

2014

Report
ACT NOWaste
ACT Recycling Drop Off Centres (RDOC)
Co-mingled recycling composition audit



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EXECUTIVE SUMMARY

Audit details

- RDOC co-mingled recycling bins at six locations were audited on 17 June 2014.
- A total of 2,139.6kg and 25,630 litres was sorted, at the Material Recovery Facility at Hume

Composition of RDOC bins

- Bagged waste is 2.3% of the total weight of the RDOC bin contents.
- By weight, RDOC bins comprise 47% paper/cardboard/liquidpaperboard, 44% recyclable containers, and 9% non-recyclable material.
- By volume, RDOC bins comprise 53% paper/cardboard/liquidpaperboard, 37% recyclable containers, and 10% non-recyclable material.
- Paper and cardboard makes up 46% by weight and 51% by volume of the overall RDOC contents. Liquidpaperboard accounts for less than 1% of weight and 2% of volume.
- By weight, glass containers make up 78% of the total recyclable containers and 34% of the overall weight. Plastic containers make up 7% overall, steel containers 2% and aluminium containers 0.5%.
- When measured by volume, the majority of the recyclable containers are plastic. Plastic containers make up 23% of the total volume, and glass containers 11%. Steel containers are 3% of the total, and aluminium containers 1%.
- It is not clear if only commingled or paper bins were also collected by the contractor as paper accounts for almost half of the bin by weight. This material is recoverable at the MRF so not considered as contamination

Non-recyclable materials in the RDOC bins

- The main contaminant of the RDOC bins is general waste, which makes up 90% by weight and 61% by volume of the contamination in the bins.
- General waste is 8% of total RDOC weight and 6.1% of total volume.
- The other contaminants in the bins are plastic bags and film (3% of total weight, 0.5% of volume), and small amounts of expanded polystyrene (0.1% of total weight, 0.5% of volume) and hazardous/problem wastes (0.6% of total weight and volume).

Recommendations

- Continue to educate residents on what is acceptable in the RDOC co-mingled recycling bins, focusing on general waste and bagged waste.
- Continue to educate residents about the correct disposal methods and local recycling opportunities for plastic bags, plastic film, expanded polystyrene and hazardous/problem wastes.
- Ensure that RDOC bins have clear signage showing that bagged general waste, plastic bags, plastic film, expanded polystyrene and hazardous wastes are not accepted in the bins.

1 INTRODUCTION

ACT NOWaste engaged A. Prince Consulting (APC) to undertake a waste audit of the contents of the co-mingled recycling bins at Recycling Drop off Centres (RDOC).

ACT NOWaste operates a network of RDOCs across Canberra that allows residents and businesses to dispose of excess paper, cardboard and comingled recycling. The RDOC are located at:

- Jolly Street, Belconnen;
- O'Brien Place, Gungahlin;
- Botany Street, Phillip;
- Scollay Street, Tuggeranong;
- Mugga Resource Management Centre; and
- Parkwood Resource Management Centre.

This audit covers the co-mingled bins only – the paper and cardboard bins were not included.

The objectives of the audit are to:

- provide information to assist in the development of waste avoidance, recycling strategies and policies specific to the RDOC network;
- improve waste and recycling operations in the ACT and to assist with community education programs conducted by ACT NOWaste;
- better understand current recycling and waste disposal needs of the ACT and Queanbeyan; and
- assist with planning for future waste and resource recovery services and infrastructure.

This report presents the findings of the audit.

2 METHODOLOGY

2.1 Project inception meeting

A teleconference was held with ACT NOWaste staff to discuss the operational aspects of the project and to confirm project requirements including logistics, documentation, WHS, reporting and the project timeline. The initial timeline was moved due to operational constraints within the ACT and the current workload commitments of APC.

2.2 Staff inductions

Work, Health Safety (WHS) inductions were undertaken for APC staff at the Remondis MRF, where the sorting took place in addition to our own safety briefings.

2.3 Sample size and collection

The samples were collected over a single day on 17th June 2014, from a number of RDOC locations. The samples were collected by the ACT NOWaste collection contractor Sita and we are not aware if all or only some sites were visited.

A total sample size of 4,940 kg was collected. The MRF manager and APO supervisor directed the plant operator to remove half the load while both were in attendance. The remaining materials were sorted.

2.4 Sorting

The samples were delivered by the ACT NOWaste Contractor Sita to the Material Recovery Facility on John Cory Circuit, Hume.

APC provided five staff including a supervisor to undertake the sorting.

The delivered load was separated and then categorised material placed into mobile garbage bins (MGBs) provided by ACT NOWaste. APC provided all other auditing and sorting equipment, including calibrated floor scales to measure material weights.

The contents of bins were weighed on a set of electronic scales, and the weight of each material entered into the appropriate space on a data recording sheet by material category.

All bagged material was recorded as bagged material, and then opened and its contents identified and recorded as recyclable and non-recyclable according to the specified material categories.

On completion of the sorting, weighing and recording the recyclable materials were processed by the MRF.

The sorting categories were selected to give the required information in the most cost effective way, whilst allowing comparison with previous audits. The categories used for this audit, and their corresponding categories from previous audits, are shown in Table 1 below.

Table 1 Sorting categories

Previous audit categories	2014 aggregated categories
Mixed clean paper cardboard	Paper / cardboard
Liquidpaperboard	Liquidpaperboard
Glass containers	All glass
Glass Fines (less than 50mm)	
Aluminium	Aluminium
Steel	Steel
PET clear	All plastics recyclable
HDPE semi opaque	
Mixed plastic containers	
Film plastics and plastic bags	Plastic film
Expanded polystyrene	Expanded polystyrene
Food and kitchen waste	General waste
Green waste and timber	
Non-recyclable glass and crockery	
Other miscellaneous	
Nappies	
Non-recyclable waste	
Textiles	
Electrical appliances	
Hazardous	Problem hazardous

In total 2,140kg of material was sorted.

2.5 Data entry and analysis

All analysis carried out in this project was conducted using the best available data and published methods. Our statistician with over 20 years' experience in waste audit data undertook this analysis.

2.6 Data verification and accuracy

A number of techniques and procedures were used to check and verify data. At the data-entry stage, each coded data sheet on which sorting data was recorded (by weight and volume) was checked.

2.7 Study limitations

The data for this study was collected and analysed using the best and most accurate methods available within the constraints of available time and budget. This study is a survey, which means that a relatively small amount of data has been collected and then treated as representative of the total. As in any survey there are limitations to the accuracy of the data, as described below:

Timeframe: This audit was carried out over one day. The data was then used as being representative of all RDOC contents. It should be noted that seasonal trends may change waste generation over time. Thus, the results of this audit should be treated with due caution when analysing this report or comparing it to reports based on data taken at different times of year.

Representative sample: The sample for this audit is necessarily small due to the resource-intensive nature of waste auditing. There is always a small probability of inadvertently collecting waste from atypical RDOCs, resulting in non-representative data. This audit entailed random sampling of half the total material collected from the RDOCs, to minimise the chance of this situation occurring.

Limitations of sample size: All surveys carry an element of sampling error which is the mathematical error associated with using a sample to represent a total population. Sampling error can be reduced by taking larger samples. The sampling error involved in waste audits is usually small and can be tabulated by producing estimates augmented by upper and lower confidence intervals.

It is not possible to calculate confidence intervals for this data collection as there is essentially just one observation. However, this data collection comprises 25 cubic metres of recycling waste collected from a number of different locations. As this is a large amount of material sourced from multiple locations, it could reasonably be assumed that this is a representative and accurate set of data.

3 IMAGES OF AUDIT PROCESS

	
<p>The entire load delivered and covered overnight</p>	<p>The front end loader removing half the load</p>
	
<p>Sorting the waste into wheelie bins</p>	
	
<p>Sorting the contents of plastic bags</p>	

4 RESULTS

4.1 Proportion of bagged material

Of a total of 2,139.6kg audited, bagged material was weighed at 50.52kg. This represents 2.3% of the RDOC co-mingled material total weight. Raw data is provided in **Appendix A** and images of the contamination are provided at **Appendix B**.

4.2 RDOC recycling composition by weight

By weight, the RDOC recycling material consists of 47% paper/cardboard/liquidpaperboard, 44% recyclable containers, and 9% non-recyclable material, as shown in Chart 1.

Chart 1: Consolidated composition by weight

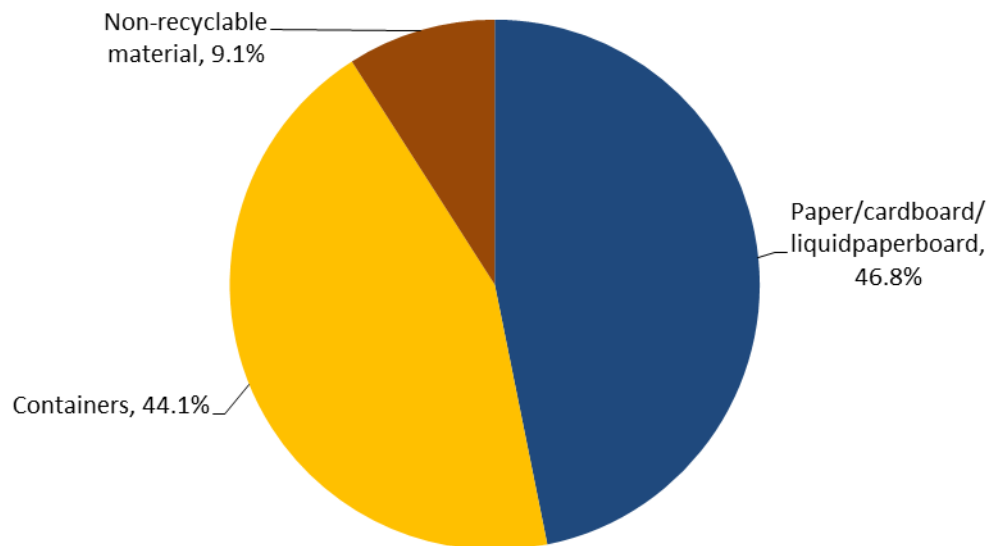
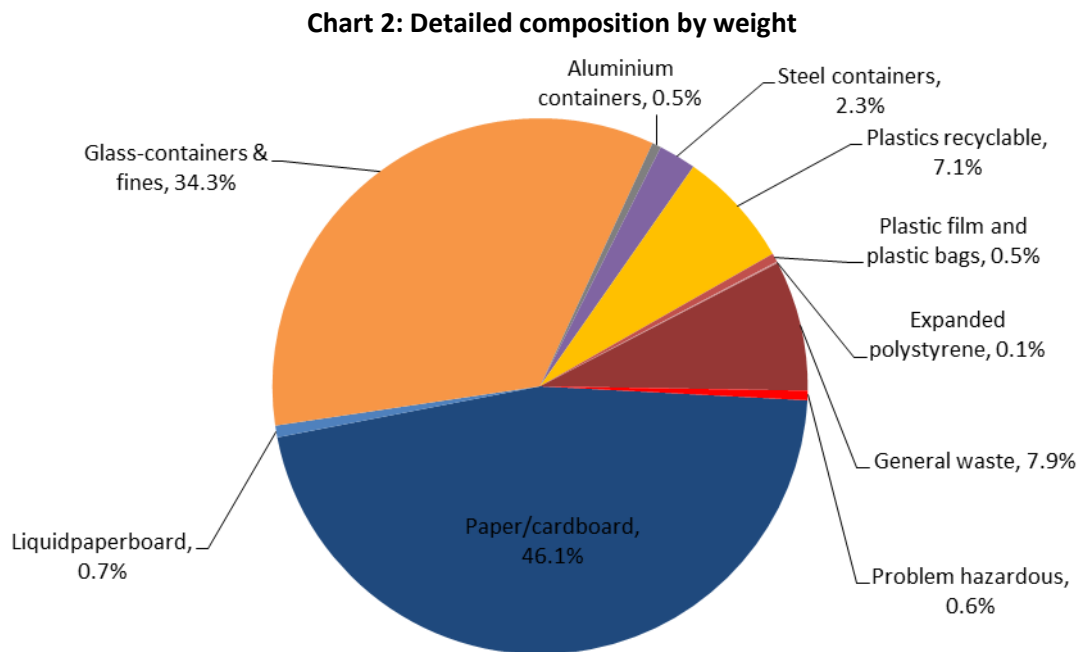


Chart 2 shows a more detailed composition of the RDOC recycling, by weight. The majority of the recyclable containers are glass; glass containers make up 78% of the total recyclable containers and 34% of the overall weight. Plastic containers make up 7% overall, steel containers 2% and aluminium containers 0.5%.

Almost all of the paper/cardboard/liquidpaperboard category is paper and cardboard, which makes up 46% of the total weight of RDOC material. Liquidpaperboard accounts for less than 1% of the total.



Almost 90% of the non-recyclable material in the bins is general waste, which makes up 8% of the total weight of the RDOC bins. The other non-recyclable material is made up of small amounts of hazardous waste (0.6% of total), plastic film and plastic bags (0.5%) and expanded polystyrene (0.1%).

4.3 RDOC recycling composition by volume

By volume, the RDOC recycling material consists of 53% paper/cardboard/liquidpaperboard, 37% recyclable containers, and 10% non-recyclable material, as shown in Chart 3.

Chart 3: Consolidated composition by volume

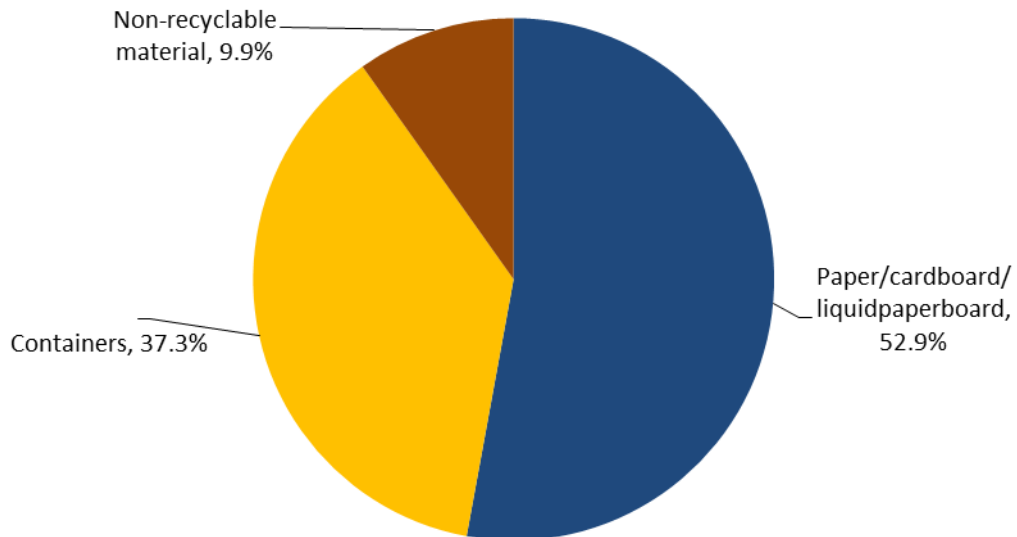
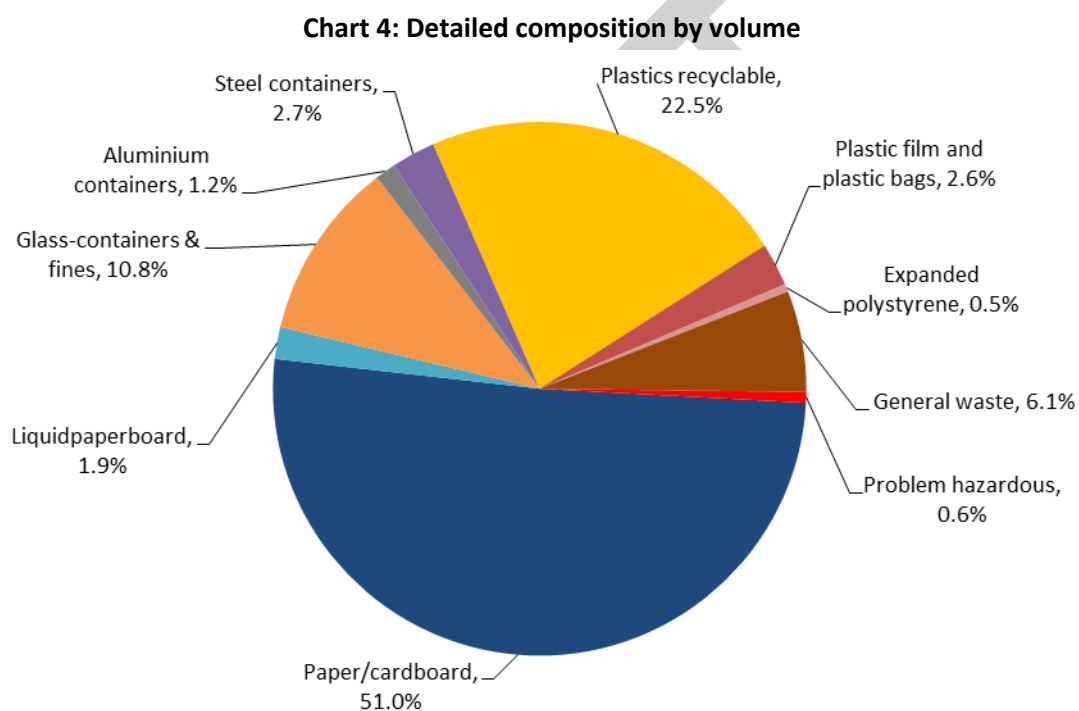


Chart 4 shows the detailed composition of the RDOC recycling, by volume. When measured by volume, the majority of the recyclable containers are plastic ones, as they are much lighter than glass. Plastic containers make up 23% of the total volume, and glass containers 11%. Steel containers are 3% of the total, and aluminium containers 1%.

Almost all of the paper/cardboard/liquidpaperboard category is paper and cardboard, which makes up 51% of the total volume of RDOC material. Liquidpaperboard accounts for 2% of the total – more than it does by weight, but still a small percentage of the overall material in the RDOC bins.



By volume, general waste remains the largest contaminant, comprising 6% of the total (and 61% of the non-recyclable material in the bins).

Of the other contaminants, plastic bags and film contribute a larger proportion by volume than they do by weight (3% of the total, compared to only 0.5% by weight). Hazardous waste comprises 0.6% (the same as it does by weight), and expanded polystyrene is 0.5%.

5 KEY FINDINGS

- Bagged waste represents 2.3% of material placed in the RDOC co-mingled recycling bins.
- By weight, RDOC bins comprise 47% paper/cardboard/liquidpaperboard, 44% recyclable containers, and 9% non-recyclable material.
- By volume, RDOC bins comprise 53% paper/cardboard/liquidpaperboard, 37% recyclable containers, and 10% non-recyclable material.
- Paper and cardboard makes up 46% by weight and 51% by volume of the overall RDOC contents. Liquidpaperboard accounts for less than 1% of weight and 2% of volume.
- By weight, the majority of the recyclable containers are glass; glass containers make up 78% of the total recyclable containers and 34% of the overall weight. Plastic containers make up 7% overall, steel containers 2% and aluminium containers 0.5%.
- When measured by volume, the majority of the recyclable containers are plastic ones, as many containers are larger and lighter than glass. Plastic containers make up 23% of the total volume, and glass containers 11%. Steel containers are 3% of the total, and aluminium containers 1%.
- General waste is 8% of total RDOC weight and 6.1% of total volume.
- The main contaminant of the RDOC bins is general waste, which makes up 90% by weight and 61% by volume of the contamination in the bins.
- The other contaminants in the bins are plastic bags and film (3% of total weight, 0.5% of volume), and small amounts of expanded polystyrene (0.1% of total weight, 0.5% of volume) and hazardous/problem wastes (0.6% of total weight and volume).

6 DISCUSSION

It was our understanding that only commingled recycling bins were to be collected. However, these results either indicate that almost half of the comingled bins contain paper and cardboard or the driver collected a mix of comingled and paper and cardboard bins.

Unfortunately, as our supervisor did not accompany the driver we cannot state which of these two situations occurred.

Given it is unknown from which bins the products were collected we suggest that the ACT government seek to gain clarity from the supervisor and driver of exactly which bins were serviced for this audit.

7 RECOMMENDATIONS

APC recommends that ACT NOWaste should:

1. Determine if the contents of these bins were from comingled containers or a combination of paper/cardboard and co-mingled bins;
2. If and when any future audits are to be conducted we strongly suggest that a third party or a representative of ACTNOWaste accompanies the collection vehicle so as the exact location, number and type of bins collected is known;
3. Continue to educate residents on what is acceptable in the RDOC co-mingled recycling bins – focusing on general waste, which is the major contaminant, and reminding residents that bagged waste is not accepted;
4. Continue to educate residents about the correct disposal methods and local recycling opportunities for plastic bags, plastic film, expanded polystyrene and hazardous/problem wastes; and
5. Ensure that RDOC bins have clear signage showing that general waste, plastic bags, plastic film, expanded polystyrene and hazardous wastes are not accepted in the bins.

8 APPENDIX A: AUDIT DATA

Material	Volume (L)	Weight (kg)
Paper/cardboard	13060	986.52
Liquidpaperboard	495	15.18
Glass-containers & fines	2775	732.91
Aluminium containers	320	11.66
Steel containers	685	48.34
Plastics recyclable	5770	151.02
Plastic film and plastic bags	670	11.36
Expanded polystyrene	120	1.86
General waste	1570	168.44
Problem hazardous	165	12.32
Total	25630	2139.61

Total weight: 2,139.61 kg

Bagged waste: 51.52 kg

Total volume: 25,630 litres

Images of contamination

Plastic bags



Other contamination present in bins



