# Region of Sudbury

*In Partnership with:*

WDO
ONTARIO
WASTE DIVERSION
ORGANIZATION

# Sudbury Residential Waste Audit Results

## Final Report

*Prepared By:*

ENVIROSRIS
knowledge innovation solutions

*January, 2001*

# Table of Contents

# 1.0 Introduction

In October 2000, the Region of Sudbury retained Enviros RIS to conduct a single-family residential waste audit. The study was partial funded by the Ontario Waste Diversion Organization (WDO).

A waste audit was conducted over a four-week period, in November in three residential areas in and around the Region of Sudbury. The main objective of the audit was to determine the recovery rates for recyclables. Another aim was to ascertain the level of contamination in the Blue Box and the composition of the garbage stream.

This report documents the results of the waste audit and provides key findings about set outs and the types and quantities of residential solid waste generated and recovered.

# 2.1 Sampling Methodology

## 2.1 Household Selection and Collection of Materials

The sampling protocol was similar to previous waste audits conducted in Ontario by Enviros RIS for Corporations Supporting Recycling (CSR).

Regional staff selected 27 homes on Laroque and Guimond in the community of Val Therese, 26 homes on Mary and Earnest in the community of Naughton and 30 homes on Village Crescent in the City of Sudbury. The homes were chosen because they were representative of single-family, middle-income housing within the Region.

Each Tuesday, Wednesday and Thursday, for four consecutive weeks all recyclables, garbage and yard waste was collected from the pilot homes. The same homes were sampled each week. The dates of the audits were:

- November 7, 14, 21 and 28 in Sudbury;
- November 15$^{th}$, the 22$^{nd}$ and the 29$^{th}$ in Val Therese (only three weeks were actually sampled)
- November 9$^{th}$, 16$^{th}$ 23$^{rd}$ and 30$^{th}$ in Naughton.

As the samples were being collected, staff noted the number of bags or equivalent units set out per household. Separated yard waste (e.g. bags of leaves) and bulky wastes (e.g. humidifier) were weighed on the truck and left at the curb for collection by the regular garbage collection vehicle.

Over the four-week sampling period 83 homes in the pilot areas set out a total of 4,894 kg of waste. Seventy-nine percent, by weight, was set out at the curb as “garbage” and 21% in blue boxes as “recycling”.

## 2.2 Sorting Methodology

Enviros RIS retained Integrated Environmental Services (IES) to provide waste auditing services. The two-person IES audit team de-bagged the material and hand-sorted it into 54 waste categories at a Regional Works Department garage in Chelmsford. The garbage was sorted separately from the blue box recyclables and the protocols followed were similar to those used in other CSR sponsored studies.

The audit team sorted for 9 targeted paper fibres, PET containers, HDPE containers, aluminium cans and foil trays, steel cans, glass jars and bottles. The team also identified the contamination (including plastics #3 to #7, plastic film, aseptic boxes, gable top cartons, non-recyclable paper fibre, aerosol cans, and other wastes). All the sorted material was weighed and the weights were entered on a datasheet.

# 3.0 Setout, Generation and Recovery Results for Naughton

Setout and participation information for Naughton is summarized in Table 1 below and summary waste generation and recovery results are presented in Table 2. The generation and recovery results are presented on a kg/hh/yr basis and have not been seasonally adjusted.

### 3.1 Recycling Setouts for Naughton

In Naughton, all 26 households sampled set out recyclables at least once over the four-week sampling period; the average was 2.2 times. The average weekly setout rate for blue box recyclables was 56%. A total of 321 kg of material was set out and collected from the 26 sample homes in Naughton over the four-week period. On average, households set out 3.1 kg each week.

### 3.2 Garbage Setouts for Naughton

Only a few of residents did not set out garbage each week. The average weekly set out rate was 96%. The average was 3.7 times over the four-week sampling period. A total of 1,412 kg of garbage was collected in the pilot area over the four-week period. On average, each household set out 13.6 kg each week. The average number of bags set out was 2.4. Seventeen percent of the 99 setouts over the four-week sampling period were for 4 bags or more and the most anyone set out was 8.

**Table 1: Summary of Setouts and Participation for Naughton**

| Stream | Nov 9, 2000 | | Nov 16, 2000 | | Nov 23, 2000 | | Nov 30, 2000 | | Average Weekly Setout Rate | Participation Rate* (if Blue Box set out anytime over 4 week period) |
|---|---|---|---|---|---|---|---|---|---|---|
| | hhlds with setouts | units set out | hhlds with setouts | units set out | hhlds with setouts | units set out | hhlds with setouts | units set out | | |
| Garbage | 26 | 58 | 25 | 64 | 25 | 56.5 | 24 | 68 | 96% | - |
| Blue Box | 14 | 15 | 15 | 16.5 | 13 | 14 | 16 | 17 | 56% | 100% |

- **sample size = 26 houses**
- **garbage / blue box collection is weekly**

### 3.3 Waste Generation and Recovery Results for Naughton

From the November audit results, it is estimated that household waste generation in Naughton is approximately 706 kg of waste each year. Of total waste generated, the audit found that 35% of the material that can be recovered through Sudbury's recycling program. Of that 35%, about half (52.3%) is being diverted through the Blue Box. Paper fibre, plastic and metal container recovery ranged from 52% to 55% and glass recovery was lower at 40%. On average, each household is setting out 158.6 kg of fibre and container material for collection each year (111.3 kg of paper fibres, 23.1 kg of glass, 17.2 kg of metal cans and 7.0 kg of plastic). A high Household Special Waste (HSW) figure is the result of high quantity of paint waste found in the in the third week.

**Table 2: Summary of Generation and Recovery Results for Naughton***

| Material Category | Garbage Total Net Weight (kg) | Recycling (Blue Box) Total Net Weight (kg) | Garbage Generation (kg/hhld/yr) | Recycling (Blue Box) Generation (kg/hhld/yr) | Total Waste Generation (kg/hhld/yr) | Waste Composition (%) | Recovery Rate (%) |
|---|---|---|---|---|---|---|---|
| Recyclable Paper Fibre | 183.90 | 222.66 | 91.95 | 111.33 | 203.28 | 23.5% | 54.8% |
| Other Paper Fibre | 63.75 | 0.74 | 31.88 | 0.37 | 32.25 | 3.7% | |
| Recyclable Plastics | 12.30 | 14.00 | 6.15 | 7.00 | 13.15 | 1.5% | 53.2% |
| Other Plastics | 98.90 | 1.47 | 49.45 | 0.74 | 50.19 | 5.8% | |
| Recyclable Metal Cans and Foil | 50.90 | 34.41 | 25.45 | 17.21 | 42.66 | 4.9% | 40.3% |
| Other Metal | 42.40 | 0.00 | 21.20 | 0.00 | 21.20 | 2.4% | |
| Recyclable Glass | 42.20 | 46.20 | 21.10 | 23.10 | 44.20 | 5.1% | 52.3% |
| Other Glass | 10.10 | 1.00 | 5.05 | 0.50 | 5.55 | 0.6% | |
| HSW | 13.35 | 0.00 | 6.68 | 0.00 | 6.68 | 0.8% | |
| Organics | 562.60 | 0.00 | 281.30 | 0.00 | 281.30 | 32.5% | |
| Other Waste | 331.55 | 1.00 | 165.78 | 0.50 | 166.28 | 19.2% | |
| Total Waste Audit Sample | 1,411.95 | 321.48 | 705.98 | 160.74 | 866.72 | 100% | |
| Total Recyclables | 289.30 | 317.27 | 144.65 | 158.64 | 303.29 | 35.0% | 52.3% |
| Total Waste | 1,122.65 | 4.21 | 561.33 | 2.11 | 563.43 | 65.0% | |

Results based on 104 household waste samples collected over a four week period (November 9, 16, 23 and 30) from 26 homes on Mary and Ernest.

## 4.0 Setout and Recovery Results for Val Therese

In Val Therese, on November 8th, the first data collection day, the regular collection vehicles inadvertently collected the recyclables and garbage. Thus, there is only three weeks of data for this area, not four weeks.

Setout and participation information for Val Therese is summarized in Table 3 and summary waste generation and recovery results are presented in Table 4. The generation and recovery results are presented on a kg/hh/yr basis and have not been seasonally adjusted.

### 4.1 Recycling Setouts for Val Therese

In Val Therese all 27 households sampled set out recyclables at least once over the three-week sampling period; the average was 1.7 times. The average weekly setout rate for blue box recyclables was 56%. A total of 234 kg of material was set out and collected from the 27 sample homes in Val Therese over the three-week period. On average, households set out 2.9 kg each week.

### 4.2 Garbage Setouts for Val Therese

Most residents set out some garbage each week. The average was 2.4 times over the three-week sampling period. The average weekly set out rate was 79%. A total of 705 kg of garbage was collected in the pilot area over the three-week period. On average, each household set out 8.7 kg each week. The average number of bags set out was 1.8. Sixteen percent of the 63 setouts over the three-week sampling period were for 4 bags or more and the most anyone set out was 8.

**Table 3: Summary of Setouts and Participation for Val Therese**

| Stream | Nov 15, 2000 | | Nov 22, 2000 | | Nov 29, 2000 | | Average Weekly Setout Rate | Participation Rate (if Blue Box set out anytime over 3 week period) |
|---|---|---|---|---|---|---|---|---|
| | hhlds with setouts | units set out | hhlds with setouts | units set out | hhlds with setouts | units set out | | |
| Garbage | 22 | 45 | 19 | 43 | 23 | 59 | 79% | - |
| Blue Box | 15 | 18 | 15 | 18 | 15 | 15 | 56% | 100% |

- sample size = 27 houses
- garbage / blue box collection is weekly

### 4.3 Waste Generation and Recovery Results for Val Therese

From the November audit results, it is estimated that household waste generation in Val Therese is 643 kg of waste each year. An estimated 41% of the waste generated was found to be material that is recoverable through Sudbury's recycling program. Of that 41%, 59.6% is being diverted through the Blue Box. The recovery rate is highest for paper fibres (63.7%) followed by glass (57.7%), plastics (53.0%) and metal cans and foil (41.7%). On average, each household is setting out 158.9 kg of fibre and container material for collection each year (118.7 kg of paper fibres, 19.8 kg of glass, 14.1 kg of metal cans and 6.3 kg of plastic).

**Table 4: Summary of Recovery Results for Val Therese***

| Material Category | Garbage Total Net Weight (kg) | Recycling (Blue Box) Total Net Weight (kg) | Garbage Generation (kg/hhld/yr) | Recycling (Blue Box) Generation (kg/hhld/yr) | Total Waste Generation (kg/hhld/yr) | Waste Composition (%) | Recovery Rate (%) |
|---|---|---|---|---|---|---|---|
| Recyclable Paper Fibre | 98.85 | 173.48 | 67.63 | 118.70 | 186.33 | 29.0% | 63.7% |
| Other Paper Fibre | 51.36 | 0.03 | 35.14 | 0.02 | 35.16 | 5.5% | |
| Recyclable Plastics | 8.30 | 9.20 | 5.68 | 6.29 | 11.97 | 1.9% | 53.0% |
| Other Plastics | 45.70 | 1.21 | 31.27 | 0.83 | 32.10 | 5.0% | |
| Recyclable Metal Cans and Foil | 28.85 | 20.60 | 19.74 | 14.09 | 33.83 | 5.3% | 41.7% |
| Other Metal | 5.60 | 0.05 | 3.83 | 0.03 | 3.87 | 0.6% | |
| Recyclable Glass | 21.20 | 28.90 | 14.51 | 19.77 | 34.28 | 5.3% | 57.7% |
| Other Glass | 2.60 | 0.00 | 1.78 | 0.00 | 1.78 | 0.3% | |
| HSW | 0.80 | 0.00 | 0.55 | 0.00 | 0.55 | 0.1% | |
| Organics | 286.80 | 0.70 | 196.23 | 0.48 | 196.72 | | |
| Other Waste | 154.45 | 0.30 | 105.68 | 0.21 | 105.88 | 16.5% | |
| Total Waste Audit Sample | 704.51 | 234.47 | 482.03 | 160.43 | 642.46 | 100% | |
| Total Recyclables | 157.20 | 232.18 | 107.56 | 158.86 | 266.42 | 41% | 59.6% |
| Total Waste | 547.31 | 2.29 | 374.48 | 1.57 | 376.04 | 59% | |

* Results based on 76 household waste samples collected over a three week period (November 15, 22 and 29) from 27 homes on Laroque and Guimond. On November 29 the recycling from five homes on Guimond was inadvertently collected by the regular truck. Consequently, the waste from these houses was not included in the sample (i.e. waste collected from 22 homes not 27)

# 5.0 Setout and Recovery Results for Sudbury

Setout and participation information for the Sudbury is summarized in Table 5 below and summary waste generation and recovery results are presented in Table 6. The generation and recovery results are presented on a kg/hh/yr basis and have not been seasonally adjusted.

## 5.1 Recycling Setouts for Sudbury

In Sudbury all 30 households sampled set out recyclables at least once over the four-week sampling period; the average was 2.5 times. The average weekly setout rate for blue box recyclables was 88%. A total of 478 kg of material was set out and collected from the 30 sample homes in Sudbury over the three-week period. On average, households set out 4.0 kg each week.

## 5.2 Garbage Setouts

Most residents set out some garbage each week. The average was 3.5 times over the four-week sampling period. The average weekly set out rate was 88%. A total of 1,748 kg of garbage was collected in the pilot area over the four-week period. On average, each household set out 14.6 kg each week. The average number of bags set out was 0.9 and 12% of the 107 setouts were for 4 bags or more. The largest setout was 10 bags.

**Table 5: Summary of Setouts and Participation for Sudbury**

| Stream | Nov 7, 2000 | | Nov 14, 2000 | | Nov 21, 2000 | | Nov 28, 2000 | | Average Weekly Setout Rate | Participation Rate (if Blue Box set out anytime over 4 week period) |
|---|---|---|---|---|---|---|---|---|---|---|
| | hhlds with setouts | units set out | hhlds with setouts | units set out | hhlds with setouts | units set out | hhlds with setouts | units set out | | |
| Garbage | 29 | 57 | 25 | 48 | 26 | 62 | 26 | 65 | 88% | - |
| Blue Box | 19 | 19 | 19 | 22 | 17 | 19 | 20 | 28 | 63% | 100% |

- sample size = 30 houses
- garbage / blue box collection is weekly

### 5.3 Waste Generation and Recovery Results for Sudbury

In the City of Sudbury, each household is generating, on average, 965 kg of waste each year. An estimated 33% of the waste generated is material that can be recovered through Sudbury's recycling program. Of that 33%, 65.4% is currently being diverted through the Blue Box. The recovery rate is highest for glass (78.7%) followed by metal cans and foil (70.6%), plastics (65.9%) and paper (62.9%). On average, each household is setting out 205.6 kg of fibre and container material for collection each year (149.74 kg of paper fibres, 26.8 kg of glass, 19.1 kg of metal cans and 9.9 kg of plastic).

The higher waste generation figure for Sudbury is primarily the result of the high yard waste measured during the first week of sampling. The first sample period fell the week after Halloween and the yard waste figure included other pumpkins and orange 'pumpkin' bags that were filled with leaves for yard decorations. Approximately 45% of the total 'compostables' figure is leaf and yard waste, the majority of which was collected the first week.

The first week was missed in Val Therese so the 'Halloween' generation was not a factor. While yard waste generation was lower in Naughton, virtually all of what was measured was collected during sample week 1. Most of leaves were 'down' by the time the sampling took place in November. With the yard waste removed from each sample area, overall waste generation was calculated at: Naughton - 850 kg/hh/yr, Val Therese - 642 kg/hh/yr and Sudbury - 764 kg/hh/yr.

**Table 6: Summary of Recovery Results for the City of Sudbury***

| Material Category | Garbage Total Net Weight (kg) | Recycling (Blue Box) Total Net Weight (kg) | Garbage Generation (kg/hhld/yr) | Recycling (Blue Box) Generation (kg/hhld/yr) | Total Waste Generation (kg/hhld/yr) | Waste Composition (%) | Recovery Rate (%) |
|---|---|---|---|---|---|---|---|
| Recyclable Paper Fibre | 204.15 | 345.55 | 88.47 | 149.74 | 238.20 | 24.7% | 62.9% |
| Other Paper Fibre | 60.60 | 0.20 | 26.26 | 0.09 | 26.35 | 2.7% | |
| Recyclable Plastics | 11.75 | 22.75 | 5.09 | 9.86 | 14.95 | 1.6% | 65.9% |
| Other Plastics | 88.50 | 1.45 | 38.35 | 0.63 | 38.98 | 4.0% | |
| Recyclable Metal Cans and Foil | 18.45 | 44.20 | 8.00 | 19.15 | 27.15 | 2.8% | 70.6% |
| Other Metal | 11.00 | 0.00 | 4.77 | 0.00 | 4.77 | 0.5% | |
| Recyclable Glass | 16.75 | 61.90 | 7.26 | 26.82 | 34.08 | 3.5% | 78.7% |
| Other Glass | 14.80 | 1.30 | 6.41 | 0.56 | 6.98 | 0.7% | |
| HSW | 4.20 | 0.00 | 1.82 | 0.00 | 1.82 | 0.2% | |
| Organics | 1,021.25 | 0.60 | 442.54 | 0.26 | 442.80 | 45.9% | |
| Other Waste | 296.30 | 0.00 | 128.40 | 0.00 | 128.40 | 13.3% | |
| Total Waste Audit Sample | 1,747.75 | 477.95 | 757.36 | 207.11 | 964.47 | 100% | |
| Total Recyclables | 251.10 | 474.40 | 108.81 | 205.57 | 314.38 | 33% | 65.4% |
| Total Waste | 1,496.65 | 3.55 | 648.55 | 1.54 | 650.09 | 67% | |

* Results based on 120 household waste samples collected over a four week period (November 7, 14, 21 and 28) from 30 homes on Village Cresent.

## 6.0 Overall Waste Generation and Recovery Results for Sudbury

Overall waste composition, generation and recovery results for all three areas studied are summarized in Table 7. Results are presented on a kg/hh/yr basis and have not been seasonally adjusted. The key findings are summarized below:

- The overall recovery rate measured for recyclables was 60%. Recyclable fibre recovery was measured at 60.4% and recyclable container material at 57%.

- Of the total waste generated (3,864 kg) 25.1% was recyclable fibre, 10.0% recyclable container material, 38.2 % was compostable organic waste (yard waste, food waste, animal waste), and 26.7% residual garbage.

- The total waste generation per household was calculated to be 849 kg/hhld/year. This includes 213 kg/hhld/yr of recyclable fibre, 86 kg/hhld/yr recyclable container material and 550 kg/hhld/yr of residual garbage (of which 325 kg/hhld/yr or 60% is organic waste, i.e. food, animal waste and yard waste)

- The largest components of the waste (garbage, recycling and yard waste) were food waste (26%), newspaper at (11%), yard waste (10%), building renovation materials (6%), with recyclable glass and textiles (4%) rounding out the top 5 4%. Please note these ranked by weight and not volume.

- Contamination in the blue box was measured at 1.0%. Three quarters of the contamination was non-recyclable fibre (e.g. cartons, aseptic) and container material (e.g. plastics) and the rest was other garbage.

- 18% of material in the garbage stream was recyclable material; 12.5% was recyclable fibre and 5.5% container material.

Overall generation and recovery rates for recyclables are summarized in Figures 1 and 2. Figure 1 shows, graphically, generation and recovery for Blue Box newspaper, boxboard, cardboard and mixed papers. Figure 2 presents generation and recovery for blue box glass, metal, HDPE, aluminium and PET containers.

Newspaper and cardboard recovery was found to be relatively high (74% and 72% respectively), however the recovery rate for boxboard was only 43% and the rate for mixed papers 18%. The recovery rates for container material were lower than for the fibre material; they ranged from a high of 63% for glass to a low of 38% for PET containers.

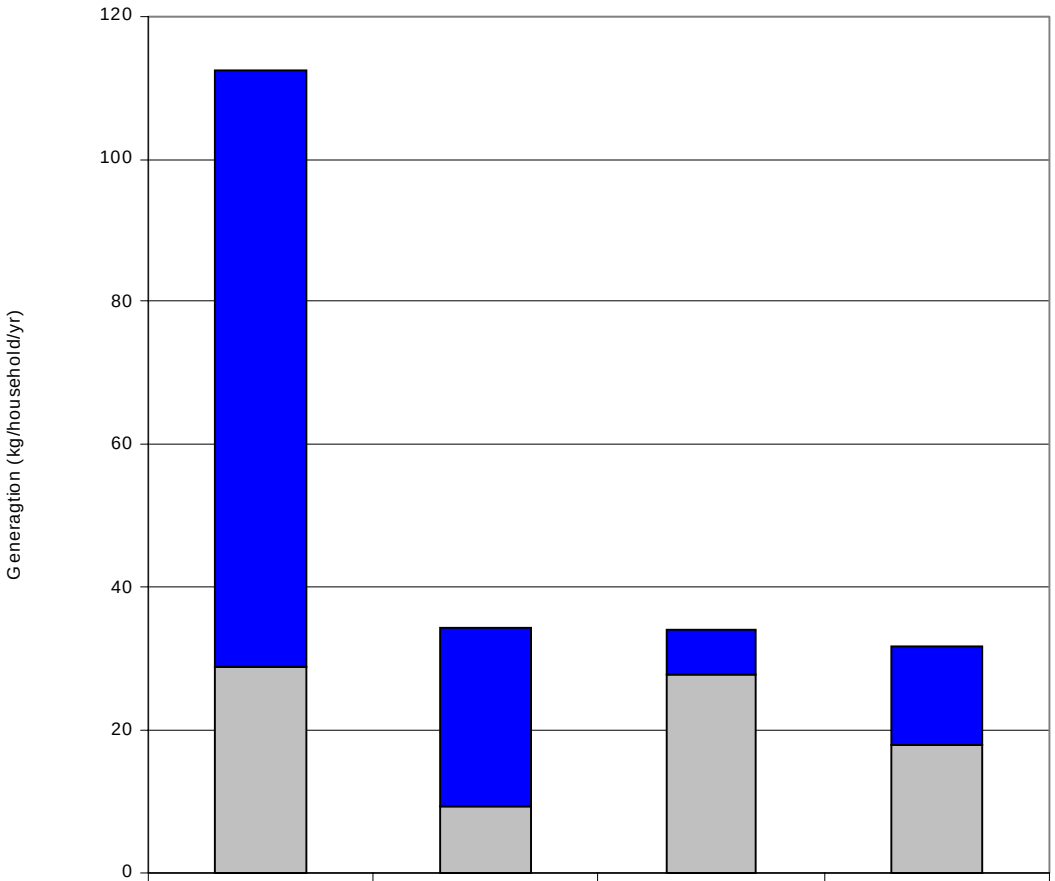
Figure 3 shows the percent composition of the total waste collected in the three study areas including garbage, Blue Box material and yard waste. The dark blue sections that jut out from represent the percent diverted from the landfill. The sections shaded light blue represent the recyclables found in the garbage.

## Table 7.0 Overall Summary of Waste Generation and Recycling Recovery Results*

| Material Category | Garbage Total Net Weight (kg) | Recycling (Blue Box) Total Net Weight (kg) | Garbage Generation (kg/hhld/yr) | Recycling (Blue Box) Generation (kg/hhld/yr) | Total Waste Generation (kg/hhld/yr) | Waste Composition (%) | Recovery Rate (%) |
|---|---|---|---|---|---|---|---|
| **Paper Fibres** | **662.61** | **742.66** | **114.85** | **128.73** | **243.58** | **28.7%** | |
| **Recyclable Paper Fibre** | **486.90** | **741.69** | **84.40** | **128.56** | **212.96** | **25.1%** | **60.4%** |
| **Other Paper Fibre** | **175.71** | **0.97** | **30.46** | **0.17** | **30.62** | **3.6%** | |
| Newspaper | 140.50 | 402.80 | 24.35 | 69.82 | 94.17 | 11.1% | 74.1% |
| Magazines | 18.70 | 70.50 | 3.24 | 12.22 | 15.46 | 1.8% | 79.0% |
| Phone Books | 1.80 | 3.70 | 0.31 | 0.64 | 0.95 | 0.1% | 67.3% |
| Cardboard | 32.55 | 142.50 | 5.64 | 24.70 | 30.34 | 3.6% | 81.4% |
| Boxboard/Rolls | 103.80 | 79.80 | 17.99 | 13.83 | 31.82 | 3.7% | 43.5% |
| Mixed Papers | 146.20 | 33.50 | 25.34 | 5.81 | 31.15 | 3.7% | 18.6% |
| Molded Pulp | 6.05 | 4.80 | 1.05 | 0.83 | 1.88 | 0.2% | 44.2% |
| Books | 15.00 | 2.61 | 2.60 | 0.45 | 3.05 | 0.4% | 14.8% |
| Kraft Paper | 22.30 | 1.48 | 3.87 | 0.26 | 4.12 | 0.5% | 6.2% |
| Spiral Wound | 3.76 | 0.21 | 0.65 | 0.04 | 0.69 | 0.1% | |
| Tissue/Toweling | 124.20 | 0.00 | 21.53 | 0.00 | 21.53 | 2.5% | |
| Other Paper | 35.30 | 0.36 | 6.12 | 0.06 | 6.18 | 0.7% | |
| Gable Top Cartons | 10.15 | 0.34 | 1.76 | 0.06 | 1.82 | 0.2% | |
| Aseptic Containers | 2.30 | 0.06 | 0.40 | 0.01 | 0.41 | 0.0% | |
| **Plastics** | **265.45** | **50.08** | **46.01** | **8.68** | **54.69** | **6.4%** | |
| **Recyclable Plastics** | **32.35** | **45.95** | **5.61** | **7.96** | **13.57** | **1.6%** | **58.7%** |
| **Other Plastics** | **233.10** | **4.13** | **40.40** | **0.72** | **41.12** | **4.8%** | |
| PETE Soft Drink | 9.65 | 12.00 | 1.67 | 2.08 | 3.75 | 0.4% | 55.4% |
| PETE Other | 8.45 | 15.30 | 1.46 | 2.65 | 4.12 | 0.5% | 64.4% |
| HDPE bottles | 12.55 | 17.50 | 2.18 | 3.03 | 5.21 | 0.6% | 58.2% |
| HDPE Tubs | 1.70 | 1.15 | 0.29 | 0.20 | 0.49 | 0.1% | 40.4% |
| PVC | 1.00 | 0.35 | 0.17 | 0.06 | 0.23 | 0.0% | |
| LDPE/PP Bottles | 4.55 | 0.60 | 0.79 | 0.10 | 0.89 | 0.1% | |
| PS | 9.80 | 0.40 | 1.70 | 0.07 | 1.77 | 0.2% | |
| Recyclable Film | 37.15 | 0.50 | 6.44 | 0.09 | 6.53 | 0.8% | |
| Non-Recyclable Film | 81.00 | 0.07 | 14.04 | 0.01 | 14.05 | 1.7% | |
| Wide Mouth Tubs/Lids #4,5,6 | 10.60 | 0.40 | 1.84 | 0.07 | 1.91 | 0.2% | |
| Other Containers | 24.30 | 0.70 | 4.21 | 0.12 | 4.33 | 0.5% | |
| Other Plastics | 64.70 | 1.11 | 11.21 | 0.19 | 11.41 | 1.3% | |
| **Metals** | **157.20** | **99.26** | **27.25** | **17.21** | **44.45** | **5.2%** | |
| **Recyclable Metal** | **98.20** | **99.21** | **17.02** | **17.20** | **34.22** | **4.0%** | **50.3%** |
| **Other Metal** | **59.00** | **0.05** | **10.23** | **0.01** | **10.24** | **1.2%** | |
| Aluminum Cans | 32.25 | 25.50 | 5.59 | 4.42 | 10.01 | 1.2% | 44.2% |
| Aluminum Foil Trays | 4.90 | 0.51 | 0.85 | 0.09 | 0.94 | 0.1% | 9.4% |
| Steel Cans | 52.55 | 72.40 | 9.11 | 12.55 | 21.66 | 2.6% | 57.9% |
| Aerosol Cans | 11.40 | 0.05 | 1.98 | 0.01 | 1.98 | 0.2% | |
| Paint Cans | 8.50 | 0.80 | 1.47 | 0.14 | 1.61 | 0.2% | 8.6% |
| Other Metal | 47.60 | 0.00 | 8.25 | 0.00 | 8.25 | 1.0% | |
| **Glass** | **107.65** | **139.30** | **18.66** | **24.15** | **42.80** | **5.0%** | |
| **Recyclable Glass** | **80.15** | **137.00** | **13.89** | **23.75** | **37.64** | **4.4%** | **63.1%** |
| **Other Glass** | **27.50** | **2.30** | **4.77** | **0.40** | **5.17** | **0.6%** | |
| LCBO Clear | 17.70 | 45.00 | 3.07 | 7.80 | 10.87 | 1.3% | 71.8% |
| LCBO Coloured | 6.65 | 23.90 | 1.15 | 4.14 | 5.30 | 0.6% | 78.2% |
| Clear | 43.00 | 66.30 | 7.45 | 11.49 | 18.95 | 2.2% | 60.7% |
| Coloured | 12.80 | 1.80 | 2.22 | 0.31 | 2.53 | 0.3% | 12.3% |
| Other Glass | 27.50 | 2.30 | 4.77 | 0.40 | 5.17 | 0.6% | |
| **HSW** | **18.35** | **0.00** | **3.18** | **0.00** | **3.18** | **0.4%** | |
| Batteries | 3.20 | 0.00 | 0.55 | 0.00 | 0.55 | 0.1% | |
| Paint | 13.30 | 0.00 | 2.31 | 0.00 | 2.31 | 0.3% | |
| Motor Oil | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0% | |
| Flammables | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0% | |
| Other HSW | 1.85 | 0.00 | 0.32 | 0.00 | 0.32 | 0.0% | |
| **Organics** | **1,870.65** | **1.30** | **324.25** | **0.23** | **324.47** | **38.2%** | |
| Food Waste | 1264.50 | 1.20 | 219.18 | 0.21 | 219.39 | 25.8% | |
| Leaf & Yard Waste | 495.05 | 0.10 | 85.81 | 0.02 | 85.83 | 10.1% | |
| Animal waste | 111.10 | 0.00 | 19.26 | 0.00 | 19.26 | 2.3% | |
| **Other** | **782.30** | **1.30** | **135.60** | **0.23** | **135.82** | **16.0%** | |
| Textiles | 203.50 | 0.00 | 35.27 | 0.00 | 35.27 | 4.2% | |
| Building Renovations | 295.75 | 0.00 | 51.26 | 0.00 | 51.26 | 6.0% | |
| White Goods | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0% | |
| Sanitary Products | 110.90 | 0.00 | 19.22 | 0.00 | 19.22 | 2.3% | |
| Appliances | 63.20 | 0.00 | 10.95 | 0.00 | 10.95 | 1.3% | |
| Rubber | 3.50 | 0.00 | 0.61 | 0.00 | 0.61 | 0.1% | |
| Furniture | 47.90 | 0.00 | 8.30 | 0.00 | 8.30 | 1.0% | |
| Computer equipment | 0.50 | 0.00 | 0.09 | 0.00 | 0.09 | 0.0% | |
| Other Waste | 57.05 | 1.30 | 9.89 | 0.23 | 10.11 | 1.2% | |
| **Total Waste** | **3,864.21** | **1,033.90** | **669.80** | **179.21** | **849.01** | **100%** | |
| **Total Recyclables** | **697.60** | **1,023.85** | **120.92** | **177.47** | **298.38** | **35%** | **59.5%** |
| **Total Other Waste** | **3,166.61** | **10.05** | **548.88** | **1.74** | **550.62** | **65%** | |

*Results based on 300 household waste samples collected over a four week period in the communities of Naughton (November 9, 16, 23 and 30, from 26 homes on Mary and Ernest) and Val Therese (November 15, 22 and 27, from 27 homes on Laroque and Guimond) and in Sudbury (November 7, 14, 21 and 28, from 30 homes on Village Cresent). Blue Box Contamination is 1.74 kg/hhld/year and the Blue Box Contamination Rate is 1.0%

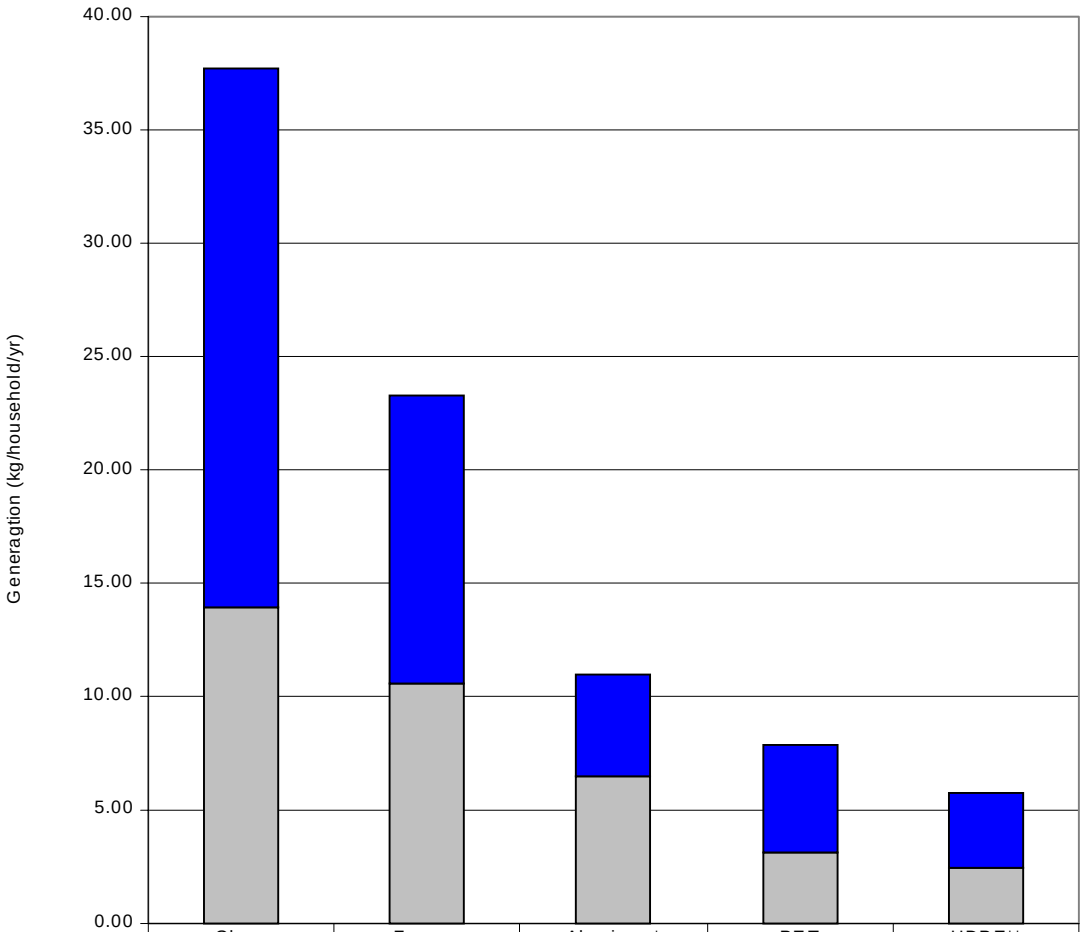
**Figure 1**
**Recyclable Fibre Generation and Recovery for all Sample Areas Combined**




| | Newspaper* | Cardboard** | Mixed Papers*** | Boxboard**** |
|---|---|---|---|---|
| Blue Box | 83.51 | 24.96 | 6.26 | 13.83 |
| Garbage | 28.96 | 9.51 | 27.94 | 17.99 |
| Recovery Rate | 74% | 72% | 18% | 43% |

* including magazines, phone books, and molded pulp trays
** including kraft paper
*** including fine paper, writing paper, office paper, books
**** including toweling/tisue rolls

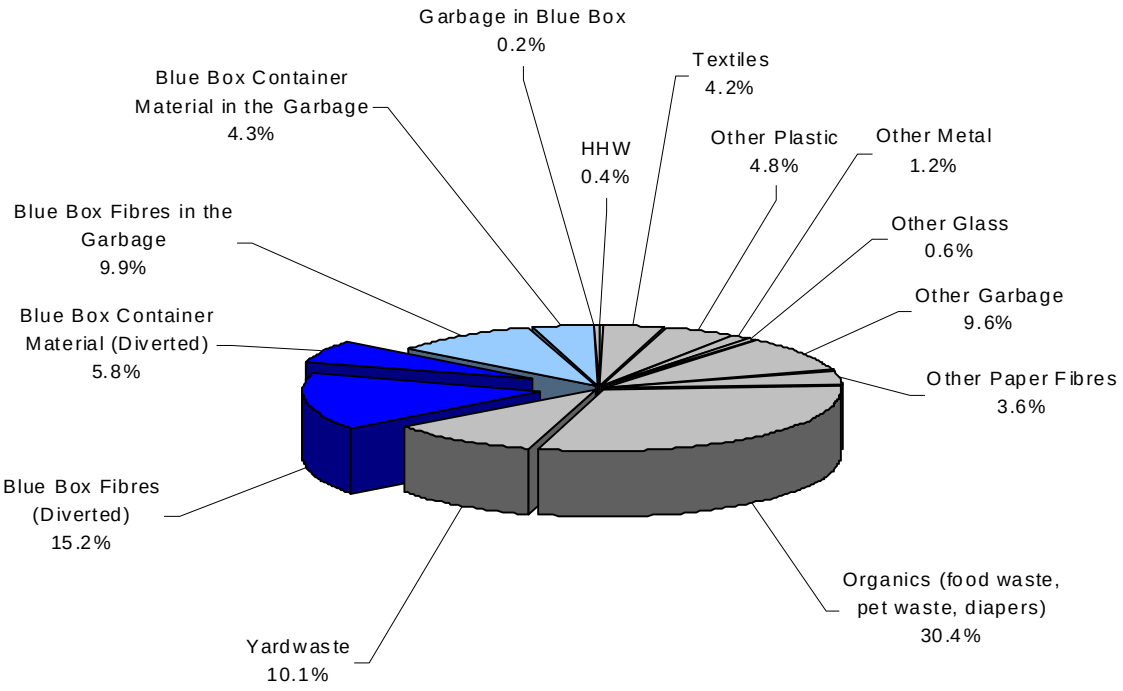
**Figure 2**
**Recyclable Container Material Generation and Recovery for all Sample Areas Combined**




| | Glass | Ferrous | Aluminum* | PET | HDPE** |
|---|---|---|---|---|---|
| Blue Box | 23.75 | 12.69 | 4.51 | 4.73 | 3.23 |
| Garbage | 13.89 | 10.58 | 6.44 | 3.14 | 2.47 |
| Recovery Rate | 63% | 55% | 64% | 38% | 57% |

* including foil and foil trays
** HDPE bottle and tubs

**Figure 3**
**Composition of the Total Waste Stream by Weight**



# 7.0 Conclusions and Recommendations

Based on the results of the residential waste audit, Enviros RIS has identified a number of summary conclusions and recommendations for consideration Sudbury's waste management staff:

***Paper Recovery***

- Newspaper recovery rate of 74% is low relative to other communities that have conducted similar audits over the past year. For example, single family recovery rates measured during audits in Peterborough, Toronto, Durham, North Glengary and London show newspaper recovery ranging from a low 86% to 97%.

- Recovery rates for other recyclable paper are more consistent with results from other communities, with the exception of mixed papers that had a very low rate of 19%.

- Future promotion and education efforts would best be directed to increasing paper recovery, especially for newspaper, boxboard and household fine/mixed paper.

***Container Recovery***

- Aluminum recovery is low when compared to other communities. Aluminum is the highest value material in the blue box and increasing recovery should be a priority in ongoing communication and promotion efforts.

- Steel can recovery rates are similar to those found in other communities. Paint can recovery is low, but this is a new material and high recovery rates for paint cans are not anticipated due to the effort homeowners have take in preparing the paint can for recycling (i.e. emptied, dried etc.)

- The recovery rates for PET, HDPE and glass were similar to those found in other communities.

***Potential New Diversion Opportunities***

- Sudbury should develop an organic waste diversion strategy that addresses the diversion of leaf, yard waste and household food waste for the short and long term. Compostable food, leaf and yard waste together represented almost 36% of the residential waste stream (newspaper was next at 11%). A study for the Region of Peel found that 80% of non-grass leaf and yard waste is generated over a 20-week period during the Spring (April-June) and Fall (September-November) peaks. The shorter 'growing' season may shorten this peak in the case of Sudbury to approximately 15 weeks.

- Improving or deepening the capture rate of materials currently being collected, primarily paper, aluminum and plastics should be priority to Sudbury before expanding the number of materials collected in the blue box.

- Sudbury should explore with their contractor adding empty aerosol containers to their program. A number of communities over the past few years have added empty paint cans and aerosol containers together to metals accepted in the blue box program, including Region of Peel, Centre South Hastings, Peterborough and Hamilton. While the overall diversion impact will be minimal, there would also be few incremental costs or operational changes required.

- Polycoated containers such including gable top (e.g. milk and juice cartons) and aseptic (e.g. juice drinking boxes) are recyclable with viable markets available for Ontario communities. Based on the generation figures from the audit, roughly 80 tonnes of gable top cartons and 18 tonnes of aseptic drinking boxes are generated annually in Sudbury.

  Atlantic Packaging in Toronto, in cooperation with Tetra Pak Canada, is currently sourcing separated loads of aseptic boxes only from municipalities. The City of Barrie is one community that is currently collecting aseptics only.

  Most other communities in Ontario that collect polycoated containers collect aseptic and gable top cartons together. The most common market for this mixed load is Great Lakes Fiber in upstate Michigan.

- Sudbury, like 90% of Ontario municipal programs, collects PET and HDPE plastics. Roughly 30% of municipalities collect other plastic packaging such as wide mouth tubs (e.g. yogurt, margarine) and lids, polystyrene (e.g. styrofoam cups), recyclable film (e.g plastic bags). As a result of the incremental collection and processing costs associated with these materials, combined with low relative market values for these materials, Sudbury should thoroughly analysis the net benefits, costs and market availability for plastics when developing waste diversion programs in the future.