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Analysis of Solid Waste Streams in Hauraki District

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Prepared by:
Bruce Middleton, Waste Not Consulting

For:

Environment Waikato
PO Box 4010
HAMILTON EAST

Hauraki District Council
PO Box 17
Paeroa

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Dr Vivienne Smith Date: July 2007

Approved for release by:
Dr Robert Brodnax Date: July 2007

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1 Introduction

The Local Government Act 1996 requires local territorial authorities to take responsibility for waste management within their boundaries. District councils are required to promote effective and efficient waste management while having regard for the environment and economic costs and benefits for the district.

To better fulfil its obligations under the Act, in April 2006 Hauraki District Council, with financial assistance from Environment Waikato, commissioned Waste Not Consulting to undertake two projects – an analysis of the composition of domestic kerbside bagged refuse collected by the council and a district-wide waste survey. The audit of domestic kerbside bagged refuse was completed in May 2006. Previous waste surveys, at council's refuse transfer stations (RTS) in Paeroa and Waihi, had been conducted by Waste Not Consulting in 2004.

The objective of the district-wide waste survey, reported on in this document, is to quantify as accurately as possible all solid waste generated within Hauraki district and disposed of to landfill. The survey is a desk top exercise, based on compiling data from a range of sources and combining the data to produce estimates of the size and composition of the different waste streams.

To supplement the existing data, a survey form was sent to all of the waste operators known to be operating in the region. The survey sought information on the total quantity of waste collected in Hauraki district, the quantity of domestic kerbside refuse collected, and the quantity of waste not disposed of at Tirohia landfill.

1.1 Overview of waste services in Hauraki district

The 2006 census results indicate there were 6762 occupied dwellings in the district and a usually resident population of 17,190. About half of the district's population live in the townships of Waihi (4500) and Paeroa (3975).

Hauraki District Council provides a range of refuse disposal and recycling services to its residents. Council owns and operates two refuse transfer stations (RTS), at Paeroa and Waihi. The Paeroa RTS operates from 8am to 4pm seven days per week. The Waihi RTS is open five days per week from 10am to 4pm.

As well as accepting non-hazardous refuse, both RTS offer separate drop-off facilities for:

- paper
- cardboard
- plastic bottles #1 and #2
- steel and aluminium cans
- glass bottles and jars
- green waste
- domestic quantities of hazardous goods
- metal.

Refuse from both RTS is transported by HG Leach & Company Ltd for disposal at HG Leach's Tirohia landfill. Green waste is also transported by HG Leach to its composting operation at the landfill. Due to operational problems, the green waste from Waihi RTS is frequently too contaminated for composting, and is disposed of to landfill.

Recyclable materials and hazardous goods are collected by National Waste NZ Ltd and transported to its Thames facility for storage, prior to transport to recycling markets.

Council provides for a weekly kerbside collection of domestic bagged refuse to 3140 properties in Ngatea, Paeroa, Karangahake/Mackaytown, Waikino, Waihi, and Whiritoa. The Council domestic collection is contracted to Streetsmart Ltd. Collected refuse from all centres is disposed of at the Paeroa RTS.

Each household is entitled to set out one 60-litre bin or bag each week free of charge. Extra bags can be purchased from council offices or retail outlets. There is no kerbside collection of recyclable materials within the Hauraki District.

Urban ratepayers in the district (that is, ratepayers in Ngatea, Paeroa, Karangahake/ Mackaytown, Waikino, Waihi, and Whiritoa) pay an annual refuse charge. Properties outside of the urban areas can make arrangements for the collection and disposal of domestic refuse with one of the private waste operators in the district.

2 Summary of existing data

2.1 Domestic kerbside bagged refuse

The domestic kerbside bagged refuse collected by Council was audited in May 2006. A total of 200 refuse bags was collected and sorted for the survey.

Sampling was undertaken on one day in Paeroa and one day in Waihi. On each day, 100 bags of refuse were collected. The streets from which the sample was collected covered all parts of the towns and a range of socio-economic levels. The collected bags were transported to the Waitakere Refuse and Recycling Transfer Station in Waitakere City for sorting.

The bags were sorted in sampling units of five bags. Each bag in a sample unit of five bags was weighed in, then all bags were opened, the contents spread on a sorting table, and the individual items sorted into one of 30 categories. When all of the items were sorted, the individual classifications were weighed out and the material disposed of.

2.1.1 Primary composition of Hauraki District domestic kerbside refuse

The primary composition of domestic kerbside refuse, which will be used in the calculations for this report, is given in Table 2.1. The secondary composition is presented in Appendix 1.

Table 2-1: Primary composition of Hauraki domestic kerbside refuse

Primary category	Proportion of total	Mean wt/ household
Paper	19.0%	1.40 kg
Plastics	13.7%	1.01 kg
Putrescibles	38.5%	2.84 kg
Ferrous metals	10.0%	0.74 kg
Non-ferrous metals	0.8%	0.06 kg
Glass	8.1%	0.60 kg
Textiles	2.4%	0.18 kg
Nappies and sanitary	5.3%	0.39 kg
Rubble, concrete, etc.	1.0%	0.07 kg
Timber	0.1%	0.01 kg

Rubber	0.2%	0.02 kg
Potentially hazardous	0.7%	0.05 kg
TOTAL	**100%**	**7.37 kg**

2.2 Paeroa refuse transfer station

Refuse entering Paeroa RTS was surveyed in May 2004 and February 2005. The audits included only vehicles disposing of refuse to landfill, not vehicles carrying recyclables or any other material that was not intended for landfill disposal. Vehicles carrying green waste were included in the survey, as it was understood that, at the time of the surveys, the green waste was being used for landfill cover.

As each vehicle to be surveyed entered the tipping area, the auditor would record the time, the vehicle registration number, and the type of vehicle (car, trailer, or truck). After each vehicle had unloaded, the auditor would assess the relative weight of each constituent present in the load on the basis of volume and density. These data were recorded as a proportion, by weight, for each secondary constituent. The survey data were later combined with the weighbridge data for each vehicle to determine a weight for each constituent in each load.

Vehicles carrying council domestic refuse collection were not included in the following analysis of the 'general' waste stream. The council's domestic collection was included in the calculations of an 'overall' waste stream entering the facility. The primary compositions from the two surveys are presented in Table 2.2 below. The secondary compositions are given in Appendix 2.

The 'average' column in the table is the mean of the two survey results. As green waste from the facility is currently being separated at the RTS for composting at the Tirohia landfill, an adjustment is needed to the average to take into account the proportion of green waste (a secondary classification of putrescibles) that is no longer being landfilled. For the final column, two-thirds of the proportion of the secondary 'green waste' classification disposed of at Paeroa RTS has been removed (from an average of 24.2% for the two surveys to 8.0% for the adjusted figure).

Table 2-2: Primary composition of general waste at Paeroa RTS

Primary category	May 2004	February 2005	Average	Adjusted for green waste recovery
Paper	9.1%	6.8%	8.0%	9.6%
Plastics	19.1%	6.1%	12.6%	15.3%
Putrescibles	24.1%	39.5%	31.8%	17.2%
Ferrous metals	19.5%	5.4%	12.5%	15.1%
Non-ferrous metals	3.0%	1.1%	2.1%	2.4%
Glass	2.8%	5.0%	3.9%	4.7%
Textiles	2.1%	3.4%	2.8%	3.3%
Nappies and sanitary	2.3%	2.4%	2.4%	2.9%
Rubble, concrete, etc.	9.5%	12.3%	10.9%	13.2%
Timber	7.5%	16.2%	11.9%	14.4%
Rubber	0.7%	0.8%	0.8%	0.9%
Potentially hazardous	0.5%	1.0%	0.8%	0.9%

2.3 Waihi refuse transfer station

Refuse entering Waihi RTS was surveyed in June 2004. The audits included only vehicles disposing of refuse to landfill, not vehicles carrying recyclables or any other material that was not intended for landfill disposal. Vehicles carrying green waste were

included in the survey, as it was understood that the green waste was being used for landfill cover.

At Waihi, all vehicles were stopped and weighed on a portable weighbridge installed for the audit. Vehicles then entered the tipping area as usual, unloaded, and were weighed upon exiting. As each vehicle to be surveyed entered the tipping area, the auditor would record the time, the vehicle registration number, and the type of vehicle (car, trailer, or truck). After each vehicle had unloaded, the auditor would assess the relative weight of each constituent present in the load on the basis of volume and density. These data were recorded as a proportion, by weight, for each secondary constituent. The survey data were later combined with the weighbridge data for each vehicle to determine a weight for each constituent in each load.

As no council domestic refuse collections are disposed of at Waihi RTS, the 'general' waste stream is the 'overall' waste stream. It is understood that due to contamination issues with the green waste currently entering the station, the green waste is included with the landfill waste and is disposed of to landfill, so no green waste adjustment, as has been done with the Paeroa results, is necessary.

However, the proportion of non-ferrous metals appears anomalously high, given that for most RTS the proportion of non-ferrous metals is about 1-2%. This could have been caused by one-off loads that included large quantities of non-ferrous metals, or could have been the result of surveyor error. For the current analysis, the proportion of non-ferrous metal will be set at 1.5%, and the other constituents adjusted accordingly.

The primary composition from the survey is presented in Table 2.3 below. The secondary compositions are given in Appendix 3.

Table 2-3: Primary composition of waste at Waihi RTS

Primary category	June 2004	Adjusted
Paper	6.1%	6.3%
Plastics	9.4%	9.8%
Putrescibles	29.4%	30.8%
Ferrous metals	5.5%	5.8%
Non-ferrous metals	5.8%	1.5%
Glass	2.5%	2.6%
Textiles	3.7%	4.0%
Nappies and sanitary	1.1%	1.2%
Rubble, concrete, etc.	11.8%	12.4%
Timber	24.0%	25.1%
Rubber	0.3%	0.3%
Potentially hazardous	0.3%	0.3%

2.4 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 region. This survey was undertaken in conjunction with a similar waste survey being done for Matamata-Piako District Council. A copy of the survey letter is included in Appendix 4.

The survey of waste operators was mailed or faxed to:

- EnviroWaste Services Ltd, PO Box 20231, Te Rapa, Hamilton
- Matamata Refuse Contractors, PO Box 65, Matamata, (07) 888 5310
- National Waste NZ Ltd, 84 Puriri Valley Road, Thames, (07) 868 3866

- National Waste Collections Ltd, 10 Wrigley Pl, Matamata
- Waste Management NZ Ltd, PO Box 5513, Hamilton, (07) 847 8316
- Wheelie Bin Services, 71 Peria Rd, Matamata, (07) 888 4322
- Wightman Contractors, 410 Beach Rd, Waihi Beach, Waihi, (07) 863 7509.

Responses were received from four of the seven 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.

Although no response was received from Wightman Contractors, all refuse disposed of by the company at Tirohia landfill is invoiced through Hauraki District Council, so the tonnage is known. The proportion of the refuse collected by Wightman Contractors that was domestic kerbside refuse is not known. However, as the waste operator handles a significant proportion of waste collected in the district, the proportion of domestic kerbside refuse is important to further calculations. In the absence of any data, an assumed figure, which is given in the confidential version of this report, will be used.

2.5 General waste direct to Tirohia landfill

While H.G. Leach was not able to supply information on individual waste operators transporting refuse directly to Tirohia landfill, an amalgamated figure of 2060 tonnes for 2006 was provided. This means that approximately 27% of all waste from Hauraki District is commercial waste taken directly to landfill, rather than through one of the RTS. It is believed that 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, likely fewer than five per day. This makes visual surveying at the landfill an inefficient process. For the composition of the commercial waste, an assumed composition based on the commercial waste stream entering a large Auckland refuse transfer station was used. This assumed composition is given in Appendix 5.

2.6 Special wastes

2.6.1 Sewage sludge

There are wastewater treatment plants in Whiritoa, Waihi, Paeroa, Kerepehi, Turua, Ngatea, and Waitakaruru. These plants generate sewage sludge, which accumulates in the oxidation ponds. For most of the plants, de-sludging of the ponds occurs every 20-30 years.[1.] Sewage sludge from the Paeroa Wastewater Treatment Plant is currently disposed of at the closed Paeroa refuse tip on Puke Road (State Highway 2).[2] No sewage sludge from the plants was landfilled in 2006.

2.6.2 Wastewater treatment plant screenings

The wastewater treatment plants at Waihi, Paeroa, and Ngatea generate small quantities of screenings. In 2006, 16 tonnes of screenings were disposed of at Tirohia landfill.

2.7 Industrial wastes

The principal industrial sites in Hauraki district are shown on the map below.[3] The principal sites are a sawmill and a bobby veal processing works in Paeroa. The map does not include the mining operations at Waihi or quarry operations.

[1] Hauraki District Council, Water and Sanitary Services Assessment, online
[2] Hauraki District Council, Solid Waste Management Plan, Appendix, online
[3] http://www.ew.govt.nz/enviroinfo/profile/districts/industry.htm

Figure 2-1: Principle industry sites in Hauraki district

While these industries were not specifically investigated for this report, it is likely that the majority of general wastes generated on these sites are disposed of at Tirohia landfill and would be included in the data provided by the landfill operator (Section 2.5). There are likely to be wastewater treatment ponds at the meat processing factory, and the sludge from these ponds might be removed periodically and disposed of to landfill.

2.8 Hazardous wastes

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

3 Overall waste flows in Hauraki district

3.1 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 Hauraki district. An estimate of 2060 tonnes for the period December 2005 – December 2006 was provided.

Using the annual data for 2006 supplied by Tirohia landfill for waste disposal from Hauraki district, and the results from the RTS surveys, the waste flows into Tirohia landfill can be broken down as shown in the following table.

Table 3-1: Primary waste flows into Tirohia landfill from Hauraki District - 2006

Source of waste to Tirohia landfill		**Tonnes - 2006**	**% of total**
General waste direct to landfill		**2657**	**35%**
Private domestic collection direct to landfill		**597**	**8%**
Paeroa RTS	General	1221	16%

	Kerbside collection	1629	21%
	Subtotal	**2850**	**37%**
Waihi RTS		**1526**	**20%**
Special wastes to landfill		**16**	**0.2%**
	Total to Tirohia landfill	**7646**	**100%**

Based on assumption that an estimated proportion of waste collected by Wightman Contractors is domestic kerbside refuse, Paeroa RTS is the largest single source of waste into Tirohia landfill from Hauraki district, comprising 37% of the total. General waste taken directly to landfill is the second largest source, comprising 35%. A further 8% is domestic kerbside refuse taken directly to landfill by Wightman Contractors. These results are illustrated graphically in Figure 3.1 and Figure 3.2 on the following pages.

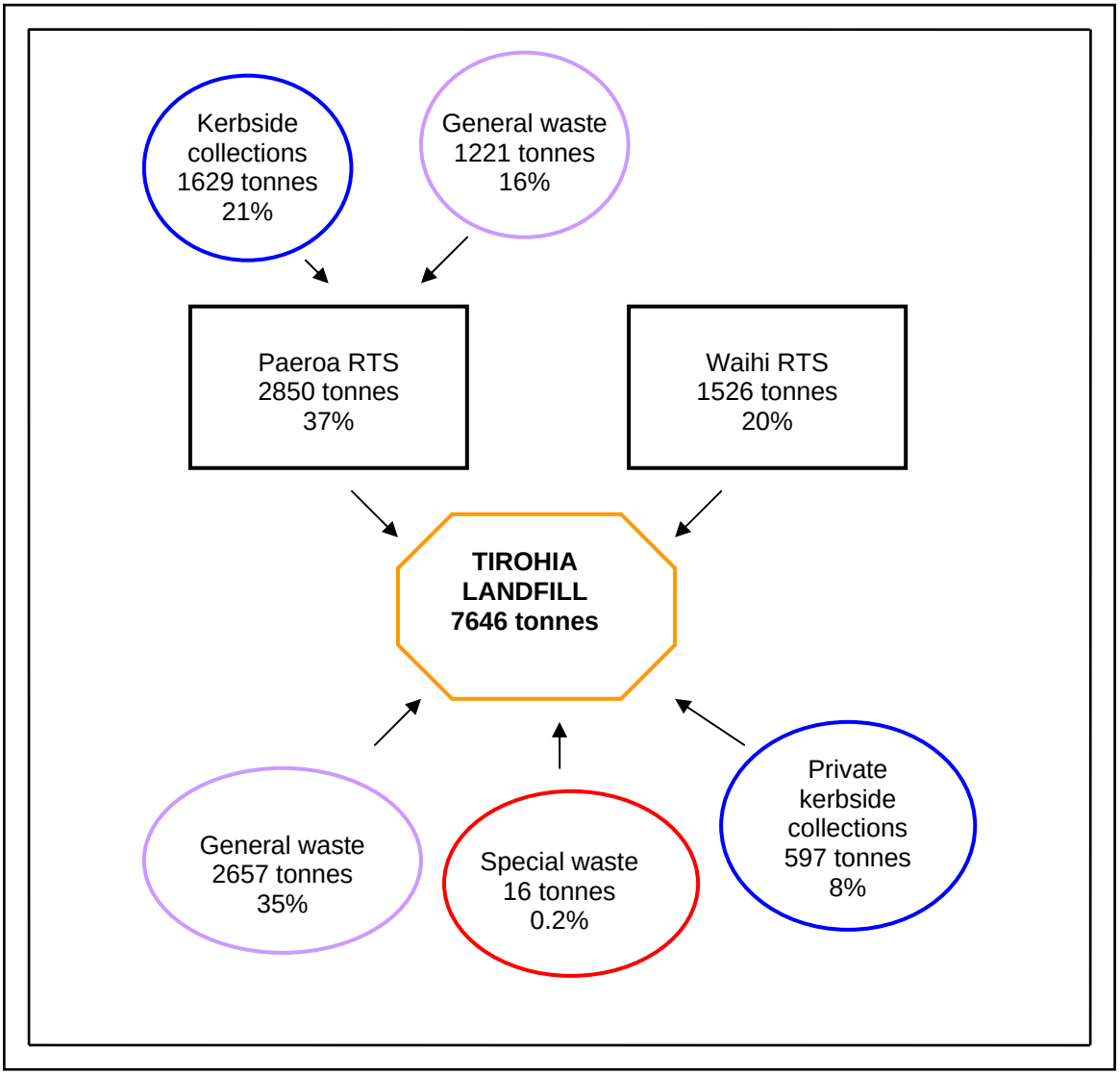

Figure 3-1: Primary waste flows into Tirohia landfill from Hauraki district – 2006

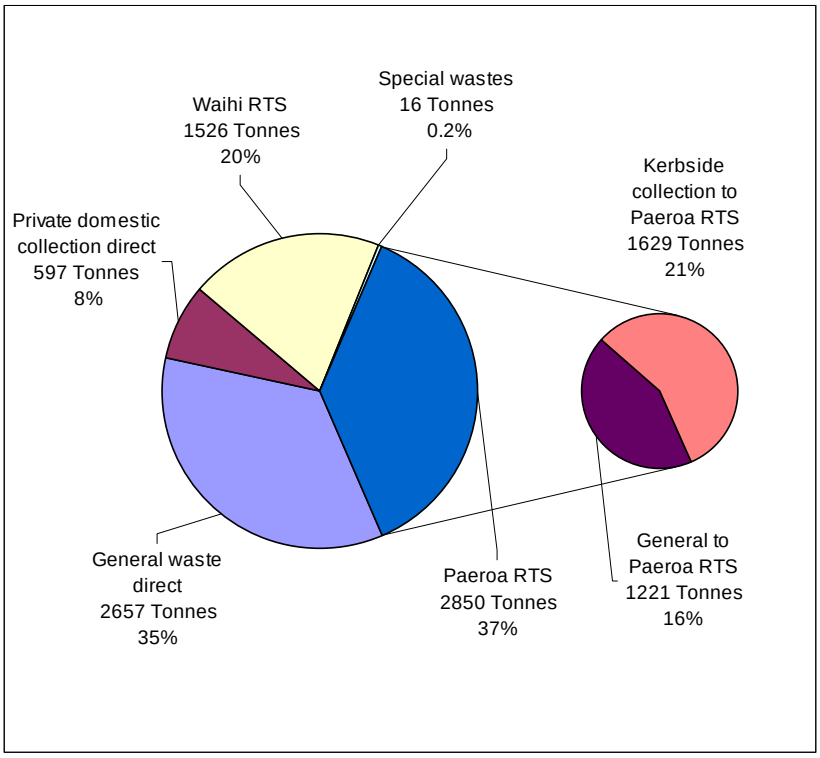

Figure 3-2: Primary waste flows into Tirohia landfill from Hauraki district – 2006

3.2 Composition of waste into Tirohia landfill from Hauraki 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 Hauraki 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 35% of the total, in the absence of direct data it has been necessary to adopt the method used here. The 2657 tonnes of general waste disposed of in 2006 amounts to less than 9 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 undertaken 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 Hauraki district disposed of at Tirohia landfill is given in Table 3.2 and Figure 3.3 on the following page. The secondary composition is given in Appendix 6.

Table 3-2: Composition of waste from Hauraki district into Tirohia landfill - 2006

Primary category	% of total	Tonnes
Paper	14.5%	1107
Plastics	13.2%	1008
Putrescibles	29.4%	2246
Ferrous metals	8.0%	615
Non-ferrous metals	1.4%	105
Glass	5.3%	403
Textiles	3.5%	264
Nappies and sanitary	3.8%	289
Rubble, concrete, etc.	7.1%	543
Timber	12.0%	920
Rubber	1.2%	95
Potentially hazardous	0.7%	53
Total	**100.0%**	**7647**

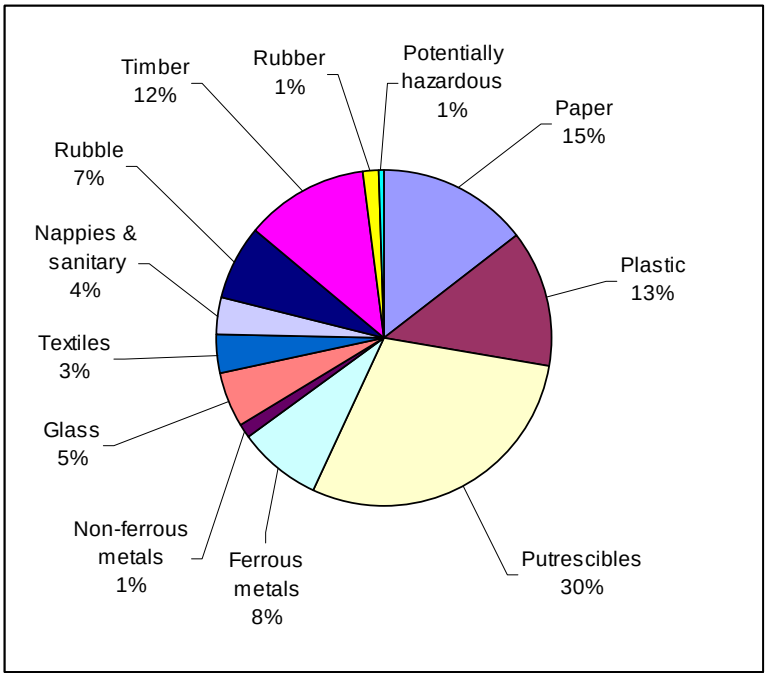

Figure 3-3: Composition of waste from Hauraki district into Tirohia landfill – 2006

Putrescible material is the largest component of the waste from Hauraki district, comprising 30% of the total. Paper is the second largest component, at 15%, and plastic is the third, at 13%.

4 Discussion and analysis

4.1 Per capita generation of domestic refuse

The per capita generation of domestic refuse is calculated in the table below, based on the figures given in Figure 3.1. The table includes bags of domestic refuse taken directly to refuse transfer stations by residents. The figures given are estimates only, as an unknown proportion of the bagged refuse collected by council is from commercial

premises and it has been necessary to use an estimate of the proportion of the refuse collected by Wightman Contractors that is from domestic kerbside collections.

Table 4-1: Per capita generation of domestic refuse

National Waste NZ Ltd[4]	231
Wheelie Bin Services Ltd[5]	156
Domestic bags taken by residents to Paeroa RTS[6]	100
Domestic bags taken by residents to Waihi RTS[7]	145
Wightman Contractors Ltd[8]	597
Council kerbside collection	1629
Total domestic kerbside collections	**2858 tonnes**
Usually resident population 2006 census	**17,190**
Kg domestic refuse per capita 2006	**166 kg**

The figure of 166 kg/per capita/per annum is very similar to a national average calculated by Waste Not Consulting for Ministry for the Environment in 2005.

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 3.1.

Table 4-2: Per capita generation of waste

Paeroa RTS	2850 tonnes
Waihi RTS	1526 tonnes
Direct to Tirohia landfill	3254 tonnes
Special wastes to landfill	16 tonnes
Total waste to landfill	**7646 tonnes**
Usually resident population 2006 census	**17,190**
Kg waste to landfill per capita 2006	**445 kg**

The figure of 445 kg/per capita/per annum is somewhat lower than that for other rural districts for which Waste Not Consulting has undertaken similar studies. This would be accounted for by the relatively low level of commercial and industrial activity in the district.

4.3 Comparison with other districts

Waste Not Consulting has previously undertaken district-wide waste surveys for Matamata-Piako and Rodney district councils. The results of these surveys are

[4] Based on responses to survey of waste operators.
[5] Based on responses to survey of waste operators.
[6] Based on count of domestic bags made during surveys at RTS.
[7] Based on count of domestic bags made during surveys at RTS.
[8] Based on estimate of waste collected being domestic kerbside refuse.

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

	Hauraki district 2006	Matamata-Piako district 2006	Rodney district actual 2005	Rodney district special waste removed
Paper	14.5%	15.1%	8.0%	10.9%
Plastics	13.2%	11.9%	7.2%	9.8%
Putrescibles	29.4%	28.4%	19.6%	26.7%
Ferrous metals	8.0%	5.2%	5.1%	7.0%
Non-ferrous metals	1.4%	0.9%	1.1%	1.5%
Glass	5.3%	3.5%	3.0%	4.1%
Textiles	3.5%	4.4%	4.3%	5.9%
Nappies and sanitary	3.8%	5.4%	3.1%	4.2%
Rubble, and concrete, etc.	7.1%	10.1%	6.8%	9.3%
Timber	12.0%	13.0%	13.4%	18.3%
Rubber	1.2%	1.3%	0.8%	1.1%
Potentially hazardous	0.7%	0.8%	0.9%	1.2%
Special wastes	<1%	0%	26.7%	
Usually resident population	**17,190**	**30,500**	**89,200**	**89,200**
Kg domestic kerbside refuse per capita	**166 kg**	**153 kg**	**170 kg**	**170 kg**
Kg waste to landfill per capita	**445 kg**	**523 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 overall than the other districts, as the levels of industrial and commercial activity are not lower than those in Matamata-Piako and Hauraki districts.

Appendix I: Composition of domestic refuse

Primary classification	Secondary classification	% of total		Mean wt per household set out	
		Margins of error for 95% confidence interval			
Paper	Recyclable packaging	2.7%	±0.4%	0.20 kg	±0.03 kg
	Junk mail	5.3%	±1.4%	0.39 kg	±0.10 kg
	Other recyclable	9.3%	±1.8%	0.68 kg	±0.13 kg
	Non-recyclable packaging	1.6%	±0.3%	0.12 kg	±0.02 kg
	Multimaterial/other	0.2%	±0.2%	0.02 kg	±0.02 kg
	Subtotal	**19.0%**	**±2.5%**	**1.40 kg**	**±0.19 kg**
Plastics	# 1 and 2 bottles only	2.9%	±0.4%	0.21 kg	±0.03 kg
	Other # 1 and 2 packaging	0.4%	±0.1%	0.03 kg	±0.01 kg
	# 5 packaging	0.7%	±0.1%	0.05 kg	±0.01 kg
	# 3,4,6,7 and unlabelled pack.	2.1%	±0.3%	0.15 kg	±0.02 kg
	Plastic bags and films	6.4%	±0.5%	0.48 kg	±0.04 kg
	Multimaterial/other	1.3%	±0.5%	0.09 kg	±0.03 kg
	Subtotal	**13.7%**	**±1.1%**	**1.01 kg**	**±0.08 kg**
Putrescibles	Kitchen waste	28.9%	±3.8%	2.13 kg	±0.28 kg
	Green waste	6.9%	±5.2%	0.51 kg	±0.38 kg
	Other	2.7%	±1.2%	0.20 kg	±0.09 kg
	Subtotal	**38.5%**	**±6.2%**	**2.84 kg**	**±0.46 kg**
Ferrous metals	Steel cans	9.3%	±0.5%	0.69 kg	±0.03 kg
	Other packaging	0.0%	±0.0%	0.00 kg	±0.00 kg
	Multimaterial/other	0.7%	±0.5%	0.05 kg	±0.04 kg
	Subtotal	**10.0%**	**±0.8%**	**0.74 kg**	**±0.06 kg**
Non-ferrous metals	Aluminium cans	0.5%	±0.2%	0.04 kg	±0.01 kg
	Other packaging	0.3%	±0.1%	0.02 kg	±0.01 kg
	Multimaterial/other	0.1%	±0.1%	0.01 kg	±0.01 kg
	Subtotal	**0.8%**	**±0.2%**	**0.06 kg**	**±0.02 kg**
Glass	Bottles/jars	7.7%	±1.9%	0.57 kg	±0.14 kg
	Multimaterial/other	0.5%	±0.2%	0.03 kg	±0.01 kg
	Subtotal	**8.1%**	**±1.9%**	**0.60 kg**	**±0.14 kg**
Textiles	Clothing and textiles	1.6%	±0.6%	0.11 kg	±0.04 kg
	Multimaterial/other	0.9%	±0.6%	0.06 kg	±0.04 kg
	Subtotal	**2.4%**	**±0.8%**	**0.18 kg**	**±0.06 kg**
Nappies and sanitary		**5.3%**	**±1.8%**	**0.39 kg**	**±0.13 kg**
Rubble, concrete, etc.		**1.0%**	**±0.7%**	**0.07 kg**	**±0.05 kg**
Timber		**0.1%**	**±0.1%**	**0.01 kg**	**±0.01 kg**
Rubber		**0.2%**	**±0.2%**	**0.02 kg**	**±0.01 kg**
Potentially hazardous	Household	0.5%	±0.3%	0.04 kg	±0.02 kg
	Other	0.2%	±0.2%	0.01 kg	±0.01 kg
	Subtotal	**0.7%**	**±0.3%**	**0.05 kg**	**±0.02 kg**
	TOTAL	**100.0%**		**7.37 kg**	**±0.52 kg**

Appendix II: Paeroa RTS general waste

Paeroa RTS general waste (excludes council domestic collection)		May 04	February 05	Average	Adjusted for green waste removal
Paper	Recyclable	6.7%	5.1%	5.9%	7.2%
	Non-recyclable	2.3%	1.8%	2.1%	2.5%
	Subtotal	**9.1%**	**6.8%**	**8.0%**	**9.6%**
Plastics	Recyclable	2.4%	1.5%	2.0%	2.4%
	C and D	1.7%	0.4%	1.1%	1.3%
	Other	15.0%	4.2%	9.6%	11.6%
	Subtotal	**19.1%**	**6.1%**	**12.6%**	**15.3%**
Putrescibles	Kitchen waste	4.4%	7.8%	6.1%	7.4%
	Green waste	19.2%	29.2%	24.2%	8.0%
	Other	0.5%	2.5%	1.5%	1.8%
	Subtotal	**24.1%**	**39.5%**	**31.8%**	**17.2%**
Ferrous metals	C and D	8.7%	1.8%	5.3%	6.4%
	Other	10.8%	3.6%	7.2%	8.7%
	Subtotal	**19.5%**	**5.4%**	**12.5%**	**15.1%**
Non-ferrous metals	C and D	1.1%	0.2%	0.7%	0.8%
	Other	1.8%	0.9%	1.4%	1.6%
	Subtotal	**3.0%**	**1.1%**	**2.0%**	**2.4%**
Glass	Recyclable	1.9%	3.0%	2.5%	3.0%
	C and D	0.0%	0.2%	0.1%	0.1%
	Other	0.9%	1.8%	1.4%	1.6%
	Subtotal	**2.8%**	**5.0%**	**3.9%**	**4.7%**
Textiles	C and D	0.3%	1.0%	0.7%	0.8%
	Multimaterial/other	1.8%	2.4%	2.1%	2.5%
	Subtotal	**2.1%**	**3.4%**	**2.8%**	**3.3%**
Nappies and sanitary	**Subtotal**	**2.3%**	**2.4%**	**2.4%**	**2.9%**
Rubble, Concrete, etc.	C and D	9.0%	7.0%	8.0%	9.7%
	Other	0.5%	5.3%	2.9%	3.5%
	Subtotal	**9.5%**	**12.3%**	**10.9%**	**13.2%**
Timber	C and D	4.8%	11.0%	7.9%	9.6%
	Other	2.7%	5.2%	4.0%	4.8%
	Subtotal	**7.5%**	**16.2%**	**11.9%**	**14.4%**
Rubber	**Subtotal**	**0.7%**	**0.8%**	**0.8%**	**0.9%**
Potentially hazardous	**Subtotal**	**0.5%**	**1.0%**	**0.8%**	**0.9%**

Appendix III: Waihi RTS waste

Waihi RTS		June 2004	Adjusted
Paper	Recyclable	4.0%	4.2%
	Non-recyclable	2.0%	2.1%
	Subtotal	**6.1%**	**6.3%**
Plastics	Recyclable	1.0%	1.0%
	C and D	2.4%	2.5%
	Other	6.0%	6.3%
	Subtotal	**9.4%**	**9.8%**
Putrescibles	Kitchen waste	4.3%	4.5%
	Green waste	24.6%	25.8%
	Other	0.5%	0.5%
	Subtotal	**29.4%**	**30.8%**
Ferrous metals	C and D	1.3%	1.4%
	Other	4.2%	4.4%
	Subtotal	**5.5%**	**5.8%**
Non-ferrous metals	C and D	1.8%	0.8%
	Other	4.1%	0.8%
	Subtotal	**5.8%**	**1.5%**
Glass	Recyclable	1.3%	1.4%
	C and D	0.7%	0.7%
	Other	0.5%	0.5%
	Subtotal	**2.5%**	**2.6%**
Textiles	C and D	0.7%	0.7%
	Multimaterial/other	3.1%	3.2%
	Subtotal	**3.7%**	**4.0%**
Nappies and sanitary	**Subtotal**	**1.1%**	**1.2%**
Rubble, Concrete, etc.	C and D	10.1%	10.6%
	Other	1.7%	1.8%
	Subtotal	**11.8%**	**12.4%**
Timber	C and D	17.7%	18.5%
	Other	6.3%	6.6%
	Subtotal	**24.0%**	**25.1%**
Rubber	**Subtotal**	**0.3%**	**0.3%**
Potentially hazardous	**Subtotal**	**0.3%**	**0.3%**

Appendix IV: Letter to waste 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 cooperation 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? (that is, ***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 V: Assumed composition of commercial waste

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%
	Green waste	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 and sanitary	**Subtotal**	**4.4%**
Rubble	Rubble, concrete	0.6%
	Plasterboard	1.1%
	Multimaterial/other	4.7%
	Subtotal	**6.4%**
Timber	C and 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 landfill – 2006

Hauraki district waste to landfill - 2006		% of total	Tonnes - 2006
Paper	Recyclable	11.7%	898
	Non-recyclable	2.7%	209
	Subtotal	**14.5%**	**1107**
Plastics	Recyclable	1.9%	147
	Non-recyclable	11.3%	861
	Subtotal	**13.2%**	**1008**
Putrescibles	Kitchen waste	17.2%	1313
	Green waste	10.0%	765
	Other	2.2%	168
	Subtotal	**29.4%**	**2246**
Ferrous metals		**8.0%**	**615**
Non-ferrous metals		**1.4%**	**105**
Glass	Recyclable	4.2%	322
	Non-recyclable	1.1%	80
	Subtotal	**5.3%**	**403**
Textiles		**3.5%**	**264**
Nappies and sanitary		**3.8%**	**289**
Rubble		**7.1%**	**543**
Timber		**12.0%**	**920**
Rubber		**1.2%**	**95**
Potentially hazardous		**0.7%**	**53**
	TOTAL	**100.0%**	**7647 tonnes**