

Survey of Waste Streams in Matamata-Piako District

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1 Introduction

Under the Local Government Act (2002), Matamata-Piako District Council is responsible for promoting effective and efficient waste management and waste reduction practices within the District. Pursuant to its responsibilities under the Act, in July 2005 the Council approved a Waste Management Plan.

The Plan sets a target of reducing the tonnage of waste disposed of to landfill by 5% per capita per annum, based on 2003/2004 levels. Some of the Plan's key actions for monitoring its success are to:

- Conduct composition surveys of refuse collected by the kerbside collection service and refuse deposited at the Transfer Stations once every year.
- Conduct recycling participation surveys
- Participate in regional surveys of all waste to landfill
- Monitor and report tonnages of refuse and recycling collected by the Council's kerbside collection contractor each year.

In September 2006, Council, with the financial assistance of Environment Waikato, contracted Waste Not Consulting to undertake a survey of all waste streams originating within the District. The results of this waste stream survey are presented in this report.

1.1 Objectives of survey

The survey of waste streams was designed to provide the following information:

- An overview of the 'flow' of waste within the District
- An estimate of the composition of the overall waste stream calculated by using weighbridge data supplied by the facilities operator
- An estimate of the composition of waste entering each of the three transfer stations in the District
- Composition of the different waste streams by material types, comprising 12 primary categories divided into 26 secondary categories
- An assessment of the proportion of waste received at each facility according to "activity source"

1.2 Refuse disposal services in Matamata-Piako District

A range of refuse disposal services is available to residents of Matamata-Piako District. The Council provides a weekly collection of refuse and recycling to about 8000 households in the District. Refuse is collected from the kerbside in official Matamata-Piako District Council refuse bags (each household is provided by Council with 52 bags per annum). Bags are collected by Council's contractor EnviroWaste Services Ltd, which transports the bags to a transfer station or directly to landfill.

Domestic recycling is collected weekly from the kerbside in green Matamata-Piako recycling bins, which are provided to each household by Council. As of March 2007, the collection is undertaken by EnviroWaste Services Ltd and the materials are transported to transfer stations for consolidation of loads for further transport.

The District has three transfer stations, located in Matamata, Morrinsville, and Waihou. Waste from the three transfer stations is transported to the Tirohia landfill in Hauraki District. The transfer stations are owned and maintained by Council and operated by HG Leach & Co Ltd. The Tirohia Landfill is owned and operated by HG Leach & Co Ltd.

Commercial waste is disposed of either through private refuse collections or directly to a transfer station. Private waste operators transport commercial waste to the transfer stations or directly to Tirohia landfill.

A very small amount of waste is collected within Matamata-Piako and disposed of at facilities outside the District.

The three transfer stations in Matamata-Piako District are open 10am to 4pm on the following days:

Table 1-1: Transfer station operating days

	Operating days
Matamata	Tues, Wed, Thurs, Sat & Sun
Morrinsville	Mon, Tues, Thurs, Sat & Sun
Waihou	Wed, Fri & Sun

Matamata and Morrinsville transfer stations both operate a weighbridge and charge for refuse disposal by the tonne. At Waihou transfer station, charging is based on volume. The prices for refuse, green waste and scrap steel disposal are outlined below.

Table 1-2: Transfer station charges

Transfer station	Charges	Refuse	Green Waste	Scrap Steel
Matamata and Morrinsville	Car	\$95.00 per tonne Minimum charge \$5.00	\$1.00 per bag or equivalent	
	Ute, Station wagon, Single axle trailer	\$95.00 per tonne Minimum charge \$12.00	\$40.00 per tonne Minimum charge \$6.00	\$45.00 per tonne Minimum charge \$8.00
	Tandem Axle, High Side Trailer, Commercial	\$95.00 per tonne Minimum charge \$20.00	\$40.00 per tonne Minimum charge \$15.00	\$45.00 per tonne Minimum charge \$8.00
Waihou	Bag	\$2.00	\$1.00	
	Car	\$5.00/0.2m3	\$3.00	
	Station wagon / Ute	\$12.00/0.4m3	\$6.00	
	Single axle trailer	\$20.00/1.0m3	\$10.00	\$12.00
	Light Truck / Tandem Trailer	\$40.00/2.0m3	\$20.00	\$24.00
	Compactor Truck	\$72.00m3	\$40.00m3	

All of the transfer stations have separate drop-off facilities for recyclable containers, such as glass bottles and steel cans, cardboard and paper, greenwaste, metals, and hazardous goods.

2 Methodology

In order to survey all of the waste streams originating within the Matamata-Piako District, Waste Not Consulting designed a methodology that defines the different waste streams and classifies the loads of waste within each waste stream according to an “activity source”.

The composition and tonnage of each separate waste stream and from each separate activity source can then be calculated.

2.1 Waste streams

Wastes originating within Matamata-Piako District are classified as follows:

- Council domestic kerbside bagged refuse collections
- Private domestic kerbside refuse collections
- General unclassified waste taken to a transfer stations
- General unclassified waste taken directly to Tirohia landfill
- General unclassified waste taken to disposal facilities outside of the District.

2.2 Activity source of waste loads

Waste Not has developed its own categories for the “activity source” of waste, aimed at providing the information that is most useful to Councils for monitoring waste streams and effectively targeting waste minimisation initiatives. The categories that have been used for this survey are as follows:

1. **Domestic kerbside collection** – domestic waste collected from residential premises by either council or private kerbside waste collections
2. **Residential general** – all waste originating from residential premises other than that covered by one of the other, more specific classifications (includes drop-offs of domestic waste)
3. **Commercial general** – waste from industrial, commercial, and institutional sources
4. **Construction, demolition, and landscaping (CDL)** – waste materials from the construction or demolition of a building, including the preparation and / or clearance of the property or site and waste from landscaping activity and garden maintenance, both domestic and commercial
5. **Transfer station** (for waste entering Tirohia landfill).

2.3 Survey strategy

Different methods were used to gather data on each of the waste streams in Matamata-Piako District. These methodologies are outlined below.

2.3.1 Domestic kerbside collection

Accurate measurement of domestic kerbside refuse can best be undertaken with a dedicated sort and weigh survey, based on Procedure One of the Ministry for the Environment’s Solid Waste Analysis Protocol 2002 (SWAP).

While a Procedure One SWAP has not been undertaken for Matamata-Piako District; Waste Not Consulting has previously undertaken Procedure One surveys for all of the councils in the Auckland region, and these data are able to be used to provide an estimate of the composition of domestic refuse in Matamata-Piako District. This assumed composition is shown in Appendix 2. It is considered likely that this estimate falls within the margins of error that a Procedure One survey of Matamata-Piako domestic refuse would generate. It is not considered that more accurate information on domestic refuse is necessary for a District-wide waste survey.

Data on both Council domestic and private domestic kerbside collections were gathered from transfer station weighbridge records, which record the tonnage of each load of waste, listed by customer. The assumed composition has then been applied to these tonnages.

2.3.2 General waste to transfer stations

The Council’s three transfer stations, at Morrinsville, Matamata, and Waihou, represent a high proportion of District waste being disposed of at Tirohia landfill. To collect data on the composition of waste entering these facilities, visual surveyors were employed

at each of the transfer stations for a total of ten days of surveying. Surveying was undertaken according to the schedule in the table below.

Table 2-1: Survey schedule

Matamata	Morrinsville	Waihou
Thursday 26 October	Thursday 26 October	Sunday 29 October
Saturday 28 October	Saturday 28 October	Wednesday 1 November
Wednesday 1 November	Sunday 29 October	
Tuesday 7 November	Tuesday 7 November	

Visual surveying provides information on vehicle loads of waste entering a disposal facility in terms of both the composition of the waste load and the activity source of the waste. The classification of the composition of waste is based on the 12 primary categories (e.g. paper, plastics etc) recommended by the SWAP, with 26 secondary classifications being chosen in consultation with Council.

The surveys included only vehicles disposing of waste intended for landfill disposal, not vehicles carrying greenwaste, recyclables, or any other material that was not intended for landfill disposal.

As each vehicle to be surveyed entered the transfer station tipping area, the surveyor recorded the time, the vehicle registration number, the activity source, and the type of vehicle (car, trailer, or truck). After each vehicle had unloaded, the surveyor assessed the relative weight of each constituent present in the load on the basis of volume and density. Absolute weights were not estimated; rather, the proportion of weight represented by each material was estimated. These data were recorded as a proportion, by weight, for each constituent.

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, was used as a template for the composition and was adjusted according to the materials that were visible. These data were then combined with weighbridge records of the weight of the load, and a weight for each of the individual materials in each load was calculated.

As there is no weighbridge at Waihou transfer station, the overall weight of all loads was approximated by the surveyor. The approximations were based on averages determined for each type of vehicle load and load type (e.g. a trailer load of greenwaste) at other disposal facilities with weighbridges.

Weekly tonnages for Matamata and Morrinsville transfer stations were based on the weighbridge records for the four-week period during which the surveys were conducted. Weekly tonnage for Waihou transfer station was based on the Tirohia landfill records for waste from the transfer station during the same four-week period.

2.3.3 General waste direct to Tirohia landfill

Approximately 40% of all waste from Matamata-Piako District is commercial waste taken directly to Tirohia landfill, rather than through one of the transfer stations. The majority of this waste is transported by Waste Management NZ Ltd.

Although this is a high proportion of the waste stream, it is transported by a relatively small number of vehicles, fewer than ten per day according to landfill management. This would have made visual surveying an inefficient process. For the composition of the commercial waste, an assumed composition based on the commercial waste stream entering a large Auckland transfer station was used. Tonnages for 2006 waste from Matamata-Piako District disposed of at Tirohia landfill by customers other than Council were provided by the landfill operators.

2.3.4 Survey of waste operators

To gather further information on waste flows within the District, and specifically on waste being transported directly to Tirohia landfill, a survey was sent to all waste operators identified as operating in the District. This survey was undertaken in conjunction with a similar survey being done for Hauraki District Council. A copy of the survey letter is included in Appendix 1.

2.3.5 Special wastes

Special wastes are those for which special handling is required due to the waste's physical, chemical, or eco-toxic properties. Examples are sewage sludges and contaminated soils. Information of the disposal of special wastes was obtained from Tirohia landfill records and through discussions with Council staff.

3 Results

3.1 Matamata transfer station

3.1.1 Analysis of vehicles surveyed

Matamata transfer station was surveyed over four days between the 26 October and 7 November 2006. An analysis of the numbers and types of vehicle loads carrying general waste (i.e. excluding Council and private domestic refuse collection vehicles) included in the survey are given in Table 3.1 below. Vehicles carrying only recyclable materials, greenwaste, or only domestic refuse bags were not included in the survey.

Table 3-1: Matamata transfer station vehicle load analysis

	Cars	Trailers	Trucks	Total
CDL	Nil	14	5	19
Commercial general	Nil	16	5	21
Residential general	39	21	3	63
Total	39	51	13	103

Of the vehicles surveyed at Matamata transfer station, 20% were vehicles carrying commercial waste, 61% were vehicles carrying residential waste, and 18% were vehicles carrying CDL waste. Half the vehicles were trailers, 38% cars, and 13% trucks.

3.1.2 Primary composition of Matamata transfer station general waste

Every general waste load (i.e. all loads exclusive of private and Council domestic waste collections) was classified according to the type of activity resulting in the generation of the waste. Table 3.2 below shows the primary composition of the residential, commercial and CDL waste streams, separately and combined. Weekly tonnages for each waste stream are shown, based on the average of the four weeks' data provided for the survey. The secondary compositions of the results are given in Appendix 3.

Table 3-2: Primary composition of Matamata general waste streams

Primary category	CDL	Commercial	Residential	Combined
Paper	1.6%	33.3%	13.2%	12.1%
Plastics	1.7%	26.1%	7.5%	8.7%
Putrescibles	9.3%	17.7%	15.3%	13.0%
Ferrous metals	4.1%	3.4%	16.7%	8.1%

Non-ferrous metals	0.1%	0.8%	0.3%	0.3%
Glass	0.5%	2.2%	3.1%	1.7%
Textiles	3.0%	0.4%	10.7%	5.0%
Nappies & sanitary	0.0%	4.4%	1.1%	1.3%
Rubble	36.7%	6.3%	10.7%	21.8%
Timber	42.4%	4.6%	20.1%	27.1%
Rubber	0.0%	0.3%	0.6%	0.3%
Potentially hazardous	0.5%	0.5%	0.8%	0.6%
Tonnes per week	22 tonnes	10 tonnes	16 tonnes	48 tonnes

3.1.3 Overall waste stream to Matamata transfer station

The overall waste stream being disposed of at Matamata transfer station is composed of the three general waste streams and the Council and private domestic kerbside collections. The average weekly tonnage of the general waste streams totalled 48 tonnes and the Council domestic and private domestic kerbside collections totalled 45 tonnes. The sources of the overall waste stream are as shown in Figure 3.1 below.

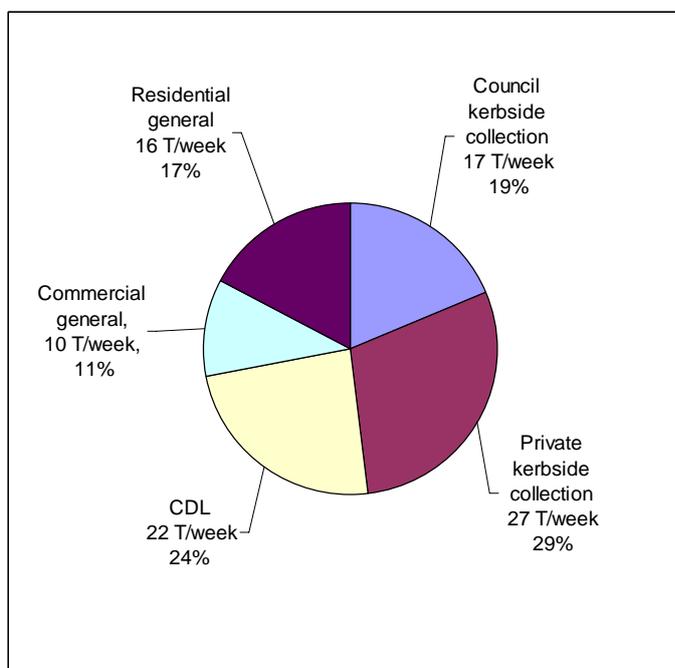


Figure 3-1: Source of overall waste stream to Matamata transfer station during survey period

By combining the previously determined compositions of the general waste streams and the assumed composition of the kerbside collection in the proportions shown in the figure above, the primary composition of the overall waste stream is determined, as shown in Table 3.3 and Figure 3.2 on the following page. Secondary classification and tonnages for the average week during the survey period are included in Appendix 4.

Table 3-3: Composition of overall waste stream to Matamata transfer station during survey period

Primary category	% of total	Tonnes/week
Paper	14.2%	13.2
Plastics	10.8%	10.0
Putrescibles	29.4%	27.3
Ferrous metals	5.5%	5.1
Non-ferrous metals	0.5%	0.5
Glass	2.6%	2.4
Textiles	3.9%	3.7
Nappies & sanitary	6.0%	5.5
Rubble & concrete	11.6%	10.8
Timber	14.5%	13.5
Rubber	0.2%	0.2
Potentially hazardous	0.8%	0.7
Total	100%	92.7 tonnes

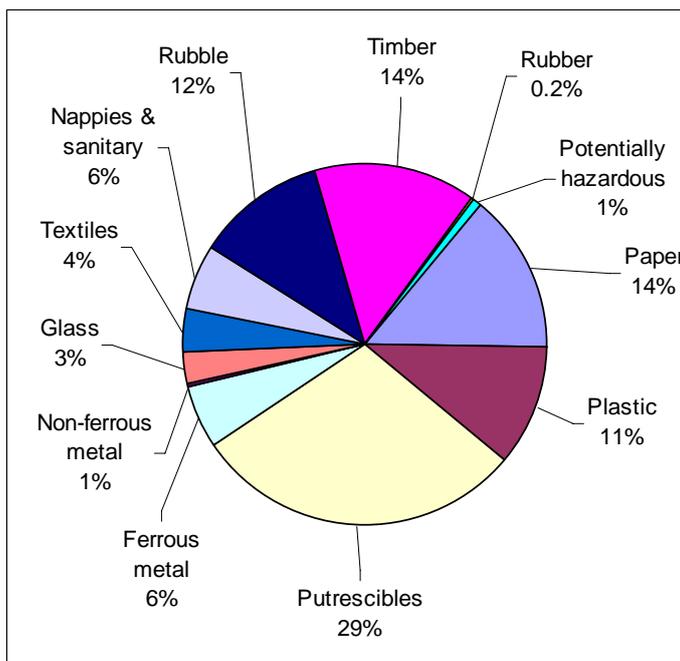


Figure 3-2: Primary composition of overall waste stream to Matamata transfer station during survey period

Putrescible material comprises the single largest classification of material being disposed of to Matamata transfer station (29%), followed by paper and timber (both 14%), and plastic (11%).

3.2 Morrinsville transfer station

3.2.1 Analysis of vehicles surveyed

Morrinsville transfer station was surveyed over four days between the 26 October and 7 November 2006. An analysis of the numbers and types of vehicle loads carrying general waste (i.e. excluding private and Council domestic refuse collection vehicles)

included in the survey are given in Table 3.4 below. Vehicles carrying only recyclable materials, greenwaste, or only domestic refuse bags were not included in the survey.

Table 3-4: Morrinsville transfer station vehicle load analysis

	Cars	Trailers	Trucks	Total
CDL	Nil	15	Nil	15
Commercial	1	13	5	19
Residential	52	42	Nil	94
Total	53	70	5	128

Of the vehicle loads of waste disposed of at Morrinsville transfer station during the auditing, 15% were commercial loads, 73% residential loads, and 12% CDL loads. Trailers accounted for 55% of vehicles, cars for 41%, and trucks for 4%.

3.2.2 Primary composition of Morrinsville transfer station general waste

Every general waste load (i.e. all loads exclusive of private and Council domestic waste collections) was classified according to the type of activity resulting in the generation of the waste. Table 3.5 below shows the primary composition of the residential, commercial, and CDL waste streams, separately and combined, during the survey period. Weekly tonnages for each waste stream are provided, based on the average of the four weeks' data provided for the survey. The secondary compositions are given in Appendix 3.

Table 3-5: Primary composition of Morrinsville general waste streams

Primary category	CDL	Commercial	Residential	Combined
Paper	1.5%	18.4%	13.5%	11.5%
Plastics	3.2%	27.9%	13.8%	13.7%
Putrescibles	15.3%	4.0%	11.4%	11.0%
Ferrous metals	6.3%	18.0%	14.1%	12.9%
Non-ferrous metals	0.2%	0.4%	1.4%	1.0%
Glass	0.6%	6.3%	1.7%	2.2%
Textiles	7.4%	12.3%	11.1%	10.5%
Nappies & sanitary	0.1%	0.6%	2.0%	1.3%
Rubble	22.6%	0.5%	8.0%	10.2%
Timber	40.0%	10.5%	21.6%	24.0%
Rubber	2.8%	0.0%	0.9%	1.2%
Potentially hazardous	0.0%	1.0%	0.5%	0.5%
Tonnes per week	4.2 tonnes	3.1 tonnes	10.7 tonnes	18.0 tonnes

3.2.3 Overall waste stream to Morrinsville transfer station

The average weekly tonnage of the general waste stream to Morrinsville transfer station totalled 18.0 tonnes and the Council domestic and private domestic kerbside collections totalled 33.2 tonnes. The general waste stream was 17% commercial in origin, 60% residential, and 23% CDL. When these proportions are combined with the Council and private domestic kerbside collections, the sources of the overall waste stream are as shown in Figure 3.3 below.

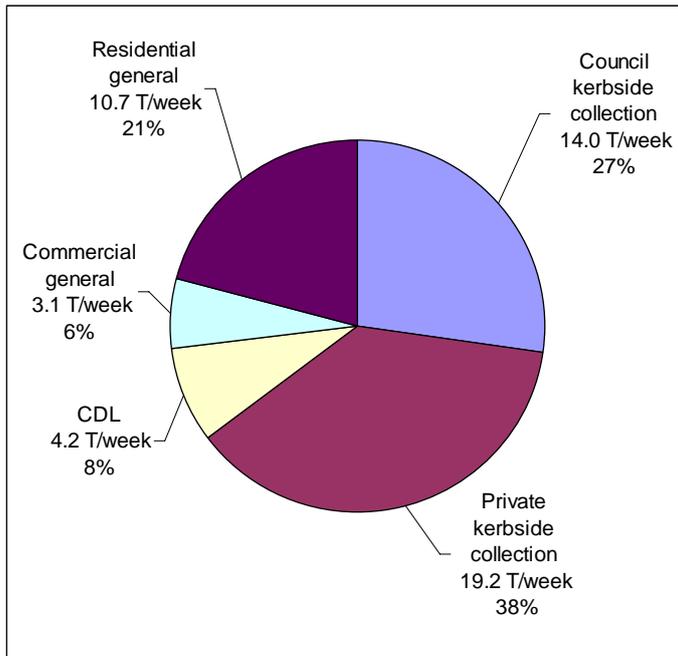


Figure 3-3: Source of overall waste stream to Morrinsville transfer station during survey period

By combining the previously determined compositions of the general waste streams and the assumed composition of the domestic kerbside collection in the proportions shown in the figure above, the primary composition of the overall waste stream is determined, as shown in Table 3.6 and Figure 3.4 on the following page. Secondary classification and tonnages for the average week during the survey period are included in Appendix 4.

Table 3-6: Composition of overall waste stream to Morrinsville transfer station during survey period

Primary category	% of total	Tonnes/week
Paper	14.7%	7.5
Plastics	13.3%	6.8
Putrescibles	34.4%	17.6
Ferrous metals	6.3%	3.2
Non-ferrous metals	0.8%	0.4
Glass	3.1%	1.6
Textiles	5.5%	2.8
Nappies & sanitary	7.6%	3.9
Rubble & concrete	4.0%	2.0
Timber	9.0%	4.6
Rubber	0.6%	0.3
Potentially hazardous	0.8%	0.4
Total	100%	51.1 tonnes

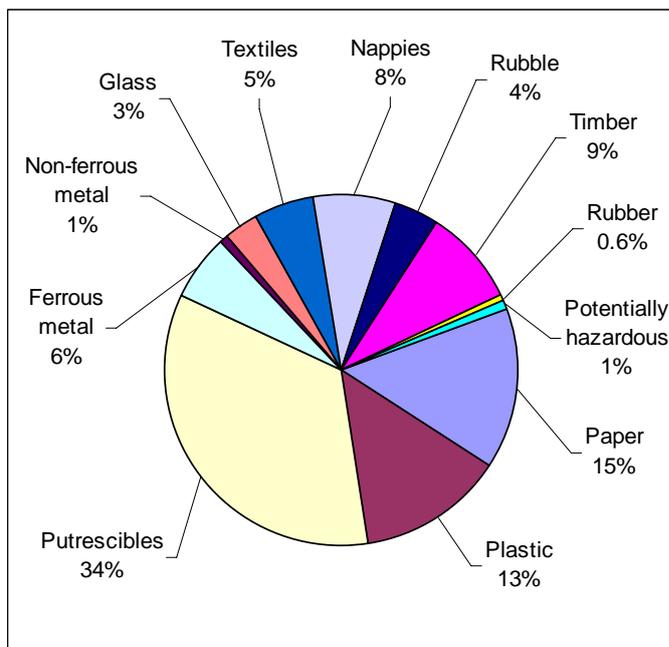


Figure 3-4: Primary composition of overall waste stream to Morrinsville transfer station

Putrescible material comprises the single largest classification of material being disposed of to Morrinsville transfer station (34%), followed by paper (15%), and plastic (13%).

3.3 Waihou transfer station

3.3.1 Analysis of vehicles surveyed

Waihou transfer station was surveyed over two days between the 26 October and 7 November 2006. An analysis of the numbers and types of vehicle loads carrying general waste included in the survey are given in Table 3.7 below. There were no vehicles carrying domestic kerbside refuse. Vehicles carrying only recyclables materials or greenwaste were not included in the survey.

Table 3-7: Waihou transfer station vehicle load analysis

	Cars	Trailers	Trucks	Total
CDL	1	21	1	23
Commercial	Nil	1	1	2
Residential	9	19	Nil	28
Total	10	41	2	53

Of the vehicles surveyed at Waihou, 4% were carrying loads of commercial waste, 53% loads of residential waste, and 43% loads of CDL waste. Trailers accounted for 77% of the vehicles, cars for 19%, and trucks for 4%.

3.3.2 Primary composition of Waihou transfer station general waste

Every general waste load surveyed at Waihou transfer station was classified according to the type of activity resulting in the generation of the waste. Table 3.8 below shows the primary composition of the CDL, commercial, and residential waste streams, separately and combined. Weekly tonnages for each waste stream are based on the average of the four weeks' survey period data for waste from Waihou disposed of at Tirohia landfill. The secondary compositions of the results are given in Appendix 3.

Table 3-8: Primary composition of Waihou transfer station general waste

Primary category	CDL	Commercial	Residential	Combined
Paper	1.7%	20.0%	10.9%	4.8%
Plastics	0.6%	14.7%	8.4%	3.2%
Putrescibles	10.7%	4.8%	11.1%	10.7%
Ferrous metals	2.6%	15.7%	15.9%	6.8%
Non-ferrous metals	0.3%	3.1%	1.7%	0.8%
Glass	0.4%	3.7%	4.6%	1.7%
Textiles	3.7%	6.5%	11.3%	5.9%
Nappies & sanitary	0.0%	9.6%	1.7%	0.8%
Rubble	59.9%	7.0%	18.3%	46.6%
Timber	19.9%	13.6%	15.5%	18.5%
Rubber	0.0%	0.6%	0.1%	0.0%
Potentially hazardous	0.1%	0.6%	0.7%	0.3%
Tonnes per week	13.4 tonnes	0.5 tonnes	5.6 tonnes	19.6 tonnes

A high proportion of the waste, by weight, disposed of at Waihou transfer station is rubble. It is assumed that, as the facility does not have a weighbridge and charges are based on volume rather than weight, rubble is transported to Waihou from throughout the area due to the lower disposal charges incurred.

3.3.3 Overall waste stream to Waihou transfer station

The average weekly tonnage of the general waste stream to Waihou transfer station during the survey period totalled 19.6 tonnes. There was no Council domestic or private domestic kerbside collections disposed of at Waihou transfer station. Figure 3.5 below shows the proportions of the waste streams to Waihou transfer station.

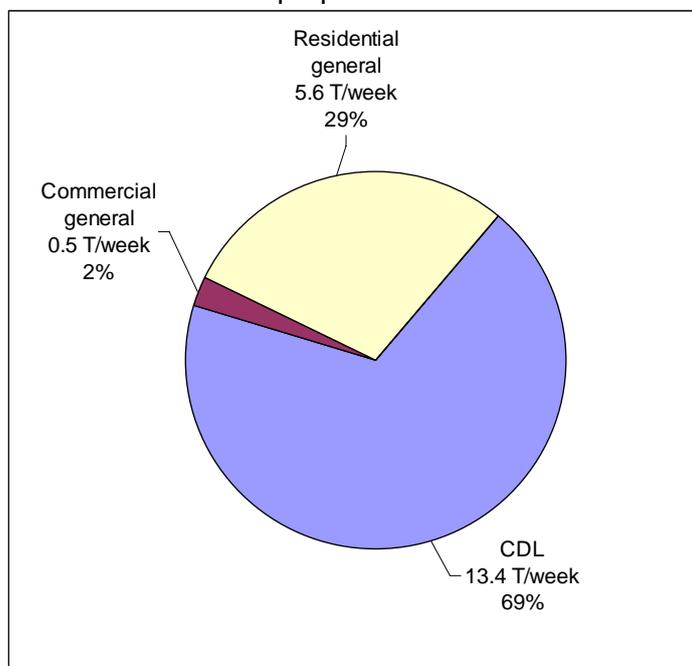


Figure 3-5: Source of overall waste stream to Waihou transfer station

As there is no waste stream other than the combined general waste stream entering the facility, the combined general waste stream comprises the overall waste stream entering Waihou transfer station. The primary composition of the overall waste stream is shown in Figure 3.6 on the following page.

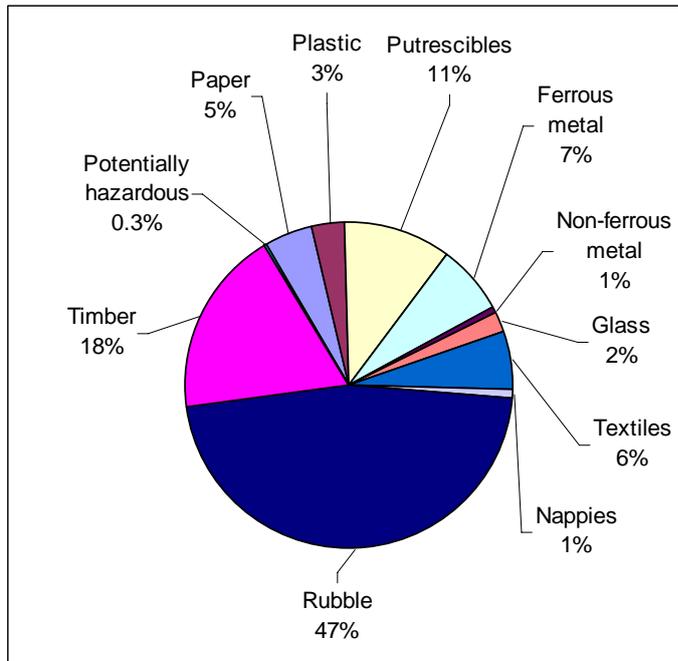


Figure 3-6: Primary composition of overall waste stream to Waihou transfer station

Rubble comprises the single largest classification of material being disposed of to Waihou transfer station (47%), followed by timber (18%), and putrescibles (11%).

3.4 Results of survey of waste operators

A copy of the survey of waste operators contained in Appendix 1 was mailed or faxed to the waste operators known to be operating in the District:

- EnviroWaste Services Ltd, PO Box 20231, Te Rapa, Hamilton
- Matamata Refuse Contractors, PO Box 65, Matamata, 07 8885310
- National Waste NZ Ltd, 84 Puriri Valley Road, Thames, 07 8683866
- National Waste Collections Ltd, 10 Wrigley Pl, Matamata
- Waste Management NZ Ltd, PO Box 5513, Hamilton, 07 8478316
- Wheelie Bin Services, 71 Peria Rd, Matamata, 07 8884322
- Wightman Contractors, 410 Beach Rd, Waihi Beach, Waihi, 07 8637509.

Responses were received from 4 of the 7 operators to whom the surveys were sent. As the results of the survey are commercially-sensitive, the data are not included in this report. The data have been included in a confidential version of this report, Final 1.0 Confidential, which has been provided to Council.

As the quantities of waste reported by the waste operators as being disposed of outside the District (i.e. other than at Tirohia landfill), are insignificant, these will not be dealt with in any of the further analyses. However, it is not assumed that there has not been misreporting, or that the waste operators that did not respond to the survey do not dispose of significant quantities of waste elsewhere. In the absence of further evidence, though, it will be assumed that the quantities disposed of outside of the District are insignificant.

3.5 Special wastes

3.5.1 Sewage sludge

There are three wastewater treatment plants in Matamata-Piako District that generate sewage sludge, at Matamata, Morrinsville, and Te Aroha. As of writing (2007), the sludge from all three is contained within the treatment lagoons. In the near future, the

Morrinsville pond will require de-sludging, and approximately 15,000 tonnes of dewatered sludge will require disposal. Tirohia landfill is the most likely disposal site.¹

A District sludge-dewatering facility, which would serve all three wastewater treatment plants, is currently being investigated by Council. Such a facility would generate several tonnes of dewatered sludge per day. Potentially, this could increase the total quantity of solid waste landfilled from the District by 5-10%, based on the totals in Table 3.10.

3.5.2 Roading infrastructure maintenance

Road maintenance undertaken by Kaimai Valley Services, a Council business unit, generates road sweepings and cesspit cleanings. These are stockpiled at a depot, and periodically trucked to a local overburden site for disposal. Approximately 50 tonnes per year are handled in this manner.² As road sweepings and cesspit cleanings are generally considered hazardous waste due to elevated heavy metal content, the appropriateness of both the storage and disposal methods should be considered by Council.

3.5.3 Other special wastes

Screenings from the Morrinsville and Te Aroha wastewater treatment plants are disposed of at Tirohia landfill. Landfill records indicate that Kaimai Valley Services disposed of approximately 20 tonnes of this material, as special waste, during 2006. As this represents a very minor proportion of the total waste to landfill from Matamata-Piako District, special wastes will not be considered as a separate category in the analysis in the following sections.

3.6 Overall waste stream into Tirohia landfill from Matamata-Piako District

3.6.1 Sources and tonnage of waste into Tirohia landfill

Waste Management NZ Ltd is the major waste operator transporting waste directly to Tirohia landfill. As no response to the waste operator survey was received from Waste Management NZ, it was necessary to use an estimate from the landfill operator as to the quantity of general waste delivered directly to the landfill from Matamata-Piako District. An estimate of 6629 tonnes for the period December 2005 – December 2006 was provided.

Using the annual data for 2006 supplied by Tirohia landfill for waste disposal from Matamata-Piako District, and the results from the transfer station surveys, the waste flows into the landfill can be broken down as shown in the following table. In the table, Council and private domestic kerbside collections are combined into "Kerbside collections".

¹ Phil Smith, MPDC, personal communication, 21 March 2007

² Lance Gwynne, Kaimai Valley Services, personal communication, 21 March 2007

Table 3-9: Primary waste flows into Tirohia landfill from Matamata-Piako District - 2006

Source of waste to Tirohia landfill		Tonnes - 2006	% of total
General direct	Subtotal	6,629	42%
Matamata transfer station	General	2646	17%
	Kerbside collection	2448	15%
	Subtotal	5,108	32%
Morrinsville transfer station	General	947	6%
	Kerbside collection	1747	11%
	Subtotal	2,694	17%
Waihou transfer station	Subtotal	1,053	7%
Te Aroha kerbside collection	Subtotal	495	3%
Total to Tirohia landfill		15,979 tonnes	100%

These results are illustrated graphically in Figure 3.7 on the following page.

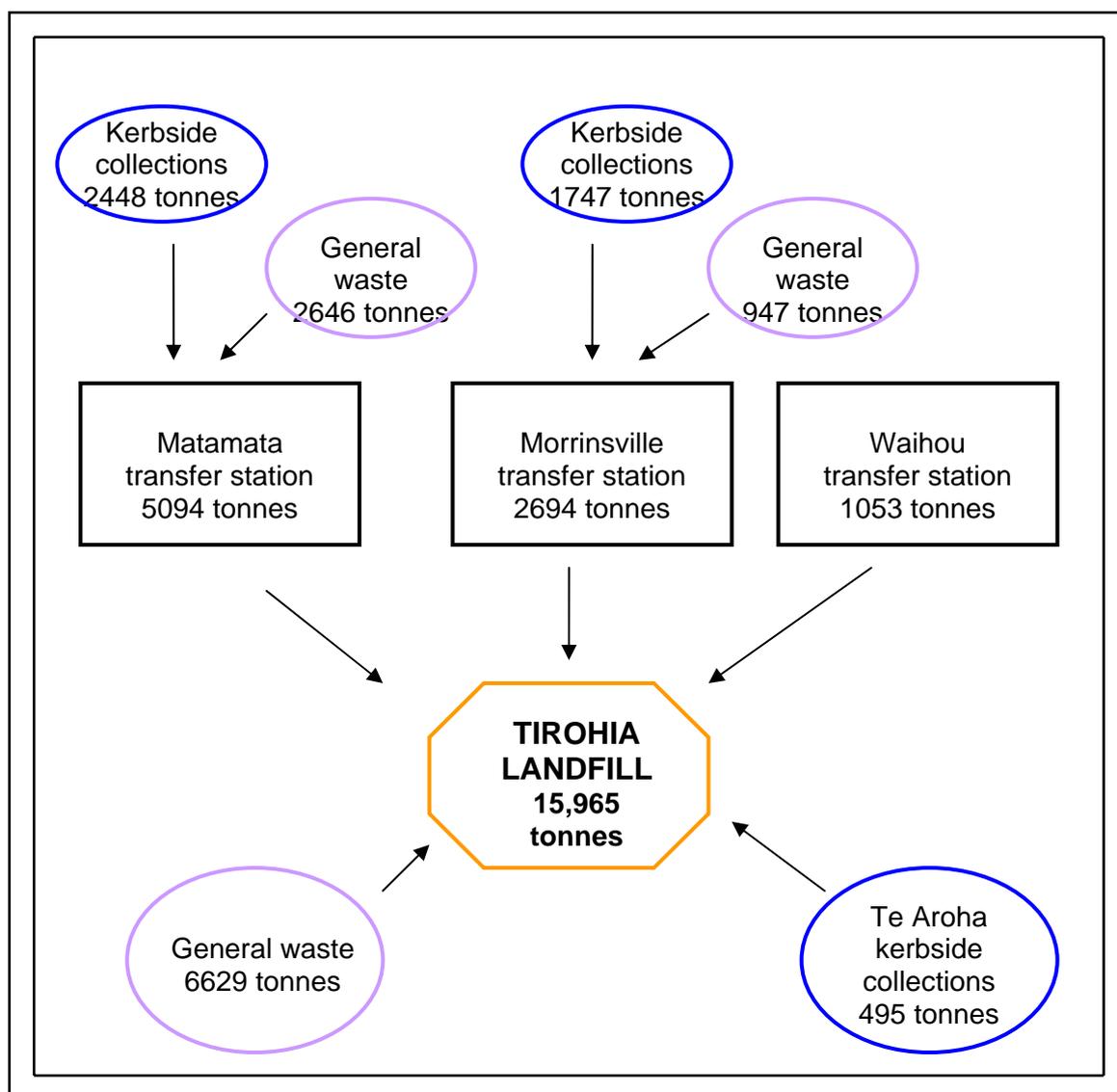


Figure 3-7: Overall waste flows in Matamata-Piako District - 2006

3.6.2 Composition of waste into Tirohia landfill from Matamata-Piako District

By combining the composition of the different waste streams with the proportion of those waste streams in the overall waste flow into Tirohia landfill, the composition of waste from Matamata-Piako District being disposed of at Tirohia landfill can be calculated.

To achieve this, an assumed composition for the general waste being transported directly to the landfill has been used. This composition has been based on commercial waste entering an Auckland transfer station. While this is not an ideal method, given that the general waste comprises over 40% of the total, in the absence of direct data it has been necessary to do so. The 6600 tonnes of general waste disposed of annually amounts to less than 20 tonnes per day, and this waste is mostly being carried by large vehicles, possibly fewer than five trucks per day. While it is possible to collect data on such a waste stream, it has not been considered worthwhile due to the costs involved. The assumed composition that has been used for the calculations is given in Appendix 5.

The primary composition of the waste from Matamata-Piako District disposed of at Tirohia landfill is given in Table 3.10 and Figure 3.8 below. The secondary composition is given in Appendix 6.

Table 3-10: Waste from Matamata-Piako District into Tirohia landfill - 2006

Primary category	% of total	Tonnes
Paper	15.1%	2413
Plastics	11.9%	1905
Putrescibles	28.4%	4534
Ferrous metals	5.2%	833
Non-ferrous metals	0.9%	145
Glass	3.5%	554
Textiles	4.4%	697
Nappies & sanitary	5.4%	862
Rubble & concrete	10.1%	1615
Timber	13.0%	2070
Rubber	1.3%	214
Potentially hazardous	0.8%	123
Total	100.0%	15,965

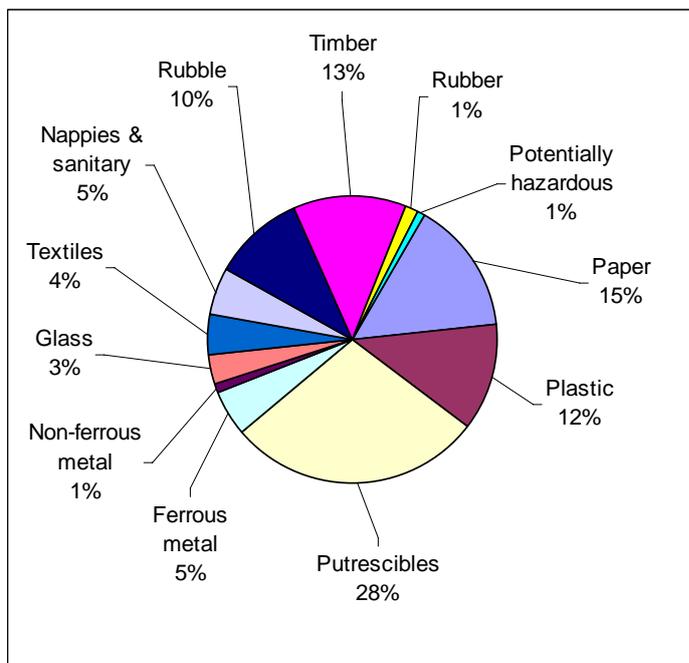


Figure 3-8: Waste from Matamata-Piako District into Tirohia landfill - 2006

Putrescible materials are the largest single component of the waste, comprising 28% of the total. Paper is the second largest component, at 15%, followed by timber (13%), and plastic (12%).

4 Discussion and analysis

4.1 Per capita generation of domestic kerbside refuse

The per capita generation of domestic kerbside refuse is calculated in the table below, based on the figures given in Figure 3.7. The totals in Figure 3.7 closely match the total for the weighbridge records for Council's 2006 collections and the tonnages reported by the waste operators.

Table 4-1 Per capita generation of domestic kerbside refuse

Matamata transfer station	2448 tonnes
Morrinsville transfer station	1747 tonnes
Direct to Tirohia landfill	495 tonnes
Total domestic kerbside collections	4690 tonnes
Usually resident population 2006	30,500
Kg domestic kerbside refuse per capita 2006	153 kg

The figure of 153 kg/per capita/per annum is 8% lower than a national average calculated by Waste Not for MfE in 2005. The difference may be the result of sampling errors, or may be due to a higher proportion of the population in Matamata-Piako District living in rural areas, and disposing of more waste on their own properties.

4.2 Per capita generation of waste to landfill

The per capita generation of waste to landfill is calculated in Table 4.2 below, based on the figures given in Figure 3.7.

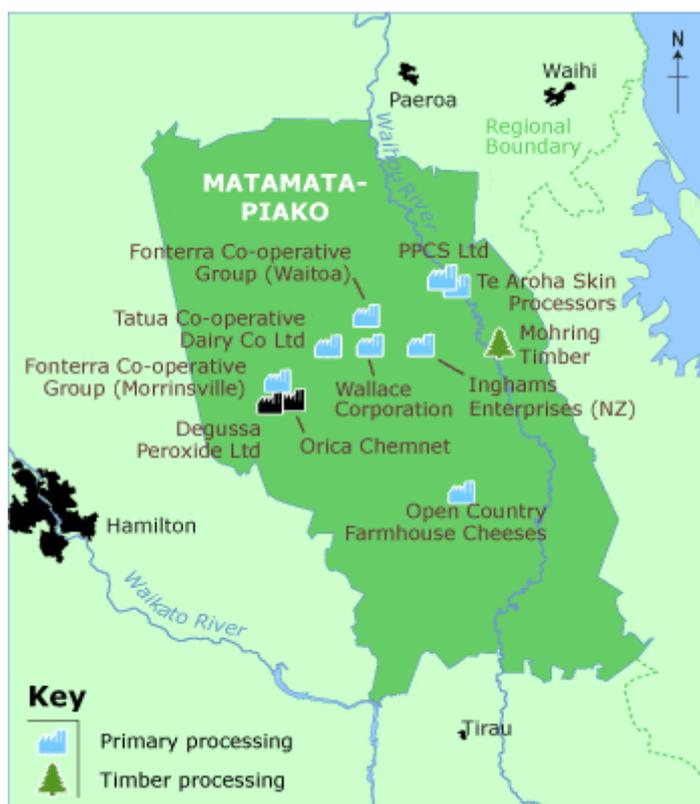
Table 4-2: Per capita generation of waste

Matamata transfer station	5094 tonnes
Morrinsville transfer station	2694 tonnes
Waihou transfer station	1053 tonnes
Direct to Tirohia landfill	7124 tonnes
Total waste to landfill	15,965 tonnes
Usually resident population 2006 census	30,500
Kg waste to landfill per capita 2006	523 kg

The figure of 523 kg/per capita/per annum is similar to other rural districts for which Waste Not has undertaken similar studies.

4.3 Industrial wastes

The principal industrial sites in Matamata-Piako District are shown on the following map³. Four of the primary industries are dairy-related and four are meat or poultry processors. There are two chemical manufacturers and one timber mill.



While these industries were not specifically investigated for this report, it is likely that the majority of general wastes generated by these industries are disposed of at Tirohia landfill and would be included in the data provided by the landfill operator (Section 2.3.3). It is, however, possible, that some of the wastes from the sites near Morrinsville are disposed of at Horotiu landfill, north of Hamilton. Any hazardous wastes generated by the chemical manufacturers are likely to be taken out of the District for disposal, as Horotiu landfill does not accept hazardous wastes.

There are likely to be wastewater treatment ponds at the dairy factories, and the sludge from these ponds would be removed periodically and disposed of to landfill.

³ <http://www.ew.govt.nz/enviroinfo/profile/districts/industry.htm>

4.4 Hazardous wastes

Small quantities of hazardous wastes are collected at the three transfer stations in the District, and transported to Auckland for treatment and disposal. No data on these wastes have been included in this report.

4.5 Comparison with other districts

Waste Not has previously undertaken district-wide waste surveys for Hauraki and Rodney District Councils. The results of these surveys are presented in Table 4.3 below. A high proportion (26.7%) of the Rodney District waste stream is “special waste”, which includes sewage sludge, contaminated fill, and sediments from roading stormwater retention ponds. As there is a very small quantity of special wastes being disposed of to landfill from the other Districts, the final column of the table shows a recalculation of the composition of the Rodney District waste with the special waste removed. This allows a more accurate comparison with the other Districts’ waste.

Table 4-3: Comparison with other districts

	Matamata-Piako District 2006	Hauraki District 2006	Rodney District actual 2005	Rodney District special waste removed
Paper	15.1%	14.5%	8.0%	10.9%
Plastics	11.9%	13.2%	7.2%	9.8%
Putrescibles	28.4%	29.4%	19.6%	26.7%
Ferrous metals	5.2%	8.0%	5.1%	7.0%
Non-ferrous metals	0.9%	1.4%	1.1%	1.5%
Glass	3.5%	5.3%	3.0%	4.1%
Textiles	4.4%	3.5%	4.3%	5.9%
Nappies & sanitary	5.4%	3.8%	3.1%	4.2%
Rubble & concrete	10.1%	7.1%	6.8%	9.3%
Timber	13.0%	12.0%	13.4%	18.3%
Rubber	1.3%	1.2%	0.8%	1.1%
Potentially hazardous	0.8%	0.7%	0.9%	1.2%
Special wastes	0%	<1%	26.7%	
Usually resident population	30,500	17,190	89,200	89,200
Kg domestic kerbside refuse per capita	153 kg	166 kg	170 kg	170 kg
Kg waste to landfill per capita	523 kg	445 kg	530 kg	390 kg

The most significant difference in the composition of the waste streams is in the timber, with Rodney District having a markedly higher proportion of timber than the other districts. This is related to the high level of construction activity in Rodney. The differences in the per capita generation of domestic refuse are not significant, given the degree of estimation that was needed for the calculations. There is no apparent reason for Rodney District to be generating less waste per capita than the other Districts, as the levels of industrial and commercial activity are not appreciably different to those in Matamata-Piako and Hauraki Districts.

4.6 Comparison of Matamata transfer station composition with previous audits

A series of surveys at Matamata transfer station were undertaken in 2003 and 2004 as part of MfE Baseline Programme. The table below compares the results for the composition of the overall waste stream from the current audit with audits from 2003 and 2004.

Table 4-4: Comparison with previous surveys at Matamata transfer station

Overall waste stream	% of total			Tonnes/week		
	Oct/Nov 2006	Sept 04	Dec 03	Oct/Nov 2006	Sept 04	Dec 03
Paper	14.2%	13.0%	13.7%	13.2	10.3	10.4
Plastics	10.8%	13.4%	14.0%	10.0	10.6	10.6
Putrescibles	29.4%	27.0%	36.0%	27.3	21.3	27.2
Ferrous metals	5.5%	7.9%	7.7%	5.1	6.3	5.8
Non-ferrous metals	0.5%	1.4%	1.1%	0.5	1.1	0.8
Glass	2.6%	5.1%	6.7%	2.4	4.1	5.1
Textiles	3.9%	8.7%	3.3%	3.7	6.8	2.5
Nappies & sanitary	6.0%	7.5%	5.6%	5.5	5.9	4.2
Rubble & concrete	11.6%	8.5%	3.2%	10.8	6.7	2.4
Timber	14.5%	6.3%	7.1%	13.5	5	5.4
Rubber	0.2%	0.4%	0.2%	0.2	0.3	0.2
Potentially hazardous	0.8%	0.8%	1.3%	0.7	0.6	1.0
Total	100%	100%	100%	92.7 tonnes	79.1 tonnes	75.6 tonnes
			General waste	48.1 tonnes	26.6 tonnes	22.8 tonnes
			Domestic kerbside collections	44.6 tonnes	52.5 tonnes	52.8 tonnes

The quantities of some of the materials being disposed of at Matamata transfer station, such as plastic, have changed little over the three-year period. Other materials, such as timber and rubble & concrete (both materials related to construction and demolition), have increased substantially. The quantity of glass has decreased by over 50% in that time.

The quantity of domestic kerbside refuse disposed of at the facility has declined slightly, while the quantity of general waste has increased markedly. This increase is largely due to the increase in timber and rubble & concrete.

Appendix I Waste operator survey – letter to operators

RE: SOLID WASTE SURVEY IN MATAMATA-PIAKO AND HAURAKI DISTRICTS

Matamata-Piako and Hauraki District Councils have commissioned Waste Not Consulting to study solid waste flows in Matamata-Piako and Hauraki Districts.

This research is important for the Councils to monitor the progress of their Waste Management Plans. The co-operation of the local waste operators in answering the questions below would help to make the survey as accurate as possible. To protect the commercial sensitivity of the data, the questions are of a very general nature and only the amalgamated results of the survey will be made public.

1) In the last 12 months, approximately how many tonnes of solid waste did you collect in each District?

Hauraki District

Matamata-Piako District

2) Of the solid waste that you collected in the last 12 months, how many tonnes were household waste from kerbside collections (such as bags or wheelie bins)?

Hauraki District

Matamata-Piako District

3) Of the waste that you collected in the last 12 months, how many tonnes were disposed of at facilities **outside** of Matamata-Piako and Hauraki Districts? (i.e. **other** than at Tirohia Landfill, or Matamata, Morrinsville, Paeroa, Waihi, and Waihou transfer stations)

Solid waste from
Hauraki District

Solid waste from
Matamata-Piako District

It would be appreciated if you could fill out this form and return it by email to TShergill@mpdc.govt.nz or fax to (07) 884 0077.

Regards

Tajinder Shergill
Waste Management Officer
Matamata-Piako District Council

Appendix II Assumed composition of domestic bagged refuse

Primary classifications	Secondary classifications	% by weight
Paper	Recyclable paper	11.5%
	Cardboard	2.0%
	Multimaterial/other	3.0%
	Subtotal	16.5%
Plastics	Recyclable (#1 and 2)	3.0%
	Multimaterial/other	10.0%
	Subtotal	13.0%
Putrescibles	Kitchen waste	36.0%
	Greenwaste	8.1%
	Other	3.0%
	Subtotal	47.1%
Ferrous metal	Steel cans	1.5%
	Multimaterial/other	1.2%
	Subtotal	2.7%
Non-ferrous metal	Aluminium cans	0.2%
	Multimaterial/other	0.5%
	Subtotal	0.7%
Glass	Recyclable glass	3.0%
	Multimaterial/other	0.5%
	Subtotal	3.5%
Textiles	Clothing/textile	1.8%
	Multimaterial/other	1.0%
	Subtotal	2.8%
Nappies & sanitary	Subtotal	11.0%
Rubble	Rubble, Concrete	0.0%
	Plasterboard	0.0%
	Multimaterial/other	0.6%
	Subtotal	0.6%
Timber	C&D	0.0%
	Fabricated	0.5%
	Multimaterial/other	0.4%
	Subtotal	0.9%
Rubber	Subtotal	0.2%
Potentially hazardous	Household	0.5%
	Other	0.5%
	Subtotal	1.0%

Appendix III Transfer station general waste streams

Matamata Transfer Station		Proportion of waste (by weight)			
Primary classifications	Secondary classifications	CDL	Commercial general	Residential general	Combined
Paper	Recyclable paper	0.5%	15.6%	6.5%	5.7%
	Cardboard	1.0%	14.0%	6.4%	5.5%
	Multimaterial/other	0.1%	3.7%	0.4%	0.9%
	Subtotal	1.6%	33.3%	13.2%	12.1%
Plastics	Recyclable (#1 and 2)	0.2%	1.4%	0.6%	0.6%
	Multimaterial/other	1.5%	24.7%	6.8%	8.1%
	Subtotal	1.7%	26.1%	7.5%	8.7%
Putrescibles	Kitchen waste	0.1%	7.8%	3.7%	2.9%
	Greenwaste	9.1%	9.4%	11.3%	9.9%
	Other	0.0%	0.5%	0.3%	0.2%
	Subtotal	9.3%	17.7%	15.3%	13.0%
Ferrous metal	Steel cans	0.0%	0.7%	0.2%	0.2%
	Multimaterial/other	4.1%	2.7%	16.5%	7.9%
	Subtotal	4.1%	3.4%	16.7%	8.1%
Non-ferrous metal	Aluminium cans	0.0%	0.6%	0.0%	0.1%
	Multimaterial/other	0.1%	0.1%	0.3%	0.2%
	Subtotal	0.1%	0.8%	0.3%	0.3%
Glass	Recyclable glass	0.1%	2.2%	0.9%	0.8%
	Multimaterial/other	0.4%	0.0%	2.2%	0.9%
	Subtotal	0.5%	2.2%	3.1%	1.7%
Textiles	Clothing/textile	0.0%	0.4%	2.3%	0.8%
	Multimaterial/other	3.0%	0.1%	8.4%	4.2%
	Subtotal	3.0%	0.4%	10.7%	5.0%
Nappies & sanitary	Subtotal	0.0%	4.4%	1.1%	1.3%
Rubble	Rubble, Concrete	5.4%	0.0%	4.0%	3.8%
	Plasterboard	17.1%	0.0%	4.9%	9.5%
	Multimaterial/other	14.1%	6.3%	1.8%	8.4%
	Subtotal	36.7%	6.3%	10.7%	21.8%
Timber	C&D	36.4%	1.2%	7.1%	19.4%
	Fabricated	1.2%	1.8%	12.4%	5.0%
	Multimaterial/other	4.9%	1.5%	0.6%	2.7%
	Subtotal	42.4%	4.6%	20.1%	27.1%
Rubber	Subtotal	0.0%	0.3%	0.6%	0.3%
Potentially hazardous	Household	0.0%	0.3%	0.1%	0.1%
	Other	0.5%	0.1%	0.7%	0.5%
	Subtotal	0.5%	0.5%	0.8%	0.6%

Morrinsville Transfer Station		Proportion of waste (by weight)			
Primary classifications	Secondary classifications	CDL	Commercial general	Residential general	Combined
Paper	Recyclable paper	0.4%	6.1%	5.7%	4.5%
	Cardboard	1.1%	11.5%	6.8%	6.3%
	Multimaterial/other	0.0%	0.7%	1.1%	0.8%
	Subtotal	1.5%	18.4%	13.5%	11.5%
Plastics	Recyclable (#1 and 2)	0.0%	0.7%	0.7%	0.5%
	Multimaterial/other	3.2%	27.2%	13.2%	13.2%
	Subtotal	3.2%	27.9%	13.8%	13.7%
Putrescibles	Kitchen waste	0.2%	2.8%	6.1%	4.2%
	Greenwaste	15.1%	1.0%	4.7%	6.5%
	Other	0.0%	0.3%	0.5%	0.4%
	Subtotal	15.3%	4.0%	11.4%	11.0%
Ferrous metal	Steel cans	0.1%	0.6%	0.3%	0.3%
	Multimaterial/other	6.2%	17.4%	13.8%	12.6%
	Subtotal	6.3%	18.0%	14.1%	12.9%
Non-ferrous metal	Aluminium cans	0.0%	0.4%	0.6%	0.4%
	Multimaterial/other	0.2%	0.0%	0.8%	0.6%
	Subtotal	0.2%	0.4%	1.4%	1.0%
Glass	Recyclable glass	0.0%	3.1%	0.9%	1.1%
	Multimaterial/other	0.6%	3.3%	0.8%	1.2%
	Subtotal	0.6%	6.3%	1.7%	2.2%
Textiles	Clothing/textile	0.2%	0.4%	3.3%	2.1%
	Multimaterial/other	7.2%	12.0%	7.8%	8.4%
	Subtotal	7.4%	12.3%	11.1%	10.5%
Nappies & sanitary	Subtotal	0.1%	0.6%	2.0%	1.3%
Rubble	Rubble, Concrete	18.5%	0.0%	6.3%	8.1%
	Plasterboard	3.2%	0.5%	0.4%	1.1%
	Multimaterial/other	0.9%	0.0%	1.3%	1.0%
	Subtotal	22.6%	0.5%	8.0%	10.2%
Timber	C&D	29.0%	0.2%	8.8%	12.0%
	Fabricated	10.6%	1.0%	12.6%	10.1%
	Multimaterial/other	0.4%	9.3%	0.2%	1.8%
	Subtotal	40.0%	10.5%	21.6%	24.0%
Rubber	Subtotal	2.8%	0.0%	0.9%	1.2%
Potentially hazardous	Household	0.0%	0.0%	0.3%	0.2%
	Other	0.0%	0.9%	0.2%	0.3%
	Subtotal	0.0%	1.0%	0.5%	0.5%

Waihou Transfer Station		Proportion of waste (by weight)			
Primary classifications	Secondary classifications	CDL	Commercial general	Residential general	Combined
Paper	Recyclable paper	0.4%	10.8%	4.4%	1.8%
	Cardboard	1.2%	3.5%	5.0%	2.3%
	Multimaterial/other	0.0%	5.7%	1.5%	0.6%
	Subtotal	1.7%	20.0%	10.9%	4.8%
Plastics	Recyclable (#1 and 2)	0.0%	2.4%	0.6%	0.2%
	Multimaterial/other	0.6%	12.3%	7.8%	2.9%
	Subtotal	0.6%	14.7%	8.4%	3.2%
Putrescibles	Kitchen waste	0.1%	0.0%	5.2%	1.6%
	Greenwaste	10.6%	1.2%	5.3%	8.9%
	Other	0.0%	3.6%	0.5%	0.2%
	Subtotal	10.7%	4.8%	11.1%	10.7%
Ferrous metal	Steel cans	0.0%	1.2%	1.0%	0.3%
	Multimaterial/other	2.6%	14.4%	14.9%	6.5%
	Subtotal	2.6%	15.7%	15.9%	6.8%
Non-ferrous metal	Aluminium cans	0.0%	0.4%	0.5%	0.1%
	Multimaterial/other	0.3%	2.8%	1.2%	0.6%
	Subtotal	0.3%	3.1%	1.7%	0.8%
Glass	Recyclable glass	0.0%	3.0%	1.7%	0.6%
	Multimaterial/other	0.4%	0.7%	2.9%	1.1%
	Subtotal	0.4%	3.7%	4.6%	1.7%
Textiles	Clothing/textile	0.0%	4.8%	0.7%	0.3%
	Multimaterial/other	3.7%	1.7%	10.5%	5.6%
	Subtotal	3.7%	6.5%	11.3%	5.9%
Nappies & sanitary	Subtotal	0.0%	9.6%	1.7%	0.8%
Rubble	Rubble, Concrete	11.7%	0.0%	0.1%	8.1%
	Plasterboard	15.0%	0.0%	0.8%	10.5%
	Multimaterial/other	33.2%	7.0%	17.5%	28.0%
	Subtotal	59.9%	7.0%	18.3%	46.6%
Timber	C&D	19.3%	5.4%	2.4%	14.1%
	Fabricated	0.3%	4.8%	10.3%	3.3%
	Multimaterial/other	0.3%	3.4%	2.9%	1.1%
	Subtotal	19.9%	13.6%	15.5%	18.5%
Rubber	Subtotal	0.0%	0.6%	0.1%	0.0%
Potentially hazardous	Household	0.0%	0.6%	0.6%	0.2%
	Other	0.0%	0.0%	0.1%	0.0%
	Subtotal	0.1%	0.6%	0.7%	0.3%

Appendix IV Overall transfer station waste streams

Overall waste streams – by percentage		Proportion of waste (by weight)		
Primary classifications	Secondary classifications	Matamata transfer station	Morrinsville transfer station	Waihou transfer station
Paper	Recyclable paper	8.5%	9.0%	1.8%
	Cardboard	3.8%	3.5%	2.3%
	Multimaterial/other	1.9%	2.2%	0.6%
	Subtotal	14.2%	14.7%	4.8%
Plastics	Recyclable (#1 and 2)	1.7%	2.1%	0.2%
	Multimaterial/other	9.0%	11.1%	2.9%
	Subtotal	10.8%	13.3%	3.2%
Putrescibles	Kitchen waste	18.8%	24.8%	1.6%
	Greenwaste	9.0%	7.5%	8.9%
	Other	1.5%	2.1%	0.2%
	Subtotal	29.4%	34.4%	10.7%
Ferrous metal	Steel cans	0.8%	1.1%	0.3%
	Multimaterial/other	4.7%	5.2%	6.5%
	Subtotal	5.5%	6.3%	6.8%
Non-ferrous metal	Aluminium cans	0.2%	0.3%	0.1%
	Multimaterial/other	0.3%	0.5%	0.6%
	Subtotal	0.5%	0.8%	0.8%
Glass	Recyclable glass	1.8%	2.3%	0.6%
	Multimaterial/other	0.7%	0.7%	1.1%
	Subtotal	2.6%	3.1%	1.7%
Textiles	Clothing/textile	1.3%	1.9%	0.3%
	Multimaterial/other	2.6%	3.6%	5.6%
	Subtotal	3.9%	5.5%	5.9%
Nappies & sanitary	Subtotal	6.0%	7.6%	0.8%
Rubble	Rubble, Concrete	2.0%	2.8%	8.1%
	Plasterboard	4.9%	0.4%	10.5%
	Multimaterial/other	4.7%	0.7%	28.0%
	Subtotal	11.6%	4.0%	46.6%
Timber	C&D	10.1%	4.2%	14.1%
	Fabricated	2.9%	3.9%	3.3%
	Multimaterial/other	1.6%	0.9%	1.1%
	Subtotal	14.5%	9.0%	18.5%
Rubber	Subtotal	0.2%	0.6%	0.0%
Potentially hazardous	Household	0.3%	0.4%	0.2%
	Other	0.5%	0.4%	0.0%
	Subtotal	0.8%	0.8%	0.3%

Weekly tonnages during survey period		Tonnes/week		
Primary classifications	Secondary classifications	Matamata transfer station	Morrinsville transfer station	Waihou transfer station
Paper	Recyclable paper	7.9	4.6	0.4
	Cardboard	3.5	1.8	0.5
	Multimaterial/other	1.8	1.1	0.1
	Subtotal	13.2	7.5	0.9
Plastics	Recyclable (#1 and 2)	1.6	1.1	0.0
	Multimaterial/other	8.4	5.7	0.6
	Subtotal	10.0	6.8	0.6
Putrescibles	Kitchen waste	17.5	12.7	0.3
	Greenwaste	8.4	3.9	1.7
	Other	1.4	1.1	0.0
	Subtotal	27.3	17.6	2.1
Ferrous metal	Steel cans	0.8	0.5	0.1
	Multimaterial/other	4.3	2.7	1.3
	Subtotal	5.1	3.2	1.3
Non-ferrous metal	Aluminium cans	0.2	0.1	0.0
	Multimaterial/other	0.3	0.3	0.1
	Subtotal	0.5	0.4	0.2
Glass	Recyclable glass	1.7	1.2	0.1
	Multimaterial/other	0.7	0.4	0.2
	Subtotal	2.4	1.6	0.3
Textiles	Clothing/textile	1.2	1.0	0.1
	Multimaterial/other	2.5	1.8	1.1
	Subtotal	3.7	2.8	1.2
Nappies & sanitary	Subtotal	5.5	3.9	0.1
Rubble	Rubble, Concrete	1.8	1.5	1.6
	Plasterboard	4.6	0.2	2.1
	Multimaterial/other	4.3	0.4	5.5
	Subtotal	10.8	2.0	9.1
Timber	C&D	9.3	2.2	2.8
	Fabricated	2.6	2.0	0.6
	Multimaterial/other	1.5	0.5	0.2
	Subtotal	13.5	4.6	3.6
Rubber	Subtotal	0.2	0.3	0.0
Potentially hazardous	Household	0.3	0.2	0.0
	Other	0.5	0.2	0.0
	Subtotal	0.7	0.4	0.1
	TOTAL	92.7	51.1	19.6

Appendix V Assumed composition of commercial waste to Tirohia landfill

Primary classifications	Secondary classifications	% by weight
Paper	Recyclable paper	7.7%
	Cardboard	5.8%
	Multimaterial/other	4.0%
	Subtotal	17.5%
Plastics	Recyclable (#1 and 2)	1.4%
	Multimaterial/other	12.2%
	Subtotal	13.6%
Putrescibles	Kitchen waste	19.1%
	Greenwaste	4.6%
	Other	2.9%
	Subtotal	26.6%
Ferrous metal	Steel cans	1.0%
	Multimaterial/other	3.5%
	Subtotal	4.5%
Non-ferrous metal	Aluminium cans	0.4%
	Multimaterial/other	0.9%
	Subtotal	1.3%
Glass	Recyclable glass	3.5%
	Multimaterial/other	1.1%
	Subtotal	4.6%
Textiles	Clothing/textile	0.9%
	Multimaterial/other	3.2%
	Subtotal	4.1%
Nappies & sanitary	Subtotal	4.4%
Rubble	Rubble, Concrete	0.6%
	Plasterboard	1.1%
	Multimaterial/other	4.7%
	Subtotal	6.4%
Timber	C&D	4.2%
	Fabricated	3.7%
	Multimaterial/other	5.5%
	Subtotal	13.4%
Rubber	Subtotal	2.8%
Potentially hazardous	Household	0.3%
	Other	0.5%
	Subtotal	0.8%

Appendix VI Overall waste to Tirohia landfill from Matamata-Piako District – 2006

Primary classifications	Secondary classifications	% by weight	Tonnes per annum
Paper	Recyclable paper	7.9%	1262
	Cardboard	4.4%	707
	Multimaterial/other	2.8%	445
	Subtotal	15.1%	2413
Plastics	Recyclable (#1 and 2)	1.6%	256
	Multimaterial/other	10.3%	1649
	Subtotal	11.9%	1905
Putrescibles	Kitchen waste	19.3%	3088
	Greenwaste	6.9%	1102
	Other	2.2%	344
	Subtotal	28.4%	4534
Ferrous metal	Steel cans	0.9%	149
	Multimaterial/other	4.3%	684
	Subtotal	5.2%	833
Non-ferrous metal	Aluminium cans	0.3%	45
	Multimaterial/other	0.6%	100
	Subtotal	0.9%	145
Glass	Recyclable glass	2.6%	410
	Multimaterial/other	0.9%	144
	Subtotal	3.5%	554
Textiles	Clothing/textile	1.2%	190
	Multimaterial/other	3.2%	508
	Subtotal	4.4%	697
Nappies & sanitary	Subtotal	5.4%	862
Rubble	Rubble, Concrete	1.9%	303
	Plasterboard	2.8%	445
	Multimaterial/other	5.4%	868
	Subtotal	10.1%	1615
Timber	C&D	6.6%	1053
	Fabricated	3.3%	533
	Multimaterial/other	3.0%	485
	Subtotal	13.0%	2070
Rubber	Subtotal	1.3%	214
Potentially hazardous	Household	0.3%	50
	Other	0.5%	73
	Subtotal	0.8%	123
	TOTAL	100%	15,965 tonnes