WasteNot Consulting

Survey of Solid Waste in Kāpiti Coast District

Prepared for

Kāpiti Coast District Council

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1 Introduction

Territorial authorities have statutory responsibility for promoting effective and efficient waste management and waste reduction practices within their district. This responsibility is currently given to territorial authorities by the Waste Minimisation Act 2008 (WMA). Prior to the WMA, these duties were prescribed by the Local Government Act 2002 and the Local Government Amendment (No 4) Act 1996.

In 2011, the councils of the Wellington region created a joint Waste Management and Minimisation Plan 2011 – 2017. This plan has been adopted by Kāpiti Coast District Council, Porirua City Council, Wellington City Council, Hutt City Council, Upper Hutt City Council, South Wairarapa District Council, Carterton District Council, and Masterton District Council.

The overall vision of the Waste Management and Minimisation Plan (WMMP) is to "provide residents and ratepayers with highly effective, efficient and safe waste management and minimisation services in order to protect the environment from harm, and provide environmental, social, economic, and cultural benefits."

To monitor and report on progress towards the aims and objectives of the WMMP, the WMMP suggests that councils should undertake Solid Waste Analysis Protocol Audits (SWAP audits) to determine the composition of waste being disposed of to landfill.

The SWAP audit outlined in this report is the fourth audit of the composition of residual waste being disposed of from the district undertaken by Kāpiti Coast District Council (Council). The first was undertaken in 2003 by AgFirst Consultants Environmental, followed by a SWAP audit in 2007 by MWH New Zealand Ltd, and in 2010 by Waste Not Consulting.

In July 2013, Council engaged Waste Not Consulting to conduct two separate surveys: a sort-and-weigh audit of the composition of kerbside refuse and a visual survey of residual waste being disposed of at Kāpiti Coast District's (the District's) refuse transfer stations – the Otaihanga Resource Recovery Facility and the Ōtaki Transfer Station. The audit and visual survey took place in September 2013 and the results of the project are presented in this report.

The methodologies for the audit and survey, which are based on those recommended by the Ministry for the Environment's Solid Waste Analysis Protocol (SWAP), are presented in section 2. The survey methodology is identical to that used by Waste Not Consulting for the 2010 Kāpiti Coast District Council SWAP audits and the Ministry for the Environment's SWAP Baseline Data Programme in 2007/08.

The results of the project are presented in sections 3 and 4 and an estimate of the overall waste flow being disposed of to landfill from Kāpiti Coast District is presented in section 5. Section 6 includes further analysis of the results and compares several waste metrics in the District with those in other districts in New Zealand.

1.1 Waste management services in Kāpiti Coast District

1.1.1 Overview

There are currently no landfills that accept municipal solid waste in Kāpiti Coast District. Residual waste from the District is consolidated at either the Otaihanga Resource Recovery Facility or the Ōtaki Transfer Station and bulk-hauled to an out-of-district landfill, chosen by the contracted operator of each facility. At the time of writing, virtually all residual waste was being bulk-hauled to Hokio Landfill in Levin and Bonny Glenn landfill.

Kāpiti Coast District Council owns both the Otaihanga and Ōtaki facilities. The Otaihanga site is leased and operated by a commercial operator. The same arrangement will apply to the Ōtaki facility as of 1 December 2013. At that time, the Ōtaki Transfer Station will be renamed the Ōtaki Resource Recovery Facility. A drop-off facility in Waikanae for recyclables and greenwaste is also owned by Council and operated under an operational contract.

Shredded greenwaste from Otaihanga, Ōtaki, and Waikanae is bulk-hauled to the Composting New Zealand site at the Otaihanga landfill for composting. Currently, glass from Ōtaki and Waikanae is collected, transported (if required), and processed by Silaca Glass Crushers at Ōtaki Tansfer Station.

Kāpiti Coast District is, to a relatively high degree, a self-contained waste catchment. That is, a high proportion of the waste that is generated within the District is disposed of within the District (at Otaihanga and Ōtaki refuse disposal facilities) and only a small amount of the waste disposed of within the District is generated outside of the District. The (closed) landfill at Otaihanga accepts (restricted) clean fill and dried sewage sludge from the wastewater treatment plant.

A summary of waste flows and waste management services is presented in Appendix 1.

1.1.2 Waste services for the residential sector

At the time of the survey, Kāpiti Coast District Council was in the last month of phasing out its kerbside refuse bag collection service. This user-pays service had previously been offered to urban households and businesses in the District. However, Council stopped the wholesaling of Council rubbish bags as of 1 July 2013 and from 1 October 2013 Council no longer contracted for the collection of Council rubbish bags. From that time, all households needed to either use a private collection (bags or Mobile Garbage Bins (MGBs)) or transport their waste to a transfer station for disposal.

At the time of the SWAP audit, Council was in its final month of providing kerbside recycling for its bag users and no longer contracted for a recycling collection for Council bags users as of 1 October. After this date, the licensed refuse collectors on the Kāpiti Coast continued to provide kerbside recycling collection for their customers, working in partnership to provide this service. The four collectors are EnviroWaste Services Ltd (trading as Clean Green), Transpacific Industries Group NZ Ltd/Waste Management., Low Cost Bins Ltd, and Skip-E-Bins. At the time of writing, EnviroWaste collects the 55-litre kerbside recycling crates on behalf of the other partners. A page from the Council's website, showing what materials are accepted by the kerbside recycling collection service, is presented in Appendix 2.

All four private waste collectors provide kerbside collection services using Mobile Garbage Bins (MGBs). EnviroWaste and Skip E Bins also sell pre-paid rubbish bags for kerbside collections via local outlets.

Several private operators offer user-pays garden bag or bin collections. Greenwaste drop-off facilities are provided at the Otaihanga, Ōtaki, and Waikanae facilities.

Residents can transport residual refuse directly to the Otaihanga Resource Recovery Facility and Ōtaki Transfer Station. Both facilities accept residual waste and have separate drop-off points for a wide range of recyclable materials. The Waikanae transfer station accepts only recyclables and greenwaste. Residual refuse is not accepted at the Waikanae facility, except for the drop-off of pre-paid rubbish bags.

For one-off removal of large quantities of refuse from residential properties, several of the private waste operators offer gantry bin services.

1.1.3 Waste services for the commercial sector

Refuse from the commercial sector is either self-hauled to the transfer stations or collected by a private waste operator.

Several private waste operators offer both refuse and recycling services to the commercial sector. Services using pre-paid bags, MGBs, gantry skips, and front-loaders are available. These private services are provided by the four local collectors and/or collectors from outside the District.

1.1.4 Otaihanga Resource Recovery Facility

The Otaihanga Resource Recovery Facility (ORRF) is situated on Otaihanga Road, north of Paraparaumu. The facility is owned by Kāpiti Coast District Council and leased to, and operated by, MidWest Disposals Ltd

All vehicles entering the facility must stop at the weighbridge kiosk, where the kiosk operator assesses the load and directs the driver to the appropriate drop-off area. Bags and standard car loads are not weighed, but are charged at a flat rate. Vehicles with larger loads, trailers, and trucks are weighed over the double weighbridge when entering and then when leaving the facility and are charged by weight.

As of July 2012, greenwaste is no longer dropped off via the ORRF but is taken directly into the Composting New Zealand site.

Disposal charges for all waste into ORRF are set by MidWest Disposals. Council only sets the disposal charge for cleanfill to landfill. Composting New Zealand sets the charges for greenwaste. All charges are posted on the Council's website. There is no disposal charge for vehicles disposing only of 'kerbside recyclable' materials, gas bottles, batteries, cell phones, fluorescent tubes and bulbs, PCBs, and empty paint cans.

There are separate resource recovery and refuse disposal areas. At the resource recovery area, there is a re-use shop and separate drop-off points for the disposal of:

- TVs and CRT screens
- Whiteware
- Scrap metal
- Cell phones
- Fluorescent tubes/bulbs
- Paint and paint containers
- Tyres
- Aluminium cans
- Steel cans
- Flattened cardboard
- Plastic food, drink and janitorial containers
- Glass bottles
- Waste oil

Vehicles with small loads of refuse back up to the edge of the transfer pit to unload onto the tipping floor below. Commercial waste vehicles and other vehicles with large loads drive into the pit and unload directly onto the tipping floor. The tipping floor is cleared regularly with a loader and residual waste is loaded with an excavator into open truck/trailer units for transport to landfill.

On the tipping floor beside the vehicle unloading area there is a 30 cubic metre bin for customers to dispose separately of scrap steel. Transfer station staff recover a proportion of the metals that are disposed of onto the tipping floor and put these into the steel bin. Non-ferrous metals are stored in separate bins on the tipping floor. Re-usable items are set aside for staff from the re-use shop.

1.1.5 Ōtaki Transfer Station

Ōtaki Transfer Station is located at 1 Riverside Road, Ōtaki. It is a small facility owned by Kāpiti Coast District Council and at the time of the survey was operated under contract, by TPI/Waste Management. As of 1 December 2013, the Transfer Station will be become a resource recovery centre, leased and operated by EnviroWaste Services Ltd. A single weighbridge is located alongside a recycling drop-off area. All vehicles carrying waste must stop at the weighbridge kiosk, where the kiosk operator assesses the load and directs the driver to the appropriate drop-off area. Bag and car loads are not weighed, but are charged at a flat rate. Vehicles with trailers and trucks are weighed over a single weighbridge entering and leaving the facility and are charged by weight. Vehicles with greenwaste are not weighed but charged on volume, with the exception of trucks, which are charged on weight. Vehicles carrying only recyclable materials do not stop at the weighbridge kiosk, but proceed directly to the recycling drop-off area.

The gate charges for waste are currently set by Council (up to 1 December 2013). Composting New Zealand sets the greenwaste charges. The charges are posted on the Council website. Cleanfill and household hazardous waste is not accepted at the Ōtaki Transfer Station. There is no disposal charge for vehicles carrying only 'kerbside recyclable' materials, gas bottles, and paint and paint cans. There are separate resource recovery and refuse disposal areas. At the resource recovery area, there are currently separate drop-off points for the disposal of:

- Greenwaste
- Scrap metal
- Flattened cardboard
- Plastic food, drink, and janitorial containers
- Whiteware
- Glass bottles
- Aluminium cans
- Steel cans
- Paint
- Tyres
- Car bodies
- TVs and CRT screens

Residual waste disposed of in the transfer pit is pushed by a loader into a compactor, compacted into 30 cubic metre bins, and transported to landfill. Transfer station staff recover some metals from the residual waste and use the loader to move them to the steel pile. The methodology will change as of 1 December 2013 to top-loading of residual waste into open truck/trailer units for transport. Council expects that more recycling and resource recovery options and incentives will be set up in the near future.

2 Survey methodology

2.1 Overview

The quantity and composition of waste disposed of to landfill from Kāpiti Coast District was determined by combining data from several separate sources:

- a visual assessment of residual waste (i.e. waste that is not recovered and is sent for landfill disposal) disposed of at the Otaihanga Resource Recovery Facility and Ōtaki Transfer Stations over a seven-day period
- a sort-and weigh audit of the composition of kerbside refuse from residential properties, including Council residential kerbside refuse bags, private operators' kerbside refuse bags, and private waste operators' mobile garbage bins (MGBs)
- weighbridge records and invoices from the transfer stations.

The methodologies are outlined in detail in the sections that follow.

2.2 Kerbside refuse audit

The kerbside refuse audit methodology used by Waste Not Consulting is based on Procedure One of the Ministry for the Environment's Solid Waste Analysis Protocol (SWAP).

2.2.1 Sampling strategy

Over five weekdays from Friday 6 September to Thursday 12 September 2013 a total of 72 refuse bags (Council's and private) and the contents of 120 private waste operators' MGBs (56 120-litre[1] MGBs and 64 240-litre MGBs) were collected from the kerbside from throughout Kāpiti Coast District. Waste was transported to Otaihanga Resource Recovery Facility for sorting over a four-day period, from Monday to Thursday.

Only refuse from residential properties was included in the samples. The composition and quantity of kerbside refuse from residential properties varies according to a number of factors, including the socio-economic status and ethnicity of the householder, the nature of the housing stock, and the range of disposal and recycling services available. To obtain a representative sample of the kerbside refuse collections, the sample was collected from as wide a geographic area as possible and included a range of housing types. The streets from which the sample was collected were, in all except a few instances, the same as those in the 2010 audit.

A single refuse bag was taken from each dwelling selected for the bag sample, resulting in refuse bags from 72 households being collected. Only dwellings to which a distinct quantity of refuse bags could be attributed were chosen for the refuse bag sample. Refuse was not taken, for example, from beside shared driveways as it may have represented the refuse output of several households.

When a refuse bag was taken from a dwelling, the total number of bags set out by that dwelling was recorded. This has allowed the calculation of the average number of bags set out per household, which, when combined with an average bag weight, provides data on the

[1] The sample of MGBs included a small number of 80-litre and 140-litre MGBs. These bins are included in the '120-litre MGB' classification throughout this report.

average weight of refuse set out per household. This does not necessarily equate to an average weekly household waste generation, as not all households set out refuse each week.

The sample included the contents of 120 MGBs from all of the waste collectors operating in the District. The contents of the MGBs were emptied into large plastic bags for the sampling.

While the sample collection was taking place, a survey was conducted to determine the relative proportions of refuse bags, 120-litre MGBs, and 240-litre MGBs that were in use. The results of this survey are presented in Table 3.5. The streets from which the sample was collected are listed in section 3.1.

2.2.2 Audit execution

At the Otaihanga Resource Recovery Facility the sample of residential kerbside bagged refuse was sorted in sampling units of three bags. The MGB samples were sorted in units of two MGBs. The sample of 120-litre MGBs was sorted separately to the sample of 240-litre MGBs.

Each of the bags in the sample units was weighed in, one bag at a time, and then opened. The contents of all the bags in the sample unit were spread on a sorting table, and the individual items sorted into the appropriate categories. When all of the items in the sample unit were sorted, the individual classifications were weighed out and the material disposed of.

The refuse was sorted into the 23 secondary categories described in Appendix 3. These categories are based on the 12 primary categories recommended by the SWAP. The secondary classifications were chosen to identify the different types of recyclable materials present in the refuse.

2.2.3 Staff training and OSH issues

The refuse was sorted by a team of four, comprising three contract workers and a Waste Not staff member. Prior to the start of the audit, all team members received the requisite training on the requirements of the audit process and on occupational health and safety procedures. As sensitive documents are occasionally present in residential refuse, the importance of confidentiality was emphasised to all team members.

2.3 Disposal facilities survey

The visual assessment survey at Otaihanga Resource Recovery Facility and Ōtaki Transfer Station took place over a seven-day period in September 2013 and included both weekdays and weekends to capture weekly variations in the waste stream. Otaihanga Resource Recovery Facility was surveyed for four days and Ōtaki Transfer Station was surveyed for three during the seven day period by a Waste Not Consulting staff member.

Visual surveying provides information on vehicle loads of waste at a disposal facility in terms of composition of the waste load and the type of waste stream it represents (for example, landscaping, residential, and construction and demolition). The composition of waste is based on the 12 primary categories (e.g. paper, plastics etc) recommended by Ministry for the Environment's Solid Waste Analysis Protocol 2002 (SWAP). Further secondary categories were decided upon in conjunction with Council. A description of the categories is provided in Appendix 3.

2.3.1 Analysing waste flows

For the purpose of analysing waste flows at landfills and transfer stations, Waste Not differentiates between six different types of waste:

1. Construction and demolition (C&D) – waste materials from the construction or demolition of a building
2. Industrial/commercial/institutional (ICI) – waste from industrial, commercial, and institutional sources. 'Institutional sources' includes waste from hospitals, schools, prisons, and some 'municipal waste' such as litter and illegal dumping.
3. Landscaping and earthworks – waste from landscaping activity, garden maintenance, and site works from residential, commercial, and local government sources.
4. Residential – all waste originating from residential premises other than that covered by one of the other, more specific classifications (drop-offs of bagged domestic waste are classified as 'residential', and usually assumed to have the same composition as kerbside refuse collections)
5. Kerbside refuse collection – both Council and private collections of refuse bags and mobile garbage bins (MGBs) from residential and commercial/industrial properties
6. Special wastes – (not applicable to the Otaihanga and Ōtaki facilities during the survey period) This is a subjective classification that includes any substantial waste stream (such as biosolids, infrastructural cleanfill, or industrial wastes), that either requires special handling or significantly affects the overall composition of the waste stream and is markedly different from waste streams at other disposal facilities.

The first four of these types of waste are combined into what is referred to as the 'General' waste stream. Separating these types of waste is aimed at providing the information that is most useful to councils for monitoring waste and effectively targeting waste minimisation initiatives. Different methods are used to determine the composition of each of these types of waste. A generalised waste flow is shown in the diagram below:

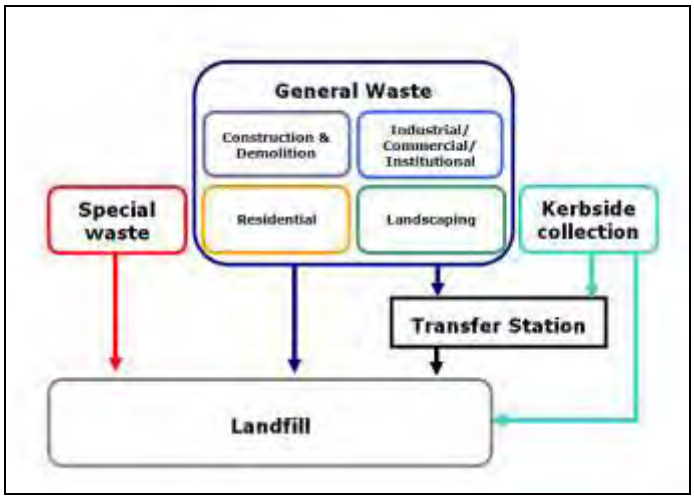


Figure 2.1 – Generic waste flow diagram

As each load of waste is unloaded onto the tipping floor, the surveyor first assesses and records the type of waste. The composition of the load is then assessed and recorded. If a load contains materials from more than one type of waste, a judgement is made as to the primary reason for the load being taken to the transfer station.

The composition of residential kerbside refuse collections is most accurately determined by sort and weigh auditing, rather than by visual surveying techniques. The results of the sort and weigh audits of residential kerbside refuse bags and residential private waste operators' MGBs, described in section 2.2, are assumed to be the composition of those types of kerbside refuse collections.

There is no precise definition for 'special' waste, as these wastes vary between disposal facilities. No waste entering the Otaihanga Resource Recovery Facility or Ōtaki Transfer Station during the survey period was classified as a 'special' waste. Special wastes, such as treated sewage sludge, that are disposed of at the closed Otaihanga landfill have not been included in the waste composition analysis.

'General' waste, with a few exceptions, is considered to be all types of waste other than kerbside refuse collections, and special wastes. The visual surveying was used primarily for determining the composition of the 'general' waste stream.

2.3.2 Visual assessment of waste composition

While each vehicle was being unloaded into the transfer pit, the surveyor assessed the relative weight of each constituent present in the load on the basis of volume and density. Absolute weights of each material were not estimated; rather, the proportion of weight represented by each material was estimated. This data was recorded as a proportion, by weight, for each constituent present in the load. For small loads, the total load weights were estimated, as these can not always be identified from the weighbridge records.

For vehicle loads in which it was difficult to distinguish the individual constituents, a generic composition, based on previous surveys of that type of vehicle load, were used as a template for the composition and adjusted according to the materials that were visible.

At Otaihanga Resource Recovery Facility and Ōtaki Transfer Station, recoverable materials (primarily scrap metal and reusable items) are removed from the waste by facility staff. In such instances, the recovered materials were *not* recorded by the surveyor as being a constituent of the waste being disposed of. Similarly, recoverable materials placed in the bins beside the vehicle unloading area were not included in the assessment of waste. In these instances, the surveyor estimated and recorded the proportion of waste that was recovered or disposed of separately, and the weight of these materials was later deducted from the vehicle load weight. The composition and weight of the waste that remains represents the residual waste that leaves the station to be disposed of to landfill. The weight of material transported to landfill from both facilities is used in all further calculations in this report and therefore represents waste to landfill from the District. This residual waste excludes treated sewage and cleanfill that are accepted into Otaihanga landfill.

The surveyors undertook visual assessments of vehicles for nine hours per day over a seven-day period. Except during very busy periods, the surveyor was able to gather data on all vehicles disposing of residual waste.

2.3.3 Identification of vehicle types

As loads carried by different vehicle types are not affected in similar ways by waste reduction initiatives, all vehicles carrying refuse were identified as one of the types shown in Table 2.1,.

Photos and further descriptions of the resource recovery potential of waste transported by the different truck types are provided in Appendix 4.

Table 2.1 – Vehicle classification system

Vehicle type	Uses
Cars	Small loads, generally from a single source, can be of either commercial or residential origin. Includes vehicles other than cars carrying very small loads, such as a van carrying a few rubbish bags.
Trailers – including vans, small trucks, and utes	Small-medium sized loads, usually from a single source, either commercial or residential, some may be from multiple sources (i.e. a garden contractor)
Compactor trucks (excluding kerbside refuse collection vehicles)	Compactor trucks can be used by both Council contractors and private operators for transporting materials other than kerbside refuse. Kāpiti Coast District Council, for example, uses compactors for collecting litter.
Front-loader trucks	Large loads, usually from numerous commercial and industrial sources that are regular users
Gantry trucks	Medium-large loads, usually from a single source, may be one-off disposal for residential or commercial waste, or regularly used by a commercial waste generator
Kerbside refuse collection vehicles	Large load from multiple regular sources, either residential or commercial or both combined and collected by both Council contractors and private waste operators.
Other trucks – including tip, box, and flat-deck	Medium to large loads, usually commercial, may be one off -loads or regular waste generators

2.4 Assumptions made regarding data and analysis

Occurring as the survey did in early spring, the composition and quantity of refuse entering the Otaihanga Resource Recovery Facility and Ōtaki Transfer Station can not be considered to be representative of the refuse at other times of the year. Seasonal effects are particularly relevant to C&D waste and landscaping waste. Other waste types, such as kerbside bagged refuse collections, tend to be less affected by seasonal factors.

The weather during the survey was generally overcast with a little rain. There were no unusual weather events or other circumstances prior to the surveys that would have significantly affected the quantity or composition of the refuse.

2.5 Waste flow diagram

In this report, separate analyses are presented for the composition of kerbside bagged refuse and 120-litre and 240-litre private refuse MGBs (which, when combined, are referred to as 'kerbside refuse collections'), 'general' waste disposed of at Otaihanga Resource Recovery

Facility and Ōtaki Transfer Station, and the 'overall' waste stream at both facilities, individually and combined. The analysis does not include the kerbside recycling collection, waste from the District that is directly transported and disposed of outside of the District, bypassing the Council facilities, or special waste and cleanfill that is disposed of at the (closed) Otaihanga landfill.

Figure 2.2 below is based on the methodology introduced in section 2.3.1, and outlines the Kāpiti Coast District waste flows that are being disposed of to landfill through the Council facilities during the survey period. The tonnage of each waste type is included, as well as the section of the report where the calculation of these tonnages and/or composition of the particular type of waste are presented. The tonnage of residual waste to landfill is based on weighbridge records of waste to landfill from both facilities for the period 2-15 September 2013.

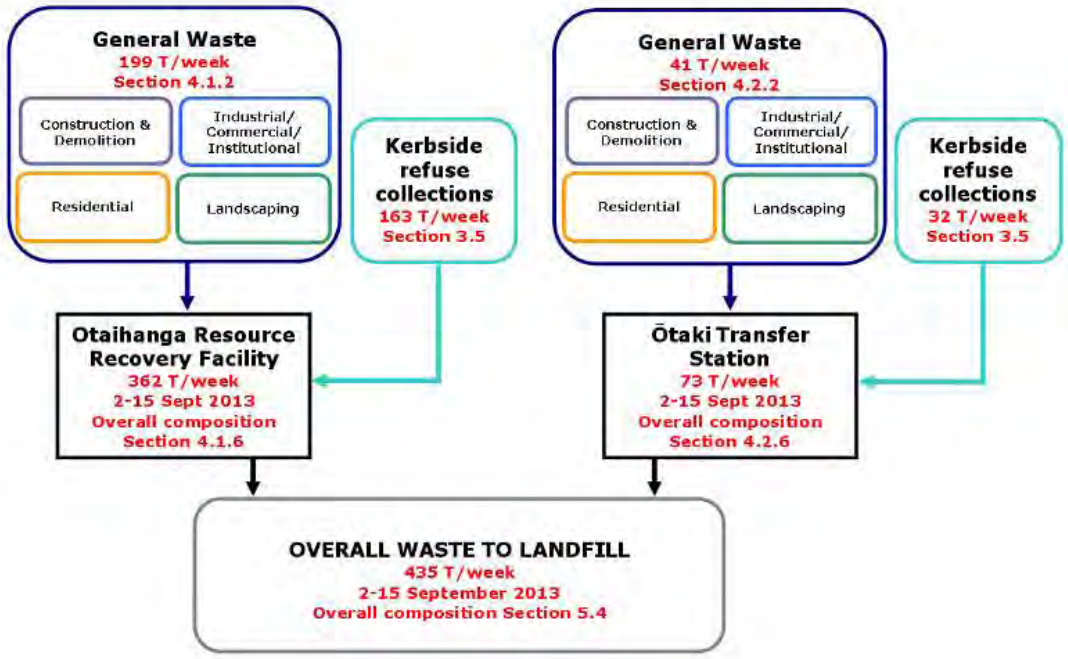


Figure 2.2 – Waste flows from Kāpiti Coast District to landfill via transfer stations– 2-15 September 2013

3 Kerbside refuse

3.1 Sampling schedule

The sort and weigh audit of kerbside refuse took place from 9-12 September 2013. The collection started on Friday 6 September, with half of a sample being collected. The other half was collected on Monday morning. On the following days the full sample was collected each morning before the auditing. During this period, the contents of a total of 72 kerbside refuse bags (Council's and private), 56 privately-serviced 120-litre MGBs, and 64 privately-serviced 240-litre MGBs were sampled and sorted. Samples were collected from throughout Kāpiti Coast District and the MGB samples included refuse from three private waste operators' MGBs. The collection schedule is shown in Table 3.1 and includes the streets from which the sample was collected.

Table 3.1 – Residential kerbside refuse collection schedule

Collection day	Collection Streets
Friday **06 September**	**Ōtaki** • Rahui Road • Temuera Street • Matene Street • Te Roto Road • Ngaio Street • Lupin Road • Hadfield Street
Monday **09 September**	**Waikanae** • Ngarara Road • Kohekohe Road • Tutere Street
Tuesday **10 September**	**Paraparaumu** • Realm Drive • Aorangi Road • The Parade
Wednesday **11 September**	**Raumati** • Hillcrest Road • Kiwi Road
Thursday **12 September**	**Paraparaumu** • Michael Road • Manly Street

3.2 Residential kerbside refuse bags

3.2.1 Primary composition of residential kerbside refuse bags

Kāpiti Coast District Council discontinued the wholesale of refuse bags in June 2013 and during the audit period the Council kerbside refuse contractor was in its final month of collecting Council bags. Two private operators have provided a pre-paid refuse bag collection service since December 2012. The primary composition of the residential kerbside refuse bags is presented in Table 3.2 below and Figure 3.1 on the following page. The composition is shown in terms of percentage, mean weight per refuse bag, mean (average) weight per household set out, and tonnes per week. The secondary composition, which includes all 23 categories, and a statistical analysis are given in Appendix 5. An analysis of the precision of the results is given in section 6.7.

The average weight of a residential kerbside refuse bag was found to be 6.15 kg. The distribution of bag weights is discussed in section 3.2.5. The mean weight per household presented in the table has been calculated from an average number of bags set out per household, based on data collected during the sample collection, and an average bag weight from the audit data. An analysis of household bag set out is given in section 3.2.6. As not all households put refuse out every week, the average household set out weight can not be regarded as equivalent to an average weekly refuse generation.

The weekly tonnage is based on survey data collected during the sample collection. A count was taken of the number of refuse bags, 120-litre MGBs, and 240-litre MGBs sighted on the kerbside during the collection. This survey data was combined with audit data and weighbridge records to determine the tonnes per week of kerbside refuse collected from each container type. It has been estimated that residential kerbside refuse bags comprised 15% of the weight of kerbside refuse collected during the sample period (see Table 3.5).

Table 3.2 – Primary composition of residential kerbside refuse bags - September 2013

Primary category	Proportion of total	Mean wt. per bag	Mean wt. per household set out	Tonnes per week
Paper	11.9%	0.73 kg	0.89 kg	3.5 T/week
Plastics	14.6%	0.90 kg	1.08 kg	4.3 T/week
Organics	41.6%	2.56 kg	3.09 kg	12.1 T/week
Ferrous metals	1.6%	0.10 kg	0.12 kg	0.5 T/week
Non-ferrous metals	1.0%	0.06 kg	0.08 kg	0.3 T/week
Glass	2.7%	0.17 kg	0.20 kg	0.8 T/week
Textiles	8.1%	0.50 kg	0.60 kg	2.4 T/week
Nappies & sanitary	15.9%	0.98 kg	1.18 kg	4.7 T/week
Rubble & concrete	0.3%	0.02 kg	0.02 kg	0.1 T/week
Timber	0.4%	0.03 kg	0.03 kg	0.1 T/week
Rubber	0.3%	0.02 kg	0.02 kg	0.1 T/week
Potentially hazardous	1.5%	0.09 kg	0.11 kg	0.4 T/week
TOTAL	**100.0%**	**6.15 kg**	**7.43 kg**	**29.2 T/week**

Organic material, primarily kitchen waste, was the largest single component of the residential bagged refuse, comprising 42% of the total. Nappies & sanitary, representing 16% of the total, was the second largest component, followed closely by plastics (15%). The compositions of the major primary categories are discussed in the following sections.

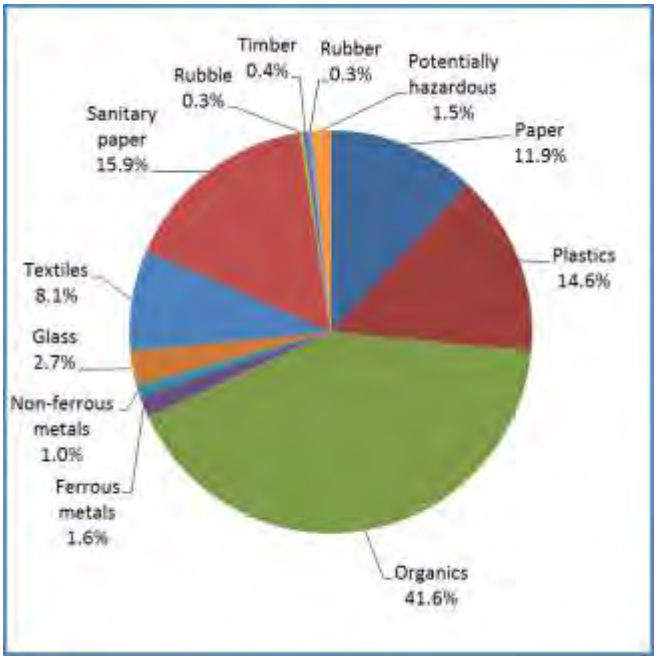


Figure 3.1 – Primary composition of residential kerbside refuse bags

3.2.2 Organics

Organic matter comprised 42% of the weight of all residential kerbside bagged refuse. The composition of the organic constituent of the refuse is shown in Figure 3.2.

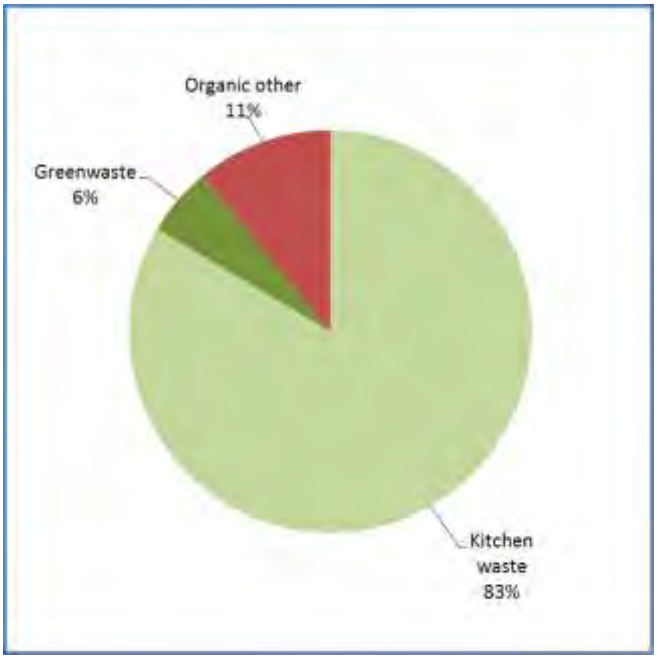


Figure 3.2 - Organic component of residential kerbside refuse bags

'Kitchen waste' compromised 83% of the organic material. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of perished goods. 'Greenwaste', or garden matter, comprised 6% of the organic material. Most of the garden waste was prunings, leaves, weeds, and lawn clippings. The 'Organic other' material (11%) included vacuum cleaner dust, animal faeces, candles, fireplace ash, and human hair. Much of this material would be suitable for composting.

3.2.3 Paper

Paper comprised 11.9% of the residential kerbside refuse bags. The composition of the paper constituent of the refuse is shown in Figure 3.3 below.

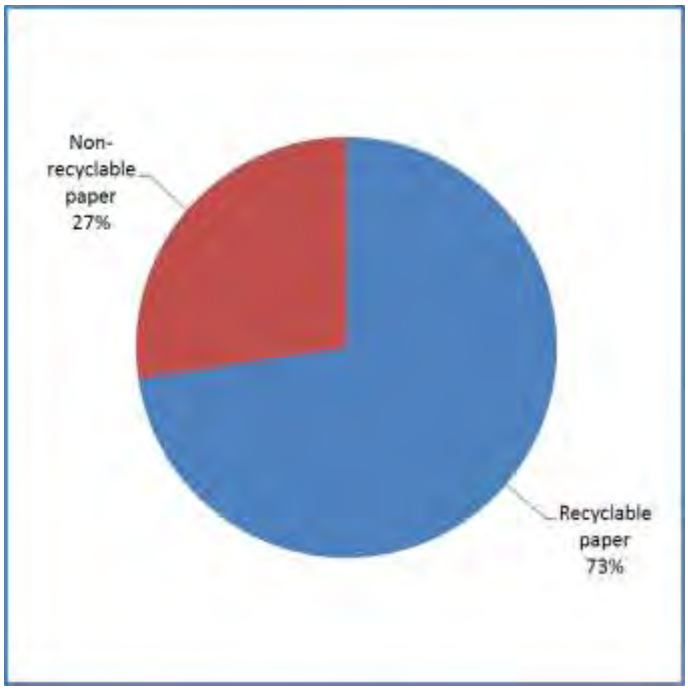


Figure 3.3 – Paper component of residential kerbside refuse bags

The largest component of the paper was 'Recyclable paper', which comprised 73% of the paper. This component included office paper, cardboard, newspapers, magazines, junk mail, paper packaging, and books. 'Non-recyclable paper' comprised 27% of the paper. This category is not accepted for recycling by the kerbside recycling collection, and included wet-strength and food-contaminated packaging.

A significant proportion of households use newspaper or similar papers for bundling food waste prior to disposal. As well, a proportion of the recyclable paper and newspaper was from takeaway food wrapping. Heavily food-contaminated paper was classified as 'Non-recyclable paper', but the less contaminated paper was considered to be recyclable for the purposes of this survey (only 'clean' paper is recyclable in educational material for the kerbside recycling collection). Paper used for food wrapping is not likely to be available for recycling by the householder unless the wrapping behaviour can be altered. It would, however, be possible to include this paper mixed with organics in a composting stream.

3.2.4 Plastics

Plastic materials comprised 14.6% of residential kerbside refuse bags. The secondary components of the plastic waste are shown in Figure 3.4 below.

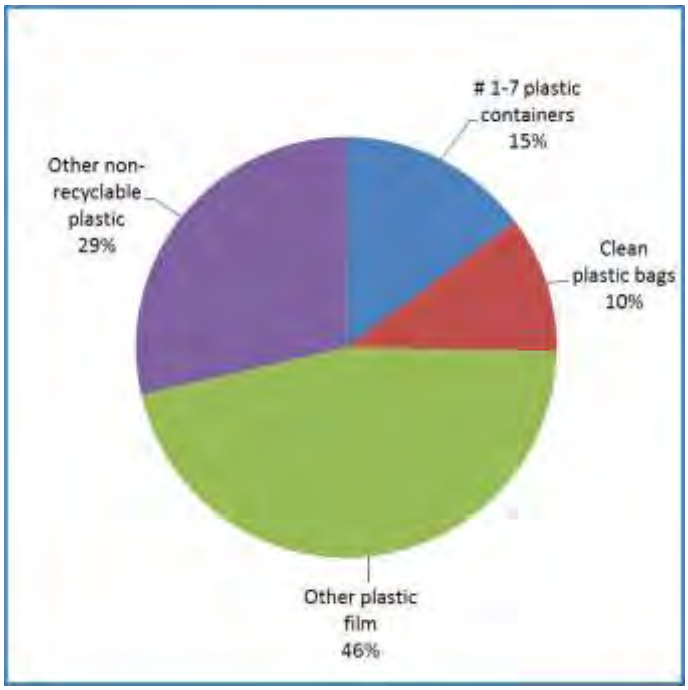


Figure 3.4 - Plastic component of residential kerbside refuse bags

'Other plastic film' comprised 46% of the plastic waste. This material is not accepted by the kerbside recycling collection. A further 15% was '#1-7 plastic containers' and 10% was 'Clean plastic bags', both of which are accepted for recycling. 'Other non-recyclable plastic' comprised 29% of all plastic.

3.2.5 Distribution of residential kerbside refuse bag weights

The average kerbside refuse bag weight was 6.15 kg. The lightest bag was 1.82 kg and the heaviest 18.28 kg. The distribution of the bag weights is shown in Figure 3.5 below.

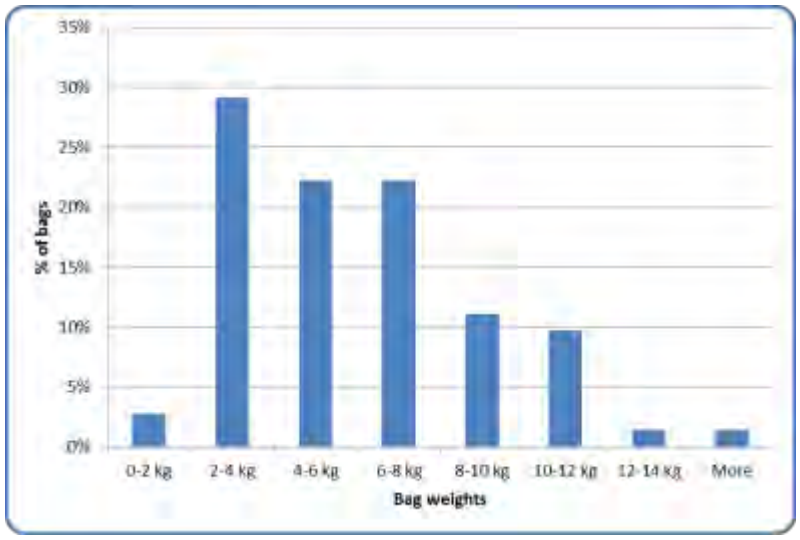


Figure 3.5 – Distribution of residential refuse bag weights

74% of all bags weighed between 2 and 8 kg. About 2% of bags weighed over 12 kg.

3.2.6 Distribution of residential kerbside refuse bag set out

As the sample of refuse bags was collected, the total number of bags set out by each household was recorded. The average household bag set out was 1.21 bags. Figure 3.6 below shows the distribution of the bag set outs.

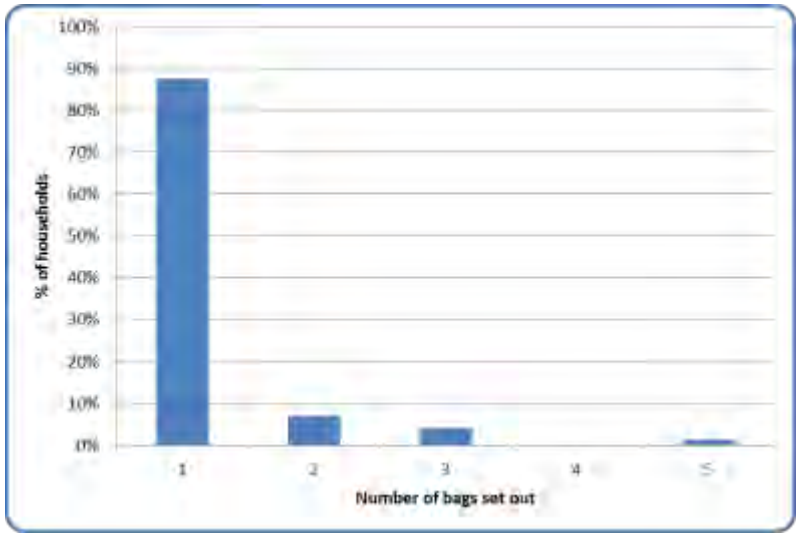


Figure 3.6 – Distribution of residential kerbside refuse bag set out

Almost 90% of all households that set out refuse bags set out a single refuse bag. About 6% of households set out more than two bags.

3.3 Residential 120-litre MGBs

3.3.1 Primary composition of residential 120-litre MGBs

The primary composition of refuse collected in 120-litre MGBs from residential premises by the private waste operators is presented in Table 3.3 below and Figure 3.7 on the following page. The secondary composition, which includes all 23categories, and a statistical analysis, is given in Appendix 6. An analysis of the precision of the results is given in section 6.7.

The weekly tonnage shown in Table 3.3 is based on survey data collected during the sample collection. A count was taken of the number of refuse bags, 120-litre MGBs, and 240-litre MGBs sighted on the kerbside during the collection. This survey data was combined with audit data and weighbridge records to determine the tonnes per week of kerbside refuse collected from each container type. It has been estimated that 120-litre MGBs comprised 22% of the weight of kerbside refuse collected during the sample period (see Table 3.5).

Table 3.3 – Primary composition of residential 120-litre MGBs

Primary category	Proportion of total	Mean wt. per MGB	T/week
Paper	9.1%	1.06 kg	3.9 T/week
Plastics	10.4%	1.20 kg	4.4 T/week
Organics	48.8%	5.67 kg	20.8 T/week
Ferrous metals	1.8%	0.21 kg	0.8 T/week
Non-ferrous metals	1.9%	0.22 kg	0.8 T/week
Glass	2.9%	0.33 kg	1.2 T/week
Textiles	3.6%	0.42 kg	1.5 T/week
Nappies & sanitary	11.0%	1.28 kg	4.7 T/week
Rubble & concrete	6.9%	0.80 kg	2.9 T/week
Timber	1.9%	0.22 kg	0.8 T/week
Rubber	0.1%	0.01 kg	0.0 T/week
Potentially hazardous	1.7%	0.19 kg	0.7 T/week
TOTAL	**100.0%**	**11.62 kg**	**42.5 T/week**

Organic material was the largest single component of the residential 120-litre MGB refuse, comprising 49% of the total. Nappies & sanitary, representing 11% of the total, was the second largest component. The compositions of the major primary categories are discussed in the following sections.

The average bin weight of 11.62 kg can not necessarily be equated with an average weekly refuse generation. Although many householders do set out their MGB every week, some have fortnightly collections and other companies may collect bins on an 'as demand' basis.

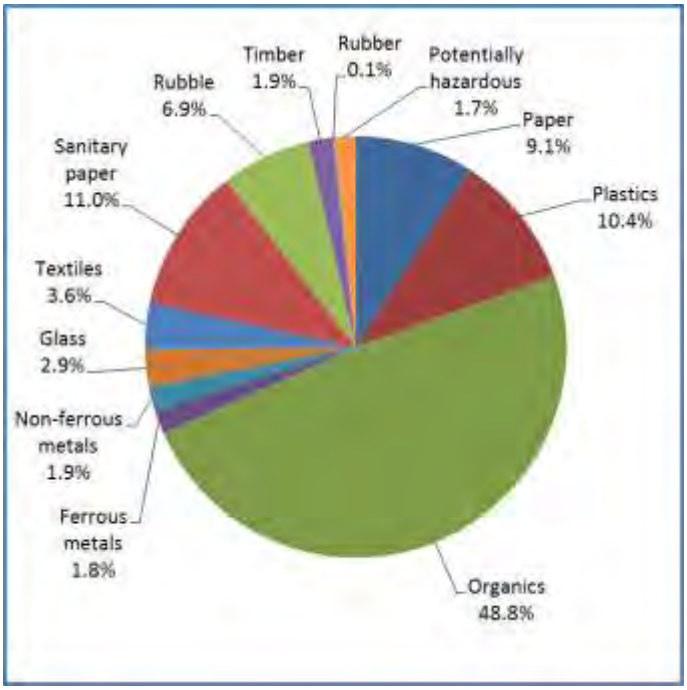


Figure 3.7 – Primary composition of residential 120-litre MGBs

3.3.2 Organics

Organic matter comprised 49% of the weight of 120-litre MGB refuse. The composition of the organic constituent of the refuse is shown in Figure 3.8 below.

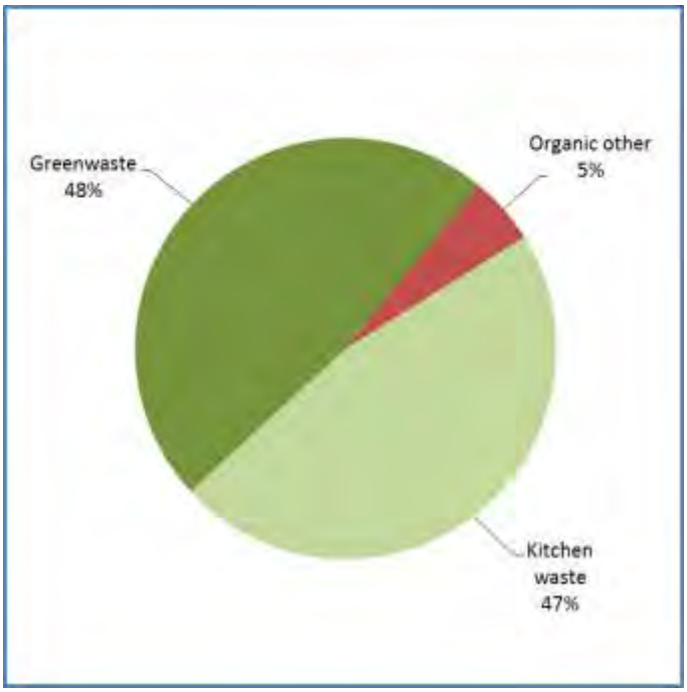


Figure 3.8 - Organics component of residential 120-litre MGBs

'Kitchen waste' comprised 47% of the organic material. Kitchen waste included food preparation waste, left-over food waste, and substantial quantities of perished goods. 'Greenwaste', or garden matter, comprised 48% of the organic material. The garden waste

included tree and shrub prunings, leaves, weeds, and lawn clippings. The 'Organic other' material (5% of organic material) included vacuum cleaner dust, animal faeces, candles, fireplace ash, and human hair. Much of this material would be suitable for composting.

3.3.3 Paper

Paper comprised 9.1% of the 120-litre residential MGBs. The composition of the paper constituent of MGB refuse is shown in Figure 3.9 below.

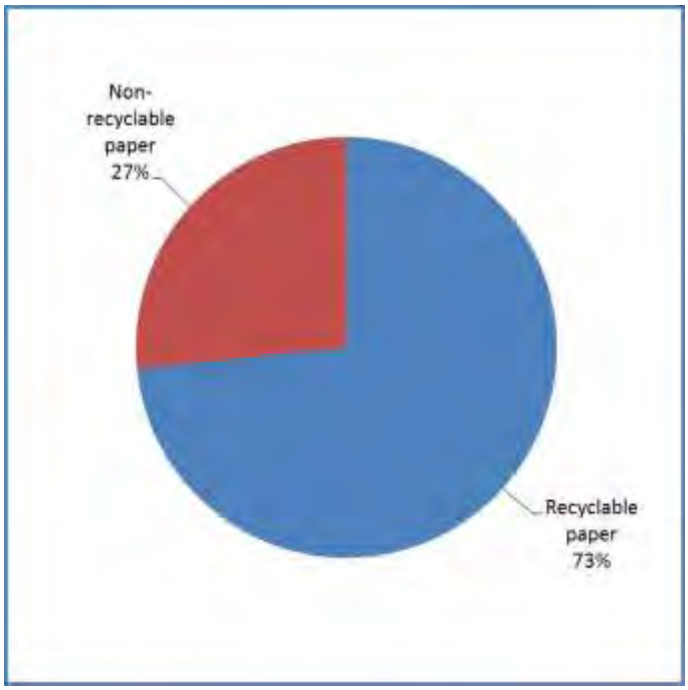


Figure 3.9 – Paper component of residential 120-litre MGBs

The largest component of the paper was 'Recyclable paper', which comprised 73% of the paper. This component included office paper, cardboard, newspapers, magazines, junk mail, paper packaging, and books. 'Non-recyclable paper' comprised 27% of the paper. Material in this category is not accepted for recycling by the kerbside recycling collection, and included wet-strength and food-contaminated packaging.

As with householders using refuse bags, a significant proportion of households with MGBs use newspaper or similar papers for bundling food waste prior to disposal, contaminating the paper with food waste. In addition, a proportion of the recyclable paper and newspaper was from takeaway food wrapping. Heavily food-contaminated paper was classified as Non-recyclable paper, but the less contaminated paper was considered to be recyclable for the purposes of this survey. Paper used for food wrapping is not likely to be available for recycling by the householder unless the wrapping behaviour can be altered. It would, however, be possible to include this paper mixed with organics in a composting stream.

3.3.4 Plastics

Plastic materials comprised 10.4% of refuse in residential kerbside 120-litre MGBs. The secondary components of the plastic waste are shown in Figure 3.10 below.

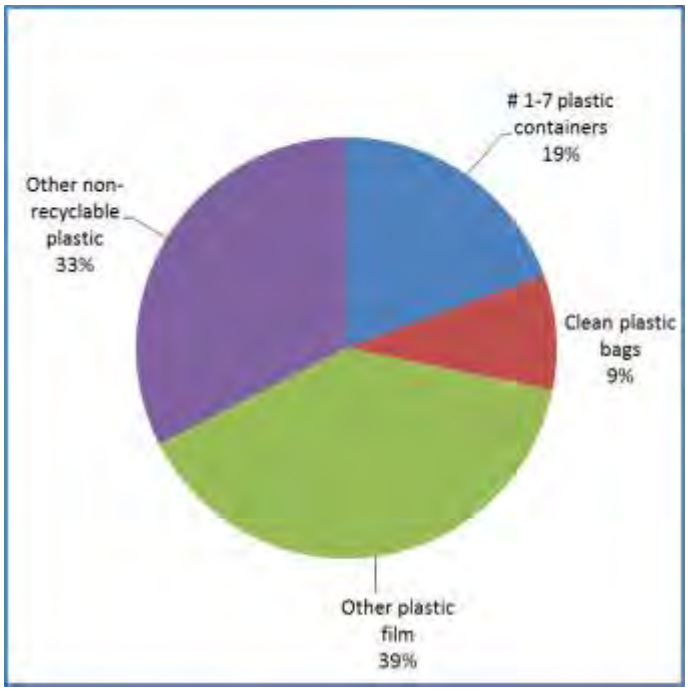


Figure 3.10 –Plastic component of residential 120-litre MGBs

'Other plastic film' comprised 39% of the plastic waste. This material is not accepted by the kerbside recycling collection. A further 19% was '#1-7 packaging' and 9% was 'Clean plastic bags', which are accepted for recycling.

'Other non-recyclable plastic' comprised 33% of all plastic.

3.3.5 Distribution of residential 120-litre MGB weights

The distribution of the weights of the contents of the 120-litre MGBs included in the audit is shown in Figure 3.11.

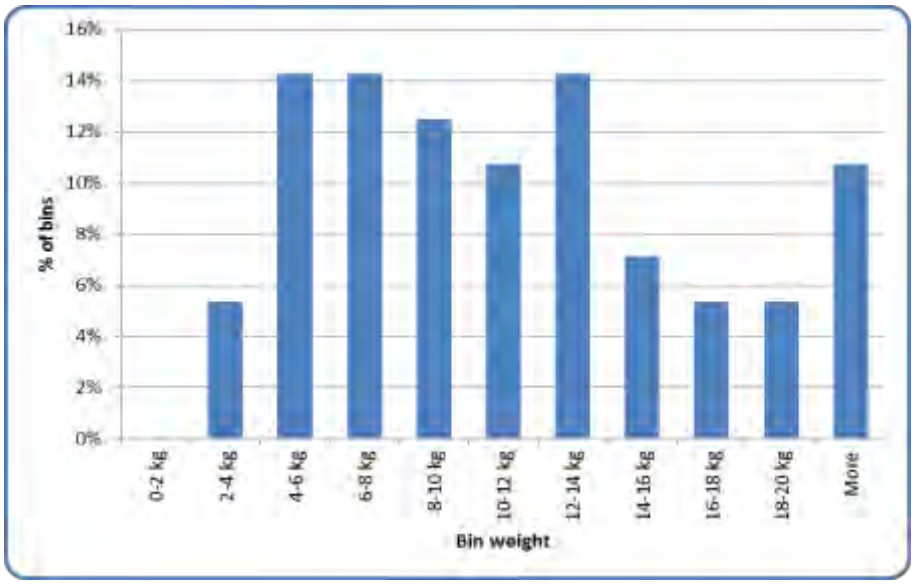


Figure 3.11 – Distribution of residential 120-litre MGB weights

The average 120-litre MGB weight was 11.73 kg. The lightest MGB was 2.16 kg and the heaviest 31.16 kg. Just over half of bins weighed between 6 kg and 14 kg. Bins weighing over 20 kg accounted for 11% of the bins, and accounted for 22% of the total weight.

3.4 Residential 240-litre MGBs

3.4.1 Primary composition of residential 240-litre MGBs

The primary composition of refuse collected in 240-litre MGBs from residential premises by the private waste operators is presented in Table 3.4 below and Figure 3.12 on the following page. The secondary composition, which includes all 23 categories, and a statistical analysis are given in Appendix 7. An analysis of the precision of the results is given in section 6.7.

The weekly tonnage shown in Table 3.4 is based on survey data collected during the sample collection. A count was taken of the number of refuse bags, 120-litre MGBs, and 240-litre MGBs sighted on the kerbside during the collection. This survey data was combined with audit data and weighbridge records to determine the tonnes per week of kerbside refuse collected from each container type. It has been estimated that 240-litre MGBs comprised 63% of the weight of kerbside refuse collected during the sample period (see Table 3.5).

Table 3.4 – Primary composition of residential 240-litre MGBs

Primary category	Proportion of total	Mean wt. per MGB	T/week
Paper	15.1%	3.32 kg	18.6 T/week
Plastics	7.4%	1.63 kg	9.1 T/week
Organics	54.3%	11.93 kg	66.7 T/week
Ferrous metals	2.2%	0.47 kg	2.6 T/week
Non-ferrous metals	0.5%	0.11 kg	0.6 T/week
Glass	3.7%	0.80 kg	4.5 T/week
Textiles	2.6%	0.58 kg	3.2 T/week
Nappies & sanitary	10.0%	2.20 kg	12.3 T/week
Rubble & concrete	0.5%	0.11 kg	0.6 T/week
Timber	2.9%	0.63 kg	3.5 T/week
Rubber	0.2%	0.05 kg	0.3 T/week
Potentially hazardous	0.6%	0.13 kg	0.8 T/week
TOTAL	**100.0%**	**21.98 kg**	**122.9 T/week**

Organic material was the largest single component of the residential MGB refuse, comprising 54.3% of the total. Paper, representing 15% of the total, was the second largest component. The compositions of the major primary categories are discussed in the following sections.

The average bin weight of 21.98 kg can not necessarily be equated with an average weekly refuse generation. Although many householders do set out their MGB every week, some have fortnightly collections and other companies may collect bins on an 'as demand' basis.

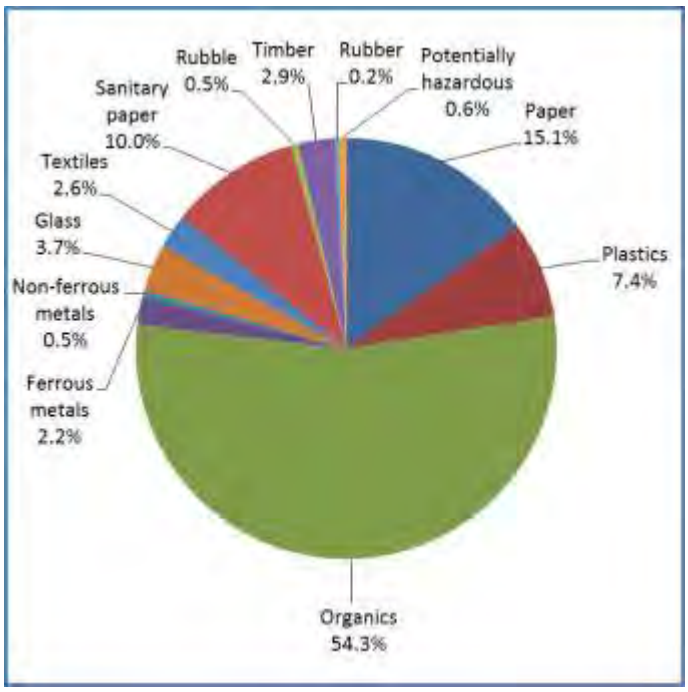


Figure 3.12 – Primary composition of residential 240-litre MGBs

3.4.2 Organics

Organic matter comprised 54% of the weight of all residential 240-litre MGB refuse. The composition of the organic constituent of the refuse is shown in Figure 3.13 below.

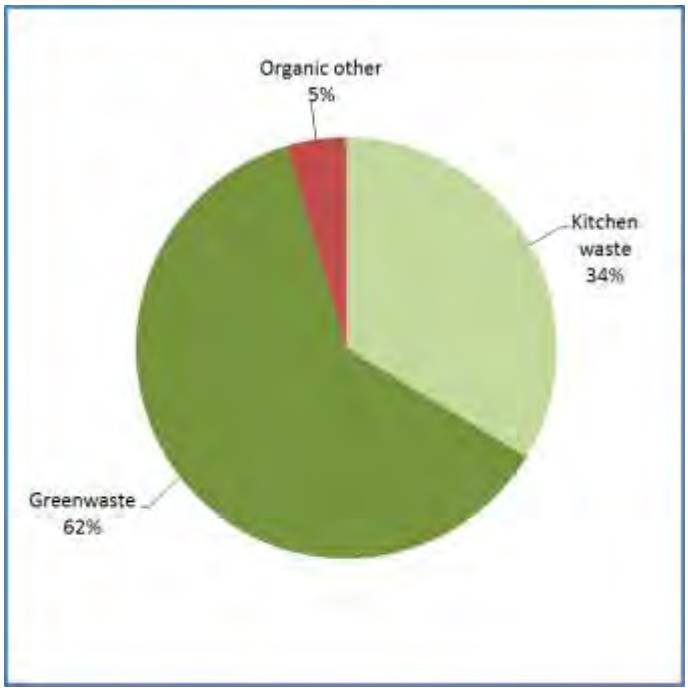


Figure 3.13 - Organics component of residential 240-litre MGBs

'Kitchen waste' comprised 34% of the organic material. 'Kitchen waste' included food preparation waste, left-over food waste, and substantial quantities of perished goods. 'Greenwaste', or garden matter, comprised 62% of the organic material. The garden waste

included tree and shrub prunings, leaves, weeds, and lawn clippings. The 'Other material' (5% of organic material) included vacuum cleaner dust, animal faeces, candles, fireplace ash, and human hair. Much of this material would be suitable for composting.

3.4.3 Paper

Paper comprised 15.1% of the residential 240-litre MGBs. The composition of the paper constituent of MGB refuse is shown in Figure 3.14 below.

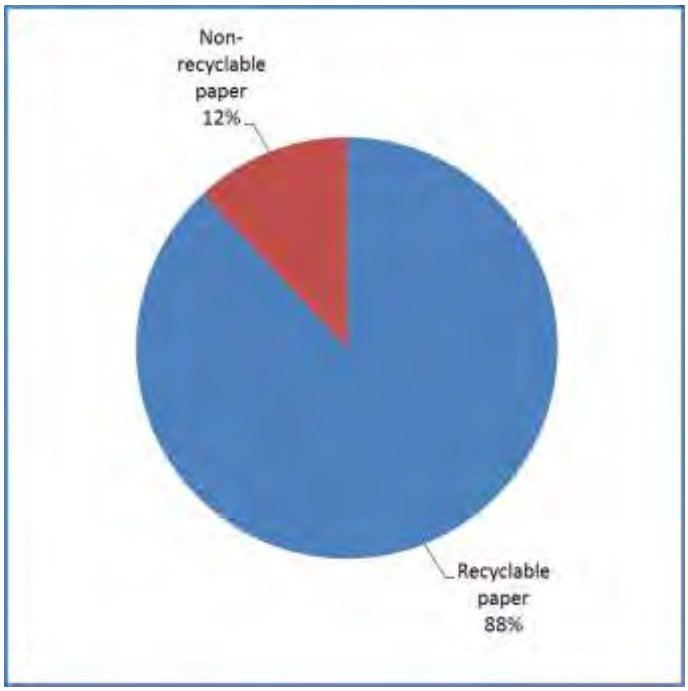


Figure 3.14 – Paper component of residential 240-litre MGBs

The largest component of the paper was 'Recyclable paper', which comprised 88% of the paper. This component included office paper, cardboard, newspapers, magazines, junk mail, paper packaging, and books. A sizable proportion of the 'Recyclable paper' was contained in a single MGB of undistributed junk mail.

'Non-recyclable paper' comprised 12% of the paper. Material in this category is not accepted for recycling by the kerbside recycling collection, and included wet-strength and food-contaminated packaging.

As with householders using refuse bags, a significant proportion of households with MGBs use newspaper or similar papers for bundling food waste prior to disposal, contaminating the paper with food waste. In addition, a proportion of the recyclable paper and newspaper was from takeaway food wrapping. Heavily food-contaminated paper was classified as 'Non-recyclable paper', but the less contaminated paper was considered to be recyclable for the purposes of this survey. Paper used for food wrapping is not likely to be available for recycling by the householder unless the wrapping behaviour can be altered. It would, however, be possible to include this paper mixed with organics in a composting stream.

3.4.4 Plastics

Plastic materials comprised 7.4% of refuse in residential 240-litre MGBs. The secondary components of the plastic waste are shown in Figure 3.15 below.

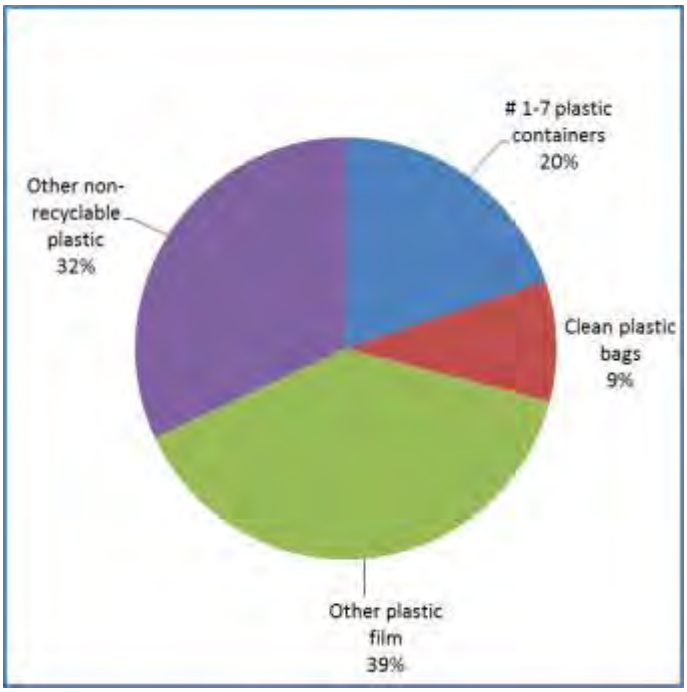


Figure 3.15 –Plastic component of residential 240-litre MGBs

'Other plastic film' comprised 39% of the plastic waste. This material was not accepted by the kerbside recycling collection. A further 20% was '#1-7 packaging' and 9% was 'Clean plastic bags', which are accepted for recycling. 'Other non-recyclable plastic' comprised 32% of all plastic.

3.4.5 Distribution of residential 240-litre MGB weights

The distribution of the weights of the contents of the 240-litre MGBs included in the audit is shown in Figure 3.16 below.

Figure 3.16 – Distribution of residential 240-litre MGB weights

The average 240-litre MGB weight was 22.23 kg. The lightest MGB was 2.10 kg and the heaviest 91.00 kg. Just over half of bins weighed less than 20 kg. Bins weighing between 20 kg and 40 kg accounted for 34% of the bins, and 6% of bins weighed over 50 kg.

3.5 Primary composition – combined kerbside refuse collections

The composition of the overall kerbside refuse stream collected in Kāpiti Coast District was calculated by combining the composition of residential refuse bags and residential 120- and 240-litre MGBs in the proportions determined by the survey undertaken during the sample collection and the results of the audits. The results of the survey are shown in Table 3.5.

Table 3.5 – Results of survey of refuse container usage

Type of container	# counted during survey	Average weight per container	Per cent of total weight
Refuse bags	361	6.15 kg	15%
120-litre MGBs	278	11.62 kg	22%
240-litre MGBs	425	21.98 kg	63%
TOTAL	**1064**	**-**	**100%**

The primary composition of the combined residential kerbside refuse stream is presented in Table 3.6 below and Figure 3.17 on the next page. The secondary composition, which includes all 24 categories, is given in Appendix 8. The weekly tonnage of kerbside refuse shown in the table has been taken from Table 5.1.

Table 3.6 – Primary composition of kerbside refuse – residential refuse bags and MGBs combined

Primary category	Combined	
	% of total	T/week
Paper	13.3%	25.9 T/week
Plastics	9.1%	17.8 T/week
Organics	51.2%	99.6 T/week
Ferrous metals	2.0%	3.9 T/week
Non-ferrous metals	0.9%	1.7 T/week
Glass	3.3%	6.5 T/week
Textiles	3.7%	7.1 T/week
Nappies & sanitary	11.1%	21.7 T/week
Rubble & concrete	1.9%	3.6 T/week
Timber	2.3%	4.5 T/week
Rubber	0.2%	0.4 T/week
Potentially hazardous	1.0%	1.9 T/week
TOTAL	**100.0%**	**194.7 T/week**

Organic material, of which 43% was kitchen waste and 52% greenwaste, was the largest single component of the residential refuse, comprising 51% of the total. Paper, representing 13% of the total, was the second largest component.

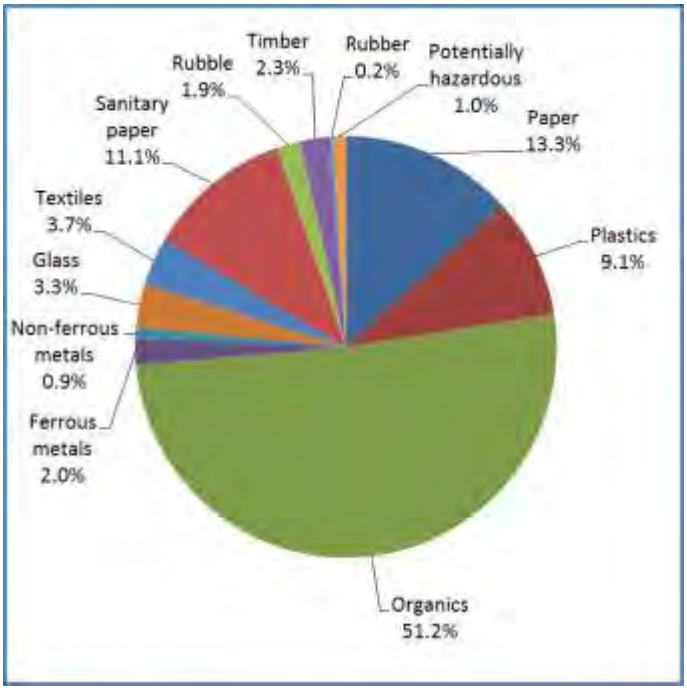


Figure 3.17 – Primary composition of combined kerbside refuse

3.6 Comparison of residential refuse bag and MGB compositions

A comparison of the primary composition of the bagged refuse and MGB refuse is given in Table 3.7 on the next page. The secondary compositions for the 'Organics' category are also shown.

The comparison is given in terms of both percentages and weight per household set out. The weight of material set out by each household is the more meaningful comparison. The household set out weight for households using residential refuse bags has been calculated as described in section 3.2, and is based on each household that set out refuse setting out 1.21 bags weighing an average of 6.15 kg each. The household set out weight for households using MGBs is considered to be the average weight of a single MGB.

Table 3.7 – Comparison of kerbside bagged refuse and MGBs

Primary category	Proportion of total			Mean wt. per household set out		
	Bags	120-litre MGBs	240-litre MGBs	Bags	120-litre MGBs	240-litre MGBs
Paper	11.9%	9.1%	15.1%	0.89 kg	1.06 kg	3.32 kg
Plastics	14.6%	10.4%	7.4%	1.08 kg	1.20 kg	1.63 kg
Organics subtotal	41.6%	48.8%	54.3%	3.09 kg	5.67 kg	11.93 kg
Kitchen waste	*34.7%*	*23.0%*	*18.3%*	*2.58 kg*	*2.67 kg*	*4.01 kg*
Greenwaste	*2.3%*	*23.3%*	*33.5%*	*0.17 kg*	*2.71 kg*	*7.37 kg*
Other	*4.5%*	*2.6%*	*2.5%*	*0.34 kg*	*0.30 kg*	*0.55 kg*
Ferrous metals	1.6%	1.8%	2.2%	0.12 kg	0.21 kg	0.47 kg
Non-ferrous metals	1.0%	1.9%	0.5%	0.08 kg	0.22 kg	0.11 kg
Glass	2.7%	2.9%	3.7%	0.20 kg	0.33 kg	0.80 kg
Textiles	8.1%	3.6%	2.6%	0.60 kg	0.42 kg	0.58 kg
Nappies & sanitary	15.9%	11.0%	10.0%	1.18 kg	1.28 kg	2.20 kg
Rubble & concrete	0.3%	6.9%	0.5%	0.02 kg	0.80 kg	0.11 kg
Timber	0.4%	1.9%	2.9%	0.03 kg	0.22 kg	0.63 kg
Rubber	0.3%	0.1%	0.2%	0.02 kg	0.01 kg	0.05 kg
Potentially hazardous	1.5%	1.7%	0.6%	0.11 kg	0.19 kg	0.13 kg
TOTAL	**100.0%**	**100.0%**	**100.0%**	**7.43 kg**	**11.62 kg**	**21.98 kg**

A household using a 240-litre MGB is setting out almost three times as much refuse as a household using bags. The average weight per bag set out is 7.43 kg and the average weight per 240-litre MGB set out is 21.98 kg.

The difference may be associated with MGBs being chosen by households that generate larger quantities of refuse than households that choose to use the bagged refuse services, but may also be a function of MGB users disposing of extra material through the kerbside refuse collection as there is a greater volume available at no marginal cost.

The biggest difference between the composition of the refuse in the bags and in the MGBs is in the quantity of organic waste, particularly 'Greenwaste'. The average bag set-out includes 0.17 kg of 'Greenwaste', while the average 120-litre MGB includes 2.71 kg and the average 240-litre MGB 7.37 kg.

Neither the average weight of an MGB nor the average household refuse bag set out weight can be considered equivalent to a weekly household weight generation. Not all users of refuse bags or MGBs set out refuse every week. Some MGBs may be emptied on an on-demand basis, and so may not be set out by the householder until the bin has been filled.

3.7 Diversion potential of kerbside refuse bags and MGBs

Common means of diverting residential refuse materials from landfill disposal is through the recycling and composting of various materials. Waste collectors in Kāpiti Coast District provide kerbside collections of recyclable containers and paper to households in the District. Kitchen waste and garden waste can be composted by residents and can be taken to the three greenwaste drop off facilities. Garden waste is also collected by private service providers in Kāpiti Coast District. Table 3.8 on the next page shows the proportion of the

Kāpiti Coast District residential kerbside refuse that could have been diverted using these diversion methods.

Table 3.8 – Diversion potential of residential refuse – weight per set out

Divertible materials	Residential refuse bags – per set out	120-litre MGBs	240-litre MGBs	Combined – T/week	Combined - % of total
RECYCLABLE MATERIALS					
Paper - Recyclable	0.64 kg	0.78 kg	2.92 kg	21.7 T/week	11.2%
Plastics - #1-7 containers	0.16 kg	0.23 kg	0.32 kg	3.3 T/week	1.7%
Plastics - Clean plastic bags	0.11 kg	0.11 kg	0.15 kg	1.7 T/week	0.9%
Ferrous metals - Steel cans	0.07 kg	0.10 kg	0.14 kg	1.4 T/week	0.7%
Non-ferrous metals – Alu. cans	0.03 kg	0.07 kg	0.05 kg	0.7 T/week	0.3%
Glass - Bottles/jars	0.12 kg	0.27 kg	0.73 kg	5.5 T/week	2.8%
Subtotal	**1.14 kg**	**1.56 kg**	**4.32 kg**	**34.3 T/week**	**17.6%**
COMPOSTABLE MATERIALS					
Organics - Kitchen waste	2.58 kg	2.67 kg	4.01 kg	42.3 T/week	21.8%
Organics - Greenwaste	0.17 kg	2.71 kg	7.37 kg	51.8 T/week	26.6%
Subtotal	**2.75 kg**	**5.38 kg**	**11.38 kg**	**94.1 T/week**	**48.4%**
TOTAL DIVERTIBLE					
Weight of divertible materials per set out	**3.89 kg**	**6.93 kg**	**15.70 kg**	**128.5 T/week**	**-**
Divertible materials as % of total	**52.3%**	**59.6%**	**71.4%**	**-**	**66.0%**

Almost 18% of the materials in the combined kerbside refuse (shown in the column on the right) could have been recycled through the existing kerbside recycling collection. A further 48% of the combined kerbside refuse could have been composted. In total, about 66% of the combined kerbside refuse could be diverted from landfill disposal by either recycling or composting. Other materials, such as clothing, are also recyclable or recoverable, but have not been included in these calculations.

The proportion of divertible material in the 120-litre MGBs was 7% higher than in the refuse bags per household set out, and in the 240-litre MGBs it was 19% higher than in the refuse bags. In terms of weight per set out, however, each 240-litre MGB contained forty times as much greenwaste and four times the total weight of divertible materials as was contained in a household set out of residential kerbside refuse bags.

4 Disposal facilities

4.1 Otaihanga Resource Recovery Facility

The Otaihanga Resource Recovery Facility (Otaihanga RRF) is situated at 220 Otaihanga Road, Otaihanga, north of Paraparaumu. A description of the facility and its operation is presented in section 1.1.4. The facility was surveyed on 7, 9, 10, and 11 September 2013. During this four-day period, data was collected on 288 vehicles, 254 of which were disposing of general waste. The other 34 vehicles were disposing of kerbside refuse collections.

The results of the survey have been calculated using the weighbridge records for large loads of waste as vehicle registration numbers and net load weights are recorded for large loads. This allowed the load weight to be identified for these loads by matching the registration numbers and times with those recorded by the surveyor. The weighbridge does not record vehicle registration numbers for vehicles that are disposing of smaller loads of waste. For these vehicles, the estimated load weight recorded by the surveyor was used. The total tonnage of waste being transported to landfill from Otaihanga Resource Recovery Facility is based on weighbridge records for 2-15 September 2013. Waste to landfill for this two-week period averaged 362 tonnes per week. This figure is used in all further calculations.

4.1.1 Otaihanga RRF waste type analysis

An analysis of the numbers and types of waste loads that were surveyed is given in Table 4.1 below. The analysis includes both the four types of waste that make up the 'general' waste stream (C&D, ICI, landscaping, and residential) and the one type of waste that is not classified as 'general' waste (kerbside refuse collections). Kerbside refuse collections are not included in the 'general' waste composition analysis in section 4.1.2, but are included in the 'overall' waste stream composition analysis, which is presented in section 5.1.

The final column in the table shows the average weight per week originating from each type of waste during the survey period. The total tonnage and the tonnage for kerbside refuse collections (which includes both Council and private kerbside refuse collections) have been taken directly from analysis of the weighbridge records for the survey period. The tonnage for the remainder of the categories was based on the percentages of the 'general' waste stream as determined from the survey. Weekly tonnages during the survey period are compared to average annual tonnages in section 6.8.

Table 4.1 – Types of waste disposed of from Otaihanga RRF to landfill – 2-15 September 2013

Type of waste	# of loads in survey	% of loads in survey	% of weight	Tonnes/ week
Construction & demolition	63	22%	24%	86.2 T/week
Industrial/commercial/institutional	43	15%	23%	83.0 T/week
Kerbside refuse collections	34	12%	45%	162.8 T/week
Landscaping & earthworks	11	4%	1%	5.2 T/week
Residential	137	48%	7%	24.7 T/week
TOTAL	**288**	**100.0%**	**100.0%**	**362.0 T/week**

Waste generated by C&D activity comprised 22% of the number of vehicle loads and 24% of the total weight. ICI activity generated 15% of loads, which combined weighed 23% of the total waste. Kerbside refuse collections, which have a higher-than-average weight per load, represented only 12% of all loads surveyed, but these loads comprised 45% of all waste, by weight. Landscaping and earthworks activity generated 4% of loads, which represented 1% of the total weight. Residential waste comprised 48% of all loads, but only 7% of the total weight. Many residential loads were vehicles dropping off a small number of refuse bags.

4.1.2 Primary composition of 'general' waste from Otaihanga RRF to landfill

The primary composition of 'general waste' (i.e. excluding kerbside refuse collections) disposed of to landfill from Otaihanga Resource Recovery Facility is given in Table 4.2 below and Figure 4.1 on the next page. Secondary classifications are given in Appendix 9.

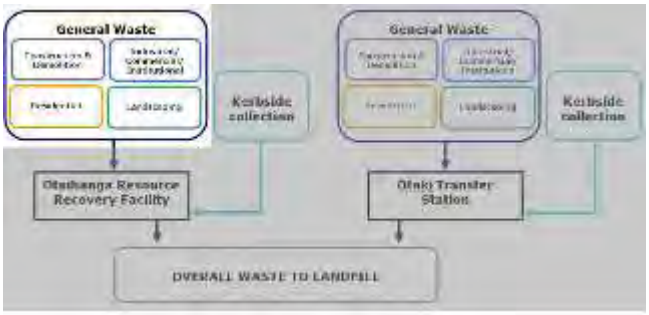


Table 4.2 – Primary composition of general waste from Otaihanga RRF to landfill - 2-15 September 2013 – excludes kerbside refuse collections

Primary category	% of total	T/week
Paper	9.6%	19.0 T/week
Plastics	8.2%	16.2 T/week
Organics	11.1%	22.1 T/week
Ferrous metals	3.2%	6.3 T/week
Non-ferrous metals	0.5%	0.9 T/week
Glass	3.2%	6.4 T/week
Textiles	8.2%	16.3 T/week
Nappies & sanitary	2.2%	4.3 T/week
Rubble & concrete	27.2%	54.1 T/week
Timber	25.8%	51.4 T/week
Rubber	0.3%	0.7 T/week
Potentially hazardous	0.7%	1.3 T/week
TOTAL	**100.0%**	**199.2 T/week**

Rubble & concrete was the largest primary category of general waste to landfill from Otaihanga RRF, comprising 27% of the total. The relatively high proportion of rubble & concrete is partially due to a single 8-tonne load of asphalt and sand. Timber was the second largest category, comprising 26%. Organics, plastics and paper comprised similar proportions, at 8% to 11% of the total.

The data from the vehicle survey was used to determine the composition of the 'general' waste disposed of to landfill. Materials that were disposed of at the separate drop-off points or separated from the waste by staff were not included in the composition survey.

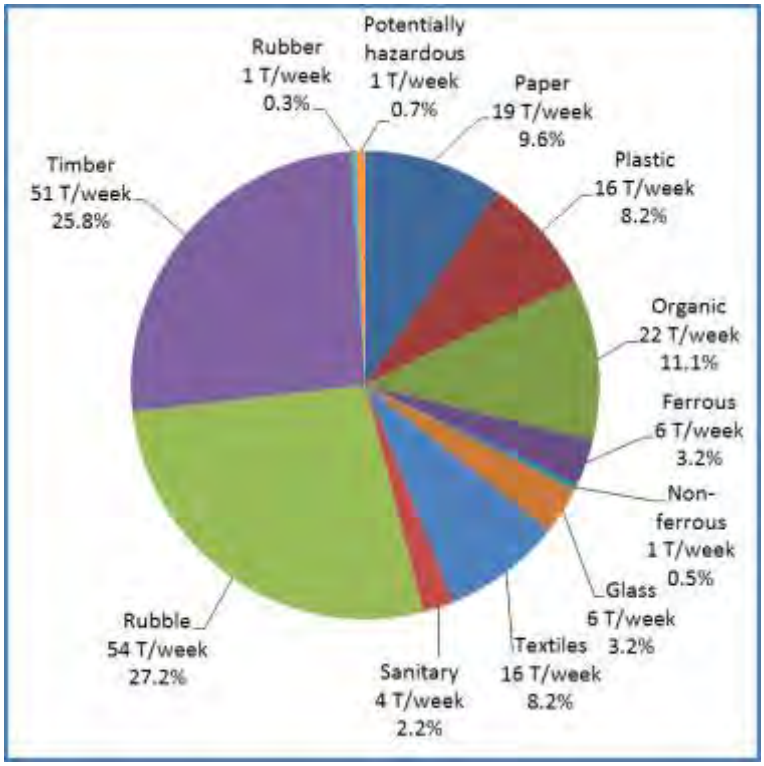


Figure 4.1 - Primary composition of general waste from Otaihanga RRF to landfill - 2-15 September 2013 – excludes kerbside refuse collections

4.1.3 Primary composition of general waste from Otaihanga RRF to landfill – by type of waste

Table 4.3 below shows the primary classifications of the four different types of waste that make up the general waste being disposed of at the Otaihanga Resource Recovery Facility. The secondary categories are shown in Appendix 10.

Table 4.3 – Primary composition of general waste from Otaihanga RRF to landfill – by type of waste - 2-15 September 2010

Primary category	C&D	ICI	Landscaping & earthworks	Residential
Paper	1.7%	17.7%	0.9%	11.4%
Plastics	1.1%	15.8%	0.6%	8.8%
Organics	2.9%	16.7%	62.8%	9.9%
Ferrous metals	0.6%	4.6%	0.0%	8.2%
Non-ferrous metals	0.0%	0.9%	0.0%	0.5%
Glass	1.1%	5.8%	1.7%	2.3%
Textiles	2.9%	9.4%	0.0%	24.4%
Nappies & sanitary	0.0%	4.9%	0.0%	0.8%
Rubble & concrete	53.5%	7.0%	22.3%	4.4%
Timber	36.2%	15.1%	11.7%	28.6%
Rubber	0.0%	0.7%	0.0%	0.5%
Potentially hazardous	0.0%	1.5%	0.0%	0.3%

Construction and demolition waste was largely composed of only two materials – rubble & concrete (53%), and timber (36%).

Industrial/commercial/institutional waste was more heterogeneous, with paper, plastics, organics and timber each comprising between 15% and 18% of the ICI waste.

Organic materials (mainly greenwaste) comprised 63% of landscaping and earthworks waste. Most of the remainder was rubble & concrete (mainly soil), and timber.

The largest component of residential waste was timber, 29%, which included fabricated items, such as furniture, and treated and untreated timber. Textiles was the next largest component, comprising 24% of the total. Much of this category was comprised of carpet and underlay. Residential waste often includes waste from several activities, including landscaping and construction.

4.1.4 General waste from Otaihanga RRF to landfill – vehicle type analysis

In addition to data on the types of waste and composition of the waste, the surveyor collected data on the types of vehicle disposing of each load of general waste. The different vehicle types are described in section 2.3.3. An analysis of the numbers of the different vehicle types surveyed is given in Table 4.4 below. The tonnages for front-loaders, gantry trucks, and compactors (litter trucks only and does not include those carrying kerbside refuse) have been taken directly from the analysis of the weighbridge records. The load counts and tonnages for the other vehicle types are based on the survey results.

Table 4.4 – Otaihanga Resource Recovery Facility vehicle analysis - excludes kerbside refuse collections - 2-15 September 2013

Vehicle type transporting general waste – excludes kerbside refuse collections	# of loads in survey	% of loads in survey	% of weight	Tonnes/ week
Cars	96	38%	4%	7.5 T/week
Compactors (excluding kerbside compactors)	4	2%	2%	3.4 T/week
Front-loaders	6	2%	25%	49.1 T/week
Gantry trucks	20	8%	19%	38.0 T/week
Other trucks	15	6%	18%	36.5 T/week
Trailers	113	44%	32%	64.7 T/week
TOTAL	**254**	**100%**	**100%**	**199.3 T/week**

Almost 40% of all loads were carried by cars (or vans or utes with very small loads that were classified as 'cars'), but these vehicles only accounted for 4% of the general waste. Front-loaders transported 25% of the general waste stream, but comprised only 2% of loads. Gantry trucks represented 8% of the loads and 19% of the general waste. Other trucks, which included tip trucks and box trucks, transported 18% of the weight of general waste. Trailers (and trailer-sized loads in other types of vehicles) comprised nearly half of all loads (44%) and represented 32% of the total weight of general waste.

4.1.5 Primary composition of general waste from Otaihanga RRF to landfill– by vehicle type

The primary composition of the waste transported by each of the six vehicle types carrying general waste is presented in Table 4.5 below. The secondary categories are shown in Appendix 11. Kerbside refuse collection vehicles are not included as they are not considered to be carrying general waste.

Table 4.5 – Primary composition of general waste from Otaihanga RRF to landfill– by vehicle type - 2-15 September 2013

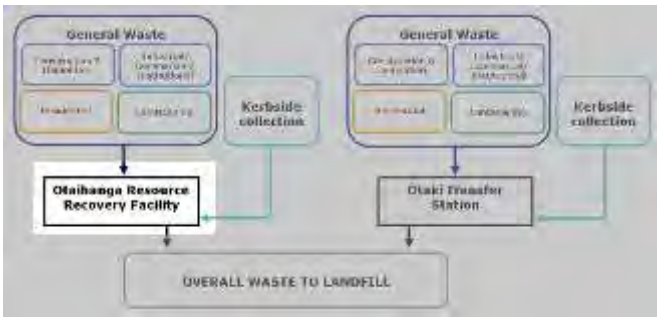
Primary category	Cars	Compactor	Front-loader trucks	Gantry trucks	Other trucks	Trailers
Paper	15.6%	32.9%	16.1%	1.4%	1.7%	8.3%
Plastics	12.3%	17.1%	16.2%	1.9%	1.3%	5.1%
Organics	15.7%	17.1%	18.4%	7.3%	6.2%	6.5%
Ferrous metals	5.4%	1.3%	5.0%	1.6%	1.5%	3.0%
Non-ferrous metals	0.7%	2.6%	0.9%	0.1%	0.1%	0.1%
Glass	1.3%	14.5%	5.6%	2.7%	0.7%	1.2%
Textiles	14.2%	3.9%	9.9%	5.7%	4.0%	10.0%
Nappies & sanitary	2.1%	10.5%	5.1%	0.0%	0.2%	0.3%
Rubble & concrete	6.3%	0.0%	6.4%	27.3%	70.1%	33.0%
Timber	24.9%	0.0%	13.9%	51.9%	14.2%	32.2%
Rubber	0.7%	0.0%	0.8%	0.0%	0.1%	0.1%
Potentially hazardous	0.6%	0.1%	1.8%	0.1%	0.1%	0.1%

There are significant differences in the materials and types of waste transported by the different types of vehicles. Most cars were carrying waste from residential activities, including bagged refuse. Front-loader trucks transported entirely ICI waste.

Over half of the gantry truck loads were from C&D, and the rest were split between residential activities, and landscaping activities. 'Other trucks' transported C&D waste, ICI waste, and some residential waste. Rubble & concrete comprised almost three quarters of all waste from these vehicles. Trailers (which included utes and vans carrying trailer-sized loads) transported primarily C&D and residential waste. Rubble & concrete and timber were the largest components, comprising 33% and 32% of the total respectively.

4.1.6 Overall waste from Otaihanga RRF to landfill 2 – 15 September 2013

The composition of the overall waste stream being disposed of to landfill from the Otaihanga Resource Recovery Facility has been calculated by combining the composition and tonnage of the general waste stream with the composition and tonnage of the kerbside refuse collections disposed of at the facility.



The composition and tonnage of the general waste stream (which excludes kerbside refuse collections) are presented in Table 4.2. The tonnage of kerbside refuse collections is given in Table 4.1 and the composition is presented in section 3.5. The composition of the overall waste stream, which includes both the general waste and kerbside refuse collections, is presented in Table 4.6 below and Figure 4.2 on the next page. The secondary composition is provided in Appendix 12.

Table 4.6 – Primary composition of overall waste from Otaihanga RRF to landfill - 2-15 September 2013

Primary category	% of total	T/week
Paper	11.2%	40.7 T/week
Plastics	8.6%	31.1 T/week
Organics	29.1%	105.4 T/week
Ferrous metals	2.6%	9.6 T/week
Non-ferrous metals	0.6%	2.3 T/week
Glass	3.3%	11.9 T/week
Textiles	6.2%	22.3 T/week
Nappies & sanitary	6.2%	22.4 T/week
Rubble & concrete	15.8%	57.2 T/week
Timber	15.2%	55.2 T/week
Rubber	0.3%	1.0 T/week
Potentially hazardous	0.8%	2.9 T/week
TOTAL	**100.0%**	**362.0 T/week**

Organic material was the largest component of the overall waste, and comprised 29% of the total. Almost half of the organic material is kitchen waste (43%), primarily from kerbside refuse collections. Rubble & concrete and timber are the next largest components of the overall waste, comprising 16% and 15% of the total respectively.

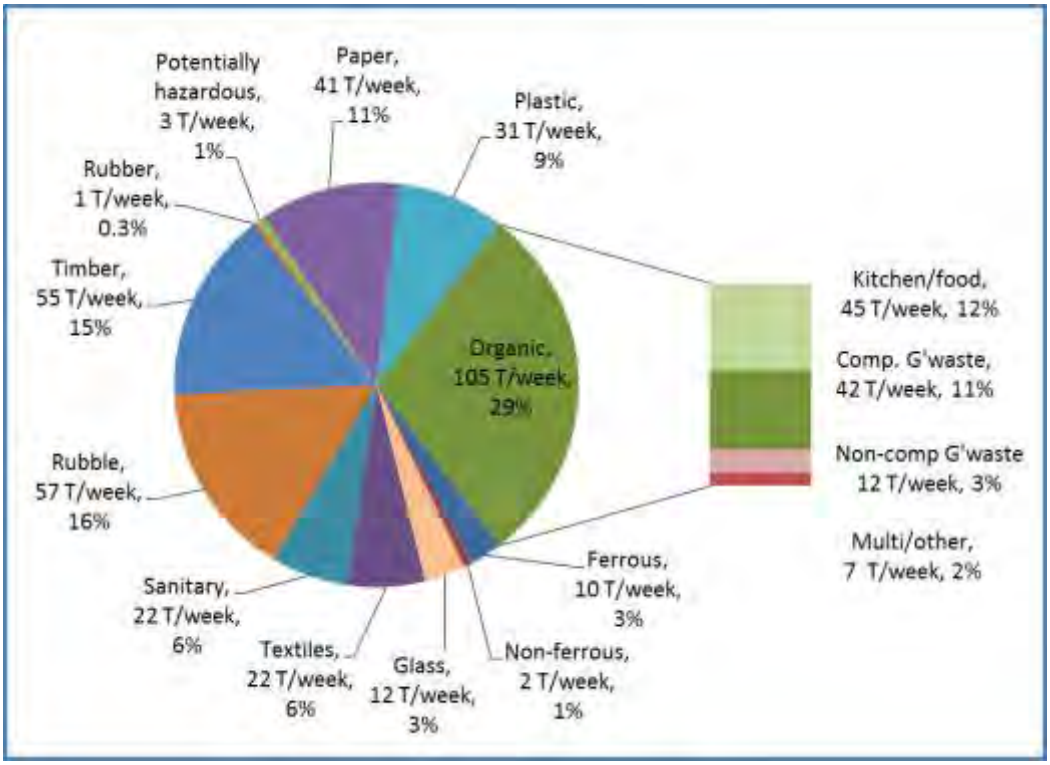


Figure 4.2 - Primary composition of overall waste from Otaihanga RRF to landfill - 2-15 September 2013

4.1.7 Resource recovery potential Otaihanga RRF to landfill 2 – 15 September 2013

A variety of separation and processing methods are available for diverting waste from landfill disposal. While recovery is possible for virtually all waste materials, only those methods commonly in use in New Zealand and relevant to Kāpiti Coast District are considered in this section. Table 4.7 shows the proportion and tonnages of the general and overall landfilled waste streams that could be diverted from Otaihanga RRF. The figures for the secondary categories are taken from the compositions of the general and overall waste streams presented in Appendix 9 and Appendix 12.

Table 4.7 – Diversion potential of overall and general waste streams from Otaihanga RRF to landfill - 2-15 September 2013

Diversion potential of waste to landfill	General waste stream (excl. kerbside refuse)		Overall waste stream (incl. kerbside refuse)	
	% of total	T/week	% of total	T/week
RECYCLABLE AND RECOVERABLE MATERIALS				
Paper - Recyclable	8.3%	16.6 T/week	9.6%	34.8 T/week
Plastics - Recyclable	0.4%	0.8 T/week	1.4%	5.0 T/week
Ferrous metals - All	3.2%	6.3 T/week	2.6%	9.6 T/week
Non-ferrous metals - All	0.5%	0.9 T/week	0.6%	2.3 T/week
Glass - Recyclable	2.2%	4.3 T/week	2.5%	9.0 T/week
Rubble - Cleanfill	9.4%	18.8 T/week	5.3%	19.1 T/week
Timber - Untreated & unpainted	4.8%	9.6 T/week	2.7%	9.6 T/week
Subtotal	**28.8%**	**57.4 T/week**	**24.7%**	**89.3 T/week**
COMPOSTABLE MATERIALS				
Organics - Kitchen/food	4.9%	9.8 T/week	12.5%	45.2 T/week
Organics - Comp. Greenwaste	3.5%	7.0 T/week	11.5%	41.6 T/week
Organics - Multi/other	1.1%	2.2 T/week	1.9%	6.8 T/week
Subtotal	**9.5%**	**18.9 T/week**	**25.8%**	**93.6 T/week**
DIVERTIBLE MATERIALS				
Recyclable + compostable	**38.3%**	**76.4 T/week**	**50.5%**	**182.9 T/week**

Over 29% of the general waste stream and 25% of the overall waste stream could be recycled or recovered. Cleanfill was the largest divertible proportion of the general waste stream, and recyclable paper was the largest divertible component of the overall waste stream.

Nearly 10% of the general waste stream and 26% of the overall waste stream could be composted. Kitchen/food waste is the largest compostable component, comprising 12% of the overall waste stream. Greenwaste comprised a slightly smaller percentage.

In total, approximately 38% of the general waste stream and 50% of the overall waste stream could be recycled, recovered, or composted. These are theoretical maximums, as no recovery system is capable of diverting 100% of a material from landfill disposal.

4.2 Ōtaki Transfer Station

The Ōtaki Transfer Station is situated at 1 Riverbank Road, Ōtaki. A description of the facility and its operation is presented in section 1.1.5.

Ōtaki Transfer Station was surveyed on 6, 8 and 12 September 2013. During this three-day period, data was collected on 104 vehicles, 96 of which were disposing of general waste. The other eight vehicles were disposing of kerbside refuse collections. The results of the survey have been calculated using the weighbridge records for large loads of waste (mainly commercial waste operators), as large loads are weighed. As the weighbridge does not record registration numbers, the surveyors' records of the time for each vehicle were matched with the weighbridge record of the time for each load. The weighbridge does not weigh vehicles that are disposing of smaller loads of waste. For these vehicles, the estimated load weight recorded by the surveyor was used.

The total tonnage of waste being disposed of to landfill from Ōtaki Transfer Station is based on weighbridge records for the period 2-15 September 2013. These records showed an average of 73 tonnes per week being disposed of to Levin landfill from Ōtaki Transfer Station.

4.2.1 Ōtaki waste type analysis

An analysis of the numbers and types of waste loads that were surveyed is given in Table 4.8 below. The analysis includes both the four types of waste that make up the 'general' waste stream (C&D, ICI, landscaping, and residential) and the one type of waste that is not classified as 'general' waste (kerbside refuse collections). A description of the types of waste is given in section 2.3.1. Kerbside refuse collections are not included in the 'general' waste analysis in section 4.2.2, but are included in the 'overall' waste stream analysis, which is presented in section 4.2.6.

The final column in the table shows the average weight per week originating from each type of waste. The tonnage for kerbside refuse collections has been taken directly from the analysis of the weighbridge records. The tonnage for the remainder of the categories was based on the percentages of the 'general' waste stream as determined from the survey.

Table 4.8 – Types of waste from Ōtaki Transfer Station to landfill – 6-12 September 2013

Type of waste	# of loads in survey	% of loads in survey	% of weight	Tonnes/ week
Construction & demolition	5	5%	3%	1.9 T/week
Industrial/commercial/institutional	13	13%	42%	30.3 T/week
Kerbside refuse collections (both Council and private)	8	8%	44%	31.9 T/week
Landscaping & earthworks	2	2%	3%	2.5 T/week
Residential	76	73%	8%	6.1 T/week
TOTAL	**104**	**100%**	**100%**	**72.5 T/week**

Waste generated by C&D activity comprised 5% of the number of vehicle loads and 3% of the total weight. ICI activity generated 13% of loads, which combined weighed 42% of the total

waste. Over 73% of the ICI waste was transported by front loaders, which have a very high average load weight. Kerbside refuse collections, which have a higher-than-average weight per load, represented only 8% of all loads surveyed, but these loads comprised 44% of all waste, by weight. Landscaping and earthworks activity generated 2% of loads, which represented 3% of the total weight. Residential waste comprised 73% of all loads, but only 8% of the total weight. Many residential loads were vehicles dropping off a small number of refuse bags.

4.2.2 Primary composition of 'general' waste from Ōtaki Transfer Station to landfill

The primary composition of 'general waste' (i.e. excluding kerbside refuse collections) disposed of to landfill from Ōtaki Transfer Station is given in Table 4.9 below and Figure 4.3 on the next page. Secondary classifications are given in Appendix 13.

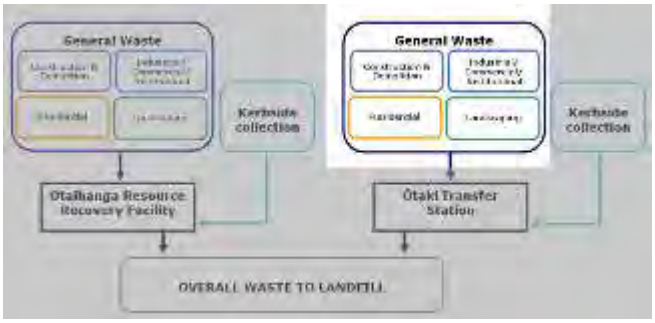


Table 4.9 – Primary composition of general waste from Ōtaki Transfer Station to landfill - 6-12 September 2013 – excludes kerbside refuse collections

Primary category	% of total	T/week
Paper	15.0%	6.1 T/week
Plastics	18.0%	7.3 T/week
Organics	19.9%	8.1 T/week
Ferrous metals	6.3%	2.6 T/week
Non-ferrous metals	1.1%	0.4 T/week
Glass	4.2%	1.7 T/week
Textiles	5.0%	2.0 T/week
Nappies & sanitary	7.0%	2.9 T/week
Rubble & concrete	4.8%	2.0 T/week
Timber	16.5%	6.7 T/week
Rubber	1.1%	0.4 T/week
Potentially hazardous	1.1%	0.4 T/week
TOTAL	**100.0%**	**40.7 T/week**

Organics was the largest primary category of general waste disposed of to landfill from Ōtaki Transfer Station, comprising 20% of the total. Plastic was the second largest category, comprising 18%. Timber and paper comprised similar proportions, at 15-17% of the total.

The data from the vehicle survey was used to determine the composition of the 'general' waste stream. Materials that were disposed of at the separate drop-off points or separated from the waste by staff were not included in the composition survey.

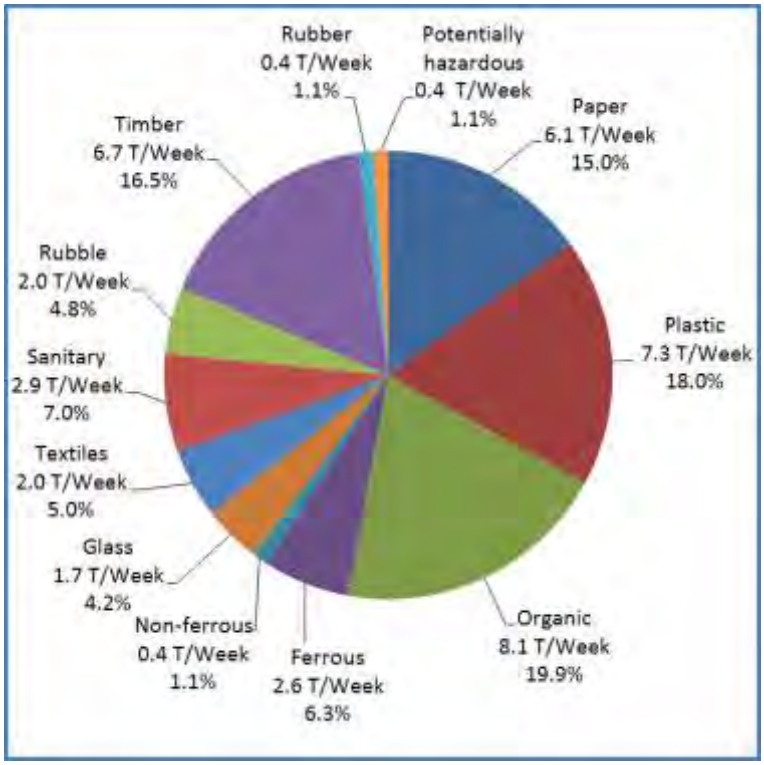


Figure 4.3 - Primary composition of general waste from Ōtaki Transfer Station to landfill - 6-12 September 2013 - excludes kerbside refuse collections

4.2.3 Primary composition of general waste from Ōtaki Transfer Station to landfill – by type of waste

Table 4.10 below shows the primary classifications of the four different types of waste that make up the general waste stream being disposed of to landfill from the Ōtaki Transfer Station. The secondary categories are shown in Appendix 14.

Table 4.10 – Primary composition of general waste from Ōtaki Transfer Station to landfill - by type of waste - 2-15 September 2013

Primary category	C&D	ICI	Landscaping & earthworks	Residential
Paper	4.6%	16.6%	1.5%	15.8%
Plastics	6.9%	21.2%	2.2%	12.0%
Organics	5.7%	13.1%	83.7%	32.1%
Ferrous metals	3.1%	6.8%	1.1%	7.0%
Non-ferrous metals	0.1%	1.3%	0.0%	0.8%
Glass	0.5%	4.9%	0.0%	3.6%
Textiles	7.2%	4.5%	0.0%	9.0%
Nappies & sanitary	1.0%	8.4%	0.1%	5.1%
Rubble & concrete	30.0%	3.9%	4.5%	1.9%
Timber	40.8%	16.9%	6.8%	11.3%
Rubber	0.0%	1.3%	0.0%	0.7%
Potentially hazardous	0.1%	1.3%	0.0%	0.6%

Construction and demolition waste was largely composed of only two materials – timber (41%) and rubble & concrete (30%).

Industrial/commercial/institutional waste was more heterogeneous, with plastics comprising the largest proportion (21%) and paper and timber comprising 17% each.

There were only two loads of landscaping and earthworks waste, which were comprised primarily of organics (84%) and some timber (7%).

A high proportion of residential waste loads comprised small numbers of residential refuse bags, and this is reflected in the composition. The largest component of residential waste was organics, 32%, which included food waste in the bagged refuse and greenwaste.

4.2.4 General waste from Ōtaki Transfer Station to landfill - vehicle type analysis

In addition to data on the types of waste and composition of the waste, the surveyor collected data on the type of vehicle disposing of each load of general waste. The different vehicle types are described in section 2.3.3. An analysis of the numbers of the different vehicle types surveyed is given in Table 4.11 below. As the weighbridge records do not include vehicle registration numbers, it is not possible to identify individual vehicles in the records. As a result, all data are based on the results of the survey.

Table 4.11 – Ōtaki Transfer Station vehicle analysis - excludes kerbside refuse collections - 2-15 September 2013

Vehicle type transporting general waste - excludes kerbside refuse collections	# of loads in survey	% of loads in survey	% of weight	Tonnes/ week
Cars	70	72.9%	11.6%	4.7 T/week
Front-loaders	3	3.1%	54.2%	22.1 T/week
Gantry trucks	1	1.0%	5.8%	2.4 T/week
Other trucks	2	2.1%	0.3%	0.1 T/week
Trailers	20	20.8%	28.1%	11.4 T/week
TOTAL	**96**	**100%**	**100.0%**	**40.7 T/week**

Over 70% of all loads that were disposed of into the push pit were carried by cars (or vans or utes with very small loads that were classified as 'cars'), but these vehicles only accounted for 12% of the general waste. Front-loaders transported 54% of the total waste stream, but comprised only 3% of loads. Gantry trucks represented 1% of the loads and 6% of the general waste. Trailers (and trailer-sized loads in other types of vehicles) comprised 21% of loads and represented 28% of the total weight of general waste.

4.2.5 Primary composition of general waste from Ōtaki Transfer Station to landfill – by vehicle type

The primary composition of the waste transported by each of the five vehicle types carrying general waste disposed of to landfill is presented in Table 4.12 below. The secondary categories are shown in Appendix 15. Kerbside refuse collection vehicles are not considered as carrying general waste.

Table 4.12 – Primary composition of general waste disposed of from Ōtaki Transfer Station to landfill– by vehicle type - 2-15 September 2013

Primary category	Cars	Front-loader trucks	Gantry trucks (1)	Other trucks	Trailers
Paper	15.3%	16.8%	2.1%	42.5%	10.9%
Plastics	13.0%	21.5%	3.1%	12.4%	10.1%
Organics	33.1%	11.8%	94.6%	8.5%	28.0%
Ferrous metals	7.5%	6.7%	0.0%	0.3%	5.7%
Non-ferrous metals	0.6%	1.3%	0.0%	0.1%	0.6%
Glass	5.7%	4.8%	0.0%	33.0%	1.9%
Textiles	7.8%	4.4%	0.0%	0.5%	7.4%
Nappies & sanitary	6.0%	8.3%	0.1%	2.2%	4.2%
Rubble & concrete	1.9%	4.0%	0.0%	0.3%	10.4%
Timber	8.0%	17.6%	0.0%	0.1%	20.0%
Rubber	0.6%	1.3%	0.0%	0.0%	0.4%
Potentially hazardous	0.6%	1.4%	0.0%	0.2%	0.4%

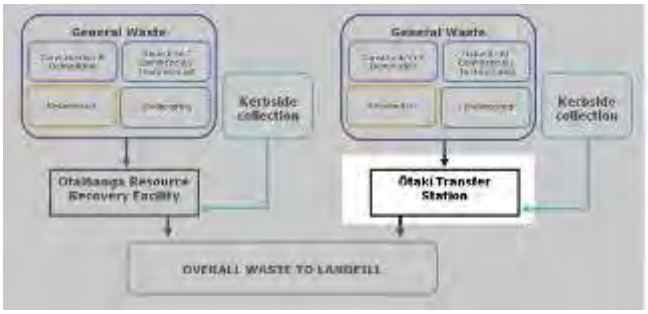
(1) Only one vehicle in survey

There are significant differences in the types of materials and types of waste transported by the different types of vehicles. Most cars were carrying waste from residential activities, including bagged refuse. Cars were not commonly used for transporting C&D-type materials, like timber and rubble. Front-loader trucks transported entirely ICI waste, and the waste contained a high proportion of plastic, timber and paper.

The single gantry truck was transporting landscaping waste. There were only two 'Other trucks' both of which were carrying small loads of ICI waste, comprised predominantly of paper and glass. Trailers (which included utes and vans carrying trailer-sized loads) transported primarily residential and C&D waste. Organics was the largest single component, comprising 28% of the total.

4.2.6 Overall waste from Ōtaki Transfer Station to landfill 2 – 15 September 2013

The composition of the overall waste stream being disposed of to landfill from the Ōtaki Transfer Station has been calculated by combining the composition and tonnage of the general waste stream with the composition and tonnage of the kerbside refuse collections disposed of at the facility.



The composition and tonnage of the general waste stream to landfill are presented in Table 4.9. The tonnage of kerbside refuse collections is given in Table 4.8 and the composition is presented in section 3.5. The composition of the overall waste stream being disposed of to landfill from Ōtaki Transfer Station, which includes both the general waste and kerbside refuse collections is presented in Table 4.13 and Figure 4.4 on the next page. The secondary composition is provided in Appendix 16.

Table 4.13 – Primary composition of overall waste from Ōtaki Transfer Station to landfill - 2-15 September 2013

Primary category	% of total	T/week
Paper	14.3%	10.4 T/week
Plastics	14.1%	10.2 T/week
Organics	33.6%	24.4 T/week
Ferrous metals	4.4%	3.2 T/week
Non-ferrous metals	1.0%	0.7 T/week
Glass	3.8%	2.8 T/week
Textiles	4.4%	3.2 T/week
Nappies & sanitary	8.8%	6.4 T/week
Rubble & concrete	3.5%	2.6 T/week
Timber	10.3%	7.4 T/week
Rubber	0.7%	0.5 T/week
Potentially hazardous	1.0%	0.8 T/week
TOTAL	**100.0%**	**72.5 T/week**

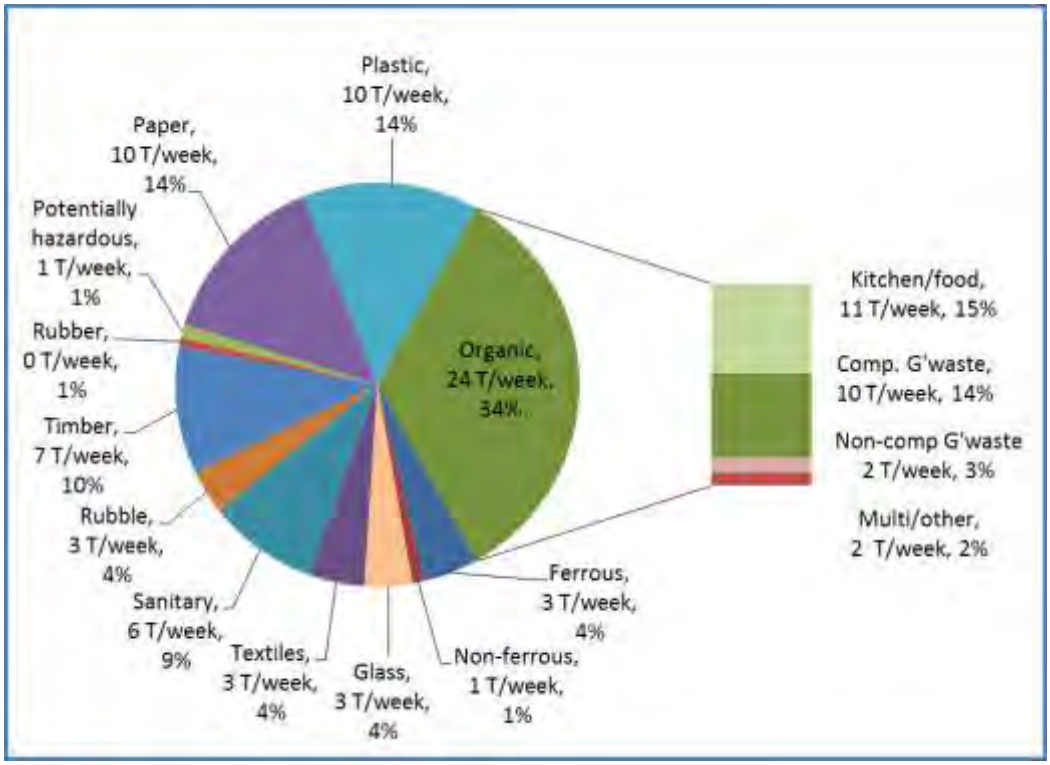


Figure 4.4 - Primary composition of overall waste from Ōtaki Transfer Station to landfill - 2-15 September 2013

5 Overall waste from Kāpiti Coast District to landfill

5.1 Calculation of composition of overall waste from Otaihanga RRF and Ōtaki Transfer Station to landfill - 2 - 15 September 2013

The composition of the overall waste stream being disposed of to landfill from Otaihanga Resource Recovery Facility and Ōtaki Transfer Station is calculated by combining four separate waste streams:

1. Residential kerbside refuse bags – Composition as analysed in section 3.2
2. Residential MGBs – Composition as analysed in sections 3.3 and 3.4
3. General waste from Otaihanga RRF to landfill – Composition as analysed in section 4.1.2
4. General waste from Ōtaki Transfer Station to landfill – Composition as analysed in section 4.2.2

These waste streams are shown in Figure 5.1 below. This figure is the same as Figure 2.2.

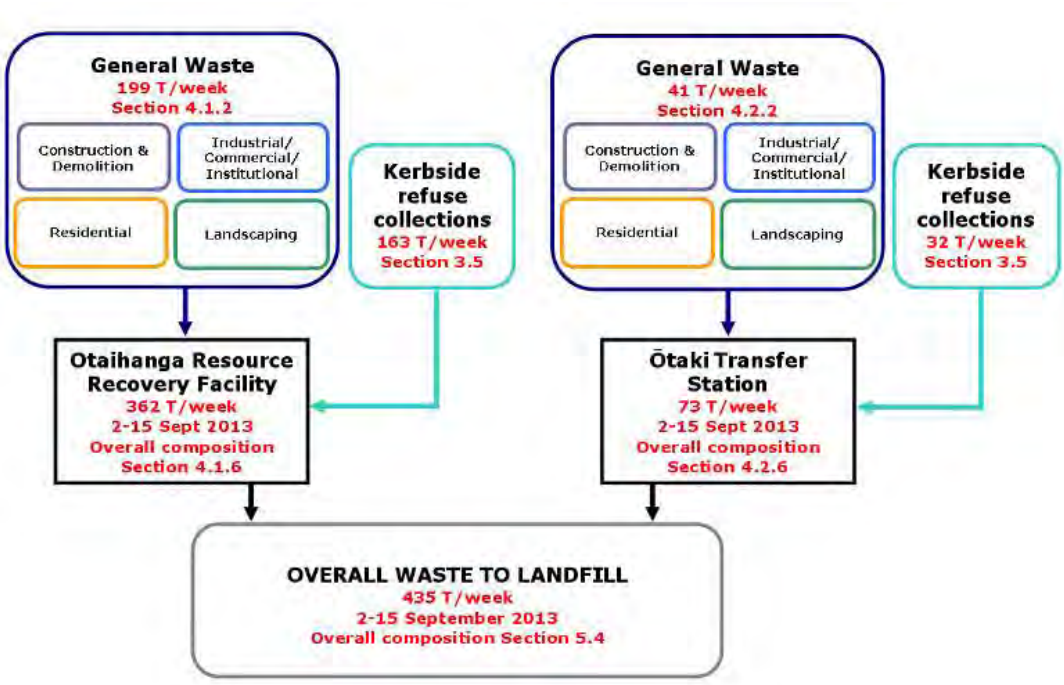


Figure 5.1 – Waste flows from Kāpiti Coast District to landfill– 2-15 September 2013

The calculations do not include materials disposed of at the closed landfill site at Otaihanga or any waste that is taken directly from the District to landfill without passing through either of the disposal facilities in the District.

5.2 Analysis of types of waste in overall waste from Otaihanga RRF and Ōtaki Transfer Station to landfill

An analysis of the types of waste comprising the overall waste stream is presented in Table 5.1 below. The tonnages for each type of waste have been calculated by adding the corresponding tonnages from the Otaihanga and Ōtaki facilities as shown in Table 4.1 and Table 4.8.

Table 5.1 – Analysis of types of waste in overall waste stream – 2-15 September 2013

Types of waste	% of weight	Tonnes/week
Construction & demolition	20.3%	88.1 T/week
Industrial/commercial/institutional	26.1%	113.3 T/week
Kerbside refuse collections	44.8%	194.7 T/week
Landscaping & earthworks	1.8%	7.7 T/week
Residential	7.1%	30.8 T/week
TOTAL	**100.0%**	**434.5 T/week**

Waste generated by C&D activity comprised 20% of the overall waste stream. C&D waste can be both seasonal and affected by economic conditions. ICI activity generated 26% of the total waste. ICI waste is affected by both seasonality and economic conditions, but to a lesser extent than C&D waste. Kerbside refuse collections comprised 45% of all waste, by weight.

Landscaping and earthworks activity generated about 2% of the total waste stream. Landscaping waste is seasonal, and the surveys took place before the rapid vegetation growth of spring had fully started. Residential waste (which excludes kerbside refuse collected from residential properties) represented about 7% of the total waste stream.

5.3 Overall waste from 'household activity'

In the estimate of the overall waste that arises from 'household activity' given in Table 5.2, it is assumed that:

1) Construction and demolition waste does not arise from household activity
2) All kerbside refuse collections are from household activity
3) All landscaping waste is from household activity

Table 5.2 – Overall waste from 'household activity' – 2-15 September 2013

Types of waste	% of weight	Tonnes/week
Kerbside refuse collections	44.8%	194.7 T/week
Landscaping & earthworks	1.8%	7.7 T/week
Residential	7.1%	30.8 T/week
TOTAL	**53.7%**	**233.2 T/week**

Based on these assumptions, 54% of the overall waste stream from Otaihanga RRF and Ōtaki Transfer Station to landfill is generated by 'household activity'.

5.4 Primary composition of overall waste from Otaihanga RRF and Ōtaki Transfer Station to landfill

The primary composition for the overall waste stream presented in Table 5.3 has been calculated using the methods described in section 5.1. The secondary composition is presented in Appendix 17. The weekly tonnage is based on the weighbridge records for 2-15 September 2013 of refuse disposed of to landfill, as provided by Council.

Table 5.3 – Primary composition of overall waste from Otaihanga RRF and Ōtaki Transfer Station to landfill - 2-15 September 2013

Primary category	% of total	T/week
Paper	11.8%	51.1 T/week
Plastics	9.5%	41.4 T/week
Organics	29.9%	129.8 T/week
Ferrous metals	2.9%	12.8 T/week
Non-ferrous metals	0.7%	3.1 T/week
Glass	3.4%	14.7 T/week
Textiles	5.9%	25.5 T/week
Nappies & sanitary	6.6%	28.8 T/week
Rubble & concrete	13.8%	59.7 T/week
Timber	14.4%	62.6 T/week
Rubber	0.3%	1.5 T/week
Potentially hazardous	0.8%	3.7 T/week
TOTAL	**100.0%**	**434.5 T/week**

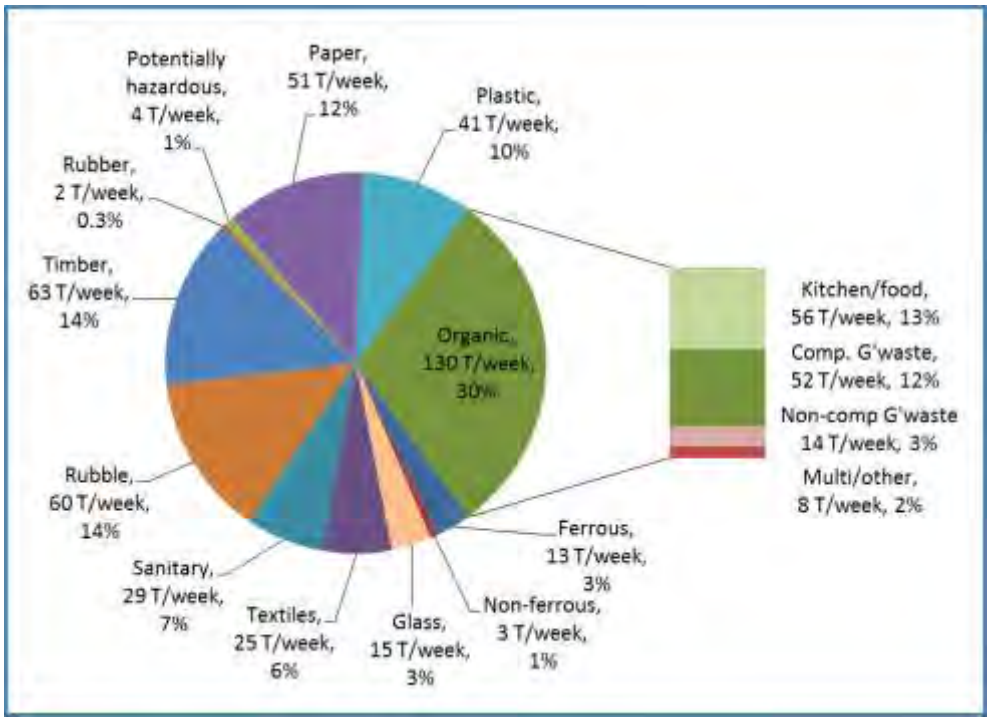


Figure 5.2 - Primary composition of overall waste to landfill – 2-15 September 2013

5.5 Resource recovery potential of overall waste stream

A variety of separation and processing methods are available for diverting waste from landfill disposal. While recovery is possible for virtually all waste materials, only those methods commonly in use in New Zealand and relevant to Kāpiti Coast are considered in this section. Table 5.4 shows the proportion and tonnages of the landfilled waste stream that could be diverted. The figures for the secondary categories are taken from the composition of the overall waste stream presented in Appendix 17.

Table 5.4 – Diversion potential of overall waste stream

Diversion potential of overall waste to landfill	% of total	T/week
RECYCLABLE AND RECOVERABLE MATERIALS		
Paper - Recyclable	10.1%	44 T/week
Plastics - Recyclable	1.4%	6 T/week
Ferrous metals - All	2.9%	13 T/week
Non-ferrous metals - All	0.7%	3 T/week
Glass - Recyclable	2.6%	11 T/week
Rubble - Cleanfill	4.5%	20 T/week
Timber - Untreated & unpainted	2.4%	10 T/week
Subtotal	**24.7%**	**107 T/week**
COMPOSTABLE MATERIALS		
Organics - Kitchen/food	12.9%	56 T/week
Organics - Comp. Greenwaste	11.9%	52 T/week
Organics - Multi/other	1.9%	8 T/week
Subtotal	**26.7%**	**116 T/week**
DIVERTIBLE MATERIALS Recyclable + compostable	**51.4%**	**224 T/week**

About 25% of the overall waste stream could be recycled or recovered. Recyclable paper is the largest component of this, comprising 10% of the overall waste stream. These are conservative figures as other materials, such as textiles and plasterboard, could also be diverted from disposal, but are not included in the analysis.

Nearly 27% of the overall waste stream could be composted. Kitchen/food waste is the largest compostable component, comprising nearly 13% of the overall waste stream. A high proportion of kitchen waste is in kerbside refuse.

In total, approximately 51% of the overall waste stream could be recycled, recovered, or composted. This is a theoretical maximum, as no recovery system is capable of diverting 100% of a material from landfill disposal.

6 Discussion and analysis

6.1 Comparisons with previous audits

Previous surveys of the composition of waste being disposed of in Kāpiti Coast District were conducted in 2002 by AgFirst Research, in 2007 by MWH New Zealand, and in 2010 by Waste Not Consulting. In this section, results of the baseline 2010 audit are compared to the 2013 audit.

The composition of the bagged refuse from the two surveys is presented in Table 6.1.

Table 6.1 – Comparison of residential bagged refuse composition – 2010-2013

Residential bagged refuse	2013	2010
Paper	11.9%	14.7%
Plastics	14.6%	14.5%
Organics - subtotal	**41.6%**	**45.1%**
Comprising Kitchen waste	*34.7%*	*38.8%*
Greenwaste	*2.3%*	*2.9%*
Other	*4.5%*	*3.4%*
Ferrous metals	1.6%	1.8%
Non-ferrous metals	1.0%	1.1%
Glass	2.7%	4.5%
Textiles	8.1%	2.2%
Nappies & sanitary	15.9%	12.3%
Rubble & concrete	0.3%	1.6%
Timber	0.4%	1.0%
Rubber	0.3%	0.2%
Potentially hazardous	1.5%	1.0%
TOTAL	**100.0%**	**100.0%**
Average bag weight	**6.15 kg**	**5.93 kg**

There are several minor differences between the 2010 and the 2013 audits, with an increase in textiles being the most significant. There is no apparent reason for the quantity of textiles to have increased to such an extent, and the increase may be due to random sampling differences. Another alternative is there has been an increase in consumer spending, with more households buying new clothes and disposing of old clothes in 2013.

The composition of MGB refuse from the two audits is compared in Table 6.2.

Table 6.2 – Comparison of MGB refuse composition – 2010-2013

MGB refuse	120-litre MGBs	240-litre MGBs	120- and 240- litre combined
	2013	2013	2010
Paper	9.1%	15.1%	16.9%
Plastics	10.4%	7.4%	9.3%
Organics - subtotal	**48.8%**	**54.3%**	**49.0%**
Comprising : Kitchen waste	*23.0%*	*18.3%*	*25.9%*
Greenwaste	*23.3%*	*33.5%*	*21.5%*
Other	*2.6%*	*2.5%*	*1.6%*
Ferrous metals	1.8%	2.2%	2.1%
Non-ferrous metals	1.9%	0.5%	0.9%
Glass	2.9%	3.7%	4.8%
Textiles	3.6%	2.6%	3.2%
Nappies & sanitary	11.0%	10.0%	6.3%
Rubble & concrete	6.9%	0.5%	3.1%
Timber	1.9%	2.9%	3.5%
Rubber	0.1%	0.2%	0.1%
Potentially hazardous	1.7%	0.6%	0.8%
TOTAL	**100.0%**	**100.0%**	**100.0%**
Average MGB weight	**11.62 kg**	**21.98 kg**	**15.49 kg**

The composition of MGB refuse is relatively similar between 2010 and 2013, with a few minor exceptions. The 2013 240-litre MGBs contained a markedly higher proportion of greenwaste than the others. This may be a function of random sampling or differences in weather preceding the audits. The relatively high proportion of rubble & concrete in 120-litre MGBs is somewhat anomalous, as the smaller bins generally contain less waste of this type than larger bins.

The composition of the overall waste stream from the 2013 audit (as presented in section 5.4) is compared with those from the 2010 audit in Table 6.3 on the next page. The 2010 audit used the same visual surveying methodology as the 2013 audit and was undertaken by the same surveyor.

Table 6.3 – Comparison of overall waste – 2010-2013

Overall waste to landfill	2013	2010
Paper	11.8%	13.0%
Plastics	9.5%	10.1%
Organics - subtotal	**29.9%**	**33.6%**
Comprising Kitchen waste	*12.9%*	*19.2%*
Greenwaste	*15.1%*	*12.8%*
Other	*1.9%*	*1.6%*
Ferrous metals	2.9%	3.0%
Non-ferrous metals	0.7%	0.8%
Glass	3.4%	4.6%
Textiles	5.9%	5.3%
Nappies & sanitary	6.6%	5.3%
Rubble & concrete	13.8%	6.7%
Timber	14.4%	16.3%
Rubber	0.3%	0.5%
Potentially hazardous	0.8%	0.7%
TOTAL	**100%**	**100%**

The greatest difference between the 2010 and 2013 audits is the increase in the proportion of rubble & concrete. This is associated with the increase in the proportion of C&D waste in 2013.

6.2 Per capita disposal of kerbside refuse per annum

The per capita disposal of kerbside refuse for residents of Kāpiti Coast District is calculated in Table 6.4 below. The total for kerbside refuse includes both private and Council collections of both residential and commercial refuse in both bags and MGBs. The results from both the 2010 and 2013 surveys are shown.

Table 6.4 – Per capita disposal of kerbside refuse – residential kerbside refuse bags and MGBs combined

Year of audit	2013	2010
Population of Kāpiti Coast District	**49,104**	**48,900**
Total kerbside refuse collections per week to Otaihanga	163 T/week	137 T/week
Total kerbside refuse collections per week to Ōtaki	32 T/week	58 T/week
Total kerbside refuse collections per week combined	195 T/week	195 T/week
Estimated annual tonnage of kerbside refuse (above total x 52)	10,123 T/annum	10,180 T/annum
Per capita disposal of kerbside refuse	**206 kg/capita/annum**	**208 kg/capita/annum**

The estimated 10,123 tonnes per annum of kerbside refuse, as calculated for the 2013 survey, equates to 206 kg/capita/annum. This is very similar to the calculated figure of 208 kg/capita/annum from the 2010 survey. These figures are compared to the disposal rates from other areas previously surveyed by Waste Not Consulting in Table 6.5 below. All of these figures are for commercial and residential kerbside refuse combined, as these are often collected in the same vehicles and can not be readily distinguished.

Table 6.5 – Comparison of per capita disposal of kerbside refuse

Residential and commercial kerbside refuse combined	Kg/capita/annum
Former North Shore City 2011	142
Hauraki District 2011	145
South Taranaki District 2010	149
Waimakariri District 2012	165
Matamata-Piako District 2011	170
Gore District 2011	180
Tauranga City and Western Bay of Plenty 2010	183
Invercargill City 2011	203
Kāpiti Coast District 2013	***206***
Kāpiti Coast District 2010	***208***
Taupo District 2013	212
Hastings District/Napier City 2012	214
Southland District 2011	250

The per capita rate of kerbside refuse disposal from Kāpiti Coast is very similar to the rate in several other districts measured. These rates are associated with the generation of residential refuse by households, the proportion of households using MGBs, the level of commercial and industrial activity, and the uptake of kerbside refuse services by the commercial sector relative to other waste services, such as gantry bins and front-loader bins.

The per capita rate of disposal is also associated with the proportion of households that are serviced by kerbside refuse collections. All private collectors provide collection services in the urban area, which is approximately 95% of households in the Kāpiti Coast District. Householders outside the urban area may take their residential refuse directly to a transfer station or enter into a contract with a private collector. Residential bagged refuse that is taken by the householder directly to a transfer station is not included in the figures in Table 6.6.

6.3 Per capita disposal of waste to landfill per annum

The per capita disposal of residual waste from Kāpiti Coast District that is disposed of to landfill through transfer stations in the District is calculated for 2010 and 2013 as shown in Table 6.7 below. This figure is compared to disposal figures from other local authorities surveyed by Waste Not Consulting since 2008 in Table 6.8 on the next page. This figure comprises all waste disposed of to landfill from Otaihanga RRF and Ōtaki Transfer station. The figures in Table 6.7 and Table 6.8 do not include special wastes, such as treated (dried) biosolids, which are being disposed of at Otaihanga closed landfill.

These calculations are based on the assumption that there is no waste taken directly from Kāpiti Coast District to landfill. Although this assumption has not been verified for this report,

discussions with waste operators and Council indicate that only minimal amounts of waste, if any, are transported from within Kāpiti Coast District to disposal facilities other than Ōtaki Transfer Station and Otaihanga RRF.

The annual tonnages for the two facilities have been taken from monthly weighbridge records provided by Council.

Table 6.7 – Per capita disposal of waste to landfill

Per capita disposal of waste to landfill	2013	2010
Population Kāpiti Coast (Stats NZ 2009 estimate)	x	48,900
Population Kāpiti Coast (Stats NZ 2013 census)	49,104	x
Otaihanga refuse to landfill – Sept 2009-August 2010	x	16,145 T
Ōtaki refuse to landfill – August 2009-July 2010	x	3,947 T
Otaihanga refuse to landfill – July 2012-June 2013	16,488 T	x
Ōtaki refuse to landfill – July 2012-June 2013	5,167 T	x
Total refuse to landfill per annum	21,655 T	20,092 T
Tonnes/capita/annum	**0.441 T/capita/ annum**	**0.411 T/capita/ annum**

The calculations show that in 2010 a total of 0.411 tonnes of waste per capita per annum was disposed of to landfill from Kāpiti Coast District. The comparable figure for 2013 was 0.441 tonnes. This represents a 7% increase.

As shown in Table 6.8, the per capita rate of waste disposal to landfill from Kāpiti Coast District is in the lower range of the territorial authority areas measured.

Table 6.8 – Disposal rates compared to other local authorities

Overall waste (excluding special waste)	Population	Waste disposed - tonnes per annum	Tonnes per capita per annum
Waimakariri District 2012	48,600	15,121	0.311
Westland District 2011	9,000	2,978	0.331
Southland District 2011	28,900	9,917	0.343
Kāpiti Coast District 2010	***48,900***	***20,092***	***0.411***
Kāpiti Coast District 2013	***49,104***	***21,655***	***0.441***
Tauranga/WBoP District 2010	157,400	71,092	0.452
Napier/Hastings 2012	133,300	64,449	0.483
Taupo District 2013	34,300	17,612	0.513
Gore District 2011	12,100	6,245	0.516
Invercargill City 2011	53,900	31,262	0.580
New Plymouth District 2010	72,300	46,952	0.630
Queenstown Lakes District 2011	28,200	19,060	0.676
Auckland Council 2010	1,463,000	1,174,078	0.803

While the necessary research required to understand the differences in waste generation and disposal has not been undertaken, it is likely that higher levels of per capita waste disposal are associated with higher levels of particular types of industrial activity.

6.4 Televisions, computer monitors, and other CRTs

The visual surveys took place shortly before the changeover from analogue to digital television broadcasting in the lower North Island. This changeover resulted in a large number of residents purchasing digital televisions and disposing of analogue models. Customers at Otaihanga RRF and Ōtaki transfer station were instructed by weighbridge staff to dispose of televisions at the designated drop-off point.

During the visual survey at Otaihanga RRF and Ōtaki transfer station, the surveyor did not observe any televisions, computer monitors, or CRTs being disposed of to landfill. All units were either separated by the customers or removed from the pit by staff.

6.5 Recoverable waste streams

The photos below show some of the waste streams observed during the course of the surveys that could be diverted from landfill disposal. Most of these waste streams could be readily diverted at source, or arrangements made by the waste generator for more appropriate disposal. For the most part, transfer station staff recover only scrap metal and reusable household items in good condition.

Cardboard in front-loader load

Tip truck load of gravel and cured asphalt

One of several loads of concrete bricks

Gantry load of greenwaste

Timber framing

Trailer load of cardboard packaging

6.6 Comparisons with other districts

6.6.1 Composition of residential kerbside refuse

Table 6.9 below compares, by percentage of total, the composition of Kāpiti Coast District Council combined kerbside refuse in 2013, as presented in section 3.5, with the results from the 2010 audit and that of four other councils' kerbside refuse. It has been necessary to amalgamate several secondary categories of plastic in order to compare the compositions directly.

Table 6.9 - Comparison of Kāpiti Coast combined kerbside refuse with other districts

Primary category	Secondary category	Kāpiti Coast District	Kāpiti Coast District	Ashburton District	New Plymouth District	Waimakariri District	Auckland City
		Sept. 2013	Sept. 2010	October 2012	March 2012	Sept 2012	April 2011
Paper	Recyclable paper	11.2%	14.2%	9.3%	10.5%	5.0%	9.2%
	Multimaterial/other	2.2%	2.2%	2.0%	1.1%	1.2%	1.4%
	Subtotal	**13.3%**	**16.4%**	**11.3%**	**11.6%**	**6.3%**	**10.7%**
Plastics	Recyclable plastic	2.6%	3.5%	2.5%	2.2%	2.7%	2.0%
	Multimaterial/other	6.6%	6.8%	13.2%	6.9%	6.0%	8.4%
	Subtotal	**9.1%**	**10.4%**	**15.7%**	**9.2%**	**8.6%**	**10.4%**
Organics	Kitchen waste	21.8%	28.5%	37.5%	17.3%	24.2%	40.5%
	Greenwaste	26.6%	17.8%	4.8%	37.0%	36.8%	12.5%
	Multimaterial/other	2.8%	1.9%	4.8%	1.3%	4.8%	3.7%
	Subtotal	**51.2%**	**48.2%**	**47.0%**	**55.6%**	**65.8%**	**56.7%**
Metal ferrous	Steel cans	0.7%	1.5%	1.4%	1.2%	0.6%	0.8%
	Multimaterial/other	1.3%	0.6%	0.5%	0.6%	0.2%	1.9%
	Subtotal	**2.0%**	**2.1%**	**1.8%**	**1.8%**	**0.8%**	**2.8%**
Metal non-ferrous	Aluminium cans	0.3%	0.2%	0.2%	0.3%	0.2%	0.2%
	Multimaterial/other	0.5%	0.8%	0.7%	0.2%	0.6%	0.6%
	Subtotal	**0.9%**	**1.0%**	**0.9%**	**0.5%**	**0.8%**	**0.8%**
Glass	Glass bottles/jars	2.8%	4.1%	2.7%	6.2%	0.6%	1.6%
	Multimaterial/other	0.5%	0.7%	0.7%	0.4%	0.4%	0.5%
	Subtotal	**3.3%**	**4.7%**	**3.3%**	**6.6%**	**1.0%**	**2.1%**
Textiles	Clothing & textile	1.8%	1.7%	2.4%	0.8%	2.0%	1.9%
	Multimaterial/other	1.8%	1.3%	2.5%	0.9%	1.5%	1.2%
	Subtotal	**3.7%**	**3.0%**	**4.9%**	**1.6%**	**3.5%**	**3.1%**
Nappies & sanitary		**11.1%**	**7.4%**	**11.7%**	**8.6%**	**6.7%**	**10.4%**
Rubble		**1.9%**	**2.8%**	**1.4%**	**2.5%**	**4.2%**	**1.2%**
Timber		**2.3%**	**3.0%**	**0.3%**	**0.4%**	**1.2%**	**1.0%**
Rubber		**0.2%**	**0.1%**	**0.7%**	**0.0%**	**0.1%**	**0.1%**
Potentially hazardous	Household	0.6%	0.7%	0.8%	0.3%	0.8%	0.9%
	Other	0.4%	0.1%	0.1%	1.2%	0.2%	0.1%
	Subtotal	**1.0%**	**0.9%**	**1.0%**	**1.5%**	**1.0%**	**0.8%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

In all cases, the composition that is given includes virtually all kerbside refuse. In Kāpiti Coast, Ashburton, New Plymouth, and Waimakiri the audits included both council refuse bags and private waste collectors' MGBs. In Auckland City, only the council's 120-litre MGBs were audited as the council service controls a very high proportion of the kerbside market.

When this comparison was made for Council's kerbside refuse bags in the 2010 report, in general, there was a higher proportion of all recyclable materials in the Kāpiti Coast refuse bags than in most of the other councils' bags. This may have been associated with the kerbside recycling service in the District having been in operation for only two years at the time. Recycling behaviour tends to improve as a recycling system 'matures'. The comparison in Table 6.9, however, shows the proportion of recyclable materials in the overall kerbside refuse stream in Kāpiti Coast is similar, in most instances, to kerbside refuse in other areas.

The proportion of materials classified as 'Nappies & sanitary' tends to vary between districts depending on the proportion of infants in the population. A higher proportion of elderly residents can also result in increased quantities of 'adult incontinence products', which are also classified as 'Nappies & sanitary'. In the 2013 audit, Kāpiti Coast kerbside refuse had a markedly higher proportion of Nappies & sanitary than in 2010. As it is unlikely the demographics of the area have changed significantly in the three year period, the change is more likely the result of differences from random sampling.

6.6.2 Types of waste to landfill

Using the methodology described in section 2.3 for determining the composition of residual waste being disposed of to landfill, Waste Not Consulting has conducted surveys for a large number of territorial authorities. This allows for a direct comparison to be made between the overall waste streams in these districts. As the global financial crisis of 2008 had a significant effect on economic activity and waste volumes, only surveys conducted in recent years have been included in the comparisons.

Table 6.10 compares the tonnes per week from each type of waste for Kāpiti Coast District from 2013 and 2010 with four other districts. 'Type of waste' refers to the vehicle load categories described in section 2.3.1. The Kāpiti Coast data for 2013 in Table 6.10 has been taken directly from Table 5.1. In Table 6.10, special wastes and cleanfill have in all instances been excluded from the analysis to provide a more meaningful comparison.

Table 6.10 – Comparison of type of waste to landfill - % of total

% of waste to landfill – excluding special wastes and cleanfill	Kāpiti Coast District	Kāpiti Coast District	Waimakariri District	Westland District	Christchurch City	Taupo District
Year of audit	**2013**	**2010**	**2012**	**2011**	**2012**	**2013**
Construction & demolition	*20%*	*10%*	*17%*	*10%*	*28%*	*18%*
Industrial/commercial/institutional	*26%*	*27%*	*20%*	*42%*	*31%*	*37%*
Landscaping & earthworks	*2%*	*2%*	*5%*	*2%*	*4%*	*4%*
Residential	*7%*	*9%*	*14%*	*7%*	*7%*	*12%*
General waste - subtotal	**55%**	**50%**	**59%**	**61%**	**71%**	**70%**
Kerbside refuse collections	45%	50%	41%	39%	29%	30%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

While the breakdown of the types of waste being disposed of to landfill from each of the six surveys is similar, there are minor differences. In both 2010 and 2013, Kāpiti Coast District had a higher proportion of kerbside refuse collections, and a lower proportion of general waste than the other districts. This may be associated with the level of commercial/industrial activity in the District compared to the others.

The proportion of C&D waste has increased markedly in Kāpiti Coast District between the 2010 and 2013 surveys. One possible reason for the increase since 2010 may be that Council has put new cleanfill disposal criteria in place at the closed Otaihanga landfill, which became effective as of July 2013. The new criteria mean larger concrete pieces, which are classified as C&D waste, are not accepted and are now disposed of at the Otaihanga Resource Recovery Facility as general waste.

6.6.3 Composition of overall waste

The corresponding primary compositions of waste to landfill for the six SWAP surveys in the previous table are shown in Table 6.11.

Table 6.11 – Primary composition of overall waste to landfill - (excluding special wastes and cleanfill)

% of waste to landfill – excluding special wastes and cleanfill	Kāpiti Coast District	Kāpiti Coast District	Waimakariri District	Westland District	Christchurch City	Taupo District
Year of audit	**2013**	**2010**	**2012**	**2011**	**2012**	**2013**
Paper	11.8%	13.0%	7.4%	19.8%	9.3%	11.6%
Plastics	9.5%	10.1%	9.6%	15.4%	12.2%	12.8%
Organics	29.9%	33.6%	36.0%	25.0%	21.0%	25.1%
Ferrous metals	2.9%	3.0%	2.7%	2.6%	3.1%	3.4%
Non-ferrous metals	0.7%	0.8%	0.5%	0.5%	0.5%	0.8%
Glass	3.4%	4.6%	1.2%	3.3%	4.0%	3.9%
Textiles	5.9%	5.3%	7.6%	4.5%	6.7%	6.6%
Nappies & sanitary	6.6%	5.3%	4.1%	5.5%	4.1%	6.3%
Rubble & concrete	13.8%	6.7%	11.8%	8.3%	13.2%	11.4%
Timber	14.4%	16.3%	18.3%	14.2%	22.0%	16.9%
Rubber	0.3%	0.5%	0.2%	0.2%	0.5%	0.6%
Potentially hazardous	0.8%	0.7%	0.6%	0.7%	3.4%	0.7%
TOTAL	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

The differences between the compositions are associated with a range of factors, such as the nature and magnitude of manufacturing and primary industry, the level of construction and demolition activity, and the availability of recycling and waste recovery services in the region. The high proportion of potentially hazardous materials in the Christchurch City waste is related to street sweepings disposed of at the transfer stations in the area.

The accuracy and precision of the surveying methods, the timing of the audits, and the effects of random sampling must be taken into account when comparing the compositions. Although the confidence intervals have not been calculated for all of the results shown, it is possible that most of the differences are not statistically significant.

6.7 Precision of results of kerbside refuse audits

The MfE's Solid Waste Analysis Protocol (SWAP) defines a precision level (margin of error/mean) of ±20% as being a "reasonable level of accuracy". The precision level of a result is directly related to the standard variation of the samples – in this case, how much the quantity of a particular material varies amongst the different samples. A material that is present in roughly similar quantities in all samples, such as "Other plastic bags & film", will have a better precision level than a material that is not common in household refuse, such as timber, or is present in highly variable amounts, such as rubble.

Precision levels for the primary categories in the refuse bag and MGB audits are given in Table 6.12.

Table 6.12 – Precision level of primary categories

Precision level	Residential refuse bags	120-litre MGBs	240-litre MGBs
Paper	***20%***	23%	83%
Plastics	***13%***	***14%***	***17%***
Organics	***19%***	21%	22%
Ferrous metals	33%	43%	82%
Non-ferrous metals	53%	100%	46%
Glass	43%	44%	49%
Textiles	68%	75%	46%
Nappies & sanitary	52%	43%	78%
Rubble, concrete, etc.	121%	128%	120%
Timber	148%	74%	83%
Rubber	151%	115%	126%
Potentially hazardous	47%	115%	44%

In the refuse bag audit, the results for three of the primary categories (paper, plastics, and organics) fell within the SWAP definition of a "reasonable level of accuracy". In the audits of 120-litre and 240-litre MGBs audit, the plastics category had precision levels less than ±20%. In the 120-litre MGB audit two other categories, paper and organics, were only slightly over ±20%. The precision level for paper in the 240-litre MGB audit was much higher than in the other audits. This was primarily due to a single MGB that contained a large quantity of undistributed junk mail.

Given the small sample sizes, the precision level of the results are satisfactory. In an audit of 500 refuse bags sorted into 50 samples, it is uncommon to obtain "reasonable levels of accuracy" for more than four of the primary categories.

6.8 Weekly waste to landfill from Kāpiti Coast District – by month

Using the monthly data provided by Council for Otaihanga RRF and Ōtaki Transfer Station for the period July 2012 to June 2013, the average weekly tonnage of waste being disposed of to landfill for each month has been calculated. The results are shown in Table 6.13 and Figure 6.1 below.

Table 6.13 – Tonnes/week to landfill from Kāpiti Coast District

Tonnes/week to landfill	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Annual average	Survey period
Otaihanga RRF	248	290	283	338	327	330	373	281	315	333	340	307	314	362
Ōtaki transfer station	71	65	108	117	117	122	130	93	93	91	94	79	98	73
TOTAL	**319**	**355**	**390**	**454**	**444**	**452**	**503**	**374**	**408**	**423**	**434**	**386**	**412**	**435**

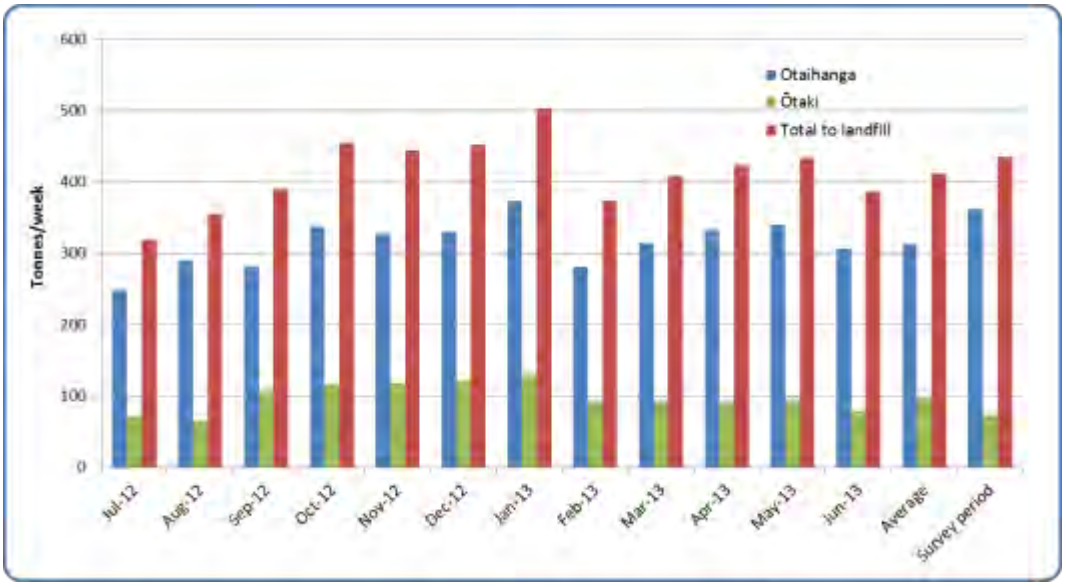


Figure 6.1 – Tonnes/week to landfill from Kāpiti Coast District

For the year to June 2013, an average of 412 tonnes per week of residual week was being disposed of to landfill from Kāpiti Coast District. During the survey period of 2-15 September, the average weekly figure was 435 tonnes, 5% higher than the annual average.

During the survey period, the weekly tonnage to landfill from Otaihanga RRF was 15% higher than the annual average and the weekly tonnage from Ōtaki Transfer Station was 26% lower than the annual average.

Appendix 1 – Waste flow summary

KĀPITI COAST DISTRICT COUNCIL - CONTROLLED WASTE STREAMS	
COUNCIL KERBSIDE REFUSE COLLECTION	
Residential kerbside	• The Council kerbside refuse collection has been phased out. As of 1 July 2013 Council was no longer selling rubbish bags to retailers, and as of 1 October 2013 Council rubbish bags are no longer collected from the kerbside.
Commercial kerbside	• Council provides no refuse collection services to commercial properties.
COUNCIL KERBSIDE RECYCLING COLLECTION	
Kerbside collection of recyclables	• Council does not provide a kerbside recycling service to residents.
Drop-off points	• Free drop off for recyclables at Park Avenue, Waikanae, the Ōtaki Transfer Station (Ōtaki TS) and Otaihanga Resource Recovery Facility (Otaihanga RRF).
INORGANIC REFUSE COLLECTION	
Kerbside collection of inorganic materials	• No Council inorganic kerbside collection
OTHER COUNCIL-CONTROLLED WASTE STREAMS	
Litter bins	• Serviced by Operations Department of KCDC • Disposed of at either Ōtaki TS or Otaihanga RRF.
Illegal dumping	• Serviced by Operations Department of KCDC • Disposed of at either Ōtaki TS or Otaihanga RRF.
Sludges/ Biosolids	• Treated (dried) sewage sludge is landfilled at Otaihanga landfill.. The resource consent is valid up to June 2029.
Sewage milliscreenings	• Screenings and grit from Paraparaumu Waste Water Treatment Plant, Waikanae Water Treatment Plant and Ōtaki Waste Water Plant are disposed of to Otaihanga landfill.
Septage	• Paraparaumu Waste Water Treatment Plant accepts domestic septage only. No direct disposal on landfill, only via Waste Water Treatment Plant.
Road sweepings	• Previously disposed of at Otaihanga landfill. This will soon change to disposal at the Otaihanga RRF.

TRANSFER STATIONS:

Two transfer stations –

- Otaihanga Resource Recovery Facility (operated by Mid-West Disposals (residual waste is consolidated and bulk-hauled to either Hokio Landfill in Levin or Bonny Glenn
- Ōtaki Transfer Station (operated by Transpacific Industries Group (NZ) Ltd). Residual waste is compacted and trucked to Hokio Landfill in Levin, greenwaste is trucked to composting site at Otaihanga.
- Waikanae Greenwaste and Recycling Centre – (operated currently by Composting New Zealand). Provided for drop off of kerbside recyclables and greenwaste only.
- Composting New Zealand composting site and sales yard at Otaihanga landfill: greenwaste drop off facility, greenwaste is trucked from Ōtaki TS and Waikanae Recycling Centre by CNZ to their composting site.
- Otaihanga RRF, Ōtaki TS, and Waikanae Greenwaste & Recycling Centre are open 8:00am to 5:00pm, Monday to Saturday, and 9.00am to 5.00pm Sunday and Public Holidays. .

General waste, recyclables and greenwaste	**Otaihanga Resource Recovery Facility Charges** (set by MidWest Disposals)	**Charges Inc. Waste Levy (Inc GST)**
	Bags	$4.20
	Car Boot	$16
	Full Car	$22.50
	Station Wagon/4WD	$34.50
	Trailer/Ute/Van < 300kg	$44.30
	Trucks & trailers via weighbridge > 300kg = minimum charge	$148.50 per tonne $44.30 minimum charge
	Polystyrene – Bulk	$1800 per tonne
	Whiteware – Stove/Dishwasher	$17.50 each
	Whiteware – Fridges/freezers (covers degassing)	$30 each
	Car bodies - fully stripped	$35 each
	Car bodies - unstripped (no rubbish)	$150 each
	Car tyres	$5 per tyre
	Truck/tractor tyres	$15 per tyre
	Waste Oil	60c per litre
	Hazardous waste	Not accepted
	Demolition waste	$148.50 per tonne
	Special waste (tree stumps, logs)	$262 per tonne
	Abestos (small quantities)	$420 per tonne $50 minimum charge
	Ōtaki Transfer Station Charges (set by Council up to 1 December 2013) changes to be published on the Council website	**Charges Inc. Waste Levy (Inc GST)**
	Bags	$4.10
	Car Boot	$16
	Full Car	$22.40
	Station Wagon/4WD	$33
	Utes/Vans	$38.60
	Trucks & trailers via weighbridge < 350kg = minimum charge	$143.70 per tonne $50.30 minimum charge
	Clean car bodies	$23.60
	Other car bodies	$74
	Clean fill	Not accepted
	Hazardous waste	Not accepted
	Car tyres	$4.90 per tyre
	Truck/tractor tyres	$11.90 per tyre
	Bulk tyres	$358 per tonne
	Waste Oil (recycling fee)	80c per litre
	TVs, CRT Monitors (recycling fee)*	$20 per item
	Fridge/Freezers Disposal (de-gassing and recycling fee)	$26.60 per item
Scrap metal	• Accepted at both Ōtaki and Otaihanga facilities	
Greenwaste	• Accepted at Composting New Zealand site at Otaihanga and at Otaki and Waikanae stations. Charges are set by Composting New Zealand. Greenwaste is then mulched and transported to the CNZ composting site where it is processed.	

	Charges set by Composting New Zealand (based on volume) Per Bag (<60L) $2.50 Wool Sack $6.00 Car Boot $7.00 Full Car/ Station Wagon $9.00 Utes/Vans $13 Small Trailer (up to 8 foot/2.44m long) $13 Medium Trailer (up to 10 foot/3m long) $16 Large Trailer (up to 12 foot / 3.66m long) $23 Extra Large Trailer (over 12 foot/3.66m) $32 Trucks by weight at Otaki TS $65 per tonne
Recyclable containers	• Drop-off points at all three facilities for kerbside recyclables (as determined by Council resolution)
Reuse Shop	• Shop at the Otaihanga RRF which is currently run by the operator of the RRF. Re-usable items can be dropped off and purchased by the public and re-usable items that are pulled out of incoming waste are also sold here.
Cleanfill, sewage sludge,	• The closed landfill at Otaihanga still accepts (limited) clean fill and treated sewage sludge from the wastewater treatment plant. The landfill site is managed by Peter's Development Group. **Otaihanga Landfill** — **Charges Inc. Waste Levy (Inc GST)** Cleanfill <350kg = minimum charge — $10.85 per tonne, $6.50 minimum charge Pre-approved* cleanfill — No charge
Other recoverable materials/ reusable goods	• The operator of the Otaihanga RRF is required by contract to reduce the incoming waste stream. This means that the operator pulls out reusable and recyclable materials/items. At the moment kerbside recyclables (paper/ cardboard/ plastics/metals), wood, metal are transported out of the station separately by the operator.
Hazardous materials	• There is no HazMobile in the District. Council does not organise any hazardous waste collection. Residents can drop off residential hazardous waste at Otaihanga RRF.
LANDFILL: No landfills in region. All residual waste from District (other than that disposed of at semi-closed Otaihanga landfill) is taken to the Otaihanga RRF or Ōtaki transfer station for sorting and recovery and the remainder of the residual waste is taken by the operators to a landfill of their choice. Currently, residual waste is taken to Hokio Landfill in Levin or Bonny Glen landfill, near Marton.	
PRIVATELY-CONTROLLED WASTE STREAMS	
Waste collections	

Kerbside residential / commercial refuse	• Commercial collectors provide all kerbside collection services in the urban area and collect on the common collection days (former Council collection days). In rural areas the collection is either covered by commercial operators or residents use the drop off facilities.).
	• Private residential MGB collections are undertaken by:
	  • EnviroWaste Services Ltd (Clean Green) (concurrent with collecting Council bags)
	  • Transpacific Industries Group (NZ) Ltd (trading as Waste Management)
	  • Skip-e-Bins
	  • Low Cost Bins
	• Pre-paid rubbish bags are sold by private collectors (EnviroWaste and Transpacific) at local supermarkets and dairies.

Kerbside residential / commercial	• Licensed refuse collectors provide kerbside recycling services to their customers in the urban area. EnviroWaste Services Ltd) provides this collection on behalf of its own customers and on behalf of the other local refuse collectors: Transpacific Industries Group (NZ) Ltd, Low

recycling	Cost Bins and Skip-E-Bins.

Kerbside greenwaste collections	• Private collection through:
	  • Skip-e-Bins
	  • Transpacific Industries Group (NZ) Ltd
	  • EnviroWaste Services (Clean Green)

Residential	• The following collect refuse from residential properties on a casual basis
	  • Skip-e-Bins
	  • Transpacific Industries Group (NZ) Ltd
	  • EnviroWaste Services (Clean Green)

Industrial/ commercial/ institutional	• Private commercial services using front-loader skips are undertaken by
	  • Skip-e-Bins
	  • Transpacific Industries Group (NZ) Ltd

Septage	• JB's Septic Tank Cleaning
Large-scale waste generators	
	• No major generators of solid waste in District
OTHER DISPOSAL FACILITIES	
	• Nil in Kāpiti Coast District

Appendix 2 – Kerbside recyclable materials

Kerbside Recycling

Accepted

Everything we put in our recycling crates will be handled by someone else – keep it clean!

Plastics

- Items with numbers 1 to 7 printed inside a triangle (except foam polystyrene)
- Remove lids if they don't have a number
- Clean plastic bags – including bread/ supermarket bags – are also accepted

Glass

- Rinsed bottles and jars – green, brown, blue and clear (no pane glass)
- Remove lids and place them in your rubbish bin

Aluminium & Steel Cans

- Clean and squash flat (if you can) before placing them in your crate
- Empty aerosol cans are also accepted

Paper & Cardboard

- E.g. packaging, newspaper, glossies/ brochures, coloured/office paper, egg cartons, magazines, books
- Place paper and flattened cardboard into supermarket bags or tie it into bundles; bundles can be stacked on top of your crate or beside it
- Flattened cardboard should be no larger than your crate

Not Accepted

Pizza Boxes

- These can't be stored hygienically for processing – tear them up and put them on your compost pile

Foam Polystyrene

- Includes meat trays and white packaging
- This material can't be recycled in Kāpiti – even if it has a number

Hazardous Items

- Nappies and broken glass can hurt our collectors or make them sick

Crates must be on the kerbside before 7:30am

Who Do I Call?

If your recycling crate has been missed, please call your normal rubbish collector. You will find their phone number on your rubbish bag or wheelie-bin.

For more information on how to Reduce, Reuse and Recycle – including a full list of accepted recyclable items, visit our website: www.kapiticoast.govt.nz/waste

Phone 0800 486 486 | **Email** waste@kapiticoast.govt.nz

Kāpiti Coast DISTRICT COUNCIL

Appendix 3 – Waste classifications

KERBSIDE REFUSE AUDIT CLASSIFICATIONS

Primary category	Secondary category	Definition
Paper	Recyclable paper	Newspapers, magazines, office paper, cardboard boxes, paper bags (excluding wet strength)
	Multimaterial/ other	Non-recyclable paper (wet-strength, food contaminated), photographic paper, playing cards, laminated paper, etc.
Plastics	#1-7 containers	Household plastic containers & lids (all plastic types)
	Supermarket & bread bags	Clean supermarket, bread, and other 'stretchy' plastic bags only
	Other plastic bags/film	All other plastic bags and film
	Multimaterial/ other	Non-recyclable plastic packaging, including polystyrene meat trays, paint, engine oil and chemical containers. All other non-packaging materials made primarily of plastic
Organics	Kitchen waste	All kitchen waste
	Greenwaste	All organic garden waste
	Multimaterial/ other	All other primarily organic items – includes cat tray litter, hair, vacuum cleaner bags
Ferrous metals	Steel cans	All steel cans, including aerosol cans
	Multimaterial/ other	All other items made primarily of ferrous metal
Non-ferrous metals	Aluminium cans	All aluminium cans and foil plates
	Multimaterial/ other	All other items made primarily of non-ferrous metal
Glass	Glass bottles/jars	All bottles and jars, emptied with the lids and contents removed
	Multimaterial/ other	All other items made primarily of glass, includes light bulbs, drinking glasses, and window glass
Textiles	Clothing & textile	All items primarily made of a fabric, such as clothes, curtains
	Multimaterial/other	Includes shoes, backpacks, handbags, rugs
Nappies & sanitary		Includes disposable nappies, paper towels, tissues
Rubble, concrete		All concrete, rubble and soil
Timber		All items made primarily of timber
Rubber		All items made primarily of rubber (e.g. kitchen gloves)
Potentially hazardous	Household	Batteries, medicines and cosmetics, cleaning agents
	Other	Potentially hazardous items not associated with domestic activity, such as used oil and garden chemicals.

TRANSFER STATION VEHICLE SURVEY CLASSIFICATIONS

Primary category	Secondary category	Description
Paper	Recyclable paper	Newspapers, cardboard, magazines, office paper, etc.
	Multimaterial/other	Multimaterials, liquid containers such as Tetra Pak and gable tops, contaminated paper, waxed papers
Plastic	Recyclable plastics	#1-7 packaging, including household plastic containers & lids (all plastic types) and supermarket/bread bags
	Multimaterial/other	Other types of plastic and multimaterials
Organics	Kitchen/food	Food and food preparation waste
	Compostable greenwaste	Vegetation, branches, lawn clippings
	Non-compostable greenwaste	Bamboo, flax, palm, cabbage tree, stumps
	Multimaterial/other	Other organic matter such as meat processing waste, dead animals
Ferrous metal	Primarily ferrous	Items made primarily of steel
	Multimaterial/other	Ferrous items containing a sizable proportion of other materials
Non-ferrous metal		Items made primarily of non-ferrous metal
Glass	Recyclable	Bottles and jars
	Multimaterial/other	Other items made primarily of glass, includes pane, TVs, and computer monitors
Textiles	Clothing/textile	Items made primarily of cloth or textiles
	Multimaterial/other	Items containing some textile and other materials, such as carpets, shoes, backpacks, suitcases
Nappies & sanitary		Sanitary paper, such as nappies, paper towels
Rubble	Concrete	All concrete
	Plasterboard	All plasterboard
	Other	Other materials such as soil, fibreglass, ceramics, rubble, rocks
Timber	Unpainted & untreated	Substantial pieces of timber that are neither painted nor treated
	Fabricated	Fabricated items, such as furniture and multimaterial items made primarily of wood
	Multimaterial/other	Other types of wood, and wooden debris
Rubber		All items made primarily of rubber such as tyres, latex foam mattresses
Potentially hazardous		Material with potentially toxic or ecotoxic properties or having properties requiring special disposal techniques. Includes sewage sludge, paint, medical waste, solvents, asbestos, and oil.

Appendix 4 – Types of waste disposal vehicles

FRONT-LOADER TRUCKS

"Front-loaders" are top-loading compactors that use forks mounted to the front of the vehicle to lift bins over the cab and tip the contents of the bin into the compactor unit at the rear. Front-loaders work primarily in urban areas, regularly servicing medium to large-scale industrial, commercial, and institutional customers. In general, a business using front-loader bins would be serviced at least weekly, but can be serviced several times a day for a business like a large supermarket. Front-loaders vary in size, and may carry loads from 4 to 10 tonnes. A single load may contain waste from ten to fifty customers.

The potential for the recovery of materials from waste transported by front-loaders is limited. The waste load is compacted by the truck, and the loads tend to be large and heterogeneous. This restricts significantly the potential for manually separating recoverable materials when the load is discharged on a tipping floor. There are usually not significant quantities of easily-separable materials other than cardboard packaging in front-loader refuse.

GANTRY TRUCK

"Gantry trucks" are used to transport gantry bins (skip bins) from customers' premises to a disposal facility. Gantry truck services are used by industrial, commercial, institutional, and residential customers. Some large-scale commercial waste generators use gantry bins as their regular disposal system. Residential customers and business customers both use gantry bins for one-off large-scale refuse removal. Some commercial customers, such as hotels and supermarkets, use portable, stationary refuse compactors that are transported for disposal by gantry trucks. The gantry truck in the photo on the next page is carrying a stationary compactor unit from a supermarket. Gantry bins are often used for special wastes, such as sludges, asbestos, and animal by-products.

Typical gantry truck loads weigh from 0.5-3 tonnes. As most refuse transported in gantry bins is not compacted, there is often opportunity for manually recovering materials from gantry bins when discharged onto a tipping floor. Gantry bins often contain significant quantities of recoverable materials, such as timber and packaging, and these materials as well as reusable items can often be recovered intact from loads.

HOOK TRUCK

Hook trucks (or "huka"trucks) transport bins that can be loaded and unloaded from the rear of the truck for transport and that can be emptied quickly like a tip truck. Hook bins are used by large-scale waste generators, either for regular waste disposal or one-off refuse removal. Hook trucks are often used for transporting 25 or 30-cubic metre bins from transfer stations to landfills or large stationary compactors. Hook bins are also used for large-scale transport of recovered materials, such as cardboard and metal. Hook bins are rarely used for residential waste disposal.

The potential for material recovery from hook bins is similar to that for gantry bins.

KERBSIDE REFUSE COLLECTION VEHICLES

Side-loading and rear-loading compactors are commonly used for the kerbside collection of residential and small business refuse. They can be designed to service bagged refuse collections, MGB refuse collections, or both. Side-loading compactors can be used for bag collections or fitted with hydraulic arms for emptying MGBs without the driver leaving the vehicle. Rear-loading compactors can also be used for bag collections or fitted with hydraulic arms for emptying bins. Non-compacting trucks are also used for kerbside refuse collections, but are less common, as the economics of transporting uncompacted waste are less favourable.

As kerbside refuse collection vehicles collect small quantities of refuse from a large number of customers and the refuse is heavily compacted, there is little opportunity for manually recovering materials from the refuse.

OTHER TRUCKS

Other truck types commonly used for the transport of waste include tip trucks, box trucks, and flat decks. Tip trucks are most commonly used for the transport of waste from landscaping, earthworks, and construction and demolition activity. Box trucks are rarely used as dedicated waste transport vehicles, but are often used for waste transport by businesses that also use them for goods pick-up and delivery. Flat decks are used for the transport of bulky waste items, or by general carriers for the disposal of stackable items, such as pallets.

Appendix 5 –Kerbside refuse bags

Residential kerbside refuse bags Margins of error for 95% confidence level		**% of total**		**Mean wt. per bag**	
Paper	Recyclable paper	8.7%	(±2.1%)	0.53 kg	(±0.13 kg)
	Multimaterial/other	3.3%	(±0.6%)	0.20 kg	(±0.04 kg)
	Subtotal	**11.9%**	**(±2.4%)**	**0.73 kg**	**(±0.15 kg)**
Plastics	#1-7 containers	2.2%	(±0.7%)	0.13 kg	(±0.04 kg)
	Supermarket/bread bags	1.5%	(±0.3%)	0.09 kg	(±0.02 kg)
	Other plastic bags/film	6.7%	(±1.1%)	0.41 kg	(±0.07 kg)
	Multimaterial/other	4.2%	(±0.8%)	0.26 kg	(±0.05 kg)
	Subtotal	**14.6%**	**(±1.9%)**	**0.90 kg**	**(±0.12 kg)**
Organics	Kitchen waste	34.7%	(±6.2%)	2.14 kg	(±0.38 kg)
	Greenwaste	2.3%	(±1.3%)	0.14 kg	(±0.08 kg)
	Multimaterial/other	4.5%	(±2.5%)	0.28 kg	(±0.15 kg)
	Subtotal	**41.6%**	**(±7.9%)**	**2.56 kg**	**(±0.48 kg)**
Ferrous metals	Steel cans	0.9%	(±0.4%)	0.06 kg	(±0.02 kg)
	Multimaterial/other	0.7%	(±0.5%)	0.04 kg	(±0.03 kg)
	Subtotal	**1.6%**	**(±0.5%)**	**0.10 kg**	**(±0.03 kg)**
Non ferrous metals	Aluminium cans	0.3%	(±0.2%)	0.02 kg	(±0.01 kg)
	Multimaterial/other	0.7%	(±0.5%)	0.04 kg	(±0.03 kg)
	Subtotal	**1.0%**	**(±0.5%)**	**0.06 kg**	**(±0.03 kg)**
Glass	Bottles/jars	1.7%	(±0.7%)	0.10 kg	(±0.05 kg)
	Multimaterial/other	1.1%	(±1.0%)	0.07 kg	(±0.06 kg)
	Subtotal	**2.7%**	**(±1.2%)**	**0.17 kg**	**(±0.07 kg)**
Textiles	Clothing/textiles	4.4%	(±4.3%)	0.27 kg	(±0.27 kg)
	Multimaterial/other	3.7%	(±3.7%)	0.23 kg	(±0.23 kg)
	Subtotal	**8.1%**	**(±5.6%)**	**0.50 kg**	**(±0.34 kg)**
Nappies & sanitary		**15.9%**	**(±8.2%)**	**0.98 kg**	**(±0.51 kg)**
Rubble		**0.3%**	**(±0.3%)**	**0.02 kg**	**(±0.02 kg)**
Timber		**0.4%**	**(±0.6%)**	**0.03 kg**	**(±0.04 kg)**
Rubber		**0.3%**	**(±0.4%)**	**0.02 kg**	**(±0.02 kg)**
Potentially hazardous	Household	1.2%	(±0.6%)	0.07 kg	(±0.04 kg)
	Other	0.3%	(±0.5%)	0.02 kg	(±0.03 kg)
	Subtotal	**1.5%**	**(±0.7%)**	**0.09 kg**	**(±0.04 kg)**
TOTAL		**100.0%**		**6.15 kg**	**(±0.67 kg)**

Residential kerbside refuse bags Margins of error for 95% confidence level		**Mean wt. per household set out**		**Tonnage per week**
Paper	Recyclable paper	0.64 kg	(±0.16 kg)	2.5 T/week
	Multimaterial/other	0.24 kg	(±0.04 kg)	1.0 T/week
	Subtotal	**0.89 kg**	**(±0.18 kg)**	**3.5 T/week**
Plastics	#1-7 containers	0.16 kg	(±0.05 kg)	0.6 T/week
	Supermarket/bread bags	0.11 kg	(±0.02 kg)	0.4 T/week
	Other plastic bags/film	0.50 kg	(±0.08 kg)	2.0 T/week
	Multimaterial/other	0.31 kg	(±0.06 kg)	1.2 T/week
	Subtotal	**1.08 kg**	**(±0.14 kg)**	**4.3 T/week**
Organics	Kitchen waste	2.58 kg	(±0.46 kg)	10.1 T/week
	Greenwaste	0.17 kg	(±0.10 kg)	0.7 T/week
	Multimaterial/other	0.34 kg	(±0.18 kg)	1.3 T/week
	Subtotal	**3.09 kg**	**(±0.58 kg)**	**12.1 T/week**
Ferrous metals	Steel cans	0.07 kg	(±0.03 kg)	0.3 T/week
	Multimaterial/other	0.05 kg	(±0.03 kg)	0.2 T/week
	Subtotal	**0.12 kg**	**(±0.04 kg)**	**0.5 T/week**
Non ferrous metals	Aluminium cans	0.03 kg	(±0.01 kg)	0.1 T/week
	Multimaterial/other	0.05 kg	(±0.04 kg)	0.2 T/week
	Subtotal	**0.08 kg**	**(±0.04 kg)**	**0.3 T/week**
Glass	Bottles/jars	0.12 kg	(±0.06 kg)	0.5 T/week
	Multimaterial/other	0.08 kg	(±0.07 kg)	0.3 T/week
	Subtotal	**0.20 kg**	**(±0.09 kg)**	**0.8 T/week**
Textiles	Clothing/textiles	0.33 kg	(±0.32 kg)	1.3 T/week
	Multimaterial/other	0.28 kg	(±0.27 kg)	1.1 T/week
	Subtotal	**0.60 kg**	**(±0.41 kg)**	**2.4 T/week**
Nappies & sanitary		**1.18 kg**	**(±0.61 kg)**	**4.7 T/week**
Rubble		**0.02 kg**	**(±0.02 kg)**	**0.1 T/week**
Timber		**0.03 kg**	**(±0.05 kg)**	**0.1 T/week**
Rubber		**0.02 kg**	**(±0.03 kg)**	**0.1 T/week**
Potentially hazardous	Household	0.09 kg	(±0.04 kg)	0.4 T/week
	Other	0.02 kg	(±0.04 kg)	0.1 T/week
	Subtotal	**0.11 kg**	**(±0.05 kg)**	**0.4 T/week**
TOTAL		**7.43 kg**	**(±0.81 kg)**	**29.2 T/week**

Appendix 6 – Residential 120-litre MGBs

Residential 120-litre MGBs Margins of error for 95% confidence level		**% of total**		**Mean wt. MGB**		**Tonnage per week**
Paper	Recyclable paper	6.7%	(±1.7%)	0.78 kg	(±0.20 kg)	2.8 T/week
	Multimaterial/other	2.4%	(±0.7%)	0.28 kg	(±0.08 kg)	1.0 T/week
	Subtotal	**9.1%**	**(±2.1%)**	**1.06 kg**	**(±0.24 kg)**	**3.9 T/week**
Plastics	#1-7 containers	2.0%	(±0.5%)	0.23 kg	(±0.05 kg)	0.9 T/week
	Supermarket/bread bags	0.9%	(±0.2%)	0.11 kg	(±0.02 kg)	0.4 T/week
	Other plastic bags/film	4.1%	(±0.7%)	0.47 kg	(±0.08 kg)	1.7 T/week
	Multimaterial/other	3.4%	(±1.1%)	0.39 kg	(±0.13 kg)	1.4 T/week
	Subtotal	**10.4%**	**(±1.5%)**	**1.20 kg**	**(±0.17 kg)**	**4.4 T/week**
Organics	Kitchen waste	23.0%	(±3.9%)	2.67 kg	(±0.46 kg)	9.8 T/week
	Greenwaste	23.3%	(±9.8%)	2.71 kg	(±1.13 kg)	9.9 T/week
	Multimaterial/other	2.6%	(±1.7%)	0.30 kg	(±0.20 kg)	1.1 T/week
	Subtotal	**48.8%**	**(±10.2%)**	**5.67 kg**	**(±1.19 kg)**	**20.8 T/week**
Ferrous metals	Steel cans	0.9%	(±0.3%)	0.10 kg	(±0.03 kg)	0.4 T/week
	Multimaterial/other	0.9%	(±0.7%)	0.11 kg	(±0.09 kg)	0.4 T/week
	Subtotal	**1.8%**	**(±0.8%)**	**0.21 kg**	**(±0.09 kg)**	**0.8 T/week**
Non ferrous metals	Aluminium cans	0.6%	(±0.6%)	0.07 kg	(±0.07 kg)	0.3 T/week
	Multimaterial/other	1.3%	(±1.8%)	0.15 kg	(±0.21 kg)	0.5 T/week
	Subtotal	**1.9%**	**(±1.9%)**	**0.22 kg**	**(±0.22 kg)**	**0.8 T/week**
Glass	Bottles/jars	2.3%	(±1.2%)	0.27 kg	(±0.13 kg)	1.0 T/week
	Multimaterial/other	0.6%	(±0.6%)	0.07 kg	(±0.07 kg)	0.2 T/week
	Subtotal	**2.9%**	**(±1.3%)**	**0.33 kg**	**(±0.15 kg)**	**1.2 T/week**
Textiles	Clothing/textiles	2.0%	(±2.0%)	0.23 kg	(±0.23 kg)	0.9 T/week
	Multimaterial/other	1.6%	(±1.5%)	0.18 kg	(±0.17 kg)	0.7 T/week
	Subtotal	**3.6%**	**(±2.7%)**	**0.42 kg**	**(±0.31 kg)**	**1.5 T/week**
Nappies & sanitary		**11.0%**	**(±4.8%)**	**1.28 kg**	**(±0.55 kg)**	**4.7 T/week**
Rubble		**6.9%**	**(±8.8%)**	**0.80 kg**	**(±1.03 kg)**	**2.9 T/week**
Timber		**1.9%**	**(±1.4%)**	**0.22 kg**	**(±0.16 kg)**	**0.8 T/week**
Rubber		**0.1%**	**(±0.1%)**	**0.01 kg**	**(±0.01 kg)**	**0.0 T/week**
Potentially hazardous	Household	0.6%	(±0.7%)	0.07 kg	(±0.08 kg)	0.2 T/week
	Other	1.1%	(±1.8%)	0.13 kg	(±0.21 kg)	0.5 T/week
	Subtotal	**1.7%**	**(±1.9%)**	**0.19 kg**	**(±0.22 kg)**	**0.7 T/week**
TOTAL		**100.0%**		**11.62 kg**	**(±1.50 kg)**	**42.5 T/week**

Appendix 7 – Residential 240-litre MGBs

Residential 240-litre MGBs Margins of error for 95% confidence level		**% of total**		**Mean wt./ MGB**		**Tonnage per week**
Paper	Recyclable paper	13.3%	(±12.4%)	2.92 kg	(±2.72 kg)	16.3 T/week
	Multimaterial/other	1.8%	(±0.6%)	0.40 kg	(±0.14 kg)	2.2 T/week
	Subtotal	**15.1%**	**(±12.5%)**	**3.32 kg**	**(±2.74 kg)**	**18.6 T/week**
Plastics	#1-7 containers	1.5%	(±0.3%)	0.32 kg	(±0.08 kg)	1.8 T/week
	Supermarket/bread bags	0.7%	(±0.1%)	0.15 kg	(±0.03 kg)	0.8 T/week
	Other plastic bags/film	2.9%	(±0.6%)	0.64 kg	(±0.13 kg)	3.6 T/week
	Multimaterial/other	2.4%	(±0.7%)	0.52 kg	(±0.15 kg)	2.9 T/week
	Subtotal	**7.4%**	**(±1.2%)**	**1.63 kg**	**(±0.27 kg)**	**9.1 T/week**
Organics	Kitchen waste	18.3%	(±3.8%)	4.01 kg	(±0.83 kg)	22.4 T/week
	Greenwaste	33.5%	(±13.3%)	7.37 kg	(±2.93 kg)	41.2 T/week
	Multimaterial/other	2.5%	(±1.5%)	0.55 kg	(±0.32 kg)	3.0 T/week
	Subtotal	**54.3%**	**(±12.1%)**	**11.93 kg**	**(±2.65 kg)**	**66.7 T/week**
Ferrous metals	Steel cans	0.6%	(±0.2%)	0.14 kg	(±0.05 kg)	0.8 T/week
	Multimaterial/other	1.5%	(±1.7%)	0.34 kg	(±0.38 kg)	1.9 T/week
	Subtotal	**2.2%**	**(±1.8%)**	**0.47 kg**	**(±0.39 kg)**	**2.6 T/week**
Non ferrous metals	Aluminium cans	0.2%	(±0.2%)	0.05 kg	(±0.04 kg)	0.3 T/week
	Multimaterial/other	0.3%	(±0.1%)	0.05 kg	(±0.03 kg)	0.3 T/week
	Subtotal	**0.5%**	**(±0.2%)**	**0.11 kg**	**(±0.05 kg)**	**0.6 T/week**
Glass	Bottles/jars	3.3%	(±1.7%)	0.73 kg	(±0.38 kg)	4.1 T/week
	Multimaterial/other	0.3%	(±0.2%)	0.08 kg	(±0.05 kg)	0.4 T/week
	Subtotal	**3.7%**	**(±1.8%)**	**0.80 kg**	**(±0.39 kg)**	**4.5 T/week**
Textiles	Clothing/textiles	1.2%	(±0.7%)	0.26 kg	(±0.15 kg)	1.4 T/week
	Multimaterial/other	1.4%	(±0.7%)	0.32 kg	(±0.16 kg)	1.8 T/week
	Subtotal	**2.6%**	**(±1.2%)**	**0.58 kg**	**(±0.27 kg)**	**3.2 T/week**
Nappies & sanitary		**10.0%**	**(±7.8%)**	**2.20 kg**	**(±1.72 kg)**	**12.3 T/week**
Rubble		**0.5%**	**(±0.6%)**	**0.11 kg**	**(±0.13 kg)**	**0.6 T/week**
Timber		**2.9%**	**(±2.4%)**	**0.63 kg**	**(±0.53 kg)**	**3.5 T/week**
Rubber		**0.2%**	**(±0.3%)**	**0.05 kg**	**(±0.07 kg)**	**0.3 T/week**
Potentially hazardous	Household	0.4%	(±0.2%)	0.09 kg	(±0.05 kg)	0.5 T/week
	Other	0.2%	(±0.1%)	0.04 kg	(±0.03 kg)	0.2 T/week
	Subtotal	**0.6%**	**(±0.3%)**	**0.13 kg**	**(±0.06 kg)**	**0.8 T/week**
TOTAL		**100.0%**		**21.98 kg**	**(±3.84 kg)**	**122.9 T/week**

Appendix 8 – Combined kerbside refuse collections

Combined residential kerbside refuse bags and MGBs		% of total	Tonnage per week
Paper	Recyclable paper	11.2%	21.7 T/week
	Multimaterial/other	2.2%	4.2 T/week
	Subtotal	**13.3%**	**25.9 T/week**
Plastics	#1-7 containers	1.7%	3.3 T/week
	Supermarket/bread bags	0.9%	1.7 T/week
	Other plastic bags/film	3.7%	7.3 T/week
	Multimaterial/other	2.9%	5.6 T/week
	Subtotal	**9.1%**	**17.8 T/week**
Organics	Kitchen waste	21.8%	42.3 T/week
	Greenwaste	26.6%	51.8 T/week
	Multimaterial/other	2.8%	5.5 T/week
	Subtotal	**51.2%**	**99.6 T/week**
Ferrous metals	Steel cans	0.7%	1.4 T/week
	Multimaterial/other	1.3%	2.5 T/week
	Subtotal	**2.0%**	**3.9 T/week**
Non ferrous metals	Aluminium cans	0.3%	0.7 T/week
	Multimaterial/other	0.5%	1.0 T/week
	Subtotal	**0.9%**	**1.7 T/week**
Glass	Bottles/jars	2.8%	5.5 T/week
	Multimaterial/other	0.5%	1.0 T/week
	Subtotal	**3.3%**	**6.5 T/week**
Textiles	Clothing/textiles	1.8%	3.6 T/week
	Multimaterial/other	1.8%	3.5 T/week
	Subtotal	**3.7%**	**7.1 T/week**
Nappies & sanitary		**11.1%**	**21.7 T/week**
Rubble		**1.9%**	**3.6 T/week**
Timber		**2.3%**	**4.5 T/week**
Rubber		**0.2%**	**0.4 T/week**
Potentially hazardous	Household	0.6%	1.1 T/week
	Other	0.4%	0.8 T/week
	Subtotal	**1.0%**	**1.9 T/week**
TOTAL		**100.0%**	**194.7 T/week**

Appendix 9 – General waste from Otaihanga RRF to landfill

Otaihanga Resource Recovery Facility general waste to landfill (excludes kerbside refuse collections) 2-15 September 2013		% of total	Tonnes per week
Paper	Recyclable	8.3%	16.6 T/week
	Multimaterial/other	1.2%	2.4 T/week
	Subtotal	**9.6%**	**19.0 T/week**
Plastics	Recyclable	0.4%	0.8 T/week
	Multimaterial/other	7.7%	15.4 T/week
	Subtotal	**8.2%**	**16.2 T/week**
Organics	Kitchen waste	4.9%	9.8 T/week
	Compostable greenwaste	3.5%	7.0 T/week
	Non-compostable greenwaste	1.6%	3.1 T/week
	Multimaterial/other	1.1%	2.2 T/week
	Subtotal	**11.1%**	**22.1 T/week**
Ferrous metals	Primarily ferrous	1.2%	2.4 T/week
	Multimaterial/other	2.0%	4.0 T/week
	Subtotal	**3.2%**	**6.3 T/week**
Non-ferrous metals		**0.5%**	**0.9 T/week**
Glass	Recyclable	2.2%	4.3 T/week
	Multimaterial/other	1.1%	2.1 T/week
	Subtotal	**3.2%**	**6.4 T/week**
Textiles	Clothing/textiles	0.9%	1.8 T/week
	Multimaterial/other	7.3%	14.5 T/week
	Subtotal	**8.2%**	**16.3 T/week**
Nappies & sanitary		**2.2%**	**4.3 T/week**
Rubble	Concrete	9.4%	18.8 T/week
	Plasterboard	5.0%	9.9 T/week
	Other	12.8%	25.4 T/week
	Subtotal	**27.2%**	**54.2 T/week**
Timber	Unpainted & untreated	4.8%	9.6 T/week
	Fabricated	3.4%	6.8 T/week
	Multimaterial/other	17.6%	35.0 T/week
	Subtotal	**25.8%**	**51.4 T/week**
Rubber		**0.3%**	**0.7 T/week**
Potentially hazardous		**0.7%**	**1.3 T/week**
TOTAL		**100.0%**	**199.2 T/week**

Appendix 10 – Types of waste in general waste from Otaihanga RRF to landfill

Otaihanga Resource Recovery Facility general waste (excludes kerbside refuse collections) 2-15 September 2013		Construction & demolition	Industrial/ commercial/ institutional	Landscaping & earthworks	Residential
Paper	Recyclable	0.9%	15.7%	0.9%	10.9%
	Multimaterial/other	0.8%	1.9%	0.0%	0.5%
	Subtotal	**1.7%**	**17.7%**	**0.9%**	**11.4%**
Plastics	Recyclable	0.0%	1.0%	0.0%	0.2%
	Multimaterial/other	1.1%	14.8%	0.6%	8.6%
	Subtotal	**1.1%**	**15.8%**	**0.6%**	**8.8%**
Organics	Kitchen waste	0.0%	10.7%	0.0%	3.3%
	Compostable greenwaste	1.0%	2.7%	46.3%	5.7%
	Non-compostable greenwaste	1.8%	0.7%	16.5%	0.5%
	Multimaterial/other	0.0%	2.6%	0.0%	0.4%
	Subtotal	**2.9%**	**16.7%**	**62.8%**	**9.9%**
Ferrous metals	Primarily ferrous	0.4%	2.0%	0.0%	1.6%
	Multimaterial/other	0.2%	2.6%	0.0%	6.6%
	Subtotal	**0.6%**	**4.6%**	**0.0%**	**8.2%**
Non-ferrous metals		**0.0%**	**0.9%**	**0.0%**	**0.5%**
Glass	Recyclable	0.0%	4.9%	0.0%	0.9%
	Multimaterial/other	1.1%	0.9%	1.7%	1.4%
	Subtotal	**1.1%**	**5.8%**	**1.7%**	**2.3%**
Textiles	Clothing/textiles	0.0%	1.7%	0.0%	1.6%
	Multimaterial/other	2.9%	7.8%	0.0%	22.7%
	Subtotal	**2.9%**	**9.4%**	**0.0%**	**24.4%**
Nappies & sanitary		**0.0%**	**4.9%**	**0.0%**	**0.8%**
Rubble	Concrete	18.8%	1.7%	10.6%	2.4%
	Plasterboard	9.2%	2.3%	0.0%	0.2%
	Other	25.4%	2.9%	11.7%	1.8%
	Subtotal	**53.5%**	**7.0%**	**22.3%**	**4.4%**
Timber	Unpainted & untreated	6.8%	3.9%	0.0%	1.9%
	Fabricated	0.4%	3.8%	4.6%	12.3%
	Multimaterial/other	29.0%	7.3%	7.0%	14.5%
	Subtotal	**36.2%**	**15.1%**	**11.7%**	**28.6%**
Rubber		**0.0%**	**0.7%**	**0.0%**	**0.5%**
Potentially hazardous		**0.0%**	**1.5%**	**0.0%**	**0.3%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 11 – General waste from Otaihanga RRF to landfill – by vehicle type

Otaihanga Resource Recovery Facility general waste (excludes kerbside refuse collections) 2-15 September 2013		Cars	Compactor	Front-loader trucks	Gantry trucks	Other trucks	Trailers
Paper	Recyclable	15.0%	26.3%	14.9%	1.1%	1.4%	6.4%
	Multimaterial/other	0.6%	6.6%	1.2%	0.3%	0.3%	1.9%
	Subtotal	**15.6%**	**32.9%**	**16.1%**	**1.4%**	**1.7%**	**8.3%**
Plastics	Recyclable	0.2%	3.9%	0.8%	0.0%	0.1%	0.0%
	Multimaterial/other	12.1%	13.1%	15.4%	1.9%	1.2%	5.1%
	Subtotal	**12.3%**	**17.1%**	**16.2%**	**1.9%**	**1.3%**	**5.1%**
Organics	Kitchen waste	9.2%	15.8%	11.6%	0.0%	0.4%	1.1%
	Compostable greenwaste	4.8%	1.3%	2.9%	5.4%	1.1%	4.5%
	Non-compostable greenwaste	1.1%	0.0%	0.8%	1.9%	4.6%	0.8%
	Multimaterial/other	0.6%	0.0%	3.2%	0.0%	0.2%	0.2%
	Subtotal	**15.7%**	**17.1%**	**18.4%**	**7.3%**	**6.2%**	**6.5%**
Ferrous metals	Primarily ferrous	0.6%	1.3%	2.0%	0.7%	0.2%	1.2%
	Multimaterial/other	4.9%	0.0%	3.0%	0.8%	1.3%	1.9%
	Subtotal	**5.4%**	**1.3%**	**5.0%**	**1.6%**	**1.5%**	**3.0%**
Non-ferrous metals		**0.7%**	**2.6%**	**0.9%**	**0.1%**	**0.1%**	**0.1%**
Glass	Recyclable	0.4%	14.5%	4.8%	0.0%	0.3%	0.4%
	Multimaterial/other	0.9%	0.0%	0.8%	2.7%	0.4%	0.8%
	Subtotal	**1.3%**	**14.5%**	**5.6%**	**2.7%**	**0.7%**	**1.2%**
Textiles	Clothing/textiles	2.6%	2.6%	1.6%	0.1%	0.6%	0.4%
	Multimaterial/other	11.6%	1.3%	8.4%	5.6%	3.4%	9.6%
	Subtotal	**14.2%**	**3.9%**	**9.9%**	**5.7%**	**4.0%**	**10.0%**
Nappies & sanitary		**2.1%**	**10.5%**	**5.1%**	**0.0%**	**0.2%**	**0.3%**
Rubble	Concrete	6.1%	0.0%	0.8%	3.1%	14.1%	22.6%
	Plasterboard	0.0%	0.0%	3.0%	13.4%	0.0%	5.7%
	Other	0.2%	0.0%	2.6%	10.8%	55.9%	4.6%
	Subtotal	**6.3%**	**0.0%**	**6.4%**	**27.3%**	**70.1%**	**33.0%**
Timber	Unpainted & untreated	2.7%	0.0%	4.7%	11.1%	2.1%	3.3%
	Fabricated	6.3%	0.0%	3.6%	1.9%	1.1%	5.5%
	Multimaterial/other	16.0%	0.0%	5.7%	38.9%	11.0%	23.5%
	Subtotal	**24.9%**	**0.0%**	**13.9%**	**51.9%**	**14.2%**	**32.2%**
Rubber		**0.7%**	**0.0%**	**0.8%**	**0.0%**	**0.1%**	**0.1%**
Potentially hazardous		**0.6%**	**0.1%**	**1.8%**	**0.1%**	**0.1%**	**0.1%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 12 – Overall waste from Otaihanga RRF to landfill

Otaihanga Resource Recovery Facility – overall waste – 2-15 September 2013		% of total	Tonnes per week
Paper	Recyclable	9.6%	34.8 T/week
	Multimaterial/other	1.6%	6.0 T/week
	Subtotal	**11.2%**	**40.7 T/week**
Plastics	Recyclable	1.4%	5.0 T/week
	Multimaterial/other	7.2%	26.1 T/week
	Subtotal	**8.6%**	**31.1 T/week**
Organics	Kitchen waste	12.5%	45.2 T/week
	Compostable greenwaste	11.5%	41.6 T/week
	Non-compostable greenwaste	3.3%	11.8 T/week
	Multimaterial/other	1.9%	6.8 T/week
	Subtotal	**29.1%**	**105.4 T/week**
Ferrous metals	Primarily ferrous	1.0%	3.6 T/week
	Multimaterial/other	1.7%	6.0 T/week
	Subtotal	**2.6%**	**9.6 T/week**
Non-ferrous metals		**0.6%**	**2.3 T/week**
Glass	Recyclable	2.5%	9.0 T/week
	Multimaterial/other	0.8%	2.9 T/week
	Subtotal	**3.3%**	**11.9 T/week**
Textiles	Clothing/textiles	1.3%	4.8 T/week
	Multimaterial/other	4.8%	17.5 T/week
	Subtotal	**6.2%**	**22.3 T/week**
Nappies & sanitary		**6.2%**	**22.4 T/week**
Rubble	Concrete	5.3%	19.1 T/week
	Plasterboard	2.8%	10.2 T/week
	Other	7.7%	27.8 T/week
	Subtotal	**15.8%**	**57.2 T/week**
Timber	Unpainted & untreated	2.7%	9.6 T/week
	Fabricated	2.9%	10.5 T/week
	Multimaterial/other	9.7%	35.0 T/week
	Subtotal	**15.2%**	**55.2 T/week**
Rubber		**0.3%**	**1.0 T/week**
Potentially hazardous		**0.8%**	**2.9 T/week**
TOTAL		**100.0%**	**362.0 T/week**

Appendix 13 – General waste from Ōtaki Transfer Station to landfill

Ōtaki Transfer Station – general waste (excludes kerbside refuse collections) 2-15 September 2013		% of total	Tonnes per week
Paper	Recyclable	13.9%	5.7 T/week
	Multimaterial/other	1.1%	0.5 T/week
	Subtotal	**15.0%**	**6.1 T/week**
Plastics	Recyclable	1.1%	0.4 T/week
	Multimaterial/other	16.9%	6.9 T/week
	Subtotal	**18.0%**	**7.3 T/week**
Organics	Kitchen waste	9.7%	4.0 T/week
	Compostable greenwaste	8.2%	3.3 T/week
	Non-compostable greenwaste	0.4%	0.2 T/week
	Multimaterial/other	1.6%	0.6 T/week
	Subtotal	**19.9%**	**8.1 T/week**
Ferrous metals	Primarily ferrous	2.4%	1.0 T/week
	Multimaterial/other	3.8%	1.6 T/week
	Subtotal	**6.3%**	**2.6 T/week**
Non-ferrous metals		**1.1%**	**0.4 T/week**
Glass	Recyclable	3.1%	1.3 T/week
	Multimaterial/other	1.1%	0.4 T/week
	Subtotal	**4.2%**	**1.7 T/week**
Textiles	Clothing/textiles	1.3%	0.5 T/week
	Multimaterial/other	3.7%	1.5 T/week
	Subtotal	**5.0%**	**2.0 T/week**
Nappies & sanitary		**7.0%**	**2.9 T/week**
Rubble	Concrete	1.4%	0.6 T/week
	Plasterboard	0.9%	0.4 T/week
	Other	2.5%	1.0 T/week
	Subtotal	**4.8%**	**2.0 T/week**
Timber	Unpainted & untreated	2.1%	0.9 T/week
	Fabricated	3.8%	1.5 T/week
	Multimaterial/other	10.6%	4.3 T/week
	Subtotal	**16.5%**	**6.7 T/week**
Rubber		**1.1%**	**0.4 T/week**
Potentially hazardous		**1.1%**	**0.4 T/week**
TOTAL		**100.0%**	**40.7 T/week**

Appendix 14 – Types of waste in general waste from Ōtaki Transfer Station to landfill

Ōtaki Transfer Station – general waste (excludes kerbside refuse collections) 2-15 September 2013		Construction & demolition	Industrial/ commercial/ institutional	Landscaping & earthworks	Residential
Paper	Recyclable	3.9%	15.3%	1.5%	15.1%
	Multimaterial/other	0.7%	1.3%	0.0%	0.7%
	Subtotal	**4.6%**	**16.6%**	**1.5%**	**15.8%**
Plastics	Recyclable	0.3%	1.3%	0.0%	0.7%
	Multimaterial/other	6.7%	19.8%	2.2%	11.3%
	Subtotal	**6.9%**	**21.2%**	**2.2%**	**12.0%**
Organics	Kitchen waste	3.1%	8.7%	0.2%	20.7%
	Compostable greenwaste	2.1%	3.9%	79.9%	2.2%
	Non-compostable greenwaste	0.1%	0.1%	3.6%	0.6%
	Multimaterial/other	0.4%	0.3%	0.0%	8.6%
	Subtotal	**5.7%**	**13.1%**	**83.7%**	**32.1%**
Ferrous metals	Primarily ferrous	1.6%	2.6%	1.1%	2.3%
	Multimaterial/other	1.6%	4.1%	0.0%	4.7%
	Subtotal	**3.1%**	**6.8%**	**1.1%**	**7.0%**
Non-ferrous metals		**0.1%**	**1.3%**	**0.0%**	**0.8%**
Glass	Recyclable	0.5%	3.6%	0.0%	2.9%
	Multimaterial/other	0.1%	1.3%	0.0%	0.8%
	Subtotal	**0.5%**	**4.9%**	**0.0%**	**3.6%**
Textiles	Clothing/textiles	0.1%	1.4%	0.0%	1.8%
	Multimaterial/other	7.0%	3.0%	0.0%	7.2%
	Subtotal	**7.2%**	**4.5%**	**0.0%**	**9.0%**
Nappies & sanitary		**1.0%**	**8.4%**	**0.1%**	**5.1%**
Rubble	Concrete	10.1%	1.3%	0.0%	0.2%
	Plasterboard	18.3%	0.0%	0.0%	0.4%
	Other	1.6%	2.6%	4.5%	1.3%
	Subtotal	**30.0%**	**3.9%**	**4.5%**	**1.9%**
Timber	Unpainted & untreated	2.3%	2.6%	0.0%	0.7%
	Fabricated	16.5%	2.6%	0.0%	7.4%
	Multimaterial/other	22.0%	11.7%	6.8%	3.2%
	Subtotal	**40.8%**	**16.9%**	**6.8%**	**11.3%**
Rubber		**0.0%**	**1.3%**	**0.0%**	**0.7%**
Potentially hazardous		**0.1%**	**1.3%**	**0.0%**	**0.6%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**

Appendix 15 – General waste from Ōtaki Transfer Station to landfill – by vehicle type

Ōtaki Transfer Station – general waste (excludes kerbside refuse collections) 2-15 September 2013		Cars	Front-loader trucks	Gantry trucks (1)	Other trucks	Trailers
Paper	Recyclable	14.5%	15.4%	2.1%	41.9%	10.2%
	Multimaterial/other	0.7%	1.3%	0.0%	0.6%	0.7%
	Subtotal	**15.3%**	**16.8%**	**2.1%**	**42.5%**	**10.9%**
Plastics	Recyclable	0.7%	1.3%	0.0%	0.6%	0.6%
	Multimaterial/other	12.3%	20.1%	3.1%	11.8%	9.5%
	Subtotal	**13.0%**	**21.5%**	**3.1%**	**12.4%**	**10.1%**
Organics	Kitchen waste	27.9%	7.4%	0.3%	6.6%	13.8%
	Compostable greenwaste	2.8%	4.0%	89.3%	0.8%	7.0%
	Non-compostable greenwaste	0.6%	0.1%	5.0%	0.2%	0.3%
	Multimaterial/other	1.9%	0.3%	0.0%	0.9%	6.9%
	Subtotal	**33.1%**	**11.8%**	**94.6%**	**8.5%**	**28.0%**
Ferrous metals	Primarily ferrous	2.5%	2.7%	0.0%	0.2%	2.1%
	Multimaterial/other	5.1%	4.0%	0.0%	0.1%	3.6%
	Subtotal	**7.5%**	**6.7%**	**0.0%**	**0.3%**	**5.7%**
Non-ferrous metals		**0.6%**	**1.3%**	**0.0%**	**0.1%**	**0.6%**
Glass	Recyclable	4.6%	3.5%	0.0%	32.8%	1.6%
	Multimaterial/other	1.1%	1.3%	0.0%	0.1%	0.3%
	Subtotal	**5.7%**	**4.8%**	**0.0%**	**33.0%**	**1.9%**
Textiles	Clothing/textiles	1.7%	1.5%	0.0%	0.3%	1.0%
	Multimaterial/other	6.1%	3.0%	0.0%	0.2%	6.3%
	Subtotal	**7.8%**	**4.4%**	**0.0%**	**0.5%**	**7.4%**
Nappies & sanitary		**6.0%**	**8.3%**	**0.1%**	**2.2%**	**4.2%**
Rubble	Concrete	0.0%	1.3%	0.0%	0.0%	2.8%
	Plasterboard	0.8%	0.0%	0.0%	0.0%	4.7%
	Other	1.1%	2.7%	0.0%	0.2%	2.9%
	Subtotal	**1.9%**	**4.0%**	**0.0%**	**0.3%**	**10.4%**
Timber	Unpainted & untreated	0.1%	2.7%	0.0%	0.0%	1.5%
	Fabricated	6.2%	2.5%	0.0%	0.1%	8.6%
	Multimaterial/other	1.8%	12.3%	0.0%	0.0%	10.0%
	Subtotal	**8.0%**	**17.6%**	**0.0%**	**0.1%**	**20.0%**
Rubber		**0.6%**	**1.3%**	**0.0%**	**0.0%**	**0.4%**
Potentially hazardous		**0.6%**	**1.4%**	**0.0%**	**0.2%**	**0.4%**
TOTAL		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

(1) Single vehicle only

Appendix 16 – Overall waste from Ōtaki Transfer Station to landfill

Ōtaki Transfer Station – overall waste 2-15 September 2013		% of total	Tonnes per week
Paper	Recyclable	12.7%	9.2 T/week
	Multimaterial/other	1.6%	1.1 T/week
	Subtotal	**14.3%**	**10.4 T/week**
Plastics	Recyclable	1.7%	1.3 T/week
	Multimaterial/other	12.4%	9.0 T/week
	Subtotal	**14.1%**	**10.2 T/week**
Organics	Kitchen waste	15.0%	10.9 T/week
	Compostable greenwaste	13.9%	10.1 T/week
	Non-compostable greenwaste	2.6%	1.9 T/week
	Multimaterial/other	2.1%	1.5 T/week
	Subtotal	**33.6%**	**24.4 T/week**
Ferrous metals	Primarily ferrous	1.7%	1.2 T/week
	Multimaterial/other	2.7%	2.0 T/week
	Subtotal	**4.4%**	**3.2 T/week**
Non-ferrous metals		**1.0%**	**0.7 T/week**
Glass	Recyclable	3.0%	2.2 T/week
	Multimaterial/other	0.8%	0.6 T/week
	Subtotal	**3.8%**	**2.8 T/week**
Textiles	Clothing/textiles	1.6%	1.1 T/week
	Multimaterial/other	2.8%	2.1 T/week
	Subtotal	**4.4%**	**3.2 T/week**
Nappies & sanitary		**8.8%**	**6.4 T/week**
Rubble	Concrete	0.9%	0.6 T/week
	Plasterboard	0.6%	0.4 T/week
	Other	2.1%	1.5 T/week
	Subtotal	**3.5%**	**2.6 T/week**
Timber	Unpainted & untreated	1.2%	0.9 T/week
	Fabricated	3.1%	2.3 T/week
	Multimaterial/other	5.9%	4.3 T/week
	Subtotal	**10.3%**	**7.4 T/week**
Rubber		**0.7%**	**0.5 T/week**
Potentially hazardous		**1.0%**	**0.8 T/week**
TOTAL		**100.0%**	**72.5 T/week**

Appendix 17 – Overall waste to landfill

Overall waste to landfill from Ōtaki Transfer Station and Otaihanga RRF 2-15 September 2013		% of total	Tonnes per week
Paper	Recyclable	10.1%	44.0 T/week
	Multimaterial/other	1.6%	7.1 T/week
	Subtotal	**11.8%**	**51.1 T/week**
Plastics	Recyclable	1.4%	6.3 T/week
	Multimaterial/other	8.1%	35.1 T/week
	Subtotal	**9.5%**	**41.4 T/week**
Organics	Kitchen waste	12.9%	56.1 T/week
	Compostable greenwaste	11.9%	51.7 T/week
	Non-compostable greenwaste	3.1%	13.7 T/week
	Multimaterial/other	1.9%	8.3 T/week
	Subtotal	**29.9%**	**129.8 T/week**
Ferrous metals	Primarily ferrous	1.1%	4.8 T/week
	Multimaterial/other	1.8%	8.0 T/week
	Subtotal	**2.9%**	**12.8 T/week**
Non-ferrous metals		**0.7%**	**3.1 T/week**
Glass	Recyclable	2.6%	11.1 T/week
	Multimaterial/other	0.8%	3.5 T/week
	Subtotal	**3.4%**	**14.7 T/week**
Textiles	Clothing/textiles	1.4%	5.9 T/week
	Multimaterial/other	4.5%	19.6 T/week
	Subtotal	**5.9%**	**25.5 T/week**
Nappies & sanitary		**6.6%**	**28.8 T/week**
Rubble	Concrete	4.5%	19.7 T/week
	Plasterboard	2.5%	10.7 T/week
	Other	6.8%	29.3 T/week
	Subtotal	**13.8%**	**59.7 T/week**
Timber	Unpainted & untreated	2.4%	10.5 T/week
	Fabricated	2.9%	12.8 T/week
	Multimaterial/other	9.1%	39.3 T/week
	Subtotal	**14.4%**	**62.6 T/week**
Rubber		**0.3%**	**1.5 T/week**
Potentially hazardous		**0.8%**	**3.7 T/week**
TOTAL		**100.0%**	**434.5 T/week**