Buried treasure: what we are throwing into landfill

Results at a glance

- Household waste was surveyed from 491 households
- Over 4600 kgs of waste was sorted and weighed
- Organics – food and garden waste – was the biggest category at nearly 60 percent
- Plastics, paper and sanitary paper were the next biggest ranging between 8.5 to 9.5 percent
- In all, two thirds of the weighed waste could have been composted or recycled
- Households with bins tended to throw out more waste than those with bags
- Council has an estimated 40% share of the household kerbside waste market
- Nearly 500 vehicles including trailers and compactor trucks were surveyed at the Southern Landfill
- An estimated 1745 tonnes per week was disposed of by these vehicles
- Of this, approximately 15 percent was easily recyclable, and 25 percent was compostable

Introduction

In October and November 2018, Wellington City Council conducted surveys of solid waste at its Southern Landfill, where most of the waste thrown out in Wellington city is taken for disposal. We survey waste to see how much could be reused, recycled or composted, to help plan and implement actions to improve waste management and minimisation and to monitor and evaluate those actions. Gathering information about what we throw away in our rubbish bags and bins is an essential aspect of managing our waste and Council recognises this in a formal way through its local action plan* which includes a commitment to collect data and conduct surveys.

The surveys

Waste Not Consulting, which specialises in waste audits, carried out:

- a six-day visual survey of “residual” waste (waste that goes to landfill regardless of what it contains) from a variety of vehicles including trailers and large rubbish trucks;
- a seven-day audit of household waste placed out at the kerbside, which was sorted into categories and weighed to get detailed information about weight and type.

Both surveys were done at the Southern Landfill, and further information was provided by an analysis of four weeks of data recorded as vehicles went over the weighbridge.

What Wellingtonian households put out in their rubbish bags each week?

Fifteen streets in six suburbs were selected to ensure a sample of waste from different types of housing, a good spread across the city and a range of public (bag) and private (wheelie bin) services. We had approval from both waste operators and residents to pick up their kerbside waste.

On seven weekdays, 365 bags and 126 wheelie bins (120/140 and 240 litres) were collected and all the waste was taken to the landfill for sorting.

In addition, the “set out” rate – meaning the number of bags put out by one household – was also recorded when waste was being collected for the audit. Through this process we’re able to calculate the average weight of what a household sets out.

At the landfill, the audit team emptied the contents on to a long table and sorted everything into different categories. That was 4.6 tonnes of material. As evidenced by the photos, it’s a messy job, but it provides valuable information about what we are throwing out.

Image: The audit team sorts material for weighing

The findings

For the kerbside audit, the stand out category by far was organics – food and green waste – which was almost 58 percent of the total sorted by weight, as shown in the pie chart below. And of this, food waste was over half. The next largest categories were plastics (9.5 percent), sanitary paper (9 percent) and paper (8.4 percent). Sanitary paper was largely nappies, tissues and paper towels.

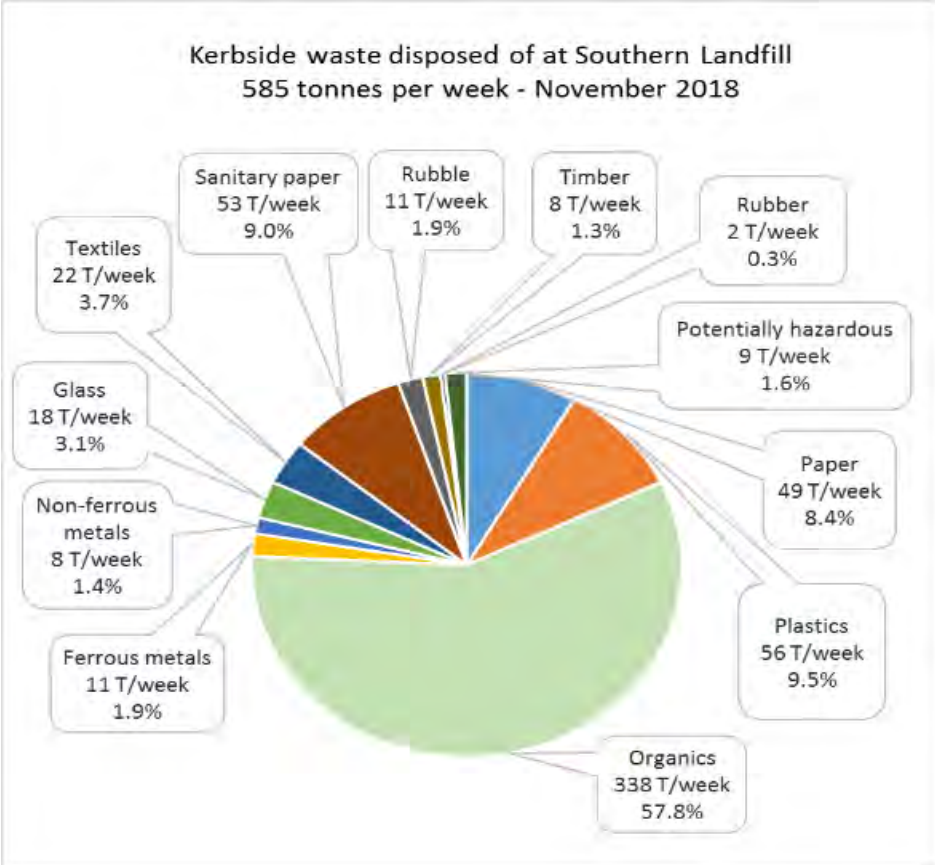

Figure 1: Kerbside waste received at the Southern Landfill.

When looking at the results for bags compared to 120/140 litre bins and 240 litre bins, it was notable that the larger the container, the greater the amount of waste and thus the potential to divert more for composting and recycling.

In addition, households using 240-litre wheelie bins set out 2.6 times as much waste as households using rubbish bags. In part this is likely to be due to differences in household sizes, as larger families may choose to use 240-litre wheelie bins, but some may also be due to differences in waste management behaviour and how frequently the service is available and used.

The potential to divert material from kerbside waste – over two thirds of the total – is shown in the following table.

Diversion potential of combined kerbside waste	% of total	Tonnes per week
Kerbside recyclable materials		
Paper - Recyclable	7.2%	42 T/week
Plastics - #1-2 containers	0.9%	5 T/week
Plastics - #3-7 containers	0.7%	4 T/week
Ferrous metals - Steel cans	0.6%	3 T/week
Non-ferrous metals - Aluminium cans	0.3%	2 T/week
Glass - Bottles/jars	2.6%	15 T/week
Subtotal	**12.3%**	**72 T/week**
Compostable materials		
Organics - Kitchen/food waste	32.9%	192 T/week
Organics Green waste	22.2%	130 T/week
Subtotal	**55.1%**	**322 T/week**
TOTAL - Potentially divertible	**67.4%**	**394 T/week**

The survey also estimated Council's share of the kerbside waste market by use and by weight. It found that Council rubbish bags were used by about 40 percent of the city's households but that by weight, this was 26 percent, with private wheelie bins accounting for the rest.

What goes into our landfill?

The landfill survey was undertaken at two locations at the landfill itself. Almost 500 vehicles were visually surveyed: 330 of them at the drop-off point for cars, trailers and small trucks (i.e. the transfer station) and 164 at the tip face which is used by larger, dedicated waste collection trucks.

While each vehicle was being unloaded, the surveyor assessed the relative weight of each material in the load, based on volume and density.

Also recorded were the type of vehicle and the source of the load by activity (e.g. construction and demolition, landscaping).

The findings

When the results of all waste disposed of at the Southern Landfill were combined (including analysis of the weighbridge data over the four weeks in November), the average disposal to landfill was 1745 tonnes per week. The following pie chart shows the break down into the 12 primary categories.

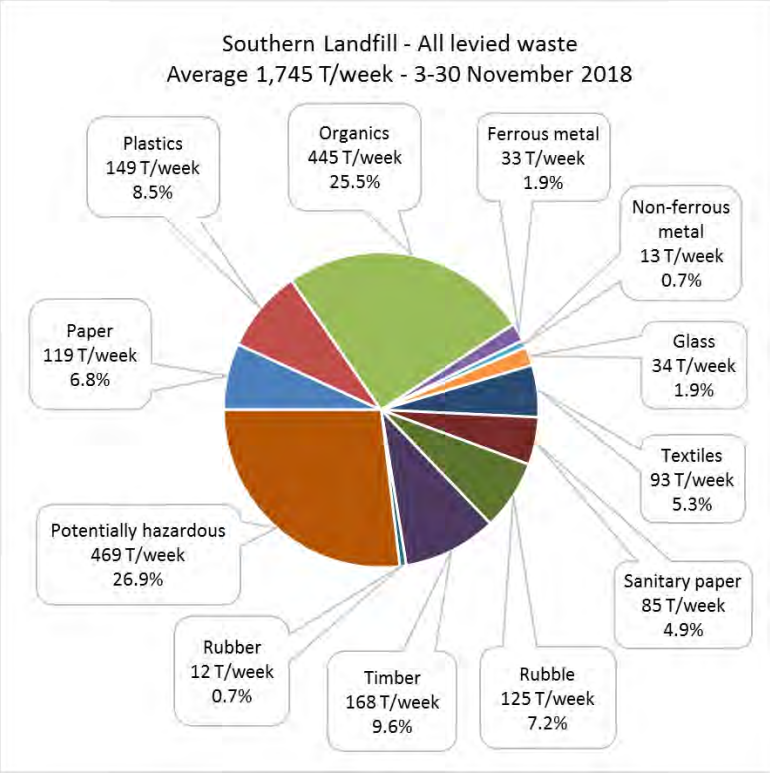

Figure 2: Waste types received at the Southern Landfill

Almost a quarter of all waste (445 tonnes per week) was organic material and could have been composted; with Kitchen being the largest component, comprising of 14.0% (243 tonnes per week).
Further analysis of the data collected revealed that about 16% of this waste could be diverted from the landfill (see table overleaf). These percentages take into account the different types of material within a category that are difficult to recycle or where market already exists. For example whilst plastics comprises of 8.5% of material received at the landfill, in reality only 3.8% of the plastics e.g. plastics 1,2 and 5 can technically be recycled.

Diversion potential of all waste to landfill

Diversion potential	3-30 November 2018	
	% of weight	Tonnes/week
Paper - Recyclable	3.8%	66 T/week
Paper - Cardboard	2.3%	40 T/week
Plastic - Recyclable	1.0%	18 T/week
Ferrous metals	1.9%	33 T/week
Non-ferrous metals	0.7%	13 T/week
Glass - Recyclable	1.3%	23 T/week
Textiles - Clothing	1.3%	23 T/week
Rubble - Cleanfill	2.7%	48 T/week

Timber - Reusable	0.5%	9 T/week
Subtotal	**15.7%**	**273 T/week**
Kitchen waste	14.0%	243 T/week
Compostable green waste	8.8%	153 T/week
New plasterboard	0.5%	9 T/week
Untreated/unpainted timber	1.2%	20 T/week
Subtotal	**24.4%**	**426 T/week**
TOTAL - Potentially divertible	**40.1%**	**699 T/week**

All up over 40% could have been put to better use. That's a lot of buried treasure.

Who brings the waste to our Landfill?
The survey also identified the sources of all levied waste deposited at the Southern Landfill. The waste was roughly broken up into different activity categories as below.

All levied waste to landfill - By activity source 3-30 November 2018	**All levied waste**	**% of total**
Construction & demolition*	131 T/week	7.5%
Industrial/commercial/institutional	454 T/week	26.0%
Landscaping & earthworks	63 T/week	3.6%
Residential	59 T/week	3.4%
Kerbside waste	585 T/week	33.5%
Special waste	454 T/week	26.0%
TOTAL	**1,745 T/week**	**100.0%**

From the results, a third of the waste deposited at the Southern landfill is from what residents put out weekly. This is followed closely by Industrial, commercial and institutional waste (ICI) and special waste. Special waste is waste that requires special handling to receive, e.g. sewage sludge or asbestos contaminated material. Sewage sludge tonnages are fairly consistent however, other special waste sources are largely dependent on the amount of construction and development projects in Wellington.
*Sources from construction and demolition sources are low, largely due to the proximity of two privately run construction and demolition landfills adjacent to this landfill that cater for these activities. If the two constructions and demolition landfills ceased operations, we expect larger amount of waste from this source.

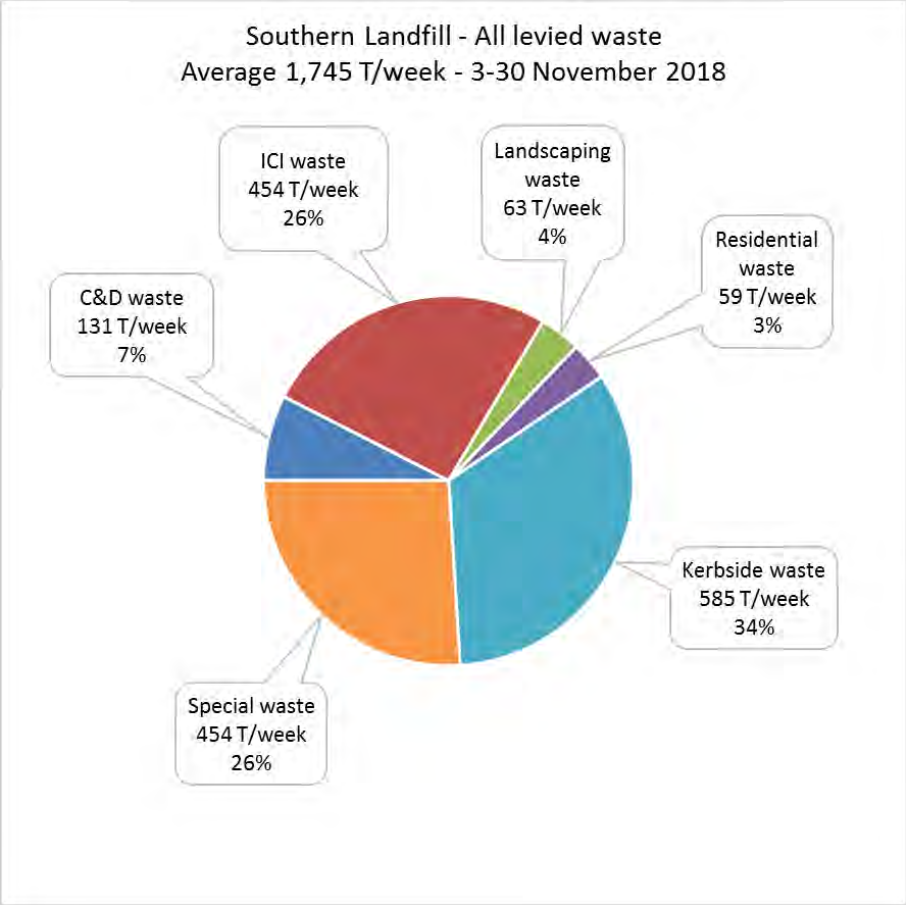

Figure 3: Activity sources for waste disposed at the Southern Landfill. For more information, you can find the report here. (INSERT LINK FOR FULL REPORT)

*Council's local action plan is a subset of the *Wellington Region Waste Management and Minimisation Plan (2017-2023)* which was produced and adopted by the eight councils in the Wellington region. *https://wellington.govt.nz/~/media/your-council/**plans**-policies-and-bylaws/**plans**-and-policies/a-to-z/wastemgmt/files/wasteplan.pdf?la=en*