



April 3, 2023

Mr. Steve Copp
Mirror Nova Scotia Limited
600 Otter Lake Drive
Lakeside, NS B3T 2E2

Dear Mr. Copp,

Re: February 2023 Performance Audit
Otter Lake Waste Processing & Disposal Facility

In February 2023, Strum Consulting was retained by Mirror Nova Scotia Limited (Mirror) to oversee a Performance Audit at the Otter Lake Waste Processing & Disposal Facility (Otter Lake) located at 600 Otter Lake Drive in Lakeside, NS.

The purpose of the Performance Audit was to characterize the incoming residential waste stream and assess the percentage of compostable waste in this stream by mass. The audit also captures the incoming percentage of white goods and household hazardous waste (HHW). This letter report provides a summary of the Performance Audit completed on February 16, 2023, and includes a statistical analysis of the quarterly performance audit data collected to date.

Summary

Based on 11 samples being collected during the February 2023 Performance Audit, the total compostable waste percentage per area ranged from a minimum of 5.95% to a maximum of 19.01%. The total weighted Compostable Waste Percentage for the February 2023 Audit is calculated to be 11.28%.

Using the combined data collected during the May 2022, August 2022, November 2022, and February 2023 Performance Audits, the total compostable waste percentage ranged from a minimum of 8.90% to a maximum of 15.15%. For the four quarterly audits completed to date, using the calculated 95% confidence interval, the percentage of Estimated Annual Compostable Waste is calculated to be between 9.31% and 14.72%, with a total weighted Compostable Waste Percentage value of 12.41%. The long-term cumulative goal (i.e., Performance Target) for Otter Lake includes compostable waste not exceeding 10% of the total amount of municipal solid waste landfilled, by mass.

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As additional sampling will be completed during future quarterly audits, it is expected that the statistical data will vary as more audit data becomes available.

Background

In March 2022, Nova Scotia Environment & Climate Change (NSECC) issued an updated Municipal Approval for Otter Lake, allowing the Front End Processor and Waste Stabilization Facility (FEP/WSF) to be deactivated upon the submission and acceptance of a Compliance Plan in accordance with the Approval requirements.

As per the Approval, the Performance Targets for Otter Lake include (but are not limited to) a long term goal of compostable waste not exceeding 10% of the total amount of municipal solid waste landfilled, by mass. Prior to the deactivation of the FEP and WSF, the submitted Compliance Plan included details of how Performance Targets will be achieved. The Compliance Plan also outlines how Performance Audits will be completed as a means to quantify the presence of compostable waste being received at Otter Lake. White goods and HHW were added to the audits based on comments received from NSECC after their review of the draft Compliance Plan.

Given the above, quarterly Performance Audits will be completed to characterize the composition of compostable waste in the incoming residential waste stream.

Methodology

The methodology followed for the February 2023 Performance Audit reflects best practices identified in the Divert NS Waste Audit Manual and Field Procedures Guide (2017), as well as site specific processes established by Halifax Regional Municipality (HRM), and is summarized below.

Sample Load Identification

Residential curbside collection is divided into eight collection areas in HRM and condominium properties which are also considered to be residential. The geographic descriptions of the various areas are described in Table A, below.

Table A: Collection Area Descriptions

Waste Collection Area	Area Description
1	Halifax (former city limits); Spryfield
2	Dartmouth (former city limits)
3	Bedford; Hammonds Plains; Pockwock
4	Beechville-Timberlea; Herring Cove; Prospect; Peggy's Cove; St. Margaret's Bay to Hubbards
5	Sackville; Beaver Bank; Fall River; Waverley, Wellington; Dutch Settlement
6	Cole Harbour; Westphal; Cherry Brook; Eastern Passage; Cow Bay
7	Porters Lake; Lawrencetown; Chezzetcook; Lake Echo; Preston
8	Middle Musquodoboit; Musquodoboit Harbour; Elderbank; Sheet Harbour; Eastern Shore
Condos	Multi-residential style properties located in various communities

Based on residential curbside collection schedules for each specific collection area and the scheduled audit date and time, sample loads are selected ahead of time by HRM staff. A random number generator is used to choose which vehicle would be sampled.

The Alberta Provincial Waste Characterization Framework (2005) was reviewed and used to guide the number and weight of the samples to be collected. A minimum annual sample number of 40 samples is recommended, and as such, one sample from six curbside collection areas (Areas 1, 2, 4, 6, 7, and 8), two samples from two collection areas (Areas 3 and 5), and one sample from condos, for a total of 11 samples, were assessed as part of the February 2023 Performance Audit.

The selected loads were visually inspected at the tip face upon arrival and photographs were taken as shown in the attached photo log. Photographs from previous audits have also been included. The following information was recorded for each load:

- Collection vehicle and route numbers
- Date/Time of arrival
- Date/Time sample taken
- Gross and tare weight of truck
- Weight of sample
- Number/type of bulky items observed
- Names of persons taking the sample
- Date/Time of sorting

Sample Size

Photographs of the auditing process are provided as Attachment 1. Once emptied from the vehicle, multiple sections of the load were selected in order to draw a sample that was representative of the load. Each sample was to contain a mix of clear and black bags. Containers shown in Photo 6 (Attachment 1) were used to collect a sample between 90 and 135 kg.

Records documenting the identifying information of each vehicle sampled (scale tickets - Attachment 2) and the Performance Audit Record field data sheets (Attachment 3) are also attached to this report.

Material Categories

The categories that were used to define the different types of compostable waste are consistent with the Approval and are outlined below in Table B.

Table B: Compostable Waste Sorting Categories

Category	Sub-Category	Examples
Fibre	Newsprint/Paper	The Chronicle Herald, The Coast, Masthead News, The Cobequid/Dartmouth/Cole Harbour Wire, flyers
	Corrugated Cardboard/Boxboard	Consumer boxes (e.g., from appliances, storage, filing, and shipping)

Category	Sub-Category	Examples
Organics	Food Waste (Putrescible)	Whole vegetables, fruit, meat, fish, leftover food waste, eggshells, peels, oils, bones, fat, packaged food if most of it consists of food
	Yard Waste	Grass, leaves, brush, branches, wood chips, soil

Materials which did not fall into one of the above noted categories were counted, weighed, and categorized as one of the following:

- Other garbage
- HHW including lead-acid (automotive) batteries, post-consumer paint products, ethylene glycol, used oil, used glycol, used oil filters, glycol containers, and oil containers.
- White goods (items such as toasters, microwaves, and coffee makers that would be mostly composed of metal materials that can be disposed of in garbage bags). It should be noted that the majority of white goods are not marketable from a recycling perspective.

Sorting Procedure

The sorting team consisted of several Mirror staff. All staff were briefed on the sorting protocols, including familiarity with example materials for each sorting category. Strum staff were designated as “Lead” and responsible for quality control and data collection.

The audit space consisted of an open area set up with tables for sorting waste materials, containers clearly labeled for each of the waste categories, and digital scales for weighing the waste materials. The containers used for sorting were weighed prior to commencing the audit and recorded on the data sheets to allow for net sample weights to be determined.

To maintain consistency, the Lead was responsible for weighing and recording the data on dedicated data sheets for each area, each time a container was filled. The process continued for each respective area until the full sample was properly sorted and weighed.

Previous Assessments

An Initial Performance Audit was completed in May 2022 as detailed in the Initial Performance Audit report (dated June 22, 2022). Using the data collected during the May 2022 Performance Audit, the total compostable waste percentage ranged from a minimum of 3.27% to a maximum of 15.4%. For the May 2022 Waste Audit, the total weighted Compostable Waste Percentage was calculated as 8.01%.

Additional Performance Audits were completed in August 2022 (report dated November 4, 2022) and November 2022 (report dated February 2, 2023). Using the combined data collected during the May 2022, August 2022, and November 2022 Performance Audits, the total compostable waste percentage ranged from a minimum of 8.34% to a maximum of 16.68%. For the May, August, and November 2022 Waste Audits, the total weighted Compostable Waste Percentage was calculated as 12.45%.

Further details of the May 2022, August 2022, and November 2022 Performance Audits are provided in the above-noted reports.

February 2023 Performance Audit Summary

A summary of the February 2023 Performance Audit completed at Otter Lake is provided below in Table C. As previously mentioned, the February 2023 Performance Audit field data sheets containing the data collected respective to each waste collection area during the audit are attached to this report as Attachment 3.

Table C: February 2023 Performance Audit Results

Waste Collection Area	Category Percentage (%)							
	Garbage/Residue	HHW	White Goods	Fibre - Newsprint/Paper	Fibre - Corrugated Cardboard	Organics - Food/Putrescible Waste	Organics - Yard Waste	Total Compostable Waste
1	89.01%	0.00%	1.76%	2.53%	3.52%	2.97%	0.00%	9.02%
2	91.18%	0.00%	0.49%	1.57%	1.47%	5.00%	0.00%	8.04%
3A	78.54%	0.00%	1.46%	3.09%	1.80%	15.02%	0.00%	19.91%
3B	81.52%	2.90%	0.36%	1.30%	1.09%	12.54%	0.07%	15.00%
4	88.46%	0.22%	0.99%	1.98%	4.07%	3.85%	0.00%	9.90%
5A	83.00%	0.00%	0.20%	3.80%	2.70%	9.40%	0.00%	15.90%
5B	88.76%	0.00%	0.56%	1.24%	2.25%	6.74%	0.00%	10.23%
6	82.25%	0.36%	4.26%	2.96%	2.60%	7.10%	0.00%	12.66%
7	89.36%	1.60%	1.91%	1.06%	2.23%	2.66%	0.00%	5.95%
8	85.71%	0.08%	2.94%	3.89%	1.27%	5.71%	0.00%	10.87%
Condos	74.69%	0.12%	0.86%	3.58%	4.57%	10.49%	0.37%	19.01%

Notes:

1. Total compostable waste percentage based on aggregate of four compostable waste category percentages.

Using the data in Table C above, the total compostable waste percentage ranged from a minimum of 5.95% (Area 7) to a maximum of 19.91% (Area 3A), based on the 11 samples collected during the February 2023 Performance Audit.

Average Total Compostable Waste Percentage

A summary of the Total Compostable Waste percentage for the May 2022, August 2022, November 2022, and February 2023 Performance Audits completed at Otter Lake is provided below in Table D. Using this data, the Average Total Compostable Waste percentage was calculated for each area.

Table D: Average Total Compostable Waste Percentage

Waste Collection Area	May 2022 Total Compostable Waste	August 2022 Total Compostable Waste	Nov.2022 Total Compostable Waste	Nov.2022 Total Compostable Waste - Secondary Samples	Feb. 2023 Total Compostable Waste	Feb. 2023 Total Compostable Waste - Secondary Samples	Average Total Compostable Waste Per Area
1	15.40%	13.09%	23.22%	15.00%	9.02%	-	15.15%
2	10.44%	20.52%	15.58%	17.92%	8.04%	-	14.50%
3	3.87%	19.32%	14.84%	-	19.91%	15.00%	14.59%
4	3.27%	12.39%	11.74%	-	9.90%	-	9.30%
5	6.34%	12.03%	14.01%	-	15.90%	10.23%	11.70%
6	3.39%	5.98%	15.66%	-	12.66%	-	9.42%
7	3.96%	7.80%	17.87%	-	5.95%	-	8.90%
8	6.90%	16.40%	8.02%	-	10.87%	-	10.55%
Condos	10.54%	13.20%	12.23%	-	19.01%	-	13.75%

Notes:

1. Average total compostable waste percentage per area based on May 2022, August 2022, November 2022, and February 2023 Waste Audit Total Compostable Waste percentages.
2. Secondary samples collected from Areas 1 and 2 during November 2022 Waste Audit.
3. Secondary samples collected from Areas 3 and 5 during February 2023 Waste Audit.

Using the data in Table D above, the average total compostable waste percentage ranges from a minimum of 8.90% (Area 7) to a maximum of 15.15% (Area 1), based on a total of 40 samples being collected during the May 2022, August 2022, November 2022, and February 2023 Performance Audits.

Overall Compostable Waste

February 2023

As shown in Table E below, given the February 2023 total compostable waste percentage per area and the three-year average of waste tonnage per area, the estimated compostable waste tonnage per year has been calculated. Using the total of the Estimated Annual Compostable Waste (5520.05 tonnes) and the three-year waste average total (48,923.19 tonnes), the weighted Compostable Waste Percentage is calculated to be 11.28%. Supporting data is provided as Table 1 (Attachment 4).

Table E: Estimated Annual Compostable Waste based on February 2023 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	February 2023 Total Compostable Waste	Estimated Annual Compostable Waste (Tonnes)
1	9918.30	9.02%	894.63
2	6866.42	8.04%	552.06
3	4358.45	17.46%*	760.99
4	5304.70	9.90%	525.17
5	8372.02	13.07%*	1094.22
6	5130.17	12.66%	649.48
7	2962.13	5.95%	176.25
8	3383.67	10.87%	367.80
Condos	2627.33	19.01%	499.46
TOTAL	48923.19	N/A	5520.05
Weighted Compostable Waste Percentage = (5520.05/48923.19) X 100 = 11.28%			

Notes:

1. Data used to calculate three year average provided by Mirror and included tonnage from the fiscal years 2019/2020, 2020/2021, and 2021/2022.
2. * February 2023 Total Compostable Waste percentages for Areas 3 and 5 are based on average of the two samples (A and B) collected from each respective area during the February 2023 waste audit.

Based on the data in Table E above, the Estimated Annual Compostable Waste per area ranges from a minimum of 176.25 tonnes (Area 7) to a maximum of 1094.22 tonnes (Area 5), with a mean of 613.34 tonnes.

May 2022, August 2022, November 2022, and February 2023

As shown in Table F below, given the average (May 2022, August 2022, November 2022, and February 2023) total compostable waste percentage per area and the three-year average of waste tonnage per area, the estimated compostable waste tonnage per year has been calculated. Using the totals of the Estimated Annual Compostable Waste (6072.14 tonnes) and the three-year waste average total (48,923.19 tonnes), the weighted Compostable Waste Percentage is calculated to be 12.41%. Supporting data is provided as Table 2 (Attachment 4).

Table F: Estimated Annual Compostable Waste based on May 2022, August 2022, November 2022, and February 2023 Data

Waste Collection Area	Three Year Waste Average (Tonnes)	Three Year Waste Average (% Total)	Average Total Compostable Waste % Per Area	Estimated Annual Compostable Waste (Tonnes)
1	9918.30	20.27%	15.15%	1502.62
2	6866.42	14.04%	14.50%	995.63
3	4358.45	8.91%	14.59%	635.90
4	5304.70	10.84%	9.30%	493.34
5	8372.02	17.11%	11.70%	979.53
6	5130.17	10.49%	9.42%	483.26
7	2962.13	6.05%	8.90%	263.63
8	3383.67	6.92%	10.55%	356.98
Condos	2627.33	5.37%	13.75%	361.26
TOTAL	48923.19	100.00%	N/A	6072.14
Compostable Waste Percentage = (6072.14/48923.19) X 100 = 12.41%				

Notes:

1. Data used to calculate three year average provided by Mirror and included tonnage from the fiscal years 2019/2020, 2020/2021, and 2021/2022.

Based on the data in Table F above, the Estimated Annual Compostable Waste per area ranges from a minimum of 263.63 tonnes (Area 7) to a maximum of 1502.62 tonnes (Area 1), with a mean of 674.68 tonnes.

Descriptive Statistics

A descriptive statistical analysis was completed on the Estimated Annual Compostable Waste tonnage and the Estimated Annual Food/Putrescible Waste calculated per area from the May 2022, August 2022, November 2022, and February 2023 Performance Audits. The statistical analysis was completed using the Microsoft Excel Analysis ToolPak Descriptive Statistics analysis tool. Supporting data for the statistical analysis is provided as Tables 3 - 8 (Attachment 4).

Compostable Waste

At 95% confidence interval, the Estimated Average Annual Compostable Waste tonnage per area is calculated to be between 505.88 tonnes (lower bound) and 799.99 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (147.05) from the mean (652.93 tonnes).

By multiplying the lower bound (505.88 tonnes) and the upper bound (799.99 tonnes) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Compostable Waste would have a calculated range from 4552.92 tonnes to 7199.91 tonnes. By dividing the lower and upper range of the Total Estimated Annual Compostable Waste by the three-year waste average total (48,923.19 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Compostable Waste is calculated to be between 9.31% and 14.72%.

Food/Putrescible Waste

At 95% confidence interval, the Estimated Average Annual Food/Putrescible Waste tonnage per area is calculated to be between 268.70 tonnes (lower bound) and 469.16 tonnes (upper bound). The confidence interval was calculated by subtracting/adding the calculated 95% confidence level (100.23) from the mean (368.93 tonnes).

By multiplying the lower bound (268.70 tonnes) and the upper bound (469.16 tonnes) of the 95% confidence interval by nine (for each area), the Total Estimated Annual Food/Putrescible Waste would have a calculated range from 2418.26 tonnes to 4222.42 tonnes. By dividing the lower and upper range of the Total Estimated Annual Food/Putrescible Waste by the three-year waste average total (48,923.19 tonnes), and multiplying the values by 100%, the percentage of Estimated Annual Food/Putrescible Waste is calculated to be between 4.94% and 8.63%. The weighted Food waste percentage is calculated to be 7.16%. Supporting data is provided as Table 6 (Attachment 4).

The above noted statistical analyses are based on a total of 40 samples collected during the May 2022, August 2022, November 2022, and February 2023 Performance Audits. As additional sampling will be completed during future audits, it is expected that the statistical data will vary as more data becomes available.

Closure

This report was prepared by [REDACTED], Project Manager. Should additional information become available, Strum requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report.

This Report and any use of the Report is subject to the terms herein (see attached Statement of Qualifications and Limitations).

If you have any questions, please contact us.

Thank you,



Statement of Qualifications and Limitations

This Report (the "Report") has been prepared by Strum Consulting ("Consultant") for the benefit of Mirror Nova Scotia Limited ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations, and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations")
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to consultant which has not been independently verified
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- was prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental, or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental, or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

The Report is to be treated as confidential and may not be used or relied upon by third parties, except:

- as agreed in writing by Consultant and Client
- as required by law
- for use by governmental reviewing agencies

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss, or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

ATTACHMENT 1
PHOTOGRAPH LOG



Photo 1: Waste collection vehicle unloading waste collected from HRM collection Area 1. Photo taken February 10, 2023.



Photo 2: Waste audit sample collected from HRM collection Area 1. Photo taken February 10, 2023.



Photo 3: Waste pile from HRM collections Area 2. Photo taken February 13, 2023.



Photo 4: Waste audit sample from HRM collection Area 2. Photo taken February 13, 2023.



Photo 5: Waste collection vehicle unloading waste collected from HRM collection Area 3. Photo taken February 13, 2023.



Photo 6: Waste audit sample from HRM collection Area 3 Load 2. Photo taken February 16, 2023.



Photo 7: Waste audit sample from HRM collection Area 3 Load 3. Photo taken February 16, 2023.



Photo 8: Waste collection vehicle unloading waste collected from HRM collection Area 4. Photo taken February 13, 2023.



Photo 9: Waste audit sample from HRM collection Area 4.
Photo taken Februaury 13, 2023.



Photo 10: Waste collection vehicle unloading waste collected from HRM collection Area 5. Photo taken February 7, 2022.



Photo 11: Waste audit sample from HRM collection Area 5.
Photo taken Februaury 16, 2023.



Photo 12: Waste pile from HRM collection Area 6.
Photo taken Februaury 16, 2023.



Photo 13: Waste collection vehicle unloading waste collected from HRM collection Area 7. Photo taken February 15, 2023.



Photo 14: Waste sample from HRM collection Area 7. Photo taken February 16, 2023.



Photo 15: Waste collection vehicle unloading waste collected from HRM collection Area 8. Photo taken February 15, 2023.



Photo 16: Waste audit sample from HRM collection Area 8. Photo taken February 16, 2023.



Photo 17: Waste collection vehicle unloading waste collected from HRM collection Area 9 (Condos). Photo taken February 15, 2023.

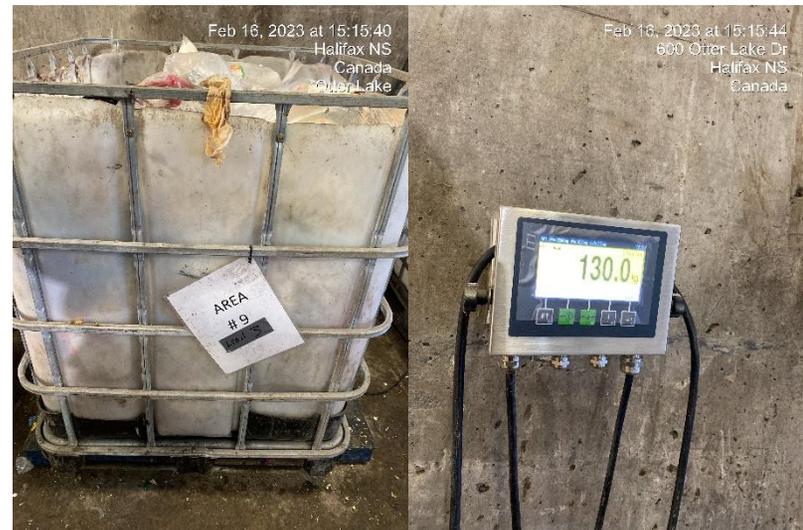


Photo 18: Waste audit sample from HRM collection Area 9 (Condos). Photo taken February 16, 2023.

ATTACHMENT 2
SCALE TICKETS

Halifax Regional Municipality

Vehicle ID: RE1034
License Plate: 56-949-D
Waste Type: residential
Origin: 1 HALIFAX
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083715
02/10/2023 12:00:18
Clerk: DMS

Gross Weight: 23,710 (kg)
Tare Weight: 16,590 (kg)
Net Weight: 7,120 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE1035
License Plate: 55-579-D
Waste Type: residential
Origin: 2 DARTMOUTH
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083744
02/13/2023 11:16:34
Clerk: Shelley

Gross Weight: 20,770 (kg)
Tare Weight: 16,560 (kg)
Net Weight: 4,210 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE1036
License Plate: 56-925-D
Waste Type: residential
Origin: 3 BEDFORD/HAMMONDS PLAINS
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083751
02/13/2023 13:01:00
Clerk: Shelley

Gross Weight: 23,670 (kg)
Tare Weight: 16,440 (kg)
Net Weight: 7,230 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE1036
License Plate: 56-925-D
Waste Type: residential
Origin: 3 BEDFORD/HAMMONDS PLAINS
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083775
02/14/2023 14:51:22
Clerk: Shelley

Gross Weight: 24,310 (kg)
Tare Weight: 16,570 (kg)
Net Weight: 7,740 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: GFL012
License Plate: 45357D
Waste Type: residential
Origin: 4 WESTERN COUNTY
Invoice: 0402150
GFL Environmental Inc

Scale Slip: 083769
02/13/2023 15:39:24
Clerk: Shelley

Gross Weight: 24,680 (kg)
Tare Weight: 16,840 (kg)
Net Weight: 7,840 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2086
License Plate: 44-069-D
Waste Type: residential
Origin: 5 SACKVILLE/FALL RIVER
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083615
02/07/2023 13:29:24
Clerk: Shelley

Gross Weight: 25,410 (kg)
Tare Weight: 16,100 (kg)
Net Weight: 9,310 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE1033
License Plate: 56-130-D
Waste Type: residential
Origin: 5 SACKVILLE/FALL RIVER
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083643
02/08/2023 12:09:30
Clerk: Shelley

Gross Weight: 24,020 (kg)
Tare Weight: 16,670 (kg)
Net Weight: 7,350 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE9056
License Plate: 58-029-D
Waste Type: residential
Origin: 6 COLE HARBOUR/EASTERN PASSAGE
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083644
02/08/2023 12:12:10
Clerk: Shelley

Gross Weight: 26,250 (kg)
Tare Weight: 16,890 (kg)
Net Weight: 9,360 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: MW6829
License Plate: 56482D
Waste Type: residential
Origin: PRESTON/LAWRENCETOWN/LAKE ECHO
Invoice: 0188466
MILLER WASTE SYSTEMS

Scale Slip: 083798
02/15/2023 13:44:51
Clerk: Shelley

Gross Weight: 23,290 (kg)
Tare Weight: 20,530 (kg)
Net Weight: 2,760 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: RE2017
License Plate: 57-441-D
Waste Type: residential
Origin: 8 EASTERN COUNTY
Invoice: 0400927
Royal Environmental Group

Scale Slip: 083795
02/15/2023 13:14:36
Clerk: Shelley

Gross Weight: 21,290 (kg)
Tare Weight: 16,560 (kg)
Net Weight: 4,730 (kg)

Total: \$0.00
\$0.00

Halifax Regional Municipality

Vehicle ID: GFL095
License Plate: 511 86D
Waste Type: residential
Origin: HALIFAX CONDOS
Invoice: 0402150
GFL Environmental Inc

Scale Slip: 083810
02/15/2023 15:12:23
Clerk: Shelley

Gross Weight: 17,670 (kg)
Tare Weight: 15,450 (kg)
Net Weight: 2,220 (kg)

Total: \$0.00
\$0.00

ATTACHMENT 3
FIELD DATA SHEETS

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 1 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	RE1034	
Collection Area	1 Halifax	
Date	10-Feb-23	
Ticket Time	12:00pm	
Gross Weight	23,710	KG
Tare Weight	16,590	KG
Net Weight	7120	KG

Weight of Gross Sample 141 **KG**
Weight of Tote Bin 50 **KG** **Date of Audit of Sample** 16-Feb-23
Net Sample of Trash 91 **KG** **Sample Audit Time Started** 9am
Number of Bulkies Observed - **Sample Audit Time Completed** 9:20am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.000	131.000	-	81.000
Fibre - Newsprint/Paper	1.100	3.400	-	2.300
Fibre - OCC	2.200	2.500	2.900	3.200
Food/Putrescible Waste	1.100	3.800	-	2.700
Yard Waste	0.000	-	-	0.000
HSW	0.000	-	-	0.000
White Goods	1.100	2.700	-	1.600

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	131.000	50.000	81.000	89.011
Fibre - Newsprint/Paper	3.400	1.100	2.300	2.527
Fibre - OCC	5.400	2.200	3.200	3.516
Food/Putrescible Waste	3.800	1.100	2.700	2.967
Yard Waste	0.000	0.000	0.000	0.000
HSW	0.000	0.000	0.000	0.000
White Goods	2.700	1.100	1.600	1.758
Lost or Gained Mass	Combined Weight Following Sorting			1.06
	142.50			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 2 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	RE1035
Collection Area	2 Dartmouth
Date	13-Feb-23
Ticket Time	11:16am
Gross Weight	20,770
Tare Weight	16,560
Net Weight	4210

KG
KG
KG

Weight of Gross Sample 152.5 **KG**

Weight of Tote Bin 50.5 **KG** **Date of Audit of Sample** 16-Feb-23

Net Sample of Trash 102 **KG** **Sample Audit Time Started** 9:25am

Number of Bulkies Observed - **Sample Audit Time Completed** 10:30am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.500	143.500	-	93.000
Fibre - Newsprint/Paper	1.100	2.700	-	1.600
Fibre - OCC	2.200	1.600	2.100	1.500
Food/Putrescible Waste	1.100	6.200	-	5.100
Yard Waste	0.000	-	-	0.000
HSW	0.000	-	-	0.000
White Goods	1.100	1.600	-	0.500

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	143.500	50.500	93.000	91.176
Fibre - Newsprint/Paper	2.700	1.100	1.600	1.569
Fibre - OCC	3.700	2.200	1.500	1.471
Food/Putrescible Waste	6.200	1.100	5.100	5.000
Yard Waste	0.000	0.000	0.000	0.000
HSW	0.000	0.000	0.000	0.000
White Goods	1.600	1.100	0.500	0.490
Lost or Gained Mass	Combined Weight Following Sorting			-0.656
	151.500			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 3 Load 2 Bin 1 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	RE1036
Collection Area	3 Bedford/Hammonds Plains
Date	13-Feb-23
Ticket Time	1:01pm
Gross Weight	23,670
Tare Weight	16,440
Net Weight	7230

KG
KG
KG

Weight of Gross Sample 166.5 KG
Weight of Tote Bin 50 KG **Date of Audit of Sample** 16-Feb-23
Net Sample of Trash 116.5 KG **Sample Audit Time Started** 10:25am
Number of Bulkies Observed - **Sample Audit Time Completed** 11am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.000	141.500	-	91.500
Fibre - Newsprint/Paper	1.100	4.700	-	3.600
Fibre - OCC	1.100	3.200	-	2.100
Food/Putrescible Waste	2.200	10.300	9.400	17.500
Yard Waste	0.000	-	-	0.000
HSW	0.000	-	-	0.000
White Goods	1.100	2.800	-	1.700

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	141.500	50.000	91.500	78.541
Fibre - Newsprint/Paper	4.700	1.100	3.600	3.090
Fibre - OCC	3.200	1.100	2.100	1.803
Food/Putrescible Waste	19.700	2.200	17.500	15.021
Yard Waste	0.000	0.000	0.000	0.000
HSW	0.000	0.000	0.000	0.000
White Goods	2.800	1.100	1.700	1.459
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	166.500			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 3 Load 3 Bin 2 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE1036	
Collection Area	3 Bedford/Hammonds Plains	
Date	14-Feb-23	
Ticket Time	2:51pm	
Gross Weight	24,310	KG
Tare Weight	16,570	KG
Net Weight	7740	KG

Weight of Gross Sample 189 **KG**

Weight of Tote Bin 51 **KG** **Date of Audit of Sample** 16-Feb-23

Net Sample of Trash 138 **KG** **Sample Audit Time Started** 11am

Number of Bulkies Observed - **Sample Audit Time Completed** 11:40am

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)				Net Sample (KG)
		1	2	3	4	
Garbage/Residue	51.000	82.500	81.000	0.000	0.000	112.500
Fibre - Newsprint/Paper	2.200	1.200	2.800	-	-	1.800
Fibre - OCC	2.200	1.300	2.400	-	-	1.500
Food/Putrescible Waste	3.300	1.300	9.100	10.200	-	17.300
Yard Waste	1.100	1.200	-	-	-	0.100
HSW	1.100	5.100	-	-	-	4.000
White Goods	1.100	1.600	-	-	-	0.500

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	81.000	51.000	112.500	81.522
Fibre - Newsprint/Paper	4.000	2.200	1.800	1.304
Fibre - OCC	3.700	2.200	1.500	1.087
Food/Putrescible Waste	20.600	3.300	17.300	12.536
Yard Waste	1.200	1.100	0.100	0.072
HSW	5.100	1.100	4.000	2.899
White Goods	1.600	1.100	0.500	0.362
Lost or Gained Mass	Combined Weight Following Sorting 189.000			0.000

Notes: Columns added for extra sorted bins due to this sample being split in to Black and clear for the monthly Waste audit.

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 4 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	GFL012
Collection Area	4 Western County
Date	13-Feb-23
Ticket Time	3:39pm
Gross Weight	24,680
Tare Weight	16,840
Net Weight	7840

KG
KG
KG

Weight of Gross Sample 142 **KG**

Weight of Tote Bin 51 **KG** **Date of Audit of Sample** Feb 16, 203

Net Sample of Trash 91 **KG** **Sample Audit Time Started** 11:43am

Number of Bulkies Observed - **Sample Audit Time Completed** 12:45pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.000	131.500	-	80.500
Fibre - Newsprint/Paper	2.200	2.500	1.500	1.800
Fibre - OCC	3.300	2.400	2.400 2.200	3.700
Food/Putrescible Waste	1.100	4.600	-	3.500
Yard Waste	0.000	-	-	0.000
HSW	1.100	1.300	-	0.200
White Goods	1.100	2.000	-	0.900

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	131.500	51.000	80.500	88.462
Fibre - Newsprint/Paper	4.000	2.200	1.800	1.978
Fibre - OCC	4.800	3.300	3.700	4.066
Food/Putrescible Waste	4.600	1.100	3.500	3.846
Yard Waste	0.000	0.000	0.000	0.000
HSW	1.300	1.100	0.200	0.220
White Goods	2.000	1.100	0.900	0.989
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	142.000			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 5 Bin 1 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE2086
Collection Area	5 Sackville/Fall River
Date	2-Feb-23
Ticket Time	12:09pm
Gross Weight	24,020
Tare Weight	16,670
Net Weight	7350

KG
KG
KG

Weight of Gross Sample 151 **KG**
Weight of Tote Bin 51 **KG** **Date of Audit of Sample** 16-Feb-23
Net Sample of Trash 100 **KG** **Sample Audit Time Started** 12:45pm
Number of Bulkies Observed - **Sample Audit Time Completed** 1:10pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	51.000	134.000	-	83.000
Fibre - Newsprint/Paper	2.200	1.800	4.200	3.800
Fibre - OCC	1.100	3.800	-	2.700
Food/Putrescible Waste	2.200	3.300	8.300	9.400
Yard Waste	0.000	-	-	0.000
HSW	0.000	-	-	0.000
White Goods	1.100	1.300	-	0.200

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	134.000	51.000	83.000	83.000
Fibre - Newsprint/Paper	6.000	2.200	3.800	3.800
Fibre - OCC	3.800	1.100	2.700	2.700
Food/Putrescible Waste	0.000	0.000	9.400	9.400
Yard Waste	1.300	1.100	0.000	0.000
HSW	0.000	0.000	0.000	0.000
White Goods	1.300	1.100	0.200	0.200
Lost or Gained Mass	Combined Weight Following Sorting			-0.331
	150.500			

Notes: Two bins for Collection Area 5, no load numbers indicated on totes.

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 5 Bin 2 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	RE2086
Collection Area	5 Sackville/Fall River
Date	7-Feb-23
Ticket Time	1:29pm
Gross Weight	25,410
Tare Weight	16,100
Net Weight	9310

KG
KG
KG

Weight of Gross Sample 138.5 KG
Weight of Tote Bin 49.5 KG **Date of Audit of Sample** 16-Feb-23
Net Sample of Trash 89 KG **Sample Audit Time Started** 1:10pm
Number of Bulkies Observed - **Sample Audit Time Completed** 1:35pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.500	128.500	-	79.000
Fibre - Newsprint/Paper	2.200	1.600	1.700	1.100
Fibre - OCC	2.200	1.600	2.600	2.000
Food/Putrescible Waste	1.100	7.100	-	6.000
Yard Waste	0.000	-	-	0.000
HSW	0.000	-	-	0.000
White Goods	1.100	1.600	-	0.500

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	128.500	49.500	79.000	88.764
Fibre - Newsprint/Paper	3.300	2.200	1.100	1.236
Fibre - OCC	4.200	2.200	2.000	2.247
Food/Putrescible Waste	7.100	1.100	6.000	6.742
Yard Waste	0.000	0.000	0.000	0.000
HSW	0.000	0.000	0.000	0.000
White Goods	1.600	1.100	0.500	0.562
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	138.500			

Notes: Two bins for Collection Area 5, no load numbers indicated on totes.

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 6 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	RE9056
Collection Area	6 Cole Harbour/Eastern Passage
Date	8-Feb-23
Ticket Time	12:12pm
Gross Weight	26,250
Tare Weight	16,890
Net Weight	9360

KG
KG
KG

Weight of Gross Sample 134 **KG**

Weight of Tote Bin 49.5 **KG** **Date of Audit of Sample** 16-Feb-23

Net Sample of Trash 84.5 **KG** **Sample Audit Time Started** 1.35pm

Number of Bulkies Observed - **Sample Audit Time Completed** 2:05pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.500	119.000	-	69.500
Fibre - Newsprint/Paper	1.100	3.600	-	2.500
Fibre - OCC	2.200	1.700	2.700	2.200
Food/Putrescible Waste	2.200	3.900	4.300	6.000
Yard Waste	0.000	-	-	0.000
HSW	1.100	1.400	-	0.300
White Goods	1.100	4.700	-	3.600

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	119.000	49.500	69.500	82.249
Fibre - Newsprint/Paper	3.600	1.100	2.500	2.959
Fibre - OCC	4.400	2.200	2.200	2.604
Food/Putrescible Waste	8.200	2.200	6.000	7.101
Yard Waste	0.000	0.000	0.000	0.000
HSW	1.400	1.100	0.300	0.355
White Goods	4.700	1.100	3.600	4.260
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	134.000			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 7 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	MW6829
Collection Area	7 Preston/ Lawrencetown/ Lake Echo
Date	15-Feb-23
Ticket Time	1:44pm
Gross Weight	23,290
Tare Weight	20,530
Net Weight	2760

KG
KG
KG

Weight of Gross Sample 143.5 KG
Weight of Tote Bin 49.5 KG **Date of Audit of Sample** 16-Feb-23
Net Sample of Trash 94 KG **Sample Audit Time Started** 2:05pm
Number of Bulkies Observed - **Sample Audit Time Completed** 2:30pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Carbage/Residue	49.500	133.500	-	84.000
Fibre - Newsprint/Paper	2.200	1.500	1.700	1.000
Fibre - OCC	2.200	2.800	1.500	2.100
Food/Putrescible Waste	1.100	3.600	-	2.500
Yard Waste	0.000	-	-	0.000
HSW	1.100	2.600	-	1.500
White Goods	1.100	2.900	-	1.800

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Carbage/Residue	133.500	49.500	84.000	89.362
Fibre - Newsprint/Paper	3.200	2.200	1.000	1.064
Fibre - OCC	4.300	2.200	2.100	2.234
Food/Putrescible Waste	3.600	1.100	2.500	2.660
Yard Waste	0.000	0.000	0.000	0.000
HSW	2.600	1.100	1.500	1.596
White Goods	2.900	1.100	1.800	1.915
Lost or Gained Mass	Combined Weight Following Sorting			0.000
	143.500			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 8 **Number of Sorters** 6

Weighscale Ticket Information

Truck Number/ID	RE2017
Collection Area	8 Eastern County
Date	15-Feb-23
Ticket Time	1:14pm
Gross Weight	21,290
Tare Weight	16,560
Net Weight	4730

KG
KG
KG

Weight of Gross Sample 176 **KG**

Weight of Tote Bin 50 **KG** **Date of Audit of Sample** 16-Feb-23

Net Sample of Trash 126 **KG** **Sample Audit Time Started** 2:30pm

Number of Bulkies Observed - **Sample Audit Time Completed** 3:15pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	50.000	158.000	-	108.000
Fibre - Newsprint/Paper	2.200	5.000	2.100	4.900
Fibre - OCC	1.100	2.700	-	1.600
Food/Putrescible Waste	1.100	8.300	-	7.200
Yard Waste	0.000	-	-	0.000
HSW	1.100	1.200	-	0.100
White Goods	1.100	4.800	-	3.700

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	158.000	50.000	108.000	85.714
Fibre - Newsprint/Paper	7.100	2.200	4.900	3.889
Fibre - OCC	2.700	1.100	1.600	1.270
Food/Putrescible Waste	8.300	1.100	7.200	5.714
Yard Waste	0.000	0.000	0.000	0.000
HSW	1.200	1.100	0.100	0.079
White Goods	4.800	1.100	3.700	2.937
Lost or Gained Mass	Combined Weight Following Sorting			-0.284
	175.500			

Notes:

Performance Audit Record

Date February 16, 2023 **Name of Supervisor** Patrick Avery

Area Area 9 **Number of Sorters** 5

Weighscale Ticket Information

Truck Number/ID	GFL095
Collection Area	9 Halifax Condos
Date	15-Feb-23
Ticket Time	3:12pm
Gross Weight	17,670
Tare Weight	15,450
Net Weight	2220

KG
KG
KG

Weight of Gross Sample 130 **KG**

Weight of Tote Bin 49 **KG** **Date of Audit of Sample** 16-Feb-23

Net Sample of Trash 81 **KG** **Sample Audit Time Started** 3:15pm

Number of Bulkies Observed - **Sample Audit Time Completed** 3:40pm

Material	Empty Bin(s) Weight (KG)	Total Separated Sample Weights (KG)		Net Sample (KG)
		1	2	
Garbage/Residue	49.000	109.500	-	60.500
Fibre - Newsprint/Paper	2.200	1.700	3.400	2.900
Fibre - OCC	2.200	3.000	2.900	3.700
Food/Putrescible Waste	1.100	9.600	-	8.500
Yard Waste	1.100	1.400	-	0.300
HSW	1.100	1.200	-	0.100
White Goods	1.100	1.800	-	0.700

Material	Gross Sample (KG)	Total Weight of Bins (KG)	Net Sample (KG)	Net Waste Percentage (%)
Garbage/Residue	109.500	49.000	60.500	74.691
Fibre - Newsprint/Paper	5.100	2.200	2.900	3.580
Fibre - OCC	5.900	2.200	3.700	4.568
Food/Putrescible Waste	9.600	1.100	8.500	10.494
Yard Waste	1.400	1.100	0.300	0.370
HSW	1.200	1.100	0.100	0.123
White Goods	1.800	1.100	0.700	0.864
Lost or Gained Mass	Combined Weight Following Sorting			-1.538
	128.000			

Notes:

ATTACHMENT 4
SUPPORTING DATA

Table 1: Total Compostable Waste Percentage Per Area (February 2023)

Project # 22-8641

Waste Collection Area	% Organics From February 16, 2023 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	9.02%	9918.30	894.63
2	8.04%	6866.42	552.06
3	17.46%	4358.45	760.99
4	9.90%	5304.70	525.17
5	13.07%	8372.02	1094.22
6	12.66%	5130.17	649.48
7	5.95%	2962.13	176.25
8	10.87%	3383.67	367.80
Condos	19.01%	2627.33	499.46
TOTAL		48923.19	5520.05

Mean	11.78%	-	613.34
Min	5.95%	-	176.25
Max	19.01%	-	1094.22

Compostable Waste Percentage	$(5520.05/48923.19)*100\% = 11.28\%$
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Notes: % Organic for Areas 3 and 5 are based on average of the two samples (A and B) collected from each respective area during the February 2023 waste audit.

Table 2: Average Total Compostable Waste Percentage Per Area (May 2022, August 2022, November 2022, and February 2023)

Project # 22-8641

Waste Collection Area	% Organics From May 19, 2022 Baseline Audit	% Organics From August 30, 2022 Waste Audit	% Organics From November 28, 2022 Waste Audit	% Organics From November 28, 2022 Waste Audit Secondary Samples	% Organics From February 16, 2023 Waste Audit	% Organics From February 16, 2023 Waste Audit Secondary Samples	% Organics Average	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
1	15.40%	13.09%	23.22%	15.00%	9.02%	-	15.15%	9918.30	1502.62
2	10.44%	20.52%	15.58%	17.92%	8.04%	-	14.50%	6866.42	995.63
3	3.87%	19.32%	14.84%	-	19.91%	15.00%	14.59%	4358.45	635.90
4	3.27%	12.39%	11.64%	-	9.90%	-	9.30%	5304.70	493.34
5	6.34%	12.03%	14.01%	-	15.90%	10.23%	11.70%	8372.02	979.53
6	3.39%	5.98%	15.66%	-	12.66%	-	9.42%	5130.17	483.26
7	3.96%	7.80%	17.87%	-	5.95%	-	8.90%	2962.13	263.63
8	6.90%	16.40%	8.02%	-	10.87%	-	10.55%	3383.67	356.98
Condos	10.54%	13.20%	12.23%	-	19.01%	-	13.75%	2627.33	361.26
TOTAL								48923.19	6072.14

Mean	11.98%	-	674.68
Min	8.90%	-	263.63
Max	15.15%	-	1502.62

Compostable Waste Percentage	$(6072.14/48923.19)*100\% = 12.41\%$
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Table 3: Estimated Annual Compostable Waste Per Area

Project # 22-8641

Audit	Waste Collection Area	% Organics	Average Waste Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
May 2022 Initial Performance Audit	1	15.40%	9918.30	1527.42
	2	10.44%	6866.42	716.85
	3	3.87%	4358.45	168.67
	4	3.27%	5304.70	173.46
	5	6.34%	8372.02	530.79
	6	3.39%	5130.17	173.96
	7	3.96%	2962.13	117.30
	8	6.90%	3383.67	233.47
	Condos	10.54%	2627.33	276.92
August 2022 Performance Audit	1	13.09%	9918.30	1298.31
	2	20.52%	6866.42	1408.99
	3	19.32%	4358.45	842.05
	4	12.39%	5304.70	657.25
	5	12.03%	8372.02	1007.15
	6	5.98%	5130.17	306.78
	7	7.80%	2962.13	231.05
	8	16.40%	3383.67	554.92
	Condos	13.20%	2627.33	346.81
November 2022 Performance Audit	1	19.11%	9918.30	1895.39
	2	16.75%	6866.42	1150.13
	3	14.84%	4358.45	646.79
	4	11.74%	5304.70	622.77
	5	14.01%	8372.02	1172.92
	6	15.66%	5130.17	803.38
	7	17.87%	2962.13	529.33
	8	8.02%	3383.67	271.37
	Condos	12.23%	2627.33	321.32
February 2023 Performance Audit	1	9.02%	9918.30	894.63
	2	8.04%	6866.42	552.06
	3	17.46%	4358.45	760.99
	4	9.90%	5304.70	525.17
	5	13.07%	8372.02	1094.22
	6	12.66%	5130.17	649.48
	7	5.95%	2962.13	176.25
	8	10.87%	3383.67	367.80
	Condos	19.01%	2627.33	499.46
	Mean	11.70%	-	652.93
	Min	3.27%	-	117.30
	Max	20.52%	-	1895.39

Notes: 1. November 2022 % Organic for Areas 1 and 2 are based on average of the two samples (A and B) collected from each respective area during the November 2022 waste audit.
 2. February 2023 % Organic for Areas 3 and 5 are based on average of the two samples (A and B) collected from each respective area during the February 2023 waste audit.

Table 4: Compostable Waste Descriptive Statistics**Project 22-8641**

Mean	652.9340372
Standard Error	72.43719532
Median	553.491024
Mode	#N/A
Standard Deviation	434.6231719
Sample Variance	188897.3016
Kurtosis	0.624669956
Skewness	0.999647302
Range	1778.086782
Minimum	117.300348
Maximum	1895.38713
Sum	23505.62534
Count	36
Confidence Level(95.0%)	147.0553245
Upper CI	799.9893618
Lower CI	505.8787127

Table 5: Total Food Waste Percentage Per Area (February 2023)

Project # 22-8641

Waste Collection Area	% Food Waste From February 16, 2023 Waste Audit	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Food Waste (Tonnes)
1	2.97%	9918.30	294.57
2	5.00%	6866.42	343.32
3	13.78%	4358.45	600.59
4	3.85%	5304.70	204.23
5	8.02%	8372.02	671.44
6	7.01%	5130.17	359.62
7	2.66%	2962.13	78.79
8	5.71%	3383.67	193.21
Condos	10.49%	2627.33	275.61
TOTAL		48923.19	3021.39

Mean	6.61%	-	335.71
Min	2.66%	-	78.79
Max	13.78%	-	671.44

Food Waste Percentage	$(3021.39/48923.19)*100\% = 6.18\%$
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Notes: % Food Waste for Areas 3 and 5 are based on average of the two samples (A and B) collected from each respective area during the February 2023 waste audit.

Table 6: Average Total Food Waste Percentage Per Area (May 2022, August 2022, November 2022, and February 2023)

Project # 22-8641

Waste Collection Area	% Food Waste From May 19, 2022 Baseline Audit	% Food Waste From August 30, 2022 Waste Audit	% Food Waste From November 28, 2022 Waste Audit	% Food Waste From November 28, 2022 Waste Audit Secondary Samples	% Food Waste From February 16, 2023 Waste Audit	% Food Waste From February 16, 2023 Waste Audit Secondary Samples	% Food Waste Average	Average Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Food Waste (Tonnes)
1	13.07%	3.84%	14.77%	7.79%	2.97%	-	8.49%	9918.30	842.06
2	7.09%	8.81%	5.89%	15.30%	5.00%	-	8.42%	6866.42	578.15
3	1.07%	11.07%	11.58%	-	15.02%	12.54%	10.26%	4358.45	447.18
4	0.56%	7.77%	9.85%	-	3.85%	-	5.51%	5304.70	292.29
5	5.55%	2.15%	8.17%	-	9.40%	6.74%	6.40%	8372.02	535.81
6	1.35%	2.41%	13.55%	-	7.10%	-	6.10%	5130.17	312.94
7	2.60%	3.73%	12.99%	-	2.66%	-	5.50%	2962.13	162.92
8	2.80%	4.47%	5.74%	-	5.71%	-	4.68%	3383.67	158.36
Condos	6.80%	5.40%	3.47%	-	10.49%	-	6.54%	2627.33	171.83
TOTAL								48923.19	3501.53

Mean	6.88%	-	389.06
Min	4.68%	-	158.36
Max	10.26%	-	842.06

Compostable Waste Percentage	$(3501.53/48923.19) * 100\% = 7.16\%$
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Table 7: Estimated Annual Food Waste Per Area

Project # 22-8641

Audit	Waste Collection Area	% Food Waste	Average Waste Based On Previous Three Fiscal Years (Tonnes)	Estimated Annual Compostable Waste (Tonnes)
May 2022 Initial Performance Audit	1	13.07%	9918.30	1296.32
	2	7.09%	6866.42	486.83
	3	1.07%	4358.45	46.64
	4	0.56%	5304.70	29.71
	5	5.55%	8372.02	464.65
	6	1.35%	5130.17	69.26
	7	2.60%	2962.13	77.02
	8	2.80%	3383.67	94.74
	Condos	6.80%	2627.33	178.66
August 2022 Performance Audit	1	3.84%	9918.30	380.86
	2	8.81%	6866.42	604.93
	3	11.07%	4358.45	482.48
	4	7.77%	5304.70	412.18
	5	2.15%	8372.02	180.00
	6	2.41%	5130.17	123.64
	7	3.73%	2962.13	110.49
	8	4.47%	3383.67	151.25
	Condos	5.40%	2627.33	141.88
November 2022 Performance Audit	1	11.28%	9918.30	1118.78
	2	10.60%	6866.42	727.84
	3	11.58%	4358.45	504.71
	4	9.85%	5304.70	522.51
	5	8.17%	8372.02	683.99
	6	13.55%	5130.17	695.14
	7	12.99%	2962.13	384.78
	8	5.74%	3383.67	194.22
	Condos	3.47%	2627.33	91.17
February 2023 Performance Audit	1	2.97%	9918.30	294.57
	2	5.00%	6866.42	343.32
	3	13.78%	4358.45	600.59
	4	3.85%	5304.70	204.23
	5	8.02%	8372.02	671.44
	6	7.01%	5130.17	359.62
	7	2.66%	2962.13	78.79
	8	5.71%	3383.67	193.21
	Condos	10.49%	2627.33	275.61
	Mean	6.06%	-	368.78
	Min	0.56%	-	29.71
	Max	13.78%	-	1296.32

Notes: 1. November 2022 % Food Waste for Areas 1 and 2 are based on average of the two samples (A and B) collected from each respective area during the November 2022 waste audit.
 2. February 2023 % Food Waste for Areas 3 and 5 are based on average of the two samples (A and B) collected from each respective area during the February 2023 waste audit.



Table 8: Food Waste Descriptive Statistics**Project 22-8641**

Mean	368.9265302
Standard Error	49.37213391
Median	318.947255
Mode	#N/A
Standard Deviation	296.2328035
Sample Variance	87753.87385
Kurtosis	1.947484681
Skewness	1.303881765
Range	1266.61549
Minimum	29.70632
Maximum	1296.32181
Sum	13281.35509
Count	36
Confidence Level(95.0%)	100.2307605
Upper CI	268.6957697
Lower CI	469.1572907