) programs, typically target the diversion of food waste, including food preparation scraps and spoiled food.

For the purpose of this discussion, SSO refers to household food waste and other household organics collected from the home for composting (e.g., paper towels, tissue, other non-recyclable but otherwise composable items).

4.1. Yard Waste

The Authority, like most municipalities in Ontario, already diverts yard waste from residents and businesses. As noted in Section 2.1, yard waste is collected curbside in each community and can also be dropped off at all three of the Authority's waste management sites: Transfer Station Site #1, Transfer Station Site #2, and the Regional Landfill. The material is either direct hauled by the municipal collector to the Regional Landfill or it is consolidated and transferred from Transfer Station Site #1 to the Regional Landfill where it is composted. As noted earlier, yard waste that is delivered to Transfer Station Site #2 is processed onsite into a saleable product.

This program has been in place for some time and future quantities of yard waste are expected to remain consistent. As part of any future plan to manage organic waste, the Authority expects to continue composting yard waste at the Regional Landfill, as this is a low-cost option for managing this type of organic waste and the program produces a usable product for Essex-Windsor residents.

4.2. Source Separated Organics Projected Volumes

The Authority has projected the estimated amount of SSO it will collect from across Essex-Windsor from 2025 to 2032. The projection (see Table 5) is based on a gradual roll-out of the program throughout Essex-Windsor. Beginning with the Towns of Essex and Lakeshore and the City of Windsor, the estimated tonnage of SSO collected will go from an initial 6,500 tonnes in

² Government of Ontario. Ontario's Food and Organic Waste Policy Statement. April 30, 2018.

2025 up to 16,400 tonnes in 2032. The actual quantities achieved will depend on the program design and the other waste collection policies implemented by the Authority. The program design and waste collection policies are discussed in the subsequent section.

Table 5: Estimated SSO Collection from 2025 to 2032

Year	2025	2026	2027	2028	2029	2030	2031	2032
Muni.	(annual tonnes) ^a							
Amherstburg	0	0	500	800	1,000	1,000	1,000	1,000
Essex	500	500	600	600	650	650	650	650
Kingsville	-	-	-	-	-	400	500	600
Lakeshore	1,000	1,300	1,600	1,600	1,650	1,650	1,700	1,700
LaSalle	-	-	-	1000	1,200	1,500	1,500	1,600
Leamington	-	-	550	700	850	850	850	850
Tecumseh	-	-	600	800	1,000	1,000	1,000	1,000
Windsor	5,000	7,250	9,000	9,000	9,000	9,000	9,000	9,000
Estimated Annual SSO Collected	6,500	9,050	12,850	14,500	15,350	16,050	16,200	16,400

Note: a) As per the Authority's RFP:2022-10-03 (Schedule D Estimated Organic Waste Tonnages by Municipality).

In August 2022, the Authority issued a contract for SSO processing to Seaclyff Energy (Seaclyff) that is slated to begin in early 2025. The SSO tonnages included in the contract allow for additional processing capacity beyond the quantities outlined in Table 5. This contingency (or surplus) capacity was obtained to ensure the Authority could accommodate tonnage increases due to population growth and varying rates in participation that may result from the program policy considerations discussed below. The Authority will develop a list of acceptable products based on what materials are acceptable to Seaclyff.

4.3. Waste Program Policy Considerations

Public participation in SSO waste diversion programs is largely a function of a municipality's garbage collection policies and programs. Experience with SSO programs across Ontario has repeatedly shown that municipalities without strong participation incentive policies significantly underperform their peers regardless of educational efforts. This point is particularly important for local municipalities that are obligated to meet specific targets under the Provincial Framework. The following sections identify policies and programs that were considered to enhance public participation in Essex-Windsor's SSO waste diversion programming.

4.3.1. Waste Collection Frequency

Over the years, municipalities have tested and implemented numerous tools and techniques to encourage public participation in waste diversion initiatives. After over three decades of concerted effort, the municipal experience indicates that the single most effective strategy for ensuring program participation in SSO diversion initiatives is shifting to 'every other week' (EOW) garbage collection. For example:

- Niagara Region reported that annual tonnage of garbage collected from curbside after switching to EOW garbage collection decreased by 17.6% compared to the year before. Additionally, the amount of organics and recycling collected from curbside increased by 22.7% and 9.7%, respectively³.
- The Region of Waterloo implemented EOW garbage collection across all seven-area municipalities in March 2017. This led to an increase of green bin organics diversion by 170%, blue box diversion by 5% and yard waste diversion by 36%, and a decrease in garbage tonnage by 26%⁴.
- Since 2016, the City of Greater Sudbury has introduced gradual changes to its garbage collection program. By October 2019, the City reduced its bag limit from two bags per household per week to one bag. In February 2021, the City adopted EOW garbage collection and allowed two bags of garbage per collection (essentially, maintaining its bag limit over a two-week period). The amount of waste landfilled decreased from about 98,000 tonnes in 2020 to about 92,000 tonnes in 2022. Changing garbage collection frequency from weekly to EOW was reported as a contributor to this change⁵.
- In British Columbia, municipalities in Metro Vancouver that have implemented both weekly organics collection and EOW garbage collection have seen a 25 to 40% reduction in the residential garbage stream and an increase of diversion rates to over 70%⁶.
- A study prepared for the Alameda County Source Reduction and Recycling Board (United States) considered collection frequencies in 13 jurisdictions in Canada and the United States. It found that communities with EOW garbage collection had higher diversion rates than communities with weekly collection, and residents in EOW communities generated less overall waste materials. The study also notes that their background review and interviews conducted with EOW jurisdictions indicate that EOW collection can significantly lower the costs of waste collection services⁷.

EOW collection does have its challenges, with the most common being the management of diapers and incontinence materials from families with children or elderly members. Municipalities that have adopted EOW collection have successfully addressed these issues by incorporating options such as alternative drop-off and collection programs for qualifying families. Other options include offering qualifying families increased bag limits, additional bag tags or free drop off at the community's public drop-off sites.

³ Alison Powell, Niagara Region. EOW Garbage Collection Diversion Impact - Full Year Analysis. Presentation to Waste Management Planning Steering Committee. December 13, 2021.

⁴ Kim A. Kidd Kitagawa, Waterloo Region. Reduction in the Garbage Limit for Single-Family Homes. Report to the Planning and Works Committee. TES-WMS-22-02. April 12, 2022.

⁵ City of Greater Sudbury. Phase 1 Report for CGS SWMMP Update: Current State. March 6, 2023.

⁶ Tetra Tech. Review of Solid Waste Collection Programs. Prepared for the Township of Langley. July 2015

⁷ SAIC and SERA. 2012 Five Year Program Audit. Prepared for the Alameda County Source Reduction and Recycling Board. July 2013.

EOW garbage collection does not necessarily generate a net savings, since the same amount of waste is still being handled irrespective in which week it is collected (either by the garbage stream or, if diversion is increased, by the relevant waste diversion streams). However, Niagara Region found that shifting to EOW garbage collection achieved savings of about \$1.1M less than weekly collection⁸ and the Region of Waterloo achieved annual contract savings of \$1.5M when implementing EOW garbage collection in 2017⁹.

As illustrated by the previous examples, shifting to EOW garbage collection should also benefit the Authority's other diversion efforts, such as Blue Box recycling. As the Authority transitions out of providing Blue Box collection, it will continue to be in the Authority's best interest to maximize the diversion of recyclables out of the residential garbage stream; not only will this continue to conserve landfill space and contribute to the other various associated environmental benefits, it will also ensure the Authority is not paying to manage materials that are now the responsibility of the Producers.

Despite the potential cost savings and diversion benefits of EOW collection, potential concerns include:

- **Perception of reduced service levels** - However, the actual reduction in collection service is minimal, as most of residents' waste would receive weekly collection of SSO. This could provide a counter-argument that service levels are increasing given the addition of the weekly SSO collection.
- **Additional holding time of garbage due to missed collections** - Residents that miss an EOW garbage collection date would be required to hold on to their garbage for an additional two weeks. This may be a concern if the waste contains odorous wastes such as dog feces or used diapers. This could potentially be alleviated by providing convenient access for residents to drop off garbage and maximizing educational opportunities to ensure households are reminded of their collection day. Given that Essex-Windsor residents currently have bi-weekly recycling and many municipalities in Ontario successfully use EOW garbage collection, it is not anticipated that Essex-Windsor residents would have any significant difficulty adjusting to an EOW garbage collection schedule.
- **Potential for increased odour issues** - Some residents may feel that collection of garbage EOW may increase odours. While compostable waste will be able to be collected weekly, some odour generating wastes such as pet waste and used diapers may have the potential to create odours and sanitation issues. When Durham Region switched to EOW collection in 2006 and 2009, it supported the new program with promotion and education on the program goals and how to package diapers and other potentially odour-generating materials (e.g., double-bagging the materials)¹⁰. The City of Ottawa addresses this issue through its Special Consideration waste program. The program was created for residents requiring collection of

⁸ Alison Powell, Niagara Region. Considerations of City of Niagara Falls Withdrawing from Regional Waste Management Services. PW 14-2020. March 10, 2020

⁹ Brad Whitelaw, Niagara Region. Proposed Base Services for Next Collection Contract. Report to Public Works Committee. PW 3-2019. January 8, 2019.

¹⁰ Peter Gorrie. Making The Move to Alternate Week Trash Collection. BioCycle August 2012, Vol. 53, No. 8, p. 25

diapers and incontinence products on the weeks without scheduled garbage collection. The participating households can place one bag of waste diapers and incontinence products out for collection on the alternating week from garbage collection. Participants are required to register and renew annually.¹¹

A summary of the key advantages and disadvantages to EOW garbage collection is provided in the following table.

Table 6: Summary of EOW Garbage Collection Advantages and Disadvantages

Advantages	Disadvantages
<ul style="list-style-type: none"> • Shown to increase diversion of Blue Box and organics materials from garbage • Potential savings on garbage collection costs • No significant cost implications to residents 	<ul style="list-style-type: none"> • Potential perception of service reductions • Potential concerns among residents of odours from garbage held for two weeks • Potential concern over stockpiled garbage among residents who miss a collection

4.3.2. Garbage Container / Bag Limits

Garbage container / bag limits (bag limits) are commonly deployed by municipalities as a tool to encourage resident participation in recycling programs. While bag limits are effective, experience has shown that they were more effective with driving Blue Box recycling than SSO diversion because the former is more of a volume-based issue. More importantly, bag limits were found to be largely ineffective unless the bag limit is two bags per week or less. As a result, they are more commonly used as a supplemental tool to support EOW collection programs. The current trend is a move to a two-bag limit for the EOW collection (i.e., equivalent to one bag per week). Combining low bag limits with EOW garbage collection has been shown to achieve better participation in SSO and related diversion programs. This can be also be augmented by implementing clear bag programs, as discussed in the next section.

Bag limits can have perceived equity issues. Large families, or those with children and elderly members that generate diapers, may find strict volume limits challenging. Municipalities using bag limits commonly address this issue by offering volume exemptions to qualifying households. Households are typically qualified by completing and submitting a standard form or questionnaire to the authorizing municipality. The exemptions are normally valid for one year at a time. Bag limits can also be administratively challenging for municipalities to manage because their effectiveness relies on the collection crews to enforce the policy. Many municipalities experience situations where collection crews ignore bag limits and collect all waste at the curb rather than contend with complaints from residents. Incidents involving illegal dumping can also occur and often require the involvement of by-law enforcement staff to resolve the issues which can, in turn, be administratively costly.

¹¹ City of Ottawa. Diapers and incontinence products collection. <https://ottawa.ca/en/3-1-1/apply-orregister/diapers-and-incontinence-products-collection>. Accessed April 22, 2022.

Many municipalities also allow combining bag limits with the sale of bag tags to allow residents to address overflow issues. Caution needs to be applied when considering the use of bag tags as it can allow residents to 'buy their way' out of participating in diversion programs. The better practice can be to allow bag limit exceptions in and around statutory holidays when excess quantities are more commonly experienced or at set times of the year (i.e., spring clean in May) to provide temporary relief from the limits.

4.3.3. Clear Bag Policies

More recently, there is a growing body of evidence suggesting that mandating the use of clear bags for garbage collection is more effective and more equitable than bag limits. The previously-mentioned issues encountered by large families and those generating large quantities of diapers and incontinence products are addressed by allowing residents to set out increased (or unlimited) volumes of garbage provided they do not contain recyclables and other materials intended for diversion. Programs using auto-carts or hard sided garbage containers can also incorporate clear bags by requiring that any garbage bags used within the container be clear.

Clear bag programs require an amendment to the municipal by-law to make participation in local waste diversion programs mandatory, and they also require a degree of judgement in their application by collection crews. However, these are often less costly to administer than bag tag programs. Clear bag programs are expected to grow in popularity as municipalities transition out of provision of Blue Box recycling services but seek to ensure residents continue to participate in the Producer-managed Blue Box system. Bulk collection programs remain unaffected and will continue to be offered as per current practices in the City and the municipalities.

As noted above, municipalities that require or allow the use of hard-sided garbage cans or bins can also integrate clear bag or other visibility requirements in their program. Materials can be either placed loose in the garbage container (i.e., no bag) or placed in clear garbage bags. For example, Selwyn Township addresses this issue in its clear bag program. In its program communications, the Township responded to the question "What if I use a container for curbside garbage?" by answering "You can keep using your container; just make sure that there is no recycling in it. If you use opaque bags in a container, start using a clear bag. You can use an opaque bag (grocery-sized) for privacy items."¹²

Use of clear bags for garbage collection is becoming increasingly common in Ontario. For example, the Continuous Improvement Fund (CIF) Clear Bag Garbage Program Implementation Toolkit, which was released in 2015, notes that 40 municipalities in Ontario have implemented clear bag garbage collection programs, including the City of Markham and Dufferin County¹³. That number has grown since then, including the City of Orillia (implemented 2022), the City of Kawartha Lakes (implemented 2017), and Tay Valley (implemented 2016)¹⁴. In addition, all municipalities within the County of Peterborough have implemented clear bag garbage programs,

¹² Township of Selwyn. Clear Garbage Bag Program & Waste Diversion Frequently Asked Questions. https://www.selwyntownship.ca/en/township-hall/resources/Public_Works/Clear-Bag-Program/Clear-Bag-FAQs-and-Waste-Diversion.pdf.

¹³ CIF. Clear Bag Garbage Program Implementation Toolkit: A municipal step-by-step guide. CIF Project 748. 2015

¹⁴ City of Peterborough. Waste Management Master Plan Update: Summary Report. October 31, 2022.

and the City of Peterborough has announced its plan to implement clear bag garbage collection on October 31, 2023.¹⁵

Clear bag programs have been found to increase diversion. For example:

- A CIF-funded study examined 22 municipalities with clear bag programs and concluded that this option could have a considerable increase on diversion rates. It noted that 13 Nova Scotia municipalities reportedly experienced, on average, a 41% decrease in residential waste, a 35% increase in residential recycling and a 38% increase in residential organics collection. One region from Nova Scotia experienced a 71% increase in tonnes of material collected for recycling. It is important to note that these averages were based on programs with existing recycling and organics diversion programs and therefore most of the gains can be directly attributed to clear bags¹⁶.
- Halifax Regional Municipality (Nova Scotia) switched to clear garbage bags in 2015. A staff report in 2020 noted that the program resulted in an immediate 25% reduction in garbage tonnages from the residential sector that has been maintained in the following years¹⁷.
- The Township of McMurrich-Monteith introduced a clear bag program in 2012. Recycling tonnage increased by 62% from 2011 to 2013¹⁸.

Use of clear bags for garbage encourages waste diversion in several ways:

- Clear bag Programs improves worker safety and allows Transfer Station attendants the ability to conduct a quick assessment of the contents within the clear bag(s) to ensure that no recyclable or hazardous items are in the bag.
- Clear bags can serve as a reminder if people forget to separate out these materials from their garbage, as the clear bag allows residents to see what is being thrown out.
- Clear bags prompt people to reflect on their waste disposal habits and encourage them to consider waste diversion options.
- Clear bags can assist with the enforcing of municipal material disposal bans by allowing waste collectors to monitor for compliance and reject any bags containing banned items.

The literature review identified several key considerations that would need to be considered when designing and implementing a clear bag program. These include:

¹⁵ City of Peterborough. Green Bins, Clear Bags, and Garbage Collection Plan. <https://www.peterborough.ca/en/news/green-bins-clear-bags-and-garbage-collection-plan.aspx>. Posted on February 27, 2023.

¹⁶ Quinte Waste Solutions. The Use of Clear Bags for Garbage as a Waste Diversion Strategy: Background Research on Clear Garbage Bag Programs across North America. 2008

¹⁷ Brad Anguish. Cart Based Garbage and Recycling Collection. Halifax Regional Council Information Report. March 11, 2020.

¹⁸ CIF 2015.

- **Privacy concerns** - Perceived lack of privacy can be a significant issue for some members of the public, as they have concerns about others being able to view the contents of their garbage. Privacy issues must be addressed before implementing a program.
- **Clarity of what is and is not acceptable in the clear bag** - An easily understandable list of what materials are acceptable in the clear bags and what materials are not, needs to be prepared and circulated amongst the residents,
- **Inadequate retailer supply of clear bags** - The insufficient supply of clear bags is a common concern. Retailers should be given sufficient notice to ensure that they have enough clear bag supplies to meet the demand (ideally, 8 to 10 months of lead time to deplete inventories of opaque bags and to stock clear bags). As an alternative, the City could also consider selling clear bags to address an initial bag shortage.
- **Stockpile of opaque bags** - Sufficient notice must be given to the public to help them with the transition and to give them a chance to use up their solid colored / non-transparent bags.
- **Enforcement concerns** - Residents may get concerned about overlooking residual recyclable materials remaining in the clear bags. Enforcement with clear guidelines on the allowable percentage of residual recyclables or SSO is necessary for program success.
- **Bylaws** – It is noted that the City and Tecumseh currently have bylaws requiring residents to use hard-sided containers for garbage. These bylaws were implemented in an effort to manage issues caused by rodents and urban wildlife. An amendment to the bylaws of these municipalities would be required if a clear bag policy were to be adopted across Essex-Windsor.

4.3.4. Enforcement

Most waste management programs rely primarily on a combination of public education and community support to achieve their objectives. The use of by-law enforcement is, however, occasionally necessary to address issues of severe or chronic non-compliance. Development of an up-to-date waste by-law and appropriate resourcing of enforcement staff to address issues of non-compliance is particularly important during new program launches, such as the Authority's impending SSO program.

4.4. Waste Program Policy Recommendations

Based on the discussion presented in Sections 4.1 to 4.3, the following program policy recommendations are suggested. The recommendations are being made here (and will be summarized at the end of this report) because they form the foundation upon which analysis regarding regionalization, transfer and hauling costs stand.

1. EOW garbage collection should be implemented in areas where curbside SSO collection is introduced. Implementation of the EOW and SSO collection should occur concurrently.

The experience of other municipalities in Ontario and elsewhere indicate that a shift to EOW garbage collection when there is curbside recycling and SSO services encourages waste diversion and reduces system costs. Implementing EOW garbage collection alongside SSO collection would increase the SSO program's likelihood of success and its ability to achieve the targets as outlined in the Framework.

There may be an inclination to delay implementation of the EOW garbage collection until residents have a chance to become accustomed to the new SSO program. The EOW program will speed up participation in the SSO program by forcing its use. Also, implementing the two programs together will help residents get used to program changes all at once and in a short timeframe, rather than incrementally over a longer period.

Considerations for EOW garbage collection should be included when developing the business case, implementation plan, and outreach materials for the SSO program.

2. Introduce a clear bag policy for garbage collection across Essex-Windsor.

Based on the preceding discussion on bag limits and clear bag waste (garbage) collection policies, the use of clear bags is preferred over lower bag limits for the following reasons:

- Bag limits would need to be reduced substantially to motivate residents to ensure all of their recyclable and compostable materials are not entering the garbage.
- There would need to be separate bag limits in urban and rural areas them to be effective. For example, urban settlement areas would need very low bag limits to ensure residents maximize diversion into the SSO and Blue Box programs. However, the bag limits set for urban areas may not be suitable for households in rural areas, as they would not have an SSO program (unless the program is rolled out across Essex-Windsor). Therefore, there would be two different bag limits throughout the Essex-Windsor, which would likely cause confusion and could potentially generate animosity over a perceived disparity of service.
- As noted previously, bag limits also create disposal inconveniences for large families or those families that are required to use diapers.
- Clear bags are equitable, as they could be implemented across Essex-Windsor.
- Clear bags would encourage households to maximize diversion for whichever diversion programs are provided in their area.
- There is ample documentation of the potential issues (real and perceived) and their solutions that are raised during the planning and implantation of clear bag programs, including many in Ontario.
- Clear bag programs would be compatible with the hard-sided garbage container requirements that City and Tecumseh currently have. This requirement was introduced to

help deal with issues caused by rodents and urban wildlife. The introduction of curbside SSO collection, the introduction of EOW garbage collection and the use of clear garbage bags should help ensure little to no putrescible food waste is left behind in the garbage stream.

3. Undertake a by-law review once curbside collection programs and policies are confirmed to ensure the necessary by-law updates are identified and implemented to support the new programming.

Effective waste management by-laws are critical components of any successful waste management program. While the majority of households will try to follow the instructions included in waste management communication materials, there are times when enforcement is needed to ensure materials are sorted and segregated correctly. Indeed, waste management by-laws often form the basis for the messaging in the waste management communications.

A review of waste management by-laws in Essex-Windsor is recommended once the waste collection programs and policies are confirmed. The review should describe the existing by-law framework supporting waste management in Essex-Windsor, identify gaps, and provide recommendations for updates to ensure the by-laws are adequate and consistent with planned program changes. These changes may include, for example, lists of acceptable waste collection containers, or lists of acceptable materials for garbage, recycling and SSO, and any other relevant waste streams.

5. Program Design Options: Collection and Haulage

Two key components that must be reviewed when developing or modifying curbside waste management programs are collection and haulage.

As the term implies, collection refers to the collection of waste from the households. There are two main options for collection that have been reviewed in this study:

- Co-collection - when two material streams are collected in the same collection vehicle but in separated compartments; and
- Single-stream collection - when the entire collection capacity of the vehicle consists of one compartment for an individual waste stream.

These collection options are discussed below in Section 5.1.

The other component is haulage. This term refers to how the collected waste is transported to the facility where it will be processed or otherwise managed (such as a MRF, composting facility or landfill). There are two main options for haulage that have been reviewed in this study:

- Transfer - occurs when the collected waste is taken to a collection point or site (e.g., a transfer station) to be dropped off and aggregated, and then the larger aggregated volume of waste is hauled to the facility where the material is to be processed or otherwise managed.
- Direct haul - occurs when the waste collection truck takes the waste collected from curbside directly to the facility where the material is to be processed or otherwise managed.

These haulage options are discussed further below in Section 5.2.

5.1. Co-collection vs. Single-stream Collection

One of the key questions in designing a new SSO program is whether to collect the material in a dedicated truck or co-collect it with another waste material. Co-collection of SSO along with Blue Box recyclables in separate compartments on board the same truck has been a common practice for almost two decades in Ontario. This truck configuration gained acceptance because it allowed municipalities to move to EOW garbage collection while continuing to provide weekly Blue Box recycling and SSO collection. Many Ontario jurisdictions today provide EOW garbage and blue box material co-collected with SSO on a weekly basis.

The primary reason municipalities (like Toronto, Peel, Waterloo, Niagara, Simcoe, etc.) utilize co-collection vehicles is to reduce the number of passes along a street required to collect the various waste streams set out by residents. In a worst-case scenario, a municipality collecting Blue Box recyclables, SSO, yard waste and garbage could conceivably have four separate trucks stopping at each household. By reducing how often a collection vehicle must travel down the same street, co-collection reduces the potential traffic congestion impacts and greenhouse gas emissions associated with collection. Co-collection is the predominant collection system used by regional

and GTA municipalities thorough Ontario. A typical SSO/Garbage or Blue Box co-collection truck employs a 30:70 split¹⁹.

Co-collection of garbage with SSO is much less common in Ontario. However, as responsibility for collection of Blue Box materials shifts away from the municipalities, it is an approach that more municipalities may explore.

Assuming the blue box program is being phased out for collection by the municipality, and if the Authority moves to EOW garbage collection to promote and enhance SSO participation, then the co-collection program for weekly SSO collection would need to be assessed separate from the Blue Box program. Co-collection of garbage and SSO is possible, but truck routing becomes more complex if EOW garbage collection is combined with weekly SSO collection. In some cases, co-collection can be less efficient than using dedicated trucks for single-stream collection if one side of the truck fills up before the other side. This would occur if the ratio of waste materials is inconsistent with the split ration of the co-collection truck. In this case, the collection truck is required to leave its route to unload the collected waste without achieving its optimal capacity. This inefficiency can lead to an increased number of co-collection vehicles, higher operating costs and slightly higher greenhouse gas emissions.

For the purpose of this study, the approach of single stream collection for garbage and for SSO has been assumed due to the potential for SSO tonnages to change depending on what policy options are selected, the concentration of SSO tonnages in the urban areas, and the lack of Ontario examples for SSO/garbage co-collection. Opportunities for co-collection of SSO and garbage could be included in the future waste collection RFP, where bidding contractors would be able to best assess the optimal vehicles for the required collection.

5.2. Transfer vs Direct Haul

Currently, the Authority transfers approximately 80% of the garbage collected across Essex-Windsor from its transfer stations where the material is consolidated and sent to landfill for disposal. Consolidation of waste prior to this transfer offers several benefits, including:

- Reducing overall truck traffic on local roads by consolidating smaller loads onto larger vehicles;
- Providing flexibility for making waste handling and disposal options;
- Reducing air pollution, fuel consumption and road wear by reducing truck trips;
- Opportunity to screen the waste for material that may require segregation or special handling; and
- Reducing truck traffic at the disposal facility²⁰.

A typical curbside collection vehicle can carry up to 10 tonnes of waste depending on the type of vehicle, material, and waste density. However, some of the current garbage collection vehicles

¹⁹ In a 30:70 split collection truck, once compartment holds 30 percent of the collection volume and the other compartment holds 70%.

²⁰ United States Environmental Protection Agency. Waste Transfer Stations: Involved Citizens Make the Difference. EPA530-K-01-003. January 2001.

used by contractors of the Authority are smaller designs to accommodate specific needs, such as accessing alleyways. Consequently, they tend to ‘max out’ at lower load weights (i.e., 6 to 7 tonnes based on the Authority’s scale records).

Typically, the main reasons why collection vehicles are unable to carry weights to maximum capacity include:

- The density of materials being collected (for example, recyclables and yard waste each have a low density);
- Crew time management;
- Unequal filling of split-truck compartments (i.e., one side becomes full before the other side); and
- Truck size, which can be constrained by physical barriers or road geometrics encountered on the route, thereby requiring a smaller vehicle.

Conditions within the City provide an example of truck size constraints, as the City uses smaller collection trucks to navigate narrow roadways such as alleys. The City would need to phase out alleyway collection if it were to shift to larger collection vehicles. Otherwise, the City will be required to continue its use of smaller collection vehicles, thereby maintaining its elevated number of trips to Transfer Station 1. This factor would make direct hauling more costly compared to transfer, as more vehicles would be driving longer durations to Leamington. There may be areas of the County with similar concerns that would need to be addressed prior to regionalization.

In situations where small loads are being collected curbside and then taken a considerable distance for processing or disposal, the consolidation and transfer of material from a single location closer to the collection area improves efficiency. One standard tractor trailer designed for waste hauling has a capacity of approximately 25 to 30 tonnes. This gain in efficiency can result in significant cost savings over direct hauling of smaller loads and a significant reduction in related greenhouse gas emissions. By comparison, direct hauling long distances can increase the risk of disruption to curbside collection services as the collection vehicles have to travel long distances off route to unload and return. This may be further aggravated by inclement weather, vehicle breakdown, crew time management, and vehicle capacities. Therefore, most waste haulers prefer not to direct haul using curbside collection vehicles for more than 45 minutes to an hour to a waste management facility, before considering consolidating their curbside loads at a transfer facility.

Transfer costs are not, however, insignificant. The Authority’s operating costs for Transfer Station 1, for example, averages \$10/tonne. Also, there is the additional cost of transportation of the transferred material. As noted previously, the Authority anticipates managing a minimum of approximately 16,000 tonnes of SSO. This volume could become higher over time, depending on the implementation of appropriate diversion policies and their effectiveness at maximizing the participation of residents. Typically, transfer of waste becomes cost effective when the time required to haul collected waste is a round-trip of one hour or more and if the volumes are more than 5,000 tonnes.

These factors are brought into consideration in Section 8’s financial analysis discussion.

6. Regionalization

6.1. Overview

Regionalization of services in the field of waste management is a well-established practice that can provide numerous benefits for participating municipalities, including cost savings and program efficiencies. Regionalization can range from informal collaboration on communications and waste management planning, through to joint ventures on service provision and formal transfer of responsibility to upper tier municipalities.

Regionalization is not a new practice and is used in Ontario, other parts of Canada and internationally. Relevant examples are discussed below.

Region of Waterloo

The Region of Waterloo is comprised of seven lower tier municipalities (four townships and three cities). The Region assumed responsibility for the curbside collection of waste and recyclables for the lower tier municipalities on January 1, 2000. During the 2002 to 2009 contract period, service levels provided to the cities were consistent while those provided to the four townships were not. However, the seven-year contract that started in 2009 was used to enhance and ensure provision of equitable service across the townships²¹. Transferring responsibility for collection services to the Region generated a resultant savings of millions of dollars per year.

The Northern Six Partnership

The Northern Six Partnership (N6) in York Region (consisting of Aurora, East Gwillimbury, Georgina, King, Newmarket, and Whitchurch-Stouffville) has collaborated on various initiatives since 2005. In 2007, the N6 undertook a joint procurement for a 10-year waste collection contract to provide waste, recycling and green bin services²². The joint procurement contract provided \$11M of savings throughout the N6 over the initial contract period. Due to the success of the partnership, the N6 entered into other similar initiatives, including a second joint procurement process following the initial 10-year contract. This led to a second 8 (+2) year waste collection contract for the N6²³.

County of Peterborough

In March 2023, the County of Peterborough issued an RFP (Request for Proposals) for a study to determine the feasibility and options of uploading lower tier (township) garbage contracts to the upper tier (county), including an assessment of financial and service-level impacts associated with the transition. County of Peterborough staff recommended proceeding with the study based

²¹ Region of Waterloo. Waste Management Master Plan Update. April 2011.

²² East Gwillimbury. Northern Six Partnership - The Town of East Gwillimbury.
<https://www.eastgwillimbury.ca/en/government/northern-six-partnership.aspx#Waste-Collection>.
Accessed April 8, 2023.

²³ Doug Nadorozny. Northern Six Municipalities (N6) Collaborative Initiatives and Partnership Update: Town of Aurora Information Report No. CAO20-001. May 19, 2020.

on the recommendations from their 2020 Organizational Service Delivery Review and their 2021 Public Works Service Delivery Review. The anticipated benefits of this transition include cost savings associated with consolidation of up to eight high-value garbage collection contracts and cost-savings and efficiencies related to the integration of garbage collection, with additional collection services that may be offered by the County of Peterborough in the future (e.g., organics and/or leaf and yard collection)²⁴.

North Shore Municipal Modernization Partnership

The North Shore Municipal Modernization Partnership (MMP) consists of Ontario's City of Elliot Lake, Township of Sables-Spanish Rivers, Municipality of Huron Shores, Town of Blind River and Town of Spanish. The MMP undertook a Service Sharing Review in 2021 and 2022. The review's interim report recommends the consolidation of the North Shore MMP municipalities' four independent waste collection contracts (Huron Shores does not have a waste collection contract). The report notes that collection points per route-km is different for each participating municipality. This in turn would result in different pricing by the collection contractor (the four municipalities each use the same contractor but through independent contracts). The report notes that a positive feature of contract consolidation would be the opportunity for route optimization and scheduling across municipal borders. This would provide the contractor an opportunity to design routing solutions that may require fewer trucks in total to execute an integrated shared contract model. These optimized collection routes could generate savings through reduced labour, fuel, and vehicle maintenance/ depreciation costs²⁵.

Town of Okotoks, British Columbia

In 2019, the Town of Okotoks, British Columbia and surrounding smaller municipalities developed a regional solid waste management plan. At the time, each of the participating municipalities provided their own waste collection services (the Town of Okotoks was the only town with a curbside organics collection program). The plan recommended that the plan partners regionalize curbside residual waste collection. The analysis undertaken for the plan showed that this would reduce the average total cost for garbage collection across the participating municipalities because the number of trucks required for collection would drop from eight to six²⁶. In June 2020, the Town of Okotoks and the Town of Black Diamond (one of the other plan partners) implemented a pilot where the Town of Okotoks was contracted to provide curbside waste collection and disposal services for 980 dwellings in Black Diamond. The pilot was due to expire in January 2021, but the Town of Black Diamond's municipal council voted unanimously to extend the contract to February 2023. The CAO for Black Diamond was reported as saying the savings were one of the pilot's key benefits. The waste services manager for the Town of Okotoks was

²⁴ Snoddy, Kerri. Peterborough County. Garbage Upload Study Request for Proposal Specifications. Report Number 2023-06. March 1, 2023.

²⁵ Performance Concepts Consulting. North Shore MMP Project - Interim Report. March 1, 2022.

²⁶ GHD Limited. Regional Solid Waste Management Plan. Prepared for the Town of Okotoks. January 8, 2019.

reported as saying that they look forward to continued collaboration with the other neighbouring municipalities²⁷.

KPMG Blue Box Program Enhancement and Best Practices Assessment Project

In 2006 to 2007, the Municipal Industry Program Committee (MIPC) of Waste Diversion Ontario (WDO) retained a KPMG-led consortium to undertake the Blue Box Program Enhancement and Best Practices Assessment Project. The project identified a number of best practices for municipal Blue Box recycling that have been routinely implemented by Ontario municipalities. The assessment identified a multi-municipal planning approach to collection and processing recyclables as a fundamental best practice. With respect to collection, the report notes that the multi-municipal planning approach can increase bargaining power with private service providers and can result in the improvement of financial and operational efficiencies. More specially, noted benefits of multi-municipal planning included:

- **Cost Containment:** economies of scale result in savings due to: volume discounts; standardized equipment size, features, and specifications; standardized service levels; and promotion and education synergies.
- **Improved Quality and Productivity:** there is more potential for improved quality and consistency of services delivered to the participating municipalities.
- **Transferability:** residents that commute and relocate from one community to another are able to receive common messages through co-operative promotion and education and common service levels and procedures.
- **Competitiveness:** the larger tonnage should attract more bidders, including non-local bidders.

International

The benefits of regionalization are not unique to Ontario or Canada. For instance:

- The Massachusetts Department of Environmental Protection's document *Contracting for Municipal Solid Waste and Recycling Services* provides guidance on developing effective municipal solid waste and recycling contracts. It notes that regional contracting can result in cost-savings due to allowing the contractor to combine collection routes, share route supervisors and/or share other program resources between two or more municipalities. It also notes that regional contracts may attract additional, smaller or more distant firms, which can lead to better pricing through competition²⁸.
- The Gippsland Waste and Resource Recovery Group (GWRRG) in Australia examined the potential benefits of joint tendering waste services by the six councils in the Gippsland

²⁷ Calver, Brent. Black Diamond council extends garbage pickup contract to 2023. Western Wheel. Dec 23, 2020. <https://www.westernwheel.ca/wheels-west/black-diamond-council-extends-garbage-pickup-contract-to-2023-3200845>. Accessed April 8, 2023.

²⁸ Massachusetts Department of Environmental Protection. Contracting for Municipal Solid Waste and Recycling Services. Undated.

region of Australia. The assessment determined a joint procurement of waste, recycling and collection services for the councils would result in savings of about \$1.1M(AUD) per year (about 7% of the estimated total contract value)²⁹. The assessment also identified skills and knowledge transfer as a potential benefit of joint procurement, particularly for smaller municipalities that may enjoy secondary benefits when additional staff capacity and expertise from larger municipalities become available³⁰.

6.2. Summary of Benefits and Challenges

6.2.1. Benefits

The experiences of Ontario and a review of the broader literature highlight a number of potential benefits for the Authority, the City, the County and its municipalities if the regionalization of waste collection contracts were to be implemented. Potential benefits include:

- **Saving due to cost efficiencies and economies of scale:** A single waste collection contract that covers all municipal partners in Essex-Windsor would avoid duplicated work otherwise completed during the procurement and administration of multiple but similar contracts. The increased tonnage could also allow for economies of scale for a collection contractor.
- **Savings due to increased competition:** It is understood that the waste collection service tenders issued by the individual municipalities receive few bids. For example, both the 2021 waste collection tenders for Leamington and for Lakeshore each received only two bids. In comparison, the City's 2015 waste and recycling tender - which would have had much greater tonnages - received four bids. As such, the even-larger tonnage of a joint waste collection tender for the entirety of Essex-Windsor would likely attract more bids and create a more competitive bidding environment.
- **Consistency of customer service:** A regional waste collection contract would ensure that all residents - both between and within municipalities - receive a consistent level of service. This in itself provides a number of ancillary benefits:
 - **Harmonized communications:** Common waste collection services across Essex-Windsor would allow for shared waste management communications. This would increase the cost-effectiveness of communication materials and outreach efforts.
 - **Increased correct program participation and reduced contamination:** It is not uncommon for residents to work, live and/or play in the different municipalities across Essex-Windsor, and those that do may receive conflicting waste diversion messaging depending on the differences in municipal programs. This could lead to incorrect waste sorting practices and thus increased contamination or unrecovered waste resources.

²⁹ Reincarnate. Gippsland Collaborative Resource Recovery Business Case. Prepared for the Gippsland Waste And Resource Recovery Group. April 3, 2018.

³⁰ Reincarnate. Gippsland Collaborative Resource Recovery Business Case. Prepared for the Gippsland Waste And Resource Recovery Group. April 3, 2018.

Common waste collection services would help reinforce preferred waste sorting and diversion practices, thereby reducing contamination and increasing diversion.

- **Increased customer satisfaction:** Equitable waste collection services across Essex-Windsor may increase customer satisfaction - or, at least, avoid dissatisfaction - by providing all single-family households with the same type of service. This would avoid confusion among residents and the perception that some communities are being treated preferentially. Managing a single contract would also make it easier to ensure there is a consistent service quality provided to Essex-Windsor households.
- **Increased routing efficiencies:** A regional waste collection contract will remove restrictions to more efficient routing that are imposed by municipal borders. Waste collection contractors will be able to maximize their collection efficiencies by taking advantage of the flexibility afforded by the larger geographic area. This should reduce per-tonne travel time and reduce the total amount of time trucks must return with a partial load. This would in turn encourage cost reductions and greenhouse gas emission reductions due to reduced fuel consumption.

6.2.2. Challenges

Implementing regionalized collection contracts can have a number of challenges. Examples of these issues include:

- **Alignment of individual municipal contracts:** Ideally, the end dates of participating municipalities current contracts would be aligned with the start of the new regional contract. Possible options to achieve this goal include extending existing contracts for those that end in advance of the regional contract start date, negotiating early termination agreements with contractors for those that extend past the start date of the regional contract, and incorporating staggered start dates into the regional contract. These options may result in short term cost implications before the full benefits of regionalized services can be achieved.
- **Agreement of service levels:** Municipalities will likely need to agree on a common level of service to ensure competitive contract bids are optimized. This standardization of service can lead to issues with different communities feeling that the agreed to standard exceeds or does not meet their needs. Service levels that differ between the municipalities may impact the efficiency of services a contractor can provide and also potentially lead to public dissatisfaction.
- **Equity of cost burden:** One of the biggest challenges with regionalized services is development of an equitable cost sharing model. Collection services generally benefit from economies of scale; the savings and ongoing costs can be equitably shared on a cost per household basis, or individual communities can have their services be priced and then be charged by the contractor under a collective bid structure.
- **Public education:** Implementation of a regional contract and standardization of services will require an adjustment of services to many, if not all, residents across Essex-Windsor.

Updating of exiting municipal waste communications and a public education campaign will be required to promote these changes.

- **Planning:** Significant effort is required at an operational and administrative level to develop and implement a common vision of any proposed regional services. Ensuring staff resources are available to ensure timely and effective decision-making is critical.

6.3. Opportunity for Regionalization of Garbage and SSO Collection

To better understand the potential impacts of the regionalization of garbage and SSO, an analysis was undertaken of the average distances and travel times from the municipalities to the various waste facilities, including the Seacliff organics processing facility. Through in-depth discussion with hauling expert and haulers, reasonable maximum thresholds for average distance and time were established: less than 30 km travel distance or less than 2 hours in turnaround time that includes waiting, transfer, and return.

A summary of the average distances from each municipality to the various processing locations are presented in Table 7. Shaded cells highlight those average distances that are at or below the 30 km threshold.

Table 7: Average Distances from Individual Municipalities to Facilities

Municipalities/ City	Distance to Transfer Station Site #1 (km)	Distance to Transfer Station Site #2 (km)	Distance to Regional Landfill (km)	Distance to Seacliff Facility (km)
Amherstburg	36	43	20	50
Essex	23	24	14	31
Kingsville	39	8	17	16
Lakeshore	30	28	33	34
LaSalle	15	56	33	65
Leamington	53	10	25	7
Tecumseh	8	48	35	55
Windsor	7	48	45	55
Transfer Station 1	-	44	36	58
Transfer Station 2	44	-	22	10
Regional Landfill	36	22	-	36
Seacliff Facility	58	10	36	-

Similarly, a GIS analysis was undertaken to determine the boundaries between facility catchment areas based on travel time, with a maximum travel time of 40 minutes. The result of this analysis is illustrated in Figure 5, which depicts the proximity boundaries based on travel time. The map also provides the square kilometres for each municipality that falls within the generated catchment area of the various waste management facilities³¹.

³¹ GIS Map courtesy of Tom Marentette, Manager of Waste Disposal, EWSWA.

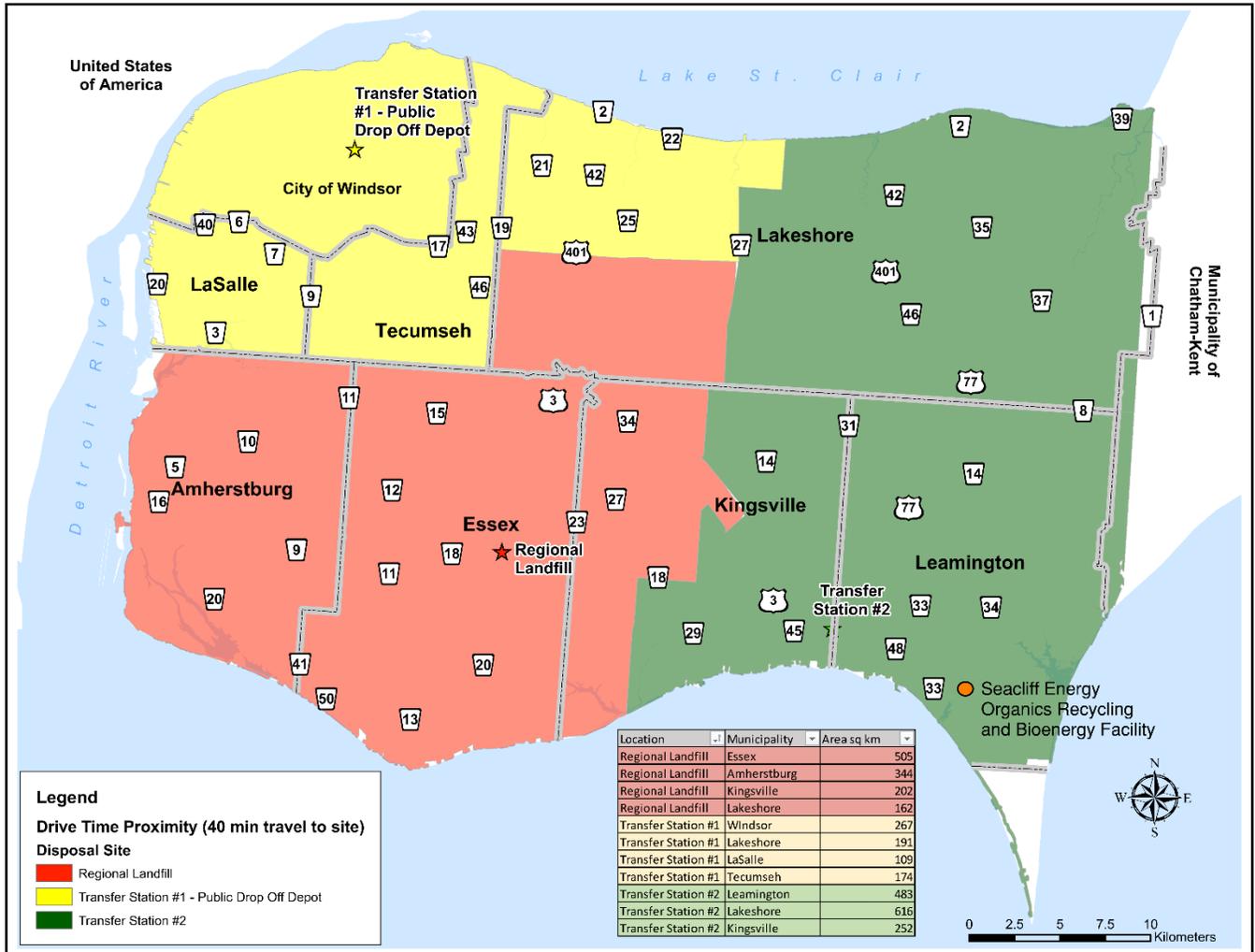


Figure 5: Drive-Time Analysis to Essex-Windsor Waste Management Facilities

Table 8 summarizes the proportion of municipalities whose area could potentially be allocated to the various waste management facilities. It should be noted that the boundaries are approximate and would fluctuate depending on a number of factors, such as the distribution of tonnage across the entire service area and within the individual municipalities, methods of collection and types of trucks used, changes in population growth and densities, among other factors. These and other considerations would be factored in by a waste collection contractor when developing routes. However, the key takeaway from the exercise is that the optimal distribution of travel distances and times does not align with municipal boundaries, and thus regionalization of waste collection would allow for more efficient routing and transfers as dictated by conditions in the field.

Table 8: Distribution of Waste by Travel Time

Muns.	Total area (km ²)	Transfer Station 1 (km ²)	Regional Landfill (km ²)	Seacliff/Transfer Station 2 (km ²)	Transfer Station 1 (%)	Regional Landfill (%)	Seacliff/Transfer Station 2 (%)
Amherstburg	344	-	344	-	-	100%	-
Essex	505	-	505	-	-	100%	-
Kingsville	454	-	202	252	-	44%	56%
Lakeshore	969	191	162	616	20%	17%	64%
LaSalle	109	109	-	-	100%	-	-
Leamington	483	-	-	483	-	-	100%
Tecumseh	174	174	-	-	100%	-	-
Windsor	267	267	-	-	100%	-	-

From the above table, it is observed that:

- Given the west/east length of Lakeshore, its collected waste can be distributed to all three transfer facilities.
- East Kingsville is closer to Transfer Station 2, and West Kingsville is closer to the Regional Landfill;
- Lasalle should be transferring its waste at Transfer Station 1; and,
- The remaining municipalities have close proximities to a single facility.

6.4. Recommendation on Regionalization

Given the preceding discussion, the following recommendation with respect to regionalization of garbage and SSO is made:

- **It is recommended that the Authority initiate discussions with the City, the County and the Municipalities to identify and confirm the necessary steps to upload these services to the Authority.**

As noted previously, there are many advantages to implementing regionalized waste collection services across Essex-Windsor. This approach will increase opportunities for improving cost-efficiencies, waste diversion, and customer satisfaction. Specifically, key advantages include:

- Improved diversion in the region as a result of consistent management and enforcement of a regional curbside garbage and SSO program;
- Centralized contracting and management, resulting in reduced administrative costs at the municipal level;
- Contracting efficiency and potential savings with the contractors due to larger waste volumes;
- Uniform service levels throughout the County and the City; and
- Increased cost efficiencies as regionalization could improve infrastructure utilization.

6.5. Considerations for Financial Analysis

Based on the preceding discussion in Sections 5 and 6, the subsequent financial analysis of garbage and SSO waste management will proceed in Section 8 based on the following assumptions:

- SSO collection would be undertaken across the entire geographic region, due to the following:
 - Program consistency across service areas have been found to improve diversion rates by reducing conflicting and confusing messaging.
 - Providing SSO collection across the entire service area will make integrated implementation of the SSO program and EOW garbage collection logistically easier, minimizing organizational and planning-related risks.
 - The simplified logistics will make the tendering process easier and provide less room for uncertainty, thereby encouraging more accurate bids and more competitive pricing.
 - Providing a consistent level of service to and within all participating municipalities will reduce the potential for acrimony among residents and elected officials that may feel are not receiving an equitable level of service.
- Collection of Garbage and SSO would be regionalized (or undertaken through a joint multi-municipal collection contract), due to the following:
 - A regional contract would provide greater opportunities for more competitive bids, thereby reducing costs compared to individual tenders;
 - A regional contract would allow contractors to provide optimal routing, which could reduce contract costs and number of vehicles, and minimize fossil fuel air emissions;
 - Regionalization of garbage and SO collection services would ensure there is a harmonized program serving residents across all municipalities, allowing for shared communications, consistent messaging, and therefore improved waste diversion.
- Garbage and SSO would each be collected in dedicated collection vehicles, due to the following:
 - Frequency of garbage and SSO collection would be different (i.e., garbage collected EOW and SSO collected weekly);
 - Even if co-collection of SSO and garbage were to proceed, the SSO side would remain more than 50% empty when the garbage side becomes full, thus creating collection inefficiencies and impacting the effective utilization of the collection fleet.
 - Regionalization of garbage and SSO collection would take a few years for the system to stabilize and become optimized in terms of days and routes for weekly SSO and EOW garbage collection; therefore, it is best to reassess co-collection after the new collection system has had time to mature and SSO participation has peaked.
- Direct haul would be minimized by the effective use of transfer stations.

The points noted above would provide ample opportunity for a contractor to carry out route rationalization and the optimization of collection schedules. A financial analysis of the transfer and direct haul scenarios (including regionalization) is presented in Section 8, which also incorporates the findings of the next section on options for transfer stations.

7. Transfer Station Discussion

7.1. Overview

As described in Section 2, the municipalities in Essex-Windsor are serviced by two transfer stations:

- Transfer Station 1 (located at Transfer Station Site #1 in Windsor) is used by the Authority to transfer the garbage collected in Windsor, Lakeshore and Tecumseh. This waste is then hauled to the Regional Landfill for disposal.
- Transfer Station 2 (located at Transfer Station Site #2 in Kingsville) is used by the Authority to transfer garbage collected in Kingsville and Leamington. This garbage is then then hauled to the Regional Landfill.

The Regional Landfill also directly receives garbage collected from Essex, LaSalle, and Amherstburg. There are some overlaps with garbage from municipalities going to more than one location based on proximity.

To assess methods to efficiently deliver collected material to the Seaclyff facility, this project considered the feasibility of new transfer stations for SSO. A review of the current waste management facilities (Transfer Station Site #1, Transfer Station Site #2, and the Regional Landfill site) was completed to assess what assets could be repurposed or which locations would be best for the construction of a new SSO transfer facility. The potential SSO transfer station options include the following:

- Conversion of an existing MRF at Transfer Station Site #1 in Windsor for the transfer of SSO;
- A new transfer station directly adjacent to Transfer Station 1³²; and,
- Construction of a new SSO transfer station at the Regional Landfill with either:
 - A smaller capacity; or
 - A larger capacity.

These options - including the capacities and estimated capital costs³³ - are discussed below.

7.2. SSO TS Option 1: MRF Conversion to SSO Transfer Station

The first transfer station option discussed is converting the Container MRF at Transfer Station Site #1 into a SSO transfer station. The capacity of this transfer station option would be 11,700 tonnes per year and receive SSO from the City and from Lakeshore and Tecumseh. The transferred SSO would then be hauled to the Seaclyff facility for processing.

The conversion of the Containers MRF would include the following installations and modifications:

³² Modification of Transfer Station 2 was not considered, given that it is in close proximity to the Seaclyff Facility and therefore of little to no value for SSO transfer.

³³ Cost estimates are considered accurate within +30% -15%.

- Truck entry through a plastic curtain;
- Tipping floor for dumping of the waste;
- Space for front-end loader to move;
- Push wall in tip floor area;
- Enclosing the existing loading area at the side of the building with an outside wall, roof, and overhead door to contain the transfer trailer;
- Top loading of the transfer trailer using the front-end loader;
- Leachate collection drain, underground collection tank, and pumping system to collect and transfer leachate for treatment via a tank truck; and
- Biofilter on the roof would maintain negative air pressure for treating air within the building.

A drawing depicting the modifications is provided as Figure 6, after Section 7.6.

Based on the estimated municipal SSO tonnage discussed previously, the anticipated SSO capacity for this transfer station would be 11,700 tonnes per year. The estimated capital cost for converting the Containers MRF to a SSO transfer station is \$669,400. The full opinion of probable cost table is provided in Appendix A.

7.3. SSO TS Option 2: New Transfer Station adjacent to Transfer Station 1

A different SSO transfer option at Transfer Station Site #1 is a new SSO transfer station built directly adjacent to Transfer Station 1. This new transfer station would be used to receive SSO collected from the City and from Lakeshore and Tecumseh. The transferred SSO would then be hauled to the Seacliff facility for processing. It would also be used for transferring garbage.

A push wall and loading area would be constructed to the south of the existing transfer station, which would include separated space for both organics and garbage. The new push wall and loading area would be covered by a new fabric covered building to limit exposure. Features of the new SSO transfer station would include:

- Concrete floor and truss roof;
- Heating and ventilation system;
- Truck entry through a plastic curtain;
- Tipping floor for dumping of the waste;
- Push wall in the tip floor area;
- Space for front-end loader to move;
- Space for a transfer trailer;
- Top loading of the transfer trailer using the front-end loader;

- Leachate collection drain, underground collection tank, and pumping system to collect and transfer leachate for treatment via a tank truck; and
- Biofilter to maintain negative air pressure for treating air within the building.

A drawing depicting the modifications is provided as Figure 7, after Section 7.6.

Based on the estimated municipal SSO tonnage discussed previously, the anticipated SSO capacity for this transfer station would be 11,700 tonnes per year. The estimated capital cost for this new building is \$843,915. The full opinion of probable cost table is provided in Appendix A.

7.4. SSO TS Option 3: New SSO Transfer Station at Regional Landfill (Small Capacity)

Another option is for a new SSO transfer station located at the Regional Landfill. This transfer station would be used to transfer SSO collected from LaSalle, Amherstburg and Essex. The transferred SSO would then be hauled to the Seacliff facility for processing.

The new transfer station could potentially be located on the south side of the Regional Landfill site, adjacent to the eastern side of the drop-off facility. A drawing depicting the modifications is provided as Figure 8, after Section 7.6.

The new SSO transfer station would include a concrete floor with a truss roof. The building would include a heating and ventilation unit, as well as the following features:

- Concrete floor and truss roof;
- Heating and ventilation system;
- Truck entry way with a plastic curtain;
- Tipping floor for dumping of the waste;
- Push wall in the tip floor area;
- Space for front-end loader to move;
- Space for a transfer trailer inside the building;
- Top loading of the transfer trailer using the front-end loader; and
- Sloped tip floor would drain into a collection sump connected to either an underground holding tank or directly to the landfill leachate collection system (either option would be approximately the same cost).

Based on the estimated municipal SSO tonnage discussed previously, the anticipated SSO capacity for this transfer station this new transfer station would be 3,250 tonnes per year, resulting in a size of about 50 feet by 50 feet. The estimated capital cost for construction of this SSO transfer station is \$521,098. The full opinion of probable cost table is provided in Appendix A.

7.5. SSO TS Option 4: New SSO Transfer Station at Regional Landfill (Large Capacity)

The fourth transfer option considered is essentially the same as the new SSO transfer station at the Regional Landfill, except that it would have a larger capacity of 14,950 tonnes per year, as it would transfer SSO collected not just from LaSalle, Amherstburg and Essex but also from Lakeshore, Tecumseh and the City. The transferred SSO would then be hauled to the Seacliff facility for processing.

If this larger SSO transfer station were built at the landfill, an SSO transfer station in Windsor would not be required.

The increased capacity would require a larger facility, about 125 feet by 50 feet in size. The estimated capital cost for construction of this SSO transfer station is about \$772,021. The full opinion of probable cost table is provided in Appendix A. The design included in this option analysis is based on the transfer conditions noted above. However, expansion of the facility to approximately double the noted capacity would be possible, which would enable it to manage SSO increases due to population growth or to accommodate SSO transfer from Kingsville and Leamington if the Seacliff facility were no longer available.

A drawing depicting the modifications is provided as Figure 9, after Section 7.6.

7.6. Summary of SSO Transfer Station Sizes and Costs

Table 9 provides a summary of the SSO transfer stations options, including their estimated annual capacity and estimated capital cost. It is acknowledged that costs in the industry are changing rapidly and have risen considerably in recent years. However, the estimates prepared for this project are for comparative evaluation only and should not be used for budget forecasting.

The larger-capacity SSO transfer station at the Regional Landfill and the new SSO transfer station at Transfer Station Site #1 were the most expensive options, followed by conversion of the Container MRF to an SSO transfer station. The smaller capacity SSO transfer station at the Regional Landfill had the lowest capital cost. However, there were overlaps among the range of costing (based on the estimates margin of error of +30%, -15%) for the larger capacity SSO transfer station and at the Regional Landfill and both SSO transfer station options at Transfer Station Site #1. Therefore, for planning purposes, the difference in capital costs were not significant.

The influence of these costs on the overall collection, transfer and hauling costs are discussed in Section 8.

Table 9: Estimated Capital Costs for SSO Transfer Station Options

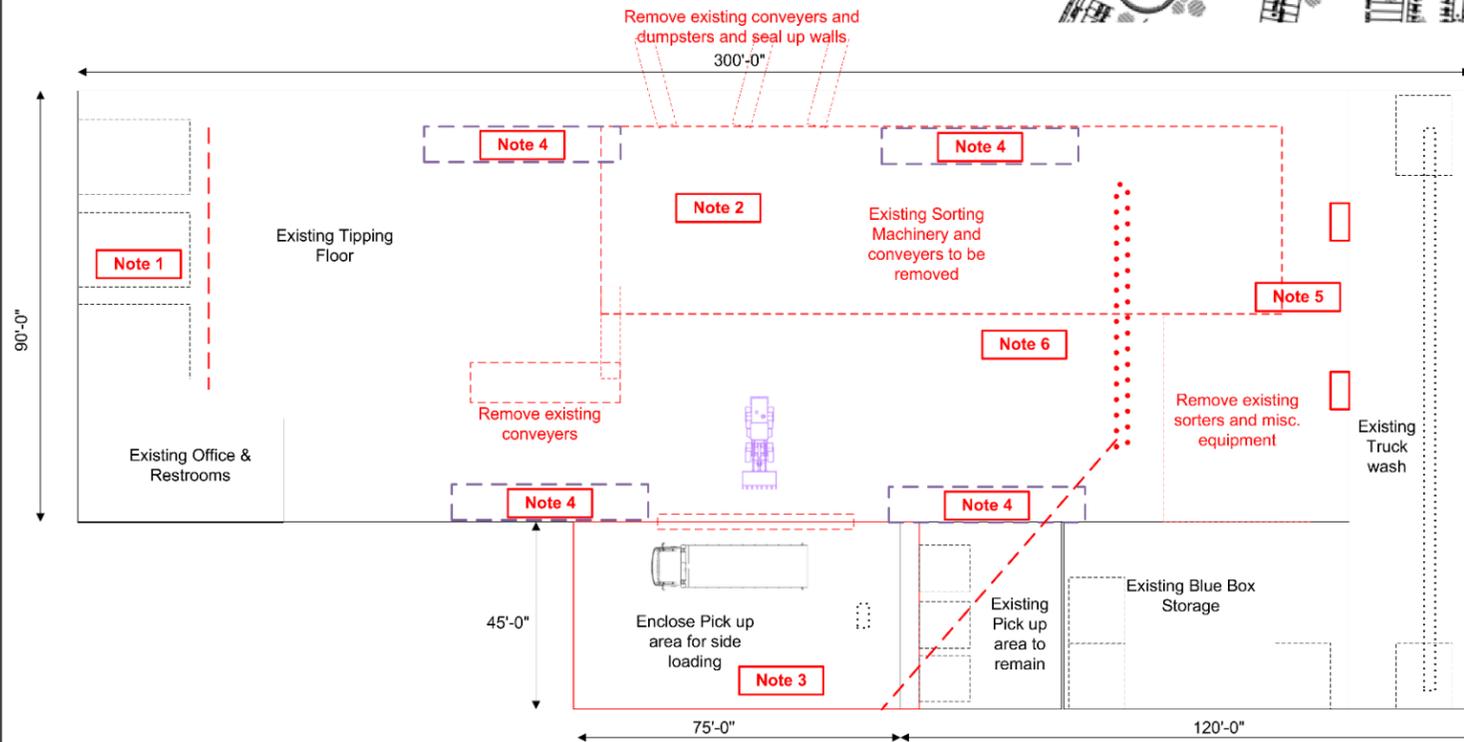
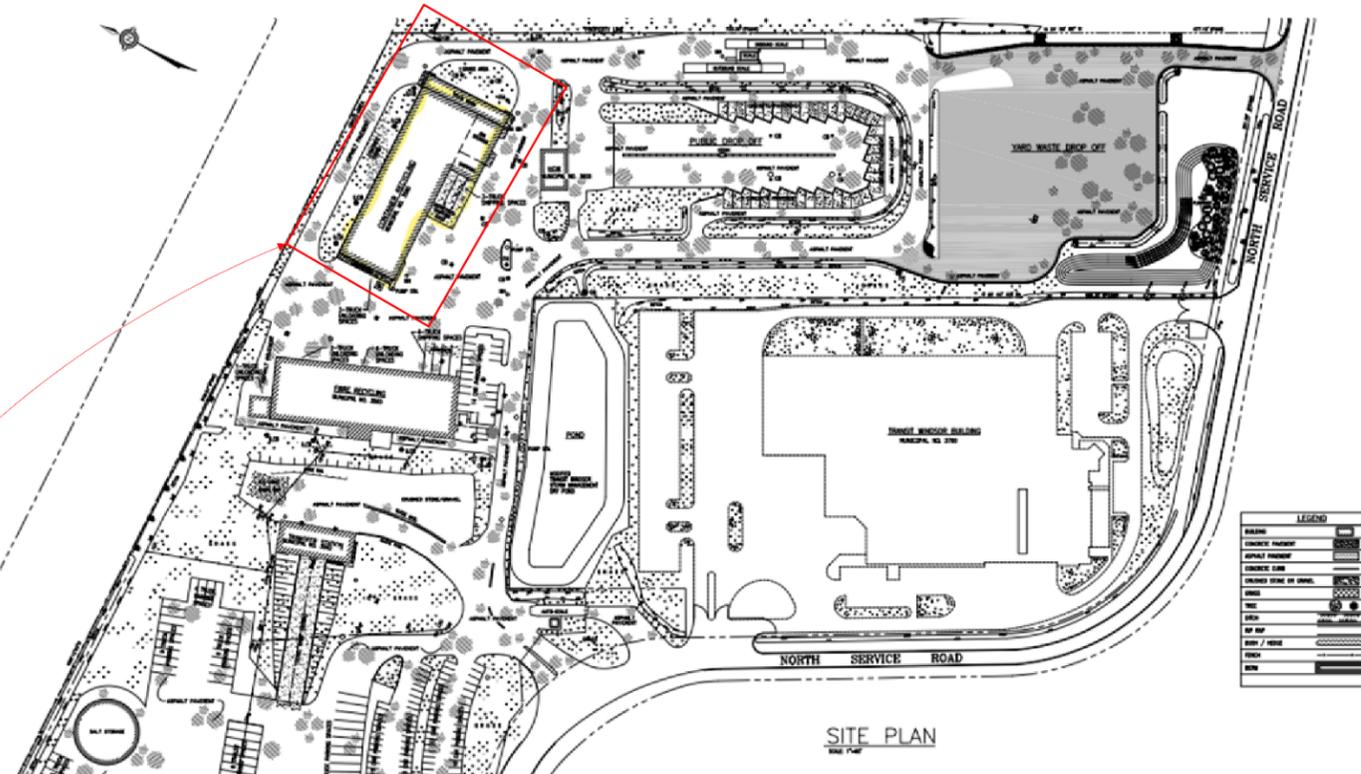
SSO Transfer Station Option #	Description	Location	Municipalities Served	Annual Capacity (annual tonnes)	Estimated Capital Cost (\$)
1	MRF Conversion to SSO Transfer Station	Transfer Station Site # 1 (Windsor)	Windsor Lakeshore Tecumseh	11,700	\$669,400
2	New SSO Transfer Station by Transfer Station 1	Transfer Station Site # 1 (Windsor)	Windsor Lakeshore Tecumseh	11,700	\$843,915
3	New (Small Capacity) SSO Transfer Station at Regional Landfill	Regional Landfill, Essex	LaSalle Amherstburg Essex	3,250	\$521,098
4	New (Large Capacity) SSO Transfer Station at Regional Landfill	Regional Landfill, Essex	LaSalle Amherstburg Essex Lakeshore Tecumseh Windsor	14,950	\$772,021

Acronyms / Notes:

- SSO TS = Source Separated Organics Transfer Station
- TS1 = Transfer Station 1
- MRF = Material Recycling Facility
- Cost estimates are based on conceptual, pre-schematic design. The cost opinion is considered accurate to within +30%, -15%.
- Estimated capital costs include 10% contingency

General Notes:

- SOW to convert the existing container building (Recycling Separation Center) into a Source Separated Organics (SSO) collection and transfer station.
1. New building will receive materials like before in tipping floor with front end loader to organize material into piles for transfer. Provide large hanging plastic separation screen to reduce odor to the outside.
 2. Remove the existing Sorting Machinery, conveyers and associated equipment to be clear out the space for the new use. All electrical connections to be terminated and J-boxes removed and floor smoothed for new use.
 3. Provide Enclosure around pick up area – side wall and roof. Knock out side wall and provide structural support and plastic drape to allow front end loader to move materials from container building to open top transfer trucks for removal and transfer of materials from site.
 4. Re-Enforce existing walls with small sloped side walls and additional back wall to provide location for storage of materials and to allow front end loader to push materials and pickup to transfer to open top transfer trucks.
 5. Seal interior perimeter of material holding area to reduce odor from escaping. Remove and seal all other openings and exhaust vents. All openings to have plastic screens to reduce air flow. Provide dual exhaust system for a minimum of 10 Air Changes with carbon filtration to reduce odors.
 6. Work to slope floor or provide squeegees to collect water or sludge from processed materials. Provide trench drain or multiple drains in low parts of the floor. Route piping to a 500 gallon leachate collection tank. Tank to be located near pick up area with tap for tanker truck to access and pump tank out during quarterly intervals.



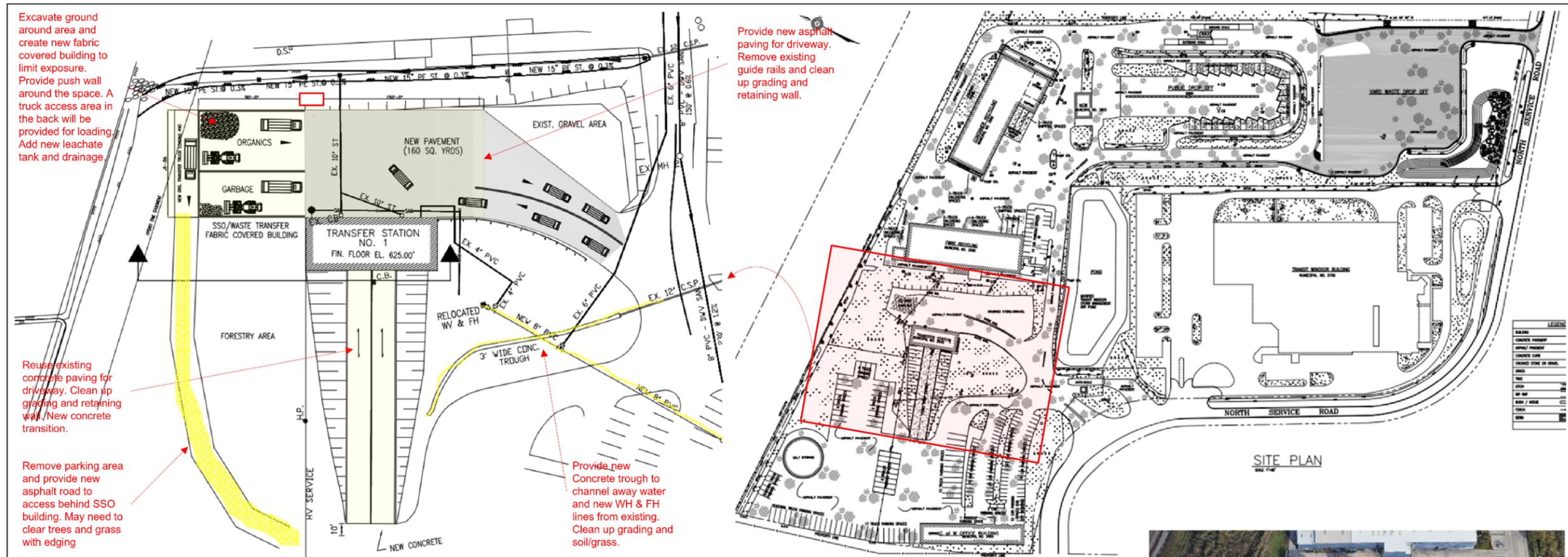
View inside building looking at sorting equipment



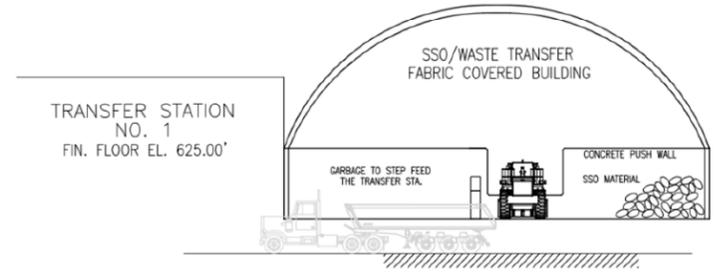
View looking into existing tipping floor area

Drawing Title									
Option 1: MRF Conversion to SSO Transfer Station									
Project Title		REFERENCE DRAWING		REVISION-LOCATION		EON		DATE	
Essex-Windsor Solid Waste Source Separated Organics (SSO) Solution		NO						BY	
		DRAWN		DATE		APPROVED		DATE	
		BY JAR		2/7/2023		BY JCL		2/7/2023	
		Branch #K000000		PROJECT NUMBER		BRM-0024853-AO		DRAWING NUMBER	
		exp.		3901 Westarre Parkway Suite 210 Richmond, Virginia 23233 PH 804-474-4500 FAX 474-4555 www.exp.com		TS1-OPT-1			

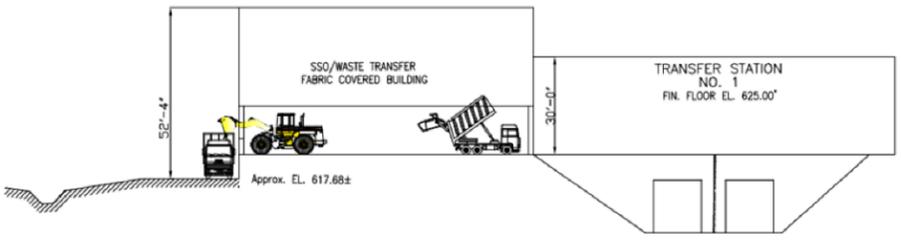
Figure 6: SSO Transfer Station Option 1: MRF Conversion to SSO Transfer Station



Option 2: New SSO Transfer Station by Transfer Station 1



NORTH ELEVATION VIEW OF NEW/EXISTING TRANSFER STATION



EAST ELEVATION VIEW OF NEW/EXISTING TRANSFER STATION



Google Earth View

General Notes:

- SOW to convert the existing Transfer Station (Municipal # 3540) into a Source Separated Organics (SSO) collection and transfer station.
- The existing Transfer Station #1 will be modified and new paving to access SSO/Waste Transfer Station fabric covered building to receive materials in tipping floor with front end loader to organize material into piles for transfer. Provide large hanging plastic separation screen to reduce odor to the outside.
- Provide concrete enclosure around SSO/Waste transfer area – side walls on 3 sides with fabric covered roof. Front end loader will organize and move materials from covered area to transfer trucks in the back.
- Re-Enforce new concrete walls with small sloped side walls and additional back wall to provide location for storage of materials and to allow front end loader to push materials and pickup to transfer to open top transfer trucks.
- Seal interior perimeter of material holding area to reduce odor from escaping. All openings to have plastic screens to reduce air flow. Provide dual exhaust system for a minimum of 10 Air Changes with carbon filtration to reduce odors.
- Floor shall be poured to slope to front so squeegees or hoses can be used to collect water or sludge from processed materials. Provide drain in floor to tank to hold leachate. Provide trench drain or multiple drains in low parts of the driveway.

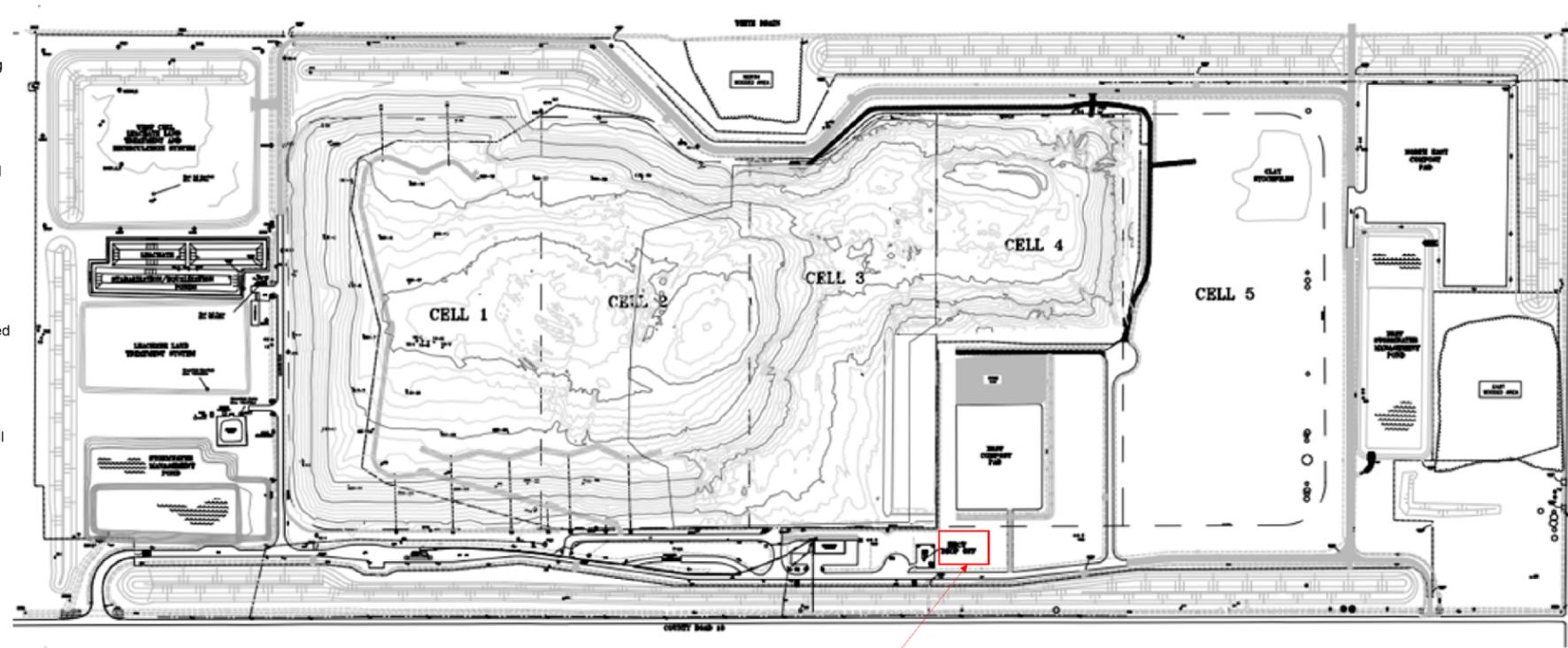
Drawing Title Option 2: New SSO Transfer Station by Transfer Station 1		REFERENCE DRAWING	NO	REVISION-LOCATION	ECN	DATE	BY
Project Title Essex- Windsor Solid Waste Source Separated Organics (SSO) Solution		DRAWN BY JAR DATE 3.29/2023		APPROVED BY JCL DATE 3/29/2023		PROJECT NUMBER BRM-0024853-AO	
Branch Information exp.		3901 Westover Parkway Suite 210 Richmond, Virginia 23233 PH 804-474-4500 FAX 474-4555 www.exp.com		DRAWING NUMBER TS1-OPT-1 ALT #1			

Figure 7: SSO Transfer Station Option 2: New Transfer Station adjacent to Transfer Station 1

General Notes:

- SOW to build a new Source Separated Organics (SSO) collection and transfer station.
1. New building will receive materials at one end. Trucks to dump onto tipping floor with front end loader to organize material into piles for transfer. Odor control is not such a critical issue here.
 2. Pick up area shall be at the other end with a reduced grade to allow front end loader to move materials from tipping floor to open top transfer trucks for removal and transfer of materials from site.
 3. Walls to be reinforced with small sloped side walls and additional back wall to provide location for storage of materials and to allow front end loader to push materials and pickup to transfer to open top transfer trucks.
 4. Structure shall be a warehouse style metal building. Provide dual exhaust system for a minimum of 10 Air Changes to provide ventilation.
 5. Main Floor shall be sloped to drains to collect water or sludge from processed materials. Provide trench drain or multiple drains in low parts of the floor. Route piping to a 500 gallon leachate collection tank. Tank to be located near pick up area with tap for tanker truck to access and pump tank out during quarterly intervals. As an alternate this leachate could be connected the landfill collection system.
 6. Modify road ways and parking lot areas to provide access to the facility, parking for vehicles and pick up pull in. Modify fencing as required.

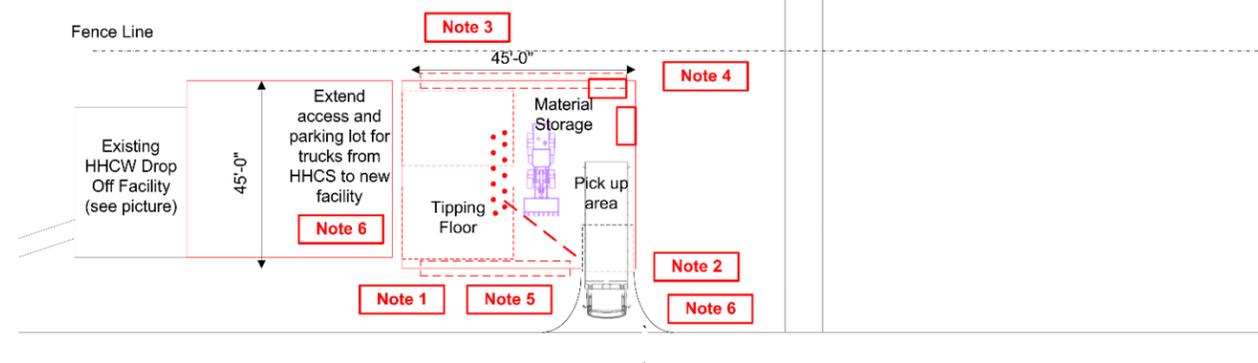
New SSO facility will be designed to handle 3,300 Tonnes (Option #1) of material annually. Option 1 will include modifications to the TS1 site which will handle an additional 12,000 Tonnes of material annually.



50' x 50' proposed site



View looking at the site available for the new facility



Option 3: New SSO Transfer Station at Regional Landfill (Small Capacity)
 Floor Plan

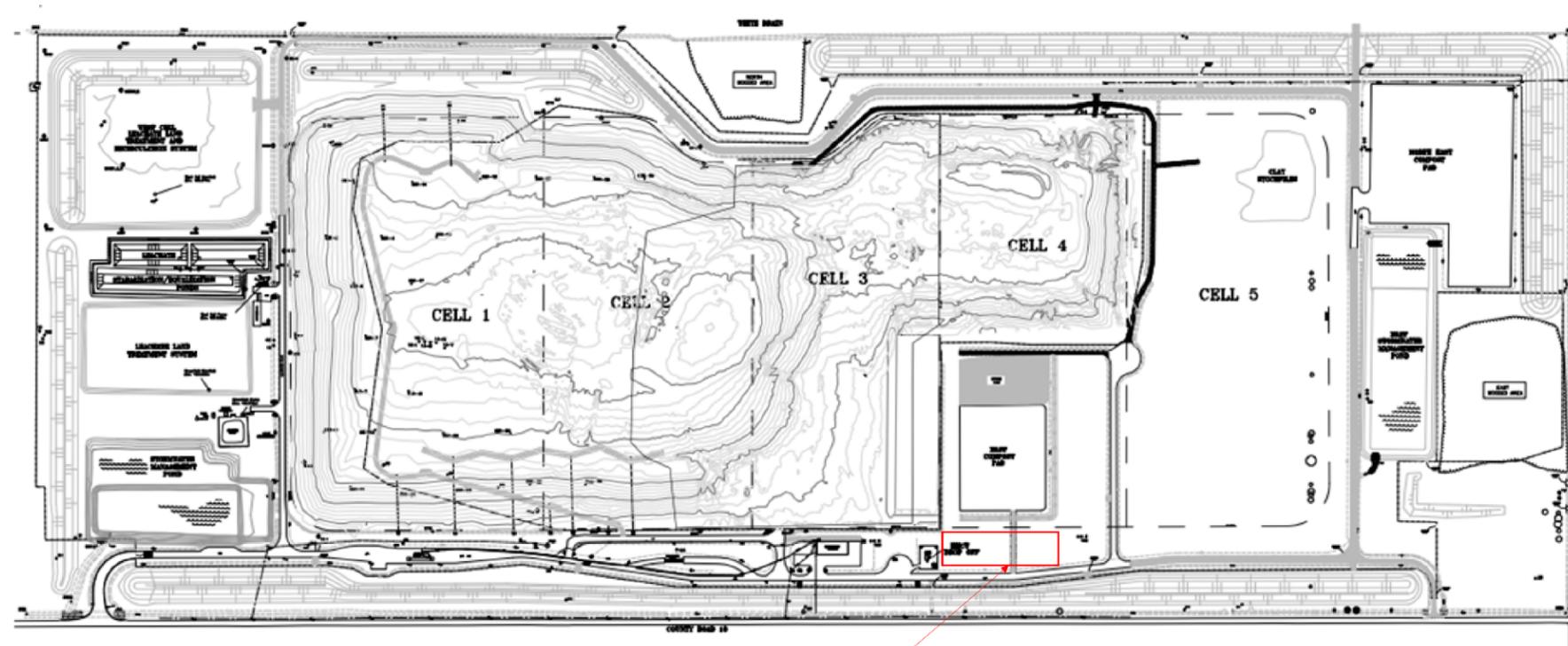
Drawing Title									
Option 3: New SSO Transfer Station at Regional Landfill (Small Capacity)									
REFERENCE DRAWING	N.O.	REVISION	LOCATION	ECA	DATE	BY			
Project Title		DRAWN		APPROVED					
Essex - Windsor Solid Waste Source Separated Organics (SSO) Solution		BY JAR DATE 02/07/2023		BY JCL DATE 02/07/2023					
		SEARCH INFORMATION		PROJECT NUMBER					
		exp.		3901 Westerre Parkway Suite 210 Richmond, Virginia 23233 PH 804-474-4500 FAX 474-4555 www.exp.com		BRM-0024853-AO			
						DRAWING NUMBER LF-OPT-1			

Figure 8: SSO Transfer Station Option 3: New SSO Transfer Station at Regional Landfill (Small Capacity)

General Notes:

- SOW to build a new Source Separated Organics (SSO) collection and transfer station.
1. New building will receive materials at one end. Trucks to dump onto tipping floor with front end loader to organize material into piles for transfer. Odor control is not such a critical issue here.
 2. Pick up area shall be at the other end with a reduced grade to allow front end loader to move materials from tipping floor to open top transfer trucks for removal and transfer of materials from site.
 3. Walls to be reinforced with small sloped side walls and additional back wall to provide location for storage of materials and to allow front end loader to push materials and pickup to transfer to open top transfer trucks.
 4. Structure shall be a warehouse style metal building. Provide dual exhaust system for a minimum of 10 Air Changes to provide ventilation.
 5. Main Floor shall be sloped to drains to collect water or sludge from processed materials. Provide trench drain or multiple drains in low parts of the floor. Route piping to a 500 gallon leachate collection tank. Tank to be located near pick up area with tap for tanker truck to access and pump tank out during quarterly intervals. As an alternate this leachate could be connected to the landfill collection system.
 6. Modify road ways and parking lot areas to provide access to the facility, parking for vehicles and pick up pull in. Relocate existing road access to East Compost Pad and modify fencing as required.

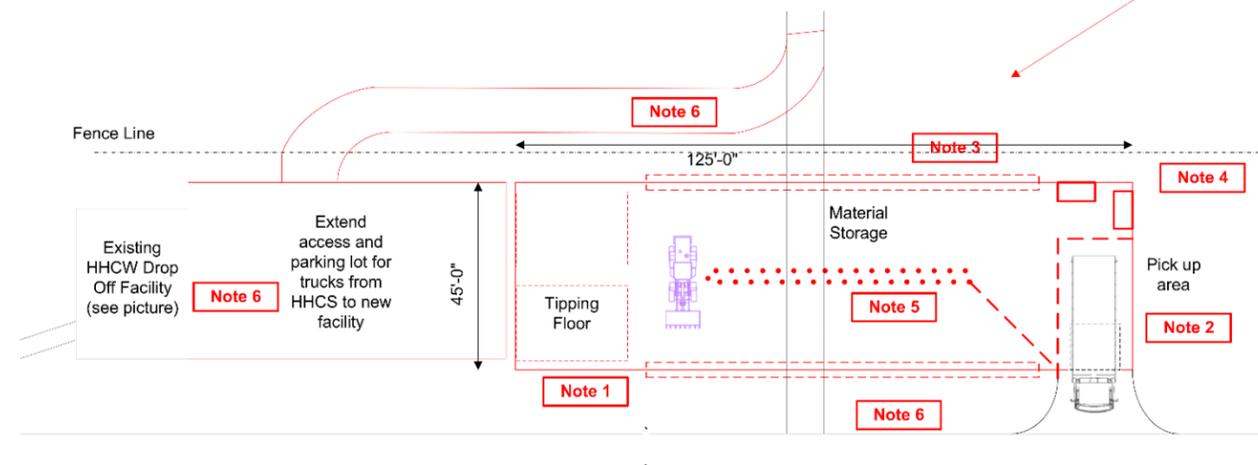
New SSO facility will be designed to handle 15,000 Tonnes (Option #2) of material annually.



125' x 50' proposed site



View looking at the site available for the new facility



Option 4: New SSO Transfer Station at Regional Landfill (Large Capacity)
 Floor Plan

Drawing Title	Option 4: New SSO Transfer Station at Regional Landfill (Large Capacity)			
Project Title	Essex- Windsor Solid Waste Source Separated Organics (SSO) Solution			
REFERENCE DRAWING	NO	REVISION-LOCATION	EON	DATE
BY	JAR	DATE	02/07/2023	BY
DATE	02/07/2023	BY	JCL	DATE
DATE	02/07/2023	PROJECT NUMBER	BRM-0024853-AO	
DRAWING NUMBER	LF-OPT-2			
exp.		3901 Westerre Parkway Suite 210 Richmond, Virginia 23233 PH: 804-474-4500 FAX: 474-4555 www.exp.com		

Figure 9: SSO Transfer Station Option 4: New SSO Transfer Station at Regional Landfill (Large Capacity)

8. Financial Analysis

8.1. Overview of Transfer and Hauling Scenarios

A review of the current approach to solid waste management across Essex-Windsor was discussed previously in Section 2. To briefly summarize, as it pertains to the objectives of this study:

- Each of the eight municipalities in Essex-Windsor are responsible for the collection of garbage in their own municipality and do so through the use of contractors (GFL holds individual contracts with each municipality).
- Garbage collected from Essex, LaSalle, and Amherstburg is delivered directly to the Regional Landfill, which is operated by the Authority. Garbage collected from the remaining County municipalities and the City are consolidated at transfer stations (also operated by the Authority) before being transferred to the Regional Landfill.
- Collection of recycling in the City is undertaken by GFL under a contract with the City. Collection of recycling in each of the seven County municipalities is contracted by the Authority to the City. The collected two-stream recyclables are taken to a fibre MRF and a container MRF that is operated by the Authority at Transfer Station Site #1.
- The Authority, the City and the County plan to implement a curbside SSO collection and processing program in each of the eight County municipalities in 2025. The SSO will be processed at the Seacliff organics processing facility in Leamington.

This financial analysis will focus on transfer costs and on hauling costs. To clarify:

- **Transfer costs:** These include the operational costs related to receiving and handling the waste collected from the eight municipalities. It includes the labour, amortization and depreciation, and overhead for the transfer stations.
- **Hauling costs:** These are the costs for transporting the consolidated waste from the transfer facilities to either the Regional Landfill (for disposal of garbage) or the Seacliff facility (for SSO processing).
- **Direct-haul costs:** These are the costs of hauling collected waste directly to the landfill or the Seacliff facility at the end of a route or shift or when a truck is full.

Garbage Transfer and Hauling Scenarios

Building on the analysis completed in the preceding sections, the following scenarios for garbage collection and transfer are considered for this report:

- **Garbage Scenario 1 (Status Quo)** - The status quo scenario for garbage collection would see the existing approach to garbage collection and transfer continue as-is.
- **Garbage Scenario 2 (Regionalization)** - The regionalization scenario would include a single regional contract for the collection of garbage and transfer to the Regional Landfill. Use of the existing transfer stations would be optimized based on proximity.

The financial analysis for each option is presented in Section 8.2.

SSO Transfer and Hauling Scenarios

Building on the analysis completed in the preceding sections, the following scenarios for SSO collection and transfer are considered for this report:

- **SSO Scenario 1 (Direct Haul)** - In this scenario, SSO would be collected for each of the eight municipalities and then direct-hauled to the Seacliff processing facility in Leamington.
- **SSO Scenario 2 (Two & One³⁴)** - In this scenario, the collected SSO would be managed using two transfer stations and direct-hauled to the Seacliff facility:
 - SSO collected in Lakeshore and Tecumseh and the City would be taken to Transfer Station Site #1 and then hauled to the Seacliff facility.
 - SSO collected in Lasalle, Essex and Amherstburg would be taken to a new SSO transfer station at the Regional Landfill and then hauled to the Seacliff facility.
 - SSO collected in Kingsville and Leamington would be direct hauled to the Seacliff facility.

SSO Scenario 2 (Two & One) is divided into two “a and b” scenarios:

- **SSO Scenario 2a:** Scenario 2a is as noted above but with SSO collection managed by each individual municipality.
- **SSO Scenario 2b:** Scenario 2b is as noted above but with regionalized SSO collection, which shifts the distribution of SSO tonnage among the transfer stations and Seacliff facility based on optimized collection (i.e., proximity to the transfer stations and Seacliff).
- **SSO Scenario 3 (One & One³⁵)** - In this scenario, the collected SSO would be taken to a new SSO transfer station at the Regional Landfill Site or direct-hauled to the Seacliff facility:
 - SSO collected in Lakeshore, Tecumseh, Lasalle, Essex and Amherstburg and the City of Windsor would be taken to a new SSO transfer station at the Regional Landfill and then hauled to the Seacliff facility.
 - SSO collected in the municipalities of Kingsville and Leamington would be direct hauled to the Seacliff facility.

SSO Scenario 3 (One & One) is divided into two “a and b” scenarios:

- **SSO Scenario 3a:** Scenario 3a is as noted above but with SSO collection managed by each individual municipality.
- **SSO Scenario 3b:** Scenario 3b is as noted above but with regionalized SSO collection.

The financial analysis for each option is presented in Section 8.3.

³⁴ “Two & One” refers to the two transfer stations and the Seacliff facility.

³⁵ “One & One” refers to the transfer station and the Seacliff facility.

Considerations

As per the discussion in the previous sections, the scenarios above include the following considerations:

- Collection and processing of recycling is no longer the responsibility of the Authority, City or the County (see Section 3.1 for discussion).
- Garbage would be collected on an EOW basis (see Section 4.3 and 4.4 for discussion).
- The SSO program would be implemented across Essex-Windsor and collected weekly (see Sections 5 and 6 for discussion).
- Garbage and SSO are each collected in dedicated collection vehicles and not co-collected (see Sections 5 and 6 for discussion).

In addition, the project team consulted with industry representatives to obtain a relevant time-based hauling cost-rate to use for estimating hauling costs. The costs ranged between \$270 to \$300 per hour. The team also calculated an estimated rate as a ground-truthing exercise and obtained an average value of \$280 per hour (see Table 10). The average hauling rate calculated in the exercise was based the contracted costs for the Authority to haul waste from Transfer Station 1 or Transfer Station 2 to the Regional Landfill.

Table 10 provides the basis for the average time-based hauling rate, which was used to determine hauling costs for the garbage and SSO scenarios.

Table 10: Estimate of Average Hauling Rate

Haul route	Distance (km)	Transit Time (hours) ^(a)	Haul Rate \$/tonne	Calculated Cost for 25 tonne Shipment ^(b)	Equivalent Hourly Rate \$/hour ^(c)	Average Rate \$/hour
Transfer Station 1 to Regional Landfill	36	1.94	\$18.75	\$468.75	\$242	\$280
Transfer Station 2 to Regional Landfill	22	1.38	\$17.58	\$439.5	\$318	

Notes:

- (a) Transit time is the time required to haul the material from the transfer station to the Regional Landfill at 50km/h (with return trip) plus 30 minutes for offloading.
- (b) The value of 25 tonnes is based on the estimated capacity (conservative) of one standard tractor trailer designed for waste hauling (see Section 5.1.1).
- (c) The equivalent hourly rate is calculated based on the cost for a 25-tonne shipment divided by the transit time. Estimates are based on current costs and expected to escalate at levels equal to or greater than inflation.

8.2. Garbage Transfer and Hauling Scenarios

8.2.1. Garbage Scenario 1 (Status Quo)

The status quo scenario for garbage collection would see the existing approach to garbage collection and transfer continue as-is. As per current practice, the collected garbage would be consolidated at either Transfer Station 1 and Transfer Station 2 (depending on the municipality) and then transported to the Regional Landfill. How the garbage is collected and transferred would not change in this scenario, other than the collection occurring EOW and the anticipated reduction in garbage tonnages due to diversion of SSO into the SSO stream.

Table 11 presents the estimated amount of residential garbage that would be collected annually, based on the tonnages for collected and transferred in 2021 for each municipality. The table presents how much garbage was collected and sent to which transfer facility by municipality in 2021. The estimated amount of garbage to be collected in this scenario was calculated by subtracting the estimated annual SSO tonnage from 2021 collected garbage. The total estimated amount of garbage collected annually is reduced from the 2021 baseline of 112,053 tonnes by 15% to 95,653 tonnes. The estimated amount of garbage collected from each municipality will be used to estimate transfer and hauling costs for both garbage transfer/hauling scenarios.

Table 11: Estimated Tonnage of Garbage Collected and Transferred (Garbage Scenario 1)

Municipality	Residential Garbage Collected - 2021				Estimated Amount of SSO Collected (annual tonnes)	Estimated Amount of Garbage Collected ^(a) (annual tonnes)
	Transfer Station 1 (annual tonnes)	Transfer Station 2 (annual tonnes)	Regional Landfill (annual tonnes)	Total Residential Garbage Collected (annual tonnes)		
Amherstburg	--	--	7,418	7,418	1,000	6,418
Essex	--	--	6,270	6,270	650	5,620
Kingsville	--	3,456	2,750	6,206	600	5,606
Lakeshore	11,961	--	77	12,038	1,700	10,338
LaSalle	--	--	9,210	9,210	1,600	7,610
Leamington	--	6,928	--	6,928	850	6,078
Tecumseh	5,559	--	537	6,096	1,000	5,096
Windsor	57,887	--	--	57,887	9,000	48,887
Total	75,407	10,384	26,262	112,053	16,400	95,653
(% of total residential waste collected)	67%	9%	23%	100%	15%	85%

(a) Estimated amount of garbage collected is equal to the total residential garbage collected in 2021 minus the estimated amount of SSO that would be collected.

Table 12 presents the estimated cost of garbage transfer and hauling based on revised garbage quantities presented in Table 11. Based on these quantities:

- The transfer cost for Transfer Stations 1 and 2 are \$961,605 and \$137,760 per year, respectively, for a total annual transfer cost of about \$1,099,365.
- The hauling cost from Transfer Station 1 and from Transfer Station 2 to the landfill is \$1,202,006 and \$161,455 per year, respectively, for a total hauling cost of about \$1,363,461 per year.
- The total annual cost for transfer and hauling for Garbage Scenario 1 (Status Quo) is about \$2,462,826.
- The total annual cost per tonne for transfer and hauling for the scenario is \$33.60 per tonne for garbage managed through the two transfer stations (does not include garbage direct-hauled the landfill).

Table 12: Estimated Garbage Transfer and Hauling Costs (Garbage Scenario 1)

Municipality	Collected Garbage (annual tonnes)			Transfer Costs (\$ per year)		Hauling to Regional Landfill (\$ per year)	
	Transfer Station 1	Transfer Station 2	Regional Landfill	Transfer Station 1	Transfer Station 2	Transfer Station 1	Transfer Station 2
Amherstburg	-	-	6,418	-	-	-	-
Essex	-	-	5,620	-	-	-	-
Kingsville	-	3,106	2,500	-	\$46,590	-	\$54,603
Lakeshore	10,261	-	77	\$153,915	-	\$192,394	-
LaSalle	-	-	7,610	-	-	-	-
Leamington	-	6,078	-	-	\$91,170	-	106,851
Tecumseh	4,959	-	137	\$74,385	-	\$92,981	-
Windsor	48,887	-	-	733,305	-	\$916,631	-
TOTAL	64,107	9,184	22,362	\$961,605	\$137,760	\$1,202,006	\$161,455

8.2.2. Garbage Scenario 2 (Regionalization)

The regionalization scenario would include a single regionalized contract for the collection of garbage to either the transfer stations or directly to the landfill. The existing transfer stations would continue to be used based on the regionalization concept of proximity.

The annual tonnage for Garbage Scenario 2 is the same for each municipality as in Garbage Scenario 1; however, the distribution of the tonnage to the transfer stations or the landfill site has been updated to reflect regionalization of its collection. Key changes to the distribution of tonnage include:

- The distribution of garbage collected in Lakeshore has shifted from primarily going to Transfer Station 1 to more than half going to Transfer Station 2 and the remainder going to Transfer Station 1 or direct hauled to the landfill.
- All of Tecumseh’s garbage would be sent to Transfer Station 1.

Table 13 presents the estimated cost of garbage transfer and hauling based on the revised garbage distributions. Based on these quantities:

- The transfer cost for Transfer Stations 1 and 2 are \$954,461 and \$236,425 per year, respectively, for a total annual transfer cost of about \$ \$1,190,886.
- The hauling cost from Transfer Station 1 and from Transfer Station 2 to the landfill is \$1,193,076 and \$277,090 per year, respectively, for a total hauling cost of about \$1,470,166 per year.
- The total annual cost for transfer and hauling for Garbage Scenario 1 (Status Quo) is about \$2,661,052.
- The total annual cost per tonne for transfer and hauling for the scenario is \$34 per tonne of garbage managed through the two transfer stations (does not include garbage direct-hauled the landfill).

Table 13: Estimated Garbage Transfer and Hauling Costs (Garbage Scenario 2)

Municipality	Collected Garbage (annual tonnes)			Transfer Costs (\$ per year)		Hauling to Regional Landfill (\$ per year)	
	Transfer Station 1	Transfer Station 2	Regional Landfill	Transfer Station 1	Transfer Station 2	Transfer Station 1	Transfer Station 2
Amherstburg	-	-	6,418	-	-	-	-
Essex	-	-	5,620	-	-	-	-
Kingsville	-	3,112	2,494	-	\$46,676	-	\$54,704
Lakeshore	2,038	6,572	1,728	\$30,566	\$98,579	\$38,207	115,535
LaSalle	7,610	-	-	\$114,150	-	\$142,688	-
Leamington	-	6,078	-	-	\$91,170	-	\$106,851
Tecumseh	5,096	-	-	\$76,440	-	\$95,550	-
Windsor	48,887	-	-	\$733,305	-	\$916,631	-
TOTAL	63,631	15,762	16,261	\$954,461	\$236,425	\$1,193,076	\$277,090

8.2.3. Garbage Scenario Comparison

Based on the two scenarios above, the following observations are made:

- There is no significant difference between the costs for transfer and hauling of garbage in either scenario.
- The utilization of Transfer Station 2 increases by 40%. It may therefore require additional staffing resources, in which case the operational costs may then increase.
- The garbage collected from Lakeshore is being distributed to all three facilities in the second scenario.
- The amount of garbage being direct hauled to the Regional Landfill reduces in Garbage Scenario 2 compared to Garbage Scenario 1.
- Transfer Station 1 continues to receive similar amounts of garbage in both scenarios.
- Regionalization appears to be economically neutral with respect to the cost of garbage transfer and hauling (while there is a cost difference of about \$100,000 - or roughly 10% of the lowest cost - this amount is not significant based on the level of accuracy of the analysis). Therefore, the bulk of the economic benefits of regionalization would be related to the elimination of municipal boundaries with respect to collection, thereby creating economies of scale, encouraging competition, and improving routing efficiencies.

8.3. SSO Transfer and Hauling Scenarios

8.3.1. SSO Scenario 1 (Direct-Haul)

In this scenario, the SSO collected in Essex-Windsor would be direct hauled to the Seaclyff facility in Leamington. The SSO transfer stations discussed in Section 7 (i.e., either SSO transfer station concepts at Transfer Station Site #1 or at the Regional Landfill) would not be required in this scenario.

In calculating the estimated costs for this scenario, the following acceptances have been determined or assumed:

- The capacity of the SSO collection vehicles are 8 tonnes.
- The average speed of the collection vehicle is 50 km/h.
- The estimated time for the collection vehicles to unload the SSO at the Seaclyff facility and depart is 30 minutes.
- The average rate for transporting waste is \$280 per hour, on average.

Table 14 provides the estimated cost for direct-hauling curbside collected SSO in each municipality to the Seaclyff facility. The total annual direct haul cost is about \$1.4M, with the bulk of that cost (about \$850,000) due to direct haul from Windsor. The average cost per tonne for direct haul is \$85.48 per tonne.

Table 14: Estimated SSO Direct Haul Costs

Municipality	Annual SSO (annual tonnes)	Number of Direct-Haul Trips per Year	Average Distance to Seaclyff Facility (km)	Average Transit Time (hours)	Estimated Cost per Direct-Haul (\$ per trip)	Estimated Annual Cost for Direct Haul (\$ per Year)
Amherstburg	1,000	125	50	2.5	\$700.00	\$87,500
Essex	650	82	31	1.7	\$487.20	\$39,950
Kingsville	600	75	16	1.1	\$319.20	\$23,940
Lakeshore	1,700	213	34	1.9	\$520.80	\$110,930
LaSalle	1,600	200	65	3.1	\$868.00	\$173,600
Leamington	850	107	5	0.7	\$196.00	\$20,972
Tecumseh	1,000	125	55	2.7	\$756.00	\$94,500
Windsor	9,000	1,125	55	2.7	\$756.00	\$850,500
Totals	16,400	2,052	-	-	-	\$1,401,893

8.3.2. SSO Scenario 2a (Two & One): by Municipality

As noted previously, this scenario would have the SSO collection managed by each individual municipality. The collected SSO material would be taken to two transfer stations and also by direct haul to the Seaclyff facility:

- SSO collected in Lakeshore and Tecumseh and the City would be taken to Transfer Station Site #1 and then hauled to the Seaclyff facility.
- SSO collected in Lasalle, Essex and Amherstburg would be taken to a new SSO transfer station at the Regional Landfill and then hauled to the Seaclyff facility.
- SSO collected in Kingsville and Leamington would be direct hauled to the Seaclyff facility.

Table 15 presents the distribution of the SSO collected in each municipality once the material has been collected, based on the preceding points. The SSO material taken to the transfer stations at Transfer Station Site #1 in Windsor and the Regional Landfill in Essex would be hauled to the Seaclyff facility in transport trailers, while the material direct hauled to the Seaclyff facility would be transported in curbside collection trucks. The estimated capacity of the new Regional Landfill SSO transfer station in Scenario 2 would have a capacity of about 3,250 annual tonnes.

Table 15: SSO Scenario 2a - Destination of SSO Tonnage after Collection

Municipality	Transfer Station Site #1 (Windsor) (annual tonnes)	Seacliff Facility (Kingsville) (annual tonnes)	Regional Landfill (Essex) (annual tonnes)	Total Tonnes of SSO (annual tonnes)
Amherstburg	0	0	1,000	1,000
Essex	0	0	650	650
Kingsville	0	600	0	600
Lakeshore	1,700	0	0	1,700
LaSalle	0	0	1,600	1,600
Leamington	0	850	0	850
Tecumseh	1,000	0	0	1,000
Windsor	9,000	0	0	9,000
Total	11,700	1,450	3,250	16,400

Table 16 presents the estimated costs for transfer and hauling. The total annual transfer and hauling cost (including direct haul) is \$694,313, or about \$41 a tonne.

Table 16: SSO Scenario 2a - Summary of Transfer and Hauling Costs

Municipality	Transfer Cost: Transfer Station Site 1 (\$ per year)	Transfer Cost: Regional Landfill (\$ per year)	Hauling Cost: From Transfer Station Site #1 (\$ per year)	Hauling Cost: Direct Haul to Seacliff Facility (\$ per year)	Hauling Cost: From Regional Landfill (\$ per year)	Total Annual Cost (\$ per year)
Amherstburg	-	\$15,000	-	-	\$21,728	\$36,728
Essex	-	\$9,750	-	-	\$14,123	\$23,873
Kingsville	-	-	-	\$23,940	-	\$23,940
Lakeshore	\$25,500	-	\$48,362	-	-	\$73,862
LaSalle	-	\$24,000	-	-	\$34,765	\$58,765
Leamington	-	-	-	\$20,825	-	\$20,825
Tecumseh	\$15,000	-	\$28,448	-	-	\$43,448
Windsor	\$135,000	-	\$256,032	-	-	\$391,032
Total	\$175,500	\$48,750	\$332,842	\$44,765	\$70,616	\$672,473

8.3.3. SSO Scenario 2b (Two & One): Regionalization

SSO Scenario 2b is similar to 2a but the SSO is managed through regionalized collection. A key result of this change is the destination of SSO after collection, which is shifted due to optimized collection. As table 17 shows, the tonnage shifts include:

- Approximately 1,365 tonnes of Lakeshore’s SSO is diverted from Transfer Station Site #1 in Windsor to either the Regional Landfill in Essex or direct hauled to the Seacliff facility.
- Approximately 1600 tonnes of LaSalle’s SSO is diverted from the Regional Landfill to Transfer Station Site #1.
- About 267 tonnes of SSO from Kingsville is sent to the potential transfer station at the Regional Landfill.

Table 17: SSO Scenario 2b - Destination of SSO Tonnage after Collection

Municipality	Transfer Station Site #1 (Windsor) (annual tonnes)	Seacliff Facility (Kingsville) (annual tonnes)	Regional Landfill (Essex) (annual tonnes)	Total Tonnes of SSO (annual tonnes)
Amherstburg	-	0	1,000	1,000
Essex	-	0	650	650
Kingsville	-	333	267	600
Lakeshore	335	1,081	284	1,700
LaSalle	1,600	-	-	1,600
Leamington	-	850	-	850
Tecumseh	1,000	-	-	1,000
Windsor	9,000	-	-	9,000
Total	11,935	2,264	2,201	16,400

Table 18 presents the estimated costs for transfer and hauling for Scenario 2b. The total annual transfer and hauling cost (including direct haul) is \$623,663, or about \$38 a tonne. The difference in annual cost between collecting the SSO either by individual municipality or regionalized is about \$71,000. However, given this scale of cost, this difference is not considered significant.

Table 18: SSO Scenario 2b - Summary of Transfer and Hauling Costs

Municipality	Transfer Cost: Transfer Station Site 1 (\$ per year)	Transfer Cost: Regional Landfill (\$ per year)	Hauling Cost: From Transfer Station Site #1 (\$ per year)	Hauling Cost: Direct Haul to Seaclyff Facility (\$ per year)	Hauling Cost: From Regional Landfill (\$ per year)	Total Annual Cost (\$ per year)
Amherstburg	-	\$15,000	-	-	\$21,728	\$36,728
Essex	-	\$9,750	-	-	\$14,123	\$23,873
Kingsville	-	\$4,004	-	\$13,288	\$5,801	\$23,093
Lakeshore	\$5,026	\$4,263	\$7,281	\$70,354	\$6,175	\$93,099
LaSalle	\$24,000	-	\$34,765	-	-	\$58,765
Leamington	-	-	\$0	\$20,825	-	\$20,825
Tecumseh	\$15,000	-	\$21,728	-	-	\$36,728
Windsor	\$135,000	-	\$195,552	-	-	\$330,552
Total	\$179,026	\$33,018	\$259,326	\$104,467	\$47,827	\$623,663

8.3.4. SSO Scenario 3a (One & One): by Municipality

As noted previously, this scenario involves the creation of a new SSO transfer facility at the Regional Landfill. SSO collected in Lakeshore, Tecumseh, Lasalle, Essex and Amherstburg and the City of Windsor would be taken to the SSO transfer station at the Regional Landfill and then hauled to the Seaclyff facility. SSO collected in the municipalities of Kingsville and Leamington would be direct hauled to the Seaclyff facility.

The new SSO transfer station at the Regional Landfill would have a capacity of 15,000 tonnes per year to accommodate the six municipalities noted above. Table 19 presents a summary of the anticipated tonnage distribution for this scenario. The majority of the collected SSO would pass through the new SSO transfer station at the Regional Landfill, while the remainder would be direct hauled to the Seaclyff facility.

Table 19: SSO Scenario 3a - Destination of SSO Tonnage after Collection

Municipality	Seacliff Facility (Kingsville) (annual tonnes)	Regional Landfill (Essex) (annual tonnes)	Total Tonnes of SSO (annual tonnes)
Amherstburg	-	1,000	1,000
Essex	-	650	650
Kingsville	600	-	600
Lakeshore	-	1,700	1,700
LaSalle	-	1,600	1,600
Leamington	850	-	850
Tecumseh	-	1,000	1,000
Windsor	-	9,000	9,000
Total	1,450	14,950	16,400

Table 20 summarizes the transfer and hauling cost for this scenario. The total cost for this scenario is \$1.39M. The largest component of this cost (\$1.12M) is the hauling cost associated with SSO coming through the new SSO transfer station that would be built at the Regional Landfill in this scenario. That hauling cost consists of:

- \$324,834 to haul the SSO from the new SSO transfer station to the Seacliff facility; and
- \$794,138 as an additional incremental cost for garbage trucks from Leamington, Tecumseh and Windsor to haul SSO to the Regional Landfill instead of to a facility at Transfer Station Site #1.

The average annual per tonne cost for this scenario is \$85 per tonne.

Table 20: SSO Scenario 3a - Summary of Transfer and Hauling Costs

Municipality	Transfer Cost: Regional Landfill (\$ per year)	Hauling Cost: Direct Haul to Seacliff Facility (\$ per year)	Hauling Cost: From Regional Landfill ^(a) (\$ per year)	Total Annual Cost
Amherstburg	\$15,000	-	\$21,728	\$36,728
Essex	\$9,750	-	\$14,123	\$23,873
Kingsville	-	\$23,940	-	\$23,940
Lakeshore	\$25,500	-	\$152,325	\$177,825
LaSalle	\$24,000	-	\$34,765	\$58,765
Leamington	-	\$20,825	-	\$20,825
Tecumseh	\$15,000	-	\$89,603	\$104,603
Windsor	\$135,000	-	\$806,427	\$941,427
Total	\$224,250	\$44,765	\$1,118,971	\$1,387,986

Notes:

- (a) Includes the extra hauling cost of garbage trucks from Leamington, Tecumseh and Windsor hauling waste to the Regional Landfill instead of to a facility at Transfer Station Site #1.

8.3.5. SSO Scenario 3b (One & One): Regionalization

SSO Scenario 3b is similar to 3a but instead the SSO is managed through regionalized collection. Table 21 presents a summary of the anticipated tonnage distribution for this scenario. The changes are not significant to SSO Scenario 3a, with most of the SSO continuing to be managed through the potential new SSO transfer station at the Regional Landfill. Table 22 presents the Scenario cost. The total difference between Scenario 3a and 3b is about \$46,000, which is not significantly different given the scale of the total cost.

Table 21: SSO Scenario 3b - Destination of SSO Tonnage after Collection

Municipality	Seacliff Facility (Kingsville) (annual tonnes)	Regional Landfill (Essex) (annual tonnes)	Total Tonnes of SSO (annual tonnes)
Amherstburg	-	1,000	1,000
Essex	-	650	650
Kingsville	333	267	600
Lakeshore	1,081	619	1,700
LaSalle	-	1,600	1,600
Leamington	850	-	850
Tecumseh	-	1,000	1,000
Windsor	-	9,000	9,000
Total	2,264	14,136	16,400

Table 22: SSO Scenario 3b - Summary of Transfer and Hauling Costs

Municipality	Transfer Cost: Regional Landfill (\$ per year)	Hauling Cost: Direct Haul to Seacliff Facility (\$ per year)	Hauling Cost: From Regional Landfill ^(a) (\$ per year)	Total Annual Cost
Amherstburg	\$15,000	-	\$21,728	\$36,728
Essex	\$9,750	-	\$14,123	\$23,873
Kingsville	\$4,004	\$13,288	\$5,801	\$23,093
Lakeshore	\$9,289	\$70,354	\$36,200	\$115,843
LaSalle	\$24,000	-	\$143,365	\$167,365
Leamington	-	\$20,825	-	\$20,825
Tecumseh	\$15,000	-	\$89,603	\$104,603
Windsor	\$135,000	-	\$806,427	\$941,427
Total	\$212,044	\$104,467	\$1,117,247	\$1,433,758

Notes:

(a) Includes the extra hauling cost of garbage trucks from LaSalle, Leamington, Tecumseh and Windsor hauling waste to the Regional Landfill instead of to a facility at Transfer Station Site #1.

8.3.6. SSO Scenario Comparison

Table 23 provides a cost comparison of the various SSO management scenarios. The lowest annual cost (total and per tonne) is for SSO Scenario 2, utilizing transfer stations to be located at Transfer Station Site #1 and the Regional landfill, and direct haul to the Seacliff facility.

The calculations in the analysis indicate that the regionalized approach may have lower costs compared to collecting SSO through the individual municipalities. However, the difference in this cost is not significant given the scale of the costs. Rather, the observation made is that the estimated cost of either sub-option is similar.

That said, while the economic costs may be similar, regionalization of the SSO collection could provide a number of other benefits, which have been discussed in some detail in Section 6 of this report. Stating briefly, they include:

- Increased cost-competitiveness through one large collection contract compared to multiple smaller collection contracts;
- Increased municipal and collection cost-efficiencies through avoided duplication of administration and increased routing efficiencies;
- Reduced greenhouse gas and other emissions due to reduced fossil fuel use, made possible through improved routing efficiency; and
- Improved customer service due to consistent service levels across Essex-Windsor and improved ability to ensure contractor performance.

Table 23: Cost Comparison of SSO Transfer / Haulage Scenarios

Scenario	Annual Transfer Cost (\$ per year)	Annual Haul Cost (\$ per year)	Total Annual Cost (\$ per year)	Cost per Tonne per Year
SSO Scenario 1 (Direct Haul)	-	\$1,401,893	\$1,401,893	\$85
SSO Scenario 2a (Two & One): by Municipality	\$224,250	\$448,223	\$672,473	\$41
SSO Scenario 2b (Two & One): Regionalization	\$212,044	\$411,620	\$623,663	\$38
SSO Scenario 3a (One & One): by Municipality	\$224,250	\$1,163,736	\$1,387,986	\$85
SSO Scenario 3b (One & One): Regionalization	\$212,044	\$1,221,714	\$1,433,758	\$87

9. Climate Change Impacts

Currently, about 112,000 tonnes per year of waste is landfilled at the Regional Landfill. This waste contains organics and mixed waste and is generated by the City and the Municipalities.

The USEPA's³⁶ Waste Reduction Model (WARM³⁷) was used by the project team to estimate the amount of greenhouse gas (GHG) emission reductions that may be achieved by diverting SSO to composting instead of landfilling. The USEPA created the WARM to provide high-level estimates of potential GHG emissions reductions, energy savings, and economic impacts from several different waste management practices. WARM estimates these impacts from baseline and alternative waste management practices, such as source reduction, recycling, anaerobic digestion, combustion, composting and landfilling.

The input assumptions for the model included:

- Base Scenario:
 - Total waste: 112,500 tonnes per year;
 - Mixed waste landfilled: 112,500 tonnes per year (with landfill gas capture and flare);
- Alternate Scenario:
 - Total waste: 112,500 tonnes per year;
 - SSO Processed: 16,500 tonnes per year (by anaerobic digestion);
 - Mixed waste landfilled: 96,000 tonnes per year (with landfill gas capture and flare).

Figure 10 (following page) presents the results of the WARM model. It shows that the anticipated carbon emissions from the two scenarios were:

- Current Baseline Emissions: 51,461 MTCO₂E
- Alternate Scenario Emissions: 42,954 MTCO₂E

This indicates that diverting SSO from mixed waste and using anaerobic digestion technology would result in a reduction of GHG emissions of about 8507 MTCO₂E, compared to the baseline scenario. This reduction would be equivalent to removing the annual GHG emissions of 1,806 passenger cars.

As the region grows, the number of curbside collection vehicles required to manage collection will increase. This will increase the benefit of transfer as it will limit the total kilometres travelled by the collection vehicles that would otherwise be required to drop off waste directly at the disposal sites.

³⁶ United States Environmental Protection Agency.

³⁷ More information on USEPA's WARM program is available at www.epa.gov/warm.

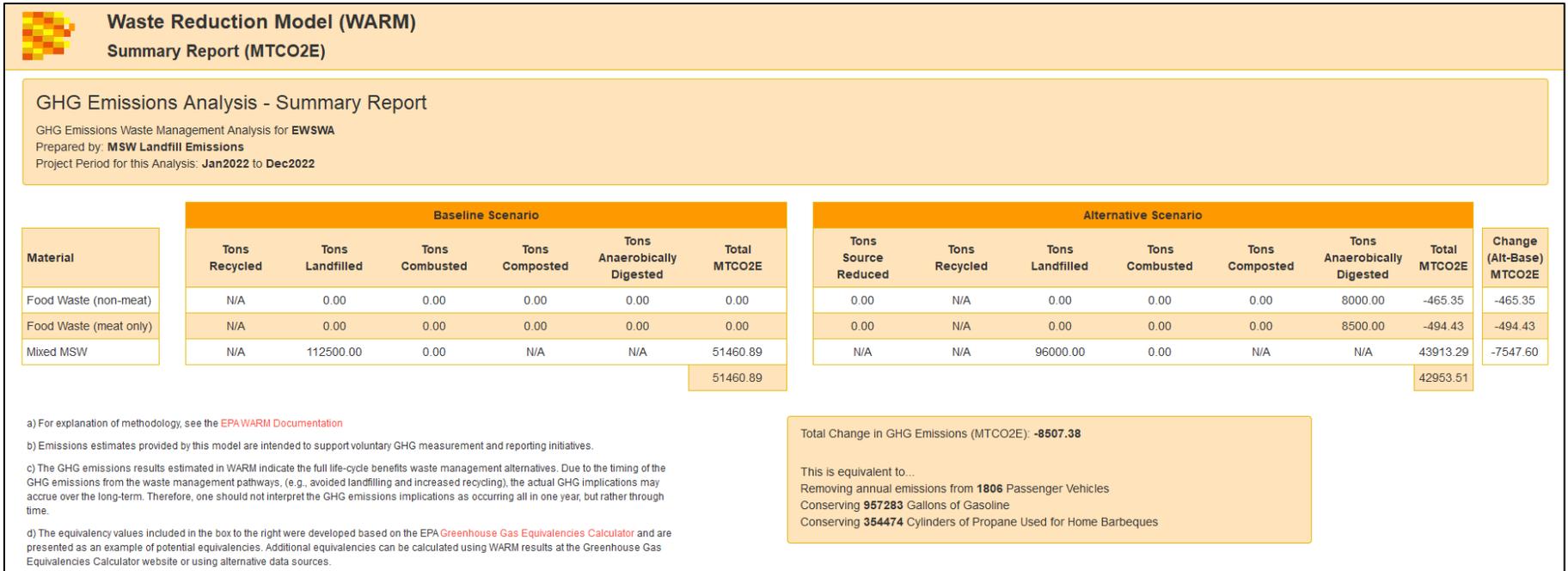


Figure 10: USEPA WARM Climate Emissions Output

10. Permits and Effluent Management

10.1. Leachate

New SSO transfer stations at Transfer Station Site #1 and the Regional Landfill site would require the ability to effectively control leachate from the SSO material.

The floors of the tipping and transfer areas of the facilities must be designed to collect the runoff and to prevent leachate from running off-site. The floor of the potential new SSO transfer stations at Transfer Station Site #1 would need to be sloped to a catchment area that would drain into an underground leachate holding tank. The leachate tank would need to be pumped and transferred to a treatment facility during the days of operation. The estimated annual cost would be \$40,000 to transfer the leachate to an approved treatment facility.

The potential new SSO transfer station at the Regional Landfill site would also require leachate containment. However, that the Regional Landfill SSO transfer station's leachate collection system could either be connected to an underground storage tank or directly to the landfill's leachate collection system. The cost to construct an underground tank or a direct connection to the landfill leachate collection system would be similar; therefore, managing the leachate from the transfer facility using the landfill system would likely result in efficiencies and reduced emissions of GHGs and other transport-related pollutants by not having to pump and haul leachate from the facility each day via a tank truck.

10.2. Approvals and Permits

Construction of the SSO transfer facilities will require an application for an amendment to the facilities Environmental Compliance Approval (ECA) and local building permit. The ECA amendment would require the development of a Design and Operations (D&O) Report. A noise and odour study would typically be considered for the application of an SSO facility but given that the facilities will be located on an already approved waste management site, these studies would likely not be required. Renovation of the Windsor container processing facility will also require a Permit to Construct and Demolish. A summary of the permits and approvals and their estimated timeline and costs are provided in Table 24.

Table 24: Approvals and Permits Summary

SSO Transfer Station Facility Options	Type of Permit	Timeline	Cost
Transfer Station Site #1: MRF Container Modification	Building Permit	2 – 3 months	\$200
	Demolition Permit	2 – 3 months	\$200
	ECA Amendment	12 months	D&O Report \$10,000 ECA Fee \$4,700
Transfer Station Site #1: New SSO Transfer Station (adjacent to the Garbage Transfer Station)	Building Permit	2 – 3 months	\$200
	ECA	12 months	D&O Report \$10,000 ECA Fee \$4,700
Regional Landfill Site SSO Transfer Station (Both small and large options)	Building Permit	3 - 5 months	\$200
	ECA	12 months	D&O Report \$10,000 ECA Fee \$4,700

11. Conclusion and Recommendations

The purpose of this assignment was to undertake an analysis of collection, hauling and transfer options for garbage and SSO, resulting in recommendations to aid the development of Essex-Windsor's organic waste collection program and a potential regional garbage collection system. The conclusions and recommendations in this report will provide the Authority, the City and the County with guidance to improve the performance of its garbage collection program in a way that support the effective implementation and operation of its future SSO diversion program.

11.1. Conclusions

Based on the overall assessment of current waste management practices in Essex-Windsor, industry best practices and the evolving legislative framework on organics management, this study arrives at the following conclusions, which support the recommendations listed in Section 11.2:

1) Policy to Support Waste Diversion

- a. The municipal experience in Ontario and elsewhere indicates EOW garbage collection is one of the most effective waste management policies to support an SSO waste diversion.
- b. EOW garbage collection may provide potential garbage collection cost savings.
- c. Bag limits are not an effective means of encouraging the diversion of organics from garbage to the SSO stream unless the bag limits are extreme low. However, this can lead to complaints of discrimination from households that legitimately generate garbage that cannot be otherwise diverted (e.g., multi-generational households, households that use diapers for either children or adults).
- d. Clear bags garbage policies have been shown to be effective at diverting SSO and Blue Box waste from the garbage stream and is becoming increasingly common throughout Ontario.
- e. Concerns about clear bag programs are well understood and be managed through careful program design, implementation, and communications. Implementation of clear bag policies require the updating of municipal waste management by-laws to ensure applicability and enforceability.

2) Collection, Transfer and Haulage Design

- a. Use of dedicated collection vehicles for the collection of garbage and SSO is a more reasonable approach for the Authority, the City and the County than co-collection. This is because:
 - i. They are few if any examples of co-collection of garbage with SSO in Ontario, and so is an untested practice;

- ii. The anticipated SSO tonnage that might be collected is variable at this time, and inconsistencies and inaccuracies in the tonnage projections could lead to collection inefficiencies; and,
 - iii. Introducing co-collection in a weekly SSO / EOW garbage collection program could increase routing and scheduling complexities and therefore risk.
- b. Implementing SSO collection across Essex-Windsor would provide a number of additional benefits beyond providing SSO diversion in urban areas, including:
 - i. Program consistency across service areas, which will reduce conflicting and confusing messaging;
 - ii. Reducing complexity of program logistics when implementing the new SSO collection with EOW garbage collection, thereby minimizing organizational and planning-related risks;
 - iii. Allowing for a less complicated bidding process, which may encourage more accurate bids and competitive pricing through a less onerous tender process;
 - iv. Maintaining a consistent and equitable level of service to all participating municipalities and their residents;
 - v. Reducing the potential for acrimony among residents and elected officials that may feel are not receiving an equitable level of service;
 - vi. Placing Essex-Windsor and its residents in an advanced state of readiness should the Province implement its proposed provincial landfill ban on organics in 2030; and
 - vii. Avoid potential confusion and contractual changes that may arise if the rural areas are brought into the program at a later date in response to pressures imposed by the planned Provincial organics landfill ban.
- c. Consolidation of waste and shipping in larger quantities reduces the number of trips required, resulting in several economic, environmental and social benefits, including:
 - i. Cost savings;
 - ii. Reduced greenhouse gas and other air emissions; and
 - iii. Fewer trucks on local roads.
- d. SSO transfer and hauling costs are most economical under SSO Scenario 3, where collected SSO is delivered to SSO transfer stations located at Transfer Station Site #1 and the Regional Landfill or direct hauled to the Seacliff facility, depending on where the material is being collected from. Regionalization of the collection does not have a significant impact on the transfer and hauling costs.

3) Regionalization

- a. Regionalization (including municipal joint procurement) of waste collection services is an accepted best practice and is well-established in Ontario.
- b. Regionalization can potentially provide not just economic benefits but also environmental and social benefits as well, including:
 - i. Cost savings due to increased competition and administrative efficiencies; improved public participation due to consistency of services and communications across Essex-Windsor;
 - ii. Reduced greenhouse gas and other air emissions due to optimized collection routes; and
 - iii. Increased customer satisfaction due to equity of service and better oversight of quality management.
- c. Regionalization does not appear to have a significant impact on transfer and hauling costs for either garbage or SSO. Rather, potential cost savings with regionalization would most likely be due to increased competition on collection tenders, less travel time due to optimized routing, and operational efficiencies for the Authority its municipal partners.

11.2. Recommendations

The following are the key recommendations of the study, organized into three key categories.

1) Policy to Support Waste Diversion

- a) Implementation of Essex-Windsor's future SSO program should be done so throughout both urban and rural areas. This approach will provide equitable service delivery and better position Essex-Windsor for when the proposed provincial landfill ban on food waste and organics is implemented.
- b) EOW garbage collection should be implemented in areas where curbside SSO collection is introduced. Implementation of the EOW and SSO collection should occur concurrently.
- c) Clear bags for garbage should be considered for adoption to motivate residents to only throw garbage in the bags and not SSO or recyclables.
- d) A by-law review should be undertaken once curbside collection programs and policies are confirmed. This will help to ensure the necessary by-law updates are identified and implemented to support the new programming.

2) Collection, Transfer and Haulage Design

- a) Given that the SSO transfer and hauling costs are most economical under SSO Scenario 2 (Two & One), the Authority and its partner municipalities should undertake next steps toward developing the required SSO transfer stations at Transfer Station Site #1 and the Regional Landfill. Regarding SSO transfer facilities at Transfer Station Site #1, the Authority has two options available; this includes either construction of a new SSO transfer

station next to Transfer Station 1 and/or a retrofit of the Containers MRF. While not costed for this study, the project team notes that, based on its visual inspection of the site, the Fibre MRF could also potentially be retrofitted as a SSO transfer station; however, this would not be the preferable choice for the SSO transfer facility.

- b) While use of split-trucks and co-collection is not included as a recommendation in this study, it should still be given consideration as an option when developing the collection tender, particularly if the Authority's members opt for EOW collection. EOW garbage collection may increase the quantities of SSO diverted (and reduce the quantities of garbage collected), therefore making the option of co-collection more feasible. The RFP process should include the option of co-collection of either yard waste or SSO with garbage, which would then allow bidders to determine its suitability and costing.
- c) SSO collected at Kingsville and Leamington should be directly hauled to the Seaclyff Energy facility in Leamington as it is within the time and distance limitations of the curbside collection vehicles.

3) Regionalization

- a) It is recommended that the Authority initiate discussions with the leadership and staff of the City, the County and the Municipalities to identify and confirm the necessary steps to proceed toward regionalization and upload waste collection services to the Authority.

Appendix A: Transfer Station Opinion of Probable Cost

COST OPINION WORKSHEET-

Date: 2/3/2023
Project: EWSWA SSO Options
Re:
Opinion #: **Option 1: MRF Conversion to SSO Transfer Station**



Cost Estimate Type:

1. Order of Magnitude (+50% - 25%)
2. Budget Cost Opinion(+30% -15%)
3. Definitive Cost Opinion (+15% -15%)

Check box	
<input checked="" type="checkbox"/>	- Conceptual, Pre-Schematic
<input type="checkbox"/>	- 50% Document Review
<input type="checkbox"/>	- 100% Document Review

Discipline	Item	Description	Quantity	Unit	Unit Cost Opinion	Sub Total	Sub Total By Discipline	BIDS
Civil	1	Minor site and soil testing	1	LS	\$ 5,000.00	\$ 5,000		
	2	Clear site for 45' x 75' addition	1	LS	\$ 5,000.00	\$ 5,000		
							\$ 10,000	
Architectural	1	Permits, mobilization, material handling, etc.	1	LS	\$ 5,000.00	\$ 5,000		
	2	Remove existing Sorting Materials and equipment	1	LS	\$ 50,000.00	\$ 50,000		
	3	Demo - wall openings	1	LS	\$ 10,000.00	\$ 10,000		
	4	Header work	1	LS	\$ 15,000.00	\$ 15,000		
	5	Sealing and tighten	1	LS	\$ 5,000.00	\$ 5,000		
	6	Touch up, repair and painting	1	LS	\$ 2,500.00	\$ 2,500		
	7	Plastic drapes	1	LS	\$ 30,000.00	\$ 30,000		
	8	Clean-up	1	LS	\$ 5,000.00	\$ 5,000		
	9	Staging - relocating materials	1	LS	\$ 5,000.00	\$ 5,000		
	10	See Structural for new building addition	1	LS		\$ -		
							\$ 127,500	
Electrical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000		
	2	wiring demo	1	LS	\$ 5,000.00	\$ 5,000		
	3	New wiring to for new areas and Efs	10	LS	\$ 1,000.00	\$ 10,000		
	4	New lighting and devices	5000	SF	\$ 2.00	\$ 10,000		
	5	Branch circuits to new equipment	10	LS	\$ 1,200.00	\$ 12,000		
							\$ 42,000	
Mechanical	1	General conditions, permit and material handling	1	LS	\$5,000.00	\$ 5,000		
	2	Remove of equipment & devices	1	LS	\$10,000.00	\$ 10,000		
	3	Remove vents and fans	10	LS	\$1,000.00	\$ 10,000		
	4	Add new exhaust fans and carbon filters	2	EA	\$5,000.00	\$ 10,000		
	5	Carbon filtration system	2	EA	\$2,500.00	\$ 5,000		
	6	BAS controls	1	LS	\$ 20,000.00	\$ 20,000		
							\$ 60,000	
Plumbing	1	General conditions, permit and material handling	1	LS	\$5,000.00	\$ 5,000		
	2	Remove of devices & Pipes	1	LS	\$5,000.00	\$ 5,000		
	3	New Drain and trench	1	LS	\$5,000.00	\$ 5,000		
	4	Drain line extended below floor	100	LF	\$50.00	\$ 5,000		
	5	Tank 500 gallon	1	EA	\$20,000.00	\$ 20,000		
							\$ 40,000	
Structural	1	50' x 12' wall opening and header	1	EA	\$ 10,000.00	\$ 10,000		
	2	Enhanced wall supports for push wall 50'	5	EA	\$ 10,000.00	\$ 50,000		
	3	New 75' x 45' Metal building enclosure	3375	SF	\$ 30.00	\$ 101,250		
							\$ 161,250	
Summary	1				Sub Total:	\$ 440,750		
	2				GC's Managed PM / Superintendent Percentage Fee:	9.8639%	\$ 43,475	
	3				GC's Base Percentage Fee:	5.4500%	\$ 26,390	
	4				Construction Cost Opinion:		\$ 510,615	
	5				A/E Fee:	5.90%	\$ 30,126	5.90%
	6				Sub Total:		\$ 540,742	
	7				A/E Reimbursable:	enter amt.	\$ 10,000	
	8				A/E - Survey:	enter amt.	\$ 5,000	
	9				A/E Other:	enter amt.	\$ -	
	10				Environmental Testing and Removal:	enter amt.	\$ 2,500	
	11				Total:		\$ 558,242	
	12				Client Project Management Labor charges:	2.00%	\$ 11,165	
	13				TOTAL:		\$ 569,407	
	14	Enter construction duration in months in yellow cell if > 2 months AND > \$100K Capital			IDC:	9	\$ 100,000	
	15				GRAND TOTAL:		\$ 669,407	

Notes:
This estimate is very basic and needs to be confirmed and is just an estimate.
This estimate does not include any modifications to the site access or vehicle transportation adjustment.
Building will be reused as is and will be only modified to address critical concerns.



COST OPINION WORKSHEET-

Date: 3/29/2023
Project: EWSWA SSO Options
Re:
Opinion #: **Option 2: New SSO Transfer Station by Transfer Station 1**



Cost Estimate Type:

1. Order of Magnitude (+50% - 25%)
2. Budget Cost Opinion(+30% - 15%)
3. Definitive Cost Opinion (+15% -15%)

Check box	
<input checked="" type="checkbox"/>	- Conceptual, Pre-Schematic
<input type="checkbox"/>	- 50% Document Review
<input type="checkbox"/>	- 100% Document Review

Discipline	Item	Description	Quantity	Unit	Unit Cost Opinion	Sub Total	Sub Total By Discipline	BIDS		
Civil	1	Minor site and soil testing	1	LS	\$ 5,000.00	\$ 5,000				
	2	Clear site for 8,100 GSF addition	1	LS	\$ 20,000.00	\$ 20,000				
	3	Excavation	1	LS	\$ 10,000.00	\$ 10,000				
	4	Concrete pavementy 1,000 SF	1000	SF	\$ 5.00	\$ 5,000				
	5	Asphalt pavement 10,000 SF	10000	SF	\$ 4.00	\$ 40,000				
							\$ 80,000			
Architectural	1	Permits, mobilization, material handling, etc.	1	LS	\$ 5,000.00	\$ 5,000				
	2	Main concrete foundation building	360	SF	\$ 20.00	\$ 7,200				
	3	Reinforced walls 8 ft high, 270 ft long	270	LF	\$ 400.00	\$ 108,000				
	4	fabric roof structure	8100	SF	\$ 25.00	\$ 202,500				
	5	Plastic drapes	1	LS	\$ 10,000.00	\$ 10,000				
	6	Soil base with concrete floor	8100	SF	\$ 5.00	\$ 40,500				
	7	Finishes	1	LS	\$ 10,000.00	\$ 10,000				
	8	See Structural for new building addition	1	LS		\$ -				
							\$ 383,200			
Electrical	1	General conditions, permit and material handling	1	LS	\$ 2,500.00	\$ 2,500				
	2	extending service to new structure	1	LS	\$ 5,000.00	\$ 5,000				
	3	New wiring to for new areas and Efs	1	LS	\$ 1,000.00	\$ 1,000				
	4	New lighting and devices	8100	SF	\$ 2.00	\$ 16,200				
	5	Branch circuits to new equipment	4	LS	\$ 1,200.00	\$ 4,800				
							\$ 29,500			
Mechanical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000				
	2	Add new exhaust fans and carbon filters	2	EA	\$ 5,000.00	\$ 10,000				
	3	Carbon filtration system	2	EA	\$ 2,500.00	\$ 5,000				
	4	BAS controls	1	LS	\$ 10,000.00	\$ 10,000				
							\$ 30,000			
Plumbing	1	General conditions, permit and material handling	1	LS	\$ 2,500.00	\$ 2,500				
	2	Remove of devices & Pipes	1	LS	\$ 5,000.00	\$ 5,000				
	3	New Drain and trench	1	LS	\$ 5,000.00	\$ 5,000				
	4	Drain line extended below floor	100	LF	\$ 50.00	\$ 5,000				
	5	Tank 500 gallon	1	EA	\$ 20,000.00	\$ 20,000				
							\$ 37,500			
Structural	1	Structural details - part of fabric structure	1	EA	\$ 10,000.00	\$ 10,000				
	2	Enhanced wall supports for push walls	1	EA	\$ 10,000.00	\$ 10,000				
							\$ 20,000			
Summary	1				Sub Total:	\$ 580,200				
	2				GC's Managed PM / Superintendent Percentage Fee:	9.8639%			\$ 57,230	
	3				GC's Base Percentage Fee:	5.4500%			\$ 34,740	
	4				Construction Cost Opinion:				\$ 672,170	
	5				A/E Fee:	5.90%			\$ 39,658	
	6				Sub Total:				\$ 711,828	
	7				A/E Reimbursable:	enter amt.			\$ 10,000	
	8				A/E - Survey:	enter amt.			\$ 5,000	
	9				A/E Other:	enter amt.			\$ -	
	10				Environmental Testing and Removal:	enter amt.			\$ 2,500	
	11				Total:				\$ 729,328	
	12				Client Project Management Labor charges:	2.00%			\$ 14,587	
	13				TOTAL:				\$ 743,915	
	14		Enter construction duration in months in yellow cell if > 2 months AND > \$100K Capital			IDC:			9	\$ 100,000
	15					GRAND TOTAL:				\$ 843,915

Notes:
This estimate is very basic and needs to be confirmed and is just an estimate.
This estimate does not include any modifications to the site access or vehicle transportation adjustment.
Building will be reused as is and will be only modified to address critical concerns.



COST OPINION WORKSHEET-



Date: 2/3/2023
Project: EWSWA SSO Options
Re:
Opinion #: **Option 3: New SSO Transfer Station at Regional Landfill (Small Capacity)**

Cost Estimate Type:

1. Order of Magnitude (+50% - 25%)
2. Budget Cost Opinion(+30% -15%)
3. Definitive Cost Opinion (+15% -15%)

Check box	
<input checked="" type="checkbox"/>	- Conceptual, Pre-Schematic
<input type="checkbox"/>	- 50% Document Review
<input type="checkbox"/>	- 100% Document Review

Discipline	Item	Description	Quantity	Unit	Unit Cost Opinion	Sub Total	Sub Total By Discipline	BIDS
Civil	1	Minor site and soil testing	1	LS	\$ 5,000.00	\$ 5,000		
	2	Clear site for 50' x 50' addition	1	LS	\$ 3,500.00	\$ 3,500		
	3	New Parking Lot 45' x 45'	2025	SF	\$ 5.00	\$ 10,125		
	4	New Roads and driveways	900	SF	\$ 5.00	\$ 4,500		
							\$ 23,125	
Architectural	1	Permits, mobilization, material handling, etc.	1	LS	\$ 5,000.00	\$ 5,000		
	2	Painting and finishes	1	LS	\$ 10,000.00	\$ 10,000		
	3	Steps and building securing	1	LS	\$ 15,000.00	\$ 15,000		
	4	Clean-up and staging	1	LS	\$ 5,000.00	\$ 5,000		
	5	Fencing	100	LF	\$ 10.00	\$ 1,000		
	6	See Structural for new building	1	LS	\$ -	\$ -		
							\$ 36,000	
Electrical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000		
	2	Electrical service to new building	1	LS	\$ 50,000.00	\$ 50,000		
	3	New wiring to for new areas and Efs	10	LS	\$ 1,000.00	\$ 10,000		
	4	New lighting and devices	2025	SF	\$ 2.00	\$ 4,050		
	5	Branch circuits to new equipment	10	LS	\$ 1,200.00	\$ 12,000		
							\$ 81,050	
Mechanical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000		
	4	Add new exhaust fans	2	EA	\$ 5,000.00	\$ 10,000		
	5	Dampers and vents	2	EA	\$ 2,500.00	\$ 5,000		
	6	BAS controls	1	LS	\$ 20,000.00	\$ 20,000		
							\$ 40,000	
Plumbing	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000		
	2	Site drainage	1	LS	\$ 5,000.00	\$ 5,000		
	3	New Drain and trench	1	LS	\$ 5,000.00	\$ 5,000		
	4	Drain line extended below floor	100	LF	\$ 50.00	\$ 5,000		
	5	Tank 500 gallon	1	EA	\$ 20,000.00	\$ 20,000		
							\$ 40,000	
Structural	1	Foundation and footing	2025	SF	\$ 10.00	\$ 20,250		
	2	Enhanced wall supports for push wall 50'	2	EA	\$ 10,000.00	\$ 20,000		
	3	New 45' x 45' Metal building enclosure	2025	SF	\$ 30.00	\$ 60,750		
							\$ 101,000	
Summary	1				Sub Total:	\$ 321,175		
	2				GC's Managed PM / Superintendent Percentage Fee:	\$ 31,680		
	3				GC's Base Percentage Fee:	\$ 19,231		
	4				Construction Cost Opinion:	\$ 372,086		
	5				A/E Fee:	\$ 23,255		
	6				Sub Total:	\$ 395,341		
	7				A/E Reimbursable:	\$ 10,000		
	8				A/E - Survey:	\$ 5,000		
	9				A/E Other:	\$ -		
	10				Environmental Testing and Removal:	\$ 2,500		
	11				Total:	\$ 412,841		
	12				Client Project Management Labor charges:	\$ 8,257		
	13				TOTAL:	\$ 421,098		
	14	Enter construction duration in months in yellow cell if > 2 months AND > \$100K Capital			IDC:	\$ 100,000		
	15				GRAND TOTAL:	\$ 521,098		

Notes:
 This estimate is very basic and needs to be confirmed and is just an estimate.
 This estimate does not include the full allowance for running power to this facility. Too many unknowns.
 Building will be basic and only addresses main function.



COST OPINION WORKSHEET-



Date: 2/3/2023
Project: EWSWA SSO Options
Re:
Opinion #: **Option 4: New SSO Transfer Station at Regional Landfill (Large Capacity)**

Cost Estimate Type:

1. Order of Magnitude (+50% - 25%)
2. Budget Cost Opinion(+30% -15%)
3. Definitive Cost Opinion (+15% -15%)

Check box

X	- Conceptual, Pre-Schematic
	- 50% Document Review
	- 100% Document Review

Discipline	Item	Description	Quantity	Unit	Unit Cost Opinion	Sub Total	Sub Total By Discipline	BIDS	
Civil	1	Minor site and soil testing	1	LS	\$ 7,500.00	\$ 7,500			
	2	Clear site for 75' x 150' addition	1	LS	\$ 10,000.00	\$ 10,000			
	3	New Parking Lot 45' x 60'	2700	SF	\$ 5.00	\$ 10,000			
	4	New Roads and driveways	2500	SF	\$ 5.00	\$ 10,000			
							\$ 37,500		
Architectural	1	Permits, mobilization, material handling, etc.	1	LS	\$ 5,000.00	\$ 5,000			
	2	Painting and finishes	1	LS	\$ 10,000.00	\$ 10,000			
	3	Steps and building securing	1	LS	\$ 30,000.00	\$ 30,000			
	4	Clean-up and staging	1	LS	\$ 5,000.00	\$ 5,000			
	5	Fencing	200	LF	\$ 10.00	\$ 2,000			
	6	See Structural for new building	1	LS		\$ -			
							\$ 52,000		
Electrical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000			
	2	Electrical service to new building	1	LS	\$ 50,000.00	\$ 50,000			
	3	New wiring to for new areas and Efs	10	LS	\$ 1,000.00	\$ 10,000			
	4	New lighting and devices	5625	SF	\$ 2.00	\$ 11,250			
	5	Branch circuits to new equipment	10	LS	\$ 1,200.00	\$ 12,000			
							\$ 88,250		
Mechanical	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000			
	4	Add new exhaust fans	2	EA	\$ 5,000.00	\$ 10,000			
	5	Dampers and vents	2	EA	\$ 2,500.00	\$ 5,000			
	6	BAS controls	1	LS	\$ 20,000.00	\$ 20,000			
							\$ 40,000		
Plumbing	1	General conditions, permit and material handling	1	LS	\$ 5,000.00	\$ 5,000			
	2	Site drainage	1	LS	\$ 5,000.00	\$ 5,000			
	3	New Drain and trench	1	LS	\$ 5,000.00	\$ 5,000			
	4	Drain line extended below floor	100	LF	\$ 50.00	\$ 5,000			
	5	Tank 500 gallon	1	EA	\$ 20,000.00	\$ 20,000			
							\$ 40,000		
Structural	1	Foundation and footing	5625	SF	\$ 10.00	\$ 56,250			
	2	Enhanced wall supports for push wall 50'	4	EA	\$ 10,000.00	\$ 40,000			
	3	New 125' x 45' Metal building enclosure	5625	SF	\$ 30.00	\$ 168,750			
							\$ 265,000		
Summary	1				Sub Total:	\$ 522,750			
	2				GC's Managed PM / Superintendent Percentage Fee:	9.8639%			\$ 51,564
	3				GC's Base Percentage Fee:	5.4500%			\$ 31,300
	4				Construction Cost Opinion:				\$ 605,614
	5				A/E Fee:	5.90%			\$ 35,731
	6				Sub Total:				\$ 641,345
	7				A/E Reimbursable:	enter amt.			\$ 10,000
	8				A/E - Survey:	enter amt.			\$ 5,000
	9				A/E Other:	enter amt.			\$ -
	10				Environmental Testing and Removal:	enter amt.			\$ 2,500
	11				Total:				\$ 658,845
	12				Client Project Management Labor charges:	2.00%			\$ 13,177
	13				TOTAL:				\$ 672,022
	14		Enter construction duration in months in yellow cell if > 2 months AND > \$100K Capital		IDC:	9			\$ 100,000
	15				GRAND TOTAL:				\$ 772,022

Notes:

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