Essex-Windsor Solid Waste Authority
Regular Board Meeting Agenda

Meeting Date: Wednesday, July 12, 2023

Time: 4:00PM

Location: Essex County Civic Centre
Council Chambers, 2nd Floor
360 Fairview Avenue West
Essex, Ontario N8M 1Y6

Meeting will be held in-person for Board Members and staff. Media representatives and interested members of the general public are invited to attend in-person.

LIST OF BUSINESS **PAGE NUMBERS**

1. Call to Order

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3. Approval of the Minutes

A. May 2, 2023 Regular Meeting Minutes 1-17

4. Business Arising from the Minutes

5. Correspondence

A. County of Essex 18-20
May 24, 2023 Letter to Minister David Piccini, Ministry of Environment, Conservation and Parks Re: Waste Diversion Programs for Industrial, Commercial and Institutional (IC&I) Sector – Food and Organic Waste

B. City of Windsor Council Decision June 12, 2023 21

6. Delegations

A. EXP. Presentation:
Logistics and Transfer of Regional Solid Waste and Source Separated Organics: Review and Strategic Plan

7. Waste Diversion

8. Waste Disposal

9. Finance & Administration

10. Other Items

11. By-Laws

12. Next Meeting Dates

Tuesday, August 1, 2023 (Cancelled)
Wednesday, September 13, 2023
Thursday, October 5, 2023
Tuesday, November 7, 2023
Tuesday, December 5, 2023

13. Adjournment

Essex-Windsor Solid Waste Authority
Regular Board Meeting
MINUTES

Meeting Date: **Tuesday, May 2, 2023**

Time: **4:00 PM**

Location: **Council Chambers**
Essex County Civic & Education Centre
360 Fairview Ave. West
Essex, Ontario

Attendance

Board Members:

Gary McNamara - Chair	County of Essex
Hilda MacDonald	County of Essex
Rob Shepley	County of Essex
Gary Kaschak – Vice Chair	City of Windsor
Kieran McKenzie	City of Windsor
Jim Morrison	City of Windsor

EWSWA Staff:

Michelle Bishop	General Manager
Steffan Brisebois	Manager of Finance & Administration
Cathy Copot-Nepszy	Manager of Waste Diversion
Tom Marentette	Manager of Waste Disposal
Teresa Policella	Executive Assistant

City of Windsor Staff:

Anne Marie Albidone	Manager of Environmental Services
Tony Ardovini	Deputy Treasurer Financial Planning
Shawna Boakes	Executive Director of Operations
Mark Spizzirri	Manager of Performance Management and Business Case Development

County of Essex Staff:

Sandra Zwiers	Director of Financial Services/Treasurer
Kate Hebert	Manager Records and Accessibility/Deputy Clerk

Absent:

Drew Dilkens	City of Windsor (Ex-Officio)
Michael Akpata	County of Essex
Kirk Walstedt	County of Essex
Mark McKenzie	City of Windsor
Mary Birch	Interim CAO and Director of Council & Community Services/Clerk

1. Call to Order

Chair McNamara called the Regular meeting to order at 4:02PM.

2. Declaration of Pecuniary Interest

The Chair called for any declarations of pecuniary interest and none were noted. He further expressed that should a conflict of a pecuniary nature or other arise at any time during the course of the meeting that it would be noted at that time

3. Closed Meeting

Moved by Kieran McKenzie
Seconded by Gary Kaschak
THAT the Board move into a closed meeting pursuant to Section 239 (2) (i) of the Municipal Act, 2001, as amended for the following reason:

(i) a trade secret or scientific, technical, commercial, financial or labour relations information, supplied in confidence to the municipality or local board, which, if disclosed, could reasonably be expected to prejudice significantly with the contractual or other negotiations of a person, group of persons, or organization.

21-2023
Carried

Moved by Hilda MacDonald
Seconded by Kieran McKenzie
THAT the EWSWA Board rise from the Closed Meeting at 4:55PM.

24-2023
Carried

4. Approval of the Minutes

Moved by Kieran McKenzie
Seconded by Jim Morrison
THAT the minutes from the Essex-Windsor Solid Waste Authority Regular Meeting, dated March 7, 2023, be approved and adopted.

25-2023
Carried

5. Business Arising from the Minutes

There were no items raised for discussion.

6. Correspondence

There were no items for discussion.

7. Delegations

There were no delegations for May 2, 2023.

8. Waste Diversion

A. Blue Box Collection Services Post Transition to Extended Producer Responsibility

The General Manager stated that the purpose of the report was to recommend to the Board that the Authority opt-out as a service provider for Blue Box Collection Services and not pursue Circular Materials Ontario's Interim Collection Offer to perform residence and eligible source collection from August 28, 2024 to December 31, 2025. The General Manager provided an update regarding the Blue Box collection transition to Extended Producer Responsibility (EPR) and summarized the background information on pages 8-10 of the agenda package.

The General Manager provided a summary of information included in the report's Discussion section. She noted that there is no obligation for the Authority to continue providing blue box collection and that CMO's payment collection model does not compensate the Authority for 100% of the residential blue box program even though the Regulation assigns 100% of these costs to Producers. The Authority has to respond to CMO by June 30, 2023, whether the Authority will opt-in or opt-out of providing blue box collection services.

The General Manager summarized significant risks with the terms of the Interim Collection Offer that had been identified by the Technical Staff Committee and included on page 12 of the report.

The General Manager identified Service Level Impacts included in the report and summarized options regarding the collection of non-eligible sources. One option would be to contact the successful residential service provider to determine if they would be willing to enter into a contract to collect non-eligible sources. Option 2 would be to contract for non-eligible source collection as a separate collection as this will be required as of January 1, 2026. The General Manager noted they will continue to monitor what other municipalities are doing. Some municipalities have introduced by-laws to enforce recycling but the Authority does not have the ability to issue such by-laws.

The General Manager stated that Administration has outlined a transition plan if the Authority were to opt-out of CMOs offer. Administration will focus on the development and implementation of a Blue Box transition plan that prepares

stakeholders, staff, assets, municipal partners, customers and operations for the changes that will occur.

The Authority is forecasted to generate savings of approximately $2-4.6 million per year as the blue box collection and processing transitions to Producers. A portion of these savings will be required to continue the collection of blue box material from non-eligible sources.

The Chair asked if there were any questions.

Mr. Kieran McKenzie stated that in terms of the offer, there is 100% responsibility of Producers to provide collection but the offer does not cover 100% of the cost. If that continues to be the case and the Producers are not paying the full cost, when does the Province step in and to what extent is the Province monitoring the situation or strengthening the Regulation.

The General Manager stated that the Province has identified that it is not the responsibility of the municipalities to bear the cost of the program. Further, they released the Regulation and perhaps did not put their minds into every aspect of the program in particular the non-eligible sources. Ontario Municipalities have voiced their concerns through AMO and other groups to the Province. Unfortunately, there have been no changes made to the Regulation. The Authority has a vested interest in the success of this transition because we own our landfill and do not want residents and non-eligible sources to simply put the material in the garbage.

The General Manager stated that the Authority will continue to play a role in the recycling program through its Waste Diversion programs for a number of reasons but specifically because of the obligation under our Environmental Compliance Approval (ECA) at the Regional Landfill. A condition of that ECA is that we have waste diversion programs to ensure not just blue box materials do not end up in the landfill but also hazardous waste, electronics and tires.

Mr. Kieran McKenzie asked if there could be more advocacy from AMO.

Chair McNamara stated that the AMO task force has been heavily involved and they do have a strong voice. In the last two to three years, they have had a senior policy advisor and Board member MacDonald also sits on the task force.

Mr. Kieran McKenzie asked if non-eligible sources that are currently receiving collection are aware of the upcoming changes and the level of risks to them.

The General Manager stated that the Authority is in the process of identifying all non-eligible sources. Further, the Manager of Waste of Diversion stated that a consultant has also been contracted to conduct an audit of the non-eligible sources throughout the region and identify all the non-eligible stops, addresses, and names. There are approximately 3,000 non-eligible sources that are currently receiving the collection. At some point, once we identify how we are

going to service these sources, the Authority will communicate to those affected.

Mr. Kieran McKenzie stated that he has a motion at the appropriate time.

Mr. Kaschak asked what items are considered contamination.

The Manager of Waste Diversion stated that anything not accepted in the program is considered contamination. She also noted that mixing fibre material with plastics is also considered contamination.

Mr. Kaschak asked how the contaminants are managed in the facility.

The Manager of Waste Diversion stated that the contaminants are pulled off the line immediately and put in the appropriate areas but there is a cost to do this as there are steps involved.

Mr. Kaschak stated that he will support the motion when appropriate.

The Chair asked if there were any other questions.

Mr. Kieran McKenzie commended Administration on a job well done. He remains concerned with the system administrator and hopefully, the government is listening.

Moved by Kieran McKenzie
Seconded by Gary Kaschak
THAT the Board receive the report as information.

THAT the Board direct the General Manager to communicate with Circular Materials Ontario that the Essex-Windsor Solid Waste Authority does not intend to pursue Circular Materials Ontario's current Interim Collection Offer to perform residence and facility collection of Blue Box Materials on Circular Materials Ontario's behalf from August 24, 2024 to December 31, 2025.

26-2023
Carried

B. Screening of Organics Tender

The Manager of Waste Diversion provided the results of the tender for the provision of equipment and labour for the screening of organic material at Authority facilities in Essex County and recommended award to Frank Dupuis Landscaping and Trucking Ltd. (Dupuis).

She stated that only one bid was received and further that Dupuis had met all the requirements of the tender. The price included in the bid document was $3.24 per yard, excluding tax. She noted that Dupuis successfully held the

previous contract that ended in May 2023. As a result of the procurement process and the specialization of work and the past work of Dupuis, Authority Administration recommends awarding the contract to Dupuis.

As part of the budget process, the Authority uses historical data to estimate the numbers of yards of compost that will require screening to calculate a budget figure. As a result of the new bid price, there may be an unfavourable variance of approximately $8,000 to the 2023 budget based on the previous three-year average.

The Manager of Waste Diversion asked if there were any questions. No questions were asked.

Moved by Jim Morrison
Seconded by Rob Shepley
THAT the Board award the tender for the provision of equipment and labour for screening of organic waste at Essex-Windsor Solid Waste Authority facilities in Essex County to Frank Dupuis Landscaping and Trucking Ltd. as per their tender submission dated April 27, 2023 for the term May 8, 2023 – May 8, 2026. The contract term is for a three (3) year period from May 8, 2023 – May 8, 2026, where the Authority has the option to extend the contract for three (3) additional, one-year extensions or portions of a year thereof at the absolute unfettered discretion of the Authority under the same terms and conditions as contained in the executed contract.

27-2023
Carried

C. FoodCycler Organics Pilot Program

The Manager of Waste Diversion provided details on a new Waste Diversion pilot program that the Authority will be offering to support the diversion of food waste from the landfill and provided a summary of the background information included in the report regarding the Ontario Food and Organic Waste Policy Statement and results of the Food and Organic waste survey that was done in 2022.

In 2022, Food Cycle Science (FCS), a social purpose organization, met with the Authority to discuss their FoodCycler product. The FoodCycler was identified as a potential solution for multi-residential buildings or for residents that may not have access to municipal diversion programs. The Manager of Waste Diversion explained the FoodCycler is a countertop food digester that dehydrates and processes food waste into a tenth of its original volume. She noted that there are two models and explained the differences between each unit. FCS was a finalist in the Government of Canada's Impact Canada's Food Waste Reduction Challenge and was awarded a $400,000 grant. The grant is being distributed to municipalities that participate in the program. FCS has offered a partnership

with the Authority. After a review of FCS, the FoodCycler and other municipal programs, the Authority included funding in the 2023 budget.

The Manager of Waste Diversion explained that through the FoodCycler Organics Pilot Program (FOPP), FCS has allocated 250 FoodCyclers for the Authority that will be made available to Essex-Windsor residents at a subsidized rate. She explained that residents will have to register and complete an online survey. Some of the criteria that will be used to determine the allocation of the FCS units will include municipality, type of household, and number of residents. This will provide a good cross-section of households in Essex-Windsor that are able to participate in the pilot program. The residents that purchase the FoodCycler will participate in a 12-week program and track information to provide waste diversion data.

The Manager of Waste Diversion noted that $25,000 has been included in the 2023 budget for the pilot program through the Waste Diversion reserve. This represents a subsidy of $100 per unit. She referred to the funding model on page 24 of the agenda package which compares the cost of the two units available.

The Manager of Waste Diversion asked if there were any questions.

Mr. Kaschak noted that he saw the units that were on display at the Earth Day event and hopes that this will get residents excited about this and get people on board before the launch of the Source Separated Organics program in 2025.

Mr. Kieran McKenzie stated that he loves the program and asked how the units will be purchased by residents.

The Manager of Waste Diversion stated that residents purchase the unit up front and keep it after the pilot program ends.

Mr. Kieran McKenzie asked if some of the units could be made available at no cost.

Mr. Kieran McKenzie does not know if there is a correlation between income levels and waste diversion rates. He does not want to slow down the program that is already in motion but possibly look at other options for lower income households.

Mr. Morrison likes the spirit of Mr. McKenzie's idea but stated that it should not be up to the Authority to determine and analyze household income levels. He stated that maybe the Authority should consider if there may be a group that would like to contribute and subsidize the cost of the unit and then potentially make them available at no cost.

Mrs. MacDonald asked if residents would be charged the retail price and hope that they will follow through with the data that is being requested from them.

The Manager of Waste Diversion stated residents would be charged the reduced rate when accepted into the pilot program and sign a document stating that they will participate.

In regards to Mr. Kieran McKenzie and Mr. Morrison's comments, the General Manager stated that the Authority has three (3) units that were purchased at a reduced rate from FSC. She noted that the units were used as a trial by staff and some Board members to ensure their quality. Once Administration is finished with those units they could be donated to a group.

Mr. McNamara stated that the unit is incredible and he has not put any organics in regular waste since using the unit.

THAT the Board receive the report as information.
Moved by Rob Shepley
Seconded by Gary Kaschak

28-2023
Carried

9. Waste Disposal

A. Regional Landfill Leachate Management

The Manager of Waste Disposal provided an update regarding the management of leachate at the Regional Landfill and summarized information that had previously been reported to the Board regarding leachate management at the Regional Landfill and the increasing volumes and intensification of leachate requiring trucking and treatment representing a significant financial burden on the Authority.

The Manager of Waste Disposal provided an overview of events that have taken place since the September 14, 2022 Board meeting including meetings with the City of Windsor (City) regarding the increase in leachate quantity and intensification and the impact on operations at the pollution control plant.

The Manager of Waste Disposal explained that the City had requested a temporary suspension of the delivery of leachate at the pollution control plant so they could assess their system and operations. The Authority suspended leachate hauling from November 25, 2022, until January 16, 2023. Following the resumption of leachate hauling, the City has been restricting the number of loads delivered. The City and the Authority have been meeting bi-weekly and continue to test and monitor the leachate. The Authority has also met with other municipalities in the area to discuss contingency plans for the delivery of leachate.

The Manager of Waste Disposal described operational changes being implemented at the Regional Landfill to improve the leachate quality including the purchase and installation of additional pond aerators.

The Manager of Waste Disposal stated the Ministry of the Environment, Conservation and Parks (MECP) visited the Regional Landfill and discussions took place regarding the management of leachate and the procedures that need to be followed in the event that the Authority needs to suspend leachate hauling.

The Manager of Waste Disposal stated that Stantec will conduct a feasibility study to assess the Town of Essex Pollution Plant's ability to receive some of the leachate from the Regional Landfill. He explained some of the key findings from the Stantec report. Essex would need some form of pre-treatment of the leachate. The Town of Essex is not interested in receiving any untreated leachate.

On April 19, 2023, the Authority expanded the scope of the Stantec engagement to include the preparation of a report regarding options for the on-site treatment of leachate at the landfill. The Stantec report will be made available to the Board when completed.

The Manager of Disposal explained the long-term capacity constraints. He noted that leachate has increased due to landfill expansion and will continue with the expansion of additional cells and increased greenhouse waste due to high moisture content. The original Regional Landfill design included a requirement for leachate treatment.

The Manager of Waste Disposal stated that the Authority staff have been working with Stantec to identify potential options for leachate treatment. He explained the pros and cons of the following three options:

1. Option 1 – Status quo – trucking and treatment at pollution control plant.

2. Option 2 - Installation of an on-site, pre-treatment solution and truck or force main to a pollution control plant.

3. Option 3 – Installation of an on-site solution and discharge to surface water drain.

The Manager of Waste Disposal referred to page 36 of the agenda package and explained the various leachate treatments.

On April 14, 2023, the Authority reviewed and authorized a proposal by Rochem utilizing reverse osmosis treatment. The Manager of Waste Disposal provided a sample of leachate at the meeting that was treated by reverse osmosis. This process would be dependent on MECP approval. He noted that

the Authority is currently testing 50 gallons of leachate as an on-site trial. The Authority will be provided with the chemical analysis results in several weeks.

The Manager of Waste Disposal stated that the 2023 budget includes a number of expenditures related to the treatment of leachate. He noted that other costs in the budget include consulting fees to fund an alternative treatment plan. In 2023, the Authority spent $87,000 to purchase three new aerators. The total cost of the on-site study conducted by Rochem is approximately $12,000. He also noted that any potential long-term solution identified will require a significant investment. The Authority is researching government funding opportunities.

The Manager of Waste Disposal noted that the final Stantec report will identify treatment and pre-treatment options. The Stantec report and the results of the on-site bench test trial conducted by Rochem will be provided to the Board.

The Manager of Waste Disposal asked if there were any questions.

Mrs. MacDonald asked if there is any way to get money back from the greenhouse industry since the vines are causing the issues they should be paying for it.

The Manager of Waste Disposal stated that tipping fees have increased substantially and should continue to increase.

Mrs. MacDonald stated that the greenhouses should be charged and not the average ratepayer.

Mr. Kaschak stated that we have to have an EPR on greenhouse vines or a large fee. He commented that the other pollution plants in the area should be able to treat this as well. He asked about the size of the force main.

The Manager of Waste of Disposal stated that the concept of a 4” diameter forcemain was proposed by Administration to the Town of Essex in November 2021 and that is what Stantec used to calculate their estimates.

Mr. Kaschak asked if installing a force main to convey leachate to the Essex PCP would involve public consultation.

The Manager of Waste Disposal responded yes. Routing of a forcemain would likely utilize public road right of way and this would be subject to the public review and consultation process.

The Manager of Waste Disposal stated that currently, the design of additional leachate storage capacity is not included in the design of Cell 5 North which is scheduled for construction in 2024. The Manager of Waste Disposal further stated that in his opinion, more lagoons are not the solution and that the

money would be better spent on alternative and sustainable ways to treat leachate.

Mr. Kaschak stated the reverse osmosis treatment seems very impressive.

Mr. Shepley asked if it would be better to build our own treatment plant instead of trucking the leachate off-site.

The Manager of Waste Disposal stated that building an on-site treatment facility is something that is currently being explored, along with the concept of installing a force main to the Town of Essex PCP which has some additional capacity. All options are being explored.

Mr. McNamara stated that we have to look at the cost of trucking leachate. He stated that he would like to know all the options. He agrees with Mr. Shepley. He stated that we have to reduce the carbon footprint and trucking does not do this. He likes the idea of looking at technology for treating leachate on-site. He noted that it makes a lot of sense and that is contained at the Landfill. Trucking costs are going to increase and climate change and rain is not a friend to landfills. He stated that as we expand the landfill and look at all the costs aggregated together, that is the direction we should be looking at. Mr. McNamara stated that he would like to see an analysis on what the costs are. He noted that even when the landfill is closed, we have the responsibility to ensure that the environment is protected from leachate impacts.

Mr. Kieran McKenzie stated that he agrees with Mr. Shepley and Chair McNamara. He stated to have the report from Stantec include environmental impacts. He also agrees with Mrs. MacDonald and her comments regarding the greenhouse vines.

Moved by Hilda MacDonald
Seconded by Kieran McKenzie
THAT the Board receive this report as information.

29-2023
Carried

10. Finance & Administration

A. EWSWA 2023 Budget Approval Status

The Manager of Finance stated that on April 3, 2023, the City of Windsor Council resolved to approve the 2023 EWSWA Budget.

Moved by Rob Shepley
Seconded by Kieran McKenzie
THAT the Board receive this report as information.

30-2023
Carried

B. January – March 2023 Three-Month Operating Financial Review

The Manager of Finance provided a three-month financial review of the Authority's operating costs and revenue for the period of January to March 2023. He noted that the report only included items that have a material variance to budget.

The Manager of Finance noted the following variances:

- Municipal revenue increased marginally by $26,695.
- An increase of 6,600 tonnes was received at the Regional Landfill from Industrial, Commercial and Institutional (ICI) customers compared to 2022.
- An increase of approximately 23,000 tonnes of non-landfilled material was delivered from ICI customers.
- A positive variance of approximately $107,000 in revenue from the sale of recyclable material. The material that generated the most revenue was from the sale of aluminum cans and plastics.
- An unfavorable expenditure variance of approximately $80,000 for the County Blue Box Collection.

The Manager of Finance noted that there were no other significant expenditure variances identified in the first quarter of 2023.

Mr. Morrison asked if there was a trend analysis regarding the 20% increase from ICI customers.

The Manager of Finance stated that the Authority has seen increases due to vines. He noted that any significant variances will be identified in the six-month financial report.

Mr. Morrison asked if the increase in ICI is mostly attributed to the increase in construction.

The General Manager stated that the three-month report is a comparator but the six-month report identifies the trend. Further that the increase in ICI material could be episodic contaminated soil from one construction project.

Moved by Rob Shepley
Seconded by Jim Morrison
THAT the Board receive this report as information.

31-2023
Carried

C. 2022 Financial Statements and Auditors' Report

The Manager of Finance presented the Authority's 2022 audited financial statements and KPMG's auditors report. KPMG has issued an "unmodified" audit opinion meaning the financial statements present fairly. He summarized significant figures included in the financial statements and in the report including:

- A receivable from the City of Windsor of approximately $4.9 million represents the market value of proceeds from the settlement of the MFP suite.
- A post-closure liability of approximately $16 million that represents the liability that must be recorded per the Public Sector Accounting Board for the Regional Landfill.
- A net long-term liability balance of $52,488,076 represents a debenture due to Sun Life Assurance Company Limited on account of the Regional Landfill.
- A summary of reserve funds of approximately $49 million.
- The 2022 final operating surplus totaled $1,621,982, which has been transferred to the Rate Stabilization Reserve.

The Chair asked if there were any questions. No questions were asked.

Moved by Gary Kaschak
Seconded by Jim Morrison
THAT the Board approve this report, the 2022 financial statements and the associated auditors' report.

32-2023
Carried

D. Staffing Requests – 2023 Budget

The General Manager stated that the 2023 Budget included funding for two additional staff positions. The Waste Diversion Project Lead will be a temporary full-time position that will support the Blue Box Transition to Extended Producer Responsibility and the Food and Organic Waste program. The second enhancement will be a Waste Diversion Labourer. This position is currently a part-time position, but with increased employee absences due to COVID and an aging workforce, Authority management has concluded that it cannot operate effectively with only two full-time employees.

The General Manager stated that the positions were included in the 2023 Budget but is requesting formal approval to post the two positions.

Moved by Kieran McKenzie
Seconded by Hilda MacDonald
THAT the Essex-Windsor Solid Waste Authority Board **Approve** the hiring of the following positions as included in the 2023 Operational Plan and Budget:

- Waste Diversion – Project Lead – Temporary Full-time
- Waste Diversion – Labourer, Material Recovery Facility – Full-time.

33-2023
Carried

E. Extension of Agreement for Farmland Rent

The General Manager stated the report is to recommend the execution of the final extension option included in the agreement with Chris Malott Farming Enterprises Inc. (CMFE) for farmland rent. She noted that CFME is a good tenant and has complied with all the terms and conditions of the agreement.

Mr. Kaschak asked if CFME is renting the Cell 5 area.

The General Manager stated that CFME is not renting the Cell 5 area. He is renting the lands around the landfill which are separate properties of the Regional Landfill.

Moved by Rob Shepley
Seconded by Gary Kaschak
THAT the Board authorize the General Manager to execute an extension agreement with Chris Malott Farming Enterprises Inc. for a one-year period November 1, 2023 – October 31, 2024 at the current agreement price of $276 per acre for 10 parcels of farmland making up 813 acres in the vicinity of the Regional Landfill.

34-2023
Carried

F. Regional Waste Collection Update

The General Manager provided an update related to the motions passed at the June 15, 2022, Essex Council meetings with regard to waste collection within the seven County municipalities.

The General Manager noted that through meetings with the regional CAOs, it was prudent to bring a report back to Essex County Council since the motions passed were during the previous term of Council to ensure there was continued support. She noted that on April 19, 2023, Essex County Council reconfirmed its commitment to a regional approach to waste management in the County of

Essex. The Authority's General Manager and the County of Essex Solicitor and Director of Financial Services/Treasurer will develop by-laws on how this service could be uploaded to the County of Essex.

The Authority has offered to attend individual municipal council meetings to provide additional information and answer questions. The General Manager noted that a presentation had been made to the Town of Tecumseh and presentations were scheduled for the Town of Essex and the Municipality of Leamington

The General Manager stated that a report by EXP will identify the logistics on how this service will be implemented along with the Source Separated Organics program. This report will be brought forward to the Board at a future meeting.

Moved by Rob Shepley
Seconded by Hilda MacDonald
THAT the Board receive this report as information.

35-2023
Carried

11. Other Items

No other items were raised for discussion.

12. By-Laws

A. By-Law 3-2023

Moved by Kieran McKenzie
Seconded by Gary Kaschak
THAT By-Law 3-2023, being a By-law to Authorize the Execution of an Agreement between the Essex-Windsor Solid Waste Authority and Frank Dupuis Landscaping & Trucking Ltd. for the Provision of Equipment and Labour for the Screening of Organic Waste at Essex-Windsor Solid Waste Authority Facilities in Essex County

36-2023
Carried

B. By-Law 4-2023

Moved by Kieran McKenzie
Seconded by Gary Kaschak
THAT By-Law 4-2023, being a By-law to Authorize the Extension of an Agreement between the Essex-Windsor Solid Waste Authority and Christopher Malott Farming Enterprises, Inc. for the Rental of Farmland in the vicinity of the Regional Landfill.

37-2023
Carried

C. By-Law 5-2023

Moved by Kieran McKenzie
Seconded by Gary Kaschak
THAT By-Law 5-2023, being a By-law to Confirm the Proceedings of the Board of the Essex-Windsor Solid Waste Authority be given three readings and be adopted this 2nd day of May, 2023

38-2023
Carried

13. Next Meeting Dates

Tuesday, June 6, 2023
Wednesday, July 12, 2023
Tuesday, August 1, 2023 (Cancelled)
Wednesday, September 13, 2023
Thursday, October 5, 2023
Tuesday, November 7, 2023
Tuesday, December 5, 2023

14. Adjournment

Moved by Rob Shepley
Seconded by Hilda MacDonald
THAT the Board stand adjourned at 6:55PM.

39-2023
Carried

All of which is respectfully submitted.

Gary McNamara
Chair

Michelle Bishop
General Manager

Mary Birch
Director, Legislative and Community Services/Clerk
The Corporation of the County of Essex

May 24, 2023

Ministry of Environment, Conservation and Parks
Attention: The Hon. David Piccini **Sent Via Email: david.piccini@pc.ola.org**
5th Floor, 777 Bay St.
Toronto, Ontario
M5B 2H7

Dear Minister Piccini,

Re: Waste Diversion Programs for Industrial, Commercial and Institutional (IC&I) Sector – Food and Organic Waste

At its meeting of Wednesday, April 19, 2023, the County of Essex passed the following motion;

> **084-2023**
> **Moved By:** Sherry Bondy
> **Seconded By:** Rob Shepley
> That Essex County Council send a letter to the Province, requesting that they move forward to require the IC&I (Industrial, Commercial and Institutional) sector to participate in mandatory organic waste programs and that the use of emerging technologies to process organics be allowed.
>
> **Carried**

In recent years the Province of Ontario has released documents relating to both waste reduction and diversion programs including the Made-In-Ontario Environment Plan and the Food and Organics Waste Policy Statement.

Although both documents identify that increased resource recovery of food and organic waste from the Industrial, Commercial and Institutional (IC&I) sector is essential in order to conserve landfill capacity as well as to reach the Province of Ontario's goals of zero waste and zero greenhouse gas emissions, to date, the Province's direction has been focused on the residential sector.

While other Provinces, such as Nova Scotia and Prince Edward Island have successfully banned food and organic waste from landfills over 20 years ago, Ontario has made little progress to date in implementing the 2030 ban included in the published documents.

Ontario is currently home to more than 170 greenhouse operations. With over 3,800 acres across Ontario, the majority of these operators grow tomatoes, peppers, & cucumbers. Discussions with the Ontario Greenhouse Vegetable Growers (OGVG) suggest the sector intends to double the number of acres being used for production in the future.

Large-scale greenhouse operations utilize high-tech innovation to maximize production and are currently required to follow stringent environmental standards. However, these measures imposed by government organizations do not extend to the end-of-life management of spent growing media used in the production process.

A significant portion of that spent growing media is disposed of at the Essex-Windsor Regional Landfill resulting in reduced landfill capacity and both financial and operational constraints related to the landfilling of the material due to the material composition and moisture content.

While mechanisms to develop and maintain organics processing infrastructure are available, the lack of a landfill ban and the cost and complexity of acquiring Environmental Approvals is expensive and time-consuming.

Further, in order to build capacity and support innovation, the Council of the County of Essex requests commitment from the Province of Ontario to continue to support markets for recovered food and organic materials, and as identified in the *Strategy for a Waste-Free Ontario: Building the Circular Economy, Action 10: Implement an action plan to reduce the volume of food and organic wastes going to landfill*:

> *"…shall consider opportunities for:*
>
> - *the development of new products or supporting existing innovations that use or integrate recovered food and organic materials*
> - *the collaboration between government and industry to update regulations and guidelines to reflect new and innovative technologies and promote new processes that support viable end markets."*

The Council of the County of Essex requests that the Province of Ontario confirm their commitment to the Waste-Free Ontario Timeline included in the Food and Organic Waste Framework and the Made-in-Ontario Environment Plan and develop and communicate a strategy for the implementation of a landfill food and organic waste ban by 2030.

Should you require further information, please contact me by email at mbirch@countyofessex.ca or by phone at extension 1335.

Regards,

Mary Birch
Interim CAO
Director, Legislative and Community Services / Clerk

CC:

- Anthony Leardi, MPP, Essex Riding (Anthony.Leardi@pc.ola.org)
- Trevor Jones, MPP, Chatham-Kent-Leamington (Trevor.Jones@pc.ola.org)
- Andrew Dowie, MPP, Windsor-Tecumseh Riding (Andrew.Dowie@pc.ola.org)
- Essex County Municipalities and City of Windsor
- AMO
- Michelle Bishop, General Manager – Essex-Windsor Solid Waste Authority mbishop@ewswa.org

THE CITY OF WINDSOR
ONTARIO, CANADA

OFFICE OF THE CITY CLERK
COUNCIL SERVICES

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City Council
Decision
Monday, June 12, 2023

That the following Council Question by Councillor Gary Kaschak **BE APPROVED,** and that Administration **BE DIRECTED** to proceed with the necessary actions to respond to the Council Question in the form of a written report, consistent with Council's instructions, and in accordance with Section 17.1 of the Procedure By-law 98-2011:

CQ 18-2023:
Assigned to Commissioner, Infrastructure Services:

Asks in order to achieve increased waste diversion targets & not fill up our Landfill as fast, I ask that Administration for a report to look into reversing the garbage day & recycle day schedules with recycling pickup day coming before garbage day. I believe this could in fact get more goods into the recycle stream if being picked up one day before garbage day. I look forward to a report from our Environmental Services group.
Carried.

Clerk's File: EI2023

Anna Ciacelli
Deputy City Clerk
June 14, 2023

Department Distribution
Public Works - Operations;

Essex-Windsor Solid Waste Authority
Administrative Report

July 4, 2023

To:	**The Chair and Board of the Essex-Windsor Solid Waste Authority**
From:	**Michelle Bishop, General Manager**
Meeting Date:	Wednesday, July 12, 2023
Subject:	**EXP. - Logistics and Transfer of Regional Solid Waste and Source Separated Organics: Review and Strategic Plan**

Purpose

The purpose of this report is to provide the Essex-Windsor Solid Waste Authority (the Authority) Board with a summary of the recommendations contained within the final EXP Services Inc. (EXP.) report received on May 23, 2023.

Further, that the Board receive both the EXP. document and the presentation as information.

Background

As previously reported to the Board, a number of resolutions related to solid waste management in the region were carried throughout 2022 at Authority Board meetings as well as at County of Essex Council and City of Windsor Council meetings. More specifically, resolutions pertaining to both the implementation of a Regional Food and Organic Waste Management Plan, as well as the review of the current garbage collection services managed by the individual County of Essex municipalities.

On August 10, 2022, the Authority Board awarded the Request for Proposals (RFP) for the Provision of Processing of Source Separated Organic (SSO) Waste to Seacliff Energy Corp. for a five (5) year term commencing Spring 2025 with the option to renew for three (3) additional, one-year extensions or portions of a year

thereof where extensions are under the same terms and conditions contained within the executed Contract.

With the execution of the short-term SSO processing contract, the Authority was able to confirm the processing delivery location of the SSO. Therefore, the next decision around SSO is whether it should be delivered directly to the SSO processing facility or is it more cost effective and/or efficient to consolidate the material at an existing Authority location and then transfer to Seacliff Energy Corp.

Due to the nature of the SSO and projected volumes, the Technical Staff Committee required the assistance of a consultant to assist in determining the best delivery method. Both operational, financial and environmental considerations needed to be considered including the ability of existing Authority locations to receive and transfer the SSO, as well as consider the cost to haul this material.

The subsequent direction from County of Essex Council to County of Essex Administration was to work with the Authority to prepare a report on potential cost savings that may be realized by transferring the jurisdiction of garbage collection from local municipalities to the County and ultimately to the Authority. This means that the Authority's scope of work would be enhanced to manage garbage collection services for the County municipalities as well.

In September 2022, the Technical Staff Committee issued an RFP for the provision of consulting services, on November 17, 2022, notification was sent to EXP. advising that they were the preferred proponent. EXP. performed site visits, gathered data from both the Authority as well as from the individual municipalities, and on May 23, 2023, the final report was received.

Discussion

Section 11 of the EXP. report includes a number of conclusions and recommendations. The following is a summary of these items:

<u>Policy to Support Waste Diversion</u>

Conclusions

a) The municipal experience in Ontario and elsewhere indicates *Every Other Week* (EOW) garbage collection is a best practice waste management policy that supports effective waste diversion behaviours, especially in SSO programs.
b) EOW garbage collection may provide potential garbage collection cost savings.
c) Bag limits are not an effective means of encouraging the diversion of SSO from garbage unless the bag limits are extremely 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).

d) Clear bags garbage policies have been shown to be effective at diverting SSO and Blue Box material from the garbage stream and is becoming increasingly common across Ontario municipalities.
e) Concerns about clear bag programs are well understood and can 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.

Recommendations

a) Implementation of Essex-Windsor's future SSO program should be done so through 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 SSO is implemented.
b) EOW garbage collection should be implemented concurrently in areas where weekly curbside SSO collection is introduced.
c) Clear bags for garbage should be adopted to motivate residents to only throw garbage in these bags and not SSO or recyclables.
d) A by-law review should be undertaken once curbside collection programs and policies are confirmed that by-laws support new programming.

Collection, Transfer and Haulage Design

Conclusions

a) Use of dedicated collection vehicles for the collection of each stream: garbage and SSO is a more reasonable approach for the Authority, the City and the County than co-collection because:

    i. There are few, if any, applicable examples of co-collection of garbage with SSO in Ontario, and so it is an untested practice that poses risk;

    ii. The anticipated SSO tonnage collected is uncertain at this time as it is a new program, and this potential variance 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 thereby increase program risk.

b) Implementing an SSO collection program across Essex-Windsor in both rural and urban areas would provide a number of additional benefits including:

   i. Program consistency across service areas, which will reduce the likelihood of conflicting and confusing messaging;

   ii. Reducing the complexity of program logistics when implementing the new SSO collection / EOW garbage collection, thereby minimizing organizational and planning-related risks;

   iii. Allowing for a less complicated bidding process, which may encourage more accurate 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 they 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 SSO 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 SSO 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 (as per the EXP. report). In this scenario, collected SSO is delivered to SSO transfer stations located at the Authority's Windsor Transfer Station Site 1 and the Regional Landfill or SSO is direct hauled to the Seacliff facility, depending on the collection origin of SSO. Regionalization of garbage

collection does not have a significant impact on the transfer and hauling costs.

Recommendations

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 the 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 the construction of a new SSO transfer station next to the existing Transfer Station 1 that consolidates garbage or retrofit the transitioning Blue Box Container Material Recovery Facility (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 an SSO transfer station; however, this would not be the preferable choice for an SSO transfer station.

b) While the use of split trucks for co-collection is not included as a recommendation in this study, it should still be considered as an option when developing the collection tender, particularly if the Authority's Board members opt for EOW garbage 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 Seacliff Energy facility in Leamington.

<u>Regionalization</u>

Conclusions

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 and its municipal partners.

Recommendation

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

Next Steps

The EXP. conclusions and recommendations contained within the report will be used to guide both Authority Administration and its Board throughout the implementation process of the new Food and Organic Waste Management or SSO Program, as well as guide the potential launch of a regional garbage collection program. The Technical Staff Committee will be considering the report findings to determine the most cost-effective and/or efficient collection, transfer and haulage design.

The EXP. document has also been provided to the Regional CAO group for consideration. A municipal working group has been formed with staff from the Authority, the City of Windsor, and the County of Essex and its seven (7) municipalities to explore both the regionalization of all waste management in the region and policies to support waste diversion.

The conclusions and recommendations regarding regionalization will also be provided to County of Essex Council along with a draft by-law to transfer the jurisdiction of waste collection to the County of Essex for Council's consideration.

Authority Administration will report on the outcome of that meeting at a subsequent meeting.

Financial Implications

There are no direct or immediate financial implications associated with this report at this time. Any financial implications arising from the implementation of any of the above recommendations will be communicated to the Board throughout the process and will be presented for approval as part of the annual budget process in the appropriate year.

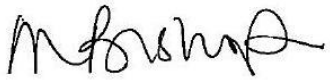
Recommendation

THAT the Board receive this report as information;

And further that the Board receive the attached report from EXP. as information;

And further that the Board receive the presentation by EXP. as information.

Submitted By



Michelle Bishop, General Manager

Essex-Windsor Solid Waste Authority
Administrative Report

May 10, 2023

To:	**The Chair and Board of the Essex-Windsor Solid Waste Authority**
From:	**Catharine Copot-Nepszy, Manager of Waste Diversion**
Meeting Date:	**Wednesday, July 12, 2023**
Subject:	**2022 Residential Waste Diversion Report**

Purpose

To present a summary of key findings included in the 2022 Residential Waste Diversion Report (attached separately).

Background

Annually, the Authority produces a Waste Diversion Report which contains information on the various waste diversion programs and the related residential waste diversion rate. Besides fulfilling Condition 5.2 of the Environmental Assessment Approval for the Regional Landfill, the report also provides the Authority with a source of information on its waste diversion programs.

Discussion

The major highlights of the Waste Diversion Report are listed below:

- 32% was the overall waste diversion rate in 2022. This figure represents the number of residential tonnes diverted from the landfill versus residential refuse collected at the curb. While tonnes of recycling residuals continued to drop in 2022 (1,342 in 2022 versus 2,632 in 2021) and residential refuse collected at the curbside also decreased (108,059

tonnes in 2022 versus 112,053 tonnes in 2021), the overall residential waste diverted was lower in 2022 (51,435 in 2022 versus 56,303 in 2021). This was due to the significant decline in organic residential yard waste delivered (4,510 tonne decrease) to EWSWA sites in 2022 as all other waste diversion programs held constant.

- Net marketed residential recyclables were similar in 2022 (20,123 tonnes) than in 2021 (20,312 tonnes) due to market availability and processing refinement of blue box materials.

- Due to a significant shift in global recycling markets, there was still a notably high basket-of-goods sale of recyclable material revenue in 2022 ($225/tonne); where 2021 was an all-time high of $237/tonne.

- The intake of other recyclables including white goods, used tires, metal, bikes, election signs and electronics were comparable to 2021 (6,462 tonnes), where 2022 diverted 6,314 tonnes.

- Total residential organics like leaf and yard waste received by the Authority dropped significantly and is the largest factor impacting the waste diversion rate in 2022 (19,009 tonnes) versus 2021 (23,519 tonnes). Decreases in both municipal (2,119 tonnes) and residentially (2,391 tonnes) delivered tonnage was noted.

- On the flip side, Garden Gold Compost sales were significantly higher in 2022 ($239,327) versus 2021 ($223,693). Program sales include: bulk sales, residentially delivered compost, bag-your-own compost, and prepackaged compost.

- In 2022, the Recycle Coach App interactions with Essex-Windsor residents continued to climb where 2.92M interactions occurred. Interactions include: reminders sent on collection schedules and/or changes, materials searches (what goes where function), page and calendar views.

- Another 102 applicants were successfully awarded a gold box through the Gold Star Recycler Program in 2022. Since the program inception in 2016, 2,769 Gold Star boxes have been awarded.

- The MHSW Waste Diversion Program (including waste oil) saw a slight decrease in 2022 diversion (621 tonnes in 2022 versus 653 tonnes in 2021).

Recommendation

THAT the Board receive this report as information.

Submitted By

Catharine Copot-Nepszy, Manager of Waste Diversion

Attachment:

2022 Residential Waste Diversion Report (separate cover)

Essex-Windsor Solid Waste Authority
Administrative Report

July 3, 2023

To: **The Chair and Board of the Essex-Windsor Solid Waste Authority**

From: **Cathy Copot-Nepszy, Manager of Waste Diversion**

Meeting Date: **Wednesday, July 12, 2023**

Subject: **Outreach Program Update**

Purpose

To provide an update to the Board on EWSWA outreach activities in Essex-Windsor.

Background

Each year, the EWSWA leads a variety of outreach activities like Earth Day, EWSWA merchandise sales, incentive-based programming (e.g., Gold Star), etc. to give residents strategies that will support them to divert waste and lead a more environmentally friendly lifestyle.

Discussion

The EWSWA has confirmed that 2023 outreach activities will centre around food and organic waste to prepare residents for the new organic and food waste curbside collection program in 2025. As a result, key messaging for upcoming events, promotions, resources, sales, etc. will support this direction. Below are outreach activities that the EWSWA will undertake in 2023.

Earth Day 2023 Celebrations

On April 23rd, 2023 from 10 am to 3 pm, the Earth Day Committee (comprised of the EWSWA and City of Windsor staff) hosted its Annual Earth Day event at Malden Park. The theme for this year's local Earth Day festivities was "Picture A Better Planet". This free event offered many interactive activities to residents of all ages and attracted over 1,800 residents. The EWSWA promoted waste diversion programs this year with a particular focus on food and organic waste. Some of the activities offered included: ways to manage food waste (FoodCycler™), May Madness Sale of Garden Gold Compost, and Sciensational Snakes. Theresa Sims-Windsor's Indigenous Storyteller, Knowledge Keeper and Elder, a mini theatre presentation promoting recycling, kids' passport game, Environmental Jeopardy game, recycle box sorting game, etc. were free key activities that residents participated in at this event. Bike Windsor-Essex, EWSWA's community partner in the WE ReCYCLE program, also conducted a 'bike giveaway' at Earth Day 2023.

This event attracted more than thirty environmental exhibitors, as well as a few food vendors which were successful in supporting a *zero-waste* event. The event captured in total two 95-gallon carts of solid waste (half a cart of each organic food waste and blue box fibre, as well as a full cart of blue box containers) that was diverted from the landfill. No garbage was sent to the landfill from this event as a result of upfront planning and support from all exhibitors, vendors, and participants. EWSWA staff were also fortunate to connect with Board Vice Chair Gary Kaschak and other local councillors at this event.

Earth Month Challenge: 30 Easy Actions in April - Social Media Campaign

Through social media (Facebook, Instagram), the EWSWA also raised awareness about Earth Month by issuing a daily action each day in the month of April. The focus of each action is based on supporting the 3R's hierarchy (Reduce, Reuse, Recycle) for better solid waste management.

For example, on April 19th a message promoted: "Buy a Backyard Composter or Green Cone Digester to reduce the amount of organic food waste that is going into residential garbage and eventually the landfill". This promotion also connected residents to know that they can buy EWSWA program merchandise at their local Home Hardware Stores in Essex-Windsor.

Gold Star

The annual Gold Star program is a great way to reward residents who are committed to being a top-notch blue box recycler. As the residential interest in this program continues to remain high, the EWSWA again ran registration for this program in April and was able to fill the 2023 program. Curbside audits were done in the month of June to see if applicant residents achieved Gold Star recycling

status to receive an honorary Gold Box at their doorstep. 104 gold boxes were awarded to homes across Essex-Windsor this year, which included Amherstburg Councillor Molly Allaire who successfully participated in this program.

"What Goes Where?" This Spring Campaign

To help increase recycling and diversion of materials seen in the spring-cleaning season, the EWSWA has taken on a *"What Goes Where?"* campaign this Spring. It spanned across radio, social media and on-line ads to educate residents on where to drop off these materials and the environmental benefits of properly disposing of and diverting them from our local landfill. More importantly, it will connect people to the EWSWA's "What Goes Where?" search function that is found on: ewswa.org or the Recycle Coach app.

Backyard Composter Sales at Home Hardware

This year, the EWSWA worked directly with four Home Hardware Stores that have volunteered to support a backyard composter sale. Through this partnership, residents were able to purchase a backyard composter discounted to $20+ tax while supplies lasted. The annual Enviro Tips newsletter which was mailed to over 172,000 addresses in Essex-Windsor in May featured a coupon offering the discounted Backyard Composter at participating Home Hardware Stores. This sale is now completed over 185 units were sold off through this sale.

More EWSWA Outreach

Currently, the EWSWA is finalizing its procurement for the design and development of a new website in 2023. This would replace the current website which is unable to support the demands and growth of operations and communications and is not AODA compatible. EWSWA administration are also in the final stages of distributing FoodCycler units to qualified residents to kick off the 12-week FoodCycler Pilot Program. Finally, the EWSWA will continue to actively engage residents through the use of social media, Recycle Coach app, ewswa.org, supporting local initiatives (e.g., YQGgreen EXPO), etc.

Financial Implications

As the work above was included in the approved 2023 Operational Plan and Budget, there are no financial implications to report at this time.

Recommendation

THAT the Board receive this report as information.

Submitted By

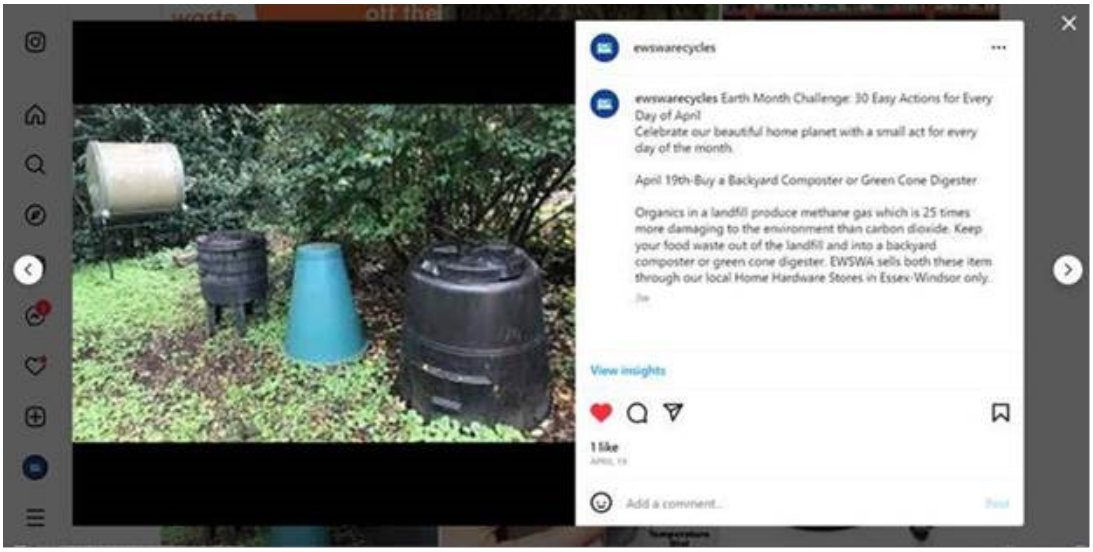
Cathy Copot-Nepszy, Manager of Waste Diversion

Attachments:

Figure 1. A portion of the EWSWA booth at Earth Day 2023.

Figure 2. Shows visitors participating at the EWSWA booth.

Figure 3. Earth Month Challenge post on Facebook for April 19th.



Essex-Windsor Solid Waste Authority Administrative Report

July 4, 2023

To: **The Chair and Board of the Essex-Windsor Solid Waste Authority**

From: **Tom Marentette, Manager of Waste Disposal**

Meeting Date: **Wednesday, July 12, 2023**

Subject: **Regional Landfill Leachate Management**

Purpose

The purpose of this report is to provide the Essex-Windsor Solid Waste Authority (the Authority) Board with an update regarding the management of leachate generated at the Essex-Windsor Regional Landfill and to provide the Board a summary of the recommendations included in the Stantec Consulting Ltd. (Stantec) report.

Further, that the Board approve the release of an Advance Contract Award Notice (ACAN) procurement document to obtain pricing for an on-site Reverse Osmosis (RO) system rental unit for the purpose of simultaneously performing a pilot study and improving the quality of leachate being sent to the City of Windsor for treatment.

Background

The management of leachate at the Essex-Windsor Regional Landfill (Landfill) is comprised of several key components; collection, conveyance, retention, trucking and treatment. Following the excavation of a new cell in preparation of waste placement, a clay liner is placed and compacted throughout the floor of the cell. Next, the cell floor is covered by filter cloth and a series of perforated collection pipes are placed above that within a layer of drainage stone. The drainage layer provides protection for the leachate collection piping network and allows for leachate to pass through to the collection pipes which can then be conveyed to

pumping stations. Leachate is then pumped to retention lagoons where the leachate is ultimately loaded into tanker trucks and transported to the Lou Romano Water Reclamation Plant (LRWRP) in the City of Windsor (the City) for treatment.

Throughout 2022 and 2023, Administration has provided the Board with information regarding current and long-term leachate management. The information provided described both operational challenges for both the Authority as well as the City of Windsor pollution control facility and forecasted a significant financial burden to the Authority for ongoing site and infrastructure maintenance as well as leachate transportation and treatment.

At the May 2, 2023 Board meeting, Administration provided details relating to the leachate management at the Landfill. Administration advised the Board of the following:

- The City is currently requiring the Authority to adhere to a reduced schedule for the delivery of leachate including a reduced daily number of loads of leachate and limiting the scheduled delivery times. A standing meeting has been put in place every 2 weeks with the Authority and City operations staff in order to continue to collaborate and discuss operational issues at both the Landfill and LRWRP;
- The City requested that the Authority explore pre-treatment methods as well as alternative or contingency disposal options;
- The Authority installed additional pond aerators and contracted for electrical upgrades to assist with the improvement of leachate quality;
- Administration engaged Stantec Inc. to conduct a feasibility study of the leachate treatment at the Essex Pollution Control Plant (PCP) and further, review the feasibility of an on-site leachate treatment system such as Reverse Osmosis (RO), Membrane Bioreactor (MBR), Moving Bed Biofilm Reactor (MBBR) or other advanced treatment methods as a potential long-term treatment option;
- An on-site bench scale demonstration study was conducted at the Landfill to showcase Rochem’s RO system and its capability to treat leachate. The results of the analytical testing will be discussed in this report, and finally;
- Due to the complexity of any long-term leachate management program and the possible lengthy timeline of initiating such projects, consideration of alternative programs such as a supplemental treatment facility or alternative method of transport should be reviewed without delay to coincide with the trucking contract end date.

Discussion

Stantec Feasibility Study of EWSWA Leachate Treatment

On June 5, 2023, Administration received the final report from Stantec for Task 1 and Task 2.

Task 1

As included in the May 2, 2023 report to the Board, Task 1 included a feasibility study of the ability to treat leachate at the Essex Pollution Control Plant (PCP). This could provide the Authority with an alternate or contingency treatment location as well as potentially reduce the cost to transport the material by constructing a force main from the Landfill to the Essex PCP.

Key findings described in the final Stantec report include:

1. The raw leachate strength is high such that there is limited capacity available within the Essex PCP to treat the landfill leachate volumes. Current estimates suggest at most 1 tanker load or approximately 40 m^3 per day could be accommodated within the Essex PCP.
2. Discussions with Essex PCP officials confirm that they will not receive untreated, raw leachate but would consider receiving pretreated leachate with concentrations less than the maximum allowable per a typical sewer use bylaw.

The report further provides a preliminary technical and financial analysis to assess on-site pre-treatment options as well as recommendations regarding the approval process of such a project and associated timelines.

Task 2

Upon receipt of the Task 1 findings, the Task 2 objectives were revised to include the review of the feasibility of an on-site leachate treatment system such as a Reverse Osmosis (RO), Membrane Bioreactor (MBR), Moving Bed Biofilm Reactor (MBBR) or other advanced treatment methods.

The revised scope of work included:

1. Perform a high-level desk review of standalone leachate treatment alternatives to identify potential preferred treatment options. The following options are to be considered for treating leachate at the landfill site.
   - Reverse Osmosis (RO) System
   - Membrane Bioreactor (MBR)
   - Moving Bed Biofilm Reactor (MBBR)

2. Recommend a preferred alternative treatment concept based on a high-level desk review and assessment of standalone leachate treatment system for partial or complete treatment onsite, including:
   - Partial treatment at Landfill Site, and then discharge to the influent pumping station at the Essex PCP via a forcemain.
   - Complete treatment at Landfill Site, and then discharge to the drain adjacent to the landfill site.

The Stantec report includes a preliminary technical and financial analysis of on-site pretreatment options which have been summarized below:

a. Construction cost - The lower capital cost solutions favour discharging to nearby surface water. This includes a physical-chemical treatment solution like Reverse Osmosis (RO)(RoChem) or an MBR biological solution like Newterra. The construction costs will vary from $9-$20M depending upon the eventual scope of work.

b. O&M cost – The operating costs are highest for RO physical-chemical (primarily due to chemicals needed by the process) than for the MBBR/MBR biological treatment options for discharging to the sanitary sewer (primarily due to the sewer surcharges assumed at $4/m^3). Annual O&M costs for these options are likely to exceed $1M/year. The lowest O&M cost option is the Newterra MBR option for discharging to surface water due to reduced chemical use and elimination of sewer surcharges. Annual O&M costs for the Newterra MBR process are approximately half the other options, estimated at approx. $0.5M/yr.

c. 20-Year Life Cycle Cost (LCC) – The Newterra MBR option discharging to surface water provides a lower 20-year LCC versus the other options, estimated at approx. $21M vs >$31M.

According to the financial analysis completed as part of Stantec's report, the preferred treatment option is an MBR treatment option like Newterra discharging to surface water. Additional study will be required to confirm the site-specific suitability of any process whether (RO or Biological). This would include: Class EA planning, Assimilative Capacity Study (ACS) to confirm effluent limits, pilot testing to confirm treatment performance, and additional engineering to better define scope and costs, and get regulatory approval from MECP.

Regardless of the chosen treatment method the report clearly states that any onsite solution could take 3 years to construct and obtain the necessary approvals.

Pilot Study

The Stantec report also acknowledges that a surface water discharge from any leachate treatment process will require an enhanced level of treatment, and therefore to increase the confidence levels of performance, Stantec recommends that a pilot study be completed. A pilot study would include operating a process for an extended period (approximately 1 year) to assess performance versus expected effluent concentration targets. This will also improve the MECP approval process. Securing equipment for a pilot study will depend upon vendor pilot/equipment availability and schedules.

MBR - Preliminary estimates provided by Newterra state that there are no pilot plants currently in stock and that the time to build a plant is likely in the range of 28-32 weeks. In addition, the treatment capacity of an MBR pilot plant would only be in the range of 10m^3 per day providing virtually no capacity for processing leachate to assist with current leachate volumes in the landfill.

RO - In April 2023, a bench-scale test was conducted by Rochem at the Regional Landfill to simulate the three primary steps of the RO leachate treatment process. Samples were collected and tested for water chemistry and analysis by an independent lab. The result of the bench-scale test determined that the Rochem RO system can with the exception of conductivity, effectively treat leachate using a single pass, high treatment system that will meet the City of Windsor's sewer discharge criteria. Further, a second pass of permeate (treated water) through the RO system exceeded all city of Windsor sewer use law criteria while achieving a permeate recovery rate of approximately 80-90% (attached).

A recent proposal submitted by Rochem to the Authority provides for the rental of a 50,000 Gal-per-day (gpd) (189 m^3 per day) plant to conduct a full-scale pilot study. This will include operating the RO process for approximately 1 year to assess the performance of effluent concentration targets and will also improve the MECP approval process. This containerized RO system will provide capacity for processing approximately 4 additional truckloads per day of leachate at the landfill. Currently, this plant is available for immediate deployment. Of note, the RO system has also demonstrated that it has the capability to address contaminants of concern that are expected to become regulated by the MECP in the coming years, including perfluorooctane sulfonate (PFOS), and polyfluoroalkyl substances (PFAS), which the biological treatment options are not equipped to remove from the leachate stream.

Next Steps - Consulting

The Authority acknowledges that timelines included in the Stantec report do not provide the Landfill or the Windsor LRWRP with any short-term operational relief. The Authority can not continue to hold excess amounts of leachate on site.

Through discussions with City of Windsor LRWRP staff, Authority Administration has engaged Stantec to prepare a letter/technical memorandum focusing on the identification of a preferred short-term solution to improve leachate quality at the Regional Landfill. More specifically, this assignment is to consider the following:

1. Review the existing leachate lagoons at the Regional Landfill, their function (both existing and design) and the current condition including current pond sludge levels and non/partial functioning valves that inter-connect the three (3) ponds;
2. Analyze whether repairs to the inter-connected valves would improve the quality of the leachate so as to allow the LRWRP to accept more leachate;
3. Analyze the sediment in the lagoons and evaluate the impact on the quality of the leachate. Advise on how the lagoons can be cleaned and whether the lagoons need to be drained. The ultimate goal is to understand whether cleaning of the ponds will improve the quality of leachate;
4. Speak to pre-treatment options at the Regional Landfill so to improve the quality of the leachate prior to sending it to LRWRP.
5. Finally, advise on any other items that the Authority can do at the Regional Landfill to improve leachate quality.

Further, given the potential magnitude both operationally and financially of this project and considering the previous Contaminating Lifespan Evaluations performed at Closed Landfills 2 & 3 have forecasted a significant financial burden to the Authority for ongoing site and infrastructure maintenance as well as leachate transportation and treatment, the Authority Administration engaged RWDI Air Inc. (RWDI) to provide an opinion regarding a long-term solution as well as a review of current site operations similar to the above. RWDI was engaged concurrently with Stantec due to their many years of landfill construction, operation and monitoring experience and has historically provided consulting services to the Authority, most recently in preparing a Leachate Generation Study report (July 2022), to assist with evaluating leachate generation at the Landfill over time.

While Stantec has considerable wastewater experience, RWDI’s experience in both landfill operations and infrastructure will provide Administration and the Board with the information it needs to critically evaluate potential legacy decisions with

respect to responsible and sustainable long-term leachate management. As recommended in the June 2023 RWDI report (attached) and considering the importance of implementing an effective leachate treatment option rapidly, the pre-treatment of leachate to an improved quality for management at the LRWRP is recommended by means of Reverse Osmosis. This pre-treatment will allow the leachate quality to meet the requirements for LRWRP to receive and manage the leachate while maintaining their facility in compliance as well as for the Authority to significantly reduce the leachate level in the waste mound for compliance with the Waste ECA.

Conclusions

Administration has met and discussed the current status of leachate at the Landfill and the recommendations included in both the Stantec and RWDI reports with the Technical Staff Committee (TSC). The TSC discussed that a long-term solution that examines the operational, financial and environmental needs of the Authority should be pursued. The TSC further acknowledges that an immediate solution that supports operations at both the Authority and the City of Windsor LRWRP is required. With the immediate or short-term solution serving to provide a basis or pilot to an eventual long-term solution.

While identified in the Stantec report, an MBR system may be more cost-effective, this is a similar system to the City of Windsor LRWRP. Leachate concentrations currently being delivered to the LRWRP are resulting in operational issues as previously noted to the Board. The TSC has noted concerns regarding a similar system being constructed at the Regional Landfill.

Therefore, opinions about the potential challenges of operating an MBR system successfully seem to favour a physical/chemical treatment process such as RO for a few reasons.

1. It is unclear as to the effectiveness of biological treatment methods on leachate at the Regional Landfill due to its strength, given that problems exist now at the LRWRP treatment plant.
2. Changes or modifications to plant operations are slow to react due to the inherent sensitive nature of a biological treatment process.
3. The potential for further discharge requirements from the MECP regarding PFOS and PFAS.
4. Availability of a biological plant for a pilot study is not readily available.

The outcome of the Rochem on-site bench scale demonstration study and the results of the analytical testing data demonstrated the effectiveness of RO in processing leachate at the Landfill.

The availability of a RO system not only provides an opportunity to further demonstrate the effectiveness of RO on a large-scale operation, but it will also provide some immediate relief by processing approximately 4 additional truckloads per day of leachate at the Landfill. The RO system will, however, not provide any financial relief as it relates to the hauling and treatment costs due to the inability at this time to discharge the treated leachate ("permeate") to surface water.

The schedule for procurement and delivery of the service is of critical importance due high demand for this equipment and its limited availability in the marketplace.

Therefore, Administration recommends that the initial pilot study be completed using RO as a long-term approach to the management of leachate at the landfill. Administration will further explore a pilot study on an MBR system for comparison. Administration has confirmed that both pilots could be completed simultaneously.

Administration has provided an estimated cost analysis to support the rental of equipment and infrastructure improvements required to conduct a pilot study in the financial section of this report.

Administration, in consultation with the County of Essex procurement department, recommends that an Advance Contract Award Notice ("ACAN") be published to provide notice to any potential proponents with available RO equipment and leachate processing experience an opportunity to submit a written statement of capabilities that clearly demonstrates how they meet the requirements of the ACAN.

All statements of capabilities received will be reviewed to determine if the other potential service providers are capable of meeting the requirements, which determination shall be in the sole and absolute discretion of the Authority.

In the event that one or more suppliers are capable of meeting the requirements, the Authority may conduct a competitive process for the Services.

If no written statements of capabilities are received, or if the Authority determines based on its evaluation that no other Service Provider is capable of meeting the Authority's requirements, the Authority would be able to award a contract for the Services to the proposed Service Provider and no further procurement process will be undertaken.

Financial Implications

Operational Plan and Budget

The additional expenditures contained in the table below are estimates based on discussions with the service provider and have been included to provide the Board

with an estimate of the cost of the project. Further, the table includes proposed funding in order to mitigate a portion of the cost and impact on the 2023 budget. Administration is currently in the process of calculating the six month financial analysis to be reported to the Board at a subsequent meeting. Any additional potential funding opportunities will be identified at that time. Ultimately, if the net result for the Regional Landfill Program was to be unfavourable, the variance would form part of the 2023 operational surplus (deficit) and be funded by the Rate Stabilization Reserve.

The 2024 Budget has yet to be created, however, funding measures will be explored in detail to assist in recovering costs from this project. Details will be presented at the time of the 2024 Budget presentation.

Cost Estimate

The Authority has received an estimate from Rochem for the rental of a 50,000 gpd RO system to provide an estimate of the cost of a one-year pilot program. In addition to the rental cost, the Authority has provided an estimate for the operating and set-up costs. As it is a pilot and many costs are estimated, the table below includes a contingency figure of $50,000. The table below details the estimated cost:

SUMMARY OF ESTIMATED COSTS	**ONE YEAR $**	**SEPT - DEC 2023 $**
EQUIPMENT RENTAL (Note 1)	**$1,180,330**	**$393,440**
OPERATING COSTS (Note 1)		
Cost of Energy	$84,760	$28,720
Cost for Cleaning Chemicals		
Alkaline	54,430	18,140
Acid	16,440	5,480
Cost of Labour (Note 2)	-	-
Cost of Antiscalant Chemical	16,740	5,580
Cost of PH Adjustment	194,360	64,790
TOTAL ESTIMATED OPERATING COSTS	**$366,730**	**$122,710**
ADDITIONAL COSTS		
FRAC Holding Tank Rental (3 units)	$84,350	$28,120
Crane (unloading and loading)	7,700	3,850
Base preparation (gravel, compaction & concrete)	22,720	22,720
Hydro service upgrades (Note 3)	90,000	90,000
Leachate pump rental	54,600	18,200
Leachate water trailer purchase or rental	100,000	33,330

SUMMARY OF ESTIMATED COSTS	ONE YEAR $	SEPT - DEC 2023 $
Contingency	50,000	16,670
TOTAL ESTIMATED ADDITIONAL COSTS	**$409,370**	**$212,890**
TOTAL 2023 COST ESTIMATE - Unbudgeted	**$1,956,430**	**$729,040**
PROPOSED FUNDING (Note 4)		
Favourable variance - Leachate hauling & treatment		$321,550
Favourable variance - Unbudgeted episodic cont. soil		227,090
One-time contribution from the Rate Stabilization Reserve		90,000
TOTAL PROPOSED FUNDING		**$638,640**
ESTIMATED 2023 - Unbudgeted Variance		**($90,400)**

Note 1 – Equipment rental and maintenance costs are quoted in US dollars, an estimate of 35% exchange has been added to the figures.

Note 2 - The RO system would not require the Authority to hire any new staff member as it is expected that existing staff would have the time capacity to manage and operate the plant. New staff would need to be considered in a long-term treatment solution.

Note 3 - The Landfill does not have the existing power available to operate a RO system. The power upgrade would be needed to support any long-term leachate treatment solution. A one-time contribution from the Rate Stabilization Reserve would be needed to fund this service upgrade.

Note 4 – Proposed funding:

REGIONAL LANDFILL PROGRAM – JANUARY-JUNE 2023 PROJECTION

EXPENDITURE	2023 BUDGET	JAN – JUNE 2023 BUDGET	JAN – JUNE 2023 PROJECTION	2023 VARIANCE
Cost to Haul Leachate	$650,100	$312,200	$153,650	$158,550
Cost to Treat Leachate	609,300	304,600	141,600	163,000
	$1,259,400	**$616,800**	**$294,950**	**$321,550**

Leachate Hauling and Treatment - The 2023 budget figure was calculated using historical leachate tonnage data prior to the City restricting the delivery of

leachate. Therefore, the restrictions have created a favourable variance in the first six months due to reduced tonnage of leachate hauled and treated.

REVENUE	2023 BUDGET	YTD ACTUAL	YTD VARIANCE
Episodic Contaminated Soil	$760,000	$987,090	$227,090

Episodic Contaminated Soil – The 2023 budget included a total of 20,000 tonnes of episodic contaminated soil for the full year. In the first six months, 25,976 tonnes was deposited at the Landfill thereby generating a positive variance in the first six months of the year.

Recommendations

1. THAT the Board receive this report as information.
2. THAT the Board receive three (3) attachments as information.
3. THAT the Board approve the release of an Advance Contract Award Notice (ACAN) to be published to provide notice to any potential proponents with available RO equipment and leachate processing experience an opportunity to submit a written statement of capabilities that clearly demonstrates how they meet the requirements of the ACAN.

Submitted By

Tom Marentette, Manager of Waste Disposal

Attachments:

- Rochem Bench Scale Testing Report
- Stantec Report – "The Feasibility Study of EWSWA Leachate Treatment"
- RWDI Report - "Preliminary Evaluation of Leachate Management Options at the Regional Landfill"

ROCHEM® AMERICAS

REVERSE OSMOSIS LEACHATE TREATMENT BENCH TEST REPORT: Essex-Windsor Landfill

Prepared for

Essex-Windsor Solid Waste Authority
Essex, Ontario

June 2023

ROCHEM® AMERICAS

Bench Test Summary

From May 2 - 4, 2023 Rochem Americas (Rochem) conducted an on-site bench scale membrane test (bench test) on leachate generated at the Essex-Windsor Landfill facility located in Essex, Ontario. The leachate was obtained from an on-site leachate lagoon. At the time of sample collection, the facility reported that aeration of leachate had commenced the prior week and that aeration capacity had recently been increased in on-site lagoons.

The purpose of the testing was to determine the effluent quality and the expected recovery rate of a full scale Rochem treatment train that would ultimately be suitable for direct discharge under an authorization that would be issued by the Ontario Ministry of the Environment, Conservation and Parks (MOE). In addition, the bench test identifies the maximum expected recovery. Should EWSA pursue a full-scale RO-based direct discharge alternative, the final discharge requirements will be determined based upon an assimilative capacity evaluation to be performed by the MOE.

The bench tests were operated using new Rochem membranes on a small volume sample (~45 gallons). Tests were conducted on the following feed streams:

1. Raw leachate stream from the EWSA landfill
2. Permeate from Test 1

Background

Reverse Osmosis (RO) is a membrane technology originally developed to desalinate seawater. RO is a broad-spectrum treatment technology capable of removing organic and inorganic compounds in a single treatment step. Rochem has over 25 years of experience using RO systems to treat landfill leachate.

The Rochem bench test unit (shown in Figure 1) is a compact tabletop system that treats wastewater in small batches. By operating in a batch mode, tests can be performed on a substantially smaller volume of feed. The test was run using a Rochem DTRO-PT Module containing approximately 1 square meter of membrane area. Operating in batch mode, the system drew feed wastewater from separate 55-gallon drums and passed the wastewater through the membranes to produce permeate and concentrate streams. The concentrate was recirculated back to the feed to continuously increase the concentration of the wastewater processed by the membranes. With this recirculation system, Rochem can simulate recovery rates while determining approximate system flux (flow) rates. The permeate was collected in a separate 55-gallon drum.

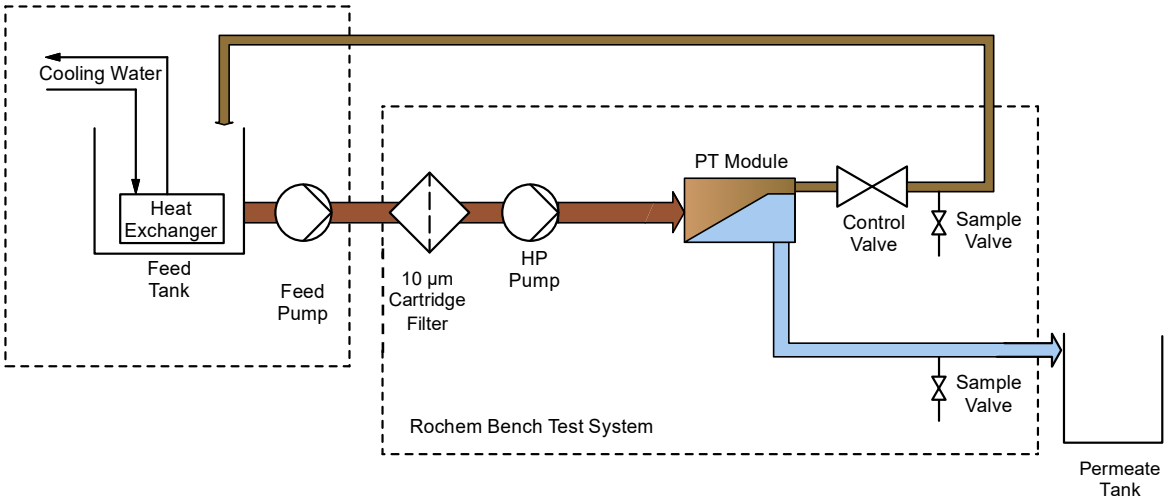


Figure 1: Bench Test Reverse Osmosis Block Diagram

During operation of the bench test unit, the Rochem field technician monitored how sample temperature and concentration affected the system operating pressure and permeate flow rate. Energy from the recirculation pump tends to heat the influent feed water, which results in a decrease in the operating pressure. However, recirculation of the concentrate increases the concentration of the concentrate stream and as such, requires an increase in operating pressure. The test is performed at a consistent membrane flux rate, which requires periodic adjustment of a manual flow control valve. By adjusting this valve to maintain a constant flux, the system pressures gradually increase as the strength (conductivity) of the feed tank (drum) increases.

Typically, in a full-scale RO system the influent wastewater is pre-treated (e.g., pH adjusted, particulate settling, filtration, etc.) prior to the stream reaching the RO membranes. During the bench tests, the influent wastewater was pH adjusted. The pH target was 5.8 and the pH was adjusted to 5.6, slightly below the desired value. During the test, all leachate is filtered through a 10-micron cartridge filter.

Photo 1: Bench Scale System

During the bench tests, the Rochem technician measured the permeate flow rate every 15-30 minutes and adjusted the pressure to maintain a constant permeate flow. Each test was run at a design permeate flux rate based on the expected sample concentration and membrane being tested. The flux rate is the flow per membrane area measured in liters per square meter per hour. The membrane area for both tests was 8.93 ft^2 (0.83 m^2).

Results

Test 1 – Untreated Leachate through RO

The primary purpose of this test was to determine the maximum recovery achievable if an RO system was used as the sole treatment for the untreated leachate.

Rochem performed a titration prior to beginning the bench test in order to determine the approximate amount of sulfuric acid that was needed to adjust the pH to 5.8. Significant foaming was observed after acid addition, indicative of leachates with high alkalinity.

Photo 2, below, shows the feed leachate tank with residual foam during system operation:

Photo 2: Feed Tank with Foam During Operation

A feed pump was used to transfer the wastewater from the feed drum to the inlet of the bench unit. The influent first passed through a 10-micron polypropylene cartridge filter and then into the high-pressure (HP) pump, which fed the Rochem PF membrane module. A manual needle control valve was adjusted as needed to increase the pressure in the system and generate the Net Driving Pressure (NDP) required to maintain a constant flux rate of 10-15 liters per square meter per hour (LMH).

An initial volume of approximately 42 gallons was concentrated to produce 36.2 gallons of permeate. The concentrate “heel” remaining in the drum after test completion could not be accurately measured due to displacement of the bag liner and hoses. Additionally for the bench unit, liquid remaining in the system piping, filters, etc. (e.g., holdup volume), includes feed water and permeate and includes the feed liquid remaining in the membrane element, cartridge filter, piping, hoses and CAT pump.

The first pass system was operated until the pump intake essentially ran dry. The monitoring data obtained during the first pass test is included in the attached Table 1. At that point, there was minimal remaining volume and volume was required to sample.

The overall recovery within the first stage test was estimated as follows:

Net Recovery = (Permeate Volume)/ (Initial Volume)

= (36.2 gal)/(42.0 gal)

= 86%

The above calculation discounts the holdup volume, which would include both permeate (treated) and feed (untreated water). While the system was terminated just before 90% recovery, the observed pressure at the time of termination was only 70 bar, indicating that there was substantial remaining capacity to operate at a higher pressure and achieve a 90% recovery.

Figure 2, below, illustrates the observed feed pressure and conductivity as a function of cumulative system recovery. The small observed decrease shown about mid-way is a result of having to shut the skid off at the end of day 1 and a lowered conductivity (after cooling).

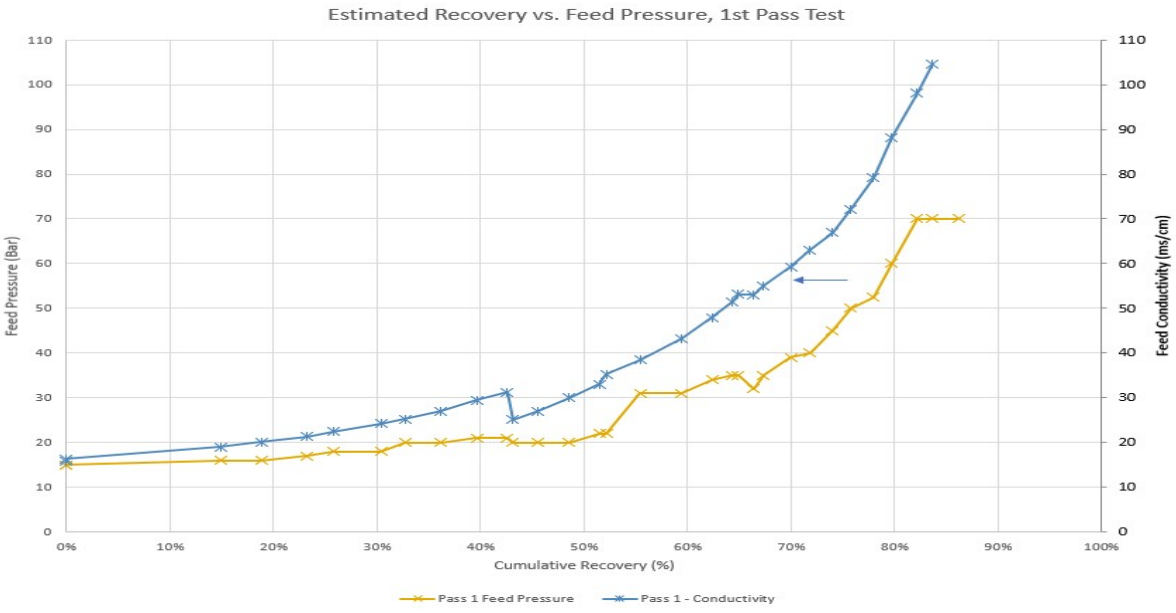


Figure 2: Pass 1 Recovery vs. Feed Pressure and Conductivity

Test 2 – RO Permeate through Second Pass RO

The purpose of this test was to demonstrate the additional treatment that can be achieved by treating permeate from the first pass of RO through a second pass. In this bench test, a high-

rejection RO membrane was selected. Due to the low mass of contaminants in the RO permeate, higher flux rates than the first pass can be achieved and a high rejection RO membrane is used which typically results in higher effluent quality.

On March 29, 2023, the drum containing the permeate from Test 1 was used as the feed for this test. The drum contained approximately 34 gallons of RO permeate (after sample collection). Otherwise, the test was conducted in an identical matter to the first test, with the clean 2nd pass permeate being separated into a clean drum.

Table 2 presents the operating data taken during the test. A starting volume of approximately 34 gallons created ~ 31 gallons of permeate, for a recovery rate of 90%.

Figure 3, below, illustrates the observed feed pressure and conductivity as a function of cumulative system recovery. The small observed decrease shown about mid-way is a result of having to shut the skid off at the end of day 1 and a lowered conductivity (after cooling).

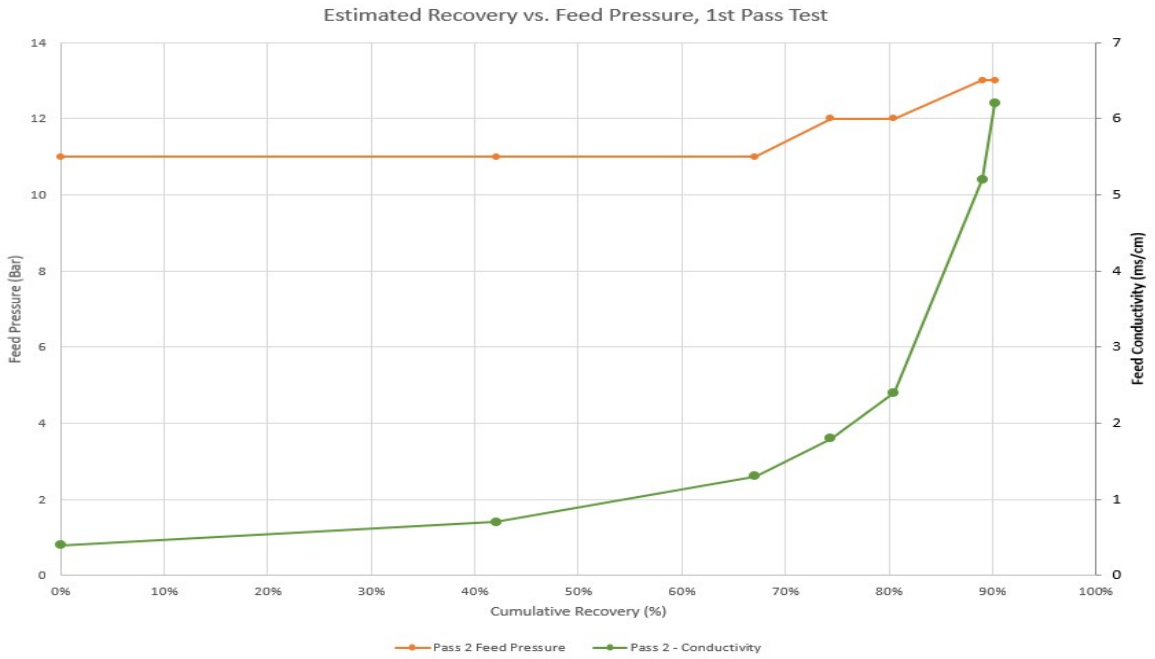


Figure 3: Pass 2 Recovery vs. Feed Pressure and Conductivity

Photo 3, below, shows the visual difference between samples obtained from the first and second pass tests. There is little visual difference between the Pass 1 and 2 permeate samples. A sample of tap water is included on the right side. Conversely, there is little visual difference between the raw leachate and the final residual. Visually, the residual is slightly darker.

Photo 3: Collected Samples from Pass 1 and Pass 2 Tests

Analytical Data

Samples were collected by WSP for third party laboratory analysis by SGC Laboratory, Windsor, Ontario for raw leachate, 1st pass concentrate, raw leachate and permeate from the first test and permeate from the second test. Sample of permeate were collected for Rochem parameters and for comparison against two different treatment scenarios comparing against MOE Provincial Water Quality Objectives as well as City of Windsor sewer use law. Table 3 summarizes the data and performance of each RO stage.

Summary of Results

The raw leachate indicated a leachate of generally medium-high strength, with a measured conductivity of over 12,000 us/cm. For many constituents, the recorded concentrations achieved non-detectable concentrations or achieved a concentrate reduction exceeding 99.9%. The following observations are made:

- With the exception of conductivity, permeate from first pass treatments was substantially lower than City of Windsor sewer discharge criteria, indicating that a single pass system with high pressure treatment would likely be suitable to meet City of Windsor discharge requirements.

- Second pass permeate exceeded all city of Windsor sewer use law criteria;

- While formal direct discharge criteria have not been established, Stantec provided target values that have appeared on other permits. Effluent data is compared against those criteria below:

Table 1: Pass 2 Effluent vs. Expected Effluent Objectives

Parameter	Pass 2 Effluent	Effluent	Non-Compliance

		Objectives	Limits
cBOD5	6/10/12(3)	5 mg/L	10 mg/L
TSS	3	5 mg/L	10 mg/L
Total Ammonia Nitrogen	5.8	1 mg/L	2 mg/L
Total Inorganic Nitrogen (Nitrate + Nitrite)	<0.06	10 mg/L	20 mg/L
Total Phosphorus	<0.03	0.2 mg/L	0.3 mg/L
Phenols (4AAP)	0.088/0.094(4)	0.005 mg/L	
Color	n/a	100 Pt-Co Units	250 Pt-Co Units
E.Coli	n/a	100 org/100mL	200 org/100mL
pH	6.99/7.22/7.29(3)		7.0 – 8.5

(1) Results reported for BOD5. Three samples collected by WSP for various treatment objectives
(2) Two samples collected by WSP for various treatment objectives

- Based on the above criteria, it is expected that tertiary treatment, such as carbon polishing, may be required to achieve the final effluent objectives for CBOD5, Total Ammonia Nitrogen and phenols. We anticipate this would be a nominal cost and likely required for any treatment system – RO effluent consistently exceeds effluent quality from other treatment systems such as MBRs.

- While color was not tested (these requirements were provided during the testing phase), the above photograph clearly demonstrates that effluent color will not be an issue

- E. coli was also not tested as part of the bench test. Given the clean nature of RO effluent, effluent disinfection may not be required or could readily be achieved with UV or chlorine disinfection, if required.

Table 4, attached to this document, provides the associated Pass 1 and Pass 2 rejection for each compound.

Conclusions

The bench scale results were successful in demonstrating the suitability of an Rochem system to treat raw leachate from the EWSA facility. In particular, we believe our system would have the following advantages:

- RO would be less sensitive to cold weather conditions compared to aerobic nitrification, which loses effectiveness when approach 15 deg C. Nitrifiers will shut down below 15 deg C unless supplemental heat is provided.

- Compared to other technologies, we believe RO is a fairly simple process utilizing pumps and limited chemistry. Operators can be readily trained and can be found from a wider pool of technical trades compared to more specialized wastewater treatment plant operators.

- While the values provided for effluent quality were not entirely achieved, we believe that they are low enough that any system would require tertiary treatment that could include carbon polishing.

- The RO process is rapidly deployable and requires little startup time compared to a biological system.

- Based on these results, we expect a Rochem system can operate between 85 and 90% recovery which will greatly reduce the residuals that require subseuquent management. Residuals management options typically include reapplication to the working face, offsite disposal, stabilization and placement into the landfill and evaporation.

- While not mentioned, it is our strong belief that an RO system is the best technology for future proofing landfill leachate against future regulatory requirements that may come with lowering effluent standards or inclusion of new constituents (e.g., PFAS). Our systems consistently can remove these consistuents to near or below method detection limits.

Table 1: EWSWA - Leachate - 1st Pass

Date: May 2 & 3, 2023 - EWSWA, Essex, ON, Canada **Operators:** Pete Baker and Dave Wharton

Date	Time of Day	Elapsed TIME (min.)	Total Elapsed Time	Feed Height	Permeate Height	FEED TEMP (°C)	PRESSURE (Bar)	RAW COND (mS/cm)	PERM COND (uS/cm)	Permeate Flow (LPH)	FLUX (Lmh)
5/2	14:43	0	0	25.375	-	16.8	15	15.8	198	10	12.0482
5/2	15:15	32	32	24.375	-	17.3	15	16.3	199	10	12.0482
5/2	15:45	30	62	23.500	-	17.7	15	16.9	197	10	12.0482
5/2	16:15	30	92	22.675	-	17.9	15	17.5	195	10	12.0482
5/2	16:45	30	122	22.000	-	18.0	15	18.2	192	10	12.0482
5/2	17:05	20	142	21.250	3.750	18.2	16	19.0	183	10	12.0482
5/2	17:42	37	179	20.375	4.750	18.4	16	20.1	181	10	12.0482
5/2	18:16	34	213	19.375	5.875	18.6	17	21.3	183	10	12.0482
5/2	18:45	29	242	18.500	6.500	18.8	18	22.5	184	10	12.0482
5/2	19:15	30	272	17.500	7.675	18.6	18	24.2	196	10	12.0482
5/2	19:42	27	299	16.875	8.250	18.9	20	25.3	202	10	12.0482
5/2	20:10	28	327	15.875	9.125	19.0	20	27.0	215	10	12.0482
5/2	20:45	35	362	15.000	10.000	19.3	21	29.5	244	10	12.0482
5/2	21:15	30	392	14.250	10.750	19.7	21	31.3	257	10	12.0482
5/3	7:30	0	392	14.000	10.875	15.9	20	25.1	189	10	12.0482
5/3	8:00	30	422	13.250	11.500	17.8	20	27.0	209	10	12.0482
5/3	8:30	30	452	12.500	12.250	18.7	20	30.0	244	10	12.0482
5/3	9:00	30	482	11.675	13.000	19.3	22	33.0	280	10	12.0482
5/3	9:15	15	497	11.000	13.175	19.6	22	35.2	315	10	12.0482
5/3	9:30	15	512	10.500	14.000	20.0	31	38.5	282	14	16.8675
5/3	9:55	25	537	9.750	15.000	21.0	31	43.3	388	12	14.4578
5/3	10:10	15	552	9.000	15.750	21.3	34	47.9	455	13	15.6627
5/3	10:20	10	562	8.500	16.250	21.6	35	51.5	597	12.5	15.0602
5/3	10:35	15	577	8.250	16.375	21.7	35	53.1	584	12.5	15.0602
5/3	10:50	0	577	-	16.750	20.8	32	53.0	577	12.5	15.0602
5/3	11:05	15	592	-	17.000	21.5	35	55.0	657	12.5	15.0602
5/3	11:20	15	607	-	17.675	22.2	39	59.3	648	12.5	15.0602
5/3	11:35	15	622	-	18.125	22.9	40	63.1	680	12.5	15.0602
5/3	11:50	15	637	-	18.675	23.4	45	66.9	720	12.5	15.0602
5/3	12:05	15	652	-	19.125	24.2	50	72.2	790	12.5	15.0602
5/3	12:20	15	667	-	19.675	24.9	52.5	79.2	854	12.5	15.0602
5/3	12:30	10	677	-	20.125	25.7	60	88.2	943	12.5	15.0602
5/3	12:50	20	697	-	20.750	27.1	70	98.1	1061	12.5	15.0602
5/3	13:00	0	697	-						0	0
5/3	13:15	15	712	-	21.125	27.8	70	104.6	1362	10	12.0482
5/3	13:30			-							
5/3											
5/3											
5/3											
5/3											

Flux = Permeate Flow (LPH) / Membrane Area (0.83 m2)

Initial Tank Volume	25.25" Leachate
Final Tank Volume	21.75" Permeate
Feed pH	5.6 (adjusted) - 8.2 (raw)

Notes:

Cartridge filter changed at end of 1st day, 2nd day - test restarted

Unit off to change suction nozzle position

Unit tripped (PS180) - suction nozzle blocked by drum liner, repositioned nozzle.

Unit tripped (PS180) - suction nozzle blocked by drum liner - level too low: test ended.

EWSWA - Permeate - 2nd Pass

Date: May 4, 2023 - EWSWA, Essex, ON, Canada **Operators:** Pete Baker and Dave Wharton

Date	Time of Day	Elapsed TIME (min.)	Total Elapsed Time	Feed Height	Permeate Height	FEED TEMP (°C)	PRESSURE (Bar)	RAW COND (uS/cm)	PERM COND (uS/cm)	Permeate Flow (LPH)	FLUX (Lmh)
5/4	8:15	0	0		-						0
5/4	8:30	15	15	20.500	-	16.4	11	0.4	16	17.5	21.0843
5/4	9:00	30	45	19.250	-	17.4	11	0.4	15	17.5	21.0843
5/4	9:30	30	75	18.875	-	18.4	11	0.5	15	17.5	21.0843
5/4	10:00	30	105	17.250	-	19.4	11	0.5	16	17.5	21.0843
5/4	10:30	30	135	15.125	-	18.6	11	0.6	15	17.5	21.0843
5/4	11:00	30	165	13.675	-	18.3	11	0.7	15	17.5	21.0843
5/4	11:30	30	195	12.375	8.625	18.2	11	0.7	15	17.5	21.0843
5/4	12:00	30	225	10.875	-	18.1	11	0.8	16	17.5	21.0843
5/4	12:30	30	255	9.375	-	18.2	11	1.0	21	17.5	21.0843
5/4	13:00	30	285	7.750	-	18.4	11	1.2	35	17.5	21.0843
5/4	13:15	15	300	7.000	13.75	18.6	11	1.3	40	17.0	20.4819
5/4	13:32	17	317	6.500	-	18.8	11	1.5	46	17.0	20.4819
5/4	13:50	18	335	5.000	15.25	18.9	12	1.8	53	17.5	21.0843
5/4	14:20	0	335	4.000	16.5	19.3	12	2.4	71	17.5	21.0843
5/4	14:30	10	345	3.750	-	19.5	12	2.7	80	17.5	21.0843
5/4	14:45	15	360	2.750	-	20.4	12	3.7	106	17.5	21.0843
5/4	15:00	15	375	-	18.25	20.4	13	5.2	144	17.5	21.0843
5/4	15:05	5	380	-	18.5	20.4	13	6.2	170	17.5	21.0843

Flux = Permeate Flow (LPH) / Membrane Area (0.83 m2)

Initial Tank Volume: 20.5" Permeate - after sampling

Final Tank Volume:

Feed pH: 6.91

Notes: Difficult to read with dark drum liner

Chiller Started

Table 3, Analytical Results Summary

		Sample ID					
		Raw	RO-CONC	Perm 1	Perm 2	Effluent	SW Effluent
	Sample Date	2-May-23	3-May-23	4-May-23	5-May-23	5-May-23	5-May-23
Analysis	**Units**						
Biochemical Oxygen Demand (BOD5	mg/L	657	2480	9	6	10	12
Alkalinity	mg/L as CaCO3	5560	5710	155	27	< 2	24
pH	No unit	8.34	7.87	7.11	6.99	7.22	7.29
Conductivity	uS/cm	12400	82200	513	57	6.7	54
Ammonia+Ammonium (N)	as N mg/L	679	5760	44.4	5.8	n/a	5.8
Total Kjeldahl Nitrogen	as N mg/L	775	7420	41.6	6.0	n/a	n/a
Sulphate	mg/L	< 20	59000	8	< 2	< 2	< 0.2
Chloride	mg/L	2000	24000	49	1	< 1	0.6
Nitrite (as N)	as N mg/L	3.20	42.5	< 0.03	< 0.03	n/a	< 0.03
Nitrate (as N)	as N mg/L	< 0.6	1.88	< 0.06	< 0.06	n/a	< 0.06
Nitrate + Nitrite (as N)	as N mg/L	3.20	44.4	n/a	n/a	n/a	n/a
Bromide	mg/L	3.7	33.5	< 0.3	< 0.3	n/a	n/a
Total Suspended Solids	mg/L	292	353	< 2	3	n/a	n/a
Total Dissolved Solids	mg/L	6900	119000	86	< 30	n/a	n/a
Chemical Oxygen Demand	mg/L	2350	23000	18	< 8	n/a	n/a
Total Organic Carbon	mg/L	626	6500	5	3	n/a	n/a
Chromium VI	µg/L	4.5	115	< 0.2	< 0.2	n/a	n/a
Fluoride	mg/L	0.50	4.30	< 0.06	< 0.06	< 0.06	n/a
Mercury (total)	µg/L	0.04	0.53	< 0.00001	< 0.00001	< 0.00001	n/a
Arsenic (total)	mg/L	0.0447	0.349	n/a	n/a	n/a	n/a
Aluminum (total)	mg/L	1.12	5.77	0.003	< 0.001	0.002	0.001
Antimony (total)	mg/L	n/a	n/a	n/a	n/a	< 0.0009	n/a
Arsenic (total)	mg/L	n/a	n/a	< 0.0002	< 0.0002	< 0.0002	n/a
Barium (total)	mg/L	0.108	1.14	0.00060	0.00026	0.00025	0.00036
Beryllium (total)	mg/L	n/a	n/a	n/a	n/a	n/a	< 0.000007
Bismuth (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00001	n/a
Boron (total)	mg/L	7.05	47.2	3.62	1.76	n/a	1.60
Calcium (total)	mg/L	104	1073	0.16	< 0.01	n/a	0.11
Cadmium (total)	mg/L	0.000900	0.0054	< 0.000003	< 0.000003	< 0.000003	0.000009
Chromium (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00008	< 0.00008
Cobalt (total)	mg/L	n/a	n/a	n/a	n/a	0.000004	0.000011
Copper (total)	mg/L	n/a	n/a	n/a	n/a	0.0127	0.0084
Iron (total)	mg/L	7.20	75.8	0.017	0.008	n/a	0.011
Lead (total)	mg/L	n/a	n/a	0.00063	0.00044	0.00053	0.00046
Magnesium (total)	mg/L	156	1643	0.108	0.007	n/a	0.016
Manganese (total)	mg/L	0.371	4.04	0.00025	< 0.00001	0.00015	0.00015
Molybdenum (total)	mg/L	n/a	n/a	n/a	n/a	0.00044	n/a
Nickel (total)	mg/L	n/a	n/a	n/a	n/a	0.0003	n/a
Phosphorus (total)	mg/L	6.80	58.9	0.007	< 0.003	< 0.003	< 0.003
Total Reactive Phosphorous (o-phos	mg/L	2.26	23.2	< 0.03	< 0.03	n/a	n/a
Potassium (total)	mg/L	1830	18900	27.3	1.18	n/a	1.18
Molybdenum (total)	mg/L	n/a	n/a	n/a	n/a	n/a	0.00045
Nickel (total)	mg/L	n/a	n/a	n/a	n/a	n/a	0.0002
Silver (total)	mg/L	0.00020	0.00210	n/a	n/a	n/a	< 0.00005
Selenium (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00004	n/a
Silver (total)	mg/L	n/a	n/a	< 0.00005	< 0.00005	< 0.00005	n/a
Sodium (total)	mg/L	970	10600	11.3	0.42	n/a	0.38
Lead (total)	mg/L	0.02910	0.271	n/a	n/a	n/a	n/a
Silicon (total)	mg/L	9.20	103	0.08	< 0.02	n/a	n/a
Silicon (dissolved)	mg/L	10.3	54.6	0.07	< 0.02	n/a	n/a
Selenium (total)	mg/L	0.00550	0.06200	< 0.00004	< 0.00004	n/a	n/a
Strontium (total)	mg/L	1.40	14.8	0.00312	0.00035	n/a	0.00037
Vanadium (total)	mg/L	0.0344	0.361	0.00008	0.00005	0.00004	0.00005
Tin (total)	mg/L	n/a	n/a	n/a	n/a	0.00040	0.00040
Titanium (total)	mg/L	n/a	n/a	n/a	n/a	0.00009	0.00010
Zinc (total)	mg/L	n/a	n/a	n/a	n/a	0.048	0.049
Cyanide (total)	mg/L	n/a	n/a	n/a	n/a	< 0.01	n/a
Oil & Grease (total)	mg/L	< 14	188	< 2	< 2	< 2	n/a
4AAP-Phenolics	mg/L	n/a	n/a	n/a	n/a	0.094	0.088
Benzene	ug/L	n/a	< 0.5	< 0.5	< 0.5	n/a	< 0.5
Toluene	ug/L	n/a	< 0.5	< 0.5	< 0.5	n/a	< 0.5
Ethylbenzene	ug/L	n/a	< 0.5	< 0.5	< 0.5	n/a	< 0.5
Xylene (total)	ug/L	n/a	2.2	2.3	< 0.5	n/a	0.6
m/p-xylene	ug/L	n/a	1.6	1.6	< 0.5	n/a	< 0.5
o-xylene	ug/L	n/a	0.6	0.7	< 0.5	n/a	< 0.5
1.1.6 PHCs		***	***	< 25	< 25	n/a	n/a
F1 (C6-C10)	µg/L	< 25	299	< 25	< 25	n/a	n/a
F2 (C10-C16)	µg/L	< 100	2760	< 100	< 100	n/a	n/a
F3 (C16-C34)	µg/L	291	2880	< 200	< 200	n/a	n/a
F4 (C34-C50)	µg/L	< 200	< 200	< 200	< 200	n/a	n/a

Table 4: Constituent Rejections

		Sample ID						Rejection (%)	
		Raw	RO-CONC	Perm 1	Perm 2	Effluent	SW Effluent	Pass 1	Pass 2
	Sample Date	2-May-23	3-May-23	4-May-23	5-May-23	5-May-23	5-May-23		
Analysis	**Units**								
Biochemical Oxygen Demand (BOD5	mg/L	657	2480	9	6	10	12	98.6%	99.1%
Alkalinity	mg/L as CaCO3	5560	5710	155	27	< 2	24	97.2%	99.5%
pH	No unit	8.34	7.87	7.11	6.99	7.22	7.29		
Conductivity	uS/cm	12400	82200	513	57	6.7	54	95.9%	99.5%
Ammonia+Ammonium (N)	as N mg/L	679	5760	44.4	5.8	n/a	5.8	93.5%	99.1%
Total Kjeldahl Nitrogen	as N mg/L	775	7420	41.6	6.0	n/a	n/a	94.6%	99.2%
Sulphate	mg/L	< 20	59000	8	< 2	< 2	< 0.2		
Chloride	mg/L	2000	24000	49	1	< 1	0.6	97.6%	100.0%
Nitrite (as N)	as N mg/L	3.20	42.5	< 0.03	< 0.03	n/a	< 0.03	99.1%	99.1%
Nitrate (as N)	as N mg/L	< 0.6	1.88	< 0.06	< 0.06	n/a	< 0.06	90.0%	90.0%
Nitrate + Nitrite (as N)	as N mg/L	3.20	44.4	n/a	n/a	n/a	n/a		
Bromide	mg/L	3.7	33.5	< 0.3	< 0.3	n/a	n/a	91.9%	91.9%
Total Suspended Solids	mg/L	292	353	< 2	3	n/a	n/a	99.3%	99.0%
Total Dissolved Solids	mg/L	6900	119000	86	< 30	n/a	n/a	98.8%	99.6%
Chemical Oxygen Demand	mg/L	2350	23000	18	< 8	n/a	n/a	99.2%	99.7%
Total Organic Carbon	mg/L	626	6500	5	3	n/a	n/a	99.2%	99.5%
Chromium VI	µg/L	4.5	115	< 0.2	< 0.2	n/a	n/a	95.6%	95.6%
Fluoride	mg/L	0.50	4.30	< 0.06	< 0.06	< 0.06	n/a	88.0%	88.0%
Mercury (total)	µg/L	0.04	0.53	< 0.00001	< 0.00001	< 0.00001	n/a	99.98%	99.98%
Arsenic (total)	mg/L	0.0447	0.349	n/a	n/a	n/a	n/a		
Aluminum (total)	mg/L	1.12	5.77	0.003	< 0.001	0.002	0.001	99.7%	99.9%
Antimony (total)	mg/L	n/a	n/a	n/a	n/a	< 0.0009	n/a		
Arsenic (total)	mg/L	n/a	n/a	< 0.0002	< 0.0002	< 0.0002	n/a		
Barium (total)	mg/L	0.108	1.14	0.00060	0.00026	0.00025	0.00036	99.4%	99.8%
Beryllium (total)	mg/L	n/a	n/a	n/a	n/a	n/a	< 0.000007		
Bismuth (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00001	n/a		
Boron (total)	mg/L	7.05	47.2	3.62	1.76	n/a	1.60	48.7%	75.0%
Calcium (total)	mg/L	104	1073	0.16	< 0.01	n/a	0.11	99.8%	99.0%
Cadmium (total)	mg/L	0.000900	0.005400	< 0.000003	< 0.000003	< 0.000003	0.000009	99.7%	99.7%
Chromium (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00008	< 0.00008		
Cobalt (total)	mg/L	n/a	n/a	n/a	n/a	0.000004	0.000011		
Copper (total)	mg/L	n/a	n/a	n/a	n/a	0.0127	0.0084		
Iron (total)	mg/L	7.20	75.8	0.017	0.008	n/a	0.011	99.8%	99.9%
Lead (total)	mg/L	0.02910	0.271	0.00063	0.00044	0.00053	0.00046	97.8%	98.5%
Magnesium (total)	mg/L	156	1643	0.108	0.007	n/a	0.016	99.9%	100.0%
Manganese (total)	mg/L	0.371	4.04	0.00025	< 0.00001	0.00015	0.00015	99.9%	99.997%
Molybdenum (total)	mg/L	n/a	n/a	n/a	n/a	0.00044	n/a		
Nickel (total)	mg/L	n/a	n/a	n/a	n/a	0.0003	n/a		
Phosphorus (total)	mg/L	6.80	58.9	0.007	< 0.003	< 0.003	< 0.003	99.9%	55.9%
Total Reactive Phosphorous (o-phos	mg/L	2.26	23.2	< 0.03	< 0.03	n/a	n/a	98.7%	98.7%
Potassium (total)	mg/L	1830	18900	27.3	1.18	n/a	1.18	98.5%	99.9%
Molybdenum (total)	mg/L	n/a	n/a	n/a	n/a	n/a	0.00045		
Nickel (total)	mg/L	n/a	n/a	n/a	n/a	n/a	0.0002		
Silver (total)	mg/L	0.00020	0.00210	< 0.00005	< 0.00005	< 0.00005	< 0.00005	75.0%	75.0%
Selenium (total)	mg/L	n/a	n/a	n/a	n/a	< 0.00004	n/a		
Silver (total)	mg/L	n/a	n/a				n/a		
Sodium (total)	mg/L	970	10600	11.3	0.42	n/a	0.38	98.8%	99.96%
Silicon (total)	mg/L	9.20	103	0.08	< 0.02	n/a	n/a	99.1%	99.8%
Silicon (dissolved)	mg/L	10.3	54.6	0.07	< 0.02	n/a	n/a	99.3%	99.8%
Selenium (total)	mg/L	0.00550	0.06200	< 0.00004	< 0.00004	n/a	n/a	92.7%	92.7%
Strontium (total)	mg/L	1.40	14.8	0.00312	0.00035	n/a	0.00037	99.8%	100.0%
Vanadium (total)	mg/L	0.0344	0.361	0.00008	0.00005	0.00004	0.00005	99.8%	99.9%
Oil & Grease (total)	mg/L	< 14	188	< 2	< 2	< 2	n/a	85.7%	85.7%

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June 19, 2023

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Re: Preliminary Evaluation of Leachate Management Options at the Regional Landfill
Essex-Windsor Solid Waste Authority
RWDI Reference No. 2306154

Dear Mr. Marentette,

RWDI AIR Inc. (RWDI) has prepared this Summary Letter to provide the Essex-Windsor Solid Waste Authority (the Authority) with a preliminary evaluation of leachate management options being considered at the Regional Landfill located at 7700 County Road 18 in Essex, Ontario (the Landfill). Although our Work Plan is to evaluate long-term leachate treatment and management options at the Landfill, this letter summarizes immediate options to effectively manage the leachate while the long-term option comes into fruition.

Understanding

RWDI understands that the Authority is in the process of evaluating leachate management options because of significant increases in both quantity and strength of leachate generated at the Landfill since approximately 2017, which have recently posed challenges with respect to leachate acceptance at the Lou Romano Wastewater Treatment Plant (WWTP). In particular, the Lou Romano WWTP has conveyed to the Authority they are unable to effectively treat the leachate from the Landfill based on volume and more importantly quality as it relates to biological oxygen demand (BOD); total suspended solids (TSS); and ammonia related parameters. In general, the situation is such that the Lou Romano WWTP has insisted that the Authority to come up with immediate corrective measures in order for leachate to continue to be accepted at their facility.

Response

In response to the above-noted position that both the Lou Romano WWTP and the Authority are collectively in together, the Authority, for their part of the treatment solution, needs to implement immediate corrective measures to improve the Landfill's leachate being trucked to the Lou Romano WWTP. Based on a leachate generation rate that is approximately double compared other similar solid non-hazardous waste landfills for reasons outlined in a previous desktop study undertaken by RWDI entitled, *"Essex-Windsor Solid Waste Authority: Leachate Generation Study"*, dated August 25, 2022 (Leachate Study); a reduction in leachate disposal volume is not possible. Current leachate storage

inventories, coupled with high generation rates support that a focus on improving leachate quality for off-site management is the most feasible choice to pursue in an immediate case.

Corrective Measure Options

Although there are various corrective measures that can be implemented, there is a pressing need for a rapid implementation of a corrective measure(s). This need is from the perspective of continuing with off-site leachate in order for the Authority to remain in compliance with the Item 2 of Schedule A of the Landfill's Ministry of Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) No. A011101, dated November 16, 2020 (Waste ECA), which is the report entitled " *Essex-Windsor Regional Landfill Site, Conditions of Approval", comprising Schedules B,C,D,E, and F. Prepared by Jagger Hims Limited dated March 1995*. This report denotes that the leachate head in any waste cell shall be maintained below 0.5 metres of the underlying bedrock aquifer hydrostratigraphic unit's potentiometric pressure.

The current leachate level, as measured at pumping station PS1, is within 2 metres of that elevation, or an approximate 7 metre column of leachate within the waste mound. This current leachate column likely is at an elevation that would cause the potential for lateral leachate migration away from the waste footprint into the various overburden hydrostratigraphic units and causing a leachate issue in the shallow groundwater at the Landfill. The long-term costs associated with this potential are beyond "simply" remedial effort in nature and go to compliance with the Authority's ability to operate the Regional Landfill in regulatory compliance with the Waste ECA. It is noted there are other various costly considerations to maintaining leachate in this manner, such as but not limited to, increasing (worsening) the strength of the leachate, landfill gas management challenges (reducing landfill gas generation followed by an eventual surge in landfill gas generation with leachate drawdown), and leachate collection system failures from biofouling (leachate piping and drainage stone).

In consideration of the importance to the implementation of an effective remedial option rapidly in order to facilitate offsite leachate management, the pre-treatment of the leachate to an improved quality for management at the Lou Romano WWTP is recommended. This pre-treatment will enable the leachate quality to meet the requirements for Lou Romano WWTP to effectively treat the leachate while maintaining their facility in compliance with their regulator MECP ECAs, as well as for the Authority to significantly reduce the leachate level in the waste mound for compliance with the Waste ECA.

Recommend Interim Corrective Option

Whatever remedial corrective option is implemented, it does not need to be permanent (could be sourced for 6 to 12 months), and should be sourced based on effectiveness and ability to be mobilized to the site rapidly without a need to amend the Landfill's ECAs (note, a biotreatment system will generate a new air emissions source that will likely require MECP approval). The key objective is to find a rapidly deployable system that enables leachate to be effectively treated in an interim (immediately)

manner while a long-term solution is properly evaluated and then implemented. It is noted that this initial interim solution could be changed out to a different (possibly better) interim solution at year 1 of a 4-year timeframe to commission the permanent long-term solution.

The Authority has proactively looked at, and continues to evaluate, various options for leachate management in the long-term and short-term. Of these options, a bench scale study of a Reverse Osmosis (RO) System (via ROCHEM Americas) was recently completed and results show chemical concentrations that significantly improve the leachate quality with treatment, as summarized below for ammonia and total Kjeldahl nitrogen (TKN).

Parameter	Raw Result	Treated Result	Windsor SS Spec
Ammonia	168 mg/L	<0.02 mg/L	0.2 mg/L
TKN	1,080 mg/L	0.6 mg/L	100 mg/L

Although ROCHEM data provided to date to RWDI do not evaluate TSS and BOD, the nature of a RO system will also significantly reduce these parameter concentrations with treatment. ROCHEM did evaluate total dissolved solids (TDS), and with treatment the leachate showed a reduction from 11,300 mg/L to 451 mg/L. ROCHEM denotes TSS and BOD should show a similar concentration reduction with RO treatment. Of recent weeks, the Lou Romano WWTP has not commented on BOD values as being a point of concern, which is speculated to be based on on-site leachate management practices implemented by the Authority at the Landfill, mainly increasing the number of floating aerators to eight along with the associated infrastructure upgrades.

The Authority has commented that ROCHEM has committed a portable RO unit to the Authority for the first week of July 2023, after which time a further timeline for mobilization is committed for the fall of 2023. This physical-chemical treatment technology consists of a three-stage system capable of treating 190 cubic metres (m^3) of leachate per day. Current leachate inventory in the waste mound at the Landfill is estimated at 250,000 cubic metres, which would take 3.6 years to manage with this system. It is noted though, that some ratio of trucks with “pre-treated” and “untreated” leachate should be manageable by the Lou Romano WWTP and reduce this timeframe accordingly.

ROCHEM has committed to a rapid mobilization to the Landfill, and the RO system is proven to treat the leachate to the required chemical loading required by the Lou Romano WWTP. It is noted that the Lou Romano WWTP should validate this position on suitable quality prior to implementing this corrective option. Additionally, the Lou Romano WWTP, would for their part of the solution, be able to evaluate the pre-treatment leachate and be able to accept more leachate, or reduce management costs as its improved quality may make operating the WWTP easier from an assimilative capacity perspective.

It is noted that most, if not all, other interim treatment systems would take months to design, build, and mobilize (likely 4 to 6 months).

Cost Considerations

Any leachate pre-treatment system to be brought to the Landfill will have a cost, and the system to be brought initially does not have to be the only system, or the best system, but needs to have the ability for the Authority to rapidly manage (pre-treat) leachate. Importantly, the system needs to be mobilized rapidly and treat the leachate to an improved quality to meet the needs of the Lou Romano WWTP. With this initial system put into place, focus on optimizing an interim system can be implemented with a goal to have a long-term system in place in an approximate 4-year timeframe.

It is noted that as outlined in the Leachate Study completed by RWDI, the main cause for the recent increase in leachate strength at the Landfill is attributable to the greenhouse vine-based waste material landfilled since 2017. Although there is a negative side (leachate strength) to managing greenhouse vine-based waste, this waste material is highly decayable in nature with 95% water being its main makeup. Therefore, for every 1 cubic metre of airspace this material consumes, it will decrease by approximately 95% over time and recreate airspace for resale in the future. In essence, this material represents resaleable airspace by a considerable margin and therefore, at a minimum represents a double sale of air space (first greenhouse, then MSW or IC&I waste). This waste should have generated funds to pay for its leachate management, then factor in the resale, is profitable by nature and can pay for its own leachate pre-treatment during this interim timeframe until a suitable long-term leachate treatment system can be implemented.

Closure

We trust that this Summary Letter for the Authority's Regional Landfill is satisfactory for your current requirements. Please contact us with any questions you may have.

Yours very truly,

RWDI AIR Inc.

Anthony Vanderheyden, B.A.Sc., EIT
Project Manager

Brent J. Langille, B.Sc., P.Geo.
Senior Technical Director | Principal

STATEMENT OF LIMITATIONS

This Summary Letter has been prepared for a specific purpose and use, as outlined herein. The scope of the undertaking was initially provided in a proposal submitted by RWDI AIR, Inc. (RWDI) to the Essex-Windsor Solid Waste Authority (the Authority). The proposal (subject to any documented scope changes requested by the Authority) constitutes an agreement between RWDI and the Authority.

RWDI relied in part, upon the data, information, specifications, and documentation (Data) provided by the Authority as well as third parties. It is assumed by RWDI that the Data provided are complete and accurate. RWDI was not retained to, nor has it conducted any independent verification of the accuracy, completeness, or suitability of the Data. As such, RWDI assumes no liability for losses, damages, or claims of any nature arising from inaccurate, incomplete, or unsuitable Data provided on this project. The Authority by receipt of this Summary Letter agrees to indemnify and hold harmless RWDI with respect thereto.

It is important that the reader of this Summary Letter, recognize that subsurface, environmental, and/or geotechnical conditions may vary geographically and temporally. This is a natural phenomenon, which is not fully accommodated in the limited testing conducted by RWDI. In addition, the analysis of the collected data, by necessity, incorporates simplifying assumptions of site conditions and analytical solutions that assume uniformity in site conditions. The opinions, conclusions, and recommendations contained within the Summary Letter therefore represent RWDI's professional judgment in-light of these limitations.

This Summary Letter is to be considered confidential and is for the sole use of the Authority. As such, the Report shall not be relied upon by third parties, except where agreed in writing between RWDI and the Authority; where required by law; or where used for governmental review. RWDI accepts no responsibility, and denies any liability whatsoever, to parties other than the Authority who may obtain access to the Summary Letter, for any injury, loss, or damage suffered by such parties arising from their use of, reliance upon, decisions or actions based on the Summary Letter or any of its contents, except to the extent where those parties have obtained prior written consent of RWDI to use and rely upon the Summary Letter and its contents. Any damages arising from improper use of the Summary Letter or parts thereof shall be borne by the party making such use.

This statement of Qualifications and Limitations is attached to and forms part of the Summary Letter and any use of the Summary Letter are subject to the terms thereof.

Essex-Windsor Solid Waste Authority
Administrative Report

July 4, 2023

To:	**The Chair and Board of the Essex-Windsor Solid Waste Authority**
From:	**Steffan Brisebois, Manager of Finance and Administration**
Meeting Date:	**Wednesday, July 12, 2023**
Subject:	**2023/2024 EWSWA Insurance**

Purpose

The purpose of this report is to update the Board on the Authority's comprehensive insurance program renewal for the period of July 1, 2023 to June 30, 2024.

Background

The Authority's insurance broker is Aon Reed Stenhouse Inc. (AON). In recent years, AON has been challenged to secure and negotiate coverage on behalf of the Authority. This is primarily due to insurers deeming the recycling industry as a whole to be of greater risk due to recent claims across the province. The Authority's last claim relating to its recycling operations dated back to 2005.

Discussion

In 2023, AON was again challenged to secure coverage for the entire replacement costs for the Authority's property and assets. Ultimately, AON was able to secure insurance for 100% of the replacement cost of all Authority assets by splitting the policy. Below is a table outlining the coverage details. If the Authority were to have a claim relating to the property and equipment policy, 4 companies would pay their portion of the total cost less the deductible.

Insurer	Expiring Policy	Renewal
Zurich	50%	50%
Specialty Risk Underwriting Ltd. (Through Northbridge General Insurance)	25%	25%
Echelon	20%	20%
Aviva	5%	5%
Total	100%	100%

Premiums

The following table summarizes the various coverages and related premiums. As shown in the table below the 2023/2024 premium increased by $35,245 from the prior year. This equates to an increase of approximately 7% year over year.

Class	2023/24 Premium	2022/23 Premium	Premium Increase / (Decrease)
Property & Equipment	$307,465	$285,239	$22,226
Contractor's Equip.	$30,312	$26,863	$3,449
Environmental (2 Year total; $70,250)	$35,125	$35,125	$0
Owned Automobile	$25,365	$25,094	$271
General Liability	$56,702	$52,931	$3,771
Umbrella Liability	$52,645	$49,000	$3,645
Errors & Omissions	$18,000	$19,772	($1,772)
Boiler & Machinery	$3,424	$3,211	$213
Directors & Officers	$6,900	$6,900	$0
Crime	$10,140	$9,890	$250
Cyber (Breach Response)	$4,192	$3,590	$602
Total Premium	$550,270	$517,615	$32,655
PST on All but Auto	$41,990	$39,400	$2,590
Total	$592,260	$557,015	$35,245

The Authority has a very different risk profile than a municipality, in particular, the risk associated with the operation of a fibre recycling facility is significantly higher than most other municipal operations. In addition, due to sustained inflationary pressure on property values and the cost of repairing or replacing buildings and equipment the Authority observed a 3% valuation increase on its Property and Equipment. For these reasons, the largest premium impact pertained to the Property and Equipment policy.

The total value of the Authority's property and processing equipment is greater than $19,000,000 and the Authority's contractor's equipment total value is approximately $5,800,000. The contractor's equipment includes equipment such as front-end loaders, bulldozers and the compactor at the Regional Landfill.

The Environment policy insurer (Zurich) offered the Authority a 2-year renewal option in 2022. This policy remained in effect for the 2023/2024 insurance renewal period with no changes made to the premiums year over year.

Savings were observed in the Errors and Omissions (E&O) policy due to exercising an option to reduce the limits of liability which had been recommended by AON.

Deductibles

The following table summarizes the deductible amounts for the various classifications:

Class	2023 / 2024 Deductible	2022 / 2023 Deductible
Property & Equipment	$100,000 - $250,000	$100,000 - $250,000
Contractor's Equipment	$2,500 - $50,000	$2,500 - $50,000
Environmental	$25,000	$25,000
Owned Automobile	$5,000 - $10,000	$5,000 - $10,000
General Liability & Legal	$5,000	$5,000
Umbrella Liability	$10,000	$10,000
Directors & Officers	$15,000	$15,000
Errors & Omissions	$5,000	$5,000
Boiler & Machinery	$10,000	$10,000
Cyber (Breach Response)	$1,000	$1,000

In 2021, AON was able to negotiate a reduction to $100,000 for claims under $1,000,000 at the Administration office and the Kingsville Transfer Station 2. The insurers were unwilling to reduce the deductible at the Regional Landfill or the Windsor Material Recovery Centre.

The deductible for the contractor's equipment policy varies depending on the value of the equipment. For example, if there was a claim on a piece of equipment with a value of less than $25,000 the deductible would be $2,500, however, if the claim was on a piece of equipment such as the compactor at the Regional Landfill with an approximate value of $1,450,000, the deductible would be $50,000.

No changes to the deductible amounts transpired in the 2023/2024 insurance renewal period.

Additional Information

Since 2014 the Authority has participated in periodic Risk Control Assessments. Insurance company representatives perform site visits at the Essex-Windsor Regional Landfill, Windsor Recycling Facilities and Windsor Transfer Station. To date, there have been no critical control recommendations received.

Additionally, the Authority has addressed all important and advisory recommendations identified by the insurer and implemented additional risk mitigation items deemed necessary by Authority staff. Some of these items include:

- Additional video cameras installed to ensure all areas of public access are clearly visible.
- New gates installed at the Windsor site to ensure the site is secure.
- Replacement of all security and fire detection equipment at all sites.
- Installation of an automatic fixed suppression system on the Regional Landfill compactor and dozers.
- Annual infrared scanning on all the electrical panels in the recycling buildings to ensure there are no hot spots that could lead to an electrical failure.
- Annual fire hydrant testing to ensure an acceptable flow and pressure rating is achieved.
- The fire department has been invited to tour the Windsor facility annually to ensure they are familiar with the site.
- All metal halide light fixtures have been replaced with LED fixtures to reduce the inherent fire risk associated with exploding metal halide fixtures.

Unfortunately, although the above steps have been taken by the Authority to reduce the potential for claims the insurer still feels that the risk level is higher than acceptable and consequently has increased premiums.

Prior to the expiration of the policy AON requested quotes from over 40 different insurance carriers. AON will continue to work throughout 2023 to ensure that the Authority is getting the best available coverage and pricing.

Financial Implications

The 2023 budget document includes an expenditure of $575,100 for insurance-related costs with approximately $278,500 incurred as of the term expiration date of June 30, 2023. The portion of the renewal for 2023 will be $296,130 for a total projection of $574,630 resulting in a favourable variance of $470 for 2023.

In 2020 the Authority Board established an Insurance Reserve in the amount of $250,000. The reserve would be used to fund and mitigate the potential financial risk to the Authority in the event of a claim. This reserve is reviewed annually as

part of the budget process to ensure adequate funds are available. The reserve would need to be replenished in the event of a claim.

Recommendation

THAT the Board receive this report as information.

Submitted By

Steffan Brisebois, Manager of Finance and Administration

Essex-Windsor Solid Waste Authority

By-Law Number 6-2023
Being a By-law to Confirm the Proceedings of the Meeting of the Board of the Essex-Windsor Solid Waste Authority

WHEREAS by Agreement dated 18 May 1994, made between the Corporation of the County of Essex and the Corporation of the City of Windsor, the Essex-Windsor Solid Waste Authority (The Authority) was created as a joint board of management pursuant to Sections 207.5 and 209.19 of the *Municipal Act, RSO 1990, Chapter M.45* and;

WHEREAS Subsection 5.(3) of the Municipal Act, RSO 2001, Chapter 25, provides that the powers of a municipality shall be exercised by By-Law and;

WHEREAS Section 1 of the Municipal Act RSO 1990, Chapter M 46 defines a municipality as including a board, commission or other local authority exercising any power with respect to municipal affairs or purposes and;

WHEREAS it is deemed expedient that the proceedings of the Authority at this meeting be confirmed and adopted by By-Law

NOW THEREFORE the members of the Authority enact as follows:

1) The action of the members of the Authority in respect to each recommendation contained in the Report/Reports of the Committees and each motion and resolution passed and other action taken by the members of the Authority at this meeting is hereby adopted and confirmed as if all such proceedings were expressly set out in this by-law.

2) The Chair and the proper officials of the Authority are hereby authorized and directed to do all things necessary to give effect to the action of the members of the Authority referred to in the preceding section hereof.

3) The Chair and the General Manager of the Authority are authorized and directed to execute all documents necessary in that behalf.

ESSEX-WINDSOR SOLID WASTE AUTHORITY

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Gary McNamara
EWSWA Board Chair

_____

Michelle Bishop
General Manager

Read a First, Second and Third Time, Enacted and Passed This 12th Day of July, 2023