

Waste Management | Sustainability Services

Waste to Resource Assessment



Prepared for:



Unity Health - St. Joseph's Health Centre
30 The Queens Way, Toronto, ON
May 3, 2023

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This assessment is designed to exceed the minimum guidelines for performing waste assessments as set forth by the US EPA and Canadian provincial regulatory authorities. This report has been prepared for the specific purpose(s) contained herein. To the extent that statements and information provided by the client, its representatives, or partners have been used in the preparation of this report, Sustainability Services and Waste Management of Canada Corporation relied upon the same to be accurate, and for which no assurances are intended, and no representations or warranties are made. Sustainability Services and Waste Management of Canada Corporation make no certification and gives no assurances except as explicitly set forth in this report. This report and the information contained herein, is produced for the expressed use of Unity Health - St. Joseph's Hospital, Toronto, ON. Sustainability Services and Waste Management of Canada Corporation specifically prohibit redistribution of this report and the material contained herein in whole or part without expressed written permission of Sustainability Services and Waste Management of Canada Corporation.





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Executive Summary

On May 3, 2023, Sustainability Services conducted a Waste to Resource™ assessment for Unity Health - St. Joseph's Health Centre located at 30 The Queens Way in Toronto, ON. A few goals of the assessment were as follows:

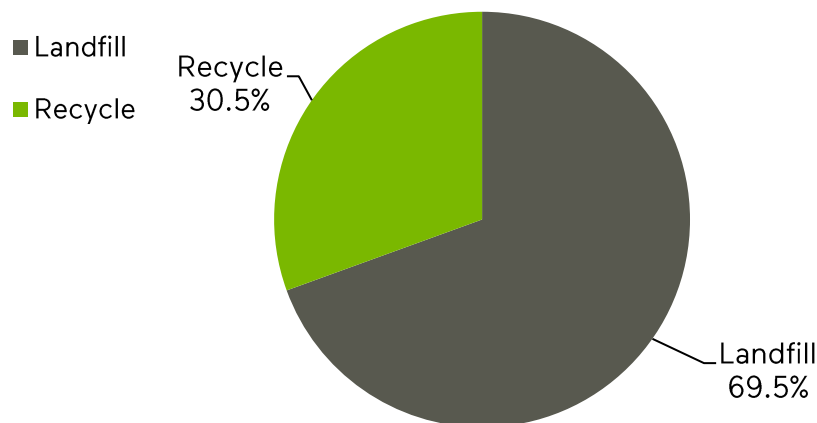
-  **Update baseline inventories for waste generation at Unity Health - St. Joseph's Hospital**
-  **To identify and quantify waste composition and commodity**
-  **To determine the recovery performance of existing programs**
-  **Identify opportunities to further increase diversion and reduce cost**
-  **Develop strategies that could be implemented throughout the facility**

Our goal is to provide Unity Health - St. Joseph's Health Centre with strategies that will maximize the efficiency of your waste management system. During the waste assessment conducted by Sustainability Services, visual inspections of waste generation points throughout the facility resulted in the discovery of additional diversion opportunities. The assessment identified four primary opportunities that should occur to improve your overall waste diversion rate. The following are our recommendations:

-  **Increase Awareness of Current Diversion Programs**
-  **Implement an Organics Collection Program**
-  **Employee, Contractor and Visitor Education and Engagement**
-  **Sustainable Hospital Practices**

The facility generated a combined 1,131.38 tonnes of waste and diverted materials in the last year. The current diversion rate for your facility is 30.5%.

Figure 1- Current Diversion Rate at Unity Health - St. Joseph's Hospital



A team of sustainability consultants performed an assessment that involved a walkthrough of the facility and a targeted sort and weigh analysis of the waste stream. The following is a summary of key findings identified during the assessment:

- ♻️ **The current diversion rate is 30.5%**
- ♻️ **Annually, it is estimated that 785.79 tonnes of waste and 345.59 tonnes of diverted materials will be generated from your facility**
- ♻️ **Of all the material generated on site, up to 42.2% potentially could have been diverted through currently available diversion programs**
- ♻️ **Plastics account for 31.7% of the waste sent to landfill**
- ♻️ **Papers account for 23.3% of the waste sent to landfill**
- ♻️ **Organics account for 15.9% of the waste sent to landfill**

Photograph 1 – Waste Sample Collected for Assessment Period



Assessment Findings and Goals Alignment

Facility Information

Table 1 – Facility Information








Item	Comments
Facility Name:	Unity Health - St. Joseph's Health Centre
Description:	Unity Health - St. Joseph's Health Centre is a teaching hospital with over 420 patient beds.
Address:	30 The Queens Way, Toronto, ON
Contact Name:	Flodina Charles
Contact Number:	416-530-6000

Table 2 – Assessment Summary

Item	Comments
Performed By:	Kirthan Sathananthan
Performed On:	May 3, 2023
Report Written:	Kirthan Sathananthan
Report Reviewed:	Christopher Doyle
Assessment Type:	Waste to Resource Assessment – Waste Audit
Assessment Level:	<input checked="" type="checkbox"/> Basic Material Characterization <input type="checkbox"/> Detailed Material Characterization <input checked="" type="checkbox"/> Basic Options Analysis <input checked="" type="checkbox"/> Detailed Option Analysis <input type="checkbox"/> Carbon Analysis <input type="checkbox"/> Material Process Mapping <input checked="" type="checkbox"/> Implementation Feasibility Analysis <input checked="" type="checkbox"/> Action Plan
Account Manager:	Keira Toscan

Goals, Objectives, and Other Factors

The following is a list of company goals, objectives, or other factors considered during this assessment.

-  **Apply findings from the waste audit to reduce waste, maximize collection of recycling materials and optimize waste management efficiencies**
-  **Set goals, monitor waste generation and track recovery levels on a regular basis**
-  **Streamline and standardize handling routines of materials throughout the facility**
-  **Reduce waste spend and disposal costs**
-  **Provide ongoing and improved employee training and education avenues**
-  **Identify areas of new or enhanced diversion opportunity**
-  **Increase capture rate of divertible materials and reduce overall generation of non-recyclable materials**

Regulatory Requirements

The facility took initiative to conduct a solid nonhazardous waste audit in effort to adhere to Ministry of the Environment, Conservation and Parks Regulations 102/94 and 103/94. Under O.Reg. 102/94, all waste audits must address:

- Identify the amount, nature and composition of the waste generated in designated functional areas of the facility.
- How the waste is produced, including relevant management decisions and policies.
- How the waste is managed; and
- The extent to which materials or products used or sold consist of recycled or reused materials or products.

According to O.Reg. 102/94, the Waste Reduction Work Plans or a summary of the plan must be posted at the facility in a place where it can be viewed. If a summary of the work plan is posted, the full Work Plan must be made available for review upon request by any employee.

- The waste audit report and waste reduction work plan must be retained on file for a minimum of five years.
- A waste audit report and waste reduction work plan must be conducted and updated annually.

Please see Appendix 6 – Ontario’s 3Rs Regulations for more details or <https://www.ontario.ca/laws/regulation/940103> and <https://www.ontario.ca/laws/regulation/940102> for the full regulations. Excerpt below:

PART IX HOSPITALS

46. This Part applies to the operator of a public hospital classified as a class A, B or F hospital in Regulation 964 of the Revised Regulations of Ontario, 1990. O. Reg. 102/94, s. 46.

47. (1) The operator shall conduct a waste audit covering the waste generated by the operation of the hospital. The audit shall also address the extent to which materials or products used consist of recycled or reused materials or products.

(2) After conducting the waste audit, the operator shall prepare a written report of the audit.

(3) In every year following the initial waste audit, the operator shall update the audit and prepare an updated written report. O. Reg. 102/94, s. 47.

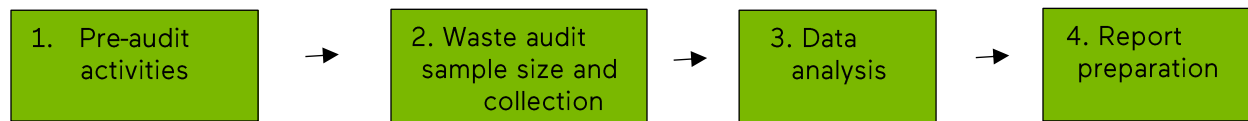
Options Overview

Four options were identified during the assessment. The table below lists key options that represent the most significant opportunities.

Table 3 – Options Summary Table

Option	Description	Benefit	Rationale
Increase Awareness of Current Diversion Programs	Stakeholders need to receive consistent messages about current diversion programs.	<ul style="list-style-type: none"> ✓ Increase diversion and capture rates ✓ Reduced waste spend 	Majority of the materials generated throughout the facility can be diverted from landfill through current reuse, recycling or compost programs.
Employee, Contractor and Visitor Education and Engagement	All stakeholders need to receive consistent messages about current diversion programs available to them.	<ul style="list-style-type: none"> ✓ Increase awareness on environmental programs and issues ✓ Increased efficiencies ✓ Ensure effective education is offered 	<p>All stakeholders need to be encouraged and re-educated regarding waste and recycling procedures within the facility.</p> <p>Dedicated and knowledgeable staff will create the opportunity for the facility to achieve superior capture rates and manage an effective program.</p>
Ensure Effective Diversion Infrastructure	Ensure receptacles and signage is present.	<ul style="list-style-type: none"> ✓ Increase efficiencies in program and reduce gaps 	Take measures to help users and set up the diversion program for success.
Sustainable Hospital Practices	Continually improve waste management program on site. Monitor and effectively manage all programs and methods in place at the facility.	<ul style="list-style-type: none"> ✓ Expand programs available ✓ Ensure the tools and infrastructure are in place to support waste management goals 	<p>Control decision-making and input regarding materials brought into the facility.</p> <p>Determine how best to capture non-traditional materials for recycling or reuse.</p>

Sampling Methodology



- 1. Pre-audit activities** - Collecting background information, historical data/ diversion reports, service receptacle information, etc. Establishing the plan for the assessment. Conducting a site tour of the facility to review procedures and current infrastructure.
- 2. Waste audit and sample size** - To characterize the material stream, visual observations and waste samples were obtained from various collection areas throughout the facility. These collection areas were identified from labels placed on the waste bags or collection receptacle. For the purposes of this assessment, a sample **generation area** is a combination of a specific collection area or department and/or waste generating process. The sample material was collected in a safe, designated location separate from other waste collection areas for the assessment.

During this assessment, samples were collected from 3 unique generation areas throughout the facility over a 24-hour period. For the purposes of this project it is assumed that the sample period chosen is a fair representation of typical activities and waste generation at the site, although daily variances are possible. The materials were sorted and divided into up to 10 waste categories and weights of each material sub-category (up to 90) were recorded.
- 3. Data analysis** – Analysis of on and off-site data provided by WM and the client. Calculation of diversion and capture rate for the site.
- 4. Report preparation** - Full report prepared including site specific recommendations and Ministry of the Environment, Conservation and Parks - Audit and Workplan forms.

Limitations

Not all Diverted Materials were available and collected during the sample period. Examples include e-waste, and light tubes which are collected on a sporadic basis.

Hazardous, Industrial, and Liquid Industrial Wastes were not included within the scope of this assessment. These materials are not typically included in MOE Reg. 102/94 solid waste audits and specialized processes are required to handle these materials due to the health and safety concerns associated.

A portion of the sample bags included diapers and medical fluids, auditors conducted limited or simple sorting of these sample bags.

Material Composition Breakdown

Landfill Waste Material Comparison by Category

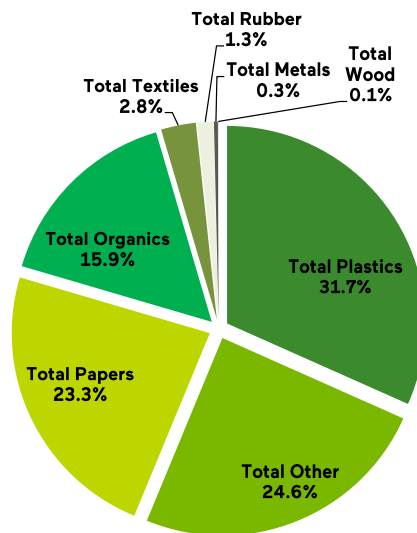
This section displays a breakdown of general material categories by weight and volume.

The largest category by weight was Plastics materials representing 31.7% of the landfill waste stream.

Table 4 – Landfill Waste Material Comparison

Waste Category	Total Audited Waste Material (kg)	Material Composition (%)	Annual Projected Volume Generated (kg)
Total Plastics	64.12	31.7%	248,851
Total Other	49.71	24.6%	192,925
Total Papers	47.21	23.3%	183,223
Total Organics	32.20	15.9%	124,969
Total Textiles	5.76	2.8%	22,355
Total Rubber	2.66	1.3%	10,324
Total Metals	0.65	0.3%	2,523
Total Wood	0.12	0.1%	466
Total Electronic Waste	0.04	<0.1%	155
Total	202.47	100.0%	785,790

Figure 2 – Landfill Waste Material by Category



Audited Waste Material Composition by Sample Collection Area

The following table displays a breakdown of the waste sources during the Sustainability Services assessment. For further in-depth analysis of the generation areas identified, consult Appendices and Supplementary Data.

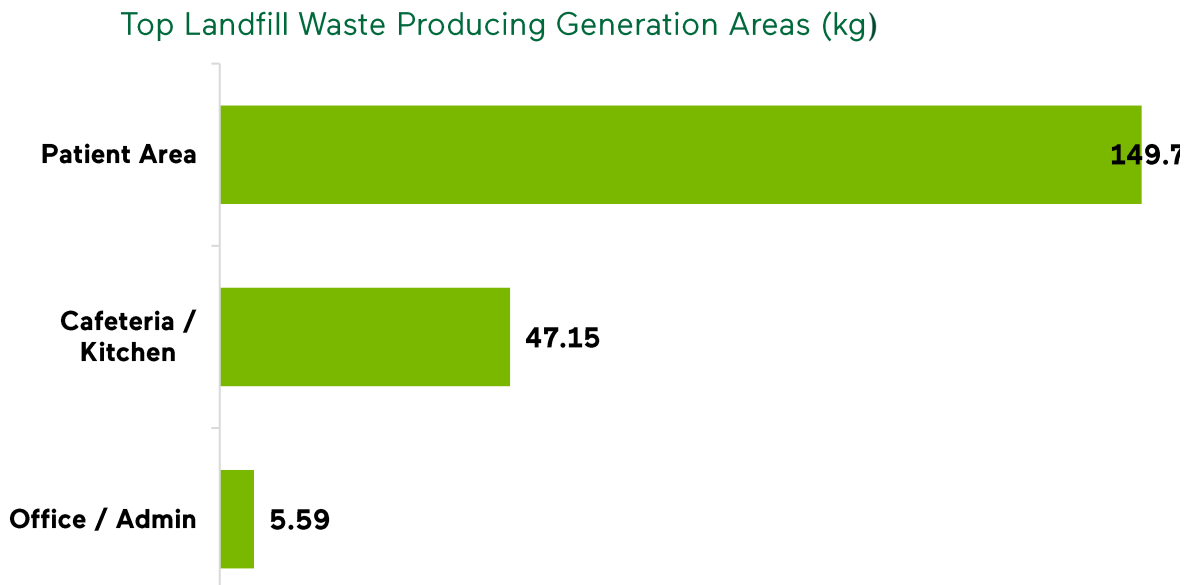
The largest generation area identified in the audit sample was the Patient Area generation area representing 74.0% of the audited sample.

Table 5 – Audited Waste Sources

Generation Area	Total Audited Waste (kg)	Generation Composition (%)	Annual Projected Volume (kg)
Patient Area	149.73	74.0%	581,105
Cafeteria / Kitchen	47.15	23.3%	182,990
Office / Admin	5.59	2.8%	21,695
Grand Total	202.47	100.0%	785,790

Figure 3, below represents the top three generation areas at the facility and some smaller areas are not specifically noted.

Figure 3 – Waste Generation by Collection Area



Diversion Opportunities

Increased diversion opportunities represent the largest potential cost savings and landfill diversion opportunity for Unity Health - St. Joseph's Hospital. While diversion programs are currently in operation, the audit shows that they are not working at their optimal efficiency.

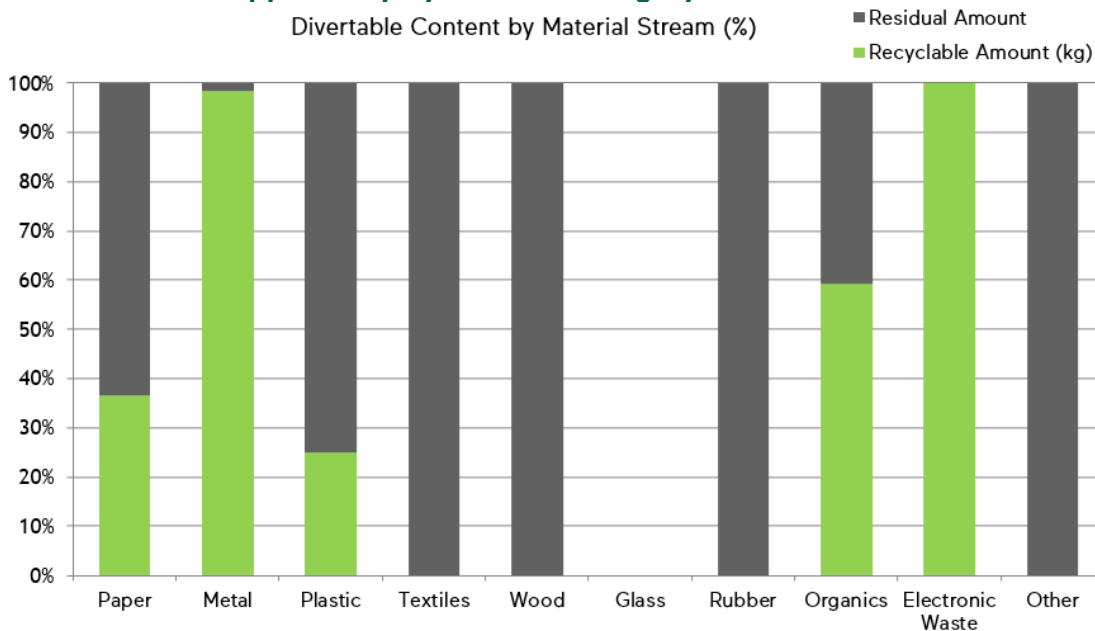
Diversion rate is calculated as follows:

$$\text{Diversion Rate} = \frac{\text{Weight of recovered material}}{\text{Total weight of material generated on-site}} \times 100\%$$

The current diversion rate at the site is 30.5%. Based on the diversion program currently in place 48.7% of the material generated at the facility is recyclable or divertible. Therefore, there is room for improvement within the diversion program where most employees in the facility handle their waste.

Figure 4 outlines the material in each category which could potentially be diverted.

Figure 4 - Diversion Opportunity by Material Category



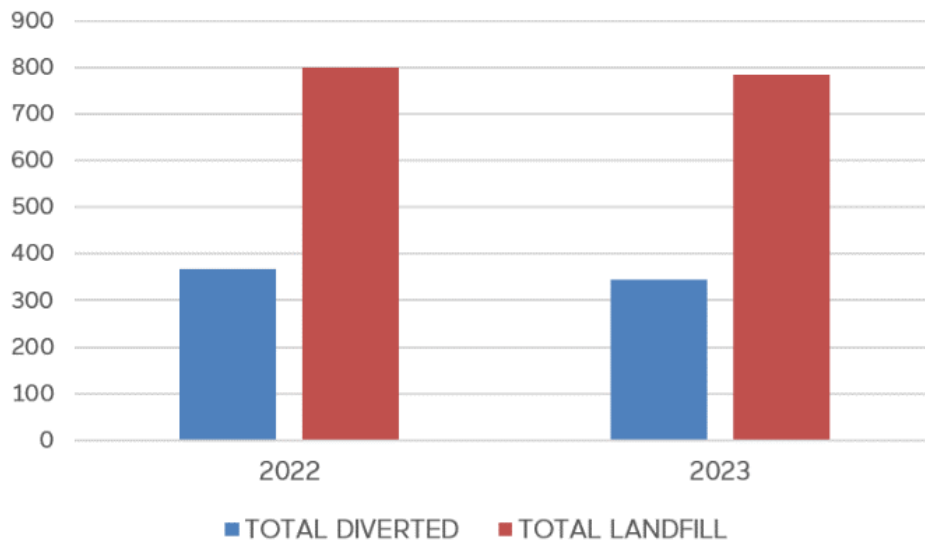
Year Over Year Audit Comparison

An assessment was completed at the facility in 2022. It was determined that the diversion rate has stayed relatively steady at 30.5% in the current assessment compared to 31.4% in the previous assessment.

The facility generated 785.79 tonnes of landfill waste in 2023, compared to 799.53 tonnes in the previous assessment.

The facility captured 345.59 tonnes of material for diversion, recycling or reuse in the current assessment compared to 366.50 tonnes in 2022.

Figure 5 – Comparison of 2022 to 2023 results (tonnes)



Diverted Material Comparison by Category

The following table displays a breakdown of assessed diverted, recycled, reused and composted materials. The facility currently has programs in place to capture the following waste streams:

Table 6 – Facility Service Information

Diversion Program	Service Provider/s	Container Type	Note
Single Stream Recycling	WM	40-yard bin	Includes cardboard
Organics	WM	35-gallon totes	
Confidential Paper Shredding	Shred-It	Shredding consoles	
E-Waste, Batteries, Light Tubes			Service information not available at the time of assessment.

Landfill at the facility was collected in a 35-yard compactor and 20-yard open top bin.

Table 7 – Diverted Material Comparison

Diverted Material	Annual Projected Volume (kg)	Percentage of all Diverted Materials (%)
Confidential Paper Shredding	127,348	36.8%
Mixed Recycling	109,500	31.7%
Organics	108,740	31.5%
Total	345,588	100.0%

Capture Rate

The **capture rate** indicates the percentage of a material (i.e. office paper, organics) that is being disposed of via one of the sites recovery programs (i.e. single stream, mixed recycling, organics). A 100% capture rate indicates that all recoverable materials being produced on-site has been placed in the correct receptacle and the landfill garbage contains no recoverable materials.

$$\text{Capture Rate} = \frac{\text{Recovered material (e.g. paper in mixed recycling)}}{\text{Recovered material (e.g. paper in mixed recycling)} + \text{Waste material (e.g. paper in garbage)}} \times 100\%$$

Based on the assessment findings, of the 1,131,378 kg of material generated at the facility in the last 12 months, 551,049 kg of that material is potentially divertible in the available diversion programs. As 345,588 kg of material was captured for recycling or compost, the facility wide capture rate was determined to be 62.7%. Table 8 below outlines the capture rate per material.





Table 8 – Capture Rate Calculations by Material

Diverted Material	Total Generated (kg)	Captured for Diversion (kg)	Landfilled (kg)	Capture Rate (%)
Aluminum cans	5,988	3,504	2,484	58.5%
Cardboard	50,431	48,180	2,251	95.5%
Fine paper	142,079	140,488	1,591	98.9%
Newsprint	1,730	876	854	50.6%
Steel cans	1,752	1,752	-	100.0%
PET (#1) plastic	13,850	4,380	9,470	31.6%
HDPE (#2)	16,755	2,628	14,127	15.7%
LDPE (#4) plastic film	25,615	-	25,615	0.0%
PP (#5) plastic containers	6,332	1,752	4,580	27.7%
Polystyrene (#6)	34,641	876	33,765	2.5%
Organics	233,709	108,740	124,969	46.5%
Boxboard	64,514	21,900	42,614	33.9%
Glossy magazines, catalogues, flyers	2,140	1,752	388	81.9%
Wood	466	-	466	0.0%
Steel	39	-	39	0.0%
Paper towels	68,073	-	68,073	0.0%
Disposable food packaging (incl. polycoat)	37,091	8,760	28,331	23.6%
Diapers	93,610	-	93,610	0.0%
Clothing/textiles	22,355	-	22,355	0.0%
Other: Mixed Medical Materials, PPE, Miscellaneous	310,210	-	310,210	0.0%



Recommendations Overview

Four options have been identified that can help Unity Health - St. Joseph's Hospital make its operations more sustainable. Each option should be carefully reviewed for operational, financial, social, and strategic fit.

-  **Increase Awareness of Current Diversion Programs**
-  **Employee, Contractor and Visitor Education and Engagement**
-  **Ensure Effective Diversion Infrastructure**
-  **Sustainable Hospital Practices**

Landfill Sample Material Category Breakdown

Increase Awareness of Current Diversion Programs:

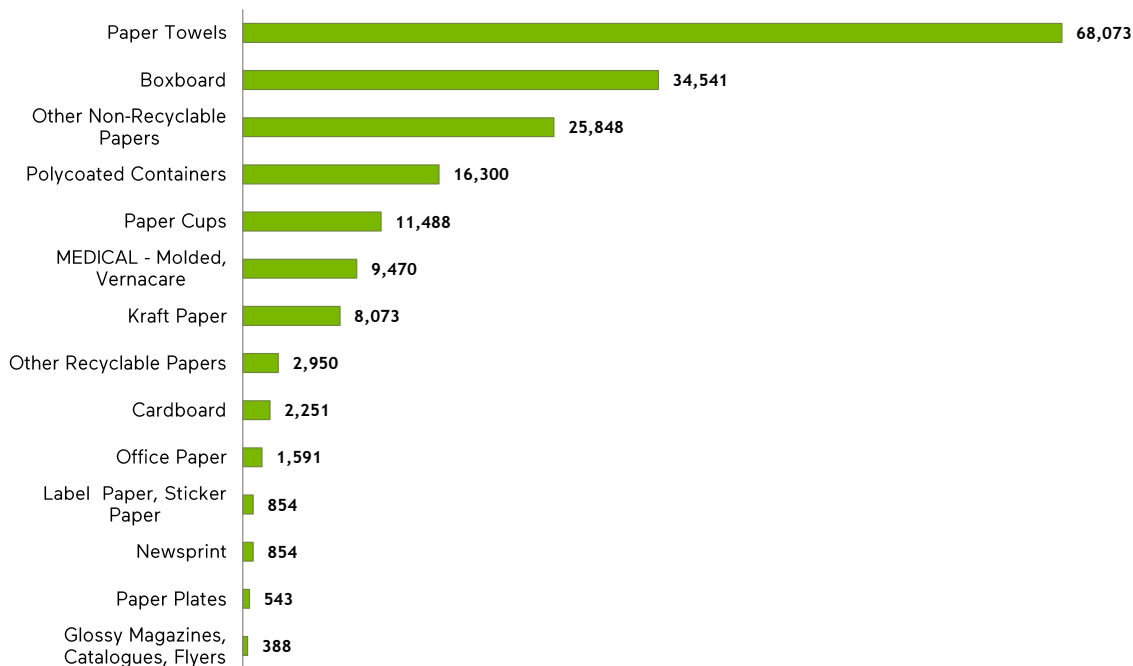
Below is a breakdown of the composition of the audited landfill material generated on site based on the analysis of the audited sample. As well as recommendations for selected sub-category material types.



Papers

Paper materials sent to landfill accounted for 23.3% of your total waste; nearly 183,223 kg of paper will be sent to landfill annually. The facility currently has programs in place to capture confidential paper shredding, cardboard and mixed paper collection for recycling.

Figure 6 - Annual Papers Disposed in Landfill (in kg)



The most predominant paper material found in the landfill was **paper towel** representing 8.7% of the landfill waste sample. This subcategory includes hand towels, facial tissue and similar materials. Paper towel is typically accepted in organic collection programs and could be included in the program already in place at the facility in the Cafeteria / Food Service generation area.

Additionally, the facility should consider providing more alternatives including hand dryers to reduce these materials, specifically in the highest generation areas such as washrooms. The facility should review hand dryer options that best suit their facility as the payback of the capital costs are often seen in reasonable time frames through reduced landfill costs and the reduction in costs of purchasing new paper towel products.

Boxboard (e.g., tissue or nitrile glove boxes) represented 4.4% of the audited sample. This material is accepted in the facility's mixed recycling program. Examples should be included on educational signage to increase awareness.

Other non-recyclable paper represented 3.3% of the landfill sample and included contaminated food packaging and wax paper.

Polycoated containers (incl. milk cartons and tetra paks) were primarily generated in the lunchroom, public areas, and represented 2.1% of the landfill sample. Employees should be re-educated about the recyclability of this material as it may not be commonly known.

Paper cups (e.g. coffee cups) were found throughout the sample and these items account for 1.5% of all landfill waste. Paper cups are not accepted in the facility's diversion program.

Medical – Molded, Vernacare, Wetstrength Paper (incl. bed pans) accounted for 1.2% of all landfilled materials. Some of these materials may be collected separately and sent for special handling.

Kraft paper (eg. brown paper bags) accounted for 1.0% of the landfill sample, in most cases these materials could be captured through existing programs.

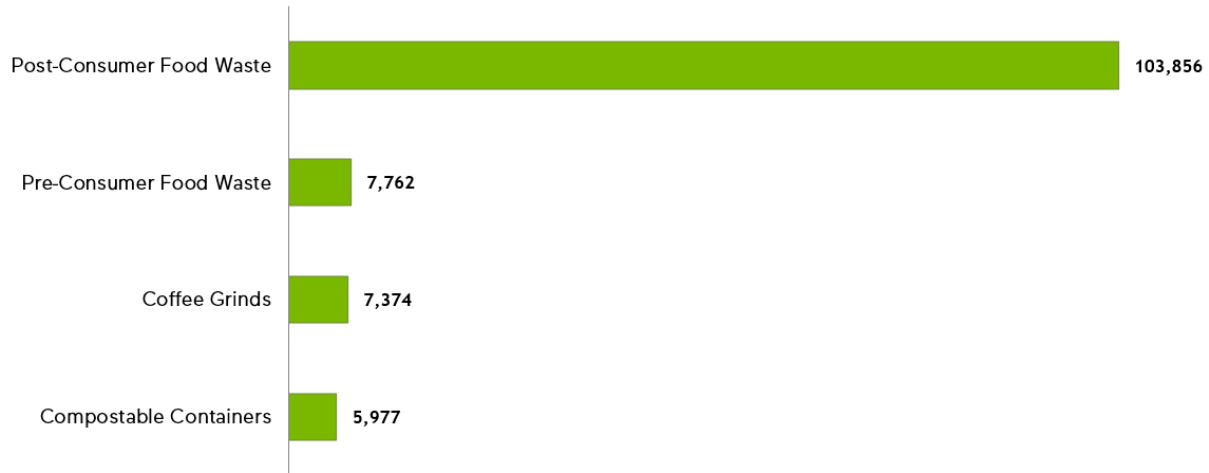
**Photographs 2 to 5 – Paper Material Examples in Landfill Sample
(Paper Towel, Boxboard, Polycoated Container, Molded Bed Pans)**



Organics

Organics materials sent to landfill accounted for 15.9% of your total waste; nearly 124,969 kg of Organics will be sent to landfill annually. A program currently exists at the facility to capture organic materials for compost, most receptacles are found throughout the kitchen and cafeteria.

Figure 7 - Annual Organics Disposed in Landfill (in kg)



Organic material was identified primarily as **post-consumer food waste**, representing 13.2% of the entire landfill waste stream. **Pre-consumer food waste, coffee grounds** and **compostable containers** were found in minimal quantities.

The material categories above could be diverted from landfill through the organics collection program in place. Additional educational material could be provided in the kitchen and cafeteria areas, where this material was mostly identified.

Photographs 6 to 7 – Organic Material Examples in Landfill Sample (Food Waste, Compostable Containers)



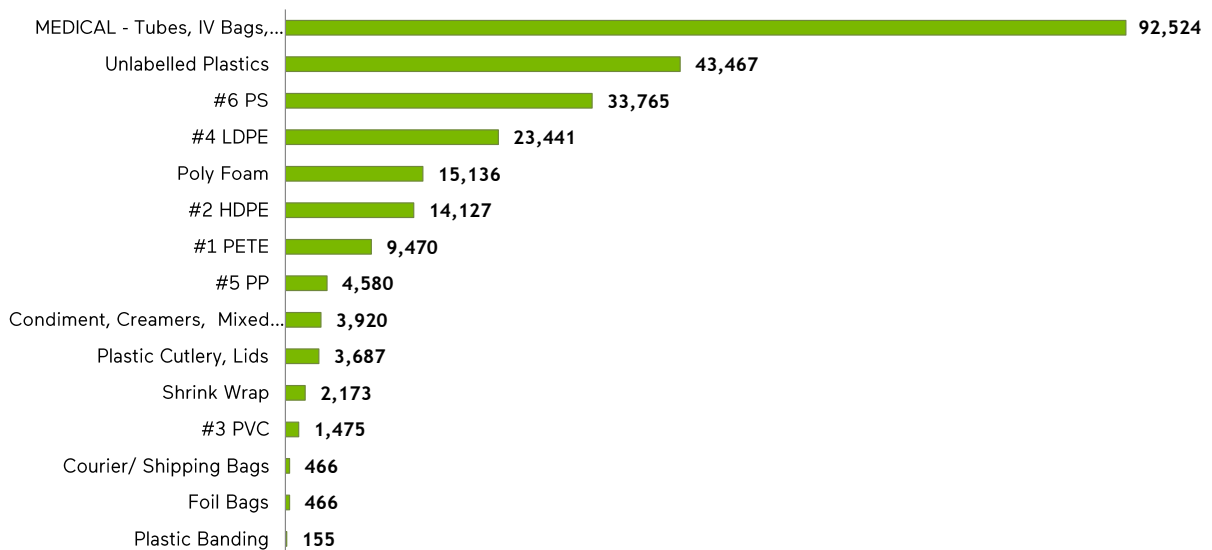


Plastics

Plastic materials account for 31.7% of your waste stream composition; 248,851 kg of plastic materials will be sent to landfill this year from your facility. The facility currently has programs in place to capture bottles and cans throughout the facility. All plastic material will be marked with a number indicating the type of plastic that was used to make the item.

Plastic is generally not a heavy material therefore the high weight generated indicated a huge volume of material. Utilizing current recycling programs will ensure this material is diverted. This number can be used to determine if recycling programs exist for that item. Most commonly, recycling programs will exist for #1, #2 & #5. Limited recycling programs exist for #3, #4 and #6 plastics.

Figure 8 - Annual Plastics Disposed in Landfill (in kg)



Medical Plastics – IV Bags, Syringes, Tubing represented 11.8% of the disposal weight. Due to health and safety issues most, medical plastics are single use plastics that are not accepted in the facility’s diversion programs. These materials were identified in patient areas.

Unlabeled plastics accounted for 5.5% of the audited sample. Each of these materials should be reviewed on an individual basis regarding their recyclability.

PS#6 representing 4.3% overall, this most often included food packaging and take out containers (excluding Styrofoam). If clean, these are often accepted as part of single stream recycling programs. Food vendors should be encouraged to provide recyclable or compostable options for the products they bring onto on facility.

#4 LDPE film bags & packaging accounted for 3.0% of landfilled materials. At this time, soft plastic materials are not accepted in mixed recycling programs.

Polyfoam/ Polystyrene was the next significant material in the audited landfill sample, representing 1.9% of all materials identified. Limited recycling options currently exist for Poly Foam plastic materials. Until new recycling developments are created, and viable options exist, this waste stream should be closely monitored for future possibilities and cost savings.

HDPE#2 was also a common plastic material; **HDPE** was generated in the form of large hard plastic food or fluid containers or cleaning supplies. This material subcategory represented 1.8% of the audited sample. Staff should be aware that these products are recyclable, examples of these materials should be included in educational signage.

The next most common material in the audited sample was **PETE#1** plastic materials representing 1.2% of the landfill sample. Water, juice and beverage containers are the most common sources of #1 PETE. These materials are accepted in the facility's single stream recycling program.

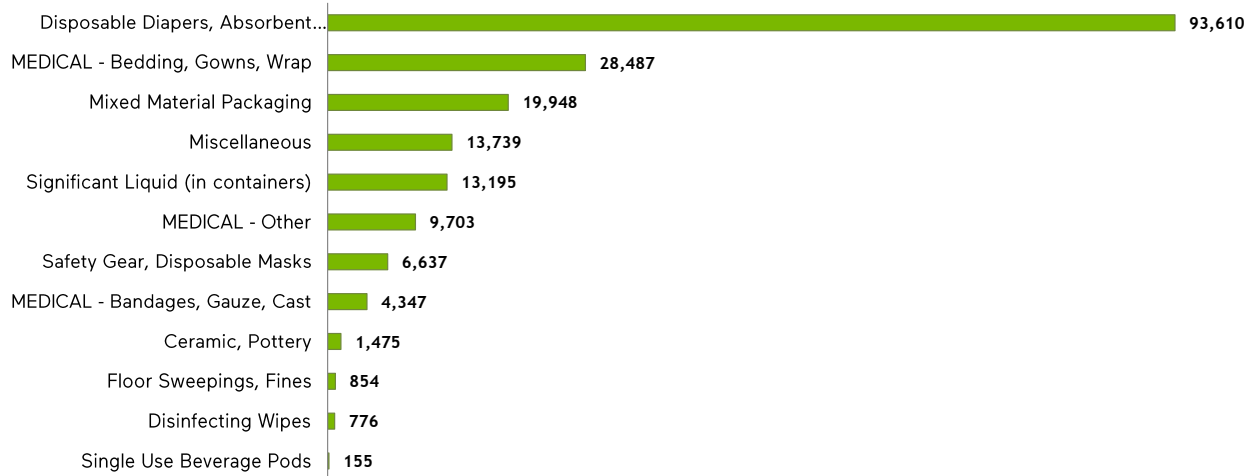
Photographs 8 to 11 – Plastic Material Examples in Landfill Sample (Medical Plastic, PS #6, LDPE #4, Poly Foam)



Other Materials

Other materials sent to landfill accounted for 24.6% of your total waste; nearly 192,925 kg of this category of material will be sent to landfill annually. Currently there are no programs in place to capture most of these materials from landfill, programs may be available for construction & demolition on an as needed basis.

Figure 9 - Annual Other Disposed in Landfill (in kg)



Disposable diapers, absorbent pads represented 11.9% of the landfill sample. Currently, no programs are available to divert this material.

Medical – bedding, gowns and wrap accounted for 3.6% of the disposal weight. These materials are not accepted facility's diversion programs due to the material involved and contact with patients.

Mixed material packaging (2.5%) includes pharmaceutical packaging, foil packaging, bubble mailer packaging and composite cans. These materials are not accepted in the single stream recycling program.

Photographs 12 to 13 – Other Material Examples in Landfill Sample (Diapers)





Metals

Metal materials sent to landfill accounted for 0.3% of your total waste; nearly 2,523 kg of Metals will be sent to landfill annually. The facility has programs in place to capture most metal food and beverage containers.

Figure 10 - Annual Metals Disposed in Landfill (in kg)



Aluminum food and beverage cans are accepted in the facility’s recycling program. Clearly labeled and easily accessible recycling receptacles are key to ensure that employees and visitors can participate. **Aluminum foil** was identified in minimal amounts. If clean, these materials could be captured through the existing bottle and can collection program already on site.



Wood

Wood materials sent to landfill accounted for 0.1% of your total waste; nearly 466 kg of Wood will be sent to landfill annually. The facility has no program to capture scrap wood for diversion.

Figure 11 - Annual Wood Disposed in Landfill (in kg)



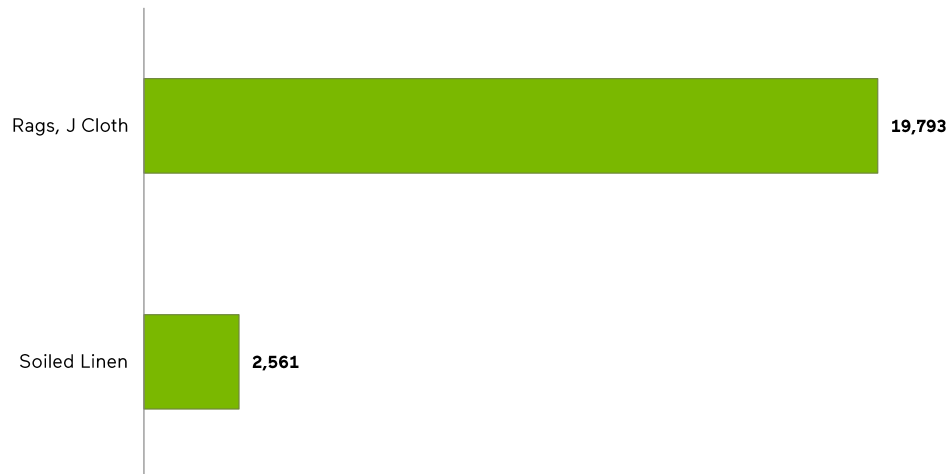
Wood was primarily identified as **wood cutlery** and **stir/chop sticks**. These materials are accepted in the organics program.



Textiles

Textiles materials sent to landfill accounted for 2.8% of your total waste; nearly 22,355 kg of Textiles will be sent to landfill annually. The facility has a program to wash hospital linen.

Figure 12 - Annual Textiles Disposed in Landfill (in kg)



Rags / J Cloth accounted for 2.5% of the audited sample. The facility should ensure the employees are trained to fully use all resources such as rags prior to disposal.

Photograph 14 – Textile Material Examples in Landfill Sample (Rags / J Cloth)





Rubber

Rubber materials sent to landfill accounted for 1.3% of your total waste; nearly 10,324 kg of Rubber will be sent to landfill annually. There are currently no programs in place to capture these items.

Figure 13 - Annual Rubber Disposed in Landfill (in kg)



This category was primarily composed of various work gloves, including **nitrile work gloves**.

The facility should consider implementing a targeted program from a supplier such as a Terracycle. Terracycle can offer programs for diverting unique materials not typically recycled.



Electronic Waste

Electronic Waste materials sent to landfill accounted for less than 0.1% of your total waste; nearly 155 kg of Electronic Waste will be sent to landfill annually. Programs are readily available for E-Waste, Batteries and Toner Cartridges through qualified haulers or through supplier take-back programs, efforts should be made to divert these materials from landfill to avoid negative environmental issues.

Figure 15 - Annual Electronic Waste Disposed in Landfill (in kg)



Batteries were identified in the landfill sample. These materials may pose significant harm to the environment, efforts should be made to divert these materials from landfill to avoid negative environmental issues. Employees should be reminded about available programs for collection and where specifically they should place used batteries for collection.

Photograph 15 – Electronic Material Examples in Landfill Sample (Batteries)



Employee, Contractor and Visitor Education and Engagement

The success of a Diversion Program is driven by user participation. If those who generated the waste are not utilizing diversion programs, success will never be achieved as it is not enough to simply implement programs and expect those programs to be effective. There are two critical factors necessary to ensure that diversion programs are effective. These factors are education and engagement.

As many different stakeholders are involved and contribute to the waste and diversion program it is important to target education towards each group.

1. Communication Program - The facility could maintain a communication program to communicate to educate all stakeholders. The following are all methods that can ensure stakeholders understand the steps that are being taken to achieve environmental sustainability within the facility and feel included in its successes.

Promotion - The facility could use internal communication such as newsletters, internal emails and educational boards to relay their message. As well as Earth Day or Environment Days to promote the waste management program through promotional materials or information booths; Waste Reduction Week in October is another opportunity for communication around waste reduction.



As well, the facility could create a **slogan or branding** to help promote their diversion program and create continuity for all promotional or educational materials.

Information can be tailored to reflect the findings of this assessment. For example, create a campaign to encourage employees to take a moment to put their mixed paper in the correct receptacle, no matter where they are on site.

Green information boards, similar to health and safety boards, can be a centralized place for relevant environmental information and reference material, example below.



Below, is an example of colour coded pictorial signage. Each provider should be able to provide similar material to educate stakeholders.



The following is an example of a customized signage in hospital cafeterias.



2. Training - Regular training of employees, custodial staff and contractors on diversion procedures help demonstrate the facility’s commitment to diversion programs, update staff on policy changes and account for changes in workforce. Regular training has also been shown to aid in the elimination of inconsistency and complacency in diversion programs.
- Training can be provided with power point presentations and examples of educational signage and recyclable materials;
 - Training can be just a few minutes during safety talks or weekly check-ins;
 - Ongoing training and education are critical due to turnover of employees and contractors as well as occasional program changes;
 - Management and supervisors could be trained on all aspects of the diversion program which will allow them to be an ambassador and a resource to support employees and visitors.

3. Maintenance/ Custodial Review – Facility management could regularly meet with the custodial manager and maintenance staff (custodians) as they may be able to provide hands on insight into aspects of the diversion program and areas of improvement.

Custodial staff should be trained on the diversion program during their orientation and reminded on a regular basis by their managers. Input from custodians and custodial managers may prove beneficial as they have firsthand knowledge of the program.

Ensure Effective Diversion Infrastructure

The infrastructure of a diversion program, including the receptacles and education materials, play an integral role in its success. If containers are not present, or accessible to collect recyclable material, users will not be able to participate.

- Facility Managers should, as part of their duties, routinely tour the facilities to monitor the infrastructure. By ensuring recycling stations are available, clean and orderly. This will aid in their effectiveness. Ensure that receptacles equipped with labelling and signage are in place for ease of use by employees, and visitors.
- Recycling receptacles should be accessible and the largest receptacles and the most available in terms of numbers.
 - As described in this report, most of the materials generated at the facility are recyclable; therefore, waste receptacles should be less prominent to encourage the use of the recycling receptacles.



- Apply a colour coding system (e.g., blue receptacles and blue labelling for mixed recycling) will help users recognize the recycling containers in different areas of the facility.



- Receptacles should be labeled (e.g., stickers, printing labels, posters, magnets) to identify what stream they are intended to collect.
 - This is an easy way to update current receptacles without the capital costs of new containers.



- Pictures, with simple easily recognizable images, should be used to indicate recyclable materials to those not familiar with the language or for young readers.



- Recycling receptacles should never be lined with black bags, as they may be confused for landfill and misplaced, during disposal; Request that the maintenance team use clear bags to collect recyclables to ensure that recyclable or compostable materials are directed to the correct receptacle. Different bags are not as easily confused in carts.



- Promotional materials help educate and increase awareness in the necessity of the 3 Rs. A green information board in common areas, can be a centralized place for relevant environmental information and reference material, example below.
 - The facility should create a slogan or branding to help promote their diversion program and create continuity for all promotional or educational materials.



Sustainable Hospital Practices

The following are suggested actions to help the hospital improve their internal processes and strive to reach higher diversion rates while maintaining a strong, efficient Diversion Program.

It is recommended that the facility regularly check with their waste hauler to confirm what materials are recyclable in their jurisdiction. As some of these materials may be integral to the operations of the facility, it is recommended that you regularly review opportunities to reduce or substitute these materials in your operations.

i. Educate Staff on 'Easy Targets' for Diversion

The hospital should target specific recyclable materials used throughout the facility, particularly in active patient areas.

Examples of materials include:

- Boxboard such as Kleenex boxes or latex gloves used by cleaning staff and medical staff.
- HDPE containers of cleaning products including sanitary wipe containers, soap dispensers, and other cleaning products used by cleaning staff, vendors and medical staff. Some of these containers may be unique to the hospital environment and may not be commonly understood as recyclable blue box items.

Examples of materials that could be easy targets for diversion (Boxboard, HDPE)



The following is an example of a customized signage used in a medical setting



ii. Capture Additional Materials

Some non-traditional recyclable materials were identified in the landfill waste sample. This included nitrile gloves and stationary items. Programs are available from companies like Terracycle in to provide the resources to set up a collection station at your facility, for such materials which can be dropped off at a nearby Staples location.

<https://zerowasteboxes.terracycle.ca/collections/zero-waste-boxes>

Example of a TerraCycle PPE collection box



In addition, Terracycle offer other recycling programs for common non-conventional materials which were identified primarily in break rooms during the audit. These include single use beverage pods, creamer containers, plastic wrappers, plastic cutlery and plates.

Example of non-conventional materials which can be recycled by Terracycle



iii. Material Substitutions: Paper Towel

When considering environmental and financial costs of paper towel manufacturing and disposal, alternatives such as High-Speed Energy Efficient (HSEE) hand dryers would be a favourable option for the facility.

- a) The **environmental factor**. In comparing the carbon footprint of paper towel and hand dryers, material production, manufacturing, transportation, material use, and its end of life are considered. The carbon footprint for an HSEE hand dryers is estimated to be less than one third of paper towel even if produced from recycled materials.
- b) The **cost factor**. Paper towel use involves continuous costs: purchasing, handling (custodial operations), disposal (both composting and landfilling have costs associated). The initial capital cost of hand dryers begins to see a payback within a reasonable timeframe.
- c) The **hygiene factor**. Paper towels are typically determined to be more hygienically effective in comparison to hand dryers as the hands dry more quickly. However, this can be mitigated with measures such as ensuring antibacterial soaps and guidelines of drying length on hand dryers. There is no research connecting use of hand dryers to infection. The research suggests that thorough handwashing will not lead to the spread of bacteria with use of hand dryers.¹

iv. Materials Substitution or Bans

A variety of containers are offer in the hospital; one style of container was **Styrofoam/polyfoam** cups. It is recommended the facility implement policies with their vendors, which ban Styrofoam as well as reduce the use of single use items to focus on those that may be diverted through programs already available at their sites.

The facility should regulate and promote the use of **compostable containers or recyclable** plastics over non- recyclable plastics.

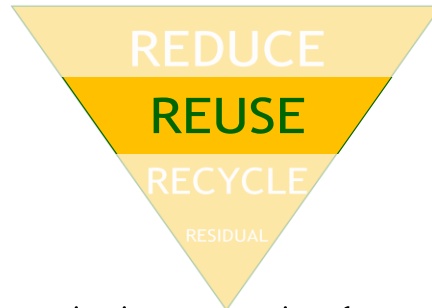
Example of Styrofoam cups identified in landfill sample



¹ [Science based medicine](#)

v. Alternatives to Recycling: Reuse Programs

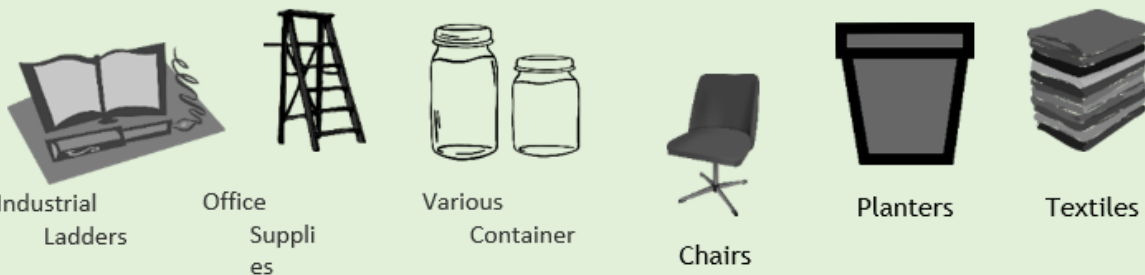
According to the waste hierarchy, recycling should be considered after reduction and reuse programs have been considered. Materials that are still usable, do not need to be disposed of, could be donated, or sold for reuse.



Several options for donations exist in your region for materials such as used furniture (ReStore, Habitat for Humanity) or bulk containers in good condition. Materials can also be bought and sold on online platforms such as Kijiji Canada, Facebook Market Place and Craigslist. These platforms can be used to sell items no longer serving the facility and could be repurposed. As well, there are organizations such as the Material Exchange Program that can facilitate that help facilitate reuse or repurposing of materials.

Material Exchange Program, operated by Partners in Project Green, is a circular economy focused platform that allows businesses and non-profit organizations access to an inventory of materials that have been donated. Conversely, the facility can also donate their reusable materials toward this inventory.

Common materials accepted in the inventory include:



[Material Exchange - Partners in Project Green: Partners in Project Green](#)

vi. Sustainability Goal Setting

It is recommended that the facility set specific diversion **goals** regarding their waste management program.

- Goals must be accompanied by a target date and progress reviewed at least once per year to maintain effectiveness.
- Through the process of goal setting, there is inherent motivation to meet those goals and it is believed that organizations who establish goals publicly are more likely to act with pressure from those who would like to see these goals met. Waste disposal represents a significant cost to the facility and all efforts to reduce disposal cost are beneficial.
- Managers and personnel may change but once the momentum is started and goals are set, new staff will be motivated to see projects through.

vii. Purchasing Power

Unity Health should use its purchasing power to influence its employees, vendors, suppliers and contactors to follow the same recommendations. A commitment to waste management should be a significant aspect within future contracts with service providers.

- The facility should establish a vendor selection protocol to reflect a commitment to the 3R's: reduction, reuse and recycling;
- The facility should conduct "vendor pre-qualifications" to evaluate the protocol and vendor environmental track records;
- Contract language should reflect the facility's objectives and allow periodic reviews to determine if those objectives are being met throughout the life of the contract;
- Get buy-in and support from contractors and service providers who work on site. All service providers, vendors or contractors should be aware of the environmental goals and be active participants, including education programs and purchasing decisions.

viii. Data Management

Each facility should continually review the waste services on site, including the number and the size of waste bins, location and frequency. Should the receptacles be found to be at less than capacity on their service day, or filled up before service day, services should be adjusted, as required, to match the amount of material generated and to be most cost effective.

It is only possible to measure the performance of the waste and recycling programs if they are measured. Each facility should set up a regular program to map the materials generated on site and regularly track progress over time, including batteries, fluorescent light tubes, etc. All managers, who arrange for these services, should track and provide the information to a centralized location or person. By reviewing this information on a monthly or quarterly basis, the company will be able to better track the success of the waste management program.

This is vital if successes are to be communicated to staff and stakeholders, and further necessary to understand the opportunities that exist within the waste and recycling systems at the facility.

Waste Management Sustainability Services 2023 Recycling Benefits for St. Joseph's Hospital

In 2023, we recycled 226 tons of cardboard, mixed paper, confidential paper shredding, aluminum cans and plastics.

These recycling efforts conserved the following resources/prevented these emissions:



5,012 Mature Trees

Represents enough saved timber resources to produce
85,196,900 sheets of printing and copy paper!

525 Cubic Yards of Landfill Airspace

Enough airspace to fulfill the annual municipal waste
disposal needs for 609 people!

370,330 Kw-Hrs of Electricity

Enough power to fulfill the annual
electricity needs of 33 homes!

**Avoided 773 Metric Tons
(MTCO₂E) of GHG Emissions**

That GHG reduction is equivalent to removing annual
emissions from 164 passenger vehicles!

684,598 Gallons of Water

Represents enough saved water to meet the daily fresh
water needs of 9,127 people!

Sources: U.S. Environmental Protection Agency, U.S. Energy Information Administration, Environmental Paper Network-Paper Calculator V4.0, Domtar Paper, Gaylord Corporation, U.S. Forest Products Laboratory, and Waste Management. © Waste Management 2020
Notes: GHG = Greenhouse Gas; MTCO₂E = Metric Tons of Carbon Dioxide Equivalent



Appendix 2 - Detailed Waste Breakdown by Generation Area

Area	Paper	Metal	Plastic	Textile	Wood	Rubber	Organic	Electric	Other	Total
Patient Area	34.02	0.49	48.38	4.58	0.10	2.62	14.36	0.04	45.14	149.73
Cafeteria / Kitchen	10.78	0.12	14.24	1.18	0.00	0.04	17.84	0.00	2.95	47.15
Office / Admin	2.41	0.04	1.50	0.00	0.02	0.00	0.00	0.00	1.62	5.59
Grand Total	47.21	0.65	64.12	5.76	0.12	2.66	32.20	0.04	49.71	202.47

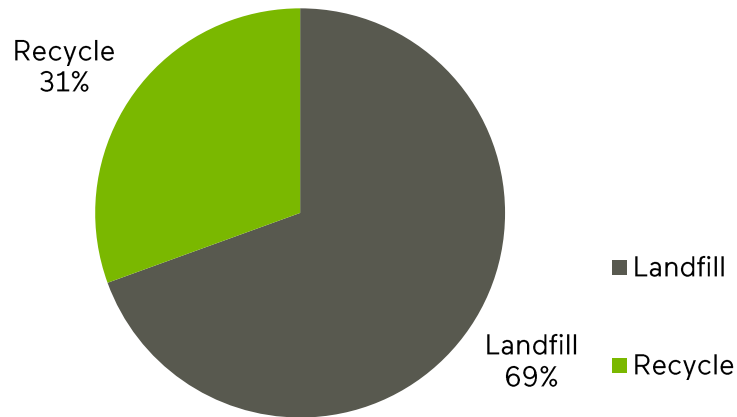
Appendix 3 – Diversion Report



Diversion Overview Unity Health - St. Joseph's Hospital, Toronto ON

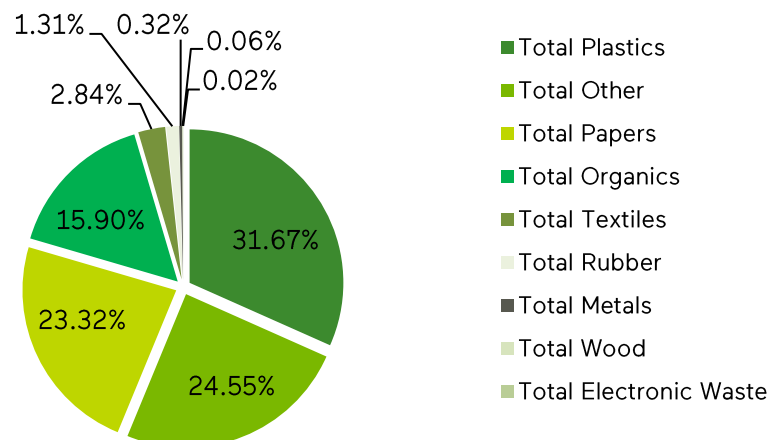
Diverted Materials	Annual Projected Volume (kg)	% of Diverted Materials
Confidential Paper Shredding	127,348	36.8%
Mixed Recycling	109,500	31.7%
Organics	108,740	31.5%
Total	345,588	100.0%

Diversion Summary



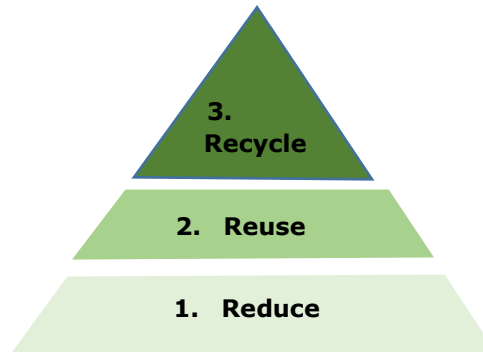
Waste Category	Material Composition (%)	Annual Projected Volume (kg)
Total Plastics	31.7%	248,851
Total Other	24.6%	192,925
Total Papers	23.3%	183,223
Total Organics	15.9%	124,969
Total Textiles	2.8%	22,355
Total Rubber	1.3%	10,324
Total Metals	0.3%	2,523
Total Wood	0.1%	466
Total Electronic Waste	< 0.1%	155
Total	100.0%	785,790

Waste Material By Category



Appendix 4 – Six Steps to a Successful Sustainability Program

The three R's waste hierarchy gives an order of priority of actions to be taken to reduce the overall amount of waste generated at your site



Studies indicate that between 2 and 5 percent of waste streams are reusable. There are many ways to prevent waste, at the source, and reuse products to reduce waste, including:

	Material	Reduction Strategies	Reuse Strategies	Recycling Strategies
Papers	Cardboard / boxboard	Encourage suppliers to use reusable packaging (e.g. plastic totes) Purchase reusable products	Re-use of cardboard for storage and packaging	Provide enough receptacles, information and signposting for OCC and mixed recycling programs
	Office paper	Encourage use of electronic communications Encourage tenants to print two sided	Encourage one sided printed paper for scrap paper Creation of scrap pads Utilize centralized notice boards	
	Paper towels	Install hand-dryers in washrooms and dish cloths in kitchens		
	Newsprint / Magazines	Provide communal newspapers in break out areas and spaces	Encourage staff to share magazines and newspapers Donate used magazines and newsprint Use newsprint for packaging materials	
	Paper cups	Place reusable coffee cups in kitchen areas Encourage users to bring reusable coffee cups Incentivize the use of own cups (discounts, loyalty cards)	Provide coffee making facilities in kitchens and encourage users to refill reusable coffee cups	
Plastics	PETE	Encourage building users to bring reusable water bottles Ensure sufficient water fountains for building users	Encourage building users to reuse plastic bottles Use refundable recycling schemes at the site	Provide enough receptacles, information and signposting for mixed recycling programs
	HDPE	Encourage bulk buying of goods to reduce volume of packaging Purchase products with minimal packaging		

	LDPE	Train custodial staff to empty individual waste receptacles into single black garbage bag		
	Polystyrene	Develop procurement policies which require on-site retailers to use compostable and recyclable packaging and cutlery		
	Organics	Set up partnerships and donation programs with local charities		Implement organics program
Containers	Beverage Cans	Encourage use of drinks dispensers at food courts and in kitchens	Use refundable recycling schemes at the site	Provide enough receptacles, information and signposting for mixed recycling programs
	Glass Bottles/Jars	Encourage use of drinks dispensers at food courts and in kitchens		
	Single Use Beverage Pods	Encourage use alternative coffee making facilities (i.e. filter coffee, pod free coffee machines)	Use reusable k-cups	Set up k-cup recycling programs with local supply companies
	Office supplies	Set up communal stationary points in offices for building users	Establish donation programs with local schools	Set up recycling programs with specialist companies such as Teracycle

Appendix 5 – Material Descriptions

Material	General Descriptions
#1 PETE	Polyethylene Terephthalate, Water Bottles, Soft Drink Bottles
#2 HDPE	High Density Polyethylene Containers, Chemical Containers or Jugs; High Density Polyethylene Bags or Film, Strong "crispy" Bags
#4 LDPE	Low Density Polyethylene Bags and Film, Garbage Bags, Shopping Bags
#5 PP	Poly Propylene, Yogurt Containers, Straws
#6 PS	Poly Styrene, Beverage Containers, Packaging Materials, Take-out Food Containers, Packing Popcorn
#7 Other	Products Labeled #7, Unlabeled Plastic Items
Aerosol Cans	Spray Cans
Air Filters	Furnace Filters, Vehicle Filters
Aluminum	Aluminum Parts and Products
Aluminum F & B Cans	Aluminum Food and Beverage Cans, Pop Cans
Aluminum Foil / Wrappers	Food Wrappers and Packaging
Batteries	Dry Cell Batteries, Large Batteries
Boxboard	Cereal, Tissue Box Material
Building Material	Construction Material, Drywall, Insulation
Bulbs	CFL, LED, Fluorescent Bulbs and Tubes
Ceramics	Objects Formed with Clay (e.g. Pottery)
Coffee Grounds	Used Coffee Grounds
Coloured Glass	Coloured Beverage Bottles and Jars
Cooking Grease	Fats, Oils and Grease
Compostable Containers	Compostable Take Out Containers, Paper Plates
Cores and Tubes	Paper-Based Cores and Tubes
Courier and Shipping Bags	Poly Mailer Bags
Clear Glass	Clear Beverage Bottles and Jars
Drinking Glass	Glass Cups, Wine Glass
Electronics	Cables, Computer Equipment, Toasters, TVs, Phones, Printers
Face Coverings	Surgical Masks, Dust Masks, N95 Masks
Floor Sweepings	Debris, Dust
Furniture	Chairs, Desks, Lamps, Shelves
Hygiene Materials	Feminine Hygiene Materials, Disposable Diapers, Cloth Diapers
Kraft Paper	Paper Bags, Heavy Brown Paper
Label Paper	Sticker Paper
Liquid in Container	Significant Liquid in Bottle, Container or Cup
Magazines	Glossy Magazines and Newspapers
Metal Banding	Metal Straps
Molded Pulp	Drink Trays, Egg Cartons, Product Packaging
Misc. Metals	Metal Shavings, Nuts and Bolts, Metal Clothes Hangers, Scrap Metal
Misc. Plastics	Plastic Utensils
Misc. Textiles	Rags, Mop Heads, Cloth Gloves

Mixed Material Packaging	Condiment Containers, Envelope with Window, Miscellaneous Product Packaging
Napkins	Paper Napkins and Tissues
Newsprint	Newspapers, Weekly Flyers
Nitrile and Latex Gloves	Nitrile and Latex Gloves
OCC	Old Corrugated Cardboard
Paint Cans	Empty Paint Cans
Pallets and Skids	Wooden Pallets and Skids
Paper Cups	Paper or Polycoated Cups
Paper Towels	Paper Hand Towels
Personal Clothing	Used Shirts, Uniforms, Hats
Photo Paper	Glossy Paper
Plants / Flowers / Yard Waste	Indoor and Outdoor Plants, Flowers, Leaves, Yard Waste
Plastic Cutlery	Plastic Forks, Spoons, Knives, Stirring Sticks
Plastic Strapping	Plastic Shipping Straps, Plastic Banding
Polycoat	Milk Cartons, Tetra Packs
Polyfoam	Foam Protective Packaging Materials, Styrofoam
Post-Consumer Waste	Scrap Food Waste
Pre-Consumer Waste	Food Preparation Waste
Rubber Tubing	Cable Protection, Metal Coverings, Pipe Fittings
Safety Gear	Safety Vests, Jackets, Harness, Safety Toe Covers, Work Gloves
Scrap Wood	Construction Materials, Misc. Wood Pieces
Shoes and Boots	Assorted Footwear
Shrink Wrap	Shrink Wrap, Plastic Film
Single Use Beverage Pods	K-Cups and Pods
Steel	Steel Food Cans, Steel Parts and Products
Stir or Chop Sticks	Wooden Stir or Chop Sticks
Tires	Car Tires, Forklift Tires
Tissue Paper	Thin Packing Paper
Wax Paper	Paper for Wrapping or Packaging
Wet Strength Paper	Wet Strength Kraft Paper, Medical Paper
White/ Ledger/ Office Paper	White Paper, Printer Paper
Wood Shavings	Scrap Construction Shavings and Debris
Wooden Crates	Shipping Crates

Appendix 6 – Ontario’s 3Rs Regulations



Ontario’s 3Rs Regulations

Ontario’s 3Rs Regulations governing non-hazardous solid waste from residential, industrial, commercial and institution sources became law in March 1994. Designated IC&I organizations are now required to conduct annual waste audits and update annual waste reduction work plans. This documents overviews the regulatory requirements for IC&I sector organizations.

Regulation	Intent	Requirements	Who Must Comply
<p>Ontario Regulation 102/94</p> <p><i>Waste Audits</i> <i>Waste Reduction Work Plans</i></p>	<p>To understand the amount and composition of all waste produced, how the waste is produced including relevant management policies and practices, and how the waste is managed</p> <p>A waste reduction work plan seeks to establish concrete goals to reduce waste</p>	<p>Annual waste audit must be completed in which the types of waste and quantities of waste are assessed.</p> <p>A waste reduction work plan must contain a strategy for reducing, reusing and recycling waste, identify who is responsible for implementation and provide a summary of timing and expected results from the waste reduction projects. This plan must be communicated with all employees</p>	<ul style="list-style-type: none"> • Retail shopping complexes of 10,000+ m² floor area • Class A, B or F hospitals under Ontario Reg. 964 • Schools with 350+ students at a location or campus • Restaurants with gross annual sales of \$3,000,000+ • Office buildings with 10,000m² of floor area • Hotels and motels with 75+ units • Building construction projects of 2,000+ m² • Building demolition projects of 2,000+ m² • Manufacturing sites with 16,000 employee hours per month
<p>Ontario Regulation 103/94</p> <p><i>Source Separation Programs</i></p>	<p>To promote the source separation of materials throughout the facility</p>	<p>Handling and storage facilities must be provided for recyclable materials. Efforts must be made to ensure the system is used and that source-separated materials are reused or recycled.</p> <p>Employees must be instructed on the use of the program</p>	<ul style="list-style-type: none"> • Manufactures or packagers of packaged food, beverage, paper or chemical products with total employee hours of 16,000+ per month • Importers of packaged food, beverage, paper or chemical products for sale in Ontario with value of goods imported \$20,000,000 per year
<p>Ontario Regulation 104/94</p> <p><i>Packaging Audits</i> <i>Packaging Reduction Work Plans</i></p>	<p>To examine the impact of packaging on the waste management system and identify waste reduction plans.</p> <p>Packaging refers to all materials used to protect, contain or transport a product.</p>	<p>Bi-annual audit must address; types and quantities of packaging used, reusability or recyclability of packaging, the environmental impact of the waste and the lifecycle of the packaging materials.</p> <p>Reduction work plan must identify ways to reduce packaging used, increase reuse or recyclability content, reduce the environmental impact and reduce the burden of waste for the consumer.</p>	<ul style="list-style-type: none"> • Manufactures or packagers of packaged food, beverage, paper or chemical products with total employee hours of 16,000+ per month • Importers of packaged food, beverage, paper or chemical products for sale in Ontario with value of goods imported \$20,000,000 per year

THINK GREEN: