

Waste Management | Sustainability Services

# Waste to Resource Assessment



Prepared for:



University of Victoria  
3800 Finnerty Road, Victoria, BC, V8P 5C2  
November 15, 2022

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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 the University of Victoria, Victoria, BC. Sustainability Services and Waste Management of Canada Corporation as stated under the agreement entered between Waste Management of Canada and University of Victoria on December 21, 2022.




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## Executive Summary

On November 15, 2022, Sustainability Services conducted a Waste to Resource™ assessment for the University of Victoria located at 3800 Finnerty Road in Victoria, BC. A few goals of the assessment were as follows:

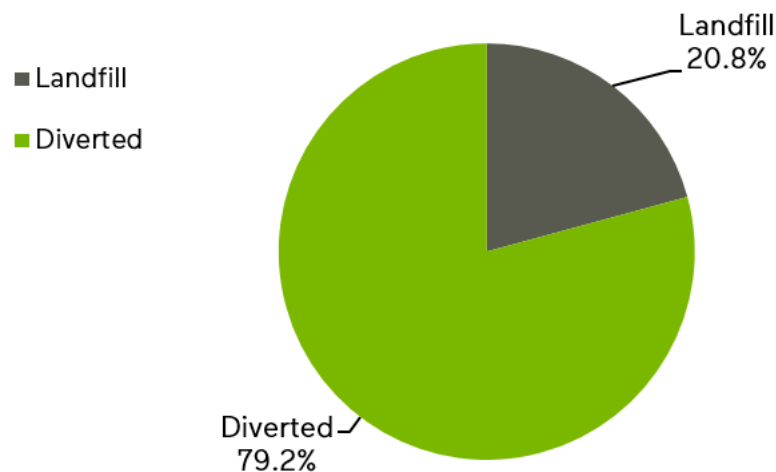
-  **Update baseline inventories for waste generation at University of Victoria**
-  **To identify and quantify waste composition and commodity**
-  **To determine the recovery performance of existing programs**
-  **Identify opportunities to further increase diversion and reduce cost**
-  **Develop strategies that could be implemented throughout the campus**

Our goal is to provide the University of Victoria 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 campus resulted in the discovery of additional diversion opportunities. The assessment identified three primary opportunities that should occur to improve your overall waste diversion rate. The following are our recommendations:

-  **Increase Awareness of Current Diversion Programs**
-  **Continue Employee and Student Education and Engagement**
-  **Continual Improvement and Additional Recommendations**

The campus generated a combined 1,795.13 tonnes of waste and diverted materials in the last year. The current diversion rate for your campus is 79.2%.







**Figure 1 – Current Diversion Rate at University of Victoria<sup>1</sup>**



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<sup>1</sup> Tables 7 and 8 outlines all diverted materials on campus

A team of sustainability consultants performed an assessment that involved a walkthrough of the campus 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 79.2%**
-  **Annually, it is estimated that 372.89 tonnes of waste and 1,422.24 tonnes of diverted materials will be generated from your facility**
-  **Papers account for 30.9% of the waste sent to landfill**
-  **Organics account for 29.9% of the waste sent to landfill**
-  **Plastics account for 19.1% of the waste sent to landfill**
-  **The campus-wide recycling and compost sample has a contamination rate of 6.6%**
  - **The Outdoor Sort-it Stations recycling and compost sample has a contamination rate of 30.8%**
  - **University Food Services<sup>2</sup> recycling and compost sample contamination rate of 4.3%**

## Assessment Findings and Goals Alignment

### Campus Information

**Table 1 – Campus Information**

Item	Comments
<b>Campus Name:</b>	University of Victoria
<b>Description:</b>	University of Victoria is a public research university located in British Columbia, Canada with 22,020 students and 5000 employees.
<b>Address:</b>	3800 Finnerty Road, Victoria, BC, V8P 5C2
<b>Contact Name:</b>	Leigh Andersen
<b>Contact Number:</b>	250-472-5594

**Table 2 – Assessment Summary**










Item	Comments
<b>Performed By:</b>	Kirthan Sathananthan, Carter Eady
<b>Performed On:</b>	November 15, 2022
<b>Report Written:</b>	Kirthan Sathananthan
<b>Report Reviewed:</b>	Christopher Doyle
<b>Assessment Type:</b>	Waste to Resource Assessment – Waste Audit
<b>Assessment Level:</b>	<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

<sup>2</sup> University Food Services include Mystic Market, The Cove, Mac Bistro, Biblio Cafe

## Goals, Objectives, and Other Factors

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The following is a list of 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 campus**
-  **Reduce waste spend and disposal costs**
-  **Identify the contamination rate in key generation areas**
-  **Develop future waste reduction strategies at campus food outlets and outdoor sort-it out stations**
-  **Provide ongoing and improved employee and student awareness, 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**

### Photograph 1 – Example of Waste and Recycling Totes Collected for Assessment<sup>3</sup>



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<sup>3</sup> Totes were colour-coded by waste stream (landfill – gray, mixed paper – brown, bottles & cans – blue, organics – green)

## Options Overview

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

**Table 3 – Options Summary Table**

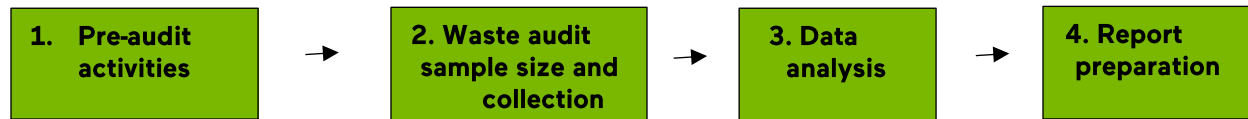
Option	Description	Benefit	Rationale
<b>Increase Awareness of Current Diversion Programs</b>	Stakeholders need to receive consistent messages about current diversion programs.	<ul style="list-style-type: none"> <li>✓ Increase diversion and capture rates</li> <li>✓ Reduced waste spends</li> </ul>	Majority of the materials generated throughout the campus can be diverted from landfill through current reuse, recycling, or compost programs.
<b>Continue Employee and Student Education and Engagement</b>	All stakeholders need to receive consistent messages about current diversion programs available to them.	<ul style="list-style-type: none"> <li>✓ Increase awareness on environmental programs and issues</li> <li>✓ Increased efficiencies</li> <li>✓ Ensure effective education is offered</li> </ul>	<p>All stakeholders need to be encouraged and re-educated regarding waste and recycling procedures within the campus.</p> <p>Dedicated and knowledgeable staff will create the opportunity for the campus to achieve superior capture rates and manage an effective program.</p>
<b>Continual Improvement and Additional Recommendations</b>	Continually improve waste management program on site. Monitor and effectively manage all programs and methods in place at the campus.	<ul style="list-style-type: none"> <li>✓ Expand programs available</li> <li>✓ Ensure the tools and infrastructure are in place to support waste reduction goals</li> </ul>	<p>Control decision-making and input regarding materials brought into the campus.</p> <p>Determine how best to capture non-traditional materials for recycling or reuse.</p>

**Photograph 2 – Waste Sorting in Progress**



## Sampling Methodology

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- 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 campus 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 campus. These collection areas were identified from labels placed on the waste totes 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 36 unique generation areas throughout the campus over a 24-hour period. This is a representative sample of waste generated on campus and does not include all areas. For the purposes of this project is it 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 8 waste categories and weights of each material sub-category (up to 50) were recorded.
- 3. Data analysis** – Analysis of on and off-site data provided by Waste Management and the client. Calculation of diversion and capture rate for the site. Annual projection calculations were determined using the weights of the samples provided projected against the campus’s operational days.
- 4. Report preparation** - Full report prepared including site specific recommendations.

## Limitations

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The audit was completed between November 15-18, 2022, the week after reading week. Waste generation variances may be possible during this week as students return from break.

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



## Material Composition Breakdown

### Landfill Waste Material Comparison by Category

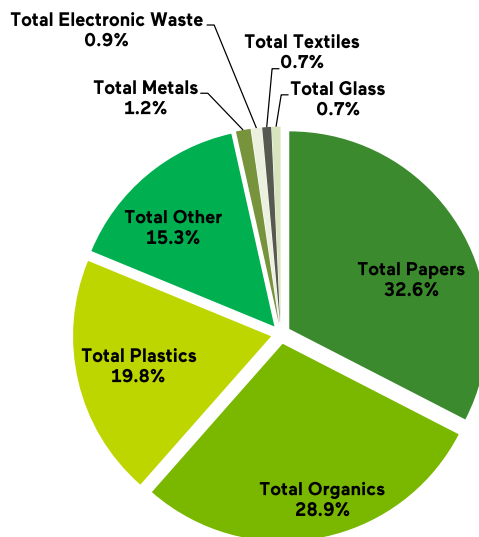
This section displays a breakdown of general material categories by weight and volume for the entire landfill sample.

The largest category by weight was paper materials representing 32.3% of the landfill waste stream. This material category includes paper towel, paper cups, office paper, boxboard and non-recyclable paper (e.g. soiled food packaging).

**Table 4 – Campus Wide Landfill Waste Material Comparison**

Waste Category	Total Audited Waste Material (kg)	Material Composition (%)	Annual Projected Volume Generated (kg)
Total Paper	403.28	32.6%	121,481
Total Organics	357.74	28.9%	107,764
Total Plastics	244.58	19.8%	73,675
Total Other	189.06	15.3%	56,952
Total Metal	14.75	1.2%	4,443
Total Electronic Waste	10.55	0.9%	3,178
Total Textiles	9.04	0.7%	2,722
Total Glass	8.88	0.7%	2,675
<b>Total</b>	<b>1,237.87</b>	<b>100.0%</b>	<b>372,890</b>

**Figure 2 – Campus Wide Landfill Waste Material by Category**



## Audited Waste Material Composition by Sample Collection Area

Table 5 displays a breakdown of the generation area categories during the Sustainability Services assessment.

Table 6 outlines a detailed displays a breakdown of the waste sources during the Sustainability Services assessment. Academic / Admin, Residence, Food Services and Student Society Food Services were broken down to detailed waste sources. For further in-depth analysis of the generation areas identified, consult Appendices and Supplementary Data.

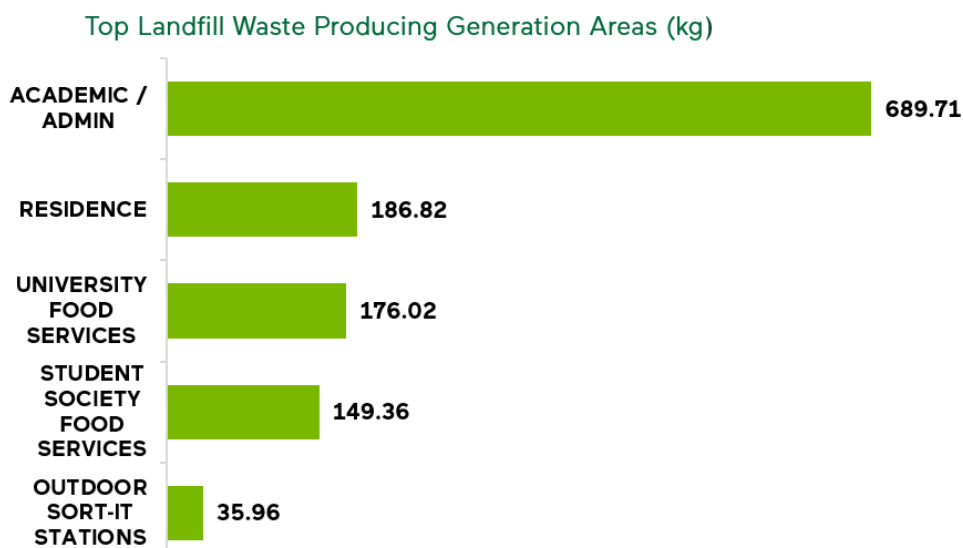
The largest generation area identified in the audit sample was the ACADEMIC / ADMIN generation area representing 55.7% of the audited sample.

**Table 5 – Audited Waste Sources**

Generation Area Category	Total Audited Waste (kg)	Material Composition (%)	Annual Projected Volume (kg)
ACADEMIC / ADMIN	689.71	55.7%	207,765
RESIDENCE	186.82	15.1%	56,277
FOOD SERVICE	176.02	14.2%	53,023
STUDENT SOCIETY FOOD SERVICES	149.36	12.1%	44,992
OUTDOOR SORT-IT STATIONS	35.96	2.9%	10,832
<b>TOTAL</b>	<b>1237.87</b>	<b>100.0%</b>	<b>372,890</b>

Figure 3 below represents the key generation areas throughout the campus and some smaller areas are not specifically noted.

**Figure 3 – Waste Generation by Collection Area**



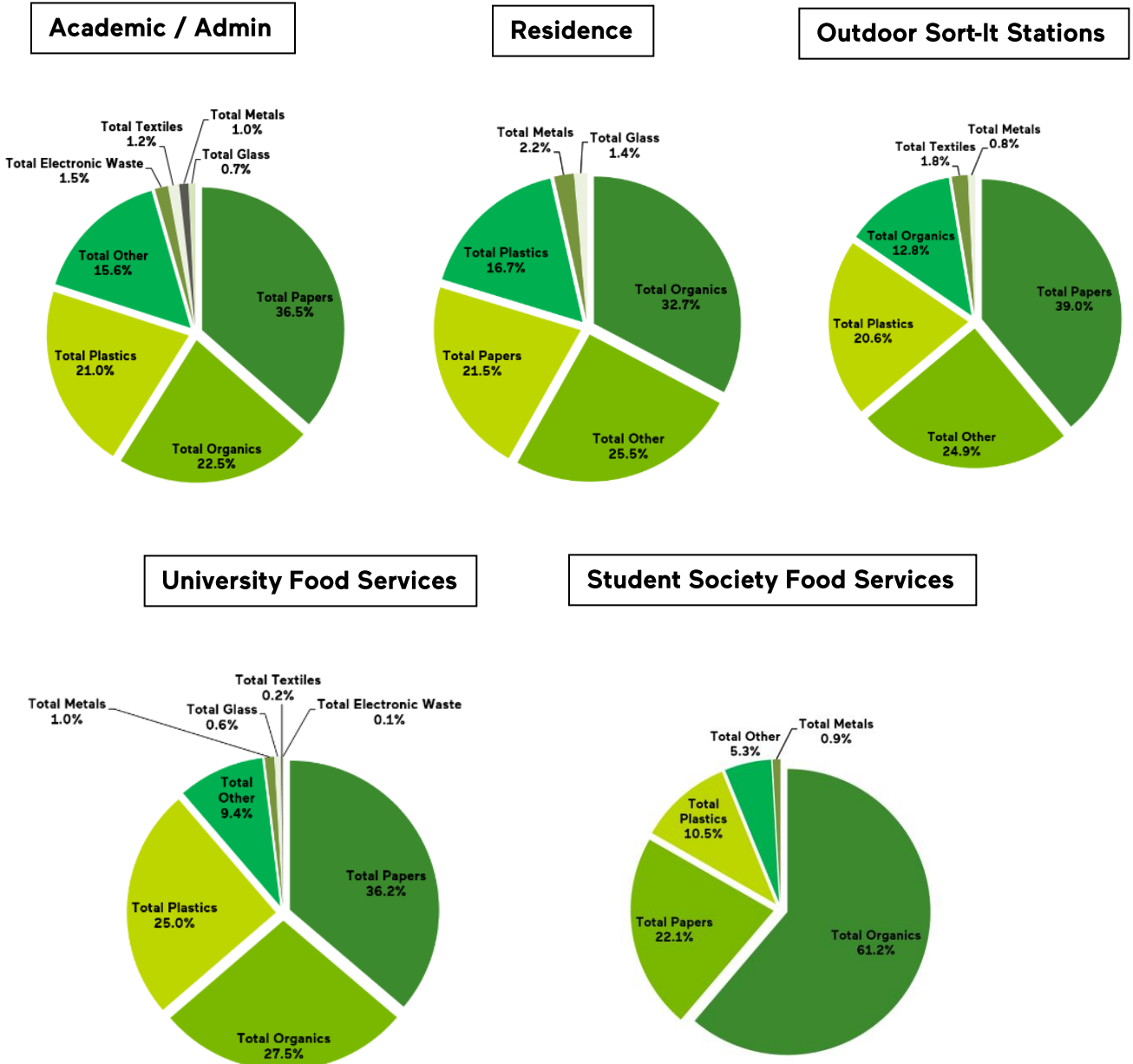
**Table 6 – Detailed Audited Waste Sources**

Generation Area	Category	Total Audited Waste (kg)	Material Generation Composition (%)	Annual Projected Volume (kg)
STUDENT UNION BUILDING	Student Society Food Services	141.43	11.4%	42,604
CARSA	Academic/Admin	92.52	7.5%	27,870
BIBLIO CAFE	University Food Services	81.72	6.6%	24,617
LIBRARY	Academic/Admin	71.24	5.8%	21,460
COVE	University Food Services	62.10	5.0%	18,707
ENGINEERING & COMPUTER SCIENCE	Academic/Admin	56.65	4.6%	17,065
MACLAURIN	Academic/Admin	56.64	4.6%	17,062
BOOKSTORE	Academic/Admin	52.80	4.3%	15,905
CLEARIHUE	Academic/Admin	50.00	4.0%	15,062
HUMAN & SOCIAL DEVELOPMENT	Academic/Admin	49.10	4.0%	14,791
RESIDENCE - FAMILY 7	Residence	48.74	3.9%	14,682
RESIDENCE - 14 (CLUSTER)	Residence	47.28	3.8%	14,242
CUNNINGHAM	Academic/Admin	40.00	3.23%	12,049
OUTDOOR SORT-IT STATIONS		35.96	2.9%	10,832
BOB WRIGHT	Academic/Admin	35.52	2.9%	10,700
ELLIOT	Academic/Admin	32.28	2.6%	9,724
RESIDENCE - 2S	Residence	28.04	2.3%	8,447
PETCH	Academic/Admin	27.88	2.3%	8,398
MYSTIC MARKET	University Food Services	27.12	2.2%	8,169
RESIDENCE - FAMILY 6	Residence	26.58	2.1%	8,007
CONTINUING STUDIES	Academic/Admin	25.57	2.1%	7,703
UNIVERSITY CENTRE	Academic/Admin	24.72	2.0%	7,447
RESIDENCE - 18	Residence	19.57	1.6%	5,895
DAVID TURPIN	Academic/Admin	18.94	1.5%	5,705
RESIDENCE - BUILDING ONE	Residence	16.61	1.3%	5,004
HEALTH & WELLNESS / TECHNOLOGY ENTERPRISE	Academic/Admin	14.25	1.2%	4,293
E-HUT	Academic/Admin	11.46	0.9%	3,452
BUSINESS & ECONOMICS	Academic/Admin	8.76	0.7%	2,639
GRADUATE STUDENTS SOCIETY	Student Society Food Services	7.93	0.6%	2,389
DAVID STRONG	Academic/Admin	6.40	0.5%	1,928
SAUNDERS	Academic/Admin	5.44	0.4%	1,639
MAC BISTRO	University Food Services	5.08	0.4%	1,530
FIRST PEOPLES	Academic/Admin	3.66	0.3%	1,103
MCKINNON	Academic/Admin	3.36	0.3%	1,012
SEDGEWICK	Academic/Admin	2.52	0.2%	759
<b>Grand Total</b>		<b>1,237.87</b>	<b>100.0%</b>	<b>372,890</b>

## Landfill Waste Material Comparison by Category and Generation Area

This section displays a breakdown of general material categories for the key generation areas.

Figure 4 to 8 – Landfill Waste Material by Category and Generation Area



## Diversion Opportunities

Increased diversion opportunities represent the largest potential cost savings and landfill diversion opportunity for the University of Victoria. 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:

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

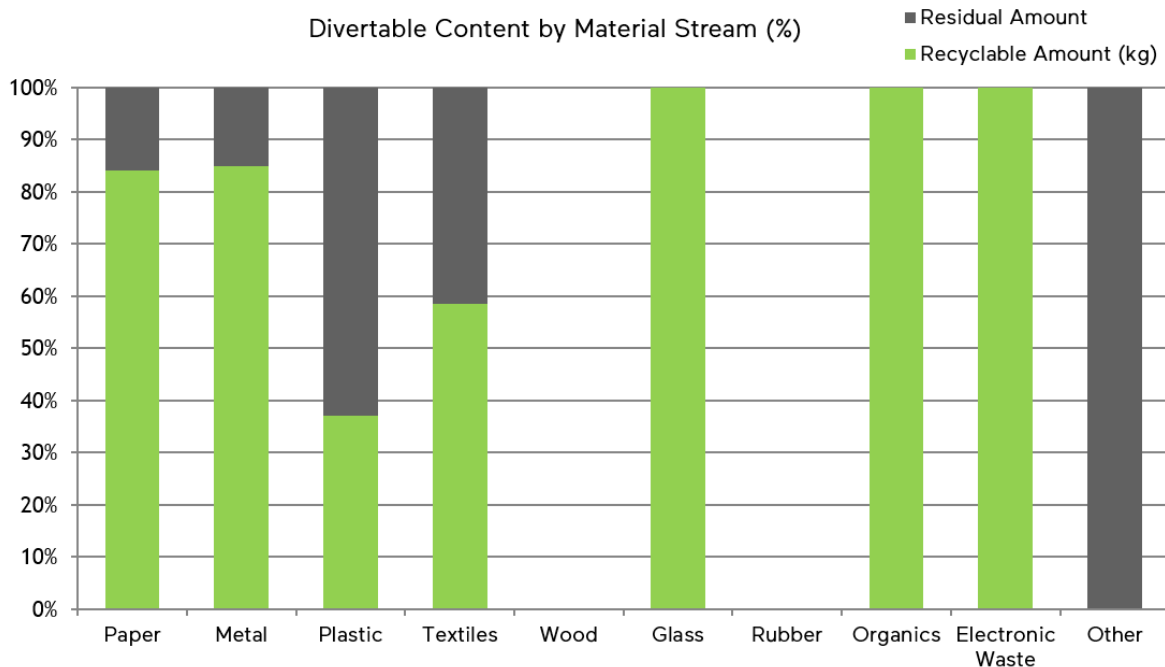
The current diversion rate on campus is 79.2%. Based on the diversion program currently in place 93.1% of the material generated at the campus could be diverted from landfill if it was captured at source.

For example, the campus has an organics compost program in place to collect paper towel for diversion. But as outlined later in the report (Page 18), nearly half of all paper towel generated on campus is going to landfill. Therefore, there is room for improvement within the diversion program where most students and staff on campus handle their waste.

Figure 9 outlines the material in each category which could potentially be diverted.

Residual amount refers to the percentage of a material stream that is not accepted in any diversion program (e.g. plastic cutlery is not accepted in any diversion program).

**Figure 9 - Diversion Opportunity by Material Category**



## Year Over Year Audit Comparison

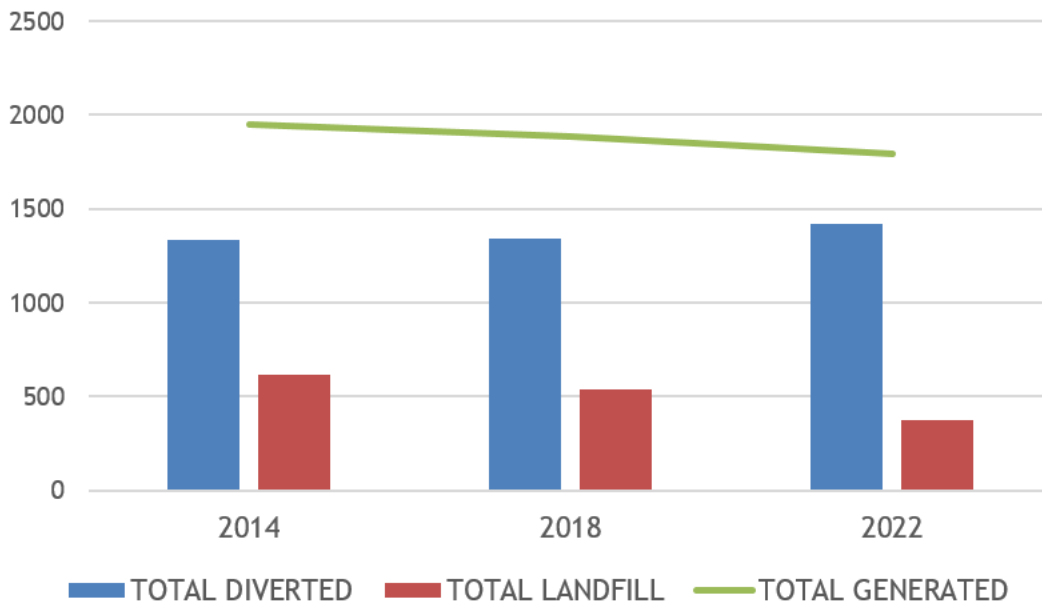
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An assessment was completed at the campus in 2014 and 2018, it was determined that the diversion rate has improved from 71.3% in 2018 to 79.2% in the current assessment. The baseline diversion rate from 2014 is 68.4%.

Most significantly the campus decreased the amount of landfill generated. The campus generated 537.44 tonnes of landfill waste in 2018, compared to the current 372.89 tonnes.

The campus captured 1,422.24 tonnes of material for diversion, recycling or reuse in the current assessment compared to 1,344.19 tonnes in 2018.

**Figure 10 – Comparison of 2014, 2018 and 2022 results (tonnes)**



## Diverted Material Comparison by Category

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

**Table 7 – Campus Service Information**

Diversion Program	Service Provider/s	Notes
Cardboard	Cascades Recovery	
Organics	Refuse Resource Recovery	
Yard Waste	McNutt Enterprises	
Mixed Paper	Cascades Recovery	
Mixed Beverage Containers	Cascades Recovery	
E-Waste	The Bottle Depot	
Batteries	Call2Recycle	
Scrap Metals	Steel Pacific	
Scrap Wood	Elice Recycling	
Light Tubes	Produce Care Recycling	
Glass	Cascades Recovery	
Mattresses	Ellice Recycle	
Soft Plastics	Pacific Mobile Depot	
Poly Foam	Pacific Mobile Depot	
Stationary Items	TerraCycle	Service information not available at the time of assessment
Disposable Masks	Vitacore	

**Table 8 – Diverted Material Comparison**

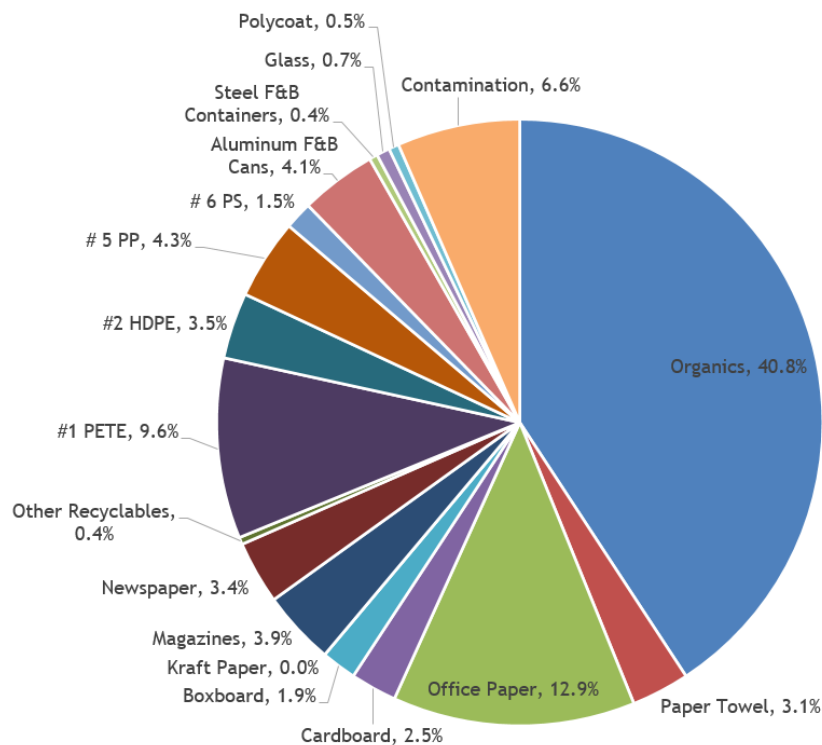
Diverted Material	Annual Projected Volume (kg)	Percentage of all Diverted Materials (%)
Organics	644,070	45.3%
Yard Waste	361,810	25.4%
Mixed Recycling	127,960	9.0%
Metal	104,530	7.3%
Cardboard	83,300	5.9%
Wood	55,200	3.9%
Mattress	20,720	1.5%
Glass	10,750	0.8%
E-Waste, Batteries	6,200	0.4%
Soft Plastics	5,760	0.4%
Light Tubes, Ballasts	1,400	0.1%
<b>Total</b>	<b>1,422,240</b>	<b>100.0%</b>

## Contamination Identified in Recycling Stream

A sample of the materials collected for the recycling and compost programs was reviewed during the assessment. It was determined that approximately 6.6% of the sample was various forms of contamination. This included liquids, food, foil wrappers and contaminated LDPE plastics identified in the recycling bags.

As well, there was a small amount of cross contamination, wherein potentially recyclable or compostable materials were placed in the wrong collection bag, for example 3.2% of the recycling stream included paper towels which were in were not placed correctly in the organics collection.

**Figure 11 – Breakdown of Audited Material Collected for Recycling and Compost**



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 1,795,130 kg of material generated at the facility in the last 12 months, 1,669,017 kg of that material is potentially divertible in the available diversion programs. As 1,422,240 kg of material was captured for recycling or compost, the facility wide capture rate was determined to be 85.2%. Table 9 below outlines the capture rate per material.

**Table 9 – Capture Rate Calculations by Material**




<b>Diverted Material</b>	<b>Total Generated (kg)</b>	<b>Captured for Diversion (kg)</b>	<b>Landfilled (kg)</b>	<b>Capture Rate (%)</b>
Aluminum food and beverage cans	13,699	10,576	3,208	76.6%
Cardboard	100,269	89,666	10,597	89.4%
Fine paper	38,519	33,337	5,151	86.6%
Glass food and beverage bottles/jars	15,239	12,563	2,675	82.4%
Newsprint	9,412	8,657	747	92.1%
Steel food and beverage cans	1,705	1,141	563	67.0%
PET (#1) plastic	33,675	24,796	8,856	73.7%
HDPE (#2)	12,761	9,078	3,675	71.2%
LDPE (#4) plastic film	21,323	-	21,323	0.0%
PP (#5) plastic containers	19,439	11,016	8,413	56.7%
Polystyrene (#6)	6,764	3,794	2,966	56.2%
Organics (excl. paper towel)	705,840	598,083	107,757	84.7%
Yard Waste	361,810	361,810	-	100.0%
Boxboard	14,420	4,851	9,586	33.5%
Glossy magazines, catalogues, flyers	10,360	10,167	184	98.2%
Wood	55,200	55,200	-	100.0%
Steel	104,876	104,530	346	99.7%
Paper towels	95,975	45,987	49,988	52.1%
Electronic waste, batteries, light bulbs	9,582	7,600	1,982	79.3%
Furniture (incl. mattress donations)	27,841	20,720	7,121	74.4%
Disposable food packaging (incl. polycoat)	22,131	2,371	19,760	10.7%
Clothing/textiles	2,723	-	2,723	0.0%
Other: PPE, Liquids, Mixed Material Packaging, Miscellaneous	472,595	368,110	104,485	77.9%



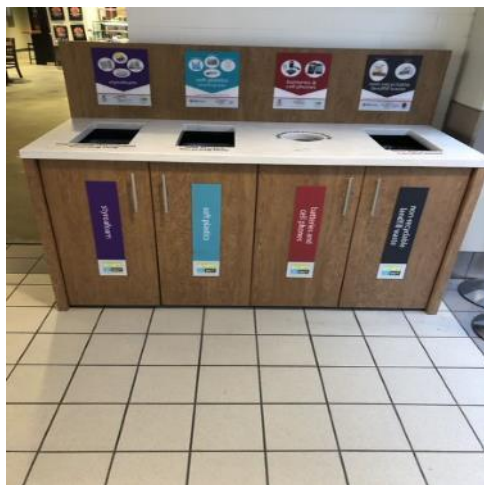
## Recommendations Overview

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Three options have been identified that can help the University of Victoria make its operations more sustainable. Each option should be carefully reviewed for operational, financial, social, and strategic fit.

-  **Increase Awareness of Current Diversion Programs**
-  **Continue Employee and Student Education and Engagement**
-  **Continual Improvement and Additional Recommendations**

## Photographs 3 to 4 – Collection Receptacle and Signage Examples on Campus



## Increase Awareness of Current Diversion Programs

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### Campus Wide Landfill Sample Material Category Breakdown

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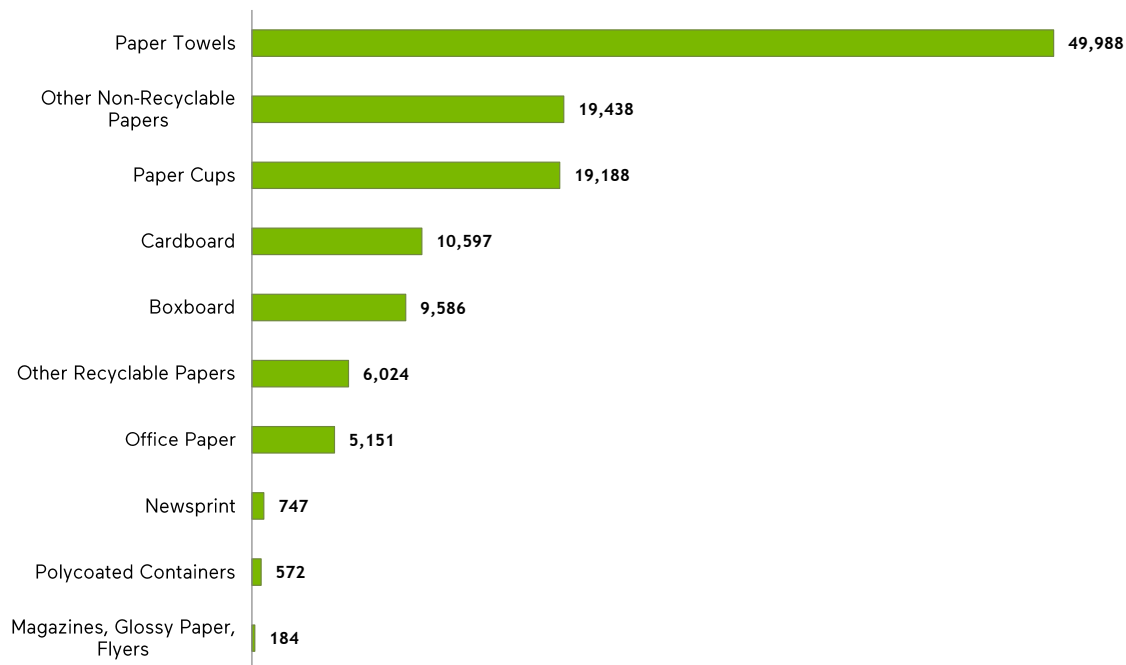
Below is a breakdown of the composition of the audited campus wide landfill material generated on site based on the analysis of the audited sample. As well as recommendations for selected sub-category material types.



#### Paper Materials in Landfill Sample

Paper materials sent to landfill accounted for 32.6% of your total waste; nearly 121,481 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 12 - Annual Papers Disposed in Landfill (in kg)**



The most predominant paper material found in the landfill was **paper towel** representing 13.4% of the landfill waste sample. This subcategory includes hand towels, facial tissue, and similar materials. Paper towel was identified throughout the campus, primarily the student residences as well as the Student Union Building, Human & Social Development, Bob Wright and Elliott buildings.

Paper towel is typically accepted in organic collection programs and could be included in the program already in place on campus. Currently, the campus has receptacles in washrooms to capture this material for the compost program.

Additionally, the campus should consider providing more alternatives including hand dryers to reduce these materials, specifically in the highest generation areas such as washrooms. The campus should review hand dryer options that best suit their campus 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.

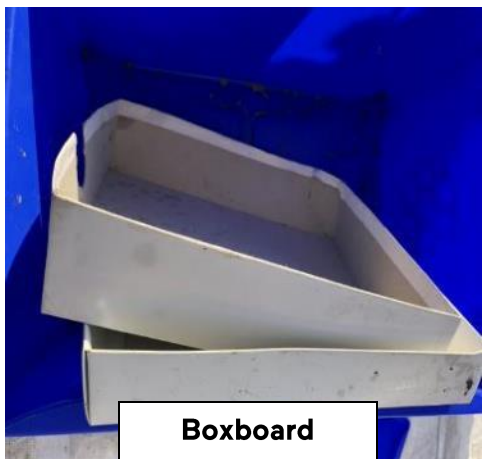
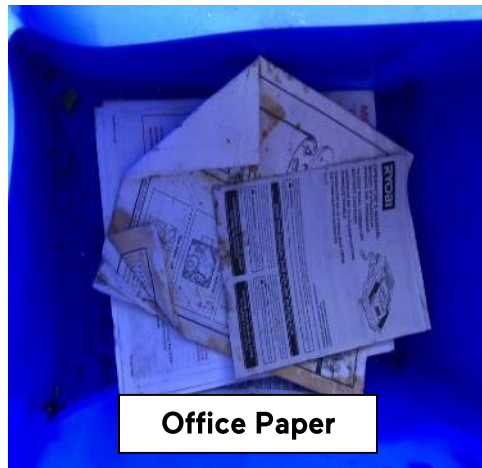
**Other Non-Recyclable Papers** (e.g. soiled food packaging) were found throughout the sample and these items account for 5.2% of all landfill waste. These materials are not accepted in this campus's diversion program.

**Paper cups** (non-waxed coffee cups) were found throughout the sample and these items account for 5.1% of all landfill waste. Paper cups are accepted in this campus's diversion program.

**Boxboard** (e.g., tissue or nitrile glove boxes) was identified in notable quantities (2.6% of the sample), while **cardboard** was a significant contributor of paper materials destined for the landfill at 2.8% of the audited sample. These materials are currently accepted by your current recycling program. Maintenance staff and food service providers who handle these containers should be reminded of the recyclability of these items to eliminate these items from the landfill stream.

**White (office) paper** represented 1.4% of all landfilled materials. Continued education for students and employees should be provided to ensure awareness of current programs and recycling opportunities. As well, campus management should ensure that receptacles for collection are placed in targeted locations where these items are most often generated such as photocopy/ printer stations.

### Photographs 5 to 8 – Paper Material Examples in Landfill Sample

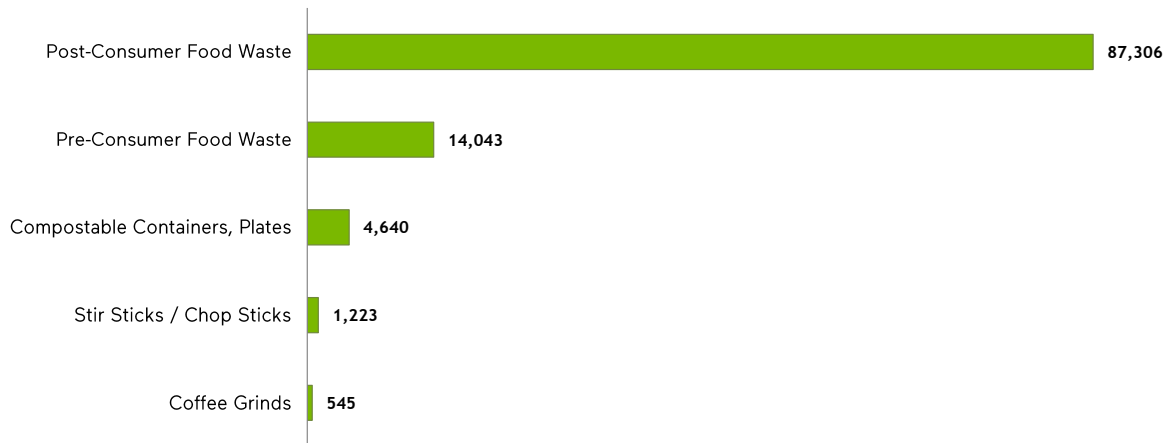




## Organic Materials in Landfill Sample

Organics materials sent to landfill accounted for 28.9% of your total waste; nearly 107,764 kg of Organics will be sent to landfill annually. A program currently exists at the campus to capture organic materials for compost.

**Figure 13 - Annual Organics Disposed in Landfill (in kg)**



Organic material was identified primarily as **post-consumer food waste** representing 23.4% of the entire landfill waste stream, while **pre-consumer food waste** (food prep waste generated from campus food outlets) accounted for 3.8% of the disposal weight. **Coffee grounds** and **compostable containers** were found in smaller quantities.

All the material categories above could be diverted from landfill through the organics collection program in place. For a detailed breakdown on waste generated at food services, please visit page 39.

### Photographs 9 to 10 – Organic Material Examples in Landfill Sample



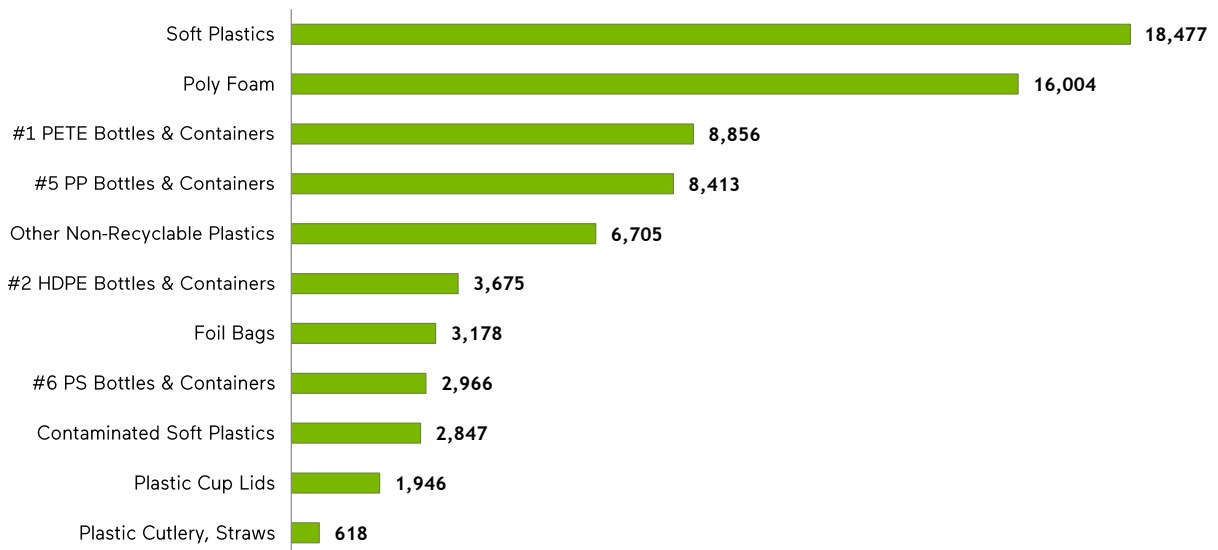


## Plastic Materials in Landfill Stream

Plastic materials account for 19.8% of your waste stream composition; 73,675 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 14 - Annual Plastics Disposed in Landfill (in kg)**



**Soft Plastics** included #4 LDPE plastic wrap, shrink wrap, bubble wrap and plastic bags. This material accounted for 5.0% of landfilled materials. The campus has a limited recycling program to collect soft plastic materials. Receptacles were identified in select areas of the campus including the Student Union Building.

Some of the soft plastics identified was contaminated with food or liquid waste. Contaminated soft plastics accounted for 0.8% of the disposal weight. In these circumstances, these materials would not be recyclable in any case, this was often from food residue, liquids or grease.

**Polyfoam/ Polystyrene** was the next significant material in the audited landfill sample, representing 4.3% of all materials identified. The campus has a program to accept polyfoam materials in recycling at select areas of the campus including the Student Union Building.

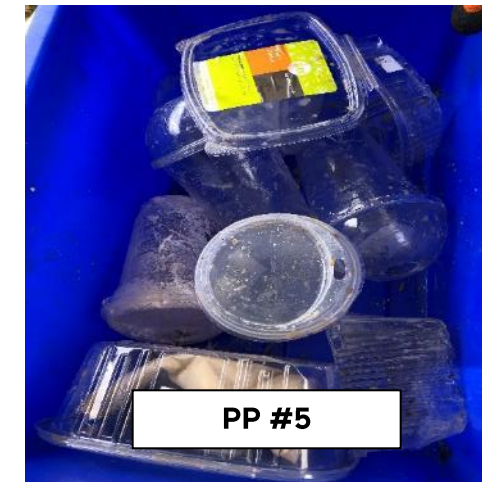
The next most common material in the audited sample was **PETE#1** plastic materials representing 2.4% of the landfill sample. Water, juice and beverage containers are the most common sources of #1 PETE and most users are aware that these types of products are

recyclable, but these items are being found in the waste stream. The campus should continue to encourage the use of reusable water bottles and containers.

**PP #5** was also a potentially recyclable plastic found in the landfill waste stream at 2.3%. Juice, yogurt, fruit containers are the most common sources of #5 and users should be aware that these products are recyclable.

**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. These materials represented 1.0% of the landfill waste stream. Employees particularly maintenance staff and those in food service providers should be educated through awareness programs that these are recyclable materials and receptacles for these items are available for their collection.

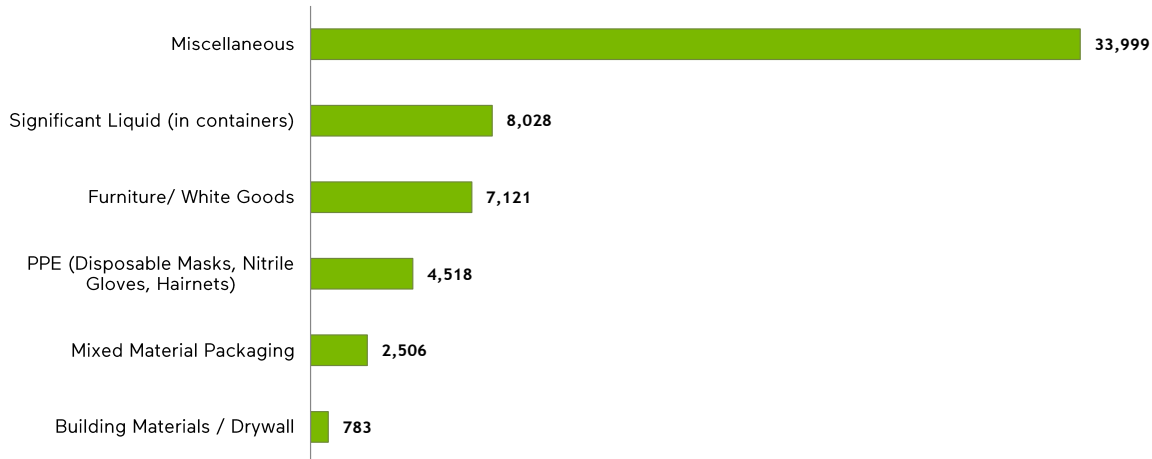
### Photographs 11 to 14 – Plastic Material Examples in Landfill Sample



## Other Materials in Landfill Stream

Other materials sent to landfill accounted for 15.3% of your total waste; nearly 56,952 kg of this category of material will be sent to landfill annually. The campus has programs to capture furniture and mattresses for donation. Additionally, the campus has a program to collect building & renovation material on an as needed basis.

**Figure 15 - Annual Other Disposed in Landfill (in kg)**



The most predominant material in this category was the **miscellaneous category** (9.1%) and included desiccants, pens, pencils and stationery, vacuum bag, curtains, art supplies and tape.

The next largest contributor to this category was **significant liquids** (2.2%) represented a notable amount of the campus's disposal weight and included water, coffee and other beverages most often unfinished in the original containers.

Also identified in large quantities was **furniture** which included broken desks and chairs accounting for 1.9% of the audited sample. The university has a program to break down and recycle surplus university owned furniture into components that can be recycled.

Identified in this category was **PPE** representing 1.2% of the audited sample. This is an unavoidable material as it is used in some areas of campus. This included materials of disposable masks, nitrile gloves, etc.

### Photographs 15 to 16 – Other Material Examples in Landfill Sample



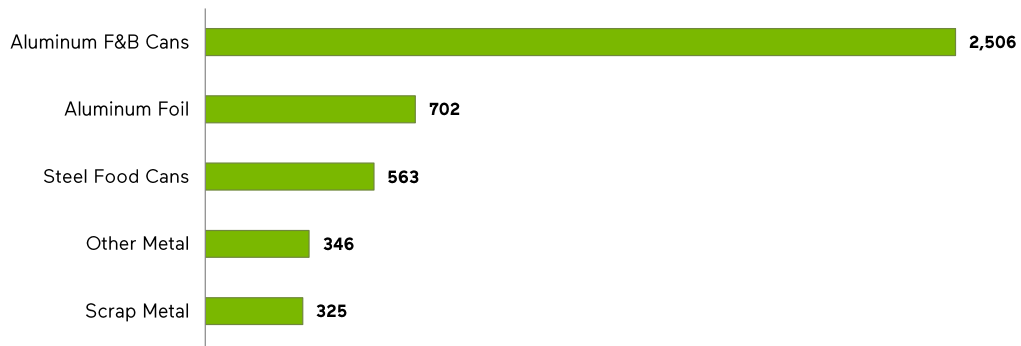




## Metal in Landfill Stream

Metal materials sent to landfill accounted for 1.2% of your total waste; nearly 4,443 kg of metals will be sent to landfill annually. The campus has programs in place to capture most metal food and beverage containers as well as scrap metal generated by maintenance activities and surplus furniture disposal.

**Figure 16 - Annual Metal Materials Disposed in Landfill (in kg)**



**Aluminum food and beverage cans** (0.7%) and **steel cans** are all recyclable materials, clearly labeled and easily accessible recycling receptacles are key to ensure that employees and visitors can participate.

**Aluminum foil** was also represented in minimal amounts (0.2%) These materials could be captured through the existing bottle and can collection program already on site.

**Photograph 17 to 18 – Metal Material Examples in Landfill Sample**

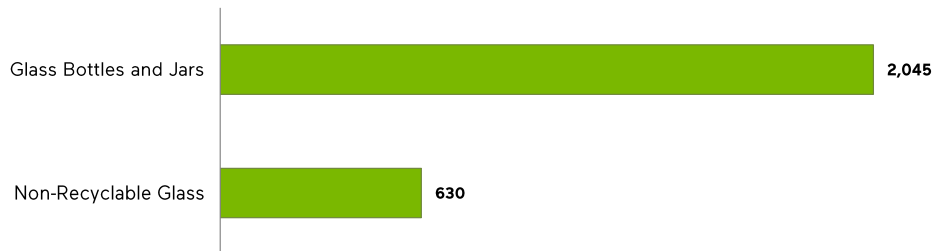




## Glass in Landfill Stream

Glass materials sent to landfill accounted for 0.7% of your total waste; nearly 2,675 kg of glass will be sent to landfill annually. The campus has programs in place to capture most glass food and beverage containers.

**Figure 17 - Annual Glass Disposed in Landfill (in kg)**



Glass bottles and all recyclable materials, clearly labeled and easily accessible recycling receptacles are key to ensure that employees and visitors can participate.

**Photograph 19 - Glass Material Example in Landfill Sample**





## Textiles in Landfill Stream

Textile materials sent to landfill accounted for 0.7% of your total waste; nearly 2,722 kg of textiles will be sent to landfill annually. The campus has a program to collect clothing donations near the residence areas and a limited number of locations throughout campus.

**Figure 18 - Annual Textiles Disposed in Landfill (in kg)**



Textile materials that could be donated included various clothing, shoes, hats, gloves and bags. This material subcategory accounted for 0.5% of the audited sample.

Textile materials that are not accepted in donation represented 0.3% of the disposal weight and included rope, mop head and fabric mask.

**Photograph 20 to 21 – Textile Material Examples in Landfill Sample**

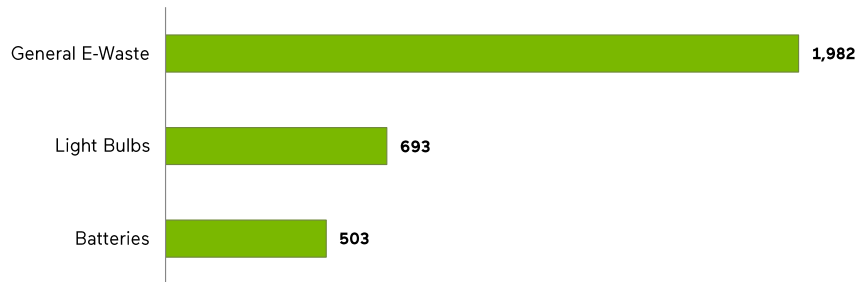




## Electronic Waste

Electronic Waste materials sent to landfill accounted for 0.9% of your total waste; nearly 3,178 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 19 - Annual Electronic Waste Disposed in Landfill (in kg)**



**General e-waste** identified in the audited sample include power adapters, cables and headphones. 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 and students should be reminded about available programs for collection and where specifically they should place used e-waste materials for collection.

**Photograph 22 to 23 - Electronic Material Examples in Landfill Sample**



## Campus Wide Recycling Sample Material Category Breakdown

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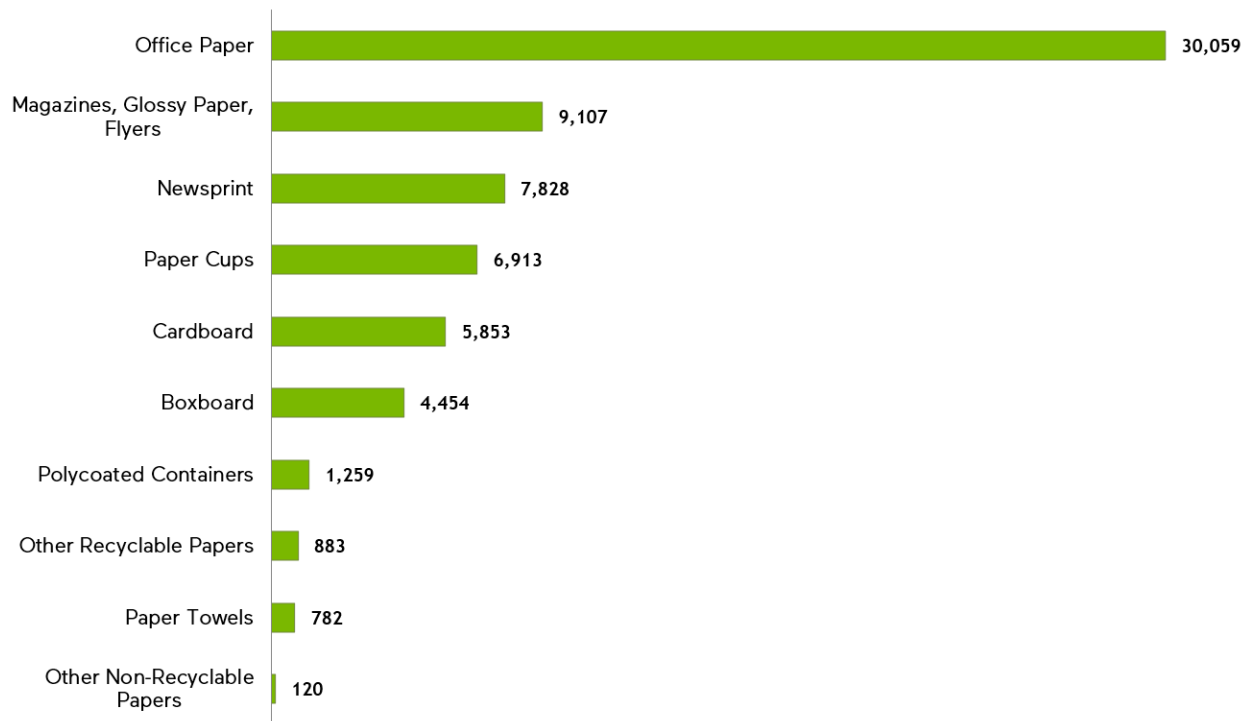
Below is a breakdown of the composition of the audited recycling material generated on site based on the analysis of the audited sample. This includes the mixed paper and mixed beverage containers stream.



### Paper Materials in Recycling Sample

Paper materials accounted for 52.5% of the audited recycling; nearly 67,219 kg of paper will be sent to recycling annually. The campus currently has programs in place to capture confidential paper shredding, cardboard and mixed paper collection for recycling.

**Figure 20 - Annual Papers Captured in Recycling (in kg)**



The most predominant paper material found in the recycling sample were:

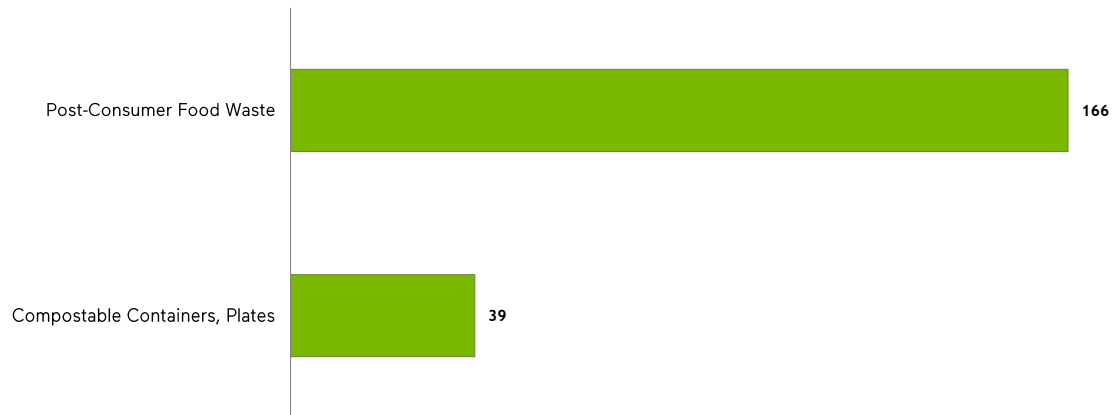
1. **Office paper**, 23.5%, accepted in recycling.
2. **Magazines**, 7.1%, accepted in recycling.
3. **Newsprint**, 6.1%, accepted in recycling.
4. **Paper cups**, 5.4%, accepted in recycling.
5. **Cardboard**, 4.6%, accepted in recycling.
6. **Boxboard**, 3.5%, accepted in recycling.



## Organic Materials in Recycling Sample

Organics accounted for 0.2% of the audited recycling; nearly 205 kg of Organics will be sent to recycling annually. A program currently exists at the campus to capture organic materials for compost, receptacles are found throughout the campus.

**Figure 21 - Annual Organics Captured in Recycling (in kg)**



The most common organic material found in the recycling sample was:

1. **Post-consumer food waste**, 0.1%, contamination.

**Photograph 24 – Organic Material Example in Recycling Sample**

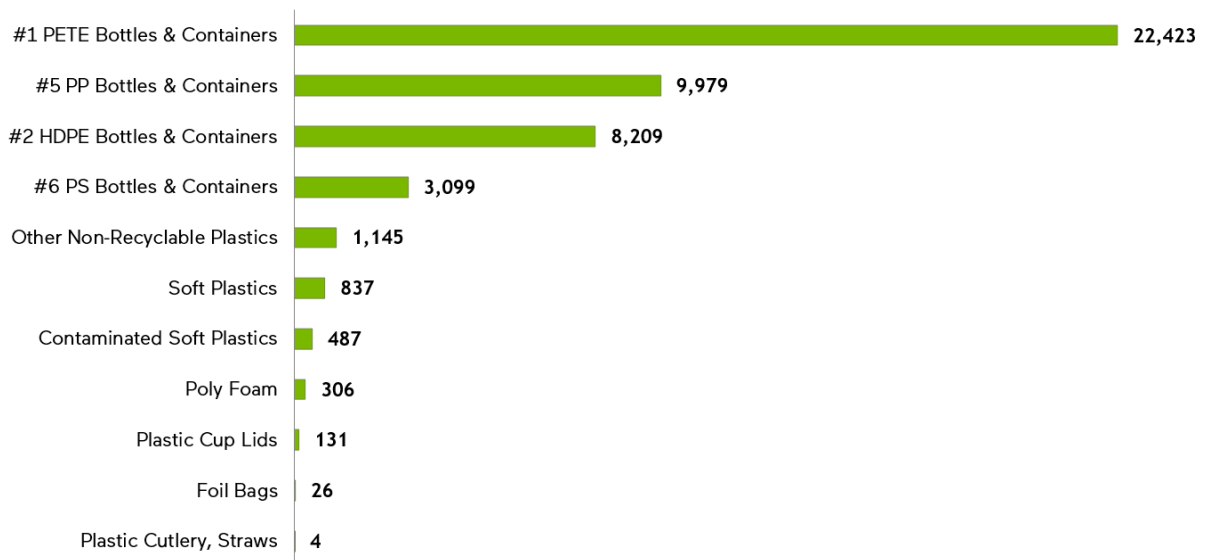




## Plastic Materials in Recycling Sample

Plastic materials accounted for 36.4% of the audited recycling; nearly 46,646 kg of plastic will be sent to recycling annually. The campus currently has programs in place to capture bottles and cans throughout the facility. Additionally, the campus has a limited recycling program to collect soft plastic and Polyfoam material.

**Figure 22 - Annual Plastics Captured in Recycling (in kg)**



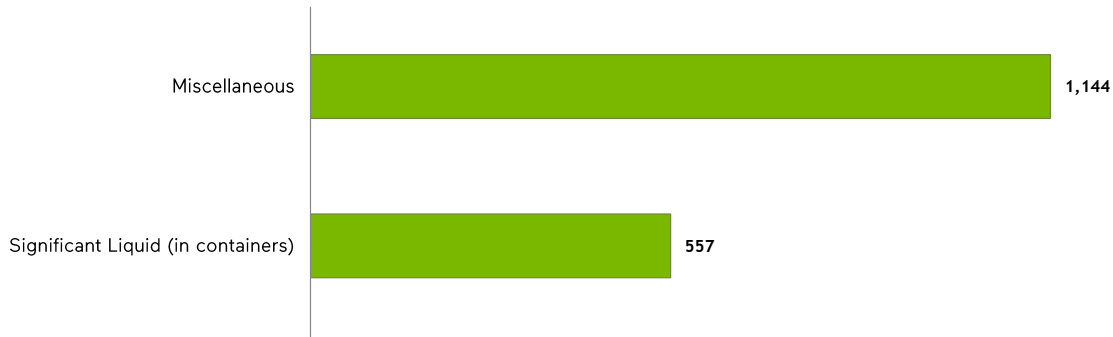
The most predominant plastic material found in the recycling sample were:

1. **#1 PETE**, 17.5%, accepted in recycling.
2. **#5 PP**, 7.8%, accepted in recycling.
3. **#2 HDPE**, 6.4%, accepted in recycling.
4. **#6 PS**, 2.4%, accepted in recycling.
5. **Other non-recyclable plastics**, 0.9%, contamination.
6. **Soft plastics**, 0.7%, accepted in recycling.
7. **Contaminated soft plastics**, 0.4%, contamination.

## Other Materials in Recycling Sample

Other materials accounted for 1.3% of the audited recycling; nearly 1,705 kg of this category of material will be sent to recycling annually. The campus has programs to capture furniture and mattresses for donation. Additionally, the campus has a program to collect building & renovation material on an as needed basis.

**Figure 23 - Annual Other Captured in Recycling (in kg)**



The most predominant other material found in the recycling sample were:

1. **Miscellaneous**, 0.9%, contamination.
2. **Liquids**, 0.4%, contamination.





## Metal Materials in Recycling Sample

Household metal materials accounted for 8.3% of your total recycling; nearly 10,509 kg of Metals will be sent to recycling annually. The campus has programs in place to capture scrap metal and most metal food and beverage containers.

**Figure 24 - Annual Metal Materials Captured in Recycling (in kg)**



The most predominant metal material found in the recycling sample were:

1. **Aluminum cans**, 7.4%, accepted in recycling.
2. **Steel cans**, 0.8%, accepted in recycling.



## Glass Materials in Landfill Sample

Glass materials accounted for 1.3% of your total recycling; nearly 1,639 kg of Glass will be sent to recycling annually. Additionally, another 10,750 kg of glass materials are captured for diversion through a separate collection program. The campus has programs in place to capture most glass food and beverage containers.

**Figure 25 - Annual Glass Captured in Recycling (in kg)**



The most predominant glass material found in the recycling sample was:

1. **Glass bottles and jars**, 1.3%, accepted in recycling.

## Campus Wide Compost Sample Material Category Breakdown

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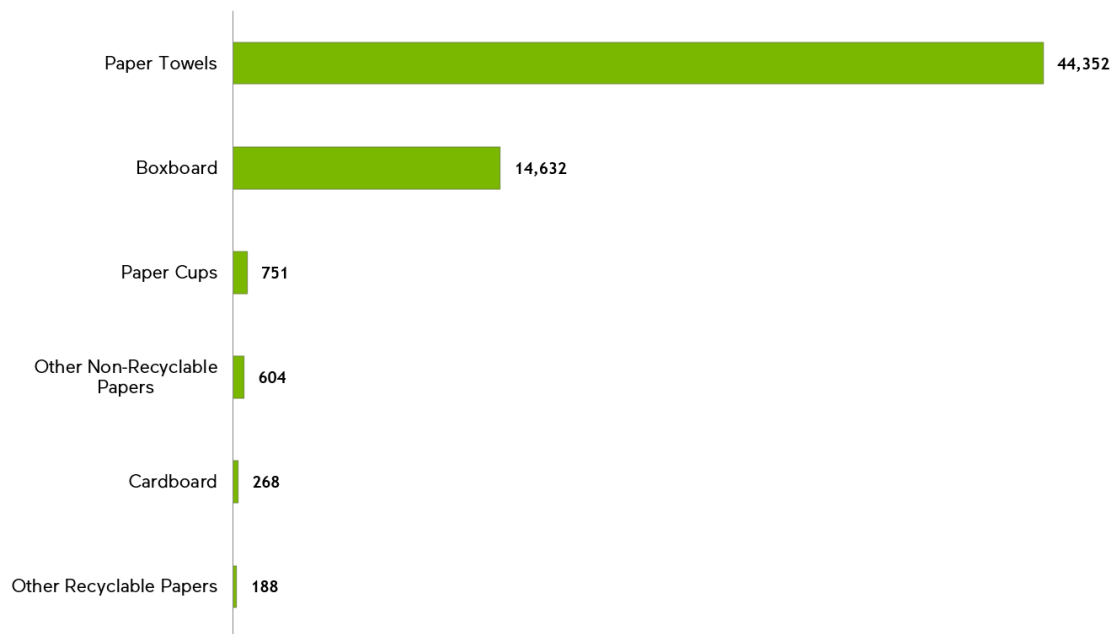
Below is a breakdown of the composition of the audited compost material generated on site based on the analysis of the audited sample.



### Paper Materials in Compost Sample

Paper materials accounted for 9.4% of your total compost; nearly 60,795 kg of paper will be sent to compost annually. The campus currently has programs in place to capture confidential paper shredding, cardboard and mixed paper collection for recycling.

**Figure 26 - Annual Papers Captured in Compost (in kg)**



The most predominant paper material found in the compost sample were:

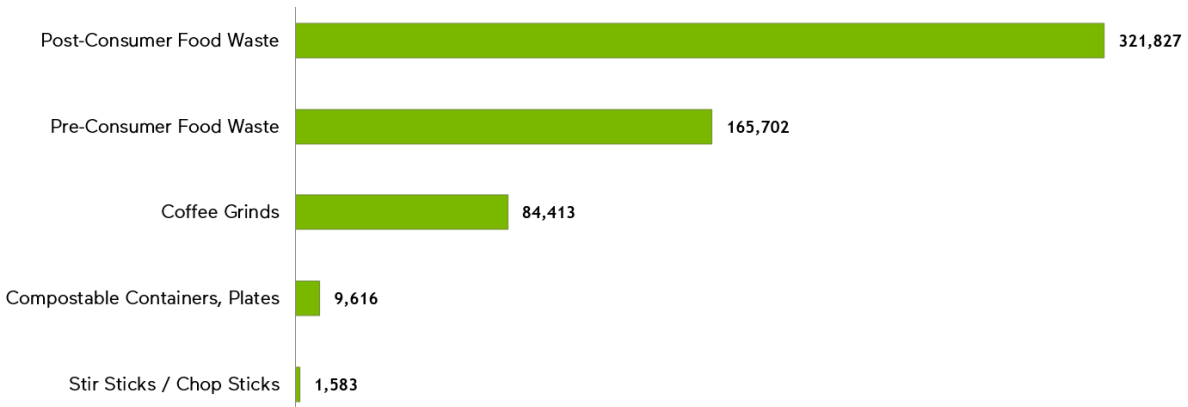
1. **Paper Towel**, 6.9%, accepted in compost.
2. **Paper Cups**, 0.1%, cross-contamination.
3. **Other Non-Recyclable Papers**, 0.1%, contamination.
4. **Cardboard**, 0.1%, cross-contamination.



## Organic Materials in Compost Sample

Organics materials accounted for 90.5% of your total compost; nearly 583,141 kg of Organics will be sent to compost annually. A program currently exists at the campus to capture organic materials for compost, receptacles are found throughout campus.

**Figure 27 - Annual Organics Disposed in Compost (in kg)**



The most predominant compost material found in the sample were:

1. **Post-Consumer Food Waste**, 50.0%, accepted in compost.
2. **Pre-Consumer Food Waste**, 25.7%, accepted in compost.
3. **Coffee Grinds**, 13.1%, accepted in compost.
4. **Compostable Containers, Plates** 1.5%, accepted in compost.
5. **Stir Sticks, Chop Sticks**, 0.2% accepted in compost.



## Plastic Materials in Compost Sample

Plastic materials account for less than 0.1% of your total compost; 134 kg of plastic materials will be sent to compost this year from your facility. All plastic materials identified in the compost stream is contamination. The campus currently has programs in place to capture bottles and cans throughout the facility. Additionally, the campus has a limited recycling program to collect soft plastic and Polyfoam material with receptacles in the Student Union Building.

**Figure 28 - Annual Plastics Disposed in Compost (in kg)**



The most common plastic material found in the sample were:

1. **Polyfoam**, < 0.1%, cross-contamination.
2. **Soft plastics**, < 0.1%, cross-contamination.

## Food Services Audit Results

Below is a detailed breakdown of the organic waste generated in the food services and the student union building.

Generation Area	Landfilled			Composted		
	Pre-Consumer Food Waste <sup>4</sup>	Post-Consumer Food Waste <sup>5</sup>	Other Compostable	Pre-Consumer Food Waste (Composted)	Post-Consumer Food Waste (Composted)	Other Compostable
<b>MAC BISTRO</b>	0.00	0.84	0.14	4.76	0.00	0.00
<b>BIBLIO CAFE</b>	0.00	6.30	3.51	3.18	0.00	0.12
<b>MYSTIC MARKET</b>	0.20	2.52	0.60	107.58	33.00	3.00
<b>GRADUATE STUDENTS SOCIETY</b>	0.00	5.05	0.00	4.64	17.86	0.00
<b>COVE</b>	0.36	3.24	0.90	43.14	57.51	0.00
<b>STUDENT UNION BUILDING</b>	0.00	81.15	0.40	8.59	22.26	0.00
<b>Total</b>	<b>0.56</b>	<b>99.10</b>	<b>5.55</b>	<b>171.89</b>	<b>130.63</b>	<b>3.12</b>

<sup>4</sup> Consists of food prep waste and coffee grinds generated from campus food outlets

<sup>5</sup> Consists of all other food waste material

## Continue Employee and Student Education and Engagement Program

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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.

The campus has already taken a number of steps to improve the waste diversion rate at the facility. For more information on UVic's waste reduction initiatives visit: [www.uvic.ca/sustainability/topics/waste/index.php](http://www.uvic.ca/sustainability/topics/waste/index.php)

The recommendations outlined below are to enhance the current efforts in place on campus:

1. **Expand Engagement Campaign** – The campus has an opportunity to launch a campus-wide campaign to motivate students and staff to divert waste and reach collective goals.

This campaign could include the following:

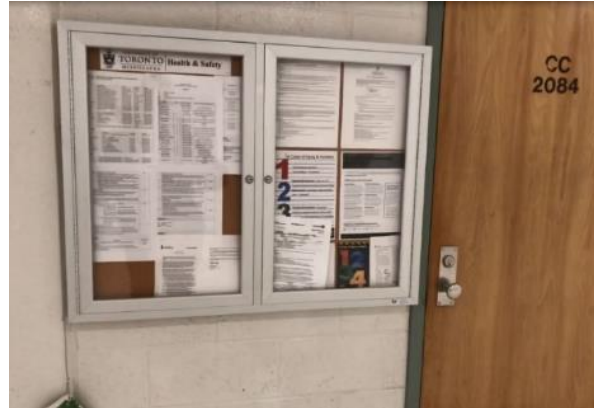
- Promote the facility's diversion programs.
- Provide students a sustainability toolkit in the beginning of each year to highlighting best practices on how to reduce and divert waste.
- Continue encouraging the usage of compostable food containers and reusable mugs in lieu of disposable cups and packaging.
- Set up peer exchange programs for staff and students to donate, sell or exchange goods.
- Repair cafes operated by volunteers could fix broken items such as computers, bicycles, lamps, small appliances and clothing.
- Implement a program to reuse or repurpose labware materials. This could be a student-led initiative.
- Allow students in Environmental Management or Environmental Science programs to come up with innovative solutions to improve campus capture rate and reduce overall waste contamination.
- Provide distinctions for food service providers that contribute to waste diversion efforts. These efforts could include vendors that:
  - Compost all pre-consumer food waste;
  - Provide only compostable or recyclable take out containers;
  - Donate excess food in lieu of disposal.

2. **Communication Program** - The campus 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 campus and feel included in its successes.

**Promotion** - The campus 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.

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, like health and safety boards shown below, can be a centralized place for relevant environmental information and reference material.



**3. Training** - Regular training of university staff and food service providers and their employees on diversion procedures help demonstrate the facility's commitment to diversion programs. Regular training has also been shown to aid in the elimination of inconsistency and complacency in diversion programs. University Food Services has a successful training program. It is recommended that the campus expand this program to all food outlets including the Student Union Building.

- 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.



**4. Maintenance/ Custodial Review** – Campus 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

- 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;
- Campus managers could be trained on all aspects of the diversion program which will allow them to be an ambassador and a resource to support staff, students, contractors and visitors.

**5. Labelling and Signage** – Receptacle stations identified in the site tour were equipped with proper labelling and signage. However, some individual receptacles were identified without labelling and signage.

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



**Site Observations** – Most receptacles identified through the assessment were equipped with proper labelling and signage.

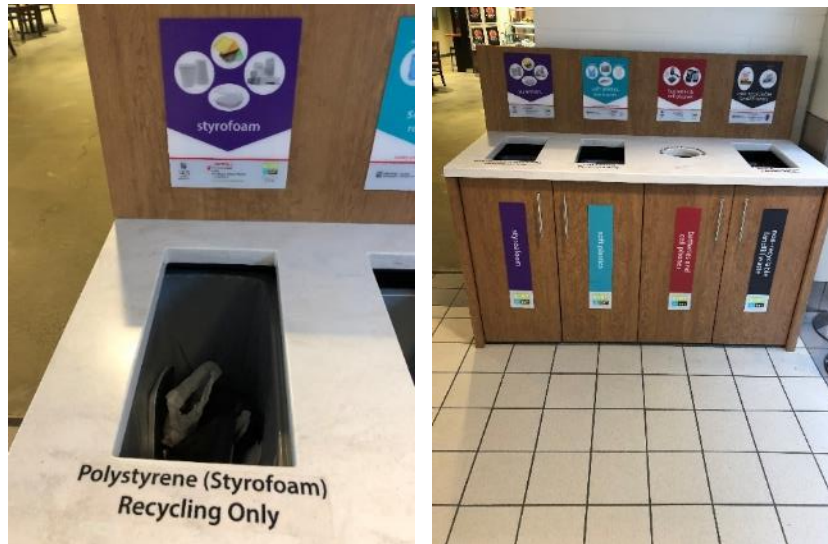
- The campus has implemented effective labelling and signage across all buildings. The collection bins should clearly indicate what materials should be collected and have a complete list of landfill materials as well as a list of items that should be diverted into other programs. When students or contractors, who are not regularly on site, are disposing of any materials, they should be able to easily identify how to best dispose of their residual materials. As seen in the example below, effective signage is established.

**Photographs 25 to 27 – Examples of labelling and signage at campus**



- The campus has a limited diversion program to collect soft plastics and Polyfoam/ Polystyrene (Styrofoam) material for recycling at select areas of the campus. However, in most buildings these materials are collected in landfill. The campus should explore the possibility to expand this program to divert more soft plastic and poly foam materials from landfill.
- Students may not be aware that this material is accepted for recycling on campus as this material was identified in large amounts in the landfill sample. Soft plastics accounted for 5.7% of the audited sample, while polyfoam accounted for 4.1% of the disposal weight.

**Photograph 28 to 29 – Example of a recycling station that accepts polyfoam, soft plastics**



**Photograph 30 – Example of a signage that excludes polyfoam, soft plastics**



- It was identified on campus that battery and cellphone bins were available for students and staff to dispose electronic waste in a proper manner. To improve the capture rate, the campus should increase the number of bins available throughout the facility. Additionally, the bins should be equipped to collect electronic waste of all forms such power adapters, headphones, and cables.

**Photograph 31 – Example of an E-Waste collection bin on campus**



- Collection totes identified in the residence area were often equipped with labelling and signage. Students should be reminded to place materials in the correct receptacles through online communications.

**Photograph 32 to 34 – Examples of collection totes at a residence area**



- Some receptacles at coffee shops (e.g., Biblio Cafe) were not equipped with any labelling and signage. Some potentially recyclable materials were identified in the receptacle. As outlined below, all receptacles on campus should be equipped with labelling and signage to reduce waste contamination and increase the overall material capture rate.

**Photograph 35 to 36 – Example of unlabelled receptacles**



## Continual Improvement and Additional Recommendations

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

It is recommended that the campus 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 campus, it is recommended that you regularly review opportunities to reduce or substitute these materials in your operations.

### **i. Contamination in Recycling Sample**

Some non-recyclable materials were identified within the recycling and compost samples. This included a significant amount of non-recyclable papers, cutlery, contaminated LDPE, food waste and liquids in the recycling sample. Based on the assessment about 6.5% of the of the mixed recycling sample could be considered contamination.

Education and awareness should be provided to ensure students and employees know that these materials may contaminate the recycling and compost streams and, in some instances, force the material to be sent to landfill, thus wasting the efforts of others who made efforts to recycle. It is recommended that recycling receptacles be equipped with labelling reminding users that garbage is not accepted here.

### **ii. Purchasing Power**

University of Victoria should use its purchasing power to influence its 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 campus should establish a vendor selection protocol to reflect a commitment to the 3R's: reduction, reuse and recycling;
- The campus 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.

### **iii. Bin Assessment**

Custodial Managers should, as part of their duties, periodically and routinely tour the campus to monitor the infrastructure of the waste management program. By ensuring recycling stations are present, and conveniently available throughout the campus, the recycling participation rate will improve. Ensuring that there are recycling receptacles in every area of the campus, where waste is generated, will allow for the proper source separation of materials.

The manager should ensure that all receptacles are clearly labelled, and pictorial guidelines are present to educate staff, as described above.

Black bags should never be used in recycling receptacles as they can often be confused as landfill waste and there is a risk that already sorted recyclables are disposed incorrectly.

#### iv. **Material Substitutions: Paper Towel**

Even with a diversion program in place to collect paper towel through organics collection in place at the facility, the material's capture rate is 33%; nearly 93.5 tonnes of paper towel is still goes to landfill on an annual basis. When considering environmental and financial costs of paper towel manufacturing and disposal, alternatives such as increasing the amount of High-Speed Energy Efficient (HSEE) hand dryers in washrooms 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 begin 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.

As well, the campus should ensure there are enough organics collection bins in washrooms and other areas where paper towel is frequently generated.

## Supplementary Information Appendix 1 – Recycling Benefits

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### Waste Management Sustainability Services 2022 Recycling Benefits for University of Victoria

In 2022, we recycled 378 tons of aluminum, cardboard, mixed paper, steel, scrap wood, glass and plastics.



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



#### 3,638 Mature Trees

Represents enough saved timber resources to produce 61,843,300 sheets of printing and copy paper!

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#### 1,000 Cubic Yards of Landfill Airspace

Enough airspace to fulfill the annual municipal waste disposal needs for 1,161 people!

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#### 833,044 Kw-Hrs of Electricity

Enough power to fulfill the annual electricity needs of 75 homes!

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#### Avoided 882 Metric Tons (MTCO<sub>2</sub>E) of GHG Emissions

That GHG reduction is equivalent to removing annual emissions from 187 passenger vehicles!

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#### 743,604 Gallons of Water

Represents enough saved water to meet the daily fresh water needs of 9,914 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; MTCO<sub>2</sub>E = Metric Tons of Carbon Dioxide Equivalent



## Appendix 2 - Detailed Landfill Breakdown by Generation Area

Area	Paper	Metal	Plastic	Textile	Glass	Organic	Electric	Other	Total
STUDENT UNION BUILDING	30.95	1.28	14.95	0.00	0.00	86.40	0.00	7.85	141.43
CARSA	27.30	1.20	16.62	0.00	0.00	41.28	0.00	6.12	92.52
BIBLIO CAFE	32.34	1.05	6.24	0.24	0.75	36.75	0.15	4.20	81.72
LIBRARY	23.44	1.20	17.04	0.00	0.00	29.16	0.00	0.40	71.24
UNIVERSITY CLUB	17.18	0.20	4.64	0.96	0.60	32.00	0.00	10.28	65.86
COVE	22.86	0.72	28.44	0.00	0.00	4.50	0.00	5.58	62.10
ENGINEERING & COMPUTER SCIENCE	16.05	0.60	7.40	0.10	1.15	16.85	1.50	13.00	56.65
MACLAURIN	23.28	0.60	4.80	0.00	2.64	14.88	0.00	10.44	56.64
BOOKSTORE	23.32	0.00	8.88	2.48	0.00	11.80	0.00	6.32	52.80
CLEARIHUE	11.85	1.15	16.90	3.10	0.00	8.50	3.50	5.00	50.00
HSD	18.80	0.20	6.40	0.00	1.20	2.70	1.10	18.70	49.10
FAMILY 7	0.88	0.72	1.00	0.00	0.76	16.48	0.00	28.90	48.74
RESIDENCE 14	12.60	1.52	11.96	0.00	0.00	16.48	0.00	4.72	47.28
CUNNINGHAM	7.90	0.00	14.22	0.00	0.00	5.52	0.12	12.24	40.00
OUTDOOR SORT-IT STATIONS	14.02	0.28	7.42	0.67	0.00	4.62	0.00	8.96	35.96
BOB WRIGHT	17.92	0.00	15.36	0.00	0.00	0.16	0.00	2.08	35.52
ELLIOT	14.52	0.00	15.36	0.00	0.00	0.36	0.00	2.04	32.28
RESIDENCE 2S	9.80	0.32	6.80	0.00	0.00	6.48	0.00	4.64	28.04
PETCH	9.00	0.94	3.06	1.44	0.00	0.20	3.44	9.80	27.88
MYSTIC MARKET	7.32	0.08	9.04	0.08	0.44	3.32	0.00	6.84	27.12
RESIDENCE FAMILY 6	5.36	0.84	4.50	0.08	1.80	10.48	0.00	3.52	26.58
CONTINUING STUDIES	10.59	0.15	2.29	0.12	0.00	7.02	0.00	5.40	25.57
UNIVERSITY CENTRE	10.14	0.06	3.84	0.18	0.00	5.52	0.06	4.92	24.72
RESIDENCE 18	5.82	0.50	4.29	0.00	0.00	4.42	0.00	4.54	19.57
DAVID TURPIN	11.32	0.12	4.96	0.08	0.00	1.70	0.00	0.76	18.94
RESIDENCE – BUILDING ONE	5.70	0.18	2.72	0.00	0.00	6.73	0.02	1.26	16.61
HWB / TEF	6.60	0.36	1.50	0.00	0.00	0.99	0.42	4.38	14.25
E HUT	7.30	0.20	1.30	0.00	0.00	1.96	0.14	0.56	11.46
BUSINESS & ECONOMICS	3.74	0.16	1.94	0.00	0.00	2.02	0.00	0.90	8.76
GRADUATE STUDENT SOCIETY	1.99	0.04	0.80	0.00	0.00	5.05	0.00	0.05	7.93
DAVID STRONG	2.68	0.06	1.20	0.00	0.00	1.70	0.00	0.76	6.40
SAUNDERS	1.82	0.16	0.52	0.00	0.00	1.36	0.10	1.48	5.44
MAC BISTRO	2.08	0.02	1.42	0.00	0.00	0.98	0.00	0.58	5.08
FIRST PEOPLES	1.78	0.02	0.52	0.06	0.00	0.99	0.00	0.29	3.66
MCKINNON	0.82	0.00	0.38	0.41	0.14	0.00	0.00	1.61	3.36
SEDGEWICK	1.39	0.02	0.51	0.00	0.00	0.38	0.00	0.22	2.52
<b>GRAND TOTAL</b>	<b>420.46</b>	<b>14.95</b>	<b>249.22</b>	<b>10.00</b>	<b>9.48</b>	<b>389.74</b>	<b>10.55</b>	<b>199.34</b>	<b>1303.73</b>

## Appendix 3 - Detailed Recycling Breakdown by Generation Area

Area	Paper	Metal	Plastic	Glass	Organic	Other	Total
RESIDENCE 16 CLUSTER	61.40	0.00	0.00	0.00	0.00	0.00	61.40
OUTDOOR SORT-IT STATIONS	12.02	0.00	31.24	0.00	0.00	1.70	44.96
CLEARIHUE	25.12	1.26	9.12	0.00	0.18	0.84	36.52
CARSA	1.77	16.64	18.00	0.00	0.00	0.00	36.41
RESIDENCE 14 CLUSTER	0.00	13.10	18.15	3.92	0.00	0.00	35.17
RESIDENCE 17	32.40	0.00	1.00	0.00	0.00	1.50	34.90
STUDENT UNION BUILDING	11.44	1.92	18.78	0.00	0.00	2.56	34.70
ENGINEERING AND COMPUTER SCIENCE	17.00	1.00	15.04	0.00	0.00	0.00	33.04
BOB WRIGHT	25.94	1.42	1.56	1.32	0.00	0.00	30.24
ELLIOT	22.32	1.06	3.34	0.22	0.36	0.10	27.40
COVE	1.56	0.18	24.51	0.00	0.00	0.00	26.25
MACLAURIN	5.24	2.34	16.51	0.00	0.00	0.00	24.09
DAVID TURPIN	13.24	0.20	7.26	0.00	0.00	0.80	21.50
MYSTIC MARKET	20.32	0.00	0.00	0.00	0.00	0.00	20.32
FAMILY 3	18.33	0.00	0.00	0.00	0.00	0.00	18.33
BOOKSTORE	3.30	0.00	14.46	0.00	0.00	0.00	17.76
BUILDING ONE	5.62	0.00	8.16	0.00	0.00	0.00	13.78
FAMILY 2	0.00	7.00	5.46	0.00	0.00	0.00	12.46
CONTINUING STUDIES	2.50	0.00	6.50	0.00	0.00	0.00	9.00
BIBLIO CAFE	7.14	0.00	1.34	0.00	0.00	0.00	8.48
RESIDENCE 18	2.20	0.90	3.20	1.80	0.00	0.00	8.10
HUMAN & SOCIAL DEVELOPMENT	2.00	0.24	2.31	0.24	0.40	0.20	5.39
DAVID STRONG	2.28	0.30	1.70	0.00	0.00	0.00	4.28
MAC BISTRO	1.20	0.24	2.64	0.00	0.00	0.00	4.08
BUSINESS & ECONOMICS	3.94	0.00	0.00	0.00	0.00	0.00	3.94
GRADUATE STUDENTS SOCIETY	3.59	0.10	0.20	0.00	0.00	0.00	3.89
HEALTH WELLNESS / TECHNOLOGY ENTERPRISE	2.41	0.00	0.00	0.00	0.00	0.00	2.41
MCKINNON	0.67	0.02	1.49	0.00	0.00	0.00	2.18
LIBRARY	1.02	0.00	0.81	0.00	0.00	0.09	1.92
SAUNDERS	0.80	0.02	0.34	0.00	0.00	0.02	1.18
EAST HUT	0.98	0.00	0.00	0.00	0.00	0.00	0.98
FIRST PEOPLE	0.00	0.15	0.32	0.00	0.00	0.00	0.47
<b>GRAND TOTAL</b>	<b>307.75</b>	<b>48.09</b>	<b>213.44</b>	<b>7.50</b>	<b>0.94</b>	<b>7.79</b>	<b>585.51</b>

## Appendix 4 - Detailed Organics Breakdown by Generation Area

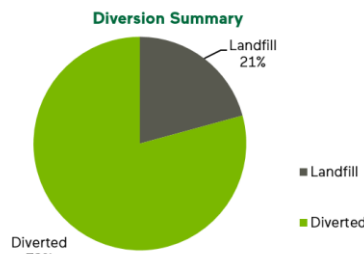
Area	Paper	Plastic	Organic	Total
MYSTIC MARKET	0.00	0.00	143.58	143.58
COVE	10.77	0.00	100.65	111.42
MACLAUREN	1.22	0.00	26.00	27.22
STUDENT UNION BUILDING	0.00	0.00	22.85	22.85
CLEARHUE	4.30	0.00	12.12	16.42
TURPIN	2.32	0.00	13.00	15.32
CUNNINGHAM	1.04	0.00	12.22	13.26
ENGINEERING & COMPUTER SCIENCE	2.14	0.00	9.90	12.04
HUMAN & SOCIAL DEVELOPMENT	8.04	0.00	3.14	11.18
SEDGEWICK	2.50	0.00	6.76	9.26
CENTRE	0.00	0.00	8.62	8.62
CONTINUING STUDIES	3.61	0.00	3.61	7.22
STRONG	2.30	0.00	3.14	5.44
PETCH	1.50	0.00	3.60	5.10
MAC BISTRO	0.00	0.00	4.76	4.76
BUSINESS & ECONOMICS	0.62	0.10	3.88	4.64
BIBLIO CAFE	0.20	0.00	3.30	3.50
ELLIOT	0.60	0.00	2.66	3.26
CARSA	0.00	0.00	2.62	2.62
SAUNDERS	0.50	0.00	1.86	2.36
HEALTH AND WELLNESS / TECHNOLOGY ENTERPRISE	1.56	0.00	0.00	1.56
OUTDOOR SORT-IT STATION	0.30	0.00	1.10	1.40
FIRST PEOPLE	0.76	0.00	0.32	1.08
LIBRARY	0.80	0.00	0.00	0.80
MAC BISTRO	0.00	0.00	0.76	0.76
MCKINNON	0.00	0.00	0.30	0.30
EAST HUT	0.25	0.00	0.00	0.25
<b>Grand Total</b>	<b>45.33</b>	<b>0.14</b>	<b>434.80</b>	<b>480.27</b>

## Appendix 5 – Diversion Report



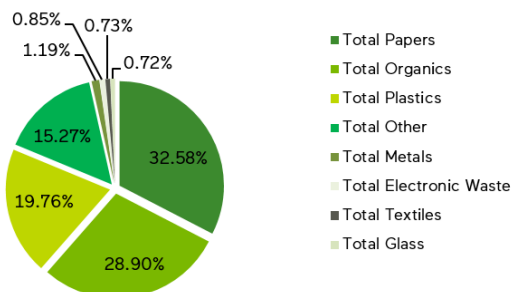
### Diversion Overview University of Victoria, Victoria BC

Diverted Materials	Annual Projected Volume (kg)	% Of Diverted Materials
Organics	644,070	45.5%
Yard Waste	361,810	25.6%
Mixed Recycling	127,960	9.0%
Metal	104,530	7.4%
Cardboard	83,300	5.9%
Wood	55,200	3.9%
Mattresses	20,720	1.5%
Glass	10,750	0.8%
E-Waste, Batteries	6,200	0.4%
Light Tubes, Ballasts	1,400	0.1%
<b>Total</b>	<b>1,415,940</b>	<b>100.0%</b>



Waste Category	Material Composition (%)	Annual Projected Volume (kg)
Total Papers	32.6%	121,481
Total Organics	28.9%	107,764
Total Plastics	19.8%	73,675
Total Other	15.3%	56,952
Total Metals	1.2%	4,443
Total Electronic Waste	0.9%	3,178
Total Textiles	0.7%	2,722
Total Glass	0.7%	2,675
<b>Total</b>	<b>100.0%</b>	<b>678,660</b>

#### Waste Material By Category



## Appendix 6 – Six Steps to a Successful Sustainability Program

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WM Sustainability Services has extensive experience in managing on-site sustainability programs safely, and in a manner that provides a framework for achieving our customers' waste reduction, continuous improvement and diversion goals. The following are several steps that we have found useful in implementing sustainability programs:

1. **Make sure that you sustain your university's ability to compete.** Any improvement or innovation should have economic *and* environmental benefit.
2. **Make sure that your first recycling initiative provides a quick payback.** It is important that the first initiative delivers a quick payback to get continued support from operational management.
3. **Explore the entire value chain.** For every dollar spent on disposal and transportation, another \$3.00 - \$10.00 is spent in generating the material in the first place.
4. **Use quantitative analysis to identify the best opportunities.** Typically, Pareto charts work best, i.e., 20% of by-products account for 80% of the cost or 80% of the cost savings.
5. **Work with your vendors, tenants, suppliers and employees.** Often, the best ideas come from those working in a particular area every day. You should push vendors and suppliers to develop programs that positively impact your goals and ask your staff for input.
6. **Win people over with enthusiasm.** Enthusiasm and communication of goals and achievements are critical for sustaining a strong Program.

### Source Reduction and Reuse Strategies

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:

#### *Implementing Purchasing Practices that Reduce Waste*

- ✓ Purchase reusable, rather than disposable products
- ✓ Request that vendors deliver products in reusable containers, such as plastic totes, rather than cardboard boxes
- ✓ Purchase in bulk to reduce packaging, while purchasing only the amount that is needed
- ✓ Purchase products with minimal packaging
- ✓ Work with suppliers to minimize the packaging used to protect their products

#### *Reducing the Amount of Material Used*

- ✓ Establish a campus-wide, double-sided, copying policy
- ✓ Create scratch pads from used paper
- ✓ Use outdated letterhead for in-house memos
- ✓ Circulate documents, post on bulletin boards, or send electronically, rather than making multiple copies
- ✓ Use central files to reduce the number of hard copies that are made

#### *Using Reusable Rather than Single-Use, or Disposable, Products*

- ✓ Change to reusable dishes in the cafeteria
- ✓ Place reusable coffee mugs in break rooms
- ✓ Offer a discount on drink prices for using reusable beverage containers
- ✓ Use rechargeable batteries
- ✓ Install hot air dryers in public restrooms and remove paper towels

#### *Reusing Materials for Other Purposes at Your Campus*

- ✓ Reuse cardboard boxes and foam peanuts for shipping from your campus
- ✓ Use newspaper and shredded paper for packaging

## Appendix 7 – Material Descriptions

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

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