

University of Regina- Office of Sustainability

Riddell Centre Commons Waste Audit Report

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Executive Summary

This report summarizes findings from a waste audit conducted by the Office of Sustainability at the University of Regina. The goal of the audit was to determine the quantity and composition of waste generated in specific categories to better understand the amount of carbon dioxide equivalent (CO₂e) emissions produced in the Riddell Centre commons area. With assistance from Facilities Management, garbage and recycling bags from the morning of October 27, 2025, were set aside for analysis. The waste was sorted into categories such as plastics, paper, organics, and landfill. Once sorted, each category was weighed, and greenhouse gas (GHG) emissions were estimated using published emission factors (Saskatchewan Environmental Society, 2017).

Results indicate that waste generated in the Riddell Centre contributes an estimated 31 tonnes of CO₂e annually. This level of emissions is roughly equivalent to those produced by 9–10 passenger vehicles per year (Natural Resources Canada, 2025). These findings provide actionable data to guide the University's ongoing sustainability initiatives and waste reduction goals.

Introduction

The Office of Sustainability is leading efforts to advance sustainable practices at the University of Regina, guided by the *Sustainability Action Plan 2022–2027* (University of Regina, 2022) and the *United Nations Sustainable Development Goals* (United Nations, 2025). The University has committed to achieving net-zero greenhouse gas (GHG) emissions and is actively developing strategies to improve waste diversion and introduce composting programs across campus.

Waste management is a critical component of these goals. Improper disposal of recyclable materials contributes significantly to campus GHG emissions, as much of this waste currently ends up in landfills rather than being diverted through proper recycling practices. To better understand the issue of improper waste sorting on campus, a waste audit was conducted for the Riddell Centre commons. The audit aimed to identify how materials are currently being disposed of and to quantify the associated GHG emissions. This information is essential for designing effective recycling and composting programs.

Methods

First, a pre-audit workshop was held by the Sustainability Office to review safety procedures and explain the importance of conducting a waste audit to collect data about waste being generated on campus and to inform improvements to waste diversion and reduce contamination. A week later, a waste audit was carried out in the Riddell Centre loading dock area to collect data on waste composition and disposal accuracy. After a review of safety procedures, the audit began around 1:00 p.m. on October 27, 2025, analyzing waste primarily generated that morning. Facilities Management collected a total of 30 waste bags from the

Riddell Centre commons and separated them into recycling and landfill piles based on the bins from which they originated.

Staff from the Office of Sustainability, along with three volunteers from RPIRG and UR Ambassadors, sorted the waste into the following categories:

- Refundable cans/bottles
- Paper/cardboard
- Metal
- Plastics #1–4, 6, 7
- Plastics #5
- Glass
- Organics
- Remaining garbage (landfill)

Sorting was completed manually, with each bag opened and its contents placed into the appropriate category. When sorting bins were full, they were weighed and recorded using both a ground scale and a hanging scale. This process continued until all waste had been sorted and measured.

Emission estimates were calculated using published conversion factors from the Saskatchewan Environmental Society (2017) as well as The Association of Plastic Recyclers (2020).

Results

The data collected during the waste audit illustrates current disposal patterns within the Riddell Centre commons and quantifies the associated greenhouse gas (GHG) emissions based on material type and volume. Although metal and glass were initially included as sorting

categories, no items fitting these materials were found in the collected waste, and they were therefore excluded from the final dataset.

Overall, we collected 37.294 kilograms (kg) of total waste, which corresponds to 68.796 kg CO₂e generated from waste produced during the morning of October 27, 2025. According to Facilities Management, waste bins in the Riddell Centre are typically emptied twice per day, although this likely represents a slight underestimation of total daily waste produced. Using this estimate, the daily emissions were calculated at 137.592 kg CO₂e, which was then multiplied by 225 academic days to produce an annual total of 30958.137 kg CO₂e or approximately 31 tonnes CO₂e. The total of 31 tonnes CO₂e annually suggests a substantial environmental impact for a single campus building, underscoring the importance of improved diversion strategies.

Category	Subtotals (kg)	Net Weight (waste only)	Percentage of total waste	kg of CO ₂ /kg material	Total CO ₂	Total per day	Total in year
Refundable cans/bottles	2.721	2.721	7.29%	7.60	20.680	41.359	9305.82
Paper/cardboard	6.802	6.802	18.24%	1.60	10.883	21.766	4897.44
Plastics #1-4, 6, 7	6.912	4.653	12.48%	1.50	6.980	13.959	3140.775
Plastics #5	11.146	8.134	21.81%	1.84	14.96656	29.933	6734.952
Organics	11.982	9.723	26.07%	0.95	9.237	18.474	4156.5825
Remaining garbage (landfill)	5.261	5.261	14.11%	1.15	6.050	12.100	2722.5675
TOTAL	44.824	37.294	100%		68.796	137.592	30958.137

Table 1. Waste audit results from the Riddell Centre showing net weights, emission factors, and corresponding daily and annual greenhouse gas (GHG) emissions.

Analysis of waste composition revealed that organics accounted for the highest percentage of total waste (26.07%), followed by plastics #5 (21.81%), and paper/cardboard (18.24%). The lowest category was refundable cans/bottles (7.29%), however, this may be partly due to the audit occurring early in the day.

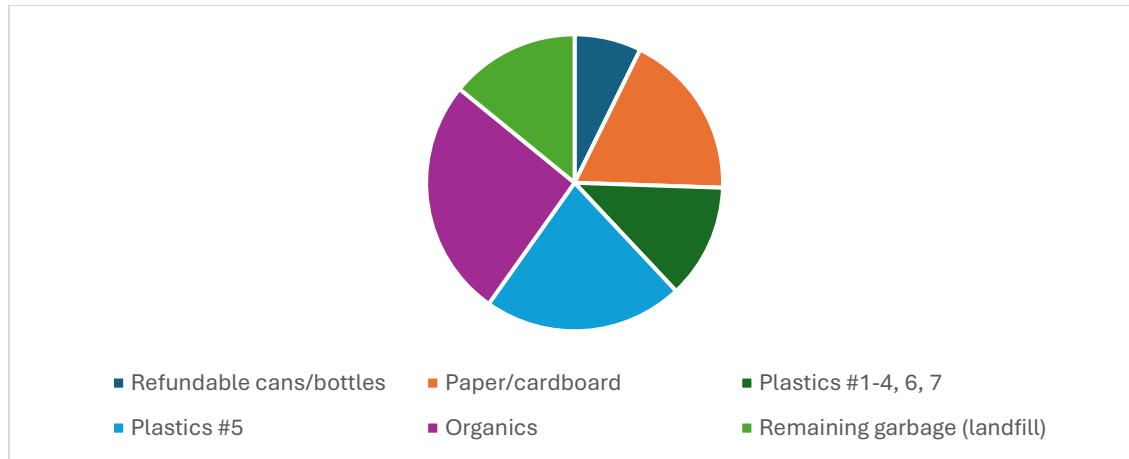


Figure 1. Proportion of total waste by category from the Riddell Centre waste audit.

It should be noted that when contents of the bags were deemed contaminated, they were placed in the landfill category. This was most common in the bags mixed with organics and small plastics. With more advanced industrial sorting facilities these could be further sorted; however, due to limitations in space, time, and available resources, these items were categorized as landfill waste for this audit.

Conclusion and Recommendations

The Riddell Centre waste audit revealed that a total of 37.294 kg of waste was generated during a single morning, producing an estimated 31 tonnes CO₂e annually. The majority of this waste consisted of organics and recyclable materials, demonstrating that improper sorting contributes significantly to campus greenhouse gas (GHG) emissions. These findings suggest that with proper sorting practices and expanded diversion systems, GHG emissions could be reduced considerably. By increasing recycling participation and implementing a campus-wide composting program, the University of Regina could take a meaningful step toward its commitment to achieving net-zero emissions.

Overall, the audit indicates that recyclable and compostable materials together accounted for over 60 % of total waste, revealing significant opportunities to reduce emissions through improved sorting and collection systems. These findings reflect a broader challenge seen worldwide. Studies show that while overall recycling rates in developed nations have stagnated, contamination from incorrectly sorted items has increased significantly (Catlin, Leonhardt, Wang, & Manuel, 2020). Addressing this issue on campus through improved waste education, bin design, and enforcement of recycling standards will be essential to improving diversion outcomes. The Riddell Centre commons waste stations currently include clearly labelled sorting categories: Landfill, Mixed Recycling, and Cans/Bottles. However, the waste audit revealed that these sorting guidelines are not being followed consistently by the campus community. Despite being collected from labelled bins, the waste bags typically contained a mix of all categories, suggesting confusion or a lack of awareness regarding proper disposal practices. This contamination of recyclable materials reinforces the need for improved waste education, clearer bin design, and more consistent recycling standards across campus.

One particular item of concern in the waste audit was disposable food containers made of #5 plastics (polypropylene). These containers made up the entirety of this category and were the second largest in weight overall. The ability to recycle #5 plastics is still very limited, with less than 1% of polypropylene recycled worldwide (Plastic Action Centre, 2023). This highlights the need to reduce their use on campus and to explore more sustainable packaging alternatives through collaboration with campus food vendors.

There are plans for implementation of a composting program on the University of Regina campus in coordination with the Circular Innovation Council. This project is still in the early stages, but planning is underway for a phased approach leading to campus wide composting.

This is another step towards a net-zero campus and is a short-term goal within the *Sustainability Action Plan 2022–2027* (University of Regina, 2022). Expanding composting across campus will directly address the large proportion of organic material identified in this audit and represents one of the most effective strategies for reducing landfill emissions in the short term.

This audit represents a critical step in understanding and addressing waste-related emissions on campus. By applying these findings, the University of Regina can make measurable progress in reducing emissions from waste, supporting both the *Sustainability Action Plan 2022–2027* and the long-term goal of achieving net-zero emissions. Continued waste audits will further enhance understanding of campus waste patterns and enable more targeted, data-driven recommendations to guide future sustainability initiatives. Each step taken to improve waste management on campus brings the University closer to a cleaner, more sustainable future and to realizing its vision of a net-zero campus.

References

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