

Four Season Waste Audits For Renfrew County

Stewardship Ontario E&E Fund Project #223

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Executive Summary

Ottawa Valley Waste Recovery Centre (OVWRC) conducted four seasonal waste audits to gain better insight into the waste generation behaviours of the residents that use its extensive waste management and diversion programs. To date, OVWRC had not undertaken any waste audits and had no baseline information by which to measure its program effectiveness or efficiency. Furthermore, staff speculated that the significant increase in vacationers during the summer season and hunters during the fall season resulted in peak season (summer and fall) and non-peak season (winter and spring) fluctuations that impacted its recycling program collection and processing efficiencies.

The combined four season waste audit results for the three participating communities, Pembroke, Petawawa and Laurentian Valley, show that Renfrew County residents are generating, on average, 750 kg/hh/yr of overall waste (not including yard waste) and 873 kg/hh/yr with yard waste. Residents diverted 51% of the waste stream (not including yard waste) and 58% of the waste stream (including the yard waste). Furthermore, the total audited residents are achieving high recovery rates for most recyclable materials including 83% recovery rate for paper, 57% for plastics, 69% for metals and 90% for glass for an overall recovery rate of 74%. The green bin compostables are achieving 60% recovery rate (not including the yard waste).

When compared with other communities (such as Simcoe County, Durham Region), Renfrew County residents are achieving comparable diversion rates for recyclable materials (and considerably higher diversion compared with West Nipissing) and its overall diversion rate, including organics (but not yard waste) is slightly higher than Durham Region. Durham Region offers organic food waste collection as part of its overall diversion program (the other two communities do not). Compared with Durham Region, Renfrew County is capturing a significant amount more food waste in its Green Bin Program.

Recently, Stewardship Ontario posted a table of compiled Ontario annual generation rates of Blue Box materials by demographic type which is based primarily on data from Stewardship Ontario's 2005 and 2006 waste audit programs augmented by other recent waste composition data. The table provides blue box material generation rates and recovery rates for small urban and rural communities based on a range of waste audit results. A comparison of Renfrew County's capture rates with a compilation of other Ontario small urban and rural communities, shows that that for every Blue Box material compared, Renfrew County is achieving higher capture rates than compiled results from audited Ontario communities.

The comparison of peak season and non-peak season results shows a significant difference in the overall waste generation rate between the peak season waste audits and the non-peak season waste audits with the participating households generating 831 kg/hh/yr of waste (excluding yard waste placed in the green bin) during the peak season waste audits and 669 kg/hh/yr during the non-peak waste audits. This represents about 25% difference in generation rates.

Further investigation reveals that the greatest variation in the composition of the waste stream occurs with the organics portion of the waste stream rather than the recyclables portion of the waste stream. The organic stream exhibits the most significant difference between the peak and non peak seasons with participating households generating 271 kg/hh/yr of green bin organics (excluding yard waste) during the peak season compared with only 191 kg/hh/yr during the non-peak season (a 42% difference). Participants, during the peak season, captured 67% of available food waste compared with 49% of available food waste captured during the non-peak season. Some of this can be explained with residents less willing to place organic materials in the green bin during the winter months.

As for the recyclables, participating households generated a total of 360 kg/hh/yr of recyclables compared with 322 kg/hh/yr during the non-peak season (a 12% difference) however, this is not reflected in a noticeable difference between the amount of recyclables collected through the recycling program during the peak season (250 kg/hh/yr) and the non-peak season (230 kg/hh/yr). Yet, the amount of potentially

recyclable materials found in the garbage stream during the peak season was almost 20% greater than the amount of potentially recyclable materials found in the garbage stream during the non-peak season, suggesting that vacationers may be less aware of recycling opportunities and resorting to putting potentially recyclable materials in the garbage stream. Interestingly, there was a noticeable increase in generation rates for PET beverage bottles and some increase in aluminum cans during the peak season compared with the non-peak season.

Finally, effort was made to evaluate the impact of Ontario's Bottle Return Program on the amount of LCBO clear and coloured glass bottles recycled through municipal recycling programs (although plastic and tetra pack LCBO bottles are also impacted, their market share, compared with glass bottles, remains minimal and is not expected to significantly impact recovery rates for those material categories during the audit period). The results were inconclusive. While it appears that the LCBO bottle return program is having an impact on coloured LCBO bottles, the results for the LCBO clear bottles are uncertain. The fall generation rates for LCBO coloured glass are similar to the winter and spring generation rates, even though the LCBO bottle return program had not been launched at the time of the fall audits. Further investigation is needed.

Overall, Ottawa Valley Waste Recovery Centre's waste diversion programs are achieving high waste diversion and recovery rates that compare with or exceed other comparable communities. Depending on the various interpretations of the Government of Ontario's 60% Waste Diversion Goal, OVWRC is achieving this goal. OVWRC is achieving a 74% recovery rate for its recyclable materials, well over a 60% recovery goal for Blue Box materials. With a 58% waste diversion rate for recyclables and organic materials combined, OVWRC will undoubtedly exceed the goal of 60% waste diversion from landfill when other materials such as HHW, bulky goods, wood waste, and backyard composting are factored into its overall diversion results.

1.0 Introduction

The Ottawa Valley Waste Recovery Centre (OVWRC) near Pembroke, Ontario serves the waste management needs of a population of nearly 40,000, comprising of five municipalities in Renfrew County. The OVWRC operates as a Joint Board of Management formed under the old Municipal Act. The only facility of its type in Ontario, it is the recipient of the prestigious FCM award for its unique program and facility for small communities. OVWRC operates a Material Recovery Facility (MRF), a Centralized Composting Facility, an Outdoor Composting Area, a Construction and Demolition Waste Recycling area, a permanent Household Hazardous Waste Depot, a waste oil transfer station and a Landfill.

Over the years, OVWRC staff have noticed that during peak seasons (summer and fall) the amount of recyclables processed at the MRF noticeably increases. Staff have speculated that the significant increase in vacationers during the summer season and hunters during the fall season has had an impact on the quantity and quality of recyclables collected and processed at the centre.

Information compiled by the Ministry of Tourism for Renfrew County shows that more than 1.3 million people visited Renfrew County in 2005, of which 74% or 962,000 were visiting friends and relatives. Since the permanent population of Renfrew County is only 95,000 people, this means that during peak seasons, visitors outnumbered residents by more than ten times.

The need for accurate waste stream composition data is believed to be critical for Renfrew County. Fluctuations in material recovery rates impact OVWRC's ability to manage its waste disposal and diversion programs. For example, OVWRC is located a considerable distance from end markets as is common with other rural and northern municipalities. Recyclable stream composition information is critical when estimating haulage costs to end markets. Other issues of concern include the impacts on collection, compaction, available tonnage, equipment needs and maintenance, and finally the dramatic loss in landfill capacity when seasonal residents fail to divert recyclables.

To date, OVWRC has not undertaken waste audits and has no baseline information from which to measure program effectiveness and efficiencies during peak and non peak periods. In 2006, OVWRC conducted two waste audits in the summer and fall to determine the impacts of peak season waste generation rates. The peak season waste audits were intended to help staff address the impact of visiting waste generators who are not familiar with OVWRC waste diversion programs (e.g. Triple R Cans, expansive list of acceptable recyclable materials in this area, alternate week collections for organics/fibres and garbage/containers). The peak season audits were partially funded by Stewardship Ontario.

The peak season curbside waste audits were conducted in the summer (August) and fall (November) of 2006 for representative households in the communities of Pembroke, Petawawa and Laurentian Valley using established audit protocols as per Stewardship Ontario. Through these audits, OVWRC was able to establish a comprehensive snap shot of waste composition and generation during the peak seasonal generation periods.

The success of the peak season waste audits resulted in OVWRC receiving funding to extend the audits into winter and spring, which also corresponds with non-peak season waste generation rates. Expanding the project to include a winter and spring audit provides OVWRC with representative data for each season, which allows for more accurate annual generation calculations and establishes baseline benchmark data for the community, taking into account seasonal variances.

This report documents the results of the four season waste audits conducted in the communities of Pembroke, Petawawa and Laurentian Valley during summer, fall, winter and spring. The report provides key findings about the type and quantity of residential recyclables, kitchen organics, and residual waste collected during the combined four season waste audits and provides a comparison of peak and non-peak season results. Also, in February 2007, the Ontario Government implemented the LCBO Deposit Return Program which is expected to impact the amount of LCBO glass and other LCBO containers in the waste stream. This report looks at the early impacts.

This report augments four seasonal reports prepared at the end of each seasonal waste audit. Further detail pertaining to each community can be acquired through these individual reports.

Program Description

Ottawa Valley Waste Recovery Centre provides full waste management services to residents in the municipalities of Pembroke, Petawawa, and Laurentian Valley. Residents in these areas receive bi-weekly collection of their blue box, Triple R can (yellow container) and regular waste. Each residential unit is permitted a maximum of four (4) garbage bags or garbage cans with a maximum weight of any item not exceeding 50 lbs. (23 kg). Container recycling is to be placed loose in the yellow triple R bins and paper recycling is to be placed loose in the blue box. In the community of Petawawa, residents receive weekly organics collection from May through October, whereas the community of Pembroke does not switch to weekly organics collection until June and only runs weekly through August. The two communities receive bi-weekly green bin collection for the remainder of the year. In the municipality of Laurentian Valley, residents received bi-weekly green bin collection throughout the year. No plastic bags can be used for holding recycling or organics. Leaf and yard waste collection varies by municipality.

Waste Audit Contractors

Ottawa Valley Waste Recovery Centre (OVWRC) contracted the winter and spring, 2007, waste audit collection and sorting work to Associate Environmental Technologies (AET) which provides a broad range of services from auditing, waste management system design, designing & monitoring long-range solid waste management plans, to the full implementation and execution of on-site waste management operations. Over the past several years, AET has conducted a range of single family and multi-family waste audits for Stewardship Ontario as well as other clients.

The previous set of waste audits conducted in the summer and fall, 2006, were undertaken by the waste audit company Wasteaway, based in Peterborough Ontario. Over the past several years, Wasteaway

has conducted numerous audits as part of Stewardship Ontario's waste audit program and is very familiar with Stewardship Ontario's waste audit procedures. Due to scheduling conflicts, however, the company was unable to provide waste auditing services for the winter and spring waste audits.

The professional approach and waste audit expertise of both companies resulted in successful waste audits and high quality data.

The Wasteaway Audit Team



The AET Audit Team



2.0 Sampling Methodology

The study team followed the waste sampling guidelines outlined in Stewardship Ontario's *Blue Box Waste Audit Program 2006 Single-Family Audits*, November 29, 2005.

2.1 Household Selection

Sample material was collected from 30 homes in Pembroke, 40 homes in Petawawa and 30 homes in Laurentian Valley. The sample areas were selected by staff at the Ottawa Valley Waste Recovery Centre using the sampling selection criteria outlined in Stewardship Ontario's protocol for single-family waste audits. The key selection criteria include:

- A. The sample material shall come from 100 single-family homes in 10 sample areas (10 homes in each of the 10 sample areas) that together represent the municipality's single-family waste generation/recovery behaviour.
- B. The partner municipality will identify the sample areas and the specific households to sample from, with Stewardship Ontario's approval. Stewardship Ontario recommends that the partner municipality work with their planning or housing departments and waste collectors to identify the sample areas.
- C. The partner municipality should pick houses that are normally collected early in the day to ensure that the contractor gets all the material set out on collection day (i.e. does not miss late setouts).

Table 2-1 describes the ten selected sample areas.

Table 2-1: Selected Waste Audit Households

Community	Sample Area	Characteristics
Pembroke	1 Sweezy Street	<ul style="list-style-type: none"> • 1-5 year old homes • upper middle class income range • new subdivision
	2 Miller Street	<ul style="list-style-type: none"> • 40-50 year old homes • middle income range • red brick homes
	3 Flora Street	<ul style="list-style-type: none"> • 50-75 year old homes • lower income range • war time bungalows - wood clad
Petawawa	4 Paardeberg Blvd (on base)	<ul style="list-style-type: none"> • 40-50 year old homes • military single family PMQs • middle income range
	5 Alice Street	<ul style="list-style-type: none"> • 40-50 year old homes • middle income range • bungalows
	6 Bayshore Drive	<ul style="list-style-type: none"> • 1-5 year old homes • middle income range • families
	7 Country Lane	<ul style="list-style-type: none"> • 50-75 year old homes • upper middle class income range • a couple of newer houses built on side lots
Laurentian Valley	8 Clearview Crescent	<ul style="list-style-type: none"> • 1-15 year old homes • middle to upper income range
	9 Mud Lake Road	<ul style="list-style-type: none"> • 25-75 year old homes • large lots - a couple of farms - mixed income types - mostly lower
	10 Forest Park Road	<ul style="list-style-type: none"> • 1-15 year old homes • large lots, mostly separated by forest • long driveways, rural area

2.2 Waste Audit Schedules and Collection

PEAK SEASON

Summer Audits

Over a two week period starting on August 30th and ending September 8th, 2006 the audit team collected all waste set out at the curb by the sample households. The material was gathered from the same homes each week.

Fall Audits

The fall audits took place during the first two weeks in November beginning November 1st to November 10th, 2006. The audit team collected all waste set out at the curb from the same sample households used for the summer audits.

NON PEAK SEASON

Winter Audits

Over a two week period, starting on the week of February 12th and ending February 24th, 2007, the audit team collected all waste set out at the curb by the sample households. The material was gathered from the same homes each week.

Spring Audits

Over a two week period, starting on the week of May 14th and ending May 25th, 2007 the audit team collected all waste set out at the curb by the sample households. The material was gathered from the same homes each week.

The collection schedule is provided in Table 2-2. During collection, the audit team tracked set out and participation information on a per household basis.

Table 2-2: Renfrew Four Season Waste Audits Sampling Schedule

Sample Area	Season	Date of Collection	Blue Box Recyclables*		Garbage	Green Bin Organics	Yard Waste
			Container	Fibres			
Pembroke, includes Sweezy Street, Miller Street, Flora Street							
1 Sweezy Street 2 Miller Street 3 Flora Street	Summer	August 30, 2006	✓		✓	✓	No
		September 6, 2006		✓		✓	
	Fall	November 1, 2006		✓		✓	Yes
		November 8, 2006	✓		✓		
	Winter	February 14, 2007	✓		✓		No
		February 24, 2007		✓		✓	
	Spring	May 16, 2007		✓		✓	No
		May 23, 2007	✓		✓		
Petawawa, includes Paardenberg Blvd, Alice Street, Bayshore Drive, Country Lane							
4 Paardeberg Blvd 5 Alice Street 6 Bayshore Drive 7 Country Lane	Summer	August 31, 2006		✓		✓	No
		September 7, 2006	✓		✓	✓	
	Fall	November 2, 2006	✓		✓		
		November 9, 2006		✓		✓	Yes
	Winter	February 14, 2007		✓		✓	No
		February 24, 2007	✓		✓	✓	
	Spring	May 17, 2007	✓		✓	✓	No
		May 24, 2007		✓		✓	
Laurentian Valley, includes Clearview Cres, Mud Lake Road, Forest Park Road							
8 Clearview Cres. 9 Mud Lake Road 10 Forest Park Road	Summer	September 1, 2006	✓		✓		No
		September 8, 2006		✓		✓	
	Fall	November 3, 2006		✓		✓	Yes
		November 10,	✓		✓		
	Winter	February 14, 2007	✓		✓		No
		February 24, 2007		✓		✓	
	Spring	May 18, 2007		✓		✓	Yes
		May 25, 2007	✓		✓		

2.3 Sorting and Analysis Methodology

As previously noted, all waste audits conducted for the Ottawa Valley Waste Recovery Centre (OVWRC) followed the single family waste audit protocol developed by Stewardship Ontario.

It should be noted that with the launch of the Ontario Deposit Return Program on February 5, 2007, Stewardship Ontario increased the number of material sort categories from 67 to 89. While this results in more disaggregated data, efforts were taken to ensure that the data collected during the winter and spring waste audits remain comparable with data collected in the summer and fall waste audits. The final winter and spring waste audit results have been modified to match the categories used in the summer and fall waste audits.

The audit teams de-bagged the sample material at Ottawa Valley's Waste Recovery Centre and hand-sorted it into the 67 waste categories during the summer and fall audits and 89 categories during the winter and spring audits (see Table 2-3 and Appendix A for a description and examples of materials in each category). The categories with stars are divertable materials (i.e. material accepted in OVWRC's diversion programs). The OVWRC has an extensive list of materials (40) that can be diverted through its recycling program or green bin program. HSW and other larger items can be diverted through depot programs operated by the OVWRC.

Each waste stream (garbage, recyclables, Green Bin, and yard waste) was sorted separately so that capture rates and contamination levels could be determined.



Table 2-3: Stewardship Ontario Waste Audit Sort Categories

2006- 67 Sort Categories			
<p>Paper Fibres Newspaper – Dailys and Weeklys** Newspaper – Other** Telephone Books / Directories* Magazines & Catalogues* Mixed Fine Paper* Books* Other Paper* Corrugated** Kraft Paper** Boxboard / Cores** Molded Pulp** Paper Cups and Paper Ice-Cream Containers** Laminated Paper Packaging* Composite Cans* Aseptic Containers* Gable Top Cartons*</p>	<p>Plastics PET Beverage Bottles* PET Other Bottles & Jars* PET Other Packaging* HDPE Beverage Bottles* HDPE Other Bottles & Jugs* PVC Bottles & Jars* Other Bottles, Jars & Jugs* Polystyrene Packaging Wide Mouth Tubs & Lids Large HDPE & PP Pails/Lids* Polyethylene PE Plastic Bags & Film – Packaging* Polyethylene* Plastic Bags & Film - Non-Packaging* Laminated/Other Plastic Bags & Film Other Rigid Plastic Packaging Durable Plastic Products</p>	<p>Metals Aluminum Cans* Aluminum Foil and Foil Trays* Other Aluminum Containers* Steel Cans* Aerosol Cans* Paint Cans* Other Metal</p> <p>Glass LCBO Clear* LCBO Coloured* Food and Beverage Clear* Food and Beverage Coloured* Other Glass</p> <p>Organics Food Waste* Yard Waste* Pet waste Tissue/Toweling*</p>	<p>HSW Batteries Paint & Stain Motor Oil Other HSW liquids Other HSW</p> <p>Other Waste Diapers and Sanitary Products Textiles* Carpeting Construction & Renovation Computer / IT Equipment Telecom Equipment TV & Audio Equipment Small Kitchen Appliances Other Electronics Tires and Other Rubber Ceramics Furniture Mattresses Other Large Bulky Items Other Waste</p>
<p>* materials that can be diverted through the OVWRC recycling program **materials that can be diverted through the OVWRC recycling program or the green bin program</p>			
Additional LCBO Sort Categories Added in 2007 (now totaling 89 categories)			
<p>Paper Fibres Corrugated further divided into: - Corrugated Wine Bag in Box - Other Corrugated</p> <p>Aseptic Containers further divided into: - Aseptic Alcohol Over 630 ml - Aseptic Alcohol 630 ml and Under - Aseptic Other containers</p> <p>Glass LCBO Clear Glass further divided into: - Clear Glass Beer Over 630 ml - Clear Glass Beer 630 ml and Under - Clear Glass Other Alcohol Over 630 ml - Clear Glass Other Alcohol Over 100 ml and Less Than or Equal to 630 ml - Clear Glass Other Alcohol 100 ml and Under</p> <p>LCBO Coloured Glass further divided into: - Coloured Glass Beer Over 630 ml - Coloured Glass Beer 630 ml and Under - Coloured Glass Other Alcohol Over 630 ml - Coloured Glass Other Alcohol Over 100 ml and Less Than or Equal to 630 ml - Coloured Glass Other Alcohol 100 ml and Under</p>	<p>Plastics Other Bottles, Jars & Jugs further divided into: - Other Plastic Alcohol Containers 100 ml and Under Other - Bottles, Jars & Jugs</p> <p>PET Beverage Bottles further divided into: - PET Beer Bottles Over 630 ml - PET Beer Bottles 630 ml and Under - PET Other Alcohol Bottles Over 630 ml - PET Other Alcohol Bottles Over 100 ml and Less Than or Equal to 630 ml - PET Other Alcohol Bottles 100 ml and Under - PET Other Beverage Bottles</p> <p>Laminated/Other Plastic Bags further divided into: - Laminated Pouches & Bag in Box Liners for Alcohol - Laminated/Other Plastic Film and Bags</p> <p>Metals Aluminum Cans further divided into: - Aluminum Alcoholic Beverage Cans Over 1 L - Aluminum Alcoholic Beverage Cans 1 L and Under - Aluminum Food & Other Beverage Cans</p> <p>Steel Cans further divided into: - Steel Alcoholic Beverage Cans Over 1 L - Steel Alcoholic Beverage Cans 1 L and Under - Steel Food & Other Beverage Cans</p>		

Analysis

The analysis took into consideration several features of Ottawa Valley's recycling and green bin program including:

- An additional material was added to the recycling program during the fall audit - composite cans.
- The list of recyclable materials is extensive and includes materials not commonly collected in other Blue Box programs such as 'other metals', which must fit into the triple R can in order to qualify as a recyclable material, and textiles.
- Ottawa Valley is unique in its use of the triple R can for storage of recyclable containers. In addition it encourages residents to use the super sized blue boxes as well as the standard sized blue boxes. During the analysis of the setouts, effort was made to provide setout information for each type of recycling container used by residents as well as to convert the various sized containers to a standard blue box container to enable comparison with other communities.
- During the summer, winter and spring audits there were no collections of separate yard waste or bulky goods provided by Ottawa Valley.
- Ottawa Valley accepts yard waste in their green bins. All yard waste encountered during the summer, winter and spring audits were reported in the green bin or other streams.
- During the fall audit, there was one yard waste collection provided. The yard waste was noted and weighed by the audit team and left at the curb. It was for the most part not included in the audit results. There were no collections of separate bulky waste during the fall audit.
- The green bin accepts a number of paper products including: tissue and toweling, cardboard, newspaper, boxboard, kraft paper, molded pulp and paper cups & ice cream containers. Where they appeared, these paper products were incorporated into the green bin organic stream in the audit results.
- The overall generation rate displayed for the Green Bin program is slightly inflated due to the acceptance of select paper fibres in the Green Bin program. For the most part, however, the diverted paper fibres in the green bin is accounted for in the capture rate for the Recyclable Paper Fibres category and Total Recyclables category and, therefore, cannot be accounted for in the capture rates in the Green Bin Organics category due to the problem of double counting. The capture rate for food waste category is not affected by this situation.

In addition, Stewardship Ontario does not include yard waste in its results due to its seasonal nature and difficulty in identifying and calculating the generation period. In keeping with Stewardship Ontario's policy, an additional section in the waste audit results has been developed to incorporate the yard waste. Therefore, two sets of results are calculated for each audited area. One set of results excludes the yard waste (found in the Green Bin) and the other set of results includes the yard waste. In the case of the fall audit, separately collected yard waste was incorporated into the yard waste component of the results. The yard waste category was multiplied by 26 weeks to calculate the annual kg/hhld generation rate. The 26 week multiplier denotes an average growing season.

3.0 Four Season Average Combined Waste Audit Results

3.1 Waste Generation, Composition and Recovery Results

The four season combined waste generation and recovery results for all three communities (Pembroke, Petawawa and Laurentian Valley) are summarized below in Table 3-1. All annual generation and recovery estimates are presented on a kilogram per household per year basis. Some materials are accepted either in the blue box or the green bin program including ONP, OCC, kraft paper, OBB, molded pulp and paper cups. The capture rates reflect the combination of both diversion opportunities.

Table 3-1: Four Season Average Combined Waste Generation and Recovery Results

Material Category	Recycle or Compost	Combined all season average				
		Garbage kg/hh/yr	Blue Box kg/hh/yr	Green Waste kg/hh/yr	All Material kg/hh/yr	Capture rate %
Paper						
Newspaper -Dailys & Weeklys	x	1.7	24.9	3.3	29.8	94%
Newspaper - Other	x	2.6	39.9	2.7	45.3	94%
Telephone Books/Directories	x	0.0	1.0	0.0	1.0	100%
Magazines & Catalogues	x	1.7	16.7	0.2	18.5	90%
Mixed Fine Papers	x	7.5	9.1	0.3	16.9	54%
Books	x	0.8	4.0	0.0	4.8	83%
Other Paper	x	1.7	1.8	0.2	3.7	49%
Paper Packaging						
Corrugated Cardboard	x	1.4	31.6	2.9	35.9	96%
Kraft Paper	x	1.6	2.7	1.0	5.3	69%
Boxboard/Cores	x	8.2	20.4	1.1	29.8	72%
Molded Pulp	x	0.6	1.5	0.6	2.7	76%
Paper Cups and Paper Ice-cream containers	x	2.3	0.6	0.6	3.6	35%
Laminated Paper Packaging	x	2.5	0.4	0.2	3.0	12%
Composite Cans	x	0.9	0.7	0.0	1.6	45%
Gable Top Cartons	x	0.7	3.1	0.0	3.8	80%
Aseptic Containers	x	0.4	0.3	0.0	0.8	40%
Total Recyclable Paper Fibres		34.30	158.4	12.2	205.9	83%
Total Non Recyclable Paper Fibres		0.25	0.2	1.0	0.5	
Total Paper Fibres		34.55	158.7	13.2	206.5	
Plastics						
PET Beverage Bottles	x	1.1	7.3	0.1	8.5	86%
PET Other Bottles & Jars	x	0.5	2.3	0.0	2.8	81%
PET Other Packaging	x	0.3	1.1	0.0	1.5	78%
HDPE Beverage Bottles	x	0.1	0.5	0.0	0.6	83%
HDPE Other Bottles & Jugs	x	0.9	3.9	0.0	4.9	81%
PVC Bottles & Jars	x	0.1	0.1	0.0	0.2	68%
Other Bottles, Jars & Jugs	x	0.5	0.7	0.0	1.2	57%
Polystyrene Packaging	x	2.3	2.9	0.2	5.3	54%
Wide Mouth Tubs & Lids	x	1.5	1.9	0.1	3.5	53%
Large HDPE & PP Pails & Lids	x	0.2	1.0	0.0	1.2	83%
Polyethylene PE Plastic Bags & Film - Pkging	x	9.6	6.4	0.3	16.3	39%
Polyethylene PE Plastic Bags & Film - Non Pkging	x	4.1	0.6	0.2	4.9	12%
Laminated/Other Plastic Bags & Film		7.7	1.2	0.4	9.3	
Other Rigid Plastic Packaging		3.4	2.9	0.0	6.4	

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Material Category	Recycle or Compost	Combined all season average				
		Garbage	Blue Box	Green Waste	All Material	Capture rate
		kg/hh/yr	kg/hh/yr	kg/hh/yr	kg/hh/yr	%
Durable Plastic Products		7.2	3.6	0.3	11.0	
Total Recyclable Plastics		21.19	28.8	0.9	50.9	57%
Total Non Recyclable Plastic Fibres		18.26	7.7	0.7	26.7	
Total Plastics		39.44	36.5	1.6	77.6	
Metals						
Aluminum Food & Beverage Cans	x	0.7	3.6	0.0	4.4	83%
Aluminum Foil & Foil Trays	x	1.1	0.4	0.0	1.5	25%
Others Aluminum Containers	x	0.0	0.1	0.0	0.1	53%
Steel Food & Beverage Cans	x	2.3	10.9	0.0	13.3	82%
Steel Aerosol Cans	x	0.5	0.3	0.0	0.8	40%
Steel Paint Cans	x	0.4	0.2	0.0	0.6	31%
Other Metal	x	3.1	2.9	0.0	6.0	48%
Total Recyclable Metals		8.22	18.3	0.1	26.6	69%
Total Non Recyclable Metals		0.00	0.0	0.0	0.0	
Total Metals		8.22	18.3	0.1	26.6	
Glass						
Alcoholic Beverage Glass Clear	x	0.3	6.9	0.0	7.2	95%
Alcoholic Beverage Glass Coloured	x	0.8	7.7	0.0	8.5	91%
Food and Beverage Glass Clear	x	2.5	16.7	0.1	19.3	87%
Food and Beverage Glass Coloured	x	0.0	0.7	0.0	0.7	100%
Other Glass		2.9	2.0	0.0	4.9	
Total Recyclable Glass		3.63	32.0	0.1	35.7	90%
Total Non Recyclable Glass		2.90	2.0	0.0	4.9	
Total Glass		6.52	33.9	0.1	40.6	
HSW						
Batteries		1.2	0.2	0.0	1.3	
Paint & Stain		0.3	0.0	0.0	0.4	
Motor Oil		0.5	0.0	0.0	0.4	
Other HSW liquids		2.1	0.2	0.5	2.8	
Other HSW		1.7	0.0	0.0	1.7	
Total HSW		5.72	0.4	0.5	6.7	
Organics						
Food Waste	x	84.4	1.7	127.8	214.0	60%
Pet Waste		50.0	0.4	4.1	54.6	
Tissue/Toweling	x	13.6	0.3	3.1	17.0	18%
Green Bin Organics		98	2.0	130.9	230.9	57%
Total Other Organics		50	0.6	3.7	60.7	
Other Materials						
Diapers and Sanitary Products		38.5	0.3	1.4	40.2	
Textiles	x	19.2	2.5	0.2	21.7	11%
Carpeting		3.5	0.0	0.0	3.5	
Construction & Renovation		19.5	0.2	2.0	21.7	
Computer / IT Equipment		0.5	0.0	0.0	0.5	
Telecom Equipment		0.2	0.1	0.0	0.3	
TV & Audio Equipment		0.1	0.5	0.0	0.6	

Final Report – Four Season Waste Audits in Renfrew County

Material Category	Recycle or Compost	Combined all season average				
		Garbage	Blue Box	Green Waste	All Material	Capture rate
		kg/hh/yr	kg/hh/yr	kg/hh/yr	kg/hh/yr	%
Small Kitchen Appliances		0.3	0.2	0.0	0.5	
Other Electronics		1.4	0.2	0.0	1.7	
Tires and Other Rubber		0.8	0.0	0.0	0.8	
Ceramics		0.9	0.8	0.0	1.7	
Furniture		0.1	0.0	0.0	0.1	
Mattresses		0.0	0.0	0.0	0.0	
Other Large Bulky Items		0.0	0.0	0.0	0.0	
Other Waste		7.5	1.2	4.3	13.0	
Total Recyclable Other Materials		19.2	2.4	2.5	35.9	
Total Non -recyclable Other Materials		73.4	3.8	7.7	90.8	
Total Other Materials		92.7	5.6	5.8	95.6	
Total Waste Stream Without Yard Waste						
Total Recyclable Paper Fibres		34.30	158.4	12.2	205.9	83%
Total Recyclable Containers		33.03	79.1	1.1	113.2	70%
Other Recyclables		19.25	2.3	0.2	21.7	11%
Total Recyclables		86.58	239.8	13.5	340.9	74%
Green Bin Organics*		98.10	2.0	143.1	230.9	62%
Other organics		50.04	0.4	4.1	54.6	
Total Organics (excluding yard waste)		148.11	2.4	147.2	285.5	
Total Divertable Waste		184.69	239.8	143.1	571.8	
Total Other Waste		150.57	16.2	15.4	177.9	
Total All Material		335.26	256.0	158.5	749.8	51%
Percent Recyclables in Waste Stream		26%				
Percent Organics in Waste Stream		29%				
Percent Waste in Diversion Streams			6%	10%		
Total Waste Stream With Yard Waste						
Yard waste collected separately		3.85	0.09	119.45	123.39	97%
Total Organics		114.46	2.2	262.7	367.1	72%
Total Divertable Waste		188.53	239.9	262.5	695.2	
Total Other Waste		150.58	16.2	15.4	177.9	
Grand Total All Material		339.10	256.1	278.0	873.1	58%

* includes recyclable papers in the green bin

** yard waste is multiplied by 26 to estimate annual generation rates

Note: figures may not sum due to rounding error

Capture rates are calculated by dividing the amount of material diverted by the total amount of material generated (based on kg/hh/yr estimates)

The capture rates for some of the paper materials (ONP, OCC, OBB, kraft paper, molded pulp and paper cups & ice cream containers) are calculated by adding together the amounts diverted through blue box and green bin programs. These paper materials are accepted in either the recycling or green bin stream and are diverted regardless which stream they enter.

The waste generation and recovery results are further summarized in Tables 3-2, 3-3 and 3-4.

**Table 3-2: Annual Waste Generation Estimates – Four Season Combined Results¹
(excluding yard waste)**

	Garbage	Blue Box	Green Bin	Total
	(kg/hh/year)	(kg/hh/year)	(kg/hh/year)	(kg/hh/year)
Recyclables	87	240	1*	341
Green Bin Organics	98	2	143**	231
Other Waste	151	14	15	178
Total All Material	335	256	159	750
Contamination Rate	55%	6%	10%	

*non-compostable recyclables

** includes paper compostables

**Table 3-3: Annual Waste Generation Estimates – Four Season Combined Results
(with yard waste)**

	Garbage	Blue Box	Green Bin	Total
	(kg/hh/year)	(kg/hh/year)	(kg/hh/year)	(kg/hh/year)
Recyclables	87	240	1*	341
Yard Waste	4	0	119	123
Green Bin Organics	98	2	143**	231
Other Waste	151	14	15	178
Total All Material	339	256	278	873

*non-compostable recyclables

** includes paper compostables

Table 3-4: Capture Rates – Four Season Combined

	Capture Rate (based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	83%
Recyclable Plastics	57%
Recyclable Metals	69%
Recyclables Glass	90%
Overall Recyclables*	74%
Green Bin Organics**	62%
Overall Diversion (without yard)	51%
Overall Diversion (with yard)	58%

* includes paper fibre diverted through the Green Bin Program

**not including yard waste

¹ The Green Bin Organics and Other Wastes totals do not equal the sum of each row cell due to the problem of double counting with the Recyclables total. Recyclable paper fibres diverted through the Green Bin and other recyclables identified in the Other Wastes category (Green Bin) are accounted for in the Recyclables total.

The participating waste audit households in Renfrew County generate, on average, 750 kg per household per year of waste (excluding yard waste placed in the green bin) and 873 kg per household per year of waste when yard waste is added into the waste stream. Without the yard waste, the garbage stream consists of 55% recyclable and compostable materials (26% for recyclables and 29% for compostables). The recyclables stream shows 6% contamination and the green bin stream shows 10% contamination.

The total audited residents are achieving fairly high recovery rates for most recyclable materials including 83% recovery rate for paper, 57% for plastics, 69% for metals and 90% for glass for an overall recovery rate of 74% (note: the paper fibres diverted through the Green Bin program are factored into the paper recovery and overall recyclables rate). The green bin compostables are achieving 62% recovery rate (not including the yard waste). Overall, residents are diverting 51% of the waste stream (not including yard waste in the green bin) and 58% (including the yard waste from the green bin) of the waste stream.

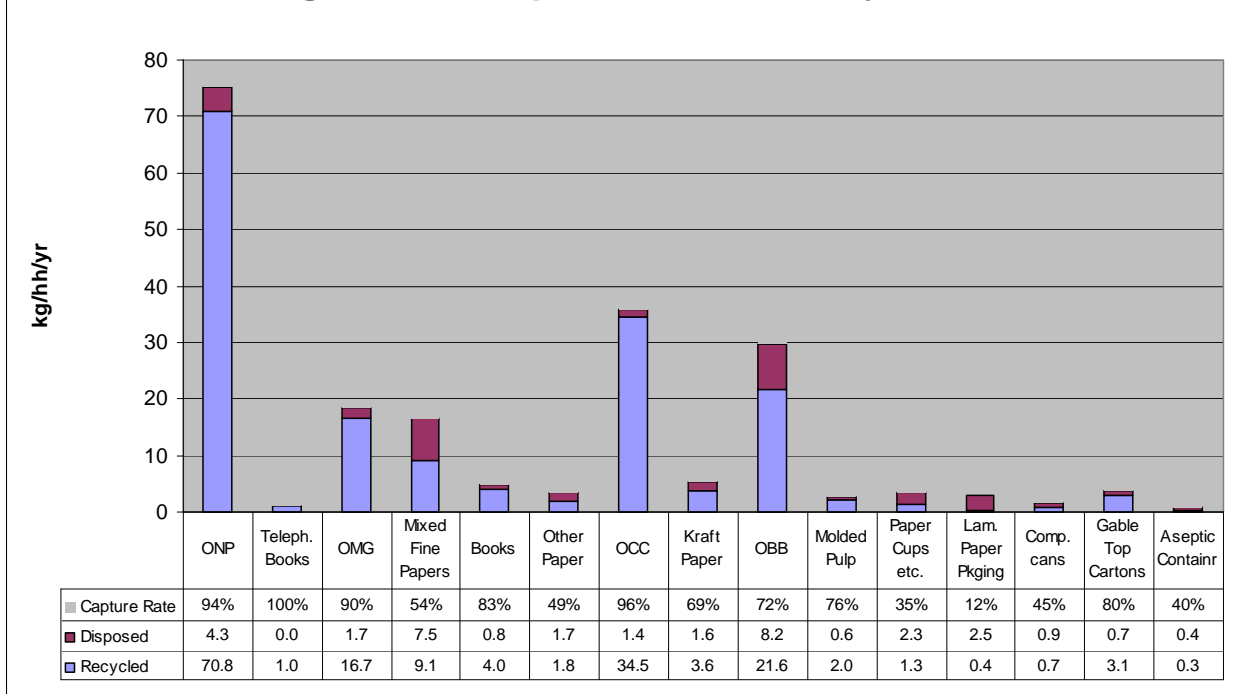
Paper Fibre Generation and Recovery – Four Season Combined Results

Generation and captures rates for the currently targeted recyclable papers are presented in Figure 3-1. The blue shaded areas represent recyclables in the recycling program and the gray shaded areas represent the recyclables that are currently being disposed. The capture rates shown here reflect those paper materials diverted through the recycling program or diverted through the green bin program (ONP, OCC, kraft paper, OBB, molded pulp and paper cups are accepted in the Green Bin program).

Eighty three percent of the recyclable paper is captured in the recycling program or the composting program among the participating households in the three audited areas. Most households are recycling available cardboard (96% capture rate), newsprint (94% capture rate) and OMG (90% capture rate). An estimated 72% of boxboard, 76% of molded pulp, 54% of mixed fine papers and 69% of available kraft paper is recycled and/or composted.

Participating households are achieving capture rates greater than 80% for ONP, OMG, books, telephone books and OCC. Poor performers (under 50% capture rates) include paper cups and ice cream containers, laminated paper packaging, composite cans and aseptic containers.

Figure 3.1: Paper Fibre Recovery Rate



Note: ONP, OCC, kraft paper, OBB, molded pulp and paper cups are accepted in the Green Bin program.

Container Generation and Recovery – Four Season Combined Results

Generation and capture rates for the currently targeted recyclable container materials are presented in Figure 3-2 and 3-3. Again, the blue shaded areas represent recyclables in the recycling program and the gray shaded areas the recyclables disposed. None of the containers are accepted in the green bin.

Seventy percent of available container material is captured in the recycling program, with plastics achieving 57% capture rate, metals achieving 69% capture rate, glass achieving 90% capture rate and textiles 11% capture rate.

Among the plastic containers, all the PET containers achieved similar recovery rates at 87% for PET beverage bottles, 81% for PET other bottles and jars and 78% for PET other packaging. The HDPE containers also achieved similar recovery rates with HDPE beverage bottles at recovery rates of 83%, and HDPE other bottles and jars at 81%. Among the poorest achievers (achieving less than 60% capture rates) were other bottles jars and jugs, wide mouth tubs and lids, polystyrene packaging, and polyethylene bags and film.

Among the other containers, aluminum food and beverage containers, steel food and beverage containers achieved high capture rates at 83% and 82%, respectively. Poor achievers included other aerosol cans (41% capture rate), steel paint cans (31% capture rate) and aluminum foil and trays (25% capture rate).

All four beverage glass container categories (clear and coloured) achieved very high capture rates with three of the four categories showing greater than 90% capture rates. Only 11% of available textile material was set out for recycling. It should be noted that the new LCBO deposit return program will have some impact on LCBO containers, especially glass bottles, in the recycling and waste streams, which is further explored in Section 7.0.

Figure 3.2: Plastic Containers

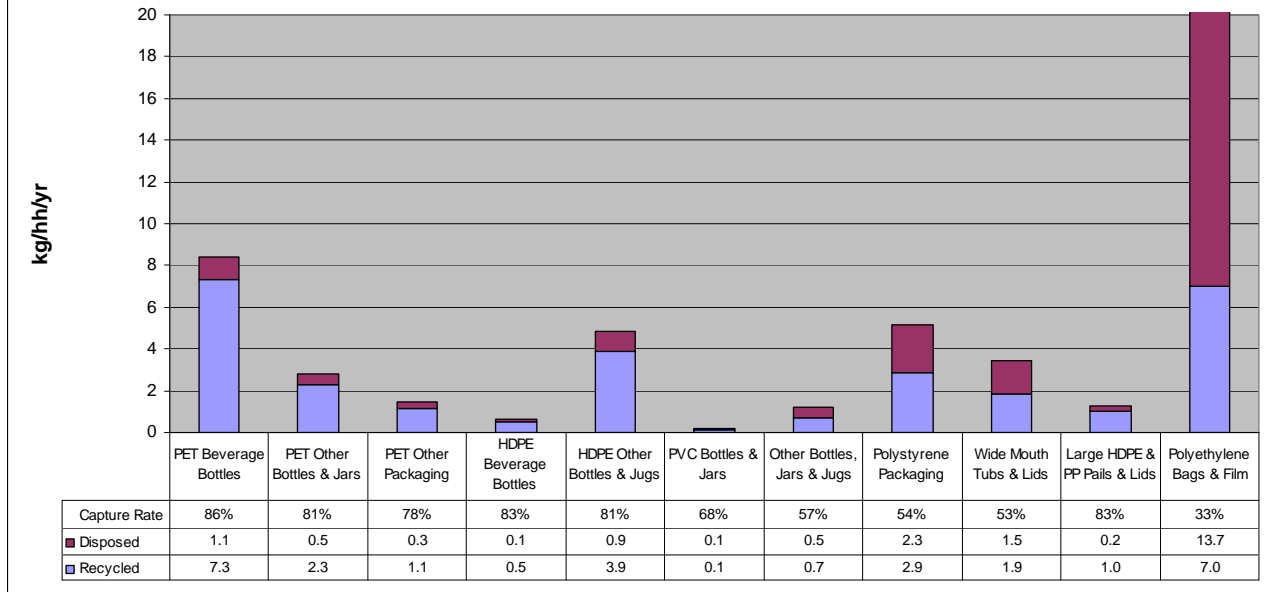
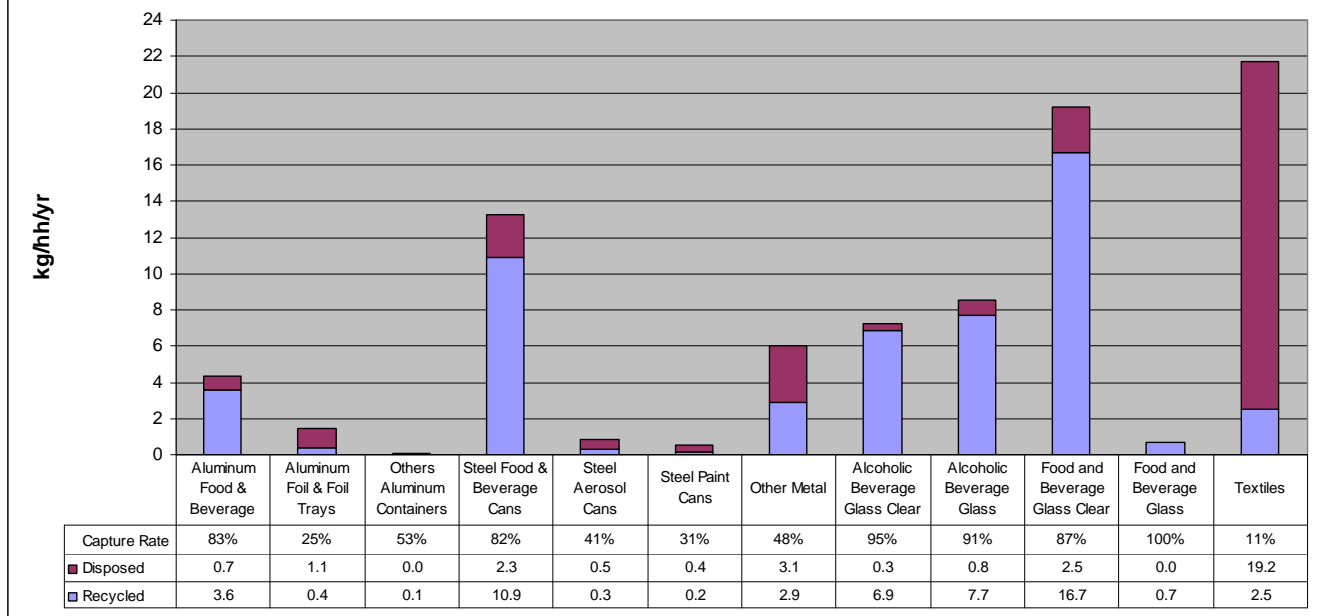


Figure 3.3: Metal & Glass Containers and Textiles



Organics Generation and Recovery – Four Season Combined Results

Table 3-5 shows the amount of organic materials diverted through the Green Bin Program compared with the amount disposed. Pet waste is not included in the Green Bin Program; however, residents have the option to include a range of paper products in their green bin, including tissue and toweling, newspaper, cardboard, boxboard, kraft paper, molded pulp, paper cups and ice cream containers. In the three audited communities, participating residents overall diverted 60% of their food waste through the green bin program and 18% of their tissue and toweling.

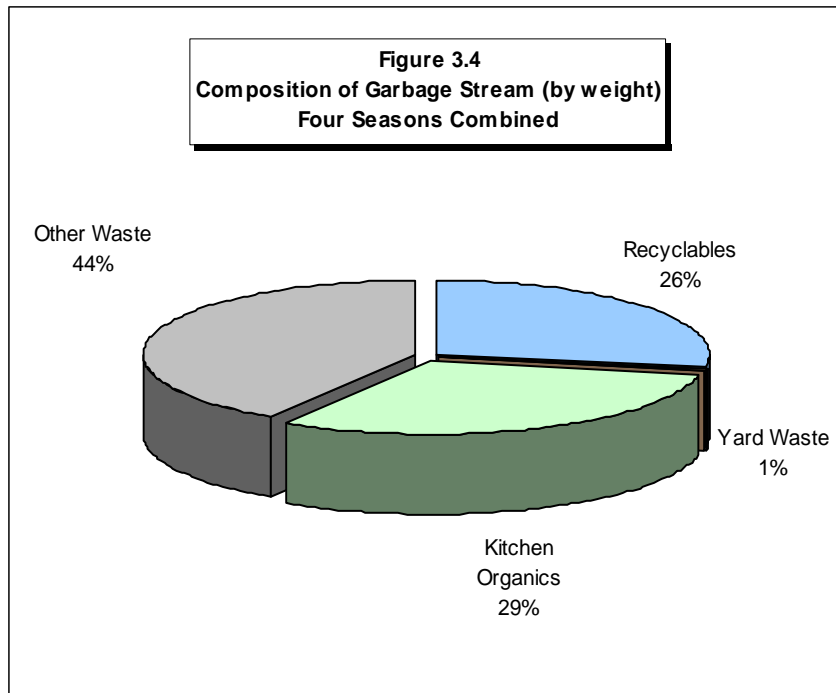
Table 3-5: Organics Diverted Through the Green Bin

	Diverted (kg/hhld/yr)	Disposed* (kg/hhld/yr)	Total Waste (kg/hhld/yr)	Capture Rate
Food Waste	128	84	214	60%
Tissue and Towelling	3	14	17	18%
Recyclable Paper	12	n.a.	n.a.	n.a.
Total diverted Organics	143	98	231	62%

*does not include food waste placed in the recycling stream

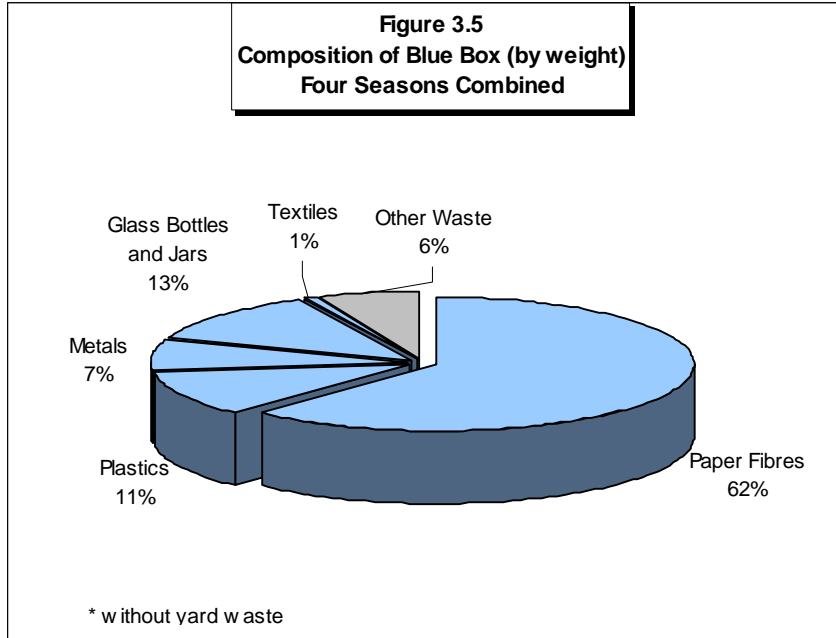
Garbage Stream Composition – Four Season Combined Results

Figure 3-4 shows the composition of the garbage stream. More than half (55%) of the material in the garbage stream is recyclable or compostable material that could be diverted (including yard waste).



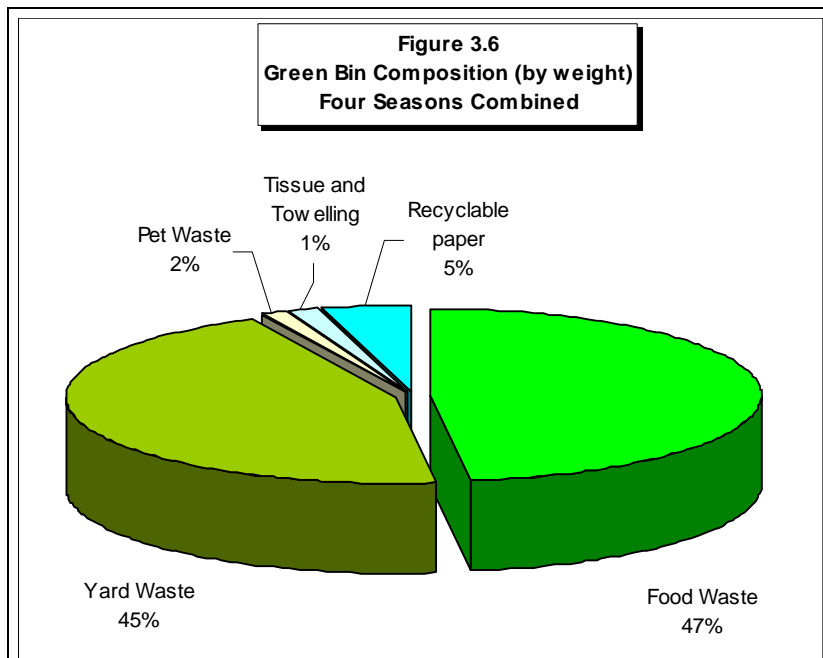
Blue Box Composition – Four Season Combined Results

Figure 3-5 shows some small amount of contamination (only 6%) in the recycling program. The bulk of the material diverted through the recycling program is recyclable paper fibres at 62%. Just over a third (31%) consists of recyclable containers, and 1% is textile waste. The remainder is non-recyclable waste at 6%.



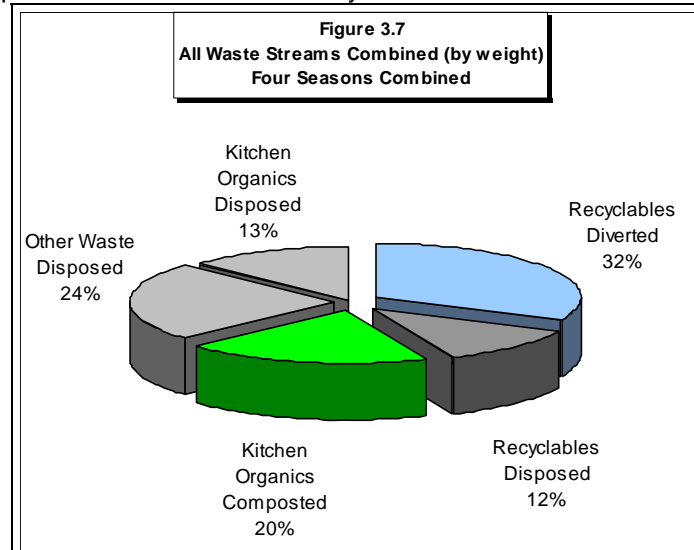
Green Bin Composition – Four Season Combined Results

Figure 3-6 shows that almost half of the material in the Green Bin program is compostable yard waste at 45%. Almost half of the material is food waste at 47% and 5% is compostable low-grade paper such as egg cartons and kraft paper and soiled tissues/toweling (1%). There was 10% contamination of other wastes in the green bin of which 2% was pet waste.



Overall Waste Composition – Four Season Combined Results

Figure 3-7 shows that 77% of the material at the curb can be recycled or composted through the Ottawa Valley’s waste diversion programs (44% is recyclable and 33% is compostable). Of this, 32% of the recyclables are being diverted and 12% are being disposed and 20% of the organics are being diverted and 13% are being disposed. This does not include yard waste.



3.2 Key Findings for Overall Four Season Combined Results

The waste audit conducted in the three communities of Pembroke, Petawawa and Laurentian Valley over the span of a year (an audit conducted during each of the four seasons) resulted in the following key findings:

- Participating residents in the three audited areas are generating 750 kg/hhld/year of overall waste (not including yard waste) and 873 kg/hhld/year of overall waste with yard waste. Most of the yard waste placed in the Green Bin was factored into the results since only one separate yard waste collection was provided at the time of the audits.
- The garbage stream consisted of a total of 56% potentially divertible materials – 26% recyclable materials and 29% compostable materials (not including yard waste).
- The recyclables stream had 6% contamination rate and the Green Bin stream had 10% contamination rate.
- The total audited residents are achieving high recovery rates for most recyclable materials including 83% recovery rate for paper, 57% for plastics, 69% for metals and 90% for glass for an overall recovery rate of 74%. The green bin compostables are achieving 60% recovery rate (not including the yard waste). Overall, residents are diverting 51% of the waste stream (not including yard waste in the green bin) and 58% (including the yard waste from the green bin) of the waste stream.
- The poorest achievers in the recycling program (achieving less than 50% capture rates) include: paper cups & ice cream containers, laminated paper, composite cans and aseptic containers, PE plastic bags & film (packaging and non-packaging), aluminum foil and trays, steel paint cans, aerosol cans and textiles.
- Audited residents are diverting 60% of available food waste in the Green Bin program. Half of the green bin was composed of yard waste (45%), followed by food waste (47%).
- Due to the extensive diversion opportunities provided to residents by the OVWRC, about 77% of material in the overall waste stream can be either recycled or composted (not including yard waste).

4.0 Comparison of Combined Results for Each Season

A comparison of capture rates among the four season waste audits is provided in Table 4-1. The overall diversion rate, not including yard waste, is similar for all four seasons, ranging from 48% to 52%. There is greater variation in the diversion rates when the yard waste is factored in to the equation. Summer, fall and spring diversion rates are similar ranging from 62% to 67% with the yard waste included and 48% in the winter, due to the lack of yard waste generated during the winter months.

Table 4-1: Comparison of Capture Rates – Summer, Fall, Winter and Spring

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Overall Recyclables*	76%	72%	74%	76%
Green Bin Organics**	65%	71%	54%	52%
Overall Diversion (without yard)	52%	52%	48%	50%
Overall Diversion (with yard)	62%	67%	48%	66%

* includes paper fibre diverted through the Green Bin Program **not including yard waste

Table 4-2 provides a comparison of overall waste generation and diversion rates for each of the seasons audited. The results show that the total waste generation rate for the summer and fall exceed those of winter and spring. This implies a peak and non-peak season trend. Contamination rates for each of the four seasons range from 51% to 59% contamination of the garbage stream (i.e. the combined presence of recyclables and compostables in the garbage stream) , 5% to 8% contamination of the recycling stream and 3% to 13% contamination of the green bin stream.

Table 4-2: Comparison of Total Waste Collected in Summer, Fall, Winter and Spring² (excluding yard waste)

	Summer				Fall			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	91	266	3*	378	96	233	1*	341
Green Bin Organics	101	2	160**	246	95	1	211**	296
Other Waste	148	20	24	188	182	12	20	212
Total All Material	340	288	185	812	373	246	231	850
Contamination Rate	56%	8%	13%		51%	5%	9%	
	Winter				Spring			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	67	186	1*	263	92	274	1*	382
Green Bin Organics	94	3	103**	192	102	2	98**	190
Other Waste	135	10	4	146	138	17	13	165
Total All Material	296	198	107	601	332	292	113	736
Contamination Rate	55%	6%	3%		59%	6%	13%	

*non-compostable recyclables ** includes paper compostables

² The Green Bin Organics and Other Wastes totals do not equal the sum of each row cell due to the problem of double counting with the Recyclables total. Recyclable paper fibres diverted through the Green Bin and other recyclables identified in the Other Wastes category (Green Bin) are accounted for in the Recyclables total.

4.1 Comparison of Four Season Recycling Results

As shown in Table 4-3, the overall capture rates for the recyclable materials are consistent for all four seasons, ranging from 72% to 76%. The capture rates were fairly consistent for the recyclable plastics and recyclable glass categories during the four season waste audits with the capture rates for plastics ranging from 53% to 58% and the capture rates for glass ranging from 86% to 91%. The capture rates for the paper category were high due to the ability for residents to divert several key fibre materials through the Green Bin program as well as the recycling program. The metals category shows the greatest fluctuation with capture rates ranging from 61% to 75% over the four seasons.

Table 4-3: Comparison of Recyclable Capture Rates in Summer, Fall, Winter and Spring

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	84%	81%	79%	86%
Recyclable Plastics	57%	58%	53%	58%
Recyclable Metals	69%	61%	75%	71%
Recyclables Glass	91%	90%	91%	86%
Overall Recyclables*	76%	72%	74%	76%

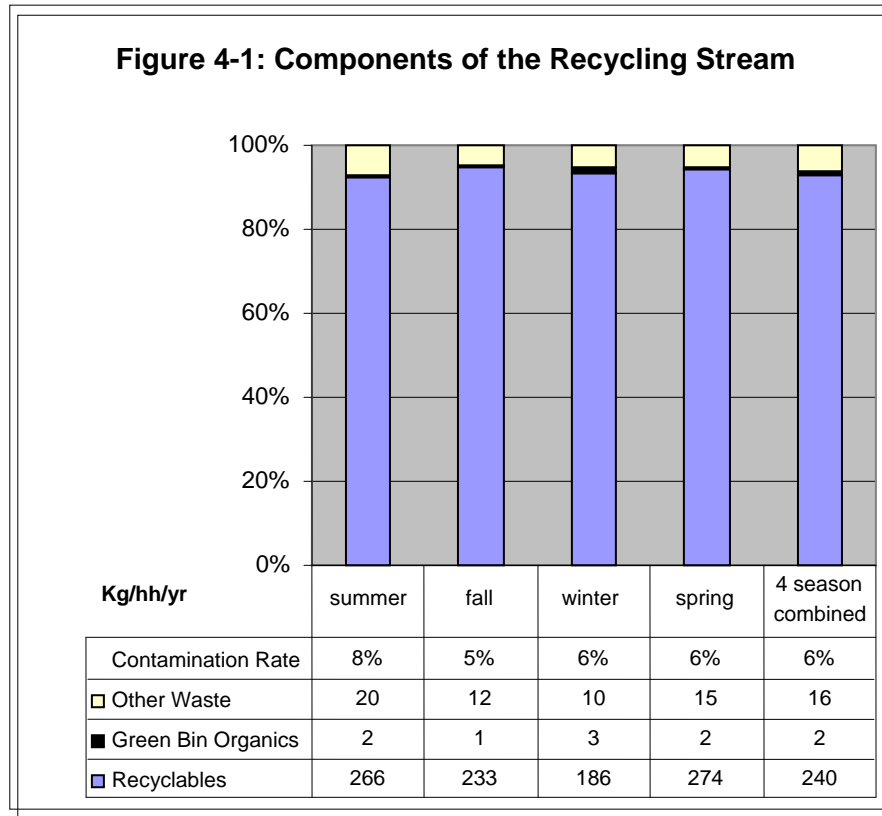
* includes paper fibre diverted through the Green Bin Program

Table 4-4 and Figure 4-1 shows the make-up of the recycling stream and the level of contamination for each season and the four seasons combined. The recycling stream is consistently achieving very low contamination rates, which range from 5% to 8% and mostly consist of other waste and not organics. About one-quarter of the recyclables remain in the garbage.

Table 4-4: Comparison of Recyclables Found in Different Streams (excluding yard waste)

	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)			
Summer	91	266	3*	378
Fall	96	233	1*	341
Winter	67	186	1*	263
Spring	92	274	1*	382
Four season combined	87	240	1*	341

*non-compostable recyclables



4.2 Comparison of Four Season Green Bin Results

Table 4-5 provides a comparison of green bin capture rates among the four seasons shows a noticeable decrease in the capture rates of organic material (not including yard waste) during the winter and spring waste audits, achieving 54% and 52%, respectively, compared with 65% and 71% capture rate during summer and fall, respectively. Although this observation is understandable during the winter audit, it is less understandable during the spring audit.

Table 4-5: Comparison of Green Bin Capture Rates in Summer, Fall, Winter and Spring (excluding yard waste)

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Green Bin Organics*	65%	71%	54%	52%

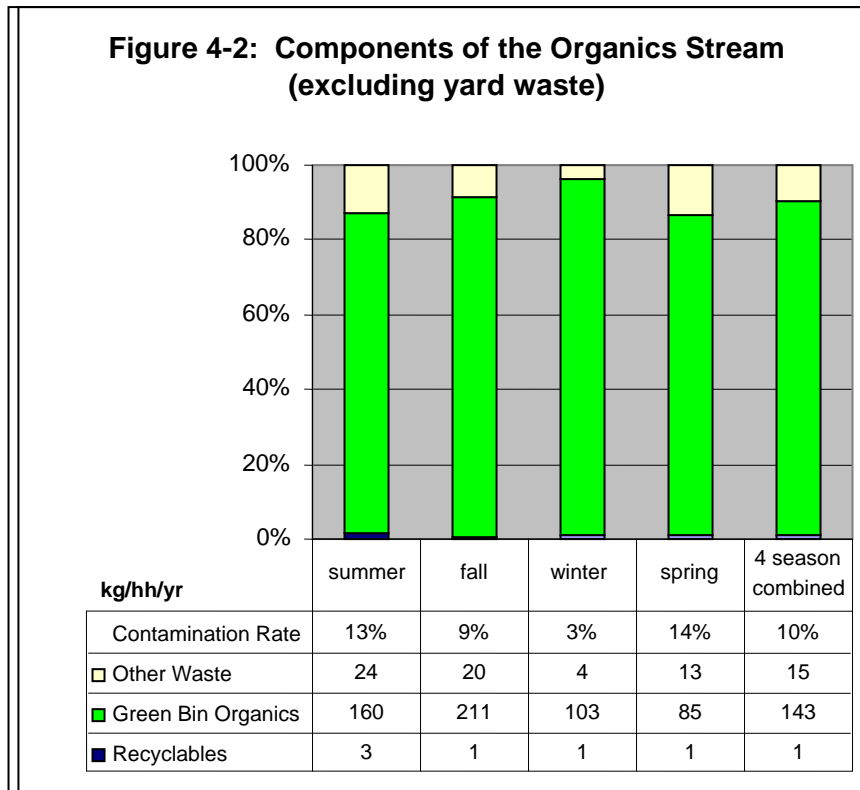
*not including yard waste

Table 4-6 and Figure 4-2 show the make-up of the green bin stream and the level of contamination for each season and the four seasons combined. The green bin stream contamination rates range from a low of 3% in the winter to 13% in the spring. Most of the contamination consists of other waste materials.

**Table 4-6: Comparison of Organics Found in Different Streams³
(excluding yard waste)**

	Garbage	Blue Box	Green Bin	Total
(kg/hh/yr)				
Summer	101	2	160**	246
Fall	95	1	211**	296
Winter	94	3	103**	192
Spring	102	2	98**	190
Four season combined	98	2	143**	231

** includes paper compostables



4.3 Comparison of Four Season Garbage Results

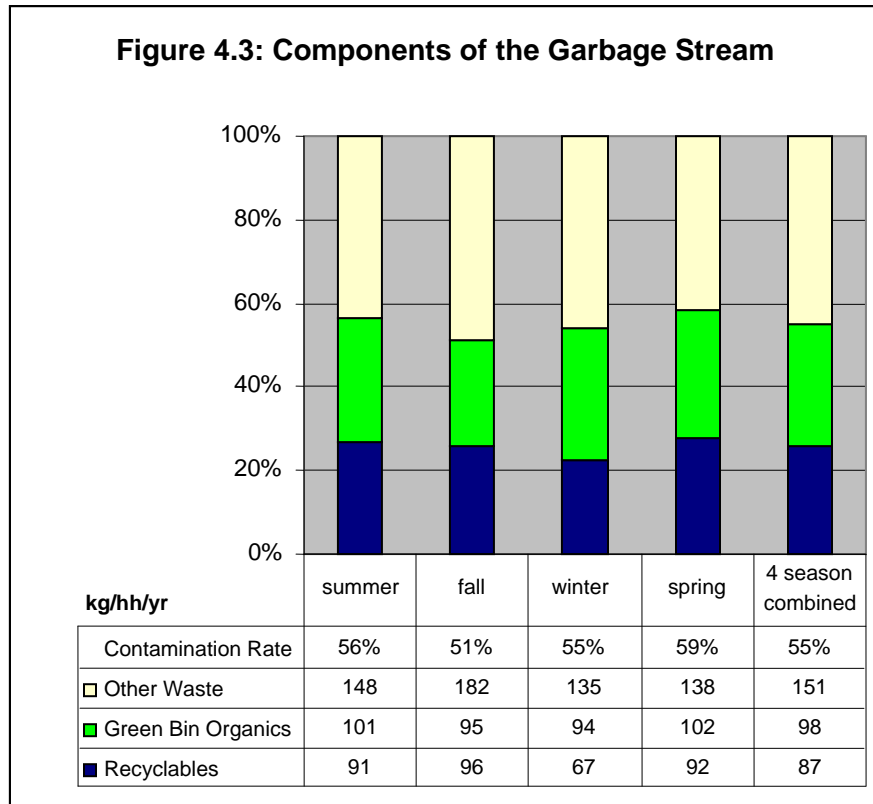
Table 4-7 and Figure 4-3 shows the make-up of the garbage stream and the level of contamination for each season and the four seasons combined. Contamination consists of the amount of potentially recyclable or compostable materials remaining in the garbage stream. The overall contamination rate for the four seasons is very consistent ranging from 51% to 59%, with the amount of potentially recyclable material ranging from 23% to 28% and the amount of potentially compostable material ranging from 25% to 32%. More than half of the garbage stream consists of potentially divertable materials.

³ The Green Bin Organics do not equal the sum of each row cell due to the problem of double counting with the Recyclables total. Recyclable paper fibres diverted through the Green Bin are accounted for in the Recyclables total.

Table 4-7: Comparison of Recyclables and Organics Found in the Garbage Stream (excluding yard waste)

	Other Waste	Recyclables	Organics	Total
(kg/hh/yr)				
Summer	148	91	101	340
Fall	182	96	95	373
Winter	135	67	94	296
Spring	138	92	102	332
Four season combined	151	87	98	335

	Contamination Rates		
	organics	recyclable	Total
	%		
Summer	30%	26%	56%
Fall	25%	26%	51%
Winter	32%	23%	55%
Spring	31%	28%	59%
Four season combined	29%	26%	55%



4.4 Key Findings

- The combined results show that during winter participating residents generated the least amount of waste with 601 kg/hh/yr, compared with the other three seasons with the spring audit at 736 kg/hh/yr, summer at 812 kg/hh/yr and fall at 850 kg/hh/yr.
- The total waste generation rate remains highest in the summer and fall compared with the spring and winter, suggesting a peak season versus non-peak season variation.
- Although contamination rates in the garbage stream for the combined areas were similar among the four seasons, the spring audit showed slightly elevated contamination rates at 59% compared with 56% in the summer, 51% in the fall and 55% in the winter. In all cases, more than half of the garbage stream consists of potentially divertable materials.
- The combined results for spring show that the capture rate for the green bin is the lowest among the four seasons at 52% compared with, 65% in the summer, 71% in the fall and 54% in the winter. This result was greatly impacted by poorer green bin capture rate recorded in Petawawa during the spring audit.
- All four seasons are achieving similar overall diversion rates ranging from 48% to 52%, not including yard waste.
- There is greater variation in the diversion rates when the yard waste is factored in to the equation. Summer, fall and spring diversion rates are similar ranging from 62% to 67% with the yard waste included and 48% in the winter, due to the lack of yard waste generated during the winter months.

5.0 Comparison of Peak Season Verses Non-Peak Season Results

The need for a series of waste audits was premised on the feeling that Ottawa Valley Waste Recovery Centre experiences fluctuations in the amount of recyclables processed at the MRF during peak seasons (summer and fall) and non-peak seasons (winter and spring). The increase in materials experienced during the peak season results from the influx of vacationers during the summer months and hunters during the fall months in Renfrew County. The need for accurate waste stream composition data was required in order to accommodate fluctuations in material recovery rates that impact OVWRC's ability to manage its waste management and diversion programs and develop educational materials to reflect the transitional characteristics of seasonal visitors.

Waste generation and recovery results are summarized in Table 5-1 below for the peak season and non-peak season data. All annual generation and recovery estimates are presented on a kilogram per household per year basis and have not been seasonally adjusted. Some materials are accepted in the blue box or the green bin program including ONP, OCC, kraft paper, OBB, molded pulp and paper cups. The capture rates reflect both diversion opportunities.

Table 5-1: Waste Generation and Recovery Results – Peak Season versus Non-Peak Season

Material Category	Recycle or compost	Peak Season (summer and fall)					Non-Peak Season (winter and spring)				
		Garbage	Blue Box	Green Waste	All Material	Capture Rate	Garbage	Blue Box	Green Waste	All Material	Capture Rate
		kg/hh/yr	kg/hh/yr	kg/hh/yr	kg/hh/yr	%	kg/hh/yr	kg/hh/yr	kg/hh/yr	kg/hh/yr	%
Paper											
Newspaper-Dailys & Weeklys	x	2.0	29.9	4.2	36.1	94%	1.3	19.9	2.4	23.5	94%
Newspaper - Other	x	2.5	33.5	2.5	38.5	94%	2.7	46.3	3.0	52.0	95%
Telephone Books/Directories	x	0.0	0.8	0.0	0.8	100%	0.0	1.1	0.0	1.1	100%
Magazines & Catalogues	x	1.5	18.9	0.1	20.6	92%	1.8	14.5	0.2	16.4	88%
Mixed Fine Papers	x	8.8	9.5	0.3	18.5	51%	6.2	8.8	0.4	15.4	57%
Books	x	1.1	2.1	0.0	3.2	66%	0.5	5.8	0.1	6.4	91%
Other Paper	x	1.1	1.4	0.1	2.5	54%	2.2	2.2	0.4	4.8	46%
Paper Packaging											
Corrugated Cardboard	x	1.5	35.9	3.4	40.8	96%	1.2	27.4	2.3	30.9	96%
Kraft Paper	x	1.7	4.1	0.9	6.6	74%	1.6	1.2	1.1	3.9	59%
Boxboard/Cores	x	8.8	18.8	1.8	29.4	70%	7.6	22.1	0.5	30.2	75%
Molded Pulp	x	0.5	1.6	0.6	2.7	81%	0.8	1.4	0.5	2.6	71%
Paper Cups & Ice-cream cont.	x	2.4	0.7	0.6	3.7	33%	2.2	0.6	0.7	3.5	37%
Laminated Paper Packaging	x	2.3	0.5	0.1	2.9	16%	2.7	0.3	0.2	3.2	8%
Composite Cans	x ⁴	1.0	0.7	0.0	1.8	40%	0.7	0.7	0.0	1.4	51%
Gable Top Cartons	x	0.9	3.3	0.0	4.2	77%	0.5	2.9	0.0	3.4	84%
Aseptic Containers	x	0.4	0.3	0.0	0.7	41%	0.5	0.3	0.0	0.9	39%
Total Recyclable Paper Fibres		36.0	161.4	14.0	212.2	83%	32.6	155.4	10.4	199.7	83%
Total Non Recyclable Paper Fibres		0.5	0.5	0.7	1.0		0.0	0.0	1.3	0.0	
Total Paper Fibres		36.5	161.9	14.7	213.2		32.6	155.4	11.8	199.7	
Plastics											
PET Beverage Bottles	x	0.9	8.6	0.2	9.7	89%	1.2	6.0	0.0	7.3	83%
PET Other Bottles & Jars	x	0.5	1.5	0.0	2.0	73%	0.5	3.1	0.0	3.6	86%
PET Other Packaging	x	0.2	1.0	0.0	1.2	83%	0.4	1.3	0.0	1.8	75%
HDPE Beverage Bottles	x	0.1	0.6	0.0	0.8	80%	0.1	0.5	0.0	0.5	87%
HDPE Other Bottles & Jugs	x	1.1	4.2	0.0	5.2	80%	0.8	3.7	0.0	4.5	82%
PVC Bottles & Jars	x	0.1	0.2	0.0	0.3	69%	0.1	0.1	0.0	0.2	67%
Other Bottles, Jars & Jugs	x	0.7	0.8	0.0	1.5	54%	0.3	0.6	0.0	0.9	62%
Polystyrene Packaging	x	3.0	3.3	0.2	6.6	50%	1.5	2.5	0.1	4.1	61%
Wide Mouth Tubs & Lids	x	1.5	2.0	0.1	3.6	56%	1.6	1.7	0.1	3.4	51%
Large HDPE & PP Pails & Lids	x	0.2	0.4	0.0	0.5	71%	0.3	1.7	0.0	2.0	86%
PE Plastic - Pkging	x	9.2	6.9	0.3	16.4	42%	10.0	5.9	0.2	16.1	37%
PE Plastic -NonPkging	x	3.8	0.8	0.1	4.7	16%	4.4	0.5	0.3	5.2	9%
Laminate/Other Bags/Film		9.8	1.4	0.7	11.8		5.5	1.0	0.1	6.7	
Other Rigid Plastic Packaging		3.1	2.8	0.0	6.0		3.8	3.0	0.0	6.8	
Durable Plastic Products		8.0	4.1	0.1	12.2		6.4	3.1	0.4	9.8	
Total Recyclable Plastics		21.3	30.1	1.0	52.4	57%	21.1	27.5	0.8	49.4	56%
Total Non Recyclable Plastic Fibres		20.9	8.3	0.9	30.1		15.7	7.1	0.5	23.3	
Total Plastics		42.1	38.4	1.9	82.5		36.8	34.6	1.3	72.7	

⁴ Composite Cans introduced into the recycling program in the fall.

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	Recycle or compost	Peak Season (summer and fall)					Non-Peak Season (winter and spring)				
		Garbage	Blue Box	Green Waste	All Material	Capture Rate	Garbage	Blue Box	Green Waste	All Material	Capture Rate
Metals											
Aluminum Food & Bev Cans	x	0.7	4.0	0.0	4.7	85%	0.8	3.2	0.0	4.0	80%
Aluminum Foil & Foil Trays	x	1.1	0.4	0.0	1.6	26%	1.1	0.3	0.0	1.4	23%
Others Aluminum Containers	x	0.1	0.0	0.0	0.1	7%	0.0	0.1	0.0	0.1	96%
Steel Food & Beverage Cans	x	2.5	10.6	0.1	13.2	81%	2.2	11.1	0.0	13.3	83%
Steel Aerosol Cans	x	0.5	0.3	0.0	0.8	35%	0.5	0.4	0.0	0.9	44%
Steel Paint Cans	x	0.5	0.1	0.0	0.7	18%	0.2	0.2	0.0	0.4	50%
Other Metal	x	4.3	2.8	0.0	7.1	40%	2.0	2.9	0.0	4.9	60%
Total Recyclable Metals		9.7	18.3	0.2	28.2	65%	6.7	18.3	0.0	25.1	73%
Total Non Recyclable Metals		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Metals		9.7	18.3	0.2	28.2		6.7	18.3	0.0	25.1	
Glass											
Alcoholic Bev Glass Clear	x	0.4	9.2	0.0	9.7	95%	0.2	4.5	0.0	4.7	95%
Alcohol Bev. Glass Coloured	x	0.7	9.8	0.0	10.4	94%	0.9	5.7	0.0	6.6	86%
Food and Bev Glass Clear	x	2.4	16.6	0.2	19.2	86%	2.5	16.8	0.0	19.4	87%
Food and Bev Glass Coloured	x	0.0	0.7	0.0	0.7	100%	0.0	0.6	0.0	0.6	100%
Other Glass		2.8	1.8	0.1	4.7		3.0	2.2	0.0	5.2	
Total Recyclable Glass		3.6	36.3	0.2	40.1	91%	3.7	27.6	0.0	31.3	88%
Total Non Recyclable Glass		2.8	1.8	0.1	4.7		3.0	2.2	0.0	5.2	
Total Glass		6.4	38.1	0.2	44.8		6.7	29.8	0.0	36.5	
HSW											
Batteries		1.4	0.3	0.0	1.7		0.9	0.1	0.0	1.0	
Paint & Stain		0.0	0.0	0.0	0.0		0.6	0.1	0.0	0.7	
Motor Oil		0.6	0.0	0.0	0.6		0.3	0.0	0.0	0.3	
Other HSW liquids		3.2	0.2	0.9	4.3		1.0	0.2	0.2	1.3	
Other HSW		0.8	0.0	0.0	0.9		2.5	0.1	0.0	2.6	
Total HSW		6.1	0.5	0.9	7.5		5.3	0.4	0.2	5.9	
Organics											
Food Waste	x	82.3	1.1	169.4	252.8	67%	86.6	2.2	86.3	175.1	49%
Pet Waste											
Tissue/Toweling	x	49.4	0.6	6.9	56.9	13%	50.6	0.3	1.3	52.2	23%
Green Bin Organics		97.9	1.4	171.8	271.1	63%	98.3	2.5	90.0	190.7	47%
Total Other Organics		49.4	0.6	6.9	56.9		50.6	0.5	1.3	64.5	
Other Materials											
Diapers and Sanitary Products		39.1	0.5	1.8	41.4		37.9	0.1	1.1	39.1	
Textiles	x	23.0	3.5	0.3	26.9	13%	15.5	1.4	0.1	16.6	9%
Carpeting		3.5	0.0	0.0	3.5		3.5	0.0	0.0	3.5	
Construction & Renovation		28.7	0.4	3.1	32.2		10.4	0.0	0.8	11.2	
Computer / IT Equipment		0.7	0.0	0.0	0.7		0.3	0.0	0.0	0.3	
Telecom Equipment		0.0	0.2	0.0	0.2		0.4	0.0	0.0	0.4	
TV & Audio Equipment		0.2	0.9	0.0	1.1		0.1	0.0	0.0	0.1	
Small Kitchen Appliances		0.5	0.3	0.0	0.7		0.2	0.2	0.0	0.4	
Other Electronics		1.9	0.2	0.0	2.1		1.0	0.3	0.0	1.3	
Tires and Other Rubber		1.2	0.0	0.0	1.2		0.4	0.0	0.0	0.4	
Ceramics		1.2	0.9	0.0	2.1		0.6	0.6	0.0	1.2	

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	Recycle or compost	Peak Season (summer and fall)					Non-Peak Season (winter and spring)				
		Garbage	Blue Box	Green Waste	All Material	Capture Rate	Garbage	Blue Box	Green Waste	All Material	Capture Rate
Furniture		0.2	0.0	0.0	0.2		0.0	0.0	0.0	0.0	
Mattresses		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Other Large Bulky Items		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Other Waste		8.2	1.0	5.6	14.7		6.9	1.3	3.0	11.3	
Total Recyclable Other Materials		23.0	3.5	0.3	26.9		15.5	1.3	0.1	16.6	
Total Non-recyclable Other Materials		85.3	4.3	10.5	100.0		61.6	3.4	4.9	69.0	
Total Other Materials		108.3	7.7	10.8	126.9		77.0	3.4	5.0	85.7	
Total Waste Stream Without Yard Waste											
Total Recyclable Paper Fibres		36.0	161.4	14.0	212.2	83%	32.6	155.4	10.4	199.7	83%
Total Recyclable Containers		34.5	84.7	1.4	120.6	70%	31.5	73.5	0.8	105.8	69%
Other Recyclables		23.0	3.5	0.3	26.9	13%	15.5	1.1	0.1	16.6	6%
Total Recyclables		93.6	249.7	15.7	359.6	74%	79.6	229.9	11.4	322.1	75%
Green Bin Organics*		97.9	1.4	185.8	271.1	52%	98.3	2.5	100.4	190.7	49%
Other organics		49.4	0.6	6.9	56.9		50.6	0.3	1.3	52.2	
Total Organics (excluding yard waste)		147.3	2.0	192.7	328.1		148.9	2.8	101.7	243.0	
Total Divertable Waste		191.5	249.7	185.8	630.8		177.8	229.9	100.4	512.9	
Total Other Waste		164.9	17.4	21.7	200.2		136.2	15.0	9.2	155.7	
Total All Material		356.5	267.0	207.5	831.0	59%	314.1	244.9	109.6	668.5	55%
%Recyclables in Waste Stream		26%					25%				
%Organics in Waste Stream		28%					31%				
Percent Waste in Blue Box Stream			6%	11%				6%	8%		
Total Waste Stream With Yard Waste											
Total yard waste**		3.3	0.0	147.0	150.3	98%	4.4	0.1	91.9	96.5	95%
Total Organics		126.2	1.7	333.1	447.1	75%	102.7	2.64	192.31	287.21	67%
Total Divertable Waste		194.8	249.7	332.8	781.1		182.3	230.03	192.31	609.34	
Total Other Waste		164.9	17.4	21.7	200.2		136.2	14.97	9.21	155.66	
Grand Total All Material		359.7	267.1	354.5	981.3	63%	318.5	245.00	201.52	765.00	58%

The waste generation and recovery results are further summarized in Tables 5-2 and 5-3.

**Table 5-2: Peak Season and Non-Peak Season Results⁵
(excluding yard waste)**

	Peak Season (summer and fall)				Non-Peak Season (winter and spring)			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	94	250	2	360	80	230	1	322
Green Bin Organics	98	1	186	271	98	3	100	191
Other Waste	165	17	22	200	136	15	9	156
Total All Material	357	267	208	831	314	245	110	669
Contamination Rate	54%	6%	11%		55%	6%	8%	

*non-compostable recyclables

** includes paper compostables

Table 5-3: Peak and Non-peak Capture Rates

	Peak Season (summer and fall) Capture Rate	Non-Peak Season (winter and spring) Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	83%	83%
Recyclable Plastics	57%	56%
Recyclable Metals	65%	73%
Recyclables Glass	91%	88%
Overall Recyclables*	74%	75%
Green Bin Organics**	69%	53%
Overall Diversion (without yard)	52%	49%
Overall Diversion (with yard)	63%	55%

* includes paper fibre diverted through the Green Bin Program

**not including yard waste

Overall, there is a significant difference in the overall waste generation rate between the peak season combined waste audits and the non-peak season waste audits with the participating households generating 831 kg/hh/yr of waste (excluding yard waste placed in the green bin) during the peak season waste audits and 669 kg/hh/yr during the non-peak waste audits. This represents about 25% difference in generation rates. Across each waste stream category, the peak season generation rates exceeded the non-peak generation rates. During the peak season waste audits, participating households generated 360 kg/hh/yr of recyclables compared with 322 kg/hh/yr during the non-peak season (a 12% difference).

The organic stream exhibits the most significant difference between the peak and non-peak seasons. Participating households generated 271 kg/hh/yr of green bin organics (excluding yard waste) during the peak season compared with only 191 kg/hh/yr during the non-peak season (a 42% difference).

⁵ The Green Bin Organics and Other Wastes totals do not equal the sum of each row cell due to the problem of double counting with the Recyclables total. Recyclable paper fibres diverted through the Green Bin and other recyclables identified in the Other Wastes category (Green Bin) are accounted for in the Recyclables total.

There is not a noticeable difference between the amount of recyclables collected through the recycling program during the peak season (250 kg/hh/yr) and the non-peak season (230 kg/hh/yr), or about an 8% difference. However, the amount of potentially recyclable materials found in the garbage stream during the peak season was almost 20% greater than the amount of potentially recyclable materials found in the garbage stream during the non-peak season, suggesting that vacationers may be less aware of recycling opportunities and resorting to discarding potentially recyclable materials in the garbage stream.

The contamination rates were similar during both audits with 54% (peak season) and 55% (non-peak season) recyclables and compostables combined in the garbage stream. The Blue Box stream had the same contamination rate (6%) during peak season and non-peak season and the Green Bin stream had 11% (peak season) and 8% (non-peak season) contamination rates.

The audited residents are achieving very similar recovery rates for most recyclable materials (paper, plastics and glass) during the peak season and non-peak season. Both peak and non-peak season audit results achieved 83% recovery rate for paper, 57% (peak season) and 56% (non-peak season) for plastics and 91% (peak season) and 88% (non-peak) for glass. The main difference in recovery rates was metals in which residents achieved 65% recovery rate during the peak season and 73% during the non-peak season.

As noted above, there is a great difference in the overall amount of green bin organics generated between the peak season and non-peak season, which is reflected in the amount captured in the green bin between the peak season and non-peak season. The green bin compostables (non including yard waste) achieved 69% recovery rate during the peak season and 53% recovery rate during the non-peak season. Participants during the peak season captured 67% of available food waste (not including the yard waste or compostable paper) compared 49% of available food waste captured during the non-peak season. Some of this can be explained by the fact that residents may be less willing to place organic materials in the green bin during the winter months.

Overall, residents achieved similar overall diversion rates during the peak and non-peak audit results with peak season achieving a 52% diversion rate and non-peak season achieving a 49% diversion rate (not including yard waste in the green bin). When yard waste is factored in, the participating residents achieved 63% diversion during the peak season and 55% in the non-peak season.

5.1 Comparison of Recycling Results

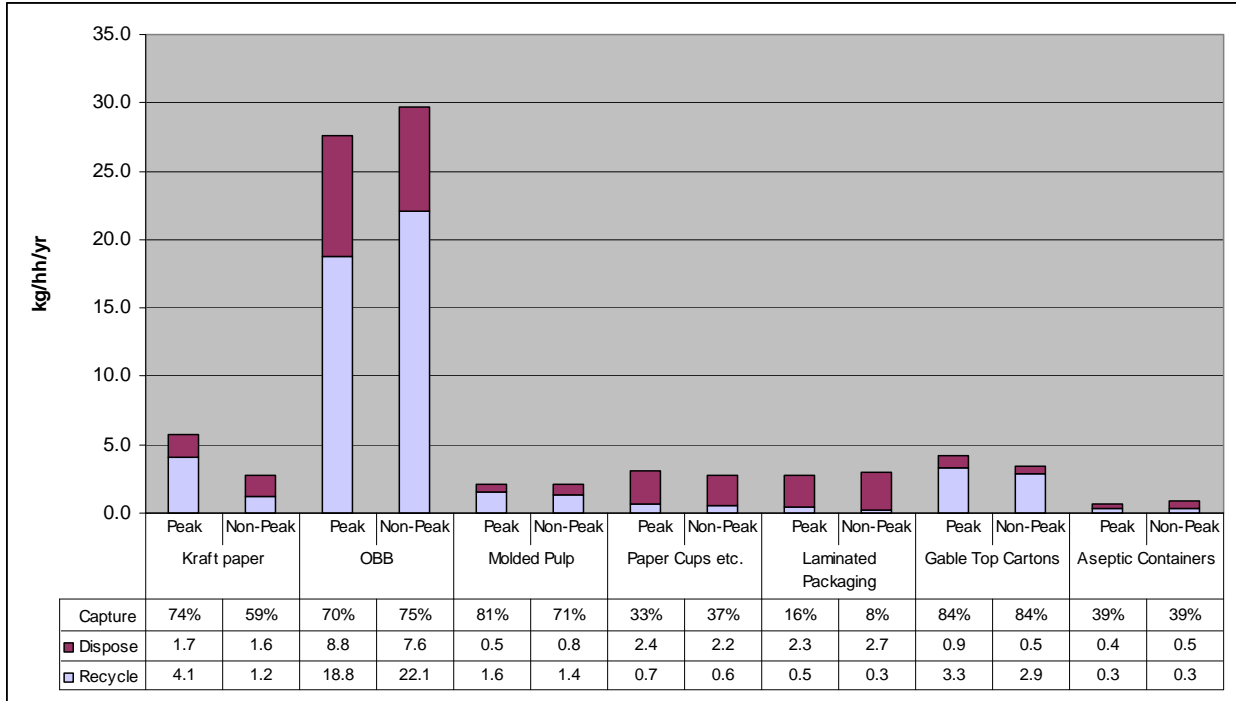
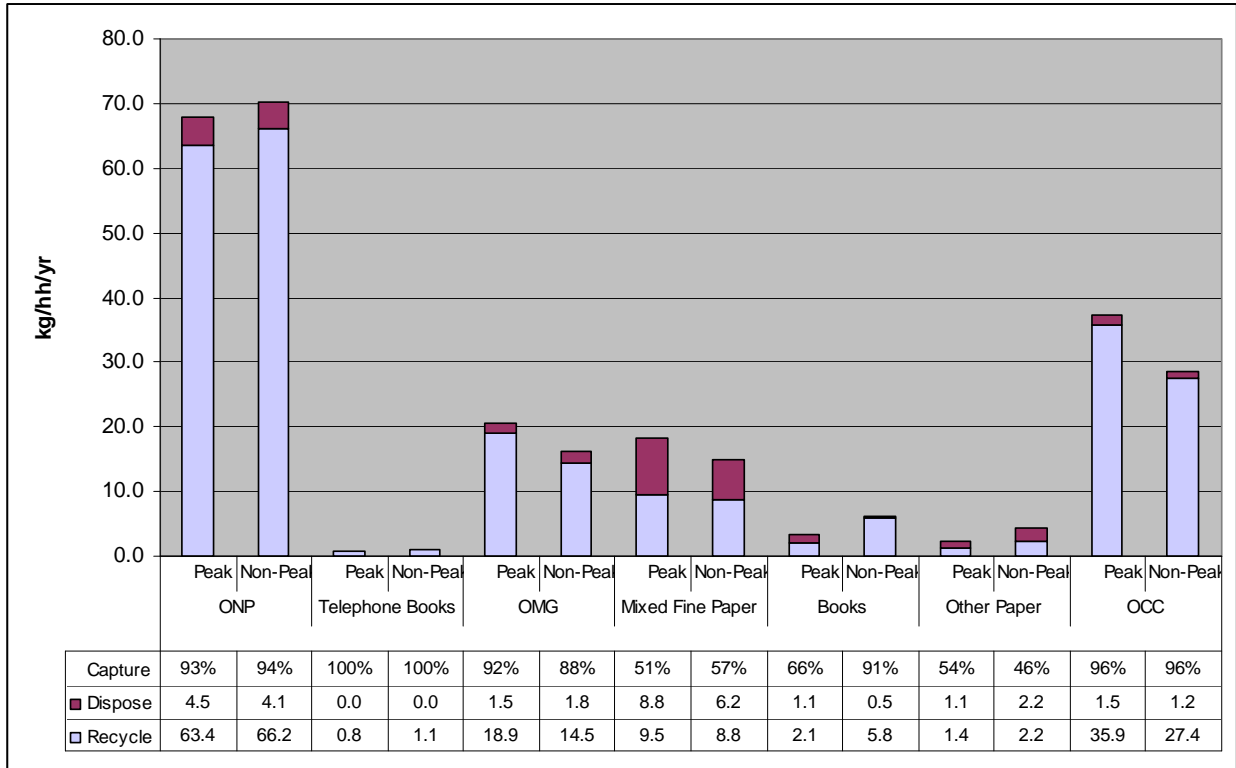
Paper Fibre Generation and Recovery – Peak and Non-Peak Season Results

Generation and captures rates for the currently targeted recyclable papers are presented in Figures 5-1a and 5-1b. The capture rates shown for recyclable fibres reflect those paper materials diverted through the recycling program and Green Bin program

Audited residents generated, on average, 212 kg/hh/yr of recyclable fibres during the peak season and 200 kg/hh/yr during the non-peak season and they recycled, on average, 161 kg/hh/yr of recyclable fibres during the peak season and 155 kg/hh/yr during the non-peak season. There is also very little variation in generation rates by individual fibre material between peak season and non-peak season.

The peak and non-peak season capture rates are virtually the same for many recyclable fibre materials including old newsprint (ONP), old magazines (OMG), other paper, and old corrugated cardboard (OCC). Most of the other materials show a slight variation of 5% to 7% difference. The only materials that show great variation in capture rates are books (66% peak season verses 91% non-peak season), kraft paper (74% peak season verses 59% non-peak season), molded pulp (81% peak season verses 71% non-peak season and laminated packaging (16% peak verses 8% non-peak season).

Figures 5-1a and 5-1b: Paper Fibre Recovery Rates for Peak and Non-Peak Seasons



Note: composite cans were introduced into the recycling program in the fall.

Container Generation and Recovery – Peak and Non-Peak Season Results

Generation and captures rates for the currently targeted recyclable container materials are presented in Figures 5-2a, 5-2b, 5-2c and 5-2d. Containers are not accepted in the green bin.

Overall recyclable containers achieved 70% capture rate during the peak season and 69% capture rate during the non-peak season. The capture rates for recyclable container materials were fairly similar, with the exception of metal. The plastics achieved 57% (peak season) and 56% (non-peak season) capture rates, glass achieved 91% (peak season) and 88% (non-peak season) recovery rates. Metals showed higher variation in capture rates, with peak season achieving 65% and non-peak season achieving 73% capture rates.

In terms of recyclable containers, the peak season audited residents generated 121 kg/hh/yr and non-peak season audited residents generated 106 kg/hh/yr in the fall and they recycled 85 kg/hh/yr during the peak season and 74 kg/hh/yr during the non-peak season.

PET beverage bottles show the greatest variation between peak and non-peak seasons (as shown in Figure 3-2a). There is a noticeably higher generation rate among the PET beverage bottles in the peak season than the non-peak season which can be explained by higher consumption of beverages during the summer and fall months than the winter and spring months.

The capture rates for recyclable plastics between the peak and non-peak season also vary with many recyclable plastic materials more than 8% variation in capture rates between the peak season and non-peak season including PET other bottles and jars, bottles and jars, polystyrene packaging, and HDPE and PP pails.

Among the traditional metal recyclables (e.g. aluminum and steel cans, aluminum foil and trays) there was no significant difference in generation or capture rates between peak season and non-peak season (see Figure 3-1c). There were slightly more aluminum cans generated during the peak season than the non-peak season which can be attributed to higher consumption of beverages in the summer and fall seasons than the winter and spring seasons. Among the metal containers, aluminum food and beverage containers achieved the highest recovery rates at 85% (peak season) and 80% (non-peak season), and steel food and beverage containers at 81% (peak season) and 84% (non-peak season).

As expected, there is a noticeable difference in generation rates among the alcoholic beverage containers between the peak and non-peak seasons, which is attributed to the launch of Ontario's LCBO bottle deposit return program in February 2007. All four beverage glass container categories (clear and coloured) achieved virtually the same and very high capture rates during the peak and non-peak seasons with all four categories showing greater than 85% capture rates.

Figures 5-2a and 5-2b: Plastic Container Recovery Rates for Peak and Non-Peak Seasons

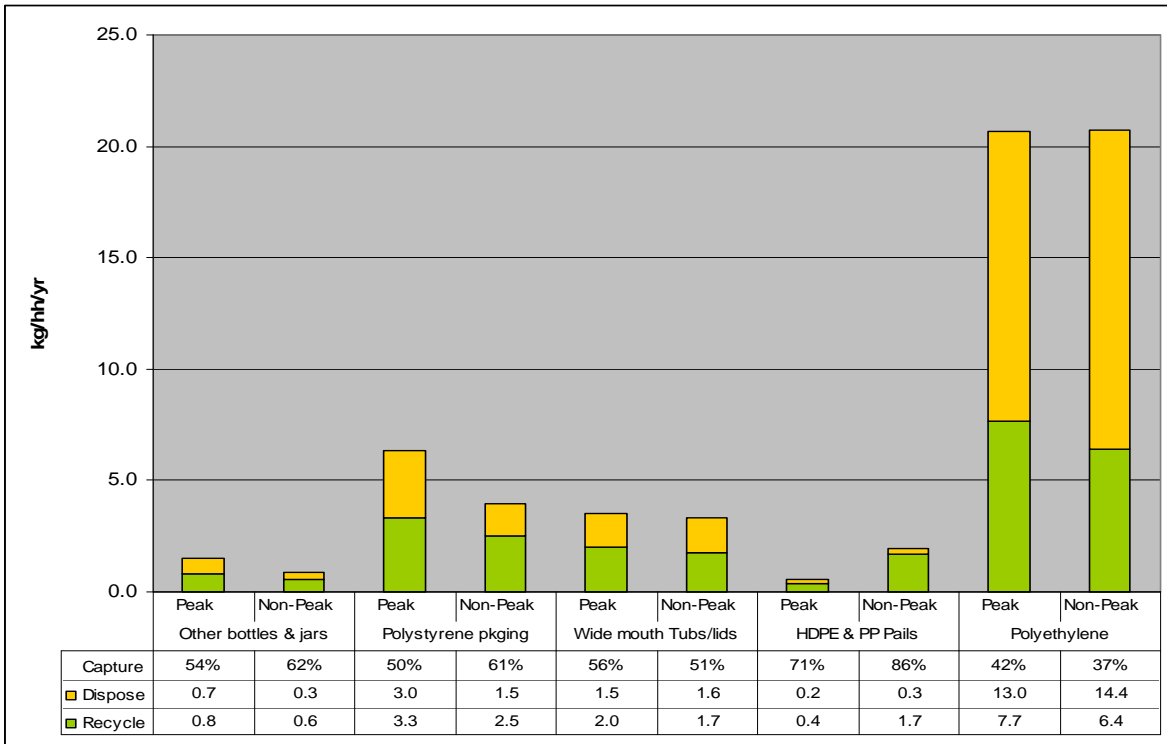
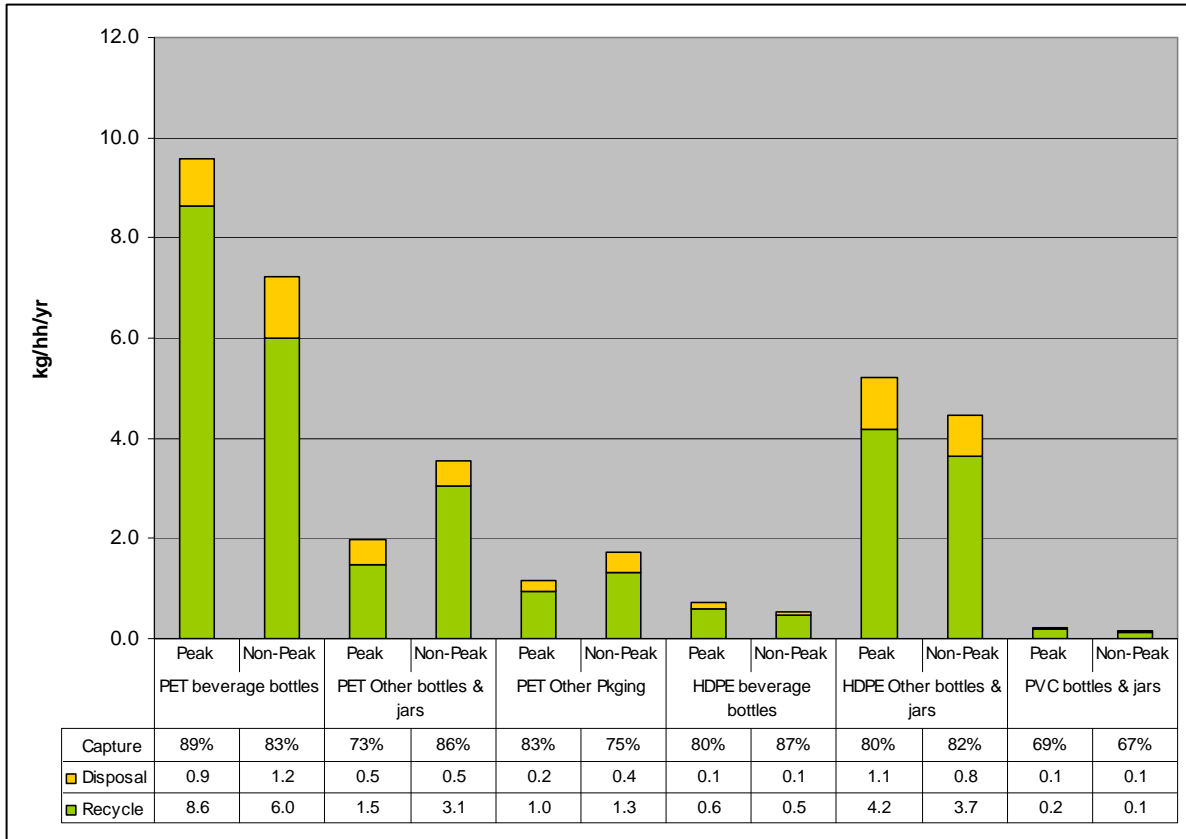


Figure 5-1c: Metal Container Recovery Rates for Peak and Non-Peak Seasons

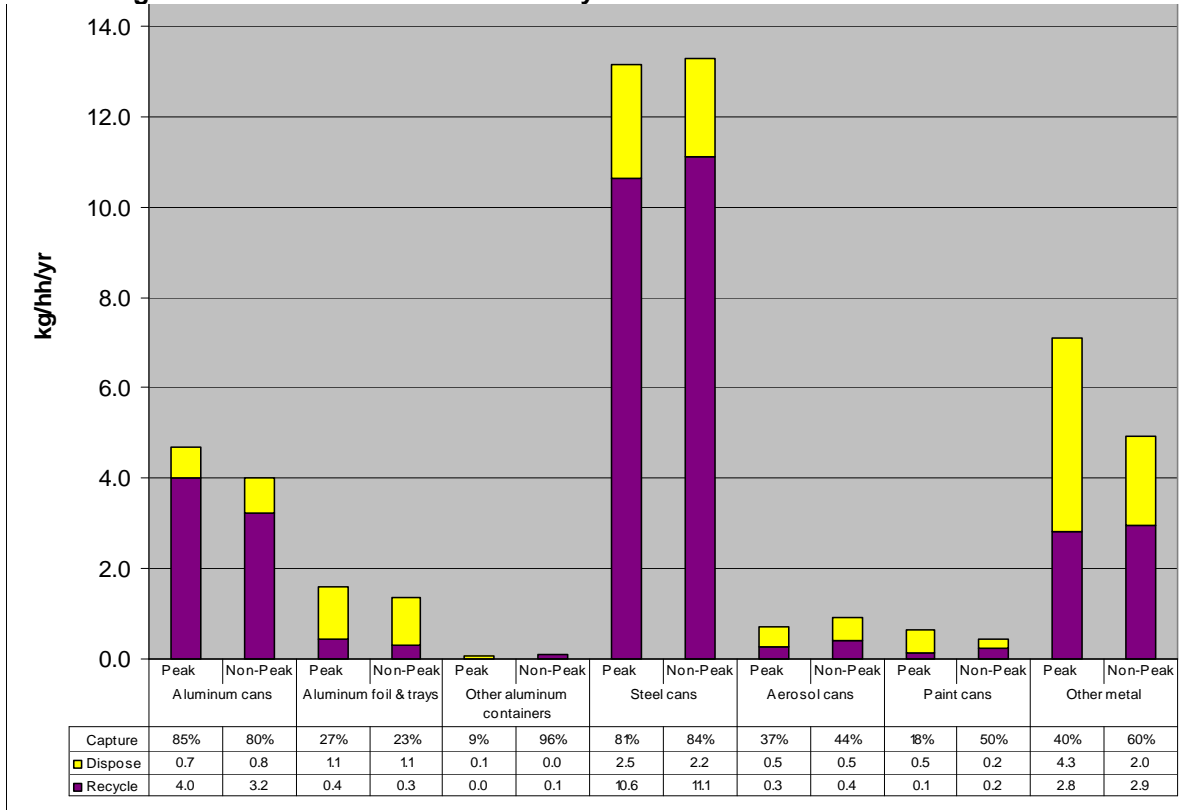
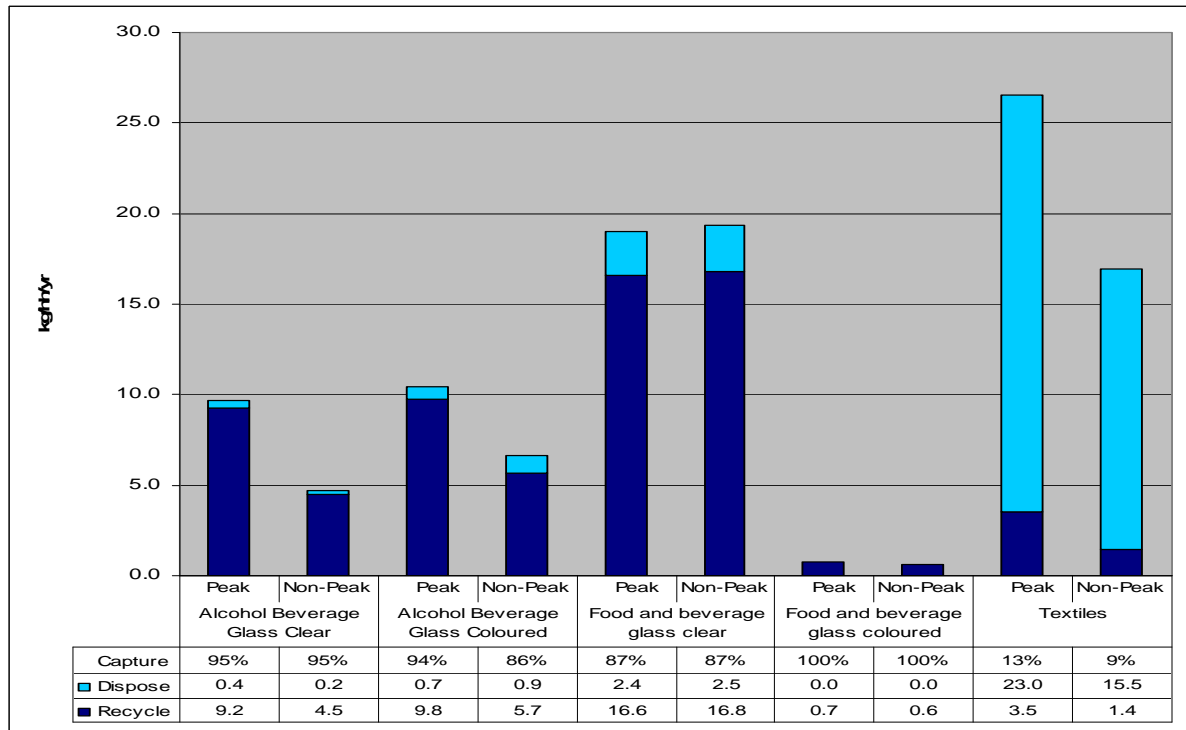


Figure 5-2d: Glass Container and Textile Recovery Rates for Peak and Non-Peak Seasons



5.2 Comparison of Green Bin Results

Organics Generation and Recovery – Peak and Non-Peak Season Results

Table 5-4 shows the amount of organic materials diverted through the Green Bin Program compared with the amount disposed. Pet waste is not included in the Green Bin Program; however, the program allows residents to include a range of paper products including tissue and toweling, newspaper, cardboard, boxboard, kraft paper, molded pulp, paper cups and ice cream containers.

The most noticeable difference between the peak and non-peak seasons is the overall amount of food waste generated and diverted through the green bin program. The peak season shows that residents generated, on average, 253 kg/hh/yr of food waste compared with 175 kg/hh/yr generated during the non-peak season, a difference of 45%. In the three audited communities, participating residents overall diverted 67% (peak season) and 49% (non-peak season) of their food waste through the green bin program and less than 25% of their tissue and toweling waste. Majority of the yard waste (over 90%) was placed in the green bin rather than in the garbage. Overall, the participating residents diverted 69% of the organic waste (excluding yard waste) during the peak season and 53% during the non-peak season.

Table 5-4: Organics Diverted Through the Green Bin in Peak and Non-Peak Seasons⁶

	Peak Season (summer and fall)				Non-Peak Season (winter and spring)			
	Diverted (kg/hh/yr)	Disposed (kg/hh/yr)	Total Waste (kg/hh/yr)	Capture Rate %	Diverted (kg/hh/yr)	Disposed (kg/hh/yr)	Total Waste (kg/hh/yr)	Capture Rate %
Food Waste	169	82	253	67%	86	87	175	49%
Tissue and Towelling	7	49	57	13%	1	51	52	23%
Recyclable Paper	14	n.a.	n.a.	n.a.	10	n.a.	n.a.	n.a.
Total	186	98	271	69%	100	98	191	53%
Yard Waste	147	3	150	98%	92	4	97	95%

5.3 Key Findings

- Overall, there is a significant difference in the overall waste generation rate between the peak season combined waste audits and the non-peak season waste audits with the participating households generating 831 kg/hh/yr of waste (excluding yard waste placed in the green bin) during the peak season waste audits and 669 kg/hh/yr during the non-peak waste audits. This represents about 25% difference in generation rates. Across each waste stream category, the peak season generation rates exceeded the non-peak generation rates.
- During the peak season waste audits, participating households generated 360 kg/hh/yr of recyclables compared with 322 kg/hh/yr during the non-peak season (a 12% difference) however, this is not reflected in a noticeable difference between the amount of recyclables collected through the recycling program during the peak season (250 kg/hh/yr) and the non-peak season (230 kg/hh/yr). Yet, the amount of potentially recyclable materials found in the garbage stream during the peak season was almost 20% greater than the amount of potentially recyclable materials found in the garbage stream during the non-peak season, suggesting that vacationers may be less aware of recycling opportunities and resorting to putting potentially recyclable materials in the garbage stream.

⁶ The Green Bin Organics do not equal the sum of each row cell due to the problem of double counting with the Recyclables total. Recyclable paper fibres diverted through the Green Bin are accounted for in the Recyclables total.

- There was noticeably higher generation rates of PET beverage bottles (and some variation of aluminum cans) during the peak season than the non-peak season which can be explained by higher consumption of beverages during the summer and fall months than the winter and spring months
- The organic stream exhibits the most significant difference between the peak and non peak seasons with participating households generated 271 kg/hh/yr of green bin organics (excluding yard waste) during the peak season compared with only 191 kg/hh/yr during the non-peak season (a 42% difference).
- The green bin compostables (non including yard waste) achieved 69% recovery rate during the peak season and 53% recovery rate during the non-peak season. Participants during the peak season captured 67% of available food waste (not including the yard waste or compostable paper) compared 49% of available food waste captured during the non-peak season. Some of this can be explained with residents less willing to place organic materials in the green bin during the winter months.
- The contamination rates were pretty well the same during both audits with 54% (peak season) and 56% (non-peak season).
- Overall, residents achieved similar overall diversion rates during the peak and non-peak audit results with peak season achieving a 52% diversion rate and non-peak season achieving a 49% diversion rate (not including yard waste in the green bin).

6.0 Key Findings for Each Community

6.1 Pembroke

Table 6-1 provides a comparison of all four season setout results after all containers have been converted to a standard blue box container size. The participation rate is comparable for all four seasons; however, there are fewer number of blue box equivalent setouts per participating household in the spring compared with the summer and fall. The average container setout per participating household is considerably lower in the spring and winter compared with the summer and fall.

Table 6-1: Comparison of Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer			Fall			Winter			Spring		
	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)
Number of households sampled	30	30	30	30	30	30	30	30	30	30	30	30
Number of households with a setout	25	22	23.0	25	19	22	24	21	22.5	25	19	22.0
Participation Rate	83%	73%	78%	83%	63%	73%	80%	70%	75%	83%	63%	73%
Total standard Blue Box equivalents	52	37	44	52	37	44	41	33	37.0	48	27	37.5
Average # of Blue Boxes per participating hhld	2.1	1.7	1.9	2.1	1.9	2.0	1.7	1.5	1.6	1.8	1.4	1.6
Average # of Blue Boxes per all hhlds	1.7	1.2	1.5	1.7	1.2	1.5	1.4	1.1	1.2	1.6	0.9	1.3

Table 6-2 compares garbage setout and participation rates for all four waste audits. About the same number of households placed garbage at the curb during the four waste audit periods, achieving about 90% participation rate each season. The total number of full bag equivalents was slightly less in the winter and spring months with participating households generating about 2.0 bags of garbage every two weeks during the winter and spring audits compared with 2.5 bags of garbage in the summer and 2.4 bags of garbage in the fall.

Table 6-2: Garbage Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer		Fall		Winter		Spring	
	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly
Number of households sampled	30	30	30	30	30	30	30	30
Number of households with a set out	26	13	26	13	27	13.5	26	13
Participation rate	87%	43%	87%	43%	90%	45%	87%	43%
Total # of full bag equivalents	63.3	31.6	64.5	32.3	55.8	27.9	51.5	25.8
Average # of bags per participating household	2.5	1.2	2.4	1.2	2.0	1.0	2.0	1.0
Average # of bags per all households	1.9	0.9	2.1	1.1	1.9	0.9	1.7	0.9

Table 6-3 provides a comparison of green bin setout and participation rates for all four waste audits. The spring audit produced greater participation rates than the other three audits. In total, 63% of participating households setout a green bin during the spring audit compared with 53%, 50% and 47% during the summer and fall waste audits, respectively.

Table 6-3: Organics Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer	Fall	Winter	Spring
	Bi-weekly average	Bi-weekly	Bi-weekly	Bi-weekly
Number of households sampled	30	30	30	30
Number of households with a set out	17	16	14	19
Participation rate	57%	53%	47%	63%
Total # of green bin setouts	17	16	14	20
Total # of full bin equivalents	7.9	10.5	7.3	n.a. ⁷
Avg. fullness of container per participating household	0.46	0.66	0.52	n.a.

A comparison of four season capture rates is provided in Table 6-4. The comparison of capture rates in the four seasons shows a slight decrease in the capture rates of organic material during the winter audit (60%) compared with about 65% capture rate for the other three seasons, which is not surprising given that fewer residents are inclined to separate out organics in the winter time.

The overall diversion rate was lowest for the fall due to the considerably lower capture rates for recyclable papers and overall recyclables. This situation may be explained by the higher amount of recyclables in the garbage stream compared with the other seasons as shown in Table 6-5. This is reflected in the fibre setout information in which the fibre setout participation rate is lower for fall (63%) than summer (73%) or winter (70%) and equal to spring (63%), whereas the garbage bag setout per participating household is considerably higher for fall (2.4 bags per participating household) than spring (2.0) and comparable to summer (2.5).

Table 6-4: Comparison of Spring Capture Rates with Winter, Summer and Fall

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	84%	77%	83%	85%
Recyclable Plastics	55%	58%	49%	51%
Recyclable Metals	65%	65%	71%	72%
Recyclables Glass	89%	90%	87%	76%
Overall Recyclables**	75%	65%	76%	73%
Green Bin Organics**	65%	66%	60%	65%
Overall Diversion (without yard)	56%	48%	55%	56%
Overall Diversion (with yard)	64%	66%	56%	67%

* includes paper fibre diverted through the Green Bin Program

**not including yard waste

⁷ It should be noted that for the spring audit, while green bins were set out at four of the participating residents on Flora St., they were inadvertently collected by the OVWRC collection crew; therefore, the average bin fullness could not be calculated.

Table 6-5 provides a comparison of overall waste generation and diversion rates for each of the seasons audited – summer, fall, winter, spring. The winter total waste generation rates are the lowest for the four seasons and for each category suggesting a peak season vs non-peak season variation. The spring rates show a climb back up to peak season generation rates but with high contamination rates.

In all cases, the garbage stream contained more than 50% divertable waste (recyclables and organics).

The amount of overall recyclables diverted through the recycling program in the fall is considerably lower than the summer and spring (229 kg/hh/yr in the fall compared with 262 kg/hh/yr in the summer and 277 kg/hh/yr in the spring) and is the same for the winter. Also, there are more recyclables in the garbage stream in the fall than the other seasons (resulting in the lower capture rates observed in the fall than the other three seasons).

The combined contamination rates are lower for the fall than the other three seasons. Further investigation reveals that this is due to the very low organic contamination rate during the fall compared with the other seasons (21% in the fall compared with 34% in the summer, 29% in the winter and 29% in the spring). The contamination rate for the recyclables remains consistent with the other three seasons.

The amount of organic material (excluding yard waste) generated in the winter and spring season is considerably lower than the amount generated during the summer and fall seasons; however, the capture rates for all four seasons are similar. It appears that participating residents are generating fewer organics during the winter and spring audit.

Table 6-5: Comparison of Total Waste Collected in Summer, Fall, Winter and Spring⁸

	Summer				Fall			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	95	262	2*	382	127	229	1*	367
Green Bin Organics	99	2	146**	225	81	1	142**	215
Other Waste	97	10	24	128	179	17	4	198
Total All Material	291	274	170	734	387	247	146	780
Contamination Rate	67%	4%	14%		54%	7%	3%	
	Winter				Spring			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	74	229	1*	317	108	277	1*	407
Green Bin Organics	75	1	99**	164	80	2	115**	176
Other Waste	107	7	5	115	88	16	11	113
Total All Material	256	237	105	597	275	295	126	696
Contamination Rate	58%	3%	5%		68%	6%	9%	

*non-compostable recyclables

** includes paper compostables

⁸ See footnote 2.

6.2 Petawawa

Table 6-6 provides a comparison of the summer, fall, winter and spring setout results after all collection containers have been converted to a standard blue box container size. The participation rate is lowest for the winter compared to the other seasons. The spring and winter audits experienced a considerably lower blue box equivalent fibre setout rate per participating household compared with the summer and fall seasons; however, the container setout was comparable.

Table 6-6: Comparison of Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer			Fall			Winter			Spring		
	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)
Number of households sampled	29	29	29	40	40	40	40	40	40	40	40	40
Number of households with a setout	27	24	25.5	30	32	31.0	32	23	27.5	34	32	33.0
Participation Rate	93%	83%	88%	75%	80%	78%	80%	58%	69%	85%	80%	83%
Total standard Blue Box equivalents	59	45	51.9	58	60	58.8	60	25	42.3	79	40	59.3
Average # of Blue Boxes per participating hhhd	2.1	2.0	2.1	2.2	1.9	2.0	1.8	1.1	1.5	2.4	1.2	1.8
Average # of Blue Boxes per all hhlds	2.0	1.6	1.8	1.5	1.5	1.5	1.5	0.6	1.1	2.0	1.0	1.5

Table 6-7 compares garbage setout and participation rates for all four waste audits. A comparable number of households placed garbage at the curb during the four waste audit periods, achieving between 85% - 95% participation rate during the four seasons. The total number of full bag equivalents was slightly lower during the spring audit with participating households generating about 2.1 bags of garbage every two weeks compared with a range of 2.3 to 2.4 bags of garbage in the other three audits.

Table 6-7: Garbage Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer		Fall		Winter		Spring	
	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly
Number of households sampled	39	39	40	40	40	40	40	40
Number of households with a set out	37	18.5	34	17	35	17.5	37	18.5
Participation rate	95%	47%	85%	43%	88%	44%	93%	46%
Total # of full bag equivalents	85.3	42.6	83.0	41.5	83.8	41.9	79.0	39.5
Average # of bags per participating household	2.3	1.1	2.4	1.2	2.4	1.2	2.1	1.1
Average # of bags per all households	2.2	1.1	2.1	1.0	2.1	1.0	2.0	1.0

Table 6-8 provides a comparison of green bin setout and participation rates for all four waste audits. The participation rates are comparable in the green bin program during the spring, summer and fall seasons and considerably lower in the winter. A total of 66% of participating households setout a green bin during the spring audit compared with 68% and 70% during the summer and fall waste audits, respectively. The winter season shows a low participation rate at 45%, which is not surprising given the challenge of accessing and moving the green bin during the cold and snowy season. The average fullness of the bins

during the winter season was 39% compared with 58%, 85% and 60% fullness for the summer, fall and spring audits, respectively.

Table 6-8: Organics Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer	Fall	Winter	Spring
	Bi-weekly average	Bi-weekly average	Bi-weekly average	Bi-weekly average
Number of households sampled	39	40	40	40
Number of households with a set out	28	28	18	29
Participation rate	68%	70%	45%	66%
Total # of green bin setouts	28	32	18	29
Total # of full bin equivalents	15.6	27.3	7.0	15.5
Avg. fullness of container per participating household	0.58	0.85	0.39	0.60

A comparison of capture rates for all four seasons is provided in Table 6-9. The comparison shows a noticeable decrease in the capture rates of organic material during the winter (57%) and spring (47%) audits, which is not surprising for the winter audit but somewhat surprising during the spring audit. This indicates that participating households are disposing a great deal more organic material in the garbage stream than in the green bin stream. The poor organic capture rate observed in the winter is corroborated by the organic setout information for the green bins which shows a 45% participation rate. However, the poor organic capture rate observed in the spring is not corroborated by the organic setout information which shows a 66% participation rates, similar to the participation rates in summer and fall. The garbage setout information does not reveal any further information that would explain this discrepancy .

The capture rates for all recyclable materials categories remain similar for all four seasons. The overall diversion rate (excluding yard waste) for the winter and spring audits is noticeably lower than the summer and fall audits.

Table 6-9: Comparison of Spring Capture Rates with Summer and Fall

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	85%	83%	76%	84%
Recyclable Plastics	55%	53%	53%	52%
Recyclable Metals	65%	56%	72%	65%
Recyclables Glass	88%	91%	93%	88%
Overall Recyclables*	77%	75%	72%	74%
Green Bin Organics**	71%	81%	57%	47%
Overall Diversion (without yard)	52%	58%	45%	46%
Overall Diversion (with yard)	62%	67%	46%	66%

* includes paper fibre diverted through the Green Bin Program

**not including yard waste

Table 6-10 provides a comparison of overall waste generation and diversion rates for each of the seasons audited – summer, fall, winter and spring. The results show that the total waste generation results for the spring audit increased compared with the winter audit but remained lower than the summer and fall audits, suggesting a variation between peak season and non-peak season.

Participating residents are experiencing about 50% contamination rates in the garbage stream during the summer, fall and winter audits and slightly elevated contamination rate in the spring (56%).

The amount of organic material generated in the spring is considerably lower than the summer or fall and slightly lower than winter. There is considerably more organics in the garbage stream in the spring audit than any other the other seasons which explains the poor capture rates discussed above. Since Petawawa residents had access to more convenient weekly green bin collection during the spring audit, the findings are baffling.

As observed in Pembroke, the amount of total recyclable materials generated in the fall is lower than summer and spring (319 kg/hh/yr in the fall compared with 367 kg/hh/yr in the summer and 376 kg/hh/yr in the spring) but greater than winter (246 kg/hh/yr). Unlike Pembroke, however, the garbage contamination rates and recyclable capture rate are similar for the fall as the other three seasons. It appears that participating residents on the whole generated fewer recyclables during the fall than the summer and spring.

Pembroke participating residents generate consistently more recyclables overall than Petawawa participating residents, averaging 368 kg/hh/yr recyclables generated in Pembroke compared with 327 kg/hh/yr in Petawawa (13% difference). The opposite is true of overall generation rates whereby Petawawa participating residents generate, on average, considerably more overall waste (799 kg/hh/yr) compared with Pembroke participating residents (702 kg/hh/yr) – a 14% difference. This is partially explained by the greater amount of organics (excluding yard waste) generated by Petawawa residents (average 261 kg/hh/yr) compared with the amount of organics generated by Pembroke residents (average 195 kg/hh/yr) – a 34% difference.

Table 6-10: Comparison of Total Waste Collected in Summer, Fall, Winter and Spring⁹

	Summer				Fall			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	85	260	3*	367	81	225	1*	319
Green Bin Organics	94	1	188**	264	78	1	293**	360
Other Waste	189	22	32	239	177	7	37	218
Total All Material	368	284	220	870	335	233	330	897
Contamination Rate	49%	8%	15%		47%	4%	11%	
	Winter				Spring			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	67	169	1*	246	97	264	2*	376
Green Bin Organics	98	3	123**	216	118	3	98**	206
Other Waste	173	11	4	185	165	15	24	201
Total All Material	338	183	127	647	380	282	122	783
Contamination Rate	49%	8%	3%		56%	6%	20%	

*non-compostable recyclables

** includes paper compostables

⁹ See footnote 4.

6.3 Laurentian Valley

Table 6-11 provides a comparison of the summer, fall, winter and spring setout results after all collection containers have been converted to a standard blue box container size. The recycling program participation rate is comparable for summer, fall and spring but considerably lower during winter. However, the average fibre setout per participating household is lower in the spring than the other three seasons (although only marginally lower than summer). The average container setout per participating household is comparable for all four seasons.

Table 6-11: Comparison of Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer			Fall			Winter			Spring		
	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)	Containers	Fibres	Average (bi-weekly)
Number of households sampled	30	30	30	30	30	30	30	30	30	30	30	30
Number of households with a setout	25	21	23.0	27	20	23.5	22	12	17.0	25	20	22.5
Participation Rate	83%	70%	77%	90%	67%	78%	73%	40%	57%	83%	67%	75%
Total standard Blue Box equivalents	68	31	49.8	66	40	52.9	53	19	36.0	63	29	45.7
Average # of Blue Boxes per participating hhd	2.7	1.5	2.1	2.5	2.0	2.3	2.4	2.1	2.3	2.6	1.4	2.0
Average # of Blue Boxes per all hhlds	2.3	1.0	1.7	2.2	1.3	1.8	1.8	0.6	1.2	2.1	1.0	1.5

Table 6-12 compares garbage setout and participation rates for all four waste audits. The winter waste audit shows much lower participation rate (77%) than the spring (90%), summer (87%) and fall (90%) audits. However, the total number of full bag equivalents during the spring months is considerably lower than the other three seasons with participating households generating about 1.7 bags of garbage every two weeks in the spring compared with 2.5 bags of garbage in the summer, 2.4 bags of garbage in the fall and 2.6 bags in the winter.

Table 6-12: Garbage Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer		Fall		Winter		Spring	
	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly	Average bi-weekly	Average weekly
Number of households sampled	30	30	30	30	30	30	30	30
Number of households with a set out	26	13	27	13.5	23	11.5	27	13.5
Participation rate	87%	43%	90%	45%	77%	38%	90%	45%
Total # of full bag equivalents	63.3	31.6	64.0	32.0	60.5	30.3	47.3	23.6
Average # of bags per participating household	2.5	1.2	2.4	1.2	2.6	1.3	1.7	0.9
Average # of bags per all households	2.1	1.0	2.1	1.1	2.0	1.0	1.6	0.8

Table 6-13 provides a comparison of green bin setout and participation rates for all four waste audits. There is noticeable difference in the green bin setout and participation rate during the spring audit compared with the summer, fall and winter audits. A total of 63% of participating households setout a green bin during the spring audit compared with 53% and 50% during the summer and fall waste audits

and 17% during the winter waste audits. The average fullness of the bins ranged from 58% to 76% fullness during the four seasons.

Table 6-13: Organics Setout and Participation Results – Summer, Fall, Winter and Spring

	Summer	Fall	Winter	Spring
	Bi-weekly average	Bi-weekly average	Bi-weekly average	Bi-weekly average
Number of households sampled	30	30	30	30
Number of households with a set out	16	15	5	19
Participation rate	53%	50%	17%	63%
Total # of green bin setouts	17	15	5	21
Total # of full bin equivalents	13.0	8.8	3.3	14.8
Avg. fullness of container per participating household	0.76	0.58	0.65	0.70

A comparison of capture rates for all four seasons is provided in Table 6-14. The comparison shows a noticeable decrease in the capture rates of organic material during the winter and spring audits, which is not surprising during the winter audit but is somewhat surprising during the spring audit. The capture rates for all recyclables and, in particular, recyclable papers, plastics and overall in the spring waste audit are comparably higher than the other three seasons.

Table 6-14: Comparison of Spring Capture Rates with Winter, Summer and Fall

	Summer	Fall	Winter	Spring
	Capture Rate	Capture Rate	Capture Rate	Capture Rate
	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)	(based on annual kg/hh/yr generation/recovery estimates)
Recyclable Paper*	82%	83%	78%	89%
Recyclable Plastics	62%	63%	55%	69%
Recyclable Metals	73%	63%	80%	75%
Recyclables Glass	96%	88%	89%	94%
Overall Recyclables*	75%	75%	73%	81%
Green Bin Organics**	51%	59%	43%	47%
Overall Diversion (without yard)	50%	49%	45%	52%
Overall Diversion (with yard)	60%	68%	43%	65%

* includes paper fibre diverted through the Green Bin Program

**not including yard waste

Table 6-15 provides a comparison of overall waste generation and diversion rates for each of the seasons audited – summer, fall, winter, spring. The results show that the total waste generation results for the spring and winter audits are lower than the summer and fall audits, suggesting a peak and non-peak seasonal difference.

The Laurentian Valley audit participants generated similar amounts of recyclables during the summer, fall and spring audits but considerably lower amounts during the winter audit. It appears that participating residents on the whole generated fewer recyclables during the winter

In all cases, the garbage stream contained more than 50% divertable waste (recyclables and organics).

The amount of organic material generated in the winter and spring season is considerably lower than the amount generated during the summer and fall seasons. The participating residents are placing proportionally greater amounts of organic materials in the garbage stream, resulting in lower capture rates for the winter and spring seasons compared with the summer and fall seasons. At the same time, participating residents are generating fewer organics during the winter and spring audit than the summer and fall audits.

Pembroke residents generate consistently more recyclables overall than Petawawa and Laurentian Valley residents, averaging 368 kg/hh/yr recyclables generated in Pembroke compared with 327 kg/hh/yr in Petawawa and 330 kg/hh/yr in Laurentian Valley (about a 13% difference). Petawawa residents are generating on average the same amount of recyclables as Laurentian Valley residents. The opposite is true of overall generation rates whereby Petawawa participating residents generate, on average, considerably more overall waste (799 kg/hh/yr) compared with Pembroke participating residents (702 kg/hh/yr) and Laurentian Valley participating residents (723 kg/hh/yr). This is partially explained by the greater amount of organics (excluding yard waste) generated by Petawawa residents (average 261 kg/hh/yr) compared with the amount of organics generated by Pembroke residents (average 195 kg/hh/yr) and Laurentian Valley residents (221 kg/hh/yr).

Table 6-15: Comparison of Total Waste Collected in Summer, Fall, Winter and Spring¹⁰

	Summer				Fall			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	94	276	2*	381	87	249	0.3*	346
Green Bin Organics	113	3	115**	224	130	0.1	172**	293
Other Waste	145	27	5	175	190	14	15	219
Total All Material	353	306	120	779	408	263	186	857
Contamination Rate	59%	10%	4%		53%	5%	8%	
	Winter				Spring			
	Garbage	Blue Box	Green Bin	Total	Garbage	Blue Box	Green Bin	Total
	(kg/hh/yr)				(kg/hh/yr)			
Recyclables	61	164	0	230	69	285	1*	366
Green Bin Organics	108	3	79	185	106	2	86**	184
Other Waste	111	11	2	124	150	14	6	168
Total All Material	281	178	81	539	325	301	92	718
Contamination Rate	61%	8%	2%		53%	5%	7%	

*non-compostable recyclables

** includes paper compostables

¹⁰ See Footnote 6.

6.4 Key Findings

- The participation rate in OVWRC's recycling program is similar for all four seasons in Pembroke but in the case of Petawawa and Laurentian Valley, the participation rate in winter is considerably lower than the other seasons.
- The average recyclable container setout per participating household remains similar for all seasons in Petawawa and Laurentian Valley but, in the case of Pembroke, the winter and spring container setouts are considerably lower than summer and fall.
- The average recyclable fibre setout per participating household is generally lower in the spring and winter audits compared with the summer and fall audits for Pembroke and Petawawa. The fibre setouts are inconsistent from one season to another in Laurentian Valley.
- The overall waste generation rates rose during the spring waste audit compared with the winter waste audit in each of the three communities – Pembroke, Petawawa and Laurentian Valley; however, the overall spring waste generation rate remained lower than the summer and fall overall waste generation rates suggesting a variation between peak season and non-peak season.
- Green bin capture rates rose during the spring waste audit compared with the winter waste audit in Pembroke and Laurentian Valley but fell in Petawawa to well below the winter capture rates. The spring green bin capture rates remained lower than the summer and fall green bin capture rates in all communities except Pembroke. In Pembroke the spring green bin capture rate was comparable to the summer and fall rates.
- Pembroke residents generate consistently more recyclables overall than Petawawa and Laurentian Valley residents, averaging 368 kg/hh/yr recyclables generated in Pembroke compared with 327 kg/hh/yr in Petawawa and 330 kg/hh/yr in Laurentian Valley (about a 13% difference). Petawawa residents are generating on average the same amount of recyclables as Laurentian Valley residents.
- The opposite is true of overall generation rates whereby Petawawa participating residents generate, on average, considerably more overall waste (799 kg/hh/yr) compared with Pembroke participating residents (702 kg/hh/yr) and Laurentian Valley participating residents (723 kg/hh/yr). This is partially explained by the greater amount of organics (excluding yard waste) generated by Petawawa residents ((average 261 kg/hh/yr) compared with the amount of organics generated by Pembroke residents (average 195 kg/hh/yr) and Laurentian Valley residents (221 kg/hh/yr).

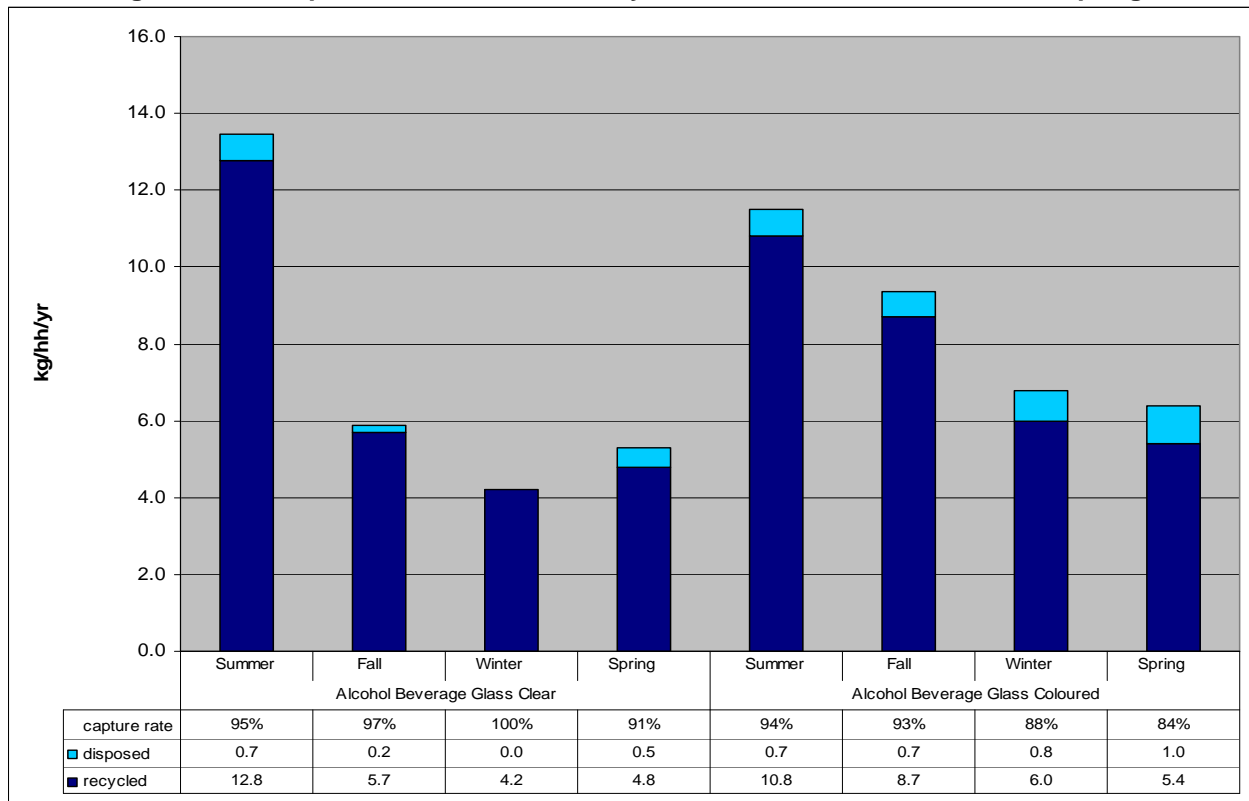
7.0 Analysis of the LCBO Bottle Return Program Impacts

With the launch of Ontario’s Bottle Return Program, which is a deposit/return program targeting empty eligible wine, beer and spirit containers, there has been much speculation about the impacts on municipal recycling programs. The Ontario Deposit Return Program is expected to have a significant impact on the amount of LCBO clear and coloured glass bottles recycled through municipal recycling programs and although plastic and tetra pack LCBO bottles are also impacted, their market share, compared with glass bottles, remains minimal. It was therefore not expected that the recovery rates for those material categories would be impacted during the audit period. For this reason, special attention has been taken to address changes in LCBO glass bottle recovery rates as a result of the Deposit Return Program.

The winter results (see Table 7-1) showed a reduction in the amount of LCBO clear and coloured glass bottles being generated by participating residents. However, since the Bottle Return Program was still in its infancy stage of implementation, having been launched less than two weeks prior to the beginning of the winter waste audit, the results were considered preliminary observations. The results could have reflected a loss of LCBO glass bottles which were being diverted through the deposit/return program or they could have reflected a situation whereby fewer residents were purchasing liquor during the winter months. The spring results were expected to help shed further light on the impact of the Bottle Return Program.

The spring audit results show a continued decline in the amount of LCBO coloured glass being generated by participating residents and a slight increase in the amount of clear glass being generated compared with the winter months. The winter and spring audits show considerably lower amount of LCBO clear and coloured glass being generated compared with the summer audits but the same observation cannot be made for the fall audits. The amount of LCBO clear glass generated in the fall is similar to that of winter and spring. The amount of LCBO colour glass generated in the fall, however, is greater than the winter and spring but lower than the summer.

Figure 7-1: Comparison of Glass Recovery Rates Summer, Fall, Winter and Spring



It appears that the LCBO bottle return program is having an impact on coloured LCBO bottles but it's impact on LCBO clear bottles is uncertain, since the fall generation rates for LCBO coloured glass are similar to the winter and spring generation rates, even though the LCBO bottle return program had not been launched at the time of the fall audits. Further investigation is needed.

8.0 Comparison of Audit Results with Other Ontario Communities

A Comparison of Compiled Blue Box Materials Audit Results

Since 2005, Stewardship Ontario has conducted a single family and multi-family waste audit program. Waste samples are collected from 100 households in each participating municipality, segmented into 10 groups of 10 households, as identified by the host municipality. Waste is separated and weighed according to the designated categories set out in the tender in four audit periods. The waste auditing methodology is the same used for this study.

This year, Stewardship Ontario posted a table of compiled Ontario annual generation rates of Blue Box materials by demographic type which is based primarily on data from Stewardship Ontario's 2005 and 2006 waste audit programs augmented by other recent waste composition data. The table provides blue box material generation and recovery rates from small urban and rural communities based on a range of waste audit results. Working with Stewardship Ontario staff, a comparison was made between prevalent blue box materials from its table and Renfrew County's waste audit results (see Table 8-1).

Table 8-1: Comparison of Renfrew County Waste Audit Results with Stewardship Ontario Compiled Blue Box Results

	Recycle or compost	Renfrew County		Stewardship Ontario		
		combined results		SFH - Urban and Rural		
		Blue Box	Capture Rate		Blue Box	Capture Rate
Material Category		kg/hh/yr	%		kg/hh/yr	%
Paper						
Newspaper	x	64.81	94%		76.22	80%
Magazines & Catalogues	x	16.69	90%		22.45	75%
Total Paper Fibres		81.49			98.67	
Paper Packaging						
Corrugated Cardboard	x	31.63	96%		33.96	70%
Gable Top Cartons	x	3.08	80%		2.96	14%
Aseptic Containers	x	0.32	40%		0.77	13%
Boxboard/Cores	x	20.45	72%		30.82	53%
Total Paper Packaging		55.47			68.51	
Plastics						
PET*	x	10.72	84%		10.97	51%
HDPE*	x	4.45	81%		6.40	52%
Polystyrene Packaging	x	2.90	54%		4.88	2%
PE Plastic - Pkgng - film	x	6.41	39%		13.17	8%
Total Plastics		28.93			35.42	
Metals						
Aluminum Food & Bev Cans	x	3.61	83%		6.00	47%
Foil and other aluminum	x	4.04	67%		0.85	9%
Total Aluminum		8.09			6.85	
Steel Food & Beverage Cans	x	10.88	82%		12.20	66%
Steel Aerosol Cans	x	0.34	40%		0.80	26%
Steel Paint Cans	x	0.17	31%		1.79	17%
Total Steel		11.39			14.79	

	Recycle or compost	Renfrew County		Stewardship Ontario	
		combined results		SFH - Urban and Rural	
		Blue Box	Capture Rate	Blue Box	Capture Rate
Glass					
Alcoholic Bev Glass Clear	x	6.87	95%	13.00	65%
Alcohol Bev. Glass Coloured	x	7.72	91%	9.78	65%
Food and Bev Glass Clear	x	16.69	87%	16.01	65%
Food and Bev Glass Coloured	x	0.69	100%	2.03	65%
Total Glass		31.97		40.82	
Total Recyclables		217.34	80%	265.06	58%

* includes beverage and other bottles and jars

The results show that for every Blue Box material compared, Renfrew County is achieving higher capture rates than compiled results from audited Ontario communities.¹¹

Renfrew County is diverting similar amounts of recyclables as other similar Ontario communities for many of the Blue Box materials, including cardboard, gable top cartons, aseptic containers, PET, HDPE, PS, steel cans, aerosol cans, paint cans and most glass. Renfrew County is diverting noticeably lower amounts in the case of newspapers, magazines, boxboard, film plastic, aluminum cans and foil, and alcoholic beverage clear glass. In the case of the alcoholic beverage clear glass, the LCBO bottle program was introduced part way through the Renfrew County audits (February 2007) and impacted the winter and spring waste audits but did not impact the compiled Ontario waste audits results from 2005 and 2006.

8.2 A Comparison of Individual Waste Audit Results

In 2005, single family waste audits were completed in Durham, Essex-Windsor, London, North Glengarry, Ottawa, Sudbury and Toronto and in 2006, waste audits were completed in Niagara Region, City of Hamilton, City of Peterborough, Sault Ste. Marie, Simcoe County, Town of Blue Mountains and West Nipissing. Once the data has been evaluated and approved by Stewardship Ontario and participating communities, it is published on the Stewardship Ontario website. Waste audit results for the 2005 and 2006 waste audits have been completed and are available for comparison with this study's results.

Selecting the communities to compare involved looking at a number of characteristics that complemented Renfrew County such as seasonal population, rural in nature, organic collection program, and two stream recycling program. The single family waste audit results have been used for the following communities:

- Simcoe County (consists of small, rural communities, seasonal population);
- West Nipissing (6 bag limit, two stream recycling program, small rural communities); and
- Durham Region (the audit featured rural and urban areas including Ajax, Pickering, Port Perry, Manchester, Newcastle and Orno and the Region offers a Green Bin program as well)

The Stewardship Ontario data is useful for comparing total waste generated and individual category generation rates. However, the data provided by Stewardship Ontario does not provide Blue box capture rates overall or by materials groupings (i.e. fibre, metals, plastic, glass). This information has had to be generated for the purposes of comparison. The data has been adjusted from kg/hh/wk results to kg/hh/yr results. The relevant data gleaned from the three community waste audits is provided in Table 8-2.

¹¹ It should be noted that the fibre materials diverted through the Green Bin program (ONP, OCC, OBB) are factored into the capture rates.

Table 8-2: Comparison with Waste Audit Results from Other Communities

	Combined Results			
	Renfrew County (kg/hh/yr)	Simcoe County (kg/hh/yr)	Durham Region (kg/hh/yr)	West Nipissing (kg/hh/yr)
Total Waste Stream	750	617	866	661
Capture Rates for Traditional Recyclable Materials				
	%	%	%	%
Newspaper	94%	87%	90%	48%
Cardboard	96%	89%	92%	70%
Boxboard	72%	59%	58%	46%
Aluminum Cans	83%	55%	72%	18%
Steel Cans	82%	72%	76%	18%
PET bottles*	84%	79%	67%	19%
HDPE bottles*	81%	65%	47%	38%
Glass food and beverage clear	87%	81%	79%	24%
Glass food and beverage coloured	100%	88%	87%	13%
Food Waste	60%	n.a.	49%	n.a.
Diversion (with only recyclables)	32%	33%	32%	13%
Overall Diversion (with food waste diverted)	51%		47%	

* includes beverage and other bottles and jars

The total waste stream generation rates for Renfrew County are greater than the total waste stream generation rates in the Simcoe County and West Nipissing; however, it is lower than the total waste stream generation rate in Durham Region.

Renfrew County’s diversion rate for only the recyclables component is on par with Simcoe County and Durham Region and is considerably higher than West Nipissing. West Nipissing’s recycling program is not as extensive as the other three communities and its capture rates for most recyclable materials remain considerably lower as well. Renfrew County’s overall diversion rate, including organics (but not yard waste) is slightly higher than Durham Region. Durham Region offers organic food waste collection as part of its overall diversion program (the other two communities do not). Compared with Durham Region, Renfrew County is capturing a significant amount more food waste in its Green Bin Program.

For all recyclable materials compared, Renfrew County achieves the highest capture rates compared with the other three communities; in fact, Renfrew County shows significantly higher capture rates for majority of the materials compared with the other communities. The capture rates in Renfrew County are comparable and often higher to the capture rates in Durham Region which has an extensive communication and education program and a community that strongly endorses waste diversion.

APPENDICES

Appendix A

67 Waste Audit Material Categories

Stewardship Ontario Waste Audit Program 2006 – Material Categories		Page 1 of 3
Material Category	Description / Examples	
PAPER		
Newspaper – Dailys and Weeklys	Daily and weekly newspapers published by the Canadian Newspaper Association (CNA) and the Ontario Community Newspapers Association (OCNA); Globe and Mail, Toronto Star, Hamilton Spectator, community newspapers. Consult Stewardship Ontario's list of OCNA/CNA publications. No inserts, flyers and magazines from newspapers.	
Newspaper - Other	Non OCNA/CNA publications (e.g. TV guides, Auto Trader, Real Estate News) plus inserts and flyers from OCNA/CNA newspapers. Consult Stewardship Ontario's list of OCNA/CNA publications. Includes glossy flyers and advertising distributed with newspapers.	
Telephone Books / Directories	Telephone books and other directories such as the Yellow Pages	
Magazines & Catalogues	Glossy magazines, catalogues, calendars, annual reports (must be bound, i.e. stapled or glued).	
Mixed Fine Paper	Fine household papers, writing paper, office paper, copy paper, bills and statements, ad mail, etc. Includes glossy flyers and advertising that are not distributed with newspapers.	
Books	Hard and soft covered books	
Other Paper	Includes gift wrap, some gift bags, construction paper, photographs, etc. This is the default paper category and as such should not contain a large amount material.	
PAPER PACKAGING		
Corrugated	Includes micro-flute corrugated containers, pizza boxes, waxed corrugated containers, etc.	
Kraft Paper	Kraft paper bags and wrap, grocery or retail bags, potato bags, some pet food bags, etc. Includes brown, white, and coloured kraft paper and bags. No bags with bonded plastic or foil liners/layers/coatings. Includes bags with a light grease coating.	
Boxboard / Cores	Boxboard, paperboard, cereal box, shoe box, frozen food box, cores from toilet paper/toweling/gift wrap, etc. Includes wet-strength boxboard, fast food cartons such as fry/onion ring boxes and paper plates	
Molded Pulp	Egg cartons, drink trays, other trays, etc.	
Paper Cups and Paper Ice-Cream Containers	Includes paper based cups with a plastic lining/layer such as coffee cups, soup cups, french-fry cups. Does not include containers that are plastic or plastic based.	
Laminated Paper Packaging	Paper based packaging (at least 85% paper) with foil or plastic liners/layers/coatings, pouches, cookie bags, microwave popcorn bags, fast food sandwich wraps, gift bags, paper based trays, etc.	
Composite Cans	Spiral wound cans with paper walls and plastic or metal tops or bottoms; frozen juice, Pringles, raisins, etc.	
Gable Top Cartons	Polycoat containers with a gable shaped top; milk, juice, some foods, etc.	
Aseptic Containers	Tetra Pak type polycoat packaging, juice boxes, some soups and sauces, etc.	
Tissue/Toweling	Tissues, napkins, paper towels (includes wet/damp items)	

Stewardship Ontario Waste Audit Program 2006 – Material Categories		Page 2 of 3
Material Category	Description / Examples	
PLASTICS		
PET Beverage Bottles	#1, soft drink, water, juice, liquor, etc	
PET Other Bottles & Jars	#1, cooking oil, peanut butter, dish soap, mouthwash, etc.	
PET Other Packaging	#1, bakery, clamshells, trays, ovenable/microwaveable trays, egg cartons	
HDPE Beverage Bottles	#2, juice, milk, etc.	
HDPE Other Bottles & Jugs	#2, laundry soap, shampoo, windshield washer fluid, etc.	
PVC Bottles & Jars	#3 bottles and jars only, lotions, soaps, bug repellants, shampoos, etc (PVC blister/bubble packs go into "Other Rigid Plastic Packaging")	
Other Bottles, Jars & Jugs	#4 LDPE, #5 PP, & #7 mixed resin, mustard, ketchup, some juices	
Polystyrene Packaging	#6 PS, trays, clamshells, cups & lids, pill and vitamin bottles, seedling trays, PS used to protect boxed product, "peanuts", etc. Non-packaging PS (e.g. plastic cutlery) goes into the "Durable Plastic Products" category	
Wide Mouth Tubs & Lids	# 2 HDPE, #4 LDPE & #5 PP tubs and lids, dairy products, etc.	
Large HDPE & PP Pails & Lids	>4litres and < 25 litres HDPE & PP pails, lawn, garden, pool supplies, kitty liter, paint, etc.	
Polyethylene PE Plastic Bags & Film - Packaging	HDPE & LDPE retail carry-out bags/sacks, dry cleaning bags, bread bags, frozen food bags, milk bags, toilet paper and toweling, over-wrap, lawn seed, soil, peat moss, etc.	
Polyethylene Plastic Bags & Film - Non-Packaging	HDPE & LDPE garbage bags, kitchen catchers, blue or clear bags for recyclables, sandwich and freezer bags, etc.	
Laminated/Other Plastic Bags & Film	Plastic film and bags that are at least 85% (by weight) plastic with up to 15% (by weight) other closely bonded or impregnated materials. This includes meat, poultry and fish wrap; vacuum sealed bacon bag; luncheon meat and cheese wrap; cereal liners; chip bags and other snack food bags; candy wraps; pasta bags; boil in a bag; plastic based food pouches; bubble wrap; cling wrap; some cookie bags, etc.	
Other Rigid Plastic Packaging	Blister packaging, tubes for pharmaceutical & health care/cosmetic products, plant pots, unmarked/coded packaging, etc.	
Durable Plastic Products	Non-packaging such as VCR tapes, CDs, toys, games, Tupperware, etc. Include multi-material items that are mainly plastic – e.g. a plastic toy truck with metal axles.	
METALS		
Aluminum Food & Beverage Cans	Soft drinks, soda, juice, certain brands of cat food, etc.	
Aluminum Foil & Foil Trays	Aluminum foil wrap, pie plates, baking trays, etc	
Other Aluminum Containers	Aluminum aerosol containers, hair products, tubes, etc.	
Steel Food & Beverage Cans	Apple juice, soup, beans, peaches, etc.	
Steel Aerosol Cans	Empty spray paint cans, cooking oil, whipped cream, etc.	
Steel Paint Cans	Empty paint cans. Does not include steel aerosol cans.	
Other Metal	Scrap metal, copper pipe, hardware, etc. Includes multi-material items that are mainly metal.	

Stewardship Ontario Waste Audit Program 2006 – Material Categories		Page 3 of 3
Material Category	Description / Examples	
GLASS		
Alcoholic Beverage Glass Clear	Clear glass alcoholic beverages	
Alcoholic Beverage Glass Coloured	Coloured glass alcoholic beverages	
Food and Beverage Glass Clear	Clear glass food & beverage containers	
Food and Beverage Glass Coloured	Coloured glass food & beverage containers	
Other Glass	Window glass, tableware, light bulbs (fluorescent tubes and compact fluorescents go in Other HSW)	
HOUSEHOLD SPECIAL WASTE		
Batteries	all types	
Paint & Stain	cans / tubs still containing product, oil and latex paint, wood stain, varnish, etc.	
Motor Oil	oil filters and jugs or cans still containing oil	
Other HSW liquids	starter fluid, solvents, antifreeze, acids, pool chemicals, etc.	
Other HSW	sharps, drugs, medicine, fluorescent tubes, etc.	
ORGANICS		
Food Waste	vegetable and fruit peelings, meats, fish, fats, oils, bones, etc	
Yard Waste	brush, branches, wood chips, grass clippings, leaves, soil, plant material	
Pet waste	animal feces, bedding, kitty litter	
OTHER MATERIALS		
Diapers and Sanitary Products	diapers, sanitary napkins, hygiene products, etc.	
Textiles	clothing, shoes, mats, drapes, sheets, etc.	
Carpeting	carpeting, underlay, mats	
Construction & Renovation	drywall, lumber, ceramic tiles, plaster, etc.	
Computer / IT Equipment	PCs, notebooks, CRT and LCD monitors, scanners, printers, mouse, cables	
Telecom Equipment	phones, pagers, Blackberry, mobile phones, etc.	
TV & Audio Equipment	televisions, DVD, radio, VCR, etc	
Small Kitchen Appliances	blenders, coffee machine, etc.	
Other Electronics	games, clocks, gadgets	
Tires and Other Rubber	Rubber tires and tubes, other rubber items such as hoses	
Ceramics	ceramic plates, cups, plant pots, etc.	
Furniture	sofas, chairs, cabinets, tables, garden furniture	
Mattresses	Mattresses and box springs, futons, foam mattresses	
Other Large Bulky Items	other large bulky items not classified elsewhere	
Other Waste	materials not classified elsewhere	

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Stewardship Ontario Waste Audit Program 2007 – Material Categories

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Material Category	Description / Examples
PAPER	
Newspaper – Dailys and Weeklys	Daily and weekly newspapers published by the Canadian Newspaper Association (CNA) and the Ontario Community Newspapers Association (OCNA); Globe and Mail, Toronto Star, Hamilton Spectator, community newspapers. Consult Stewardship Ontario's list of OCNA/CNA publications. No inserts, flyers and magazines from newspapers.
Newspaper - Other	Non OCNA/CNA publications (e.g. TV guides, Auto Trader, Real Estate News) plus inserts and flyers from OCNA/CNA newspapers. Consult Stewardship Ontario's list of OCNA/CNA publications. Includes glossy flyers and advertising distributed with newspapers.
Telephone Books / Directories	Telephone books and other directories such as the Yellow Pages
Magazines & Catalogues	Glossy magazines, catalogues, calendars, annual reports (must be bound, i.e. stapled or glued).
Mixed Fine Paper	Fine household papers, writing paper, office paper, copy paper, bills and statements, ad mail, etc. Includes glossy flyers and advertising that are not distributed with newspapers.
Books	Hard and soft covered books
Other Paper	Gift wrap, construction paper, photographs, etc. This is a default paper category and as such should not contain a large amount material.
PAPER PACKAGING	
Corrugated Wine Bag in Box	Corrugated box from bag in box wine containers. No plastic liners.
Other Corrugated	Includes micro-flute corrugated containers, pizza boxes, waxed corrugated containers, etc.
Kraft Paper	Kraft paper bags and wrap, grocery or retail bags, potato bags, some pet food bags, etc. Includes brown, white, and coloured kraft paper and bags. No bags with bonded plastic or foil liners/layers/coatings. Includes bags with a light grease coating.
Boxboard / Cores	Boxboard, paperboard, cereal box, shoe box, frozen food box, cores from toilet paper/ toweling/gift wrap, etc. Includes wet-strength boxboard, fast food cartons such as fry/onion ring boxes and paper plates
Molded Pulp	Egg cartons, drink trays, other trays, molded pulp flower pots/trays, etc.
Paper Cups and Paper Ice-Cream Containers	Includes paper based cups with a plastic lining/layer such as coffee cups, soup cups, french-fry cups. Does not include containers that are plastic or plastic based.
Laminated Paper Packaging	Paper based packaging (at least 85% paper) with foil or plastic liners/layers/coatings, pouches, cookie bags, microwave popcorn bags, fast food sandwich wraps, gift bags, paper based trays, etc.
Composite Cans	Spiral wound cans with paper walls and plastic or metal tops or bottoms; frozen juice, Pringles, raisins, etc.
Gable Top Cartons	Polycoat containers with a gable shaped top; milk, juice, some foods, etc.
Aseptic Alcohol Over 630 ml	Tetra pak type polycoat packaging for alcoholic beverages over 630 ml.
Aseptic Alcohol 630 ml and Under	Tetra pak type polycoat packaging for alcoholic beverages less than or equal to 630 ml.
Aseptic Other Containers	Tetra pak type polycoat packaging, juice boxes, soup, etc.
Tissue/Toweling	Tissues, napkins, paper towels (includes wet/damp items)

Stewardship Ontario Waste Audit Program 2007 – Material Categories		Page 2 of 3
Material Category	Description / Examples	
PLASTICS		
PET Beer Bottles Over 630 ml	#1 clear and coloured beer bottles over 630 ml.	
PET Beer Bottles 630 ml and Under	#1 clear and coloured beer bottles less than or equal to 630 ml.	
PET Other Alcohol Bottles Over 630 ml	#1 clear and coloured wine and liquor bottles over 630 ml.	
PET Other Alcohol Bottles Over 100 ml and Less Than or Equal to 630 ml	#1 clear and coloured wine and liquor bottles over 100 ml and less than or equal to 630 ml.	
PET Other Alcohol Bottles 100 ml and Under	#1 clear and coloured wine and liquor bottles 100 ml or less.	
PET Other Beverage Bottles	#1 soft drink, water, juice, etc.	
PET Other Bottles & Jars	#1 food and non-beverage bottles and jars, cooking oil, peanut butter, dish soap, etc.	
PET Other Packaging	#1, bakery, clamshells, trays, ovenable/microwaveable trays, egg cartons. No bottles and jars	
HDPE Beverage Bottles	#2 beverage bottles and jugs, juice, milk, etc.	
HDPE Other Bottles & Jugs	#2, laundry soap, shampoo, windshield washer fluid, etc.	
PVC Bottles & Jars	#3 bottles and jars only, lotions, soaps, bug repellants, shampoos, etc (PVC blister/bubble packs go into "Other Rigid Plastic Packaging")	
Other Plastic Alcohol Containers 100 ml and Other Bottles, Jars & Jugs	Other plastic alcoholic containers 100 ml or less.	
Polystyrene Packaging	#4 LDPE, #5 PP, & #7 mixed resin, mustard, ketchup, some juices	
Wide Mouth Tubs & Lids	#6 PS, trays, clamshells, cups & lids, pill and vitamin bottles, seedling trays, PS used to protect boxed product, "peanuts", etc. Non-packaging PS (e.g. plastic cutlery) goes into the "Durable Plastic Products" category	
Large HDPE & PP Pails & Lids	# 2 HDPE, #4 LDPE & #5 PP tubs and lids, dairy products, etc.	
Polyethylene PE Plastic Bags & Film - Packaging	>4litres and < 25 litres HDPE & PP pails, lawn, garden, pool supplies, kitty liter, paint, etc.	
Polyethylene Plastic Bags & Film - Non-Packaging	HDPE & LDPE retail carry-out bags/sacks, dry cleaning bags, bread bags, frozen food bags, milk bags, toilet paper and toweling, over-wrap, lawn seed, soil, peat moss, etc.	
Laminated Pouches & Bag in Box Liners for Alcoholic Beverages	HDPE & LDPE garbage bags, kitchen catchers, blue or clear bags for recyclables, sandwich and freezer bags, etc.	
Laminated/Other Plastic Film and Bags	Laminated plastic pouches and plastic bag-in-box liners for wine and other alcoholic beverages.	
Other Rigid Plastic Packaging	Plastic film and bags that are at least 85% (by weight) plastic with up to 15% (by weight) other closely bonded or impregnated materials. This includes meat, poultry and fish wrap; vacuum sealed bacon bag; luncheon meat and cheese wrap; cereal liners; chip bags and other snack food bags; candy wraps; pasta bags; boil in a bag; plastic based food pouches; bubble wrap; cling wrap; some cookie bags, etc. No alcohol pouches / bag in box liners.	
Durable Plastic Products	Blister packaging, tubes for pharmaceutical & health care/cosmetic products, plant pots, unmarked/coded packaging, etc.	
	Non-packaging such as VCR tapes, CDs, toys, games, tupperware, etc. Include multi-material items that are mainly plastic – e.g. a plastic toy truck with metal axles. Plastic shoes, gloves, clothing go in Textiles.	
METALS		
Aluminum Alcoholic Beverage Cans Over 1 L	Aluminum alcoholic beverages, beer cans over 1 L.	
Aluminum Alcoholic Beverage Cans 1 L and Under	Aluminum alcoholic beverages, beer cans 1 L and under.	
Aluminum Food Cans & Other Beverages	Soft drinks, soda, juice, certain brands of sardines and cat food	
Aluminum Foil & Foil Trays	Aluminum foil wrap, pie plates, baking trays, etc.	
Other Aluminum Containers	Aluminum aerosol containers, hair products, tubes, etc.	
Steel Alcoholic Beverage Cans Over 1 L	Steel alcoholic beverages, beer cans, Sapporo, etc over 1 L.	
Steel Alcoholic Beverage Cans 1 L and Under	Steel alcoholic beverages, beer cans, Sapporo, etc 1 L and under.	
Steel Food & Other Beverages	Apple juice, soup, beans, peaches, etc. No alcohol containers.	
Steel Aerosol Cans	Empty spray paint cans, cooking oil, whipped cream, etc.	
Steel Paint Cans	Empty paint cans. No steel aerosol paint cans.	
Other Metal	Scrap metal, copper pipe, hardware, etc. Includes multi-material items that are mainly metal. Includes empty propane tanks.	

Stewardship Ontario Waste Audit Program 2007 – Material Categories Page 3 of 3

Material Category	Description / Examples
GLASS	
Clear Glass Beer Over 630 ml	Clear glass beer bottles over 630 ml.
Clear Glass Beer 630 ml and Under	Clear glass beer bottles less than or equal to 630 ml.
Clear Glass Other Alcohol Over 630 ml	Clear glass wine and liquor bottles over 630 ml.
Clear Glass Other Alcohol Over 100 ml and Less Than or Equal to 630 ml	Clear glass wine and liquor bottles over 100 ml and less than or equal to 630 ml.
Clear Glass Other Alcohol 100 ml and Under	Clear glass wine and liquor bottles 100 ml or less.
Coloured Glass Beer Over 630 ml	Coloured glass beer bottles over 630 ml.
Coloured Glass Beer 630 ml and Under	Coloured glass beer bottles less than or equal to 630 ml.
Coloured Glass Other Alcohol Over 630 ml	Coloured glass wine and liquor bottles over 630 ml.
Coloured Glass Other Alcohol Over 100 ml and Less Than or Equal to 630 ml	Coloured glass wine and liquor bottles over 100 ml and less than or equal to 630 ml.
Coloured Glass Other Alcohol 100 ml and Under	Coloured glass wine and liquor bottles 100 ml or less.
Clear Glass Other Beverage and Food	Coloured glass food and other beverage containers, all sizes
Coloured Glass Other Beverage and Food	Coloured glass food and other beverage containers, all sizes
Other Glass	Window glass, plates and glasses, light bulbs (fluorescent tubes and compact fluorescents go in Other HSW)
HOUSEHOLD SPECIAL WASTE	
Batteries	All types
Paint & Stain	Cans / tubs still containing product, oil and latex paint, wood stain, varnish, etc.
Motor Oil	Oil filters and jugs or cans still containing oil
Other HSW liquids	Solvents, antifreeze, acids, pool chemicals, weed killer, gasoline, brake fluid, glues, adhesives, cleaners, nail polish remover, etc. Look for signal words such as "Poison", "Danger", "Warning", "Caution", and "Precautionary Statements".
Other HSW	Sharps, drug products, medicine, medical waste, fluorescent tubes, ionized smoke detectors, etc. Look for signal words such as "Poison", "Danger", "Warning", "Caution", and "Precautionary Statements".
ORGANICS	
Food Waste	Vegetable and fruit peelings, meats, fish, fats, oils, bones, etc
Yard Waste	Brush, branches, wood chips, grass, leaves, soil, plant material, ashes
Pet waste	Animal feces, bedding, kitty litter
OTHER MATERIALS	
Diapers and Sanitary Products	Diapers, sanitary napkins, hygiene products, etc.
Textiles	Clothing, shoes, mats, drapes, sheets, etc. Plastic rice sacks go in Other Rigid Plastic Packaging
Carpeting	Carpeting, underlay, mats
Construction & Renovation	Lumber, wood cut off, drywall, ceramic tiles, plaster, etc.
Computer / IT Equipment	PCs, notebooks, CRT and LCD monitors, scanners, printers, mouse, cables
Telecom Equipment	Phones, pagers, Blackberry, mobile phones, etc.
TV & Audio Equipment	Televisions, DVD, radio, VCR, etc
Small Kitchen Appliances	Blenders, coffee machine, etc.
Other Electronics	Electronic games, clocks, gadgets, anything with a plug or battery
Tires and Other Rubber	Rubber tires and tubes, other rubber items such as hoses
Ceramics	Ceramic plates, cups, plant pots, etc.
Furniture	Chairs, cabinets, tables, garden furniture
Mattresses	Mattresses and box springs, futons, foam mattresses
Other Large Bulky Items	Other large items not classified elsewhere
Other Waste	Materials not classified elsewhere, wooden fruit basket, vacuum bags, wax candles, furnace filters, etc.