



2018

Waste Audit and Waste Reduction Work Plan

Completed for:

**University of Toronto
Scarborough, Ontario**

February 13th, 2018



UNIVERSITY OF
TORONTO

Waste Audit Canada

2018

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EXECUTIVE SUMMARY

Waste Audit Canada conducted an evaluation of the waste composition of the University of Toronto Scarborough located at 1265 Military Trail, Toronto, Ontario as per the Ministry of the Environment and Climate Change Regulation 102/94. The evaluation consisted of the waste collection, handling and disposal practices observed at the building.

The scope of the waste audit included a review of onsite waste diversion activities and to provide meaningful recommendations to improve waste diversion onsite.

Table 1 provides a summary of the Sample Values related to the waste produced at the building.

Table 1: Diversion Summary

Description	Value
Total Waste Generated	125.00 kg
Total Waste Sent to Landfill	100.09 kg
Percent Diversion from Landfill	24.91 kg
Capture Rate	19.93%

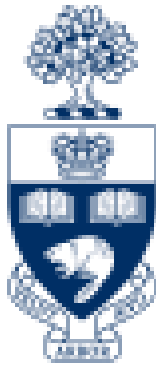
The following recommendations were made with a view to encouraging the University of Toronto to improve their waste diversion from landfill performance:

- **Environmental Training - Waste and Recycling Procedures**
- **Organic Recycling Program Expansion**
- **Waste and Recycling Containers and Signage**
- **Purchasing Policy – Compostable Food Containers**
- **Reusable Coffee Mug Program**
- **Waste Tracking**
- **Additional Recycling Opportunities**

1.0 INTRODUCTION

On February 13th, 2018 Waste Audit Canada (WAC) completed a waste audit at the University of Toronto Scarborough Campus at 1265 Military Trail, Toronto. The waste audit included the Arts & Admin building, Bladen Wing, Humanities Wing and Science Wing.

The objective of the evaluation and waste audit were to evaluate compliance against Ministry of the Environment and Climate Change Regulation 103/94, as well as with the respective vendor's acceptance criteria defined for the accepted waste streams. The waste audits were completed as per the Standard Waste Audit Methodology as set out by the Recycling Council of Ontario.



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The following audit was designed to exceed the minimum guidelines for waste audits as set forth by Canadian provincial regulatory authorities. The conclusions, observations, and recommendations contained in the report represent the opinions of Waste Audit Canada. The information in this report was provided to Waste Audit Canada by the client, its representatives, and partners. As a result, Waste Audit Canada has relied on the information to be accurate and for which no assurances are intended and no representations or warranties are made. This report and the information contained herein is produced for the expressed use of the University of Toronto. Waste Audit Canada prohibits redistribution of this report and the material contained herein in whole or part without expressed written permission of Waste Audit Canada.

1.1 Audit Objectives

The main objectives of the audit were to:

1. Conduct a waste audit on a representative sample of waste generated at the building under normal operating conditions;
2. Confirm effective implementation of a Source Separation Program in compliance with Ontario Regulation 103/94;
3. Identify any non-compliance findings related to the current waste facilities' acceptance criteria for waste and recyclables; and
4. Identify recommendations to increase diversion rate, ease of collection and handling of waste in the building.

1.2 Audit Criteria

1.2.1 Ontario Regulation 103/94

Ontario Regulation 103/94, requires educational institutions to implement a Source Separation Program for the following mandatory materials:

- Aluminum food and beverage cans
- Cardboard
- Paper
- Glass food and beverage bottles/jars
- Newsprint
- Steel food and beverage cans

The Source Separation Program must include provisions for collection, handling and storage of separated waste before removal of materials to a site with the capability and approval to handle source separated waste. The program must also be communicated to all parties who will use the program. Reasonable efforts must be made to ensure separated waste is reused or recycled.

1.2.2 Vendor Acceptance Criteria

The acceptance criteria from the vendor was identified as follows:

- Cardboard is accepted in the cardboard bin.
- Mixed recycling is accepted in the mixed recycling bin, and includes: aluminum food and beverage containers, gable tops, glass bottles and jars, HDPE 2, LDPE 4, paper, PET 1, PP 5, PS 6 condensed, tetra paks, and steel food and beverage containers. **Note that black plastic food and beverage containers, cutlery and lids are NOT accepted.**
- Organic composting is accepted in organic totes from the kitchens and includes food waste.
- Mixed waste is accepted in waste bin for landfill disposal.

1.3 Site Information & Description

Table 2: Building Description

Building	Description
Name	University of Toronto
Address	1265 Military Trail, Toronto, Ontario
Type of Establishment	Educational Establishment
Brief Description	Established in 1964, U of T Scarborough is the first of U of T's "new" campuses. Students get a head start on their futures through U of T's only co-op program as well as internships, hands-on research, community engagement and a vibrant campus life.
Areas Included from Audit	SW 5 th floor, AA 4 th floor, Humanities Hallway, and BV 4 th floor
Waste Excluded from Audit	Confidential paper shred

1.4 Current Practices

Table 3: Source Separation Summary

Waste Stream	Reg 103/94 Required	Existing Diversion Programs
Aluminum food and beverage cans	✓	✓
Boxboard		✓
Cardboard	✓	✓
Coffee cups		X
Fine paper	✓	✓
Gable top containers		✓
Glass food and beverage bottles/ jar	✓	✓
HDPE #2		✓
LDPE #4		✓
Newsprint	✓	✓
Organics		✓(Food prep)
Paper towel		X
PET #1 plastic bottles*		✓
PP 5 – Polypropylene*		✓
PS 6 - Polystyrene (condensed)*		✓
PS 6 - Polystyrene (expanded foam)		NA
Steel food and beverage cans	✓	✓
Tetra paks		✓

***Note:** Dark colored plastics of Polyethylene, Polypropylene and Polystyrene are not divertible through current recycling program.

1.4.1 Source Separation Signs and Employee Awareness

Source separation bins were located throughout the building and signs were posted in the common areas detailing the source separation programs and how materials were to be collected and sorted.

2.0 METHODOLOGY AND SCOPE

2.1 Methodology

Waste and recyclables from the building were sampled and analyzed for content from February 12th to February 13th, 2018. Waste was collected by the staff and placed in a staging area for a period of 24 hours. To analyze the waste generated, WAC conducted an on-site evaluation and material breakdown of the sample. Below is the four-step process which WAC followed in order to complete the waste audit process.

Step 1: Qualify Waste Streams

Materials were observed at the building from the origin of their generation and classified in separate categories including:

- ✓ General Waste
- ✓ Source Separated Recyclables
- ✓ Organics
- ✓ Other

Every category was broken down to identify the materials that each was comprised of.

Step 2: Quantify Waste Streams

The observations of materials were completed inside the building. Waste was observed from areas of the building defined in the scope of the waste audit. Materials produced during the audit period were carefully weighed in order to quantify the waste generation.

Step 3: Evaluate Current Waste and Recycling Processes

Through on-site analysis and conversations with building management the current processes for managing waste were evaluated.

Step 4: Waste Reduction Work Plan

Lastly, WAC established a baseline to measure the progress of recycling initiatives, and suggested recommendations to improve the waste and recycling processes and increase diversion from landfill.

2.1.1 Sample Summary

Bags were weighed and analyzed to determine contents and breakdown of waste produced during the audit collection period at the building.

- Staff collected and labelled the bags of waste with the area they originated from.
- Staff were instructed to collect waste samples **24 hours** in advance of the audit. This occurred from **February 12th – February 13th**.
- Prior to analyzing the waste samples onsite, the auditing team conducted a site review with the building management. This process allowed observation of the points of generation and how waste is handled.
- After the site review, the auditing team began analyzing the waste samples at the staging area.

2.1.2 Sample Note

Data collected during the site audit and data reported, are based on the samples analyzed and information reviewed. While effort was taken to ensure data was representative of a typical day, it must be noted that the accuracy of all data is limited by these assumptions and cannot be absolute.

3.0 WASTE AUDIT RESULTS AND ANALYSIS

Below is a summary of the waste audit findings. The total sample waste generated during the 24-hour collection period was 125.00 kg. The total sample waste that was sent to landfill disposal was 100.09 kg. The percent diverted from landfill was 19.93%.

Table 4: Diversion Summary

Description	Value
Total Waste Generated	125.00 kg
Total Waste to Landfill	100.09 kg
Total Waste Diverted	24.91 kg
Percent Diversion from Landfill	19.93%
Capture Rate	85.11%

While a number of measures to improve waste diversion have been implemented at the building, opportunities exist for continued improvement.

Addressing organic waste management at the building would result in the largest contribution to improving waste diversion from landfill performance. Of the 57.63 kg of organic waste generated, 15.89 kg or 27.57% was incorrectly placed in the mixed recycling stream.

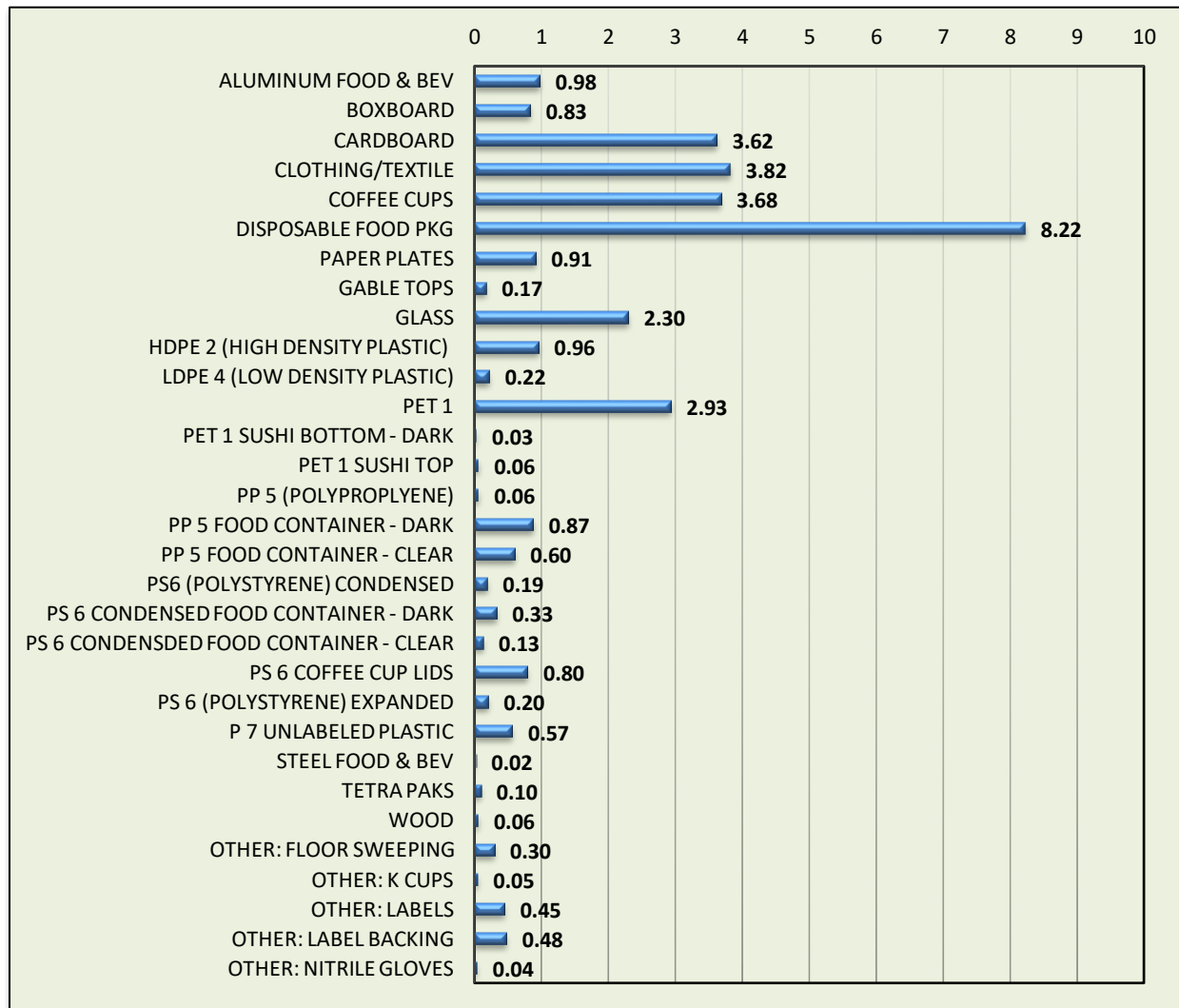
3.1 Total Waste Generated

Total waste generated was 125.00 kg.

Organics (57.63 kg), Paper Towel (18.07 kg) and Paper (15.29 kg) were the largest material categories generated.

See Chart 1 for a breakdown of total waste generation by material category.

Chart 1: Total Waste Generation by Category in Kilograms*



*Organics (59.02 kg), Paper Towel (18.17 kg) and Paper (15.29 kg) not represented in the above total waste generated chart.

3.2 Waste to Landfill

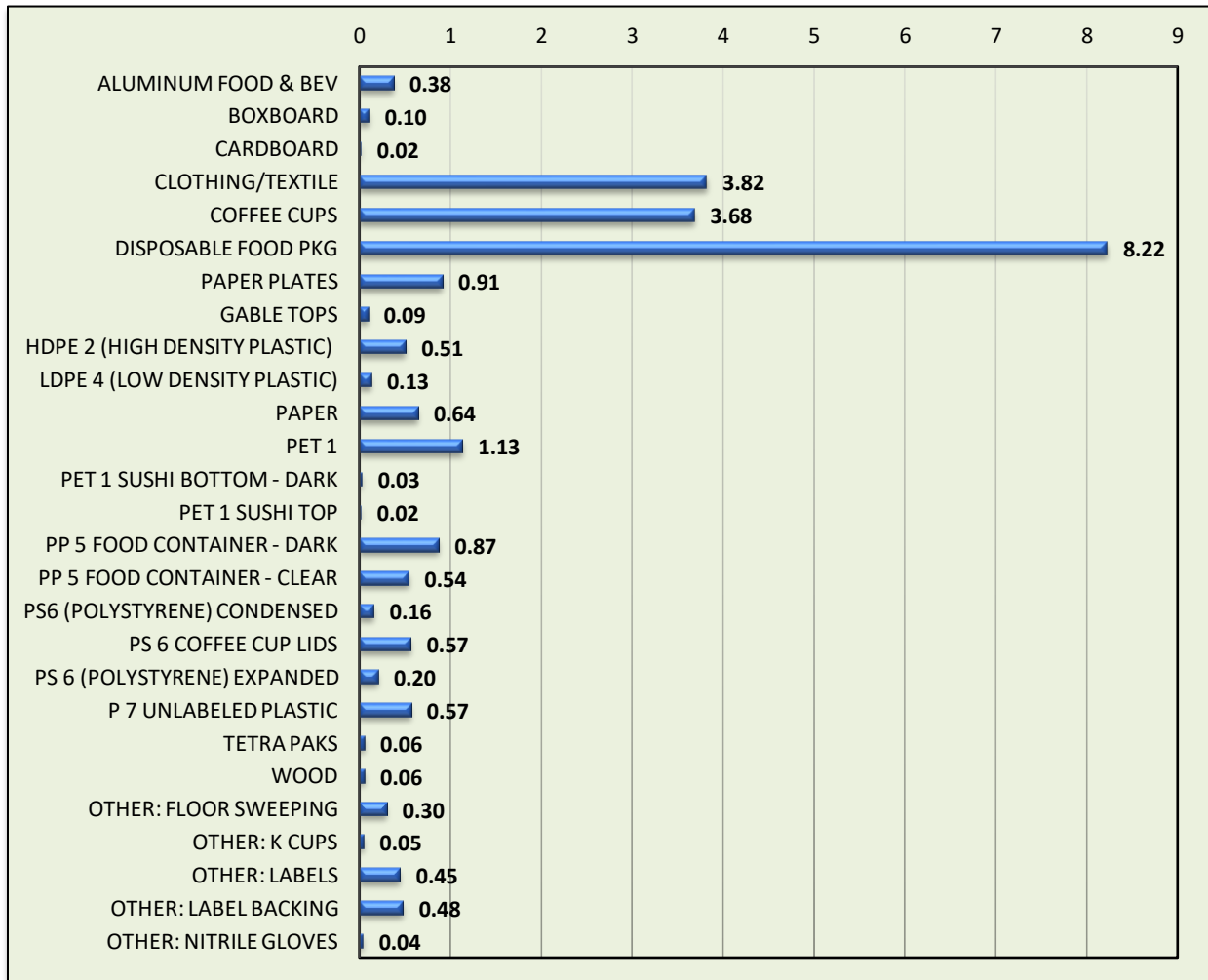
Waste to landfill generated was 100.09 kg.

Organics (57.63 kg) Paper Towel (18.07 kg) and Disposable Food Packaging (8.22 kg) were the largest material categories disposed via landfill.

See Chart 2 for a breakdown of waste to landfill by material category.

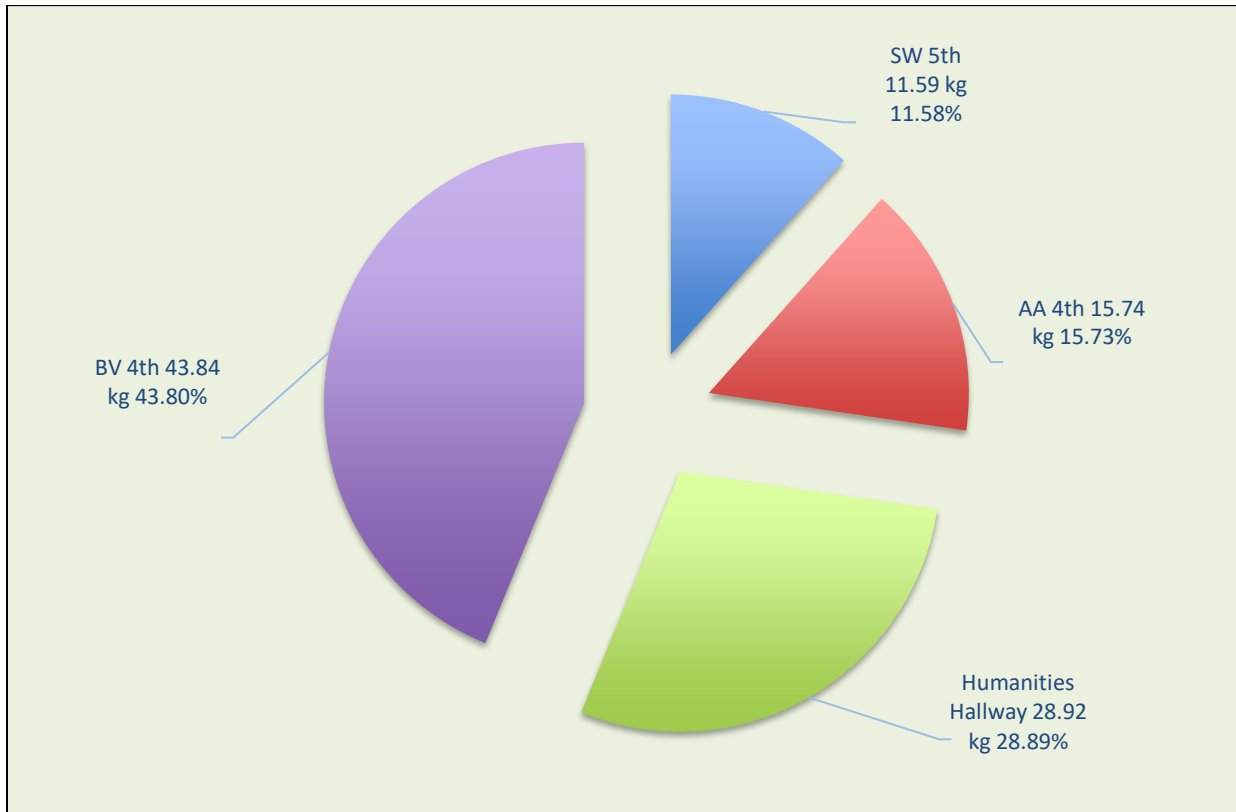
See Chart 3 for a breakdown of waste to landfill by area.

Chart 2: Total Waste to Landfill by Category in Kilograms**



**Organics (59.02 kg) and Paper Towel (18.17 kg) not represented in the above waste to landfill chart.

Chart 3: Summary Breakdown of Waste to Landfill by Area



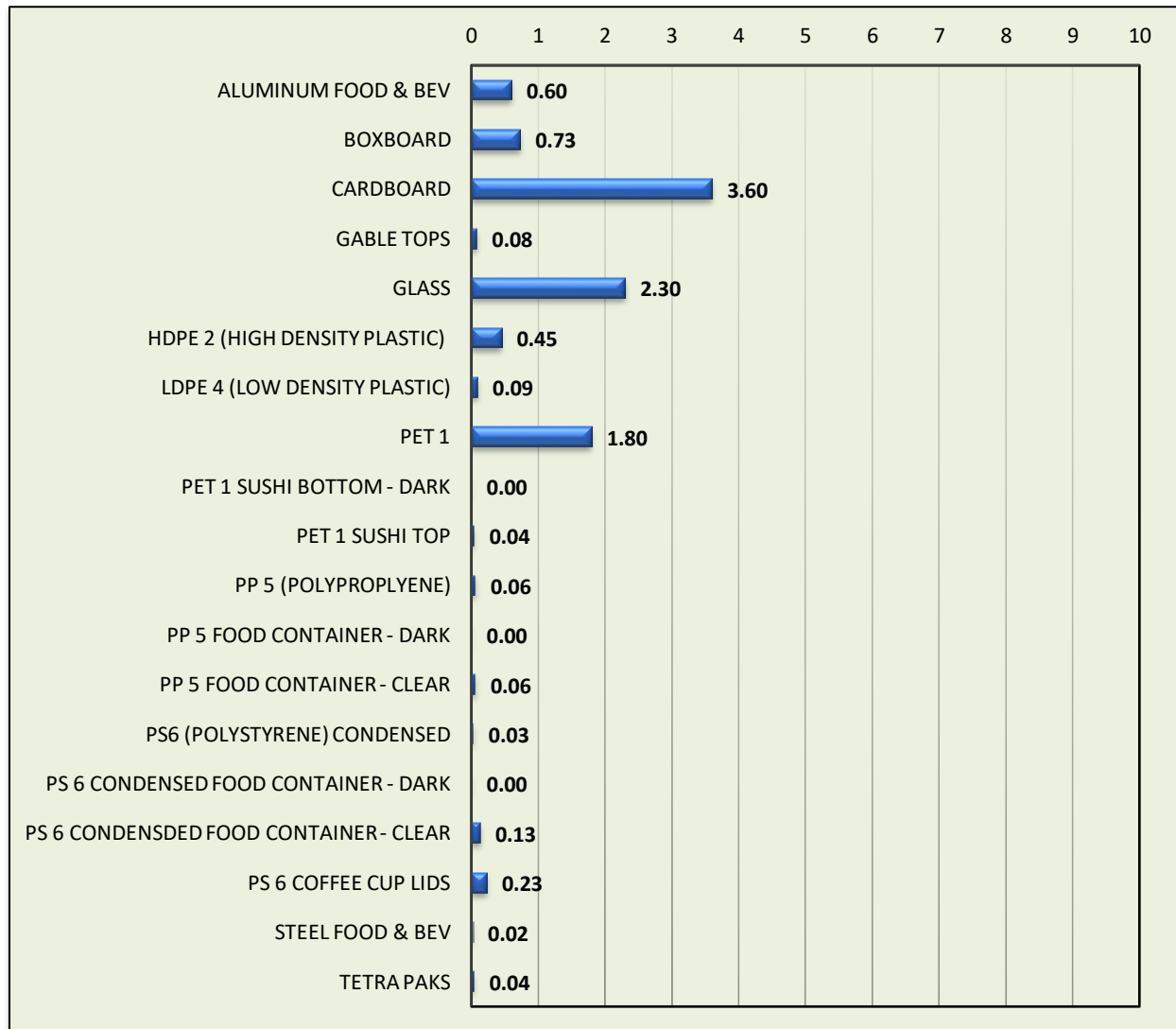
3.3 Diverted Waste

Diverted waste generated was 24.91 kg.

Paper (14.65 kg), Cardboard (3.60 kg) and Glass (2.30 kg) were the largest material categories of divertible waste.

See Chart 4 for a breakdown of diverted waste by material category.

Chart 4: Diverted Waste by Category in Kilograms***



***Paper (14.65 kg) not represented in the above waste to landfill chart.

3.3.1 Capture Rate

- The overall Capture Rate was 85.11%
- See Table 7 for the divertible waste capture rates.

Table 5: Capture Rate by Divertible Waste Category

Waste Category	Percent Captured
Aluminum Food & Bev	61.33%
Boxboard	87.58%
Cardboard	99.45%
Clothing/Textile	46.09%
Coffee Cups	100.00%
Disposable Food Pkg	46.95%
Paper Plates	40.78%
Gable Tops	95.79%
Glass	61.38%
HDPE 2 (High Density Plastic)	0.00%
LDPE 4 (Low Density Plastic)	66.67%
Organics	100.00%
Paper	0.00%
Paper Towel	9.95%
PET 1	15.79%
PET 1 Sushi Bottom - Dark	0.00%
PET 1 Sushi Top	100.00%
PP 5 (Polypropylene)	28.88%
PP 5 Food Container - Dark	100.00%
PP 5 Food Container - Clear	41.18%

3.3.2 Breakdown of Diverted Waste by Area

Chart 5: Summary Breakdown of Diverted Waste by Area

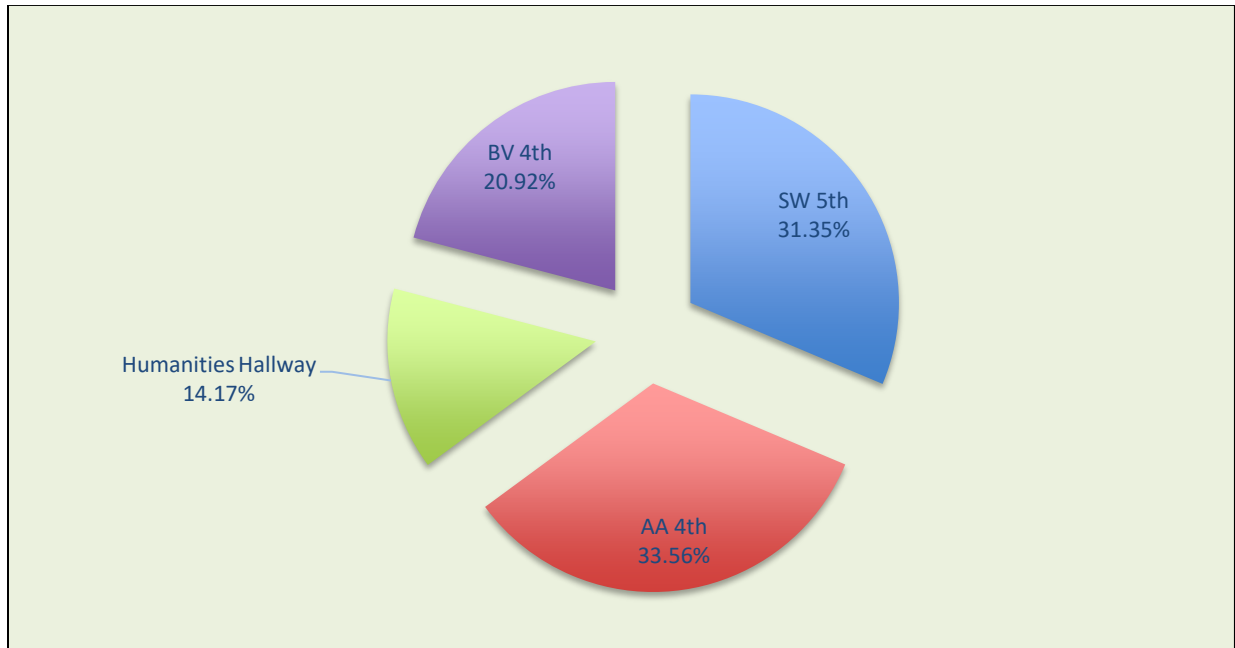


Chart 6: Breakdown of Diverted Waste – SW 5th Floor

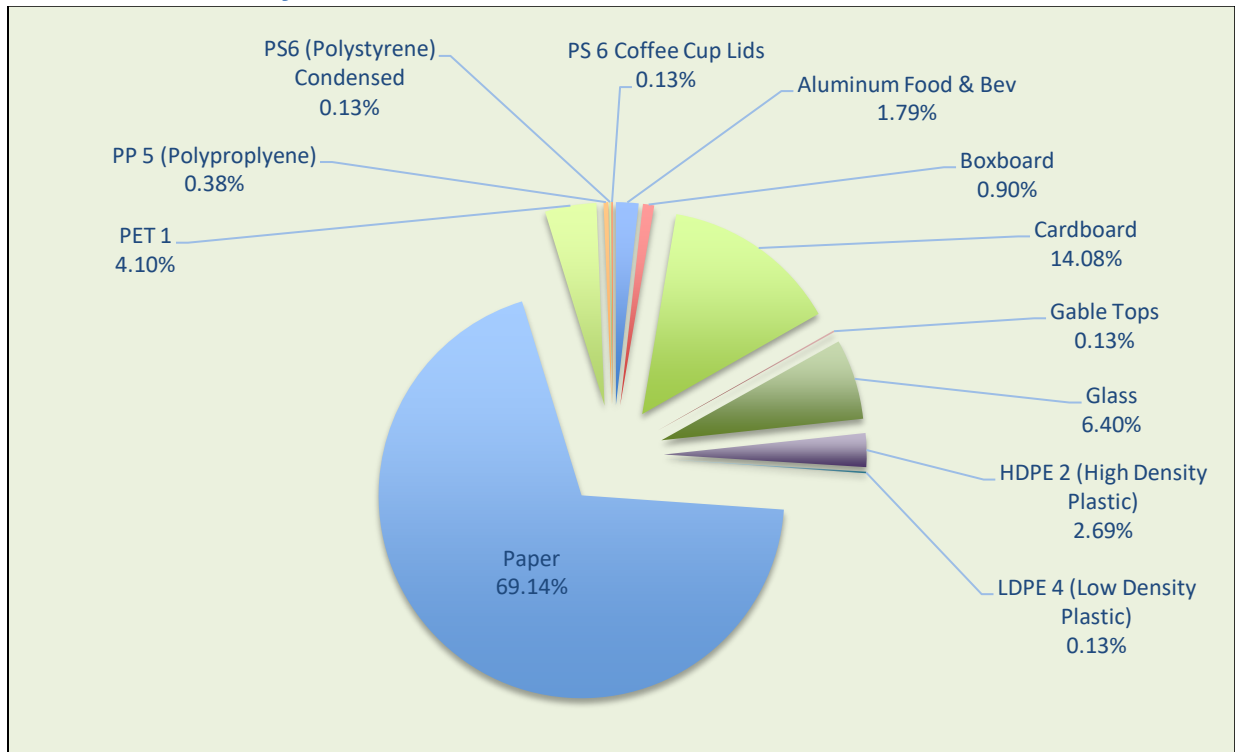


Chart 7: Breakdown of Diverted Waste – AA 4th Floor

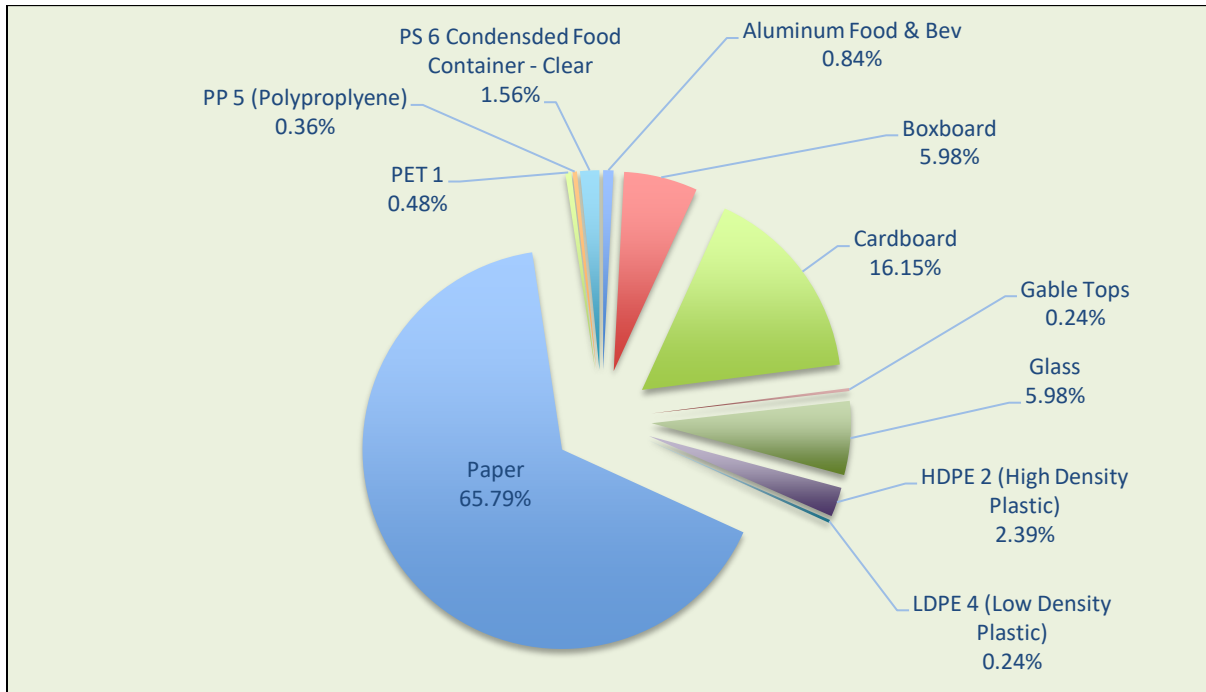


Chart 8: Breakdown of Diverted Waste – Humanities

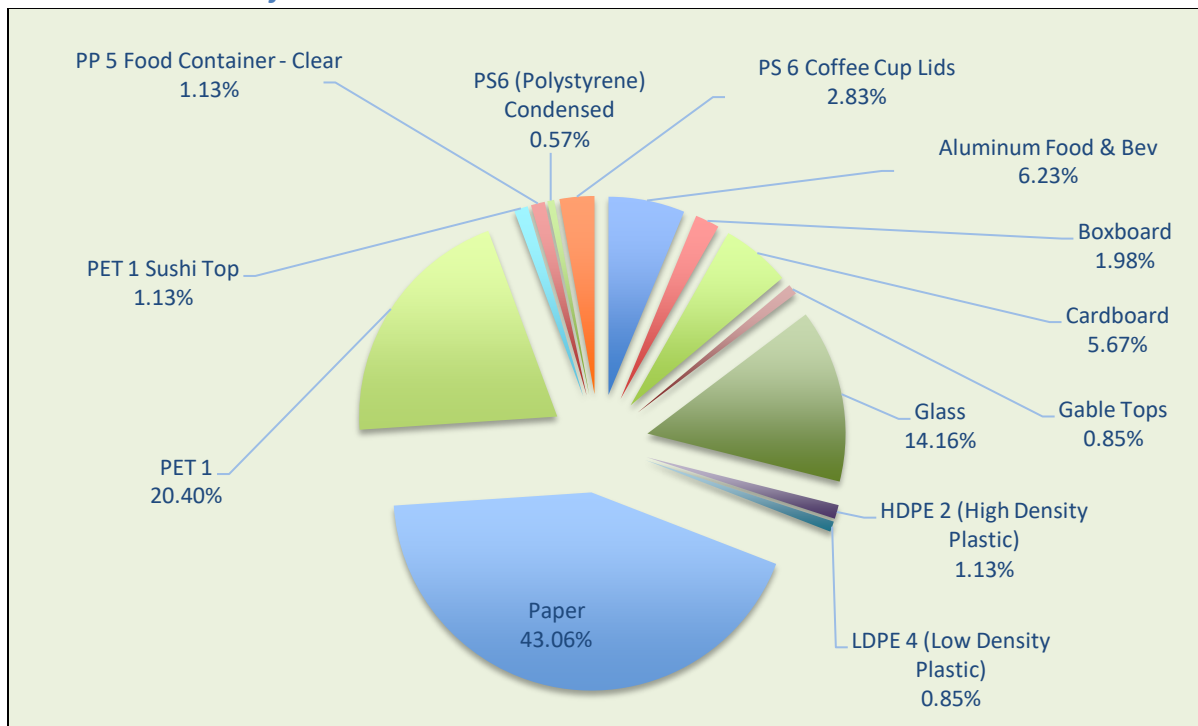
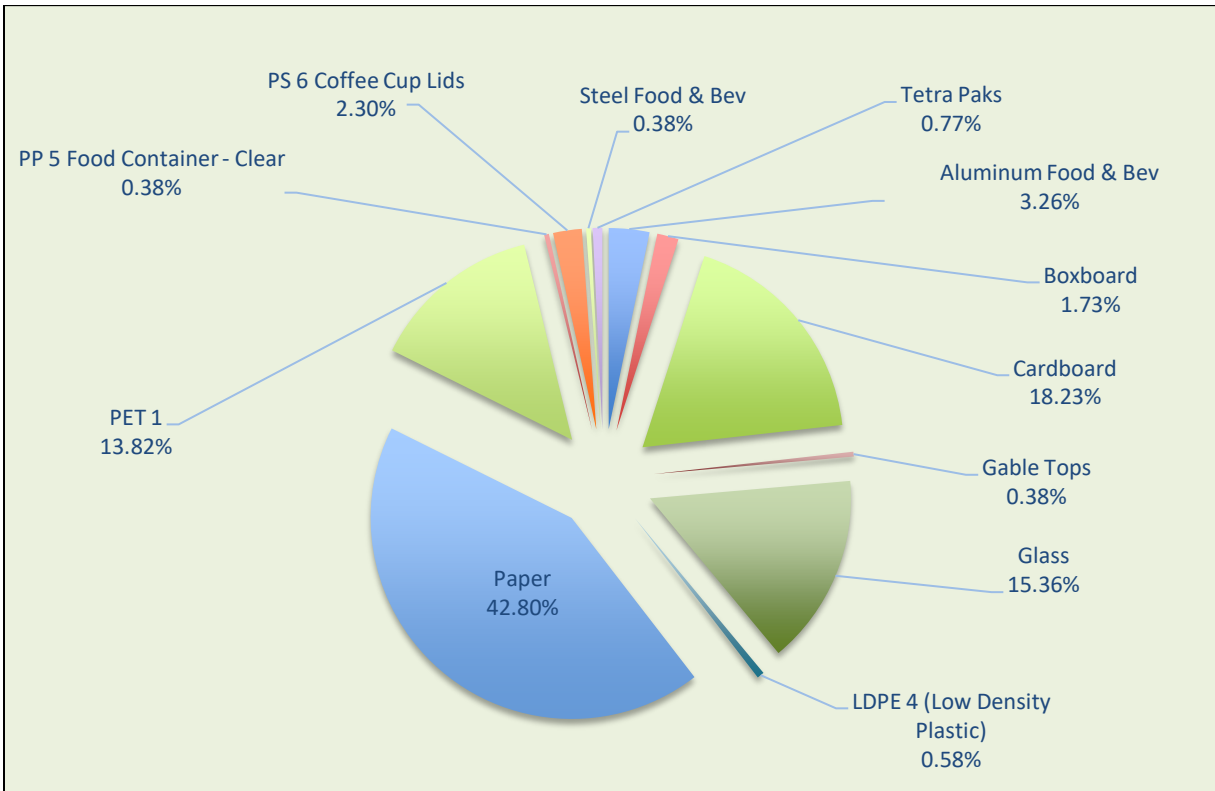


Chart 9: Breakdown of Diverted Waste – BV 4th Floor



3.4 Contamination in the Mixed Recycling Stream

- Non-divertible material found in the mixed recycling stream accounted for 16.44% of total waste generated.
- Non-divertible material found in the mixed recycling stream accounted for 20.53% of waste to landfill.

Chart 10: Summary of Contamination in the Mixed Recycling Stream – All Areas

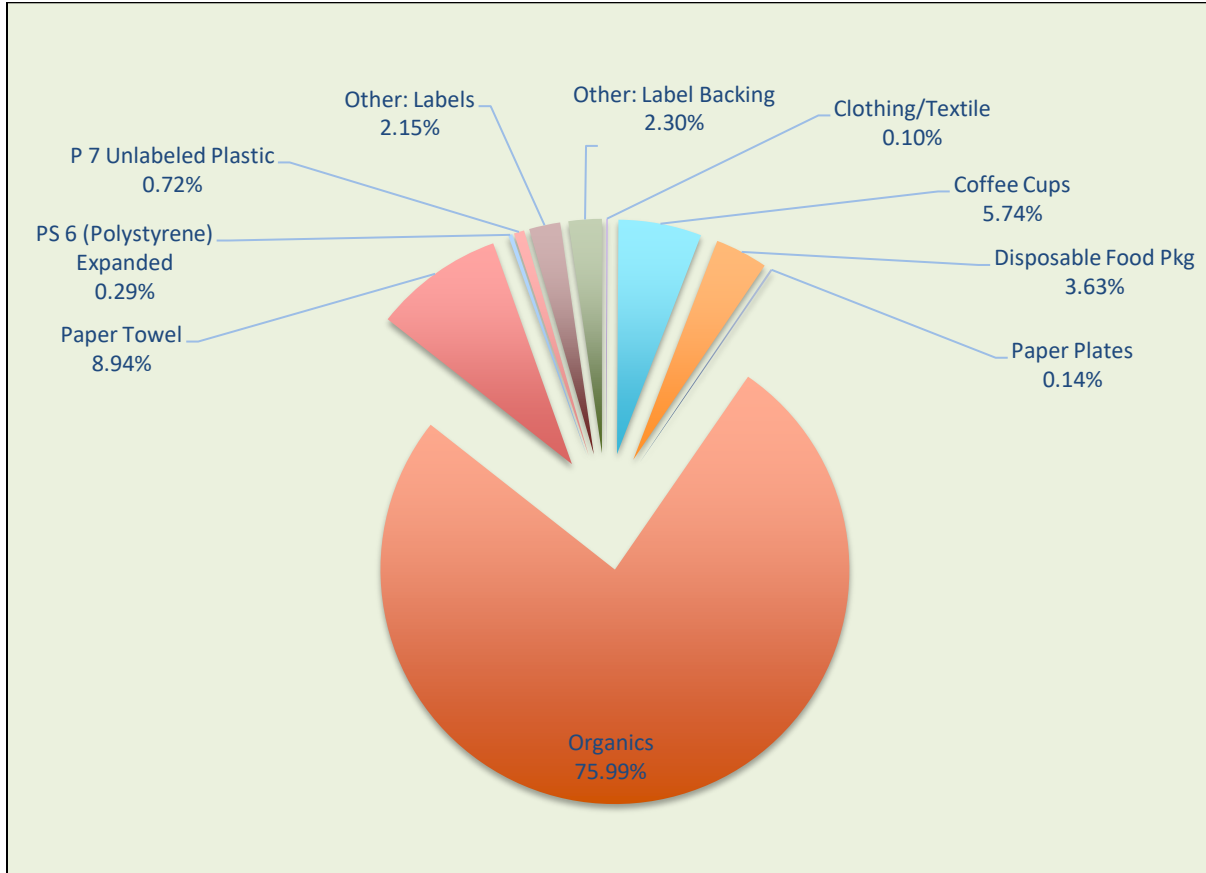


Chart 11: Breakdown of Contamination in the Mixed Recycling Stream – SW 5th Floor

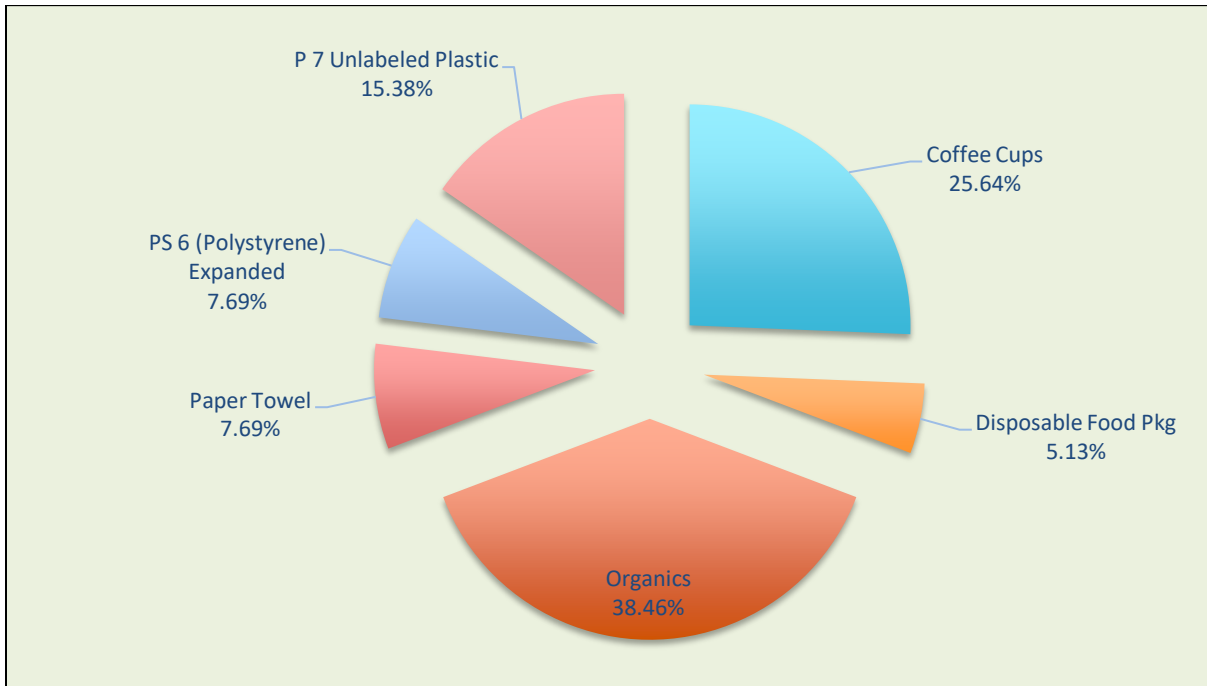


Chart 12: Breakdown of Contamination in the Mixed Recycling Stream – AA 4th Floor

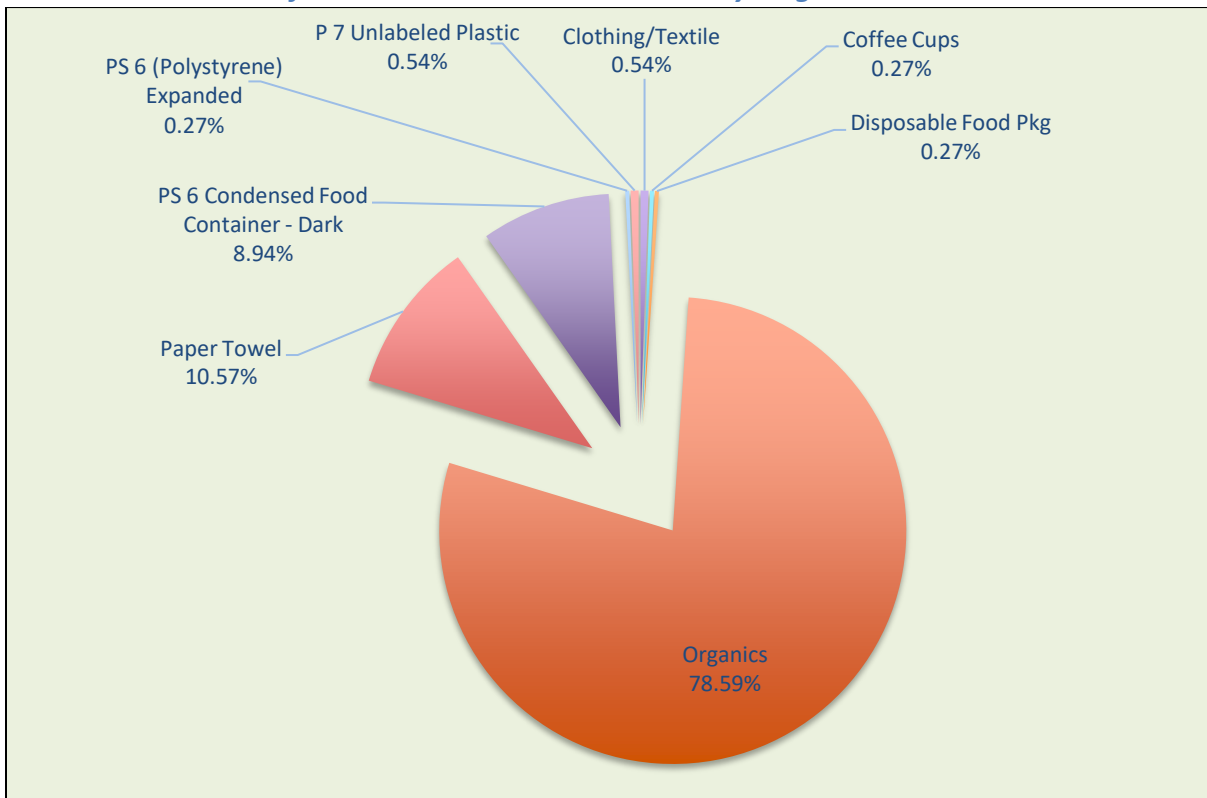


Chart 13: Breakdown of Contamination in the Mixed Recycling Stream – Humanities

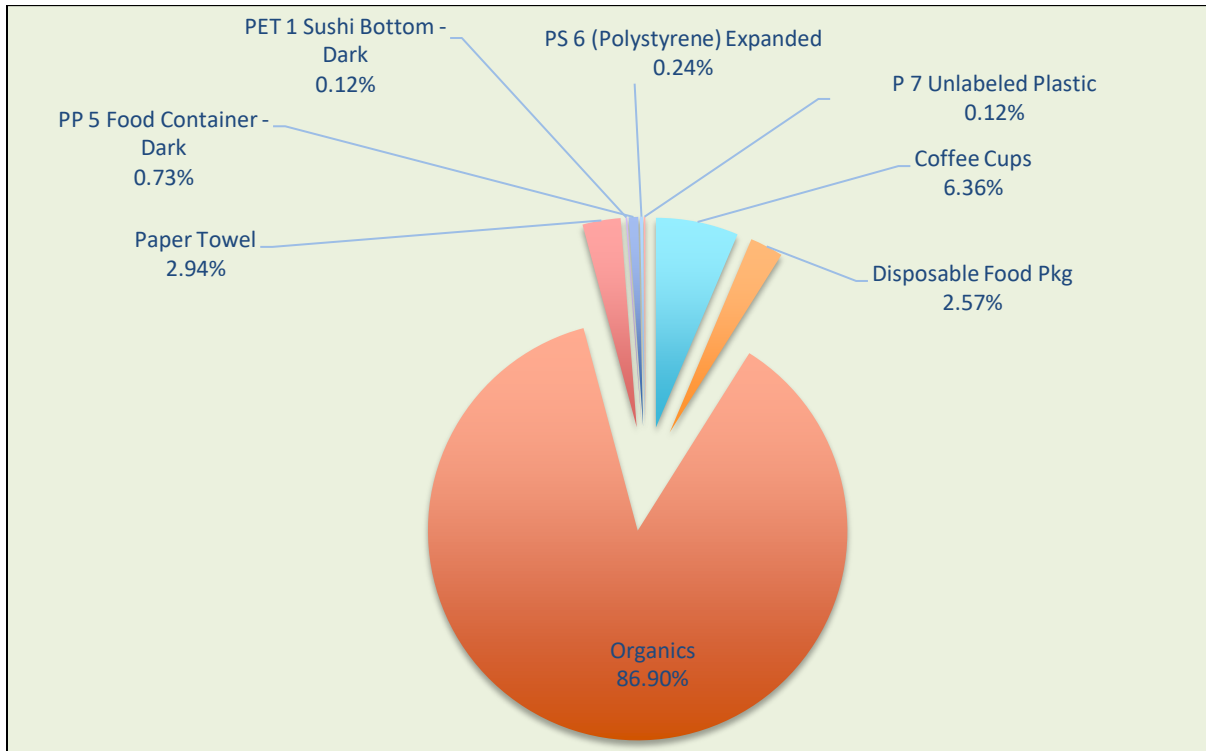
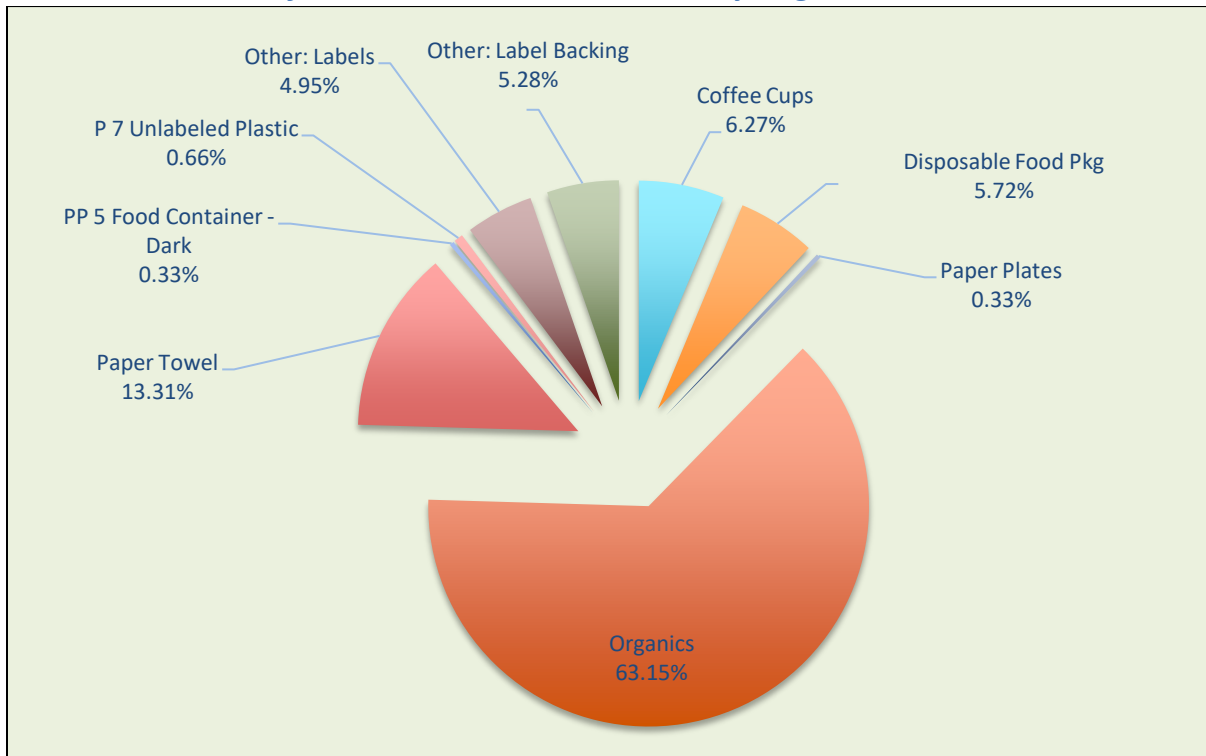


Chart 14: Breakdown of Contamination in the Mixed Recycling Stream – BV 4th Floor



4.0 RECOMMENDATIONS

4.1 Environmental Training: Waste and Recycling Procedures

Action Item:

- Ensure all University of Toronto staff and contracted staff induction package includes waste, recycling and associated environmental information relevant to their roles and activities.
- Ensure existing University of Toronto staff and contracted staff are provided with waste, recycling and associated environmental information relevant to their roles and activities.
- Contact WAC to develop and deliver waste, recycling and associated environmental training. WAC has extensive experience conducting training sessions that reflects the needs of your tenants and operations.

Audit Finding:

Mixed Recycling in the Waste to Landfill Stream

- 4.36 kg or 4.35% of the waste to landfill stream including: aluminum food & beverage, boxboard, cardboard, gable tops, glass, HDPE 2, LDPE 4, PET 1, paper, PP 5, PS 6 (condensed), steel food & beverage and tetra paks had the potential to be diverted to the existing mixed recycling stream.

Contamination in the Mixed Recycling Stream

- 21.34 kg or 46.14% of material found in the mixed recycling stream, including: clothing/textiles, coffee cups, disposable food packaging, paper plates, organics, paper towel, P6 expanded, P7 unlabeled plastic, labels and label backing, as well as dark recyclable plastics did not meet the recycling facilities' acceptance criteria.

Overall Contamination

- Contamination in the mixed recycling accounted for 21.32% of the waste to landfill.
- Contamination in the mixed recycling stream accounted for 17.07% of the total waste generated.

Justification:

Mixed Recycling in the Waste to landfill Stream

- If 50% of this material were placed in the mixed recycling stream, the diversion rate would increase from 19.93% to 21.67%.

- Employee training provides continuity between tenant behavior and waste generation and disposal within the building.
- Employee training can improve business performance and has a direct impact on company profits. Training has many additional benefits including:
 - Increased efficiencies in processes
 - Increased job satisfaction and employee morale and motivation
 - Increased brand reputation

4.2 Organic Recycling Program Expansion

Action Item:

- Consider expanding the organic program to include the food court area.

Audit Finding:

- Food court areas did not have organic bins for disposal of organic material
- Organics represented 46.11% of waste generated.
- Organics represented 57.58% of waste to landfill.
- Organic contamination represented 74.46% of the contamination in the mixed recycling stream.

Justification:

- If 50% of organics were to be diverted from the waste to landfill stream, the diversion rate would increase from 19.93% to 42.98%

4.3 Waste and Recycling Containers and Signage

Action Item:

- Consider implementing common waste and recycling containers throughout the facility.
- Consider developing waste and recycling signage with images to facilitate placement of unwanted materials.

Audit Finding:

- Waste and recycling bins of different sizes and shapes and inconsistent signage were found.
- High levels of contamination in the mixed recycling stream.
- 46.14% of the mixed recycling stream consisted of materials identified as not accepted by the recycling facility.

Justification:

- Consistent waste and recycling containers and messaging increases the relative ease of sorting and improves overall diversion rates from landfills.
- Convenience is one of the significant components in encouraging people to participate in recycling programs.
- In efforts to tackle contamination in the mixed recycling stream, consider:
 - Containers
 - Location
 - High traffic/volume areas
 - High visibility/convenience
 - Container Type
 - Size
 - Aesthetic appeal
 - Durability
 - Vandalism
 - Signage
 - Clear and simple message
 - Visual images
 - Consistent colour schemes
 - Visibility
 - Size

4.4 Purchasing Policy – Recyclable/ Compostable Food Containers

Action Item:

- Review purchasing policy to ensure preference is given for the purchase of environmentally friendly products, specifically clear recyclable plastics or compostable containers.

Audit Finding:

- PET 1, PP 5 (polypropylene) and PS 6 (polystyrene) take out food containers were found in the waste and mixed recycling stream. The ‘black’ portion of these containers are not accepted by the municipal recycling facility.

Justification:

- Providing fully recyclable or compostable containers will allow faculty, students and the public the option to divert materials produced from food services on campus.
- Increased overall diversion from landfill, from the sample analyzed the diversion rate could be expected to increase by approximately 1.00% from the areas observed.

4.5 Reusable Coffee Mug Program

Action Item:

- Consider implementing a reusable coffee mug program.

Audit Finding:

- Generated 373 coffee cups.
- 120 coffee cups were incorrectly placed in the mixed recycling stream.
- 373 coffee cups were disposed of via landfill.

Justification:

- Implementing a reusable coffee mugs program:
 - Encourages the reduction of disposable coffee cup use.
 - Reduces the amount of coffee cups sent to landfill.

4.6 Waste Tracking

Action Item:

- Consider implementing a waste tracking system to monitor weights of waste and recycling being removed from the facility.
- Contact Waste Audit Canada to find out more about our Waste Tracking software.
- Visit <http://wsc.wastetracking.com>

Audit Finding:

- There was no single source for waste and recycling tracking information available.

Justification:

- Ongoing, monthly tracking of waste and recycling data provides reliable, accurate and informative waste and recycling data.
- Reliable, accurate and informative waste and recycling data can:
 - inform management decisions,
 - heighten awareness of costs involved of waste and recycling management,
 - assist in avoiding additional hauling/processing costs,
 - be compared with and measured against production volumes.



4.7 Additional Recycling Opportunities

Action Item:

- Contact Terra Cycle to inquire about their Zero Waste Box Programs (www.terracycle.ca).

Audit Finding:

- Materials found in the waste sample had the potential to be diverted to Terra Cycle's Zero Waste Box recycling programs.
- generated 8.22 kg of disposable food packaging.
- generated 0.05 kg of coffee accessories – K cups.
- Generated 0.04 kg of nitrile gloves.

Justification:

- Terra Cycle is a recycling company that offer specialized recycling programs for typically non-recyclable items.
- Terra Cycle offer Zero Waste Box programs including:
 - Disposable food packaging
 - Coffee and tea accessories
 - Nitrile/latex gloves

