

Domestic kerbside waste and recycling in NSW

Results of the 2011 waste audits



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Summary

During 2010–11, 66 councils from the Sydney Metropolitan Area (SMA), Extended Regulated Area (ERA) and Regional Regulated Area (RRA) carried out household waste and recycling kerbside bin audits as part of the Waste and Sustainability Performance Improvement Payment (WaSIP) program set up by the NSW Environment Protection Authority (EPA). This report analyses the data collected across all of the audits and presents the findings. It covers the generation and composition of household waste and recycling, as well as the proportion of potential recyclables in the residual waste stream, and contamination in the dry recycling and garden organics streams.

Key findings

Residual waste

- overall 13,783 households were audited across 66 local government areas (LGAs)¹
- on average, each household generated 10.1 kg per week of residual waste
- there was no marked difference in average residual waste generation between the SMA, ERA and RRA compared to the overall average
- the average proportion of potential dry recyclables in residual waste streams was 22.1% based on materials typically recycled in the dry recycling stream
- the most significant materials in the residual waste bin were food and garden organics at 45%, followed by paper at 19.6%. Plastic and glass made up 10.5% and 3.7% respectively.

Dry recycling

- overall 12,230 households were audited across 54 LGAs
- on average, each household generated 5.6 kg per week of dry recycling
- households in the SMA and ERA generated close to the overall average, while households in the RRA generated 0.6 kg more than the overall household average of dry recycling
- the average contamination rate in the dry recycling bin was 7.3%
- the major component of the dry recycling stream was recyclable paper at 55.1%, followed by recyclable glass at 30.1%

Organics

Several councils within the regions now co-collect food with garden organics. These councils were treated separately for this analysis.

Garden organics

- overall 2,642 households were audited across 20 LGAs
- households on average generated 8.4 kg per week of garden organics
- the contamination rate in the garden organics bin was 2.1%

¹ The overall household generation rate is based on the total number of households sampled and does not represent an average figure for NSW.

Co-collection (food and garden organics)

- overall 603 households were audited across 3 LGAs
- households on an average generated 8.9 kg per week of garden and food organics (co-collection)
- the contamination rate in the co-collection bin was 2.8%

Introduction

This report presents the results of household kerbside residual waste, dry recycling and garden organics audits carried out across local government areas (LGAs) in NSW during 2010 and 2011. Altogether 66 audit reports, 38 from the Sydney Metropolitan Area (SMA), 13 from the Extended Regulated Area (ERA) and 15 from the Regional Regulated Area (RRA), councils were analysed for the results outlined in this report. Councils undertook kerbside waste audits as part of the Waste Service Performance Improvement Payment (WaSIP) program of the NSW Environment Protection Authority (EPA). Refer to Appendix 4 for a complete list of councils and corresponding audits undertaken.

A kerbside waste audit enables councils to determine household residual waste and resource recovery quantities as well as composition of each audited waste stream within their individual local government area. The data collected from the audits can also be used to monitor the progress towards the targets and outcomes set out in the *NSW Waste Avoidance and Resource Recovery Strategy 2007* (see: www.epa.nsw.gov.au/warr/WARRStrategy2007.htm).

The preferred methodology required by the EPA to meet the WaSIP standard was that prescribed in the *Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas, 2008* (DECC 2008) and its addendum (DECCW 2010). Appendix 2 details the prescribed methodology. The majority of all audits undertaken for this study complied with the prescribed methodology. Where this did not occur the data was assessed to determine fitness for purpose prior to its inclusion in the analysis.

Overview

Although detailed information on material composition in each waste stream was measured, this report only aims to provide information on household generation (average overall, regional and waste stream figures), composition of each waste stream, potential recyclables in residual waste stream and contamination rates in dry recycling and organics stream. Refer to Appendix 1 for statistical approaches, calculations and data limitations.

This report details the results of analyses carried out for all major material categories as well as total bin weight, contamination in the dry recycling bin and potential recyclables in the residual waste bin. The calculations are based on total samples available for respective waste streams and representative of entire collected sample size. This report does not provide any analysis to distinguish between single unit dwellings (SUD) and multi unit dwellings (MUD).

Household generation

Household generation characterises the quantity of waste generation of a typical household from the individual waste streams (residual waste, dry recycling and organics) presented at the kerbside from both SUD and MUD across NSW.

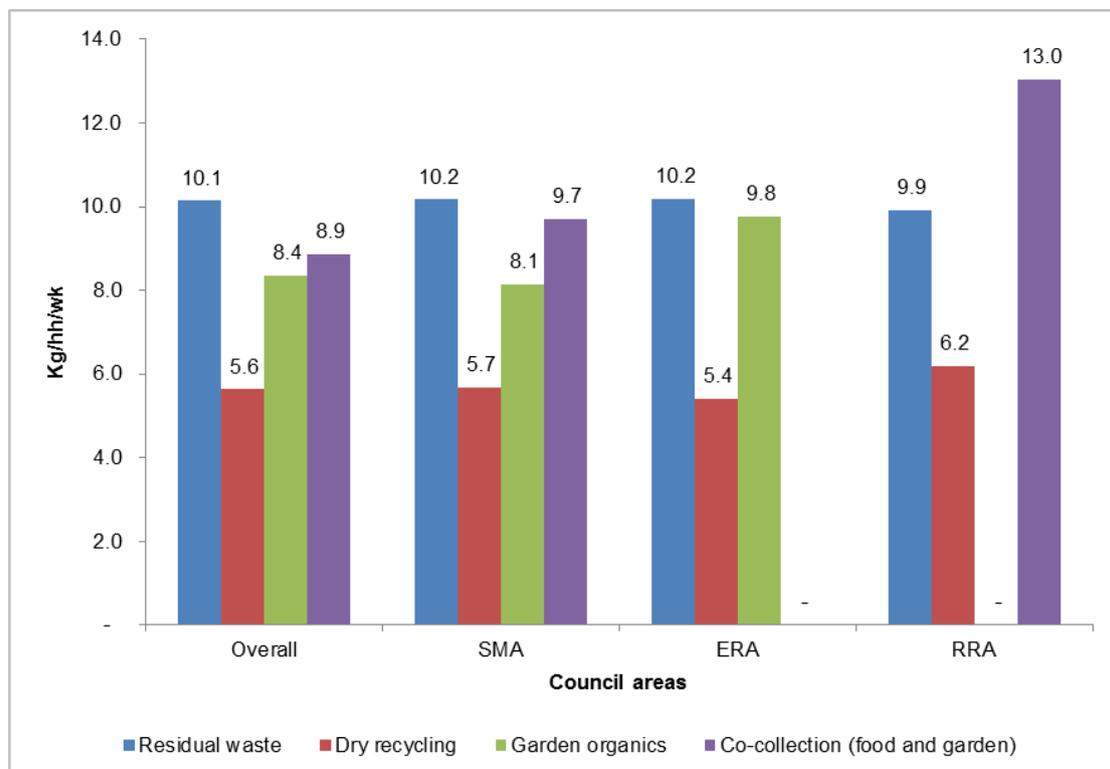
Household generation rates were calculated using the total weights of bin contents from respective collection systems divided by the number of contributing households for each stream.

$$\text{Generation rate} = \frac{\text{total weight of all bin content}}{\text{number of contributing households in unit time}}$$

The bin contents were recorded in kilograms and normalised for weekly collection across all waste streams. The number of contributing households is the total samples collected for audit purpose across the regions. The total sample size, breakdown for each region and waste stream is presented in Appendix 1. The overall generation figure is an average of all the collected samples and does not represent NSW as a whole.

The generation rates were then expressed in kilograms per household per week (kg/hh/wk). The average generation rate from each stream and region is presented in Figure 1.

Figure 1: Average household waste generation from individual streams by council area



On average 10.1 kg/hh/wk of residual waste was generated from 13,783 households audited across the 66 councils. There is no marked difference in average residual waste generation across the regions compared to the overall average. Councils within the RRA generated 9.9 kg/hh/wk whereas both the SMA and ERA councils on an average generated 10.2 kg/hh/wk.

The average weekly dry recycling generation from the SMA, ERA and RRA households was 5.7, 5.4 and 6.2 kg respectively. The overall household average of 5.6 kg/hh/wk is close to the amount generated from the SMA and ERA. However, households in the RRA generated 0.6 kg more than the overall household average. The dry recycling average figure is representative of 12,230 samples collected from 54 councils.

Households on an average generated 8.4 kg of garden organics weekly based on 2,642 samples collected from 20 councils within the SMA and ERA². The average household generation rate of garden organics in the SMA is close to the overall average at 8.1 kg/hh/wk, whereas councils within the ERA generated 1.4 kg more than the overall average at 9.8 kg/hh/wk.

The overall average household generation of 8.9 kg/hh/wk for co-collection of garden/food organics is based on 603 sampled households. Only two councils from the SMA and one from the RRA had co-collection services among all the audited councils. The councils within the SMA generated 9.7 kg/hh/wk and the single council from the RRA generated 4.1 kg more than the overall average at 13.0 kg/hh/wk.

Comparison to previous audit data

During 2007–08, councils in the SMA and the ERA carried out household residual waste audit as part of the WaSIP program. Data from all waste streams (residual waste, dry recycling and garden organics) were analysed from 51 LGAs in the Greater Sydney Region (GSR). The 2008 report (OEH 2011) on the results of waste audits of household kerbside collection systems 2007-08 presented household waste generation characteristics in terms of quantities and composition of a typical household bin. A comparison between the 2007–08 audit report and this one is made against the regional (SMA and ERA) average household generation and composition profile for each waste streams (Table 1).

The average household weekly generation rate for residual waste in SMA dropped by 1.4 kg in 2011 compared to the 2007 audits. The councils within the ERA exhibited better result than the SMA with a 2.3 kg drop in residual waste generation at 10.2 kg/hh/wk.

There was a slight increase (2%, 0.1 kg/hh/wk) in the average amount of dry recycling collected from household each week from councils within the SMA reaching 5.7 kg in 2011. Households in the ERA generated almost 1 kg less per week compared to the 2007 audit results.

Table 1: Average generation rates for regions from 2007 and 2011 waste audits

| Waste stream | 2011 | | | 2007 | |
|-----------------|------|------|------------------|------|------|
| | SMA | ERA | RRA ³ | SMA | ERA |
| Residual waste | 10.2 | 10.2 | 9.9 | 11.6 | 12.5 |
| Dry recycling | 5.7 | 5.4 | 6.2 | 5.6 | 6.3 |
| Garden organics | 8.1 | 9.8 | - | 7.8 | 9.9 |

The garden organics generation in the SMA region was 8.1 kg/hh/wk in 2011 audits, an increase of 0.3 kg per household per week compared to the 2007 audits, while households in councils within the ERA region generated only 0.1 kg more garden organics per week compared to the 2007 audits.

² Excludes councils with co-collected food and garden organics

³ No councils within RRA were audited in 2007 for garden organics

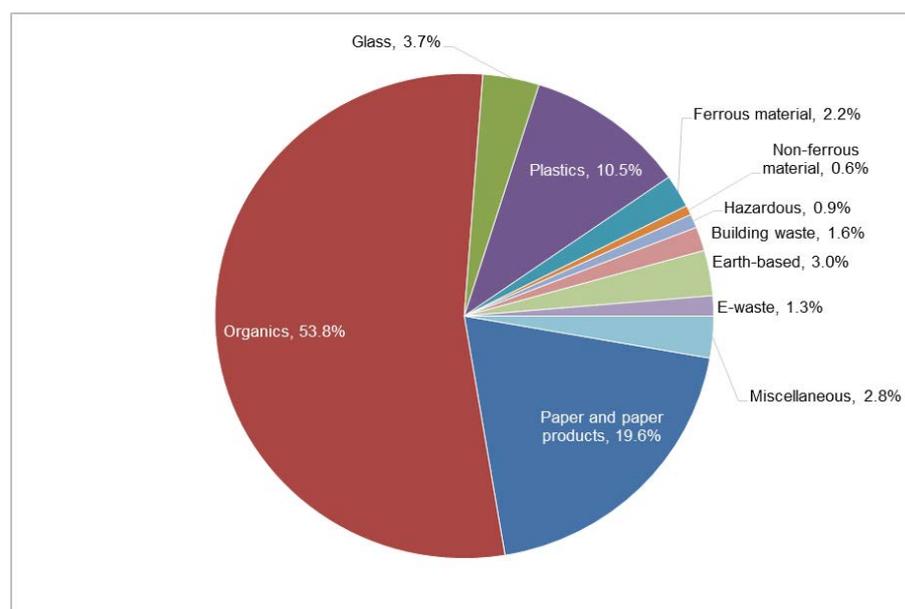
Composition profile

The composition profile of each household kerbside waste stream is calculated using the total weight of individual waste materials and subsequently categorised into major components. Appendix 3 lists waste materials and the categories for each waste stream, while Appendix 6 provides a more complete description of items within each category. The weight of individual waste materials summed to major components is then proportioned based on the total weight of all materials generated from respective waste streams. For reporting purposes, only data for major material categories is presented for each waste stream.

Residual waste

Total organics made up the largest component of residual waste composition at 53.8%, followed by total paper and paper products at 19.6%. Plastic and glass constituted the other major categories at 10.5% and 3.7% respectively. The remaining major material component (combined) contributed 12.5% of the residual waste composition with total earth-based material contributing the most at 3.0%. The total miscellaneous component comprising mostly of containerised food and liquid contributed 2.8% to the total composition.

Figure 2: Residual waste composition profile



The overall composition profile from 2011 audits as well as 2007 audits and regions are presented in Table 2. To facilitate comparison with the previous audit, material categories, without matching material type and number, are grouped as total other⁴. These materials were either categorised as miscellaneous or non-requisite for the previous audit.

Comparing the 2007 and 2011 audit results, there are no significant changes in the overall composition of the main contributing material categories. Similarly, the composition profile for each region in the 2011 audits is close to the corresponding overall profile.

⁴ Total other constitutes total of hazardous, building waste, earth-based, e-waste and miscellaneous materials.

Table 2: Overall and regional residual waste composition profile for major material category

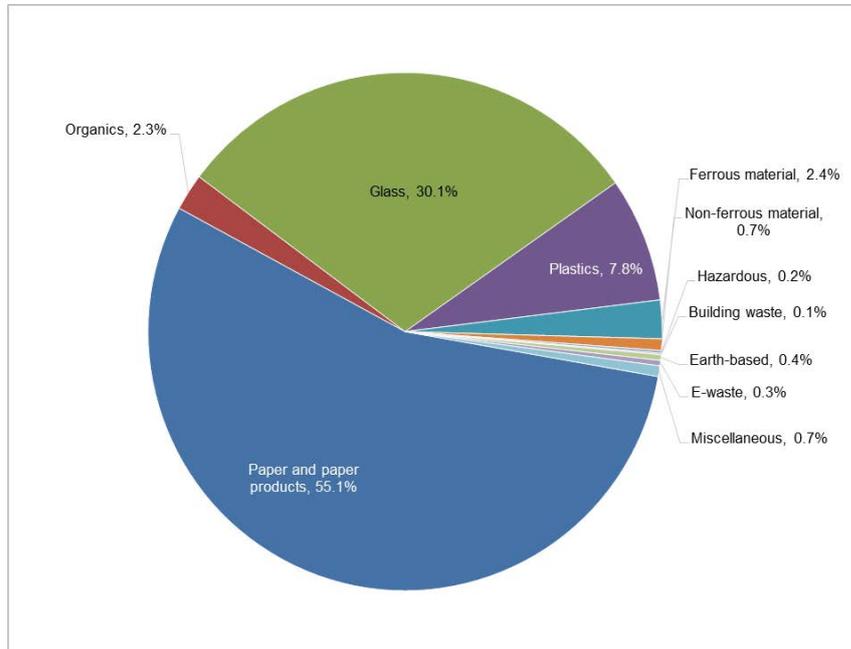
| Material category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------------------|----------------|----------------|----------------|-------|-------|
| | | | SMA | ERA | RRA |
| Total paper and paper products | 19.7% | 19.6% | 21.2% | 16.3% | 17.5% |
| Total organics | 56.0% | 53.8% | 53.2% | 56.0% | 53.4% |
| Total glass | 4.1% | 3.7% | 3.3% | 4.3% | 4.5% |
| Total plastics | 10.0% | 10.5% | 10.4% | 10.3% | 11.0% |
| Total ferrous material | 2.4% | 2.2% | 2.1% | 2.3% | 2.5% |
| Total non-ferrous material | 0.6% | 0.6% | 0.6% | 0.7% | 0.9% |
| Total other * | 7.3% | 9.6% | 9.3% | 10.3% | 10.4% |

* Total other constitutes total of hazardous, building waste, earth based, e-waste and miscellaneous materials.

Dry recycling

Recyclable paper and paper products made up the largest component in the dry recycling stream at 55.1% followed by glass and plastic at 30.1% and 7.8% respectively. The other material categories constituted the remaining 7% with total organics and ferrous materials contributing 2.3% and 2.4% respectively (Figure 3).

Figure 3: Dry recycling composition profile



Apart from a drop in the total paper (from 60.6% in 2007 to 55.1% in 2011) collected, the proportion of all the other contributing materials in the dry recycling stream increased in 2011 compared to the 2007 audits, as shown in Table 3.

Table 3: Overall and regional dry recycling composition profile for major material category

| Material category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------------------|----------------|----------------|----------------|-------|-------|
| | | | SMA | ERA | RRA |
| Total paper and paper products | 60.6% | 55.1% | 57.1% | 50.7% | 50.1% |
| Total organics | 2.2% | 2.3% | 2.5% | 1.9% | 1.6% |
| Total glass | 26.8% | 30.1% | 28.5% | 34.5% | 34.2% |
| Total plastics | 6.8% | 7.8% | 7.7% | 7.8% | 9.2% |
| Total ferrous material | 2.0% | 2.4% | 2.3% | 2.6% | 3.3% |
| Total non-ferrous material | 0.6% | 0.7% | 0.6% | 1.0% | 0.9% |
| Total other* | 1.1% | 1.6% | 1.7% | 1.5% | 0.8% |

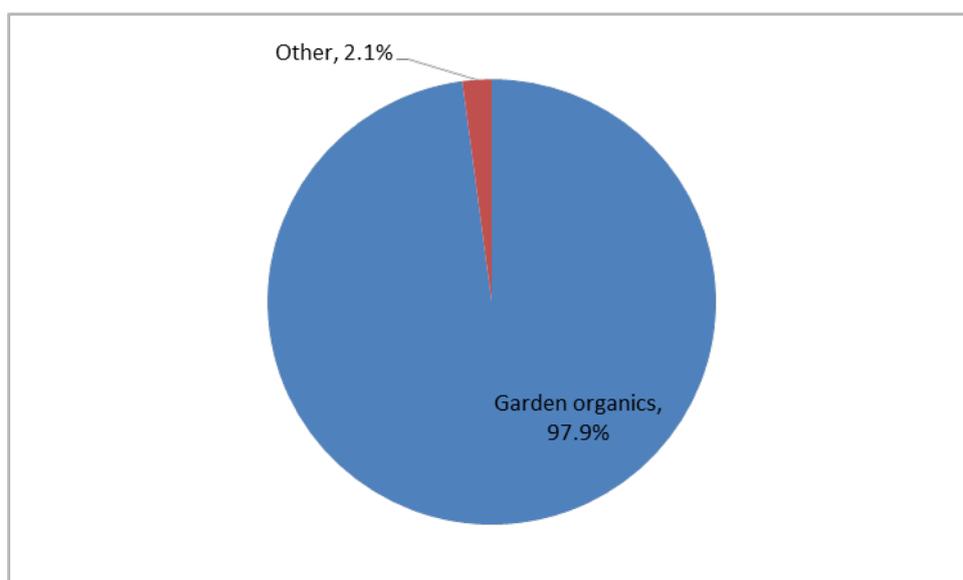
* Total other constitutes total of hazardous, building waste, earth based, e-waste and miscellaneous materials.

Organics

Garden organics

Of the audits undertaken, 18 councils included audits of households where bins were provided for garden organics only (16 in the SMA and 2 in the ERA). There were no audits from the RRA. The proportion of constituent materials in these audits is presented in Figure 4. The garden and vegetation component made up 97.9% of the composition. The remaining 2.1% was either potentially recyclables organics, like food waste (1%) or non recyclable materials. In these bins, other organic material (including food) and non recyclables were considered contamination.

Figure 4: Garden organics composition profile



The proportion of garden organics in the overall composition profile increased to 97.9% in the 2011 audits compared to the 2007 audits (96.7%) as shown in Table 4. The proportion of other organic materials including food waste, dropped from 2.2% in

2007 to 1.0% in 2011. The composition of other contributing recyclable and non-recyclable material category remained almost similar in both the audits.

Table 4: Overall and regional garden organics composition profile for major material category

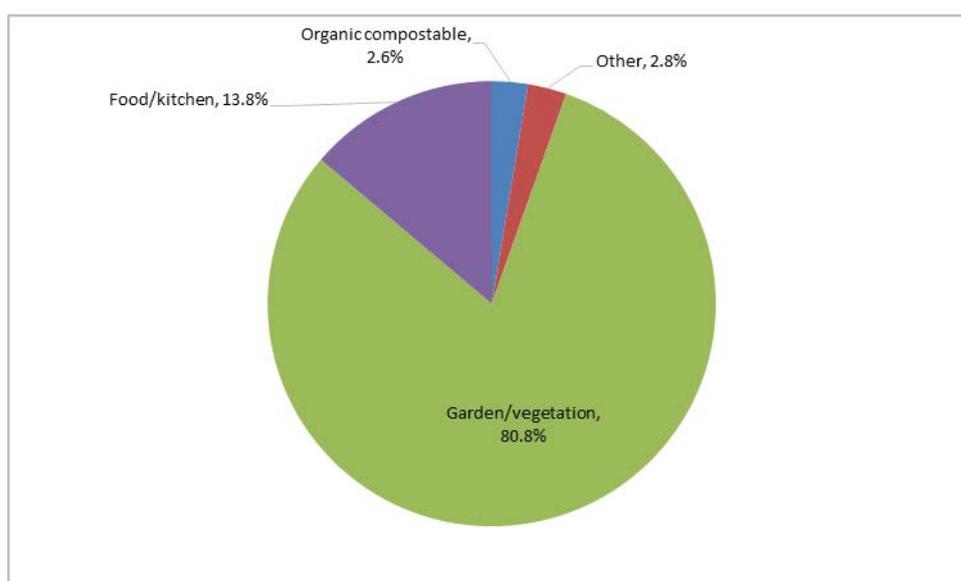
| Material category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------------------|----------------|----------------|----------------|-------|-----|
| | | | SMA | ERA | RRA |
| Garden organics | 96.7% | 97.9% | 97.8% | 98.8% | - |
| Other organics | 2.2% | 1.0% | 0.9% | 1.1% | - |
| Total paper and paper products | 0.1% | 0.1% | 0.1% | 0.0% | - |
| Total glass | 0.0% | 0.0% | 0.0% | 0.0% | - |
| Total plastics | 0.1% | 0.1% | 0.1% | 0.1% | - |
| Total ferrous | 0.0% | 0.0% | 0.0% | 0.0% | - |
| Total non-ferrous | 0.0% | 0.0% | 0.0% | 0.0% | - |
| Total other * | 0.7% | 0.8% | 0.9% | 0.1% | - |

*Total other includes total of hazardous, building, earth based, e-waste and miscellaneous waste.

Co-collection (food and garden organics)

Two councils in the SMA region and one from the RRA region conducted a waste audit on co-collection service provided by their council. No council in the ERA provided data on co-collection. The composition profile of co-collection services constituted mainly of garden/vegetation at 80.8% followed by food organics at 13.8%. The remaining proportion constituted other recyclable organic materials at 2.6% and other materials considered as contaminants at 2.8%. The contamination mainly consisted of paper products at 1.8% of the composition.

Figure 5: Co-collection (food and garden organics) composition profile



The proportion of garden/vegetation and compostable organics in co-collection composition was higher in RRA at 84.1% and 4.3% respectively compared to the overall and SMA region. The SMA had the highest proportion of food/kitchen waste at 18.5% as shown in Table 5.

Table 5: Overall and regional co-collection composition profile for major material category

| Material category | Overall (2007)* | Overall (2011) | Regions (2011) | | |
|--------------------------------|-----------------|----------------|----------------|------|-------|
| | | | SMA | ERA* | RRA |
| Garden / Vegetation Organics | - | 80.8% | 77.5% | - | 84.1% |
| Organics (Food / Kitchen) | - | 13.8% | 18.5% | - | 9.1% |
| Organic compostable | - | 2.6% | 0.9% | - | 4.3% |
| Total Paper and Paper Products | - | 1.8% | 1.6% | - | 2.0% |
| Total Glass | - | 0.1% | 0.2% | - | 0.1% |
| Total Plastics | - | 0.1% | 0.1% | - | 0.1% |
| Total Ferrous | - | 0.1% | 0.1% | - | 0.1% |
| Total Non-Ferrous | - | 0.0% | 0.0% | - | 0.0% |
| Total Other ** | - | 0.7% | 1.0% | - | 0.3% |

*No co-collection service audit was carried out in 2007

**Total other includes total of hazardous, building, earth based, e-waste and miscellaneous waste.

Potential recyclables profile

While there may be other materials considered as recyclable, only those materials considered recyclable in the dry recycling stream have been used to calculate the potentially recyclable percentage in the residual waste stream (see Appendix 5 for the nominated list of recyclable materials).

The proportion of potentially recyclable material present in the residual waste stream is calculated as:

$$\% \text{ potential recyclable} = \frac{\text{Weight of recyclable material in residual waste bin content} \times 100}{\text{Total weight of residual waste bin content}}$$

Recyclables in residual waste

Figure 6 illustrates the proportion of potentially recyclable material that was present in the residual waste stream. These were categorised as recyclable paper, plastic, glass, ferrous and non-ferrous material. The residual waste stream constituted 22.1% of potential dry recyclable materials consisting mainly of recyclable paper and plastic at 8.2% and 8.4% respectively. The other recyclables made up the remaining 5.5% of potential recyclables materials with recyclable glass contributing the most at 3.2%, as shown in Figure 6.

Figure 6: Potential dry recyclable materials in residual waste stream

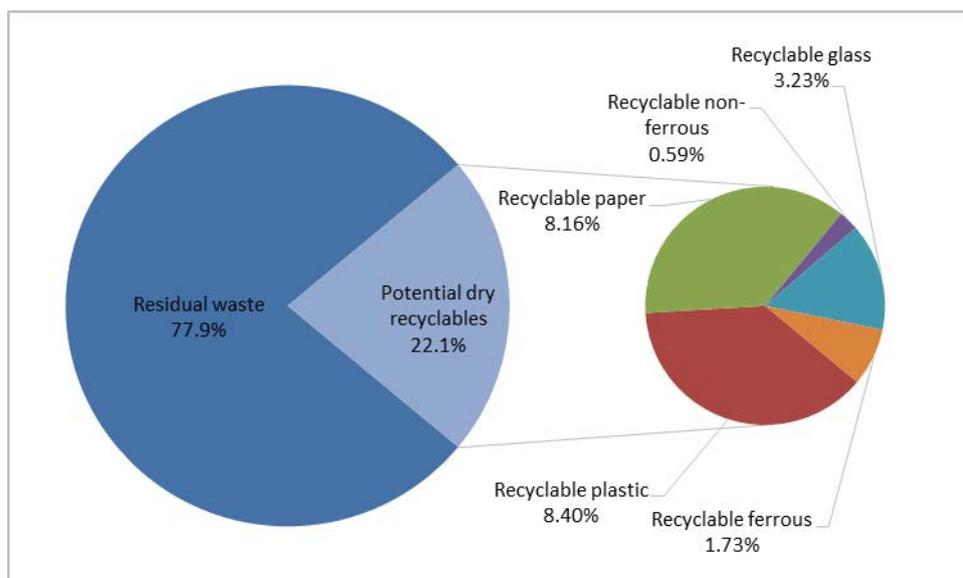


Table 6 shows that the proportion of potentially recyclable materials in the residual waste stream dropped by almost one percent in 2011 compared to the 2007 audits. The proportion of potential dry recyclables in both the ERA and RRA regions were higher than the overall figure at 22.4% and 24.0% respectively.

Table 6: Overall and regional potential dry recyclables materials in residual waste stream

| Category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|---------------------------|----------------|----------------|----------------|-------|-------|
| | | | SMA | ERA | RRA |
| Potential dry recyclables | 23.0% | 22.1% | 21.6% | 22.4% | 24.0% |
| Residual waste | 77.0% | 77.9% | 78.4% | 77.6% | 76.0% |

Garden and food organics in residual waste stream

With the addition of food and garden organic materials, the residual waste stream contained a combined total of 67.1% of potential dry recycling and organic materials. The proportion of potential food organics was the largest component at 35.3%, followed by dry recyclables at 22.1% and garden/vegetation at 9.7% (Figure 7).

Figure 7: Potential garden and food organics in residual waste stream

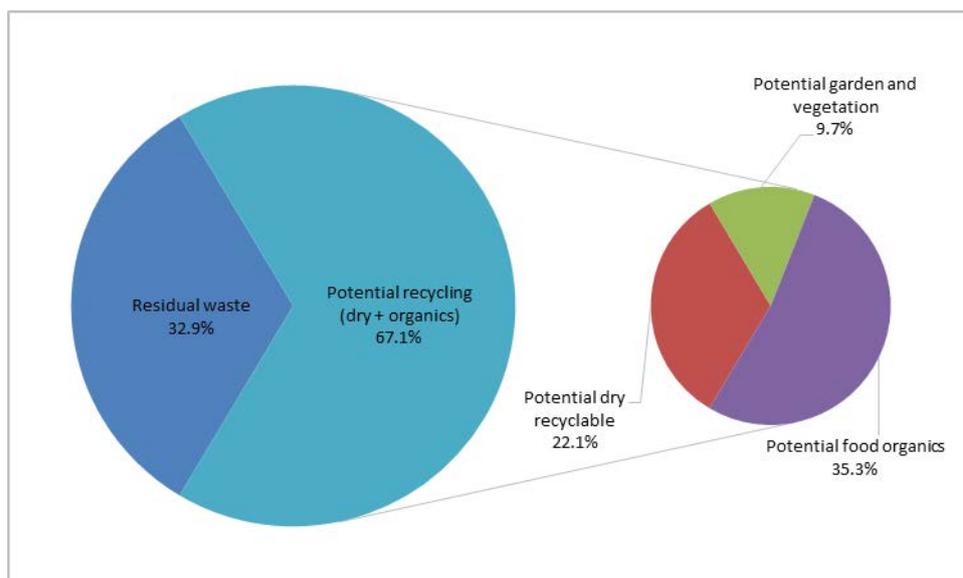


Table 7 shows that the proportion of potentially recyclable food organics in the residual waste stream dropped to 35.3% in 2011 from 40.3% in the 2007 audits. Similarly, the potentially recyclable garden and vegetation proportion dropped from 11.0% in 2007 to 9.7% in 2011. However, in 2011, councils within the ERA and RRA regions generated, on average, 29.1% and 30.2% respectively of potentially recyclable food organics, which was less than the overall average for 2011.

Table 7: Overall and regional potential garden and food organic materials proportion in residual waste stream

| Category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|---------------------------------|----------------|----------------|----------------|-------|-------|
| | | | SMA | ERA | RRA |
| Potential dry recyclables | 23.0% | 22.1% | 21.6% | 22.4% | 24.0% |
| Potential garden and vegetation | 11.0% | 9.7% | 6.8% | 17.2% | 11.9% |
| Potential food organics | 40.3% | 35.3% | 38.5% | 29.1% | 30.2% |
| Residual waste | 25.7% | 32.9% | 33.2% | 31.2% | 34.0% |

Contamination rate

Similar to the calculation of potential recyclables, contamination rates are determined by the amount of any non-recyclable materials present in the dry recycling or garden organics as a proportion of the total bin weight in those streams.

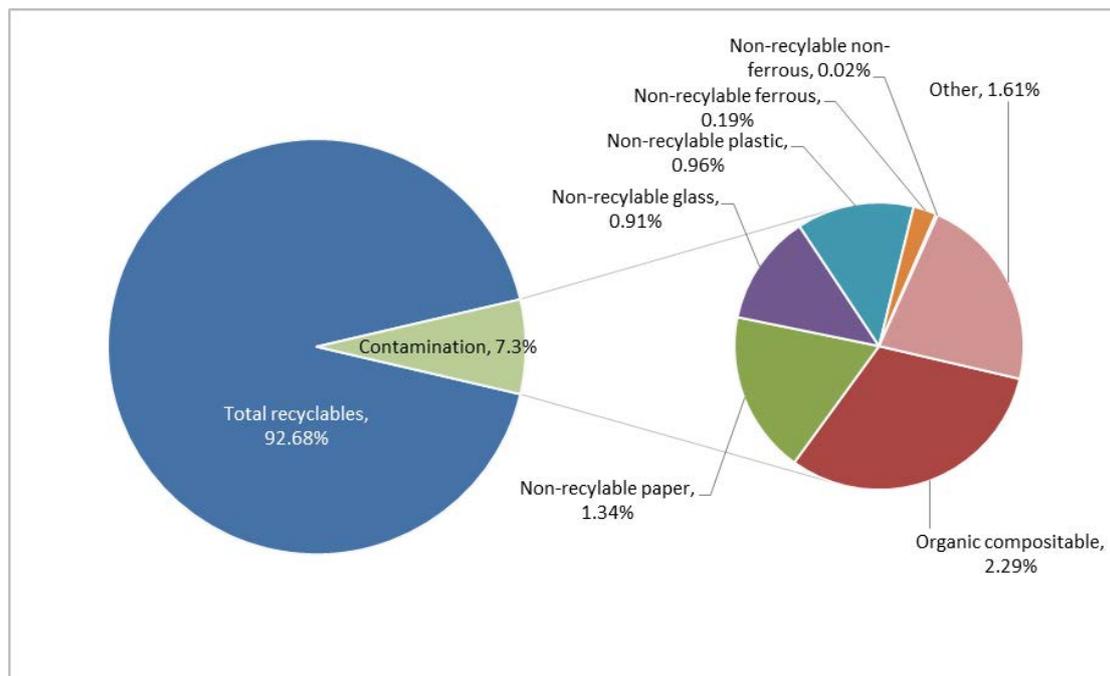
The contamination rates in dry recycling and garden organics waste stream is calculated as:

$$\% \text{ contamination} = \frac{\text{Total weight of non-recyclable material in bins} \times 100}{\text{Total weight of bin contents}}$$

Dry recycling

As shown in Figure 8, contamination in the dry recycling stream was 7.3% of the overall bin content. Organic compostable materials constituted most of the contamination in dry recycling stream at 2.3% followed by a collective total for hazardous, building, earth-based, e-wastes and other specified miscellaneous wastes at 1.6%. The remaining 3.4% constituted other non-complaint materials, including non-recyclable paper, glass and plastic.

Figure 8: Contamination in the dry recycling stream



As shown in Table 8, the contamination rate increased to 7.3% in 2011 from 5.4% in the 2007 audits. Notable differences were the rise in non-recyclable plastic and glass in the dry recycling waste stream. At 8.0%, contamination was highest in the SMA but this was offset by lower than average contamination in the ERA and RRA.

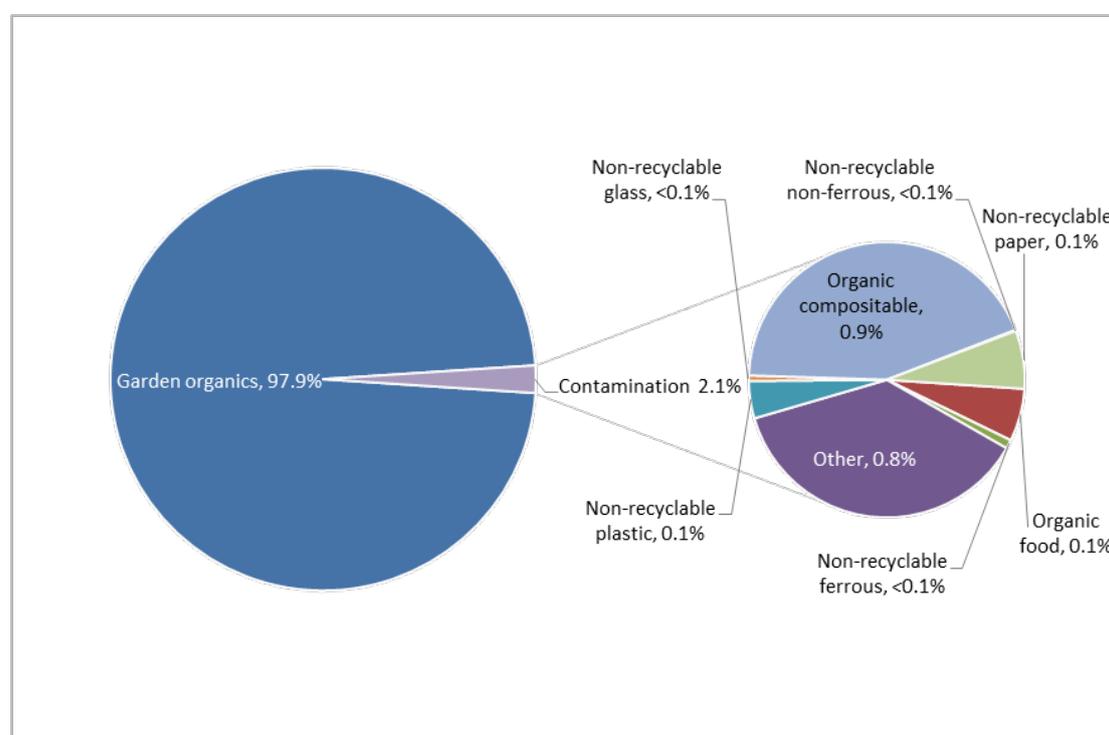
Table 8: Overall and regional contamination rate in dry recycling stream

| Category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------|----------------|----------------|----------------|------|------|
| | | | SMA | ERA | RRA |
| Contamination rate | 5.4% | 7.3% | 8.0% | 6.1% | 4.2% |

Garden organics

The contamination rate for the garden organics waste stream was 2.1% (Figure 9). Organic matter, mainly food and other compostable comprised almost half of the contamination at 1% in total. The remaining 1.1% was of other non-complaint materials.

Figure 9: Contamination in garden organics stream



Compared to the 2007 audits, the garden organics waste stream contamination rate dropped from 3.3% to 2.1% in 2011. The contamination rate for the SMA is close to the overall figure at 2.2% in 2011, however, the ERA region had a lower contamination rate at 1.2% (Table 9).

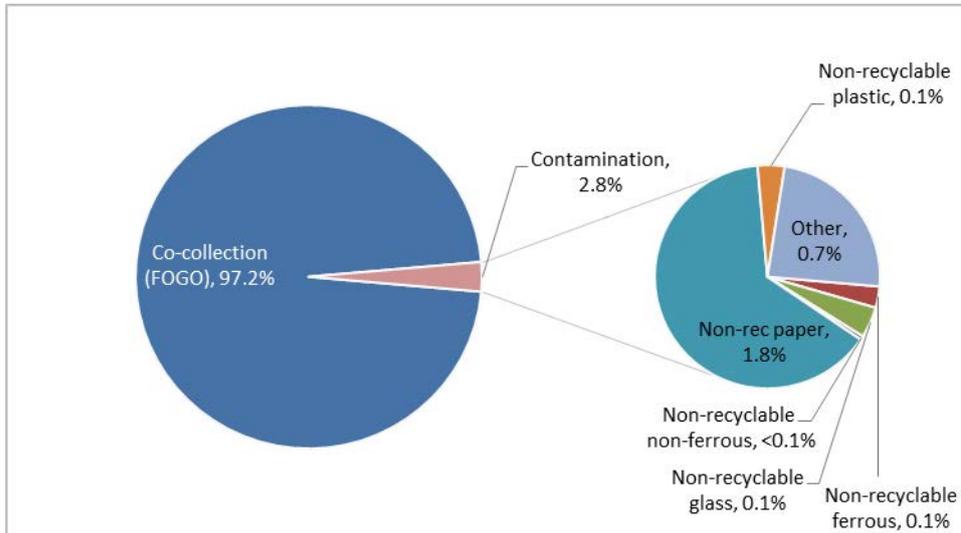
Table 9: Overall and regional contamination rate in garden organics stream

| Category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------|----------------|----------------|----------------|------|-----|
| | | | SMA | ERA | RRA |
| Contamination rate | 3.3% | 2.1% | 2.2% | 1.2% | - |

Co-collection (food and garden organics)

The contamination rate for the co-collection (food and garden organics) stream was 2.8% as illustrated in Figure 10. Non recyclable paper constituted a major part of the contamination at 1.8% and the remaining one percent was other non complaint materials also commonly found in dry recycling waste streams.

Figure 10: Contamination in co-collection (food and garden organics) stream



The contamination rate in the co-collection waste stream in the SMA was higher than the overall figure at 3.0%, but was offset by a lower 2.5% contamination rate in the RRA (Table 10).

Table 10: Overall and regional contamination rate in co-collection (food and garden organics) stream

| Category | Overall (2007) | Overall (2011) | Regions (2011) | | |
|--------------------|----------------|----------------|----------------|-----|------|
| | | | SMA | ERA | RRA |
| Contamination rate | NA | 2.8% | 3.0% | NA | 2.5% |

Appendix 1: Statistical approaches, calculations and data limitations

Statistical approach

Using statistical methodologies determined from previous waste audit data analyses (OEH2011) optimal sample sizes for kerbside residual waste, dry recycling and garden organics streams (representative of a specified geographical area being audited) were calculated for individual councils. Calculations were based on the coefficient of variation (CV) values for total weights of bin contents. The basis for this determination has been previously reported (OEH 2011) and relies upon the average of all weighed samples and the standard deviation within the sample. All statistical analyses assumed, as for previous studies, a confidence interval level of 90% with 10% uncertainty in the result.

The sample size (n) in terms of the number of households to be audited within an LGA was calculated using the formula:

$$n = \left(\frac{1.645 \times x}{10} \right)^2$$

where,

- 1.645 is the two-tailed z-score (z0.05) corresponding to the desired 90% confidence level in the sample size
- 10 is the desired % uncertainty (U) in the audit data
- CV is the coefficient of variation (expressed as a percentage in this equation) and is defined as the ratio of the standard deviation to the mean

Minimum sample sizes were made available to all councils where data was available from previous audits. In the absence of previous audit data, minimum sample sizes were based on the original minimum sample size recommended in the Guidelines, i.e. 220 (DECC 2008).

In addition to using this statistical methodology, the aggregation of data from multiple audits allowed the EPA to determine for which materials in the overall, and regional, sample sizes were sufficient to accurately calculate, within a 90% confidence interval, the true proportion of those materials within the waste stream.

For a major component, the number of samples contributing to the dataset was sufficient to accurately determine the mean composition of the majority of those components⁵. In addition, samples contributing to the overall bin weight and the weight of potential dry recycling in the residual waste stream were shown to be sufficient to provide an accurate mean value for those categories.

The results are summarised in Table A1.1.

⁵ Except for total building waste in residual waste stream, and for dry recycling stream, total hazardous, building waste, earth based, and miscellaneous components did not have sufficient sample sizes.

Table A1.1: Minimum sample size (number of audited households) for waste streams based on major material component, total weight, potential recycling and contamination rate (%)

| Category | Waste streams | | | | | | | |
|---|----------------|--------------|--------------|--------------|---------------|--------------|--------------|------------|
| | Residual waste | | | | Dry recycling | | | |
| | Overall | SMA | ERA | RRA | Overall | SMA | ERA | RRA |
| Total Paper and Paper Products | 373 | 319 | 458 | 547 | 690 | 575 | 178 | 205 |
| Total organics | 246 | 232 | 267 | 276 | 9,781 | 11,442 | 5,894 | 11,192 |
| Total glass | 1,471 | 1,025 | 1,757 | 1,954 | 745 | 662 | 511 | 464 |
| Total plastics | 192 | 166 | 196 | 286 | 508 | 441 | 298 | 228 |
| Total ferrous | 1,710 | 1,579 | 1,885 | 1,877 | 951 | 830 | 1,517 | 564 |
| Total non-ferrous | 1,370 | 996 | 2,126 | 1,286 | 3,536 | 3,723 | 1,191 | 1,709 |
| Total hazardous | 8,583 | 8,345 | 12,213 | 5,770 | 67,505 | 51,197 | 25,016 | 35,142 |
| Total building waste | 23,037 | 21,234 | 30,649 | 22,305 | 73,779 | 57,925 | 219,723 | 33,701 |
| Total earth based | 8,927 | 9,325 | 9,322 | 7,223 | 20,672 | 17,192 | 26,276 | 9,500 |
| Total e-waste | 7,888 | 6,328 | 7,388 | 11,121 | 9,815 | 8,078 | 16,893 | 17,015 |
| Total miscellaneous | 2,170 | 1,876 | 2,363 | 3,657 | 33,155 | 27,119 | 70,208 | 40,814 |
| Total | 153 | 149 | 153 | 170 | 590 | 504 | 152 | 114 |
| Potential recyclables in residual waste | 213 | 180 | 265 | 261 | | | | |
| Contamination rate in dry recycling | | | | | 2,602 | 2,102 | 2,054 | 3,235 |
| Actual sample size | 13,782 | 8,806 | 2,798 | 2,178 | 12,230 | 8,806 | 2,794 | 630 |

Note: The shaded areas indicate insufficient sample size for respective waste stream and material category.

Calculations

All statistical analyses were conducted on waste audit raw data sourced from 66 Local Government Areas (LGA) in the SMA, ERA and the RRA regions across NSW. Residual waste audits were carried out by all the 66 councils, 54 councils conducted residual waste and dry recycling audits and 23 councils conducted residual waste, dry recycling and garden organics (also includes co-collection service) audits.

The sample numbers (number of households) for each waste stream and regional breakdown used for the above calculations is provided in Table A1.2.

Table A1.2: Number of households audited for each waste stream

| Waste stream | Number of households audited | | | |
|------------------------------------|------------------------------|-------|-------|-------|
| | Overall | SMA | ERA | RRA |
| Residual waste | 13,783 | 8,806 | 2,798 | 2,179 |
| Dry recycling | 12,230 | 8,806 | 2,794 | 630 |
| Garden organics | 2,642 | 2,285 | 357 | - |
| Co-collection (food and garden) | 603 | 347 | - | 256 |

The nominated list of materials and aggregated category (see Appendix 3) were used in all calculations of averages and percentage figures.

It was assumed that total material weights recorded by the auditors were in kilograms per week for weekly collections (all residual waste audits), and in the cases where collections were on a fortnightly basis (some recycling and all garden organics) the weights were recorded as kilograms per fortnight. The total bin content weights for all waste streams were then normalised to weekly collection ahead of any analysis and further calculations.

Data limitations

For the purposes of this report no analysis has been carried out to distinguish between single unit dwelling (SUD) and multi unit dwelling (MUD) households. If the prescribed methodology was followed, data from MUD households was treated as being representative of the entire number of household within the MUD complex and each household was treated as one sample in the overall sample count, for example, if a unit block of 4 units was encountered and waste was collected for all units then the overall total weight was considered as emanating from 4 households and the MUD considered to contribute 4 samples (of equal value) to the overall sample count.

Household generation rates, expressed in kg/hh/wk, for each waste stream were calculated on the total samples available for that waste stream, whether or not they were paired with corresponding bins from that household. Generation rates for each waste stream are therefore representative of the entire sample and the addition of the individual values for each stream should not be assumed to represent the total for households where all bins were collected.

Similarly, for waste streams, composition data was determined on the total samples for individual waste streams and are representative of the entire sample for a particular region.

Appendix 2: Audit methodology

Waste audits were carried out in accordance with the EPA procedures outlined in the *Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas, 2008* (DECC 2008) and its addendum (DECCW 2010)

The audits were weight based physical audits and aimed to provide councils with cost-effective, accurate and repeatable audit methodology.

The guideline stipulated a minimum 220 sample size where previous results were not available. This was preferred for combined domestic residual waste and recycling (and/or garden organics) audit. The recommended sample size provided acceptable levels of accuracy for common material categories including food / garden organics, paper, plastics, metals, and glass.

The guideline also recommended household-by-household (also referred to as bin-by-bin) sampling technique was preferred, which involved collection of the contents of all residual waste and/or dry recycling and/or organics presented by households. The household bin contents were bagged and labelled to gather data for differences in household generation and management of waste. The preferred sampling technique provides better quality and accurate data for assessments and also enables exclusion of outliers biasing the sample. It also allows observation about different types of waste generation and resource recovery behaviours across the community.

Simple random sampling was used to select households to be audited. Both single unit dwellings (SUD) and multi unit dwellings (MUD) households were sampled for the audit.

Appendix 3: Nominated materials, codes and categories of the domestic kerbside waste stream

| Code | Material description | Category |
|------|---|--------------------------------|
| A01 | Newspaper | Total Paper and paper products |
| A02 | Magazines/ brochures | |
| A03 | Misc. Packaging | |
| A04 | Corrugated cardboard | |
| A05 | Cardboard / package board | |
| A06 | Liquid paperboard containers | |
| A07 | Disposable paper product | |
| A08 | Print/ writing/ office paper | |
| A09 | Composite (mainly paper) | |
| A90 | Nappies disposable | |
| A092 | Contaminated soiled paper | |
| B01 | Food/ kitchen | Total Organics |
| B02 | Garden/ vegetation | |
| B03 | Other putrescible | |
| C01 | Wood/ timber | |
| C02 | Textile/ rags | |
| C03 | Leather | |
| C04 | Rubber | |
| C05 | Oils | |
| D012 | Glass beverage containers | Total Glass |
| D012 | Glass non beverage containers / other packaging glass | |
| D02 | Miscellaneous/ other glass | |
| D050 | Mixed glass / fines | |

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| Code | Material description | Category |
|------|---|----------------|
| E01 | PET beverage containers | Total Plastics |
| | PET packaging (excluding beverage containers) | |
| | PET other non beverage / non packaging | |
| E02 | HDPE beverage containers | |
| | HDPE packaging (excluding beverage containers) | |
| | HDPE other non beverage / non packaging | |
| E03 | PVC beverage containers | |
| | PVC packaging (excluding beverage containers) | |
| | PVC other non beverage / non packaging | |
| E04 | LDPE packaging | |
| | LDPE non-packaging | |
| E05 | PP packaging | |
| | PP non-packaging | |
| E06 | PS packaging * | |
| | PS & EPS non-packaging | |
| | EPS packaging * | |
| E07 | Other plastics | |
| E08 | Composite (mostly plastic) | |
| | Plastic bags * | |
| | Plastic film * | |
| F01 | Steel beverage containers | Total Ferrous |
| | Steel packaging (excluding beverage containers) | |
| F02 | Steel other non-packaging | |
| F03 | Composite (mostly ferrous) | |

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| Code | Material description | Category |
|------|---|---------------------|
| G01 | Aluminium beverage containers | Total Non-ferrous |
| | Aluminium packaging (excluding beverage containers) | |
| | Aluminium non-packaging | |
| G02 | Other non-packaging non-ferrous | |
| G03 | Composite (mostly non-ferrous) | |
| H01 | Paint | Total Hazardous |
| H02 | Fluorescent tubes * | |
| H03 | Dry cell and car batteries (non-rechargeable)* | |
| H03 | Dry cell and car batteries (rechargeable) * | |
| H04 | Vehicle batteries * | |
| H05 | Household chemicals | |
| H061 | Asbestos | |
| H07 | Clinical pathogenic infectious | |
| H08 | Gas bottles * | |
| H00 | Hazardous other | |
| I50 | Building materials and fittings (NEC)** | |
| I0 | Ceramics dust dirt rock inert ash | Total Earth-based |
| | Computer equipment * | Total E-waste |
| | TVs * | |
| | Mobile phones * | |
| | Electrical items and peripherals* | |
| Y571 | Toner cartridges * | Total Miscellaneous |
| | Containerised food & liquid * | |
| XX00 | Other (specify) | |

* Plastic shopping bags

** Not elsewhere considered

Appendix 4: List of councils

| Residual waste audit | | | | Residual waste and dry recycling | | | | Residual waste, dry recycling and organics | | | |
|----------------------|------|--------|-----------------------------------|----------------------------------|------|--------|-----------------------------------|--|------|--------|-------------------------------|
| S.N | ABS | Region | Council | S.N | ABS | Region | Council | S.N | ABS | Region | Council |
| 1 | 150 | S | Ashfield Municipality | 1 | 150 | S | Ashfield Municipality | 1 | 150 | S | Ashfield Municipality |
| 2 | 200 | S | Auburn Council | 2 | 200 | S | Auburn Council | 2 | 350 | S | Bankstown City Council |
| 3 | 350 | S | Bankstown City Council | 3 | 350 | S | Bankstown City Council | 3 | 500 | S | Hills Shire Council |
| 4 | 500 | S | Hills Shire Council | 4 | 500 | S | Hills Shire Council | 4 | 1300 | S | Burwood Council |
| 5 | 750 | S | Blacktown City Council | 5 | 750 | S | Blacktown City Council | 5 | 1550 | S | Canterbury Council |
| 6 | 1100 | S | Botany Bay City Council | 7 | 1100 | S | Botany Bay City Council | 6 | 4150 | S | Hurstville City Council |
| 7 | 1300 | S | Burwood Council | 8 | 1300 | S | Burwood Council | 7 | 4450 | S | Kogarah Municipal Council |
| 8 | 1450 | S | Camden Council | 9 | 1450 | S | Camden Council | 8 | 4700 | S | Lane Cove Municipal Council |
| 9 | 1500 | S | Campbelltown City Council | 10 | 1500 | S | Campbelltown City Council | 9 | 4800 | S | Leichhardt Municipal Council |
| 10 | 1520 | S | Canada Bay Council | 11 | 1520 | S | Canada Bay Council | 11 | 4900 | S | Liverpool City Council |
| 11 | 1550 | S | Canterbury Council | 12 | 1550 | S | Canterbury Council | 12 | 5150 | S | Manly Council |
| 12 | 2850 | S | Fairfield City Council | 14 | 2850 | S | Fairfield City Council | 13 | 5200 | S | Marrickville Council |
| 13 | 3950 | S | Holroyd City Council | 17 | 3950 | S | Holroyd City Council | 14 | 5350 | S | Mosman Municipal Council |
| 14 | 4000 | S | Hornsby Shire Council | 18 | 4000 | S | Hornsby Shire Council | 15 | 6350 | S | Penrith City Council * |
| 15 | 4100 | S | Hunters Hill Municipality Council | 19 | 4100 | S | Hunters Hill Municipality Council | 16 | 6370 | S | Pittwater Council |
| 16 | 4150 | S | Hurstville City Council | 20 | 4150 | S | Hurstville City Council | 17 | 6550 | S | Randwick City Council |
| 17 | 4450 | S | Kogarah Municipal Council | 22 | 4450 | S | Kogarah Municipal Council | 19 | 7150 | S | Sutherland Shire Council |
| 18 | 4500 | S | Ku-ring-gai Council | 23 | 4500 | S | Ku-ring-gai Council | 20 | 8000 | S | Warringah Council |
| 19 | 4700 | S | Lane Cove Municipal Council | 25 | 4700 | S | Lane Cove Municipal Council | 21 | 8050 | S | Waverley Council |
| 20 | 4800 | S | Leichhardt Municipal Council | 26 | 4800 | S | Leichhardt Municipal Council | 22 | 8250 | S | Willoughby City Council |
| 21 | 4900 | S | Liverpool City Council | 28 | 4900 | S | Liverpool City Council | 24 | 8500 | S | Woollahra Municipal Council * |
| 22 | 5150 | S | Manly Council | 30 | 5150 | S | Manly Council | 10 | 4850 | R | Lismore City Council * |
| 23 | 5200 | S | Marrickville Council | 31 | 5200 | S | Marrickville Council | 18 | 6900 | E | Shellharbour City Council |
| 24 | 5350 | S | Mosman Municipal Council | 32 | 5350 | S | Mosman Municipal Council | 23 | 8450 | E | Wollongong City Council |
| 25 | 5950 | S | North Sydney Council | 34 | 5950 | S | North Sydney Council | | | | |
| 26 | 6250 | S | Parramatta City Council | 35 | 6250 | S | Parramatta City Council | | | | |
| 27 | 6350 | S | Penrith City Council | 36 | 6350 | S | Penrith City Council | | | | |
| 28 | 6370 | S | Pittwater Council | 37 | 6370 | S | Pittwater Council | | | | |

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| Residual waste audit | | | | Residual waste and dry recycling | | | |
|----------------------|-------|--------|---------------------------------|----------------------------------|------|--------|-------------------------------|
| S.N | ABS | Region | Council | S.N | ABS | Region | Council |
| 29 | 6550 | S | Randwick City Council | 39 | 6550 | S | Randwick City Council |
| 30 | 6650 | S | Rockdale City Council | 40 | 6650 | S | Rockdale City Council |
| 31 | 6700 | S | Ryde City Council | 41 | 6700 | S | Ryde City Council |
| 32 | 7100 | S | Strathfield Municipal Council | 44 | 7100 | S | Strathfield Municipal Council |
| 33 | 7150 | S | Sutherland Shire Council | 45 | 7150 | S | Sutherland Shire Council |
| 34 | 7210 | S | Sydney City Council | 46 | 7210 | S | Sydney City Council |
| 35 | 8000 | S | Warringah Council | 47 | 8000 | S | Warringah Council |
| 36 | 8050 | S | Waverley Council | 48 | 8050 | S | Waverley Council |
| 37 | 8250 | S | Willoughby City Council | 49 | 8250 | S | Willoughby City Council |
| 38 | 8500 | S | Woollahra Municipal Council | 53 | 8500 | S | Woollahra Municipal Council |
| 39 | 900 | R | Blue Mountains City Council | 6 | 900 | R | Blue Mountains City Council |
| 40 | 2700 | R | Dungog Shire Council | 27 | 4850 | R | Lismore City Council |
| 41 | 4850 | R | Lismore City Council | 51 | 8400 | R | Wollondilly Shire Council |
| 42 | 5650 | R | Muswellbrook Shire Council | 13 | 1720 | E | Cessnock City Council |
| 43 | 7000 | R | Singleton Shire Council | 15 | 3100 | E | Gosford City Council |
| 44 | 7620 | R | Upper Hunter Shire Council | 16 | 3800 | E | Hawkesbury City Council |
| 45 | 8400 | R | Wollondilly Shire Council | 21 | 4400 | E | Kiama Municipality Council |
| 46 | C3751 | R | Port Macquarie-Hastings Council | 24 | 4650 | E | Lake Macquarie City Council |
| 47 | C4350 | R | Kempsey Shire Council | 29 | 5050 | E | Maitland City Council |
| 48 | N1800 | R | Coffs Harbour City Council | 33 | 5900 | E | Newcastle City Council |
| 49 | N5700 | R | Nambucca Shire Council | 38 | 6400 | E | Port Stephens Council |
| 50 | N600 | R | Bellingen Shire Council | 42 | 6900 | E | Shellharbour City Council |
| 51 | S3050 | R | Gloucester Shire Council | 43 | 6950 | E | Shoalhaven City Council |
| 52 | S3350 | R | Greater Taree City Council | 50 | 8350 | E | Wingecarribee Shire Council |
| 53 | S3400 | R | Great Lakes Council | 52 | 8450 | E | Wollongong City Council |
| 54 | 1720 | E | Cessnock City Council | 54 | 8550 | E | Wyong Shire Council |
| 55 | 3100 | E | Gosford City Council | | | | |
| 56 | 3800 | E | Hawkesbury City Council | | | | |
| 57 | 4400 | E | Kiama Municipality Council | | | | |
| 58 | 4650 | E | Lake Macquarie City Council | | | | |

| Residual waste audit | | | |
|-----------------------------|------------|---------------|-----------------------------|
| S.N | ABS | Region | Council |
| 59 | 5050 | E | Maitland City Council |
| 60 | 5900 | E | Newcastle City Council |
| 61 | 6400 | E | Port Stephens Council |
| 62 | 6900 | E | Shellharbour City Council |
| 63 | 6950 | E | Shoalhaven City Council |
| 64 | 8350 | E | Wingecarribee Shire Council |
| 65 | 8450 | E | Wollongong City Council |
| 66 | 8550 | E | Wyong Shire Council |

*Note: * Councils with co-collection service*

Appendix 5: Nominated potentially recyclable materials

| Code | Material description | Aggregated category |
|------|---|---------------------|
| A01 | Newspaper | Recyclable paper |
| A02 | Magazines/ brochures | |
| A03 | Misc. Packaging | |
| A04 | Corrugated cardboard | |
| A05 | Cardboard / package board | |
| A06 | Liquid paperboard containers | |
| A07 | Disposable paper product | |
| A08 | Print/ writing/ office paper | |
| D012 | Glass Beverage Containers | Recyclable glass |
| D012 | Glass Non Beverage Containers / Other Packaging Glass | |
| E01 | PET beverage containers | Recyclable plastic |
| | PET packaging (excluding beverage containers) | |
| | PET other non beverage / non packaging | |
| E02 | HDPE beverage containers | |
| | HDPE packaging (excluding beverage containers) | |
| | HDPE other non beverage / non packaging | |
| E03 | PVC beverage containers | |
| | PVC packaging (excluding beverage containers) | |
| | PVC other non beverage / non packaging | |
| E04 | LDPE packaging | |
| | LDPE non-packaging | |
| E05 | PP packaging | |
| | PP non-packaging | |

| Code | Material description | Aggregated category |
|------|---|------------------------|
| E06 | PS Packaging * | |
| | PS & EPS non-packaging | |
| | EPS packaging * | |
| | Plastic bags * | |
| | Plastic film * | |
| F01 | Steel beverage containers | Recyclable ferrous |
| | Steel packaging (excluding beverage containers) | |
| F02 | Steel other non-packaging | |
| F03 | Composite (mostly ferrous) | |
| G01 | Aluminium beverage containers | Recyclable non-ferrous |
| | Aluminium packaging (excluding beverage containers) | |
| | Aluminium non-packaging | |
| G02 | Other non-packaging non-ferrous | |

Materials that are not listed in the above table, but appear in the full list of materials provided in Appendix 3, are considered as contaminants in the dry recycling stream.

Apart from E02 – Garden/vegetation, all other materials listed in Appendix 3 are considered as contaminants in the garden organics stream.

Appendix 6: Material types and items within waste categories

| AWD Code | Material type | Material items |
|-------------------------------------|-----------------------------------|--|
| Paper | | |
| A01 | Newspaper | Newspapers, newspaper like pamphlets |
| A02 | Magazines, brochures | Magazines (glossy and non-glossy), pamphlets, |
| A03 | Miscellaneous packaging | Paper napkins, paper packaging (no plastic or wax coatings) |
| A04 | Corrugated cardboard | Cardboard with corrugation |
| A05 | Package board | Cardboard without corrugation (glossy and non glossy), cereal boxes, business cards |
| A06 | Liquid paper containers | Soy milk cartons, some fruit juice cartons, UHT / Long life milk, |
| A07 | Disposable paper product | Hand towels, tissues, coffee cups, paper food bags (unsoiled) |
| A08 | Print / Writing office paper | A4 document paper, writing pads, letters, envelopes, books |
| A09 | Composite (mostly paper) | Composite paper items where the weight of the paper is estimated to be greater the weight of the other materials |
| A90 | Nappies | Used disposable nappies |
| A092 | Contaminated soiled paper | Paper not suitable for dry recyclables, mixed and other paper |
| Organic (compostables) waste | | |
| B01 | Food / Kitchen | Vegetable scraps, meat scraps, animal food, left over food. |
| B02 | Garden / Vegetation | Grass clippings, tree trimmings / prunings, flowers, tree wood (<20ml) |
| B03 | Other putrescible | Animal excrement, mixed compostable items, cellophane |
| Other organic waste | | |
| C01 | Wood / Timber | Milled wood / timber, children's wooden toys, wooden skewers, garden tree (>20ml) |
| C02 | Textile / Rags / Carpet (Organic) | Wool, cotton and natural fibre materials |
| C03 | Leather | Leather clothing, craft leather, some shoes, belts with belt buckle |
| C04 | Rubber | Rubber bands, rubber toys, shoes, latex gloves |
| C05 | Oils | Used car oil, Motor and other, vegetable, cooking oil |
| Glass | | |
| D01 | Glass beverage containers | Beer bottles, wine bottles (clear, green and amber glass) |
| | Glass non beverage containers | Food and sauce jars |
| D02 | Miscellaneous / Other glass | Plate glass (window and windscreen), Pyrex, corning ware, light globes, laboratory and medical glass, white opaque glass (i.e. Malibu alcohol bottles) |
| D050 | Mixed glass / Fines | Mixed Glass or Glass fines, non recyclable |

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| AWD Code | Material type | Material items |
|------------------------------|---|---|
| Plastics | | |
| E01 | PET beverage containers | (Polyethylene) Soft drink bottles, juice bottles |
| | PET packaging (excluding beverage containers) | Some food containers (e.g. jam & sauce bottles), mouthwash containers, peanut butter jars, |
| | PET other non beverage or packaging | Pillows, laminated sheets, carpets |
| E02 | HDPE beverage containers | (High Density Polyethylene) Milk bottles. |
| | HDPE packaging (excluding beverage containers) | Cream bottles, shampoo and cleaner bottles |
| | HDPE other non beverage or packaging | Buckets, crates, ag pipes, household bags |
| E03 | PVC beverage containers | (Polyvinyl Chloride) Clear cordial and juice bottles, blister packs, plumbing pipes and fittings |
| | PVC PACKAGING (excluding beverage containers) | Blister packs, bold bags (unused) |
| | PVC other non beverage or packaging | Electrical conduits, pipes, hoses |
| E04 | LDPE packaging | (Low Density Polyethylene) Ice cream container lids, cream bottle lids, squeeze bottles, lids, , bread bags, |
| | LDPE non packaging | poly pipe, black mulch film, plant nursery bags, builders, black plastic |
| E05 | Polypropylene packaging | Ice cream containers, |
| E05 | Polypropylene non-packaging | drinking straws, pot plant pots, some bottle caps, microwave oven ware, plastic garden settings, potato crisp bags, compost bins, worm farms |
| E06 | Polystyrene (PS) and Expanded PS packaging | Yoghurt / sour cream containers, , hot drink cups, take away containers, meat trays, packaging foam |
| E06 | PS and Expanded PS non packaging | plastic cutlery imitation crystal glassware, clothes pegs, coat hangers, office accessories, video/CD boxes |
| E07 | Other plastics | Tupperware, Mixed unidentifiable plastics, low cost brittle toys, all other resins and multi-blend plastic materials, synthetic textiles all other containers |
| E08 | Plastic – Composite (mostly plastic) | Cigarette butts, composite plastic items where the weight of the plastic is estimated to be greater than the other material items. |
| Ferrous materials | | |
| F01 | Steel beverage containers | Steel cans for beverages, e.g. juice |
| F01 | Steel Packaging (excluding beverage containers) | Food cans, pet food cans, tins, Aerosol cans |
| F02 | Steel – other non packaging | Nails, Steel items |
| F03 | Ferrous – Composite (mostly ferrous) | Composite ferrous items where the weight is estimated to be greater than the other material items. |
| Non-ferrous materials | | |
| G01 | Aluminium beverage containers | Alcoholic mixers, beer and soft drinks |
| G03 | Aluminium packaging (excluding beverage containers) | Pet food cans, aerosol cans, industrial cans. |
| G02 | Aluminium non packaging | Foils which are not packaging, rigid aluminium items |
| | Other non ferrous non packaging | Copper, brass, bronze items (non ferrous or aluminium) |
| | Non ferrous – Composite | Composite non ferrous items where the weight is estimated to be greater than the other material items. |

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| AWD Code | Material type | Material items |
|----------------------------|--|---|
| Hazardous waste | | |
| H01 | Paint | Paint (dry or wet) |
| H02 | Fluorescent tubes * | Fluorescent tubes; compact fluorescent lamps (CFLs) |
| H03 | Dry cell batteries – Non rechargeable * | Common batteries, AAA, AA etc, single use |
| H04 | Dry cell batteries - Rechargeable * | Common batteries, AAA, AA etc, rechargeable |
| H05 | Vehicle batteries * | Car batteries |
| H06 | Household chemicals | Bleach, shampoo, cleaning products, (unused medical pills. |
| H07 | Asbestos | Asbestos |
| | Pathogenic Infectious | Band aids, bandages, used tissues (items with any bodily fluids), tampons/pads, |
| | Gas bottles * | Gas bottles |
| | Hazardous – Other | Any other hazardous material, candle wax, |
| Building waste | | |
| | Building materials and fittings | Bricks and other building materials |
| Earth based waste | | |
| I0 | Ceramics/ Dust / Dirt / Rock / Inert / Ash | Ceramics(Cups, bowls, pottery items) Dust/Dirt/Rock/Inert (Vacuum bag contents, soil, rocks, dirt, concrete, plasterboard) and Ash |
| E waste | | |
| Y57 | Computer equipment * | Keyboard, monitor, cables, printers etc |
| | TVs * | |
| | Mobile phones * | Mobile Phones |
| | Electrical items * | Toaster, radio, ipod, gameboys, stereos, speakers, TVs, VCR, DVD players, small electrical, Power tools |
| | Toner cartridges * | Printer and toner cartridges |
| Miscellaneous waste | | |
| XX00 | Other | Other please specify |

References

- DECC 2007, *NSW Waste Avoidance and Resource Recovery Strategy 2007*, Department of Environment and Climate Change, Sydney (available at www.epa.nsw.gov.au/warr/WARRStrategy2007.htm).
- DECC 2008, *Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas*, Department of Environment and Climate Change, Sydney (available at www.epa.nsw.gov.au/resources/warr/0846KerbsideAuditsJune.pdf)
- DECCW 2010, *Guidelines for Conducting Household Kerbside Residual Waste, Recycling and Garden Organics Audits in NSW Local Government Areas –2008: Addendum 2010*, Department of Environment, Climate Change and Water, Sydney (available at www.epa.nsw.gov.au/resources/warr/101053AddenKrbAud.pdf)
- OEH 2011, *Domestic Kerbside Waste and Recycling in NSW: Report on the results of waste audits of household kerbside collection systems 2007–2008*, Office of Environment and Heritage, Sydney (available at www.epa.nsw.gov.au/resources/warr/110310ReportonAudits.pdf)