



# **LANDFILL AUDIT Final Report**

**for**



**and**



**October 2011**

---

APRINCE CONSULTING PTY LTD TRADING AS APC ENVIRONMENTAL MANAGEMENT

ABN 96 077 504 226

TH 4/28 West St North Sydney, NSW 2060 ~ Phone: 612 9907 0994 Fax: 612 9907 0330

Web: [www.aprince.com.au](http://www.aprince.com.au) E-mail: [admin@aprince.com.au](mailto:admin@aprince.com.au)

This report was researched and prepared by



APrince Consulting Pty Ltd trading as APC Environmental Management  
ABN 96 077 504 226  
Email: [admin@aprince.com.au](mailto:admin@aprince.com.au)  
Web: [www.aprince.com.au](http://www.aprince.com.au)

Sydney  
TH 4/28 West St  
North Sydney NSW 2060  
Phone: (02) 9907 0994  
Fax: (02) 9907 0330

for

Dulverton Waste Management  
*On behalf of Cradle Coast Waste Management Group  
and Northern Tasmanian Waste Management Group*  
Level 1 35 Stewart St  
Devonport Tasmania 7300  
Phone: 6424 7344  
Fax: 6423 4114  
E-mail: [justin@dulverton.com.au](mailto:justin@dulverton.com.au)

© October 2011 APC

**DISCLAIMER**

Any representation, statement, opinion or advice, expressed or implied in this publication is made in good faith, but on the basis that APC is not liable (whether by reason of negligence, lack of care or otherwise) to any person for any damage or loss whatsoever, which has occurred or may occur in relation to that person taking or not taking (as the case may be) action in respect to any representation, statement or advice referred to here.

## TABLE OF CONTENTS

<b>Definitions and abbreviations .....</b>	<b>6</b>
<b>Executive summary.....</b>	<b>7</b>
<b>1 Introduction .....</b>	<b>10</b>
<b>2 Background.....</b>	<b>10</b>
<b>3 Methodology .....</b>	<b>12</b>
3.1 Project inception and inductions .....	12
3.2 Sample size .....	12
3.3 Data gathering .....	13
<b>4 Results .....</b>	<b>16</b>
4.1 Overall results .....	16
4.2 Launceston .....	21
4.3 Dulverton .....	38
4.4 Burnie.....	42
4.5 Port Latta.....	51
4.6 Ulverstone .....	54
4.7 Westbury .....	60
4.8 Deloraine.....	64
<b>5 Key Findings .....</b>	<b>69</b>
<b>6 Discussion.....</b>	<b>71</b>
6.1 Identifying high priority materials to maximise recovery .....	71
6.2 Processing of high priority materials .....	72
6.3 Regional pricing policy .....	73
<b>7 Summary of recommendations .....</b>	<b>74</b>
7.1 Regional .....	74
7.2 Launceston .....	74
<b>Appendix A Data recording sheets.....</b>	<b>75</b>
<b>Appendix B Volume to weight conversion factors .....</b>	<b>78</b>
<b>Appendix C Detailed data .....</b>	<b>79</b>
<b>Appendix D Regional drop off centre compositions .....</b>	<b>81</b>
<b>Appendix E Photos.....</b>	<b>85</b>

## INDEX OF TABLES

Table 1 Existing and potential waste diversion services by site .....	8
Table 2 Landfill site information .....	10
Table 3 Audit focus for each site .....	11
Table 4 Audit timeframe .....	13
Table 5 Consolidated categories .....	14
Table 6 Number of vehicles audited by site.....	16
Table 7 Regional drop off centres waste composition - loads individually audited....	20
Table 8 Launceston - type of vehicle using the facility .....	21
Table 9 Launceston - number of vehicles by waste source .....	22
Table 10 Launceston - C&I loads by sector.....	22
Table 11 Launceston - transfer station users by suburb.....	25
Table 12 Launceston - quantity of potentially reusable materials extrapolated / year	35
Table 13 Dulverton - number of vehicles audited by waste stream.....	38
Table 14 Dulverton - C&I loads by sector .....	38
Table 15 Burnie - type of vehicles tipping at the transfer station .....	42
Table 16 Burnie - number of vehicles by waste type.....	42
Table 17 Burnie – C&I loads by sector at transfer station.....	43
Table 18 Port Latta - number of vehicles audited by waste stream .....	51
Table 19 Port Latta - C&I loads by sector .....	51
Table 20 Ulverstone - type of vehicle.....	54
Table 21 Ulverstone – C&I loads by sector .....	54
Table 22 Ulverstone - quantity of recycled materials extrapolated / year .....	58
Table 23 Westbury - type of vehicles using the facility .....	60
Table 24 Deloraine - type of vehicles using the facility .....	64
Table 25 Deloraine - C&I load by sector .....	64
Table 26 Proportion of landfill composition that is bagged - by site.....	69
Table 27 Proportion of landfill composition that could be recycled - by site.....	70
Table 28 Existing and potential waste diversion services by site .....	71
Table 29 Summary of differential gate fee pricing policies by site .....	73
Table 30 All sites - detailed composition of landfilled waste by volume.....	79
Table 31 All sites - detailed composition data by weight.....	80
Table 32 Detailed waste composition by regional drop off centres– by volume.....	81

## INDEX OF FIGURES

Figure 1 Consolidated composition of waste to landfill by volume .....	17
Figure 2 Consolidated composition of waste to landfill by weight .....	18
Figure 3 Composition of waste to landfill by weight – bagged material dispersed.....	19
Figure 4 Launceston - landfill vehicle movements by time.....	23
Figure 5 Launceston - transfer station vehicle movements by time .....	24
Figure 6 Launceston - consolidated waste composition by volume .....	26
Figure 7 Launceston - consolidated waste composition by volume landfill.....	27
Figure 8 Launceston - consolidated waste composition by weight landfill.....	28
Figure 9 Launceston - composition by weight landfill – bagged material dispersed ..	29
Figure 10 Launceston - consolidated waste composition by volume transfer station .	30
Figure 11 Launceston - detailed waste composition by volume transfer station .....	31
Figure 12 Launceston - composition by weight transfer station – bagged material dispersed .....	32
Figure 13 Launceston - composition of potentially recyclable material.....	33
Figure 14 Launceston - composition of potentially reusable material.....	34
Figure 15 Dulverton - vehicle entry times .....	39
Figure 16 Dulverton - overall consolidated composition by volume .....	40
Figure 17 Dulverton - overall consolidated composition by weight.....	40
Figure 18 Dulverton - composition by weight, bagged material dispersed .....	41
Figure 19 Burnie - vehicle entry times .....	43
Figure 20 Burnie - consolidated waste composition by volume.....	44
Figure 21 Burnie - consolidated waste composition by volume at the landfill .....	45
Figure 22 Burnie - consolidated waste composition by weight at the landfill.....	46
Figure 23 Burnie - composition by weight at the landfill bagged material dispersed .	47
Figure 24 Burnie - consolidated waste composition by volume transfer station .....	48
Figure 25 Burnie - composition by weight transfer station bags dispersed.....	49
Figure 26 Port Latta - vehicle entry times .....	52
Figure 27 Port Latta - overall consolidated composition by volume .....	52
Figure 28 Port Latta - composition by weight – bagged materials dispersed.....	53
Figure 29 Ulverstone - vehicle entry times.....	55
Figure 30 Ulverstone - consolidated waste composition by volume .....	56
Figure 31 Ulverstone - consolidated waste to landfill composition .....	56
Figure 33 Ulverstone - consolidated recycling composition by volume .....	57
Figure 34 Westbury - vehicle entry times.....	60
Figure 35 Westbury - consolidated waste composition by volume .....	61
Figure 36 Westbury - consolidated waste to landfill composition by volume .....	61
Figure 37 Westbury - landfill composition – bagged materials dispersed.....	62
Figure 38 Westbury - consolidated recycling composition by volume .....	63
Figure 39 Deloraine - vehicle entry times.....	65
Figure 40 Deloraine - consolidated waste composition by volume .....	66
Figure 41 Deloraine – consolidated waste to landfill composition by volume.....	66
Figure 42 Deloraine –landfill composition by weight - bagged materials dispersed ..	67
Figure 43 Deloraine - consolidated recycling and reuse composition by volume .....	68

## DEFINITIONS AND ABBREVIATIONS

### Abbreviations

**C&I** – Commercial and industrial

**C&D** – Construction and demolition

**CCWMG** – Cradle Coast Waste Management Group

**DECCW** – Department of Environment and Climate Change NSW (now OE&H)

**DWM** – Dulverton Waste Management

**NTWMG** – Northern Tasmanian Waste Management Group

**MRF** – Materials recovery facility (facility for sorting recyclables ready for processing)

**OE&H** – Office of Environment and Heritage NSW (Formerly DECCW)

**RORO** – Roll-On-Roll-Off container

### Definitions

**Large vehicles:** includes rear-lift, front-lift, side-lift collection vehicles, tippers and roll-on, roll-off (RORO) vehicles.

**Recyclable\*:** Based on existing markets able to be recovered, processed and used as a raw material for the manufacture of useful new product through a commercial process.

**Regional drop off centre:** a location where waste is dropped off into bulk bins ready for transport to a disposal or recycling facility.

**Reusable:** quality unwanted household items that may be appropriate for a tip shop or equivalent.

**Small vehicles:** include cars, station wagons, vans, utes and four-wheel drives with and without trailers.

**Source separation\*:** Physical sorting of the waste stream into its components at the point of generation

**Transfer station:** area within the landfill site used to aggregate materials into bulk waste containers or compactors for transport to the main tip face or reprocessing site.

**Waste composition\*:** Component material types by proportion of weight or volume.

**\* Source: AS/NZS 3831:1998**

## EXECUTIVE SUMMARY

In April 2011 A Prince Consulting trading as APC Environmental Management (APC) conducted visual waste audits of seven landfills in Northern Tasmania on behalf of the Cradle Coast Waste Management Group and Northern Tasmanian Waste Management Group. The purpose of the audit was to determine the composition of waste to landfill and opportunities for waste diversion.

Audits were conducted at different lengths of time at each site based on the volume of waste accepted each day, as well as the number and type of vehicles using the site. The aim of the audit was to visually audit every vehicle arriving at the tip face over the agreed timeframe, excluding domestic side loader vehicles at Launceston. In total 2,128 vehicles were audited over 33 audit days. Of these 1,629 were small vehicles and 489 were large vehicles.

As the audit was a visual audit only no plastic bags were physically opened or sorted and the largest proportion of the landfilled waste stream at all sites was garbage bags of rubbish. These were found to comprise 28.2% by volume and 32.6% by weight across the region.

A desk top analysis was conducted using average waste composition data for both domestic and commercial and industrial waste streams and applied to the respective loads to determine the likely composition of the bags. This resulted in the following average composition for the region by weight:

- building material – 16%;
- food and other organics – 21%;
- paper and cardboard – 11%;
- vegetation – 10%;
- plastics - 9%;
- recyclable containers – 5%;
- treated wood – 4% and
- other – 24%.

The proportion of landfilled waste at all sites that could potentially be recycled, excluding bagged material was around 49% by volume and 46% by weight. Ulverstone has the most distinctive waste composition with the highest potential for recovery as it is a non-putrescible landfill. Deloraine, Burnie and Ulverstone each have active waste diversion systems in place.

Table 1 shows a summary of the existing recycling and reuse facilities at the seven sites. The cells highlighted in grey are opportunities where there is potential to recover at least 5% of the waste stream through improving the range of diversion facilities.

As Port Latta and Dulverton only accept large vehicles there are fewer opportunities for recovery as any recoverable materials at these two facilities would need to be scavenged after being tipped. As there are fewer vehicles using these facilities there is more time for staff to scavenge between deliveries. Launceston has the greatest potential to improve recovery using existing cardboard, metal and vegetation



facilities. There is also potential to add new facilities for recovery of building material, textiles and timber/wood.

**Table 1 Existing and potential waste diversion services by site**

Site	Recyclable containers	Cardboard	Metals	Vegetation recovery	Building material	Timber/wood	E-waste	Mattresses	Textiles	Tip shop
Launceston	Y	Y	Y	Y			Y			
Dulverton	n/a		n/a	n/a	n/a	n/a	n/a		n/a	n/a
Burnie	Y	Y	Y	Y	Y	Y	Y			Y
Ulverstone	Y	Y	Y	Y		Y		Y		Y
Port Latta	n/a			n/a	n/a	n/a	n/a		n/a	n/a
Westbury	Y	Y	Y	Y	Y	Y				Y
Deloraine	Y	Y	Y	Y	Y	Y	Y			Y

Key: Y = yes have these facilities;

n/a = not applicable due to the type of facility or small volume of waste

These are recommendations that apply to all sites to maximise the resource recovery opportunities:

- Implement a regional pricing policy to encourage source separation.
- Introduce a regional mobile mulching and / or composting service for sites that don't have their own mulching and composting operation.
- Introduce a regional mobile crushing operation for all sites separating C&D waste.
- Investigate options with mattress reprocessing organisations to determine the feasibility, or likelihood of a facility operating in Tasmania, or costs of transporting mattresses to the Victorian processing facilities.
- Investigate the feasibility of a ragging or textile/carpet recycling option for the region.
- Implementing a standard region wide education and communication program that includes clear and standard signage and acceptance standards for all materials at all sites.
- Greater effort by the waste collection contractors delivering loads is required to encourage source separation at the place of waste generation by offering a recycling and waste service.

Recommendations specifically for Launceston include:

- Improve cardboard recycling infrastructure at Launceston, for greater ease of use by the public of large oversize items i.e. a cardboard skip with cover
- Introduce a green waste bin in the small vehicle transfer area
- Reconfigure the recycling drop off area to encourage maximum waste diversion by providing more dedicated bulk bins for specific materials
- Provide a dedicated bin for separation of timber/pallets at oversize area
- Investigate establishing a building waste recovery area accepting at a minimum, plasterboard, concrete, bricks, tiles, soil and plate glass.
- Consider social and environmental costs and benefits of a tip shop operation.



From an environmental impact point of view maximum diversion can be achieved by focusing on the high volume, high carbon content items such as cardboard, vegetation, mattresses and textiles.

## 1 INTRODUCTION

In April 2011 APC Environmental Management (APC) conducted waste audits on behalf of Dulverton Waste Management (DWM). DWM is a local government authority that, in addition to operating the Dulverton landfill, provides waste management advice to the regional waste management groups - Cradle Coast Waste Management Group (CCWMG) and Northern Tasmanian Waste Management Group (NTWMG).

The aim of this project was to identify resource recovery opportunities to increase diversion from landfill and prolong landfill life at each of the seven landfills in north western and northern Tasmania. Each landfill receives a mixture of municipal solid waste (MSW), commercial and industrial (C&I), and construction and demolition (C&D) wastes.

DWM has identified the key deliverables of this project as:

- Undertake visual landfill audits at seven sites;
- Identify the source of the waste materials entering each site;
- Based on information collected identify waste streams which may be easily diverted from landfill;
- Propose a suitable waste classification system based on the characteristics of the waste streams audited; and
- Report and present all findings to DWM.

## 2 BACKGROUND

The operating days and opening hours for all sites are summarised below:

**Table 2 Landfill site information**

Landfill	Operating Days	Opening hrs	Weighbridge
Launceston	7 days	8am – 5pm	Yes
Westbury	Tuesday, Thursday, Saturday & Sunday	10am-5pm	No
Deloraine	Monday, Wednesday, Friday, Saturday & Sunday	10am – 5pm	No
Dulverton	Monday to Friday Saturday	7.30am-4.30pm 7.30am-12.30pm	Yes
Burnie	Monday to Friday Saturday and Sunday	9am – 4pm 10am – 2pm	Yes
Port Latta	Monday to Friday	7am – 4pm	Yes
Ulverstone	Monday to Friday Saturday and Sunday	9am – 5pm 10am – 5pm	No

*Note: Weighbridge is only used by large vehicles.*

Each site is unique and has different issues and a slightly different focus for the audit. As each site already captures data on the amount of material sent for recycling or recovered through the tip shop, the purpose of the audit was to focus on filling the data gaps.

Table 2 outlines the waste disposal/ diversion points onsite, which vehicles were audited and what the data focus was for each site.

**Table 3 Audit focus for each site**

<b>Landfill</b>	<b>All waste disposal points</b>	<b>Vehicles Audited</b>	<b>Data Collection Focus</b>
Launceston	<ul style="list-style-type: none"> <li>• Main putrescible tip face</li> <li>• Small vehicle transfer station</li> <li>• Small vehicle recycling/hazardous waste area.</li> </ul>	Large vehicles excluding domestic, transfer station ROROs, street sweepers & cleanfill. Small vehicles at transfer station	Waste going to landfill Potential for recycling and reuse due to community interest in waste diversion, particularly a tip shop.
Westbury	<ul style="list-style-type: none"> <li>• Main putrescible tip face</li> <li>• Inert tip face</li> <li>• Recycling area/reusable items</li> <li>• Metals</li> <li>• Hazardous wastes</li> <li>• Wood/timber</li> <li>• Greenwaste</li> </ul>	Only small vehicles permitted onsite, all vehicles audited.	Verification of volume and composition of material sent to landfill. Information to assist Council with making a decision regarding closing the facility due to small quantities of waste.
Deloraine	<ul style="list-style-type: none"> <li>• Main putrescible tip face</li> <li>• Reuse/recycling area and tip shop</li> <li>• Metals (large &amp; small)</li> <li>• Hazardous wastes</li> <li>• Wood/timber &amp; carpets</li> <li>• Greenwaste</li> </ul>	All vehicles disposing of waste.	Verification of volume and composition of material sent to landfill. Understanding of composition of domestic waste disposed of.
Dulverton	<ul style="list-style-type: none"> <li>• Landfill</li> <li>• Composting</li> </ul>	Only large vehicles permitted onsite. All materials disposed of at the tip face.	Determine composition of domestic waste from surrounding regions.
Burnie	<ul style="list-style-type: none"> <li>• Small vehicle transfer station</li> <li>• Landfill</li> <li>• Tip shop</li> <li>• Small vehicle recycling</li> <li>• Scrap metal</li> <li>• Greenwaste</li> <li>• Timber</li> <li>• C&amp;D</li> </ul>	Small vehicles tipping at the bulk bins only. No monitoring of the vehicles in the recycling/tip shop area was undertaken.	Small vehicles – particularly general waste disposal. Assisting in planning for transfer station being built in November  Previous audit was undertaken on large vehicle disposal.
Port Latta	<ul style="list-style-type: none"> <li>• Main tip face, no separation of materials</li> </ul>	Only large vehicles permitted onsite. All vehicles were audited.	Understanding of composition of waste disposed of to landfill.
Ulverstone	<ul style="list-style-type: none"> <li>• Inert tip face</li> <li>• Tip shop – includes saleable bricks and timber</li> <li>• Greenwaste</li> <li>• Putrescible bins</li> <li>• Cardboard</li> </ul>	Only vehicles smaller than 4m <sup>3</sup> permitted onsite. All vehicles disposing of materials at the tip face.	This site is an inert facility only. Historically some putrescible material was mixed in with the inert waste. The focus of the audit is to determine the composition of waste being disposed of.

### 3 METHODOLOGY

The methodology used was based on the NSW Office of Environment & Heritage (formerly DECCW NSW) *Commercial and Industrial (C&I) Waste Audit Methodology 2008*. The methodology suggests that all vehicles over the audit period be visually examined. It was determined that should a large number of C&I loads be observed delivering large volumes of waste in plastic bags that a subsequent physical composition analysis may be conducted on selected loads at a later time and added to this results of this study for completeness.

#### 3.1 Project inception and inductions

A project inception meeting was attended by APC's Senior Consultant Local Government and an APC visual assessor to confirm the project timeline and methodology after inspecting each site and meeting with key staff.

APC undertakes its own safety inductions for each project. Additional site and OH&S briefings were conducted at the commencement of each audit at each site.

APC visual assessors undertook site familiarisation and training on the day prior to the scheduled commencement of the audit. The training was used to "calibrate" the eyes of the auditors in estimating the visual contents of loads as visual assessment is subjective.

#### 3.2 Sample size

The aim of the audit was to, within practical limitations; visually audit every vehicle arriving at the tip face over the agreed timeframe. Audit staff were in attendance from opening to closing time each audit day. As the facilities already have data on material being recycled the focus of the audit was on material being disposed of to landfill.

Landfills typically have different use and therefore different waste profiles based on weekend and weekday. Typically, a weekend profile has a greater number of small vehicles carrying waste from domestic origins while weekday use is more trade users and waste delivered by contractors or self hauled from commercial and industrial sector (C&I) and Construction and Demolition (C&D).

Using the estimated waste tonnages at each site APC's statistician provided three sampling options to provide a robust sample size. DWM selected the following sampling strategy which involved both weekend and weekdays at all sites to capture the expected variation in users and waste disposed:

- Launceston: 7 days visual audit at both the landfill and transfer station.
- Burnie: 3 weekdays and 2 weekend days visual,
- Dulverton: 3 weekdays and 1 weekend day visual
- Deloraine, Ulverstone: 2 weekdays, 1 weekend day audit at 1 receiving point.
- Port Latta, Westbury: 2 days

Based on advice from Dulverton Waste Management all side-loader vehicles delivering municipal kerbside waste to Launceston landfill were excluded from the visual assessment given the very high proportion of bagged waste in loads.

Table 4 outlines the audit timeframe and dates/days that auditors attended each site.

**Table 4 Audit timeframe**

Day	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed
April																				
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Launceston																				
Dulverton																				
Burnie																				
Port Latta																				
Ulverstone																				
Westbury																				
Deloraine																				

Four visual auditors worked at Launceston over the peak weekend period. Three worked for the remainder of the week. Due to smaller vehicle numbers at the other sites only one visual auditor worked at each site each day.

### 3.3 Data gathering

The data collection sheets used for this audit are provided in **Appendix A**. As there was a slightly different emphasis on the data required for each site three different datasheets were used. The sample data sheets outline the waste categories and other types of information recorded. Data included the entry time, registration number, vehicle type and volume, load classification and disposal point. Recycled, potentially reusable and disposal information was also recorded as appropriate.

Compositional data was collected by volume by auditors estimating the quantity in litres that materials occupied.

APC sought a weighbridge report on large vehicle movements from Launceston, Dulverton and Port Latta, for reconciliation with the weighbridge data collected and the visual assessment undertaken. No weighbridge data is collected at any of the sites for small vehicles.

APC staff worked closely with operational staff to minimise any disruption to normal activities and to maximise data capture.

Weight data shown in this report has been calculated by applying to the volume data, density ratios published by the NSW OE&H which were devised from extensive disposal-based visual and physical audits carried out in NSW in 2003 and 2008 (see **Appendix B**). Results using this method should be treated with care as there are likely to be variations due to the unempirical nature of the volume estimation and the use of averages to calculate volume to weight conversion factors.

Auditors recorded the detailed composition of loads. This data has been consolidated in most of the following charts for ease of presentation and interpretation. Table 5 shows the detailed waste categories that are included in the consolidated categories and which are considered recyclable or recoverable.

**Table 5 Consolidated categories**

Consolidated Category	Includes	Recyclable/ Recoverable
Paper and cardboard	Paper recyclable, cardboard	Yes
Vegetation	Vegetation/ garden	Yes
Food and other organics	Food / kitchen, paper - non-recyclable	No
Wood un treated	Stumps, logs (10 cm), wood - chipboard, MDF wood - board/pole, untreated	Yes
Wood treated	Wood - varnished/painted, wood - board/pole, treated	No
Textiles	Carpet & underlay, textiles - clothing/cloth, textiles composites (shoes, bags)	Yes
Mattresses	Mattresses spring	Yes
Rubber	Rubber/foam	No
Recyclable containers	Glass – containers recyclable, plastic - containers recyclable, metals recyclable containers	Yes
Plastics	Plastic bags and film, plastic - polystyrene foam, plastic – other	No
Metals	Metals - ferrous steel, metals - non-ferrous	Yes
Building material	Concrete / cement, bricks, tiles, plasterboard, rock/dirt/soil, asphalt,	Yes
Electrical	Computers / office equipment, toner cartridges, electrical large eg whitegoods, electrical medium eg televisions, electrical small	Yes
Hazardous	Paint, hazardous / special, oil,	No
Bags of rubbish	Garbage bags of rubbish,	No
Other	Other items, bric-a-brac, furniture, glass – plate, insulation	No

**Image 1 Launceston –visual auditing process**

### 3.3.1 Bagged waste analysis

The supplementary bagged waste analysis was undertaken after the results of the visual assessment were completed and found that bagged waste accounted for 28.2% by volume and 32.6% by weight across the region.

This analysis aims to distribute the contents and amount of waste found in garbage bags of rubbish across the existing waste categories using agreed proportions sourced from other analyses. This analysis then recalculates the amount of waste in each category by apportioning the weight of the “garbage bags of rubbish” to the existing waste category. .

The seven surveyed landfill sites were all included in this additional analysis. The method used to reapportion the weights of the category “garbage bags of rubbish” was as follows:

1. Weight data was used, as previously estimated from volume measurements using conversion factors.
2. Using individual observations of vehicle loads, weights were summed across categories for domestic loads, C&I loads and other load types.
3. For the “garbage bags of rubbish” category in Domestic and C&I, this weight was reapportioned among the other categories according to proportions drawn from other analyses.
  - Domestic – NSW Waste Avoidance and Resource Recovery Strategy Progress Report 2010 (page 17)
  - C&I – average garbage composition - NSW DECCW Disposal Based Survey of Commercial and Industrial Waste in Sydney, 2008
  - For the “Other” category (C&D, Council, Other) the category of “Garbage bags of rubbish” was left as a separate item.
4. “Domestic”, “C&I” and “Other” were re-summed to provide final estimates of weight by category including the estimated composition of the garbage bags.
5. Categories were aggregated to a consolidated list of waste items.



## 4 RESULTS

As there were seven landfill sites audited each with slightly different focus for recovery, the results have been divided into sections with overall regional results and then results for each site.

### 4.1 Overall results

This section outlines the combined results from all seven sites.

#### 4.1.1 Total number of vehicles audited

Table 6 shows the number of vehicles categorised as large and small, delivering to the audited sites during the audit period.

**Table 6 Number of vehicles audited by site**

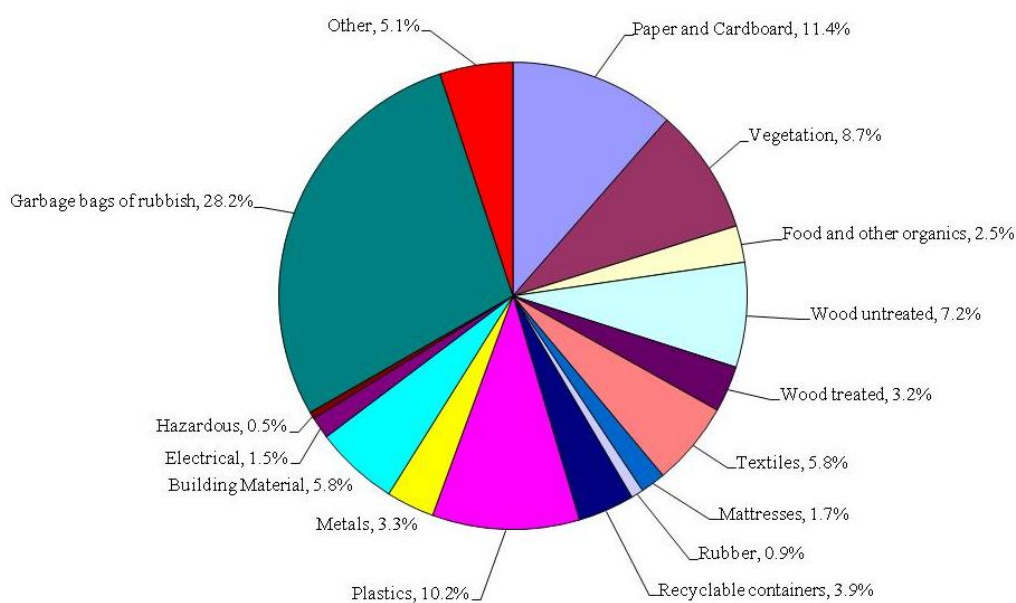
Site	Audit Days	No of Large vehicles		No of Small Vehicles		Total	
		Audited	Per Day	Audited	Per Day	Audited	Per Day
Deloraine	3	12	4	131	44	143	48
Burnie	5	4	1	199	40	203	41
Westbury	2	-	-	50	25	50	25
Ulverstone	3	10	3	91	30	101	33
Port Latta	2	17	9	-	-	17	9
Launceston Transfer Station	7	66	9	1,002	143	1,068	153
Launceston Landfill	7	299	43	33	5	332	47
Dulverton	4	81	20	-	-	81	20
<b>Total</b>	<b>33</b>	<b>489</b>	<b>89</b>	<b>1,629</b>	<b>287</b>	<b>2,128</b>	<b>376</b>

All sites had less than 50 vehicles per day on average, except Launceston. Port Latta averaged 9 vehicles per day. The largest number of vehicles audited was small vehicles. These made up around three quarters of all vehicles audited. The largest number of small and large vehicles audited was at Launceston transfer station and landfill respectively.

#### 4.1.2 General waste composition by volume

Figure 1 shows the average composition of all waste deposited to landfill by volume at all 7 sites. Because the audit was conducted over different time periods at each site, to enable meaningful aggregation, the audit data has been adjusted to a one day average for each site. Detailed waste composition overall and by site is provided in *Appendix C*.

**Figure 1 Consolidated composition of waste to landfill by volume**

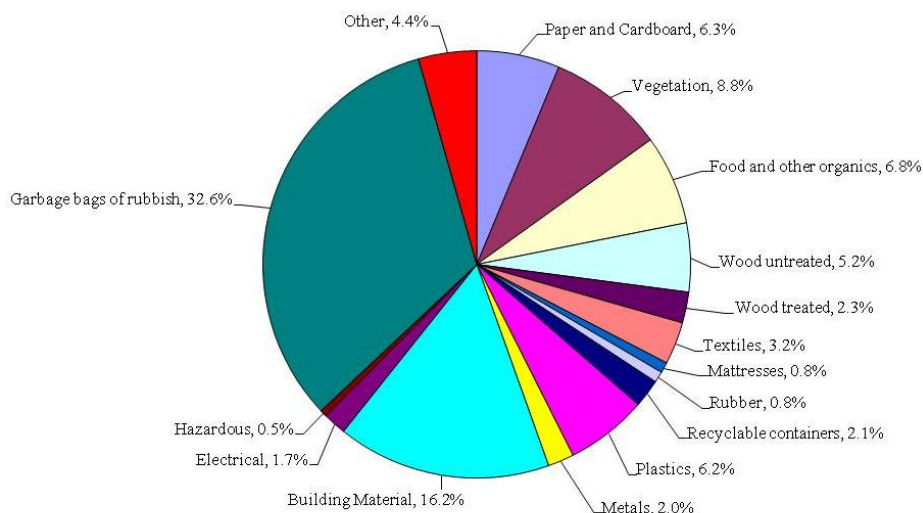


The chart includes data collected as part of this project as well as data collected by Hyder in a separate audit at Burnie Landfill. The chart shows that the largest proportion of the landfilled waste stream by volume was garbage bags of rubbish at 28.2%. Other materials found in significant proportions included paper and cardboard (11.4%) and plastics (10.2%). A number of materials landfilled are recyclable including, vegetation (8.7%), untreated wood (7.2%), recyclable containers (3.9%), metals (3.3%) and building material (5.8%) among others. The audit data shows that about 49% of the landfilled stream measured by volume could potentially be recycled.

### 4.1.3 General waste composition by weight

Figure 2 shows the composition of the waste deposited to landfill by weight at all sites. Because the audit was conducted over different time periods at each site, to enable meaningful aggregation, the audit data has been adjusted to a one day average for each site.

**Figure 2 Consolidated composition of waste to landfill by weight**



The chart includes data collected as part of this project as well as data collected by Hyder in a separate audit at Burnie Landfill. The chart shows that the largest proportion of the landfilled waste stream by weight was garbage bags of rubbish at 32.6%. Other materials found in significant proportions were building material (16.2%) and vegetation (8.8%).

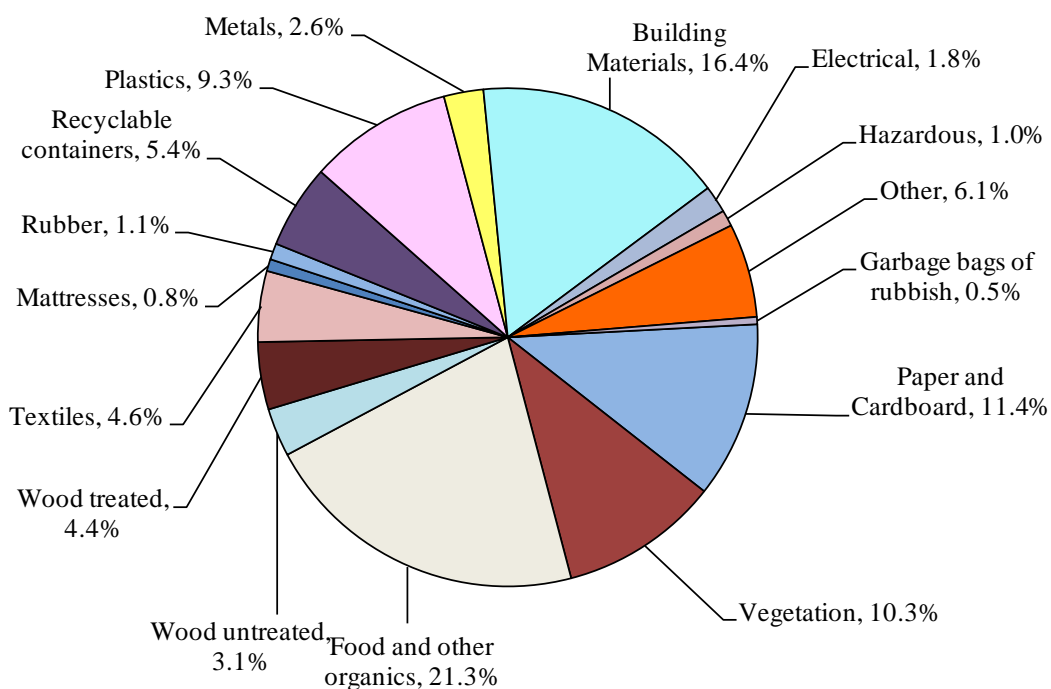
A number of materials being landfilled are recyclable including paper and cardboard (6.3%), untreated wood (5.2%), recyclable containers (2.1%), metals (2.0%) and building material (16.2%) among others. The audit data shows that around 46% of the landfilled stream measured by weight could potentially be recycled.

#### 4.1.4 General waste composition by weight – bagged materials dispersed

Figure 3 shows the composition of the waste deposited to landfill by weight at all sites. Using the method discussed in section 3.3.1 (Page 15) the 33% of bagged materials, shown in the previous chart, have been dispersed to provide a more detailed composition analysis.

It appears that the majority of bagged material is food and other organics (21% bagged compared to 7% loose) and recyclable paper and card (11% bagged compared to 6% loose). Plastics, textiles, wood and recyclable containers have all increased by 1-3%.

**Figure 3 Composition of waste to landfill by weight – bagged material dispersed.**



#### 4.1.5 Detailed composition by regional drop off centre

APC were briefed to assess and analyse loads from regional drop off centres that were deposited at each site. 49 individual loads were assessed from 20 regional centres.

Detailed composition results are displayed in *Appendix D*. Table 7 provides a summary of the regional drop off centres, where the loads were tipped and how many loads were assessed from each centre.

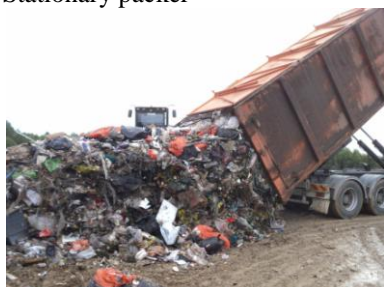
**Table 7 Regional drop off centres waste composition - loads individually audited**

Regional drop off centre or load	Disposal site	Vehicle type	Number of loads during audit period
Beaconsfield	Launceston	Stationary packer	1
Evandale	Launceston	Stationary packer	2
Exeter	Launceston	Stationary packer	3
Georgetown	Launceston	RORO	1
Lilydale	Launceston	Front lift	1
Longford	Launceston	Front lift	2
Nunamara	Launceston	RORO	1
Scottsdale	Launceston	RORO	3
Castra	Ulverstone	Enclosed RORO	1 (mattresses only)
Preston	Ulverstone Dulverton	Enclosed RORO	1 (mattresses only) 1
South Riana	Dulverton	RORO	1
Ulverstone	Dulverton	Side loader	1
Spreyton	Dulverton	RORO	14
Railton	Dulverton	Side loader	1
Sheffield	Dulverton	RORO	2
Port Sorrell	Dulverton	Side loader	1
Mole Creek	Deloraine	Front lift	1
Wynard	Port Latta	RORO	4
Circular Head	Port Latta	Side loader	1
Smithton	Port Latta	RORO	1

As APC have not visited any of the regional drop-off areas the suitability of recovery options at these sites is not known. However based on the audit results it appears that there is potential to recover more cardboard at most of these sites. 10 sites contained more than 10% cardboard. Mattresses could be intercepted for recovery at some sites, particularly Beaconsfield, Georgetown, Evandale, Longford, Smithton and Spreyton. There is a large garden vegetation component in both Circular Head (29%) and Wynard's (21%) waste streams.

Loads being tipped at Dulverton and Port Latta have a high bagged component, which is to be expected of kerbside collected materials.

Stationary packer



RORO



## 4.2 Launceston

### 4.2.1 Launceston vehicles audited

Table 8 shows the number of vehicles entering the Launceston facility and where within the facility they delivered their loads for disposal. Note the audit excludes domestic side loaders and any vehicles tipping at the greenwaste/mulching section of the waste transfer station.

**Table 8 Launceston - type of vehicle using the facility**

Vehicle Type	Transfer Station	Landfill	Total	%
Car	100	0	100	7.1%
Car and Trailer	143	10	153	10.9%
Station Wagon	60	0	60	4.3%
Station Wagon and Trailer	72	0	72	5.1%
Four Wheel Drive	22	0	22	1.6%
Four Wheel Drive and Trailer	93	0	93	6.6%
Ute	360	15	375	26.8%
Ute and Trailer	101	5	106	7.6%
Van	61	3	64	4.6%
Van and Trailer	50	0	50	3.6%
Pantech	0	12	12	0.9%
Front Lift	0	34	34	2.4%
Rear Lift	0	10	10	0.7%
Skip Truck	0	44	44	3.1%
Side Lift	Excluded from audit			
Tipper	0	110	110	7.9%
Tipper and Trailer	1	0	1	0.1%
Flat Bed	0	10	10	0.7%
Flat Bed and Trailer	0	5	5	0.4%
Roll-on-roll-off	0	27	27	1.9%
Truck and Trailer	1	8	9	0.6%
Not Recorded	4	39	43	3.1%
<b>Total</b>	<b>1068</b>	<b>332</b>	<b>1400</b>	<b>100.0%</b>
<b>Percentage</b>	<b>76%</b>	<b>24%</b>	<b>100%</b>	

Of the 1,400 vehicles entering the facility during the audit period, 1,068 tipped at the transfer station and only 332 at the main landfill. By far the largest number of vehicles using the site was small vehicles such as cars, station wagons, utes, four-wheel drives and vans, with and without trailers. Almost all of these used the transfer station while most large vehicles used the landfill. A total of 76% of vehicles using the site were small vehicles.

Table 9 shows the number and proportion of vehicles delivering waste from different identifiable waste sources at the landfill and transfer station. Note that internal transfer refers to the general waste skip located in the greenwaste drop of area.

**Table 9 Launceston - number of vehicles by waste source**

Waste sources	Landfill		Transfer station	
	No.	%	No	%
Domestic	10	3%	779	73%
C&I	179	54%	169	16%
C&D	88	27%	91	9%
Council	1	0%	0	0%
Internal transfer	4	1%	0	0%
Regional drop off centres	10	3%	0	0%
Unknown	40	12%	29	3%
<b>Total</b>	<b>332</b>	<b>100%</b>	<b>1068</b>	<b>100%</b>

The table shows that almost all the vehicles delivering domestic waste, excluding council side loader vehicles which were not included in the audit, used the transfer station while the number of C&I and C&D loads delivered to each part of the site was similar. It was not possible to determine the source of some loads as the some large vehicles were not marked and drivers did not exit the vehicle for the auditor to be able to safely ask questions or multiple deliveries arrived at the same time.

Table 10 shows the number of vehicles delivering C&I loads recorded as originating from different industry sectors.

**Table 10 Launceston - C&I loads by sector**

Sector	Number		%	
	Landfill	Transfer Station	Landfill	Transfer Station
Charity	6	3	3.2%	1.2%
Education - school/TAFE/uni	1	1	0.5%	0.4%
Government	1	0	0.5%	0.0%
Accommodation, cafes and restaurants	4	16	2.1%	6.5%
Landscaper/gardener	27	10	14.3%	4.0%
Manufacturing/factories	40	13	21.2%	5.3%
Office waste	1	3	0.5%	1.2%
Shopping centre/retail trade	20	4	10.6%	1.6%
Trade (electrician, builder, plumber, carpenter)	30	141	15.9%	57.1%
Unknown	15	2	7.9%	0.8%
Mixed small businesses	44	54	23.3%	21.9%
<b>Total</b>	<b>189</b>	<b>247</b>	<b>100.0%</b>	<b>100.0%</b>

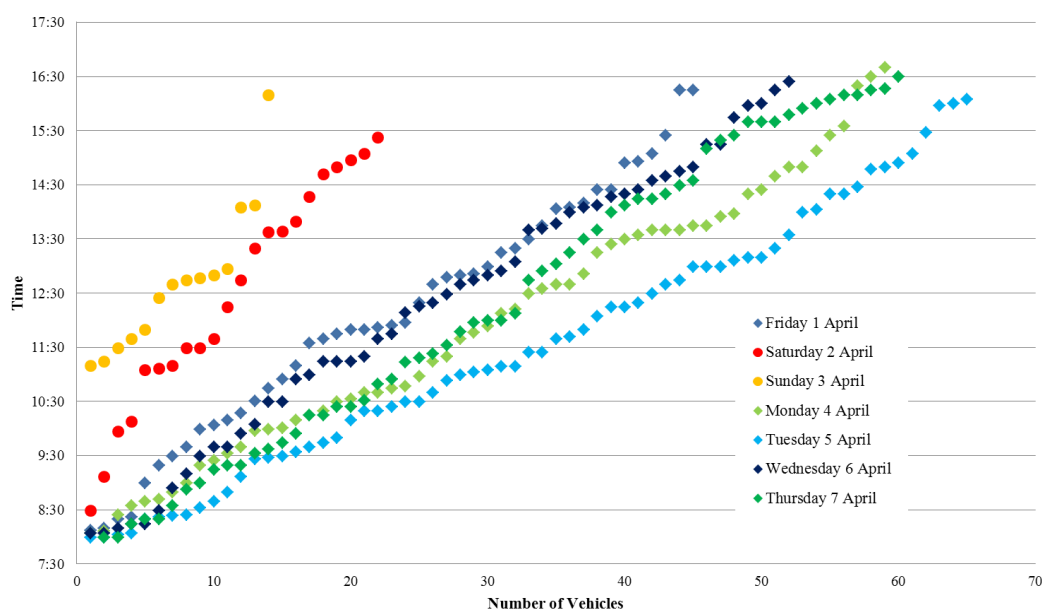
The first two columns show the number of vehicles recorded at the transfer station and landfill. The last two columns show the proportions of loads originating from each industry sector. This shows that most loads delivering to the transfer station originated from the trade sector, with small mixed business also forming a significant proportion. Together these two sectors make up 79% of all vehicles using the transfer station.



The small mixed business sector is also the origin of a significant proportion of vehicles delivering to the landfill, with manufacturing and factories, trades and landscapers and gardeners also forming the other main proportions. Together these four sectors made up 73% of vehicles delivering to the landfill.

Figure 4 shows the entry times of vehicles using the landfill on each of the audit days.

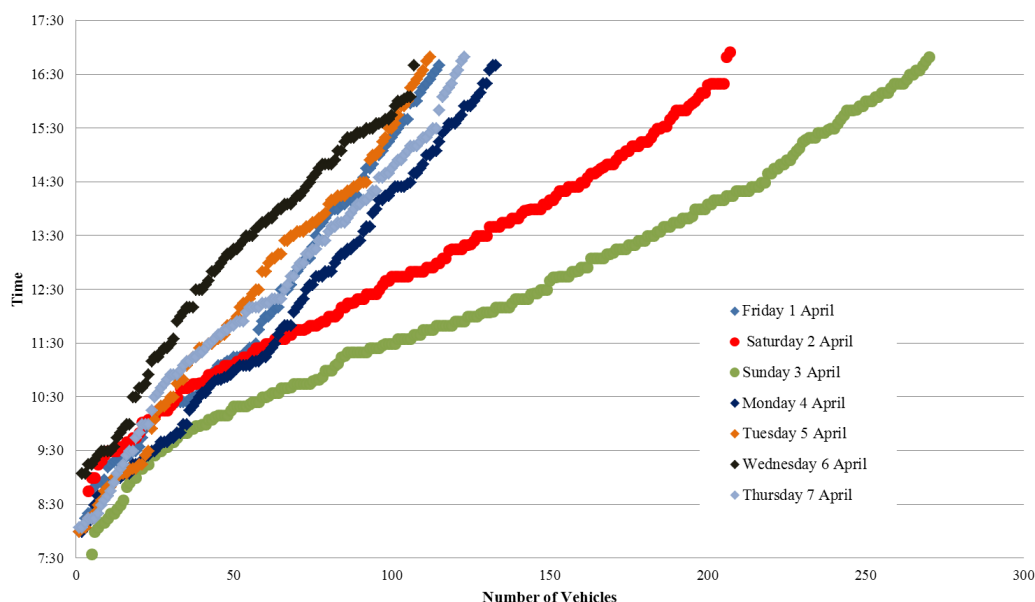
**Figure 4 Launceston - landfill vehicle movements by time**



The chart shows that fewer vehicles used the landfill on the weekend with most vehicles entering on Tuesday. The chart shows that the frequency of deliveries was consistent throughout the day in each case but with noticeable peak periods between 8 am and 8.30 am, between 11 am and 12 noon and then again before 4.30 pm, depending on the day.

Figure 5 shows the entry times of vehicles using the transfer station on each of the audit days.

**Figure 5 Launceston - transfer station vehicle movements by time**



The chart shows that more vehicles used the transfer station on the weekend with most vehicles entering on Sunday. The chart shows that the frequency of deliveries was consistent throughout the day in each case but with a noticeable increase in deliveries after 9.30 am on Sunday and 10.30 am on Saturday. The frequency of loads entering on weekdays tended to increase in the late morning except on Wednesday when this happened after 1.30 pm.

Table 11 shows the number and per cent of vehicles entering the transfer station recorded as originating from certain geographic areas around Launceston. In some cases the postcode was recorded, while in others the town or locality was recorded.

**Table 11 Launceston - transfer station users by suburb**

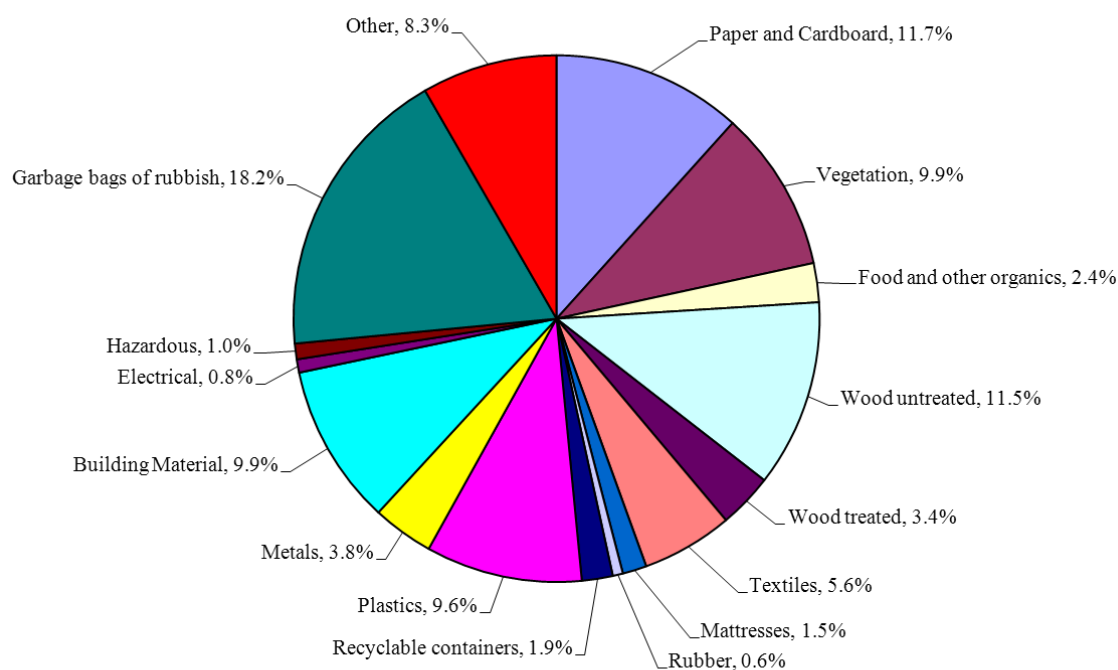
Suburb	Postcode	Transfer station	
		No	%
Albion Heights, Kingston, Kingston Beach	7050	3	0.3%
Boomer Bay, Dunalley	7177	1	0.1%
Alanvale, Inveresk, Invermay, Mayfield, Mowbray, Mowbray Heights, Newham, Rocherlea	7248	118	12.0%
Glen Dhu, Kings Meadows, Punchbowl, Sandhill, South Launceston, Youngtown	7249	162	16.4%
Blackstone Heights, East Launceston, Elphin, Launceston, Newstead, Norwood, Prospect, Ravenswood, Riverside, St Leonards, Summerhill, Travellers Rest, Trevallyn, Waverley, West Launceston	7250	677	68.7%
Beechford, Dilston, Hillwood, Lefroy, Lulworth, Mount Direction, Pipers River, Stony Head, Swan Bay, Weymouth, Windermere	7252	5	0.6%
Bungaree, Currie, Egg Lagoon, Grassy, Loorana, Lymwood, Naracoopa, Nugara, Pearshape, Pegarah, Reekara, Sea Elephant, Surprise Bay, Wickham, Yambacoon, Yarra Creek	7256	3	0.3%
Breadalbane, Relbia, White Hills	7258	2	0.2%
Myrtle Bank, Nunamara, Patersonia, Targa, Tayene	7259	1	0.1%
Lilydale, North Lilydale, Underwood	7268	1	0.2%
Bridgenorth, Grindelwald, Legana, Rosevears	7277	2	0.3%
Hadspen	7290	11	0.3%
<b>Total</b>		<b>986</b>	<b>100%</b>

The table shows that by far most loads originated from the 7250 postcode area that contains the majority of the population for the area. Of all loads delivered 97% of loads originated from the 7248, 7249 and 7250 postcode areas, around the Launceston city and suburban area. Only a few vehicles were recorded as originating from any other place.

#### 4.2.2 Launceston - overall waste composition

Figure 6 shows the combined composition of the waste disposed of at both the landfill and transfer station. The audited amounts have been consolidated into some key categories.

**Figure 6 Launceston - consolidated waste composition by volume**

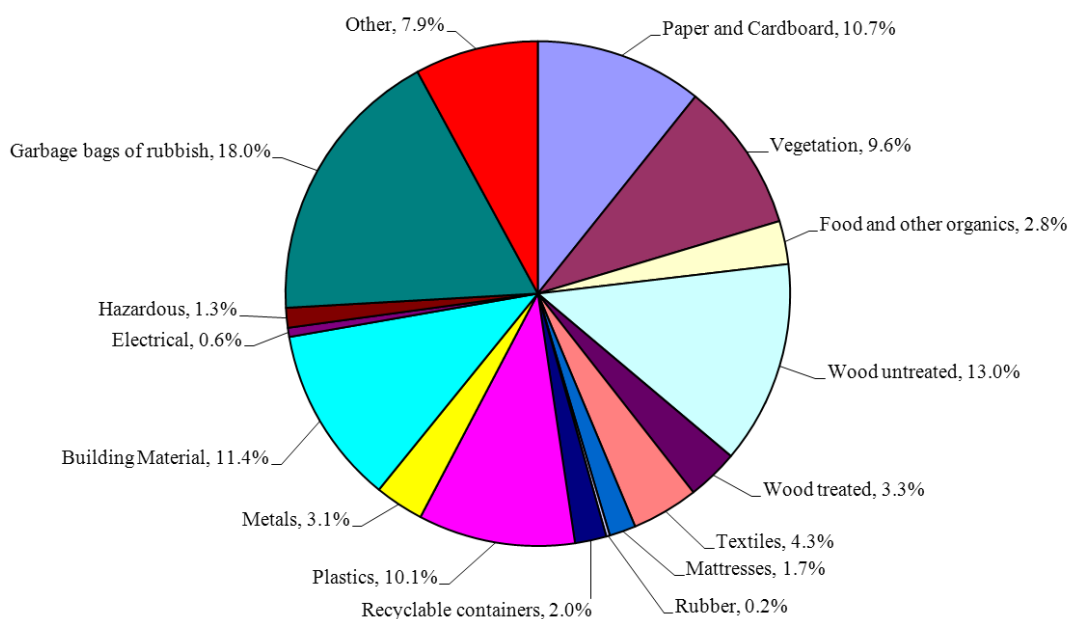


The chart shows that the largest proportion of waste disposed of by volume at the Launceston facility is garbage bags of rubbish at 18.2%. Other materials forming significant proportions included paper and cardboard (11.7%), untreated wood (11.5%) building materials and vegetation (both 9.9%) and plastics (9.6%). Many of these materials are recoverable and a total of around 57% could potentially be recycled.

### 4.2.3 Launceston - waste composition – Landfill

Figure 7 shows the composition of the waste disposed of by volume at the landfill only. The audited amounts have been consolidated into some key categories. Note that the audit excluded certain vehicles such as domestic waste side loaders, material tipped from the Launceston small vehicle transfer station, street sweepers and clean fill.

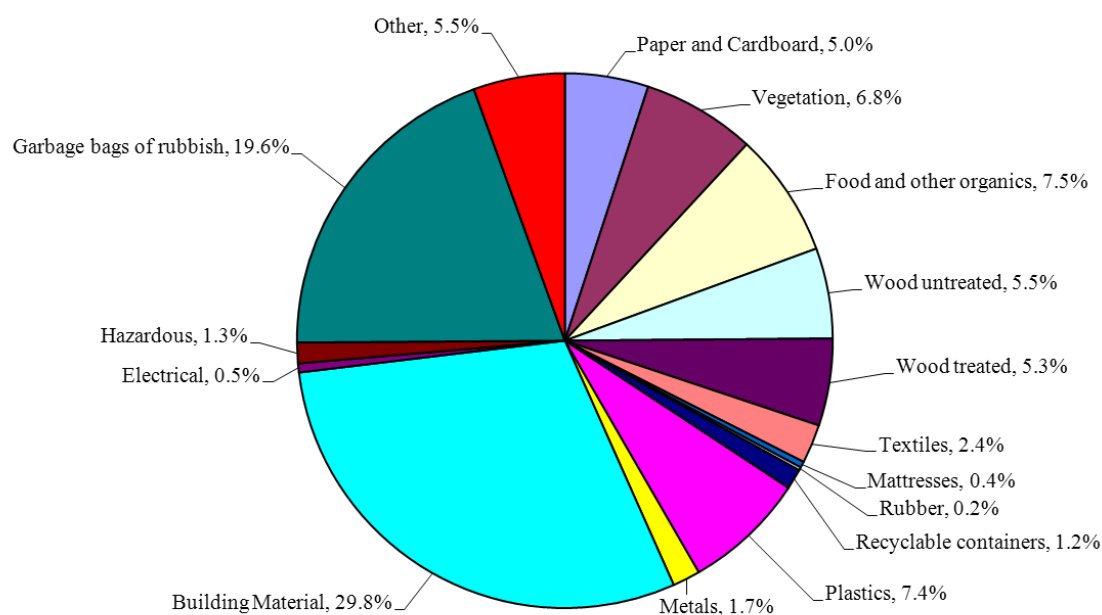
**Figure 7 Launceston - consolidated waste composition by volume landfill**



The chart shows that the largest proportion of waste disposed of by volume at the Launceston landfill is garbage bags of rubbish at 18.0%. Other materials forming significant proportions include untreated wood (13.0%) building material (11.4%), paper and cardboard (10.7%), plastics (10.1%) and vegetation (9.6%). Many of these materials are recoverable and a total of around 56% could potentially be recycled.

Figure 8 shows the composition of the waste disposed of by weight at the landfill only. The audited amounts have been consolidated into some key categories.

**Figure 8 Launceston - consolidated waste composition by weight landfill**

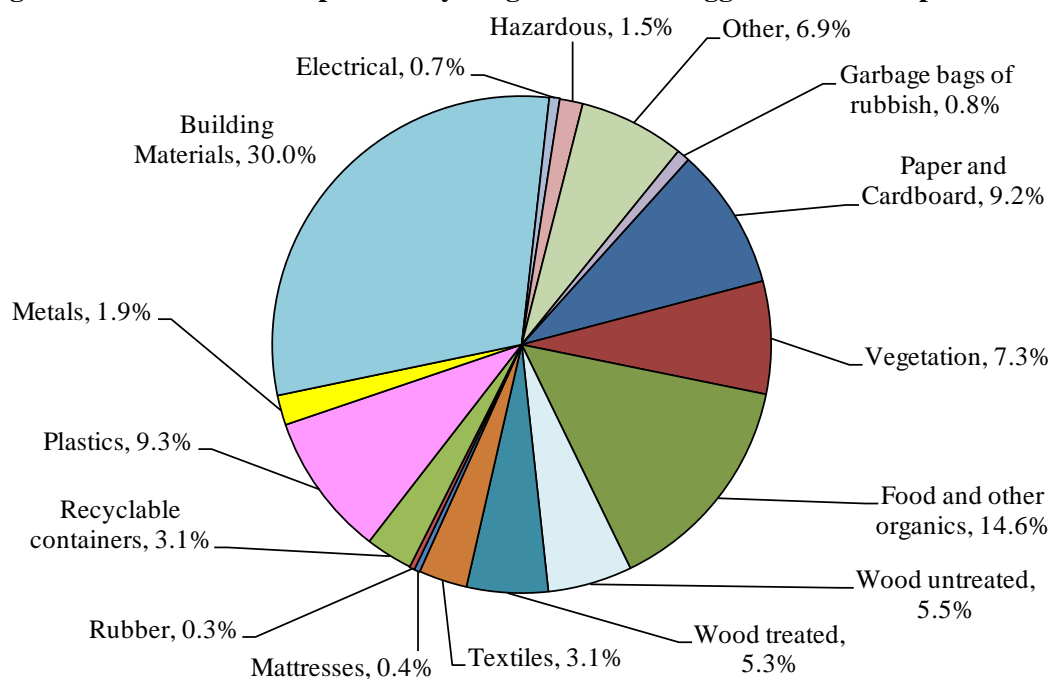


The chart shows that the largest proportion of waste disposed of by weight at the Launceston landfill is building material at 29.8%. Garbage bags of rubbish (19.6%) and food and other organics (7.5%) also formed significant proportions. Many of these materials are recoverable and a total of around 53% could potentially be recycled.

Figure 9 shows the composition of the waste disposed of by weight at the landfill with a breakdown of the 20% of garbage bags of rubbish, shown in the previous chart, into the other categories using the method outlined in Section 3.3.1.

The largest proportion of bagged material appears to be food and other organic material (15% bagged up from 7.5% loose) and paper and cardboard (9% bagged up from 5% loose). Plastics, recyclable containers increased slightly by 1-3%. Building materials and wood stayed the same proportions indicating that people did not put much of this material in bags.

**Figure 9 Launceston - composition by weight landfill – bagged material dispersed**

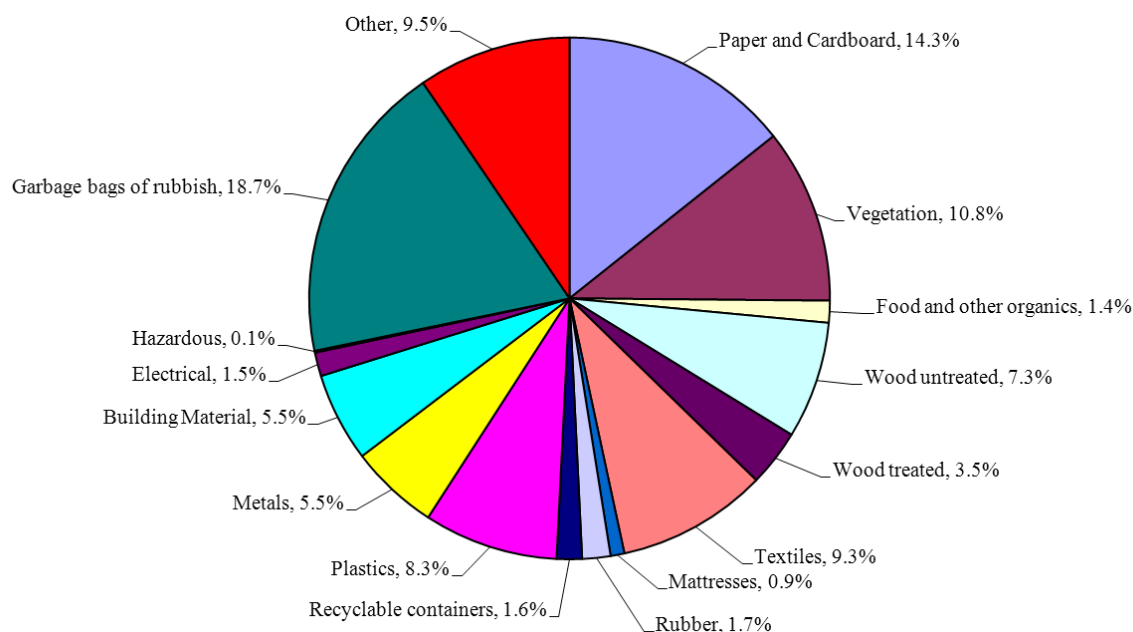




#### 4.2.4 Launceston waste composition – transfer station

Figure 10 shows the composition of the waste disposed of by volume at the transfer station only. The audited amounts have been consolidated into some key categories.

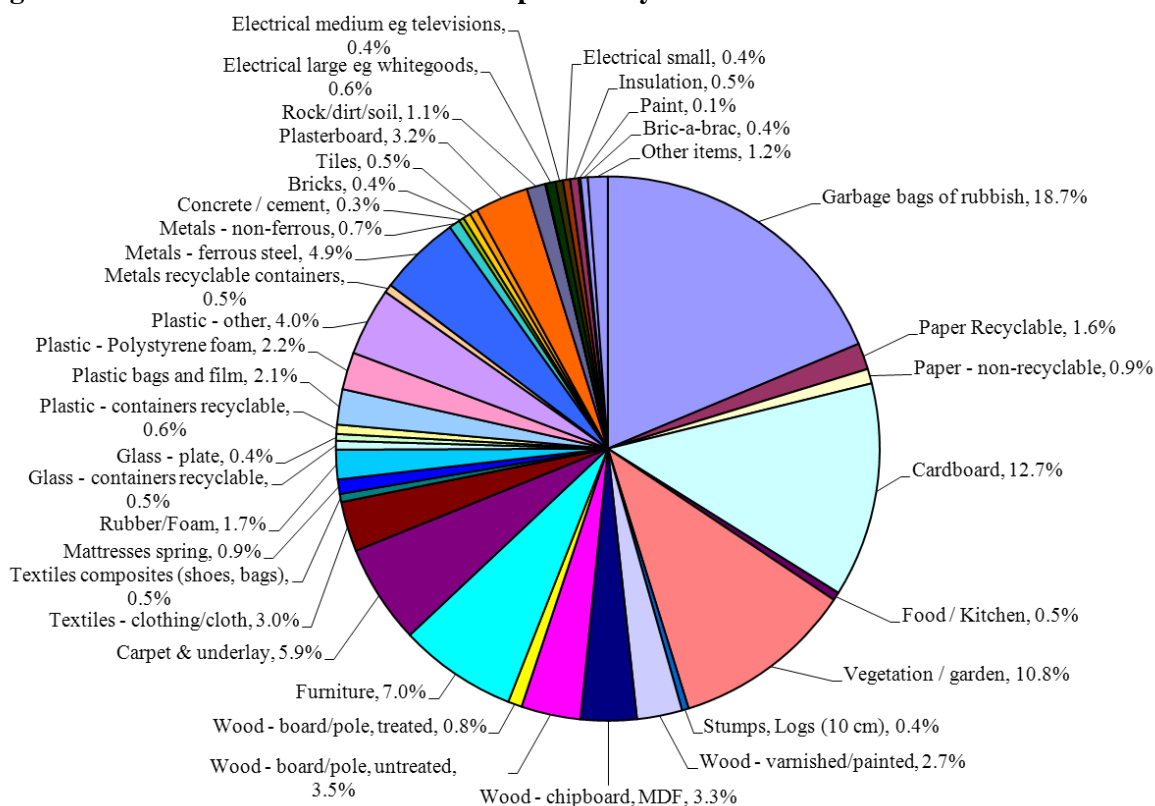
**Figure 10 Launceston - consolidated waste composition by volume transfer station**



The chart shows that the largest proportion of waste disposed of by volume at the Launceston transfer station is garbage bags of rubbish at 18.7%. Other materials forming significant proportions include paper and cardboard (14.3%) and vegetation (10.8%). Many of these materials are recoverable and a total of around 57% could potentially be recycled.

Figure 11 shows the detailed composition of the waste disposed of by volume at the transfer station only.

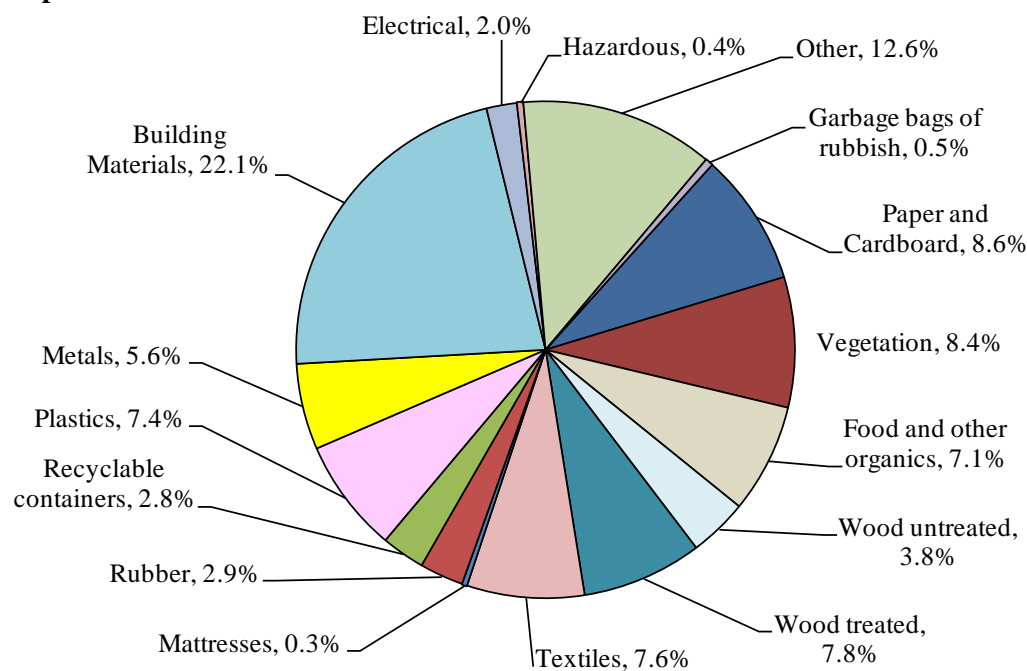
**Figure 11 Launceston - detailed waste composition by volume transfer station**



The chart shows that the largest proportion of detailed waste disposed of at the Launceston transfer station by volume is still garbage bags of rubbish at 18.7%. Other materials forming significant proportions include cardboard (12.7%) and vegetation/greenwaste (10.8%) with furniture (7.0%) and carpet and underlay (5.9%) also commonly disposed of.

Figure 12 shows the composition of the waste disposed of by volume at the transfer station with bagged material dispersed. The 13% of bagged material by weight, shown in Appendix C, has been dispersed into the other categories. As building and demolition material makes up such a large proportion by weight the adjustment for bags in most categories is fairly minor. The majority of bagged material is food and other organics, and paper and cardboard. The majority of other categories have changed by less than 2%.

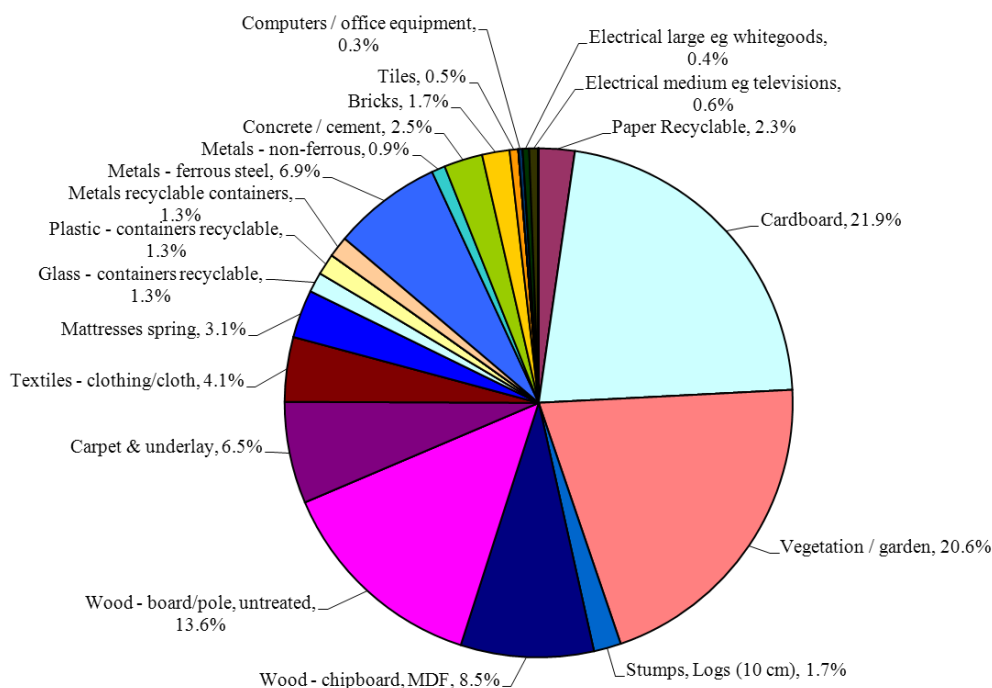
**Figure 12 Launceston - composition by weight transfer station – bagged material dispersed**



#### 4.2.5 Reuse and recycling potential – Launceston

Figure 13 shows the detailed composition of the 57% of potentially recyclable material disposed of at the transfer station, by volume. This is material that could be recycled in a conventional sense under services and systems that are available in the market. To recover all of this material council would need to invest in additional processing and separation infrastructure.

**Figure 13 Launceston - composition of potentially recyclable material**



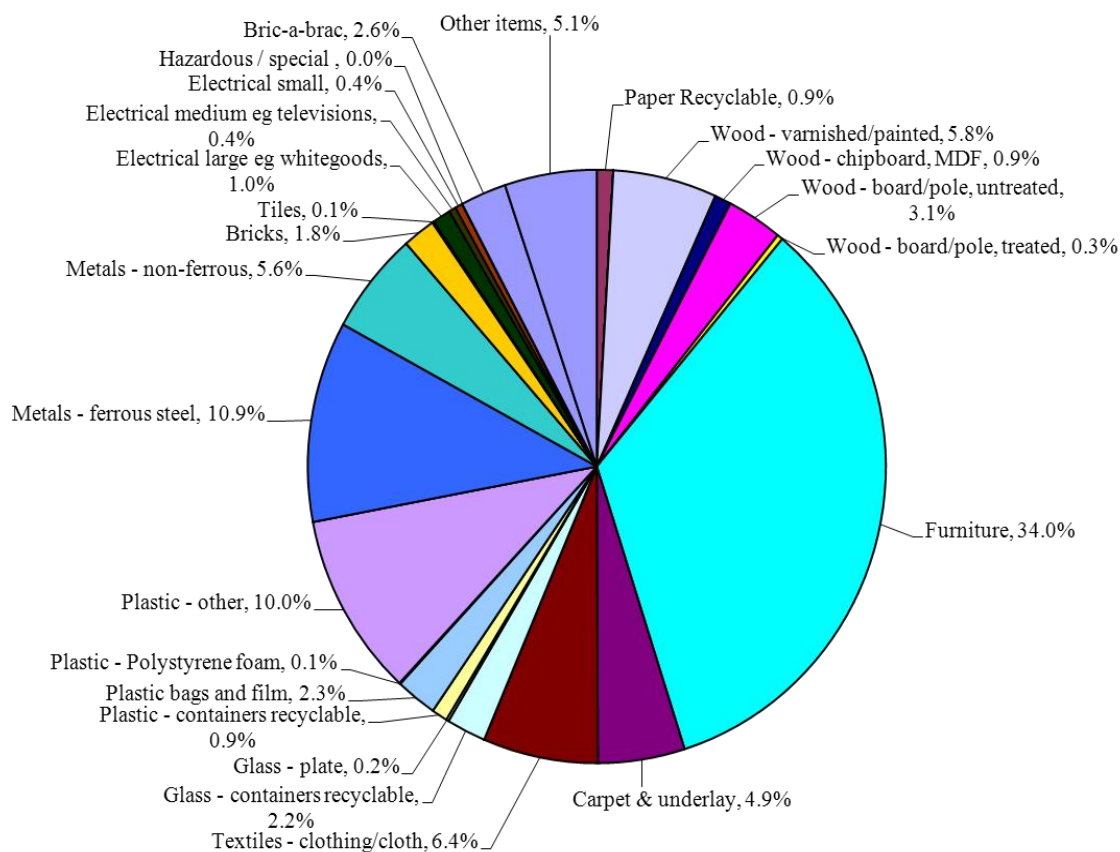
The chart shows that the largest proportions by volume of recyclable materials at the Launceston transfer station are cardboard, at 21.9% and vegetation/greenwaste, at 20.6%. Other recyclable materials forming significant proportions include wood – board/pole untreated (13.6%) and wood – chipboard/MDF (8.5%).

Whilst there is both a cardboard and greenwaste recycling option nearby the transfer station auditors observed that because the cardboard recycling bins were not particularly user friendly large proportions of clean dry cardboard were disposed of, despite users wanting to recycle. The bins are inappropriate for the large pieces of cardboard which take up airspace as they fall on an angle preventing maximum utilisation of the cages. Additionally where mixed loads of general waste and garden vegetation arrived onsite they were sent to the transfer station to reduce the risk of general waste contaminating the garden vegetation area. However there is no garden vegetation disposal option at the transfer station.

Note that this assessment is volume based which is why some light materials such as cardboard and vegetation are quite prevalent in recovery potential.

Figure 14 shows the detailed composition by volume of potentially reusable material disposed of at the transfer station. Reusable material was defined as quality unwanted household items. This is material that could be recovered for resale, for example, in a revolve centre or tip shop. Auditors recorded the quantities of likely items and materials during the course of the audit. Photographs of a range of items are provided in *Appendix E*.

**Figure 14 Launceston - composition of potentially reusable material**



The chart shows that the largest proportion by volume of recoverable material at the Launceston transfer station is furniture at 34.0%. Ferrous metals (10.9%) and plastics – other (10.0%) were also identified in significant proportions.

Table 12 shows the quantities of potentially recyclable and reusable materials extrapolated over a whole year, based on the results of the one-week audit. Care should be taken with this data, as extrapolating whole year quantities from one audit week is likely to reduce accuracy.

**Table 12 Launceston - quantity of potentially reusable materials extrapolated / year**

<b>Material</b>	<b>Reusable (tonnes)</b>	<b>Recyclable (tonnes)</b>
Paper Recyclable	2.0 (books)	54.7
Cardboard		321.6
Vegetation / garden		451.5
Stumps, Logs (10 cm)		27.5
Wood - chipboard, MDF	3.2	237.7
Wood - board/pole, untreated	4.6	200.5
Wood - board/pole, treated	0.6	
Furniture	78.7	
Carpet & underlay	2.1	270.0
Textiles - clothing/cloth	2.6	124.2
Mattresses spring		19.7
Glass - containers recyclable		66.6
Glass - plate	0.6	
Plastic - containers recyclable		18.3
Plastic bags and film		
Plastic - Polystyrene foam		
Plastic - other	13.8	
Metals recyclable containers		8.9
Metals - ferrous steel	20.2	267.9
Metals - non-ferrous	15.6	42.3
Concrete / cement		113.5
Bricks	43.1	170.3
Tiles	2.2	177.8
Computers / office equipment		3.4
Electrical large eg whitegoods	0.4	31.2
Electrical medium eg televisions	1.9	53.5
Electrical small	0.4	
Paint		7.8
Bric-a-brac	4.2	
Other items	7.8	
<b>Total</b>	<b>213.0</b>	<b>2,669.0</b>

The table shows that as much as 213 tonnes of material is potentially reusable and as much as 2,669 tonnes is potentially recyclable. The largest amounts of reusable materials recorded (all potentially more than 20 tonnes per year) were furniture, bricks, and ferrous metals while the largest amounts of recyclable materials recorded (all potentially more than 200 tonnes per year) were vegetation/greenwaste, cardboard, carpet and underlay, ferrous metals and wood - chipboard, MDF and untreated board/pole.

#### 4.2.6 Additional observations made by auditors

Some observations made by the auditors, or anecdotes from facility users, that may assist in interpretation of results and recommendations include:

- The transfer station is kept very clean, especially the walking floor that is washed down with a fire hose and cleaned with excess carpet at the end of each day
- The bulk bin in the greenwaste area with the cut away sides for non-organic waste is an excellent initiative, appears to be well used and greatly assists in reducing green waste contamination.
- It is recommended that a green waste bulk bin be placed in the transfer station area to encourage maximum diversion of green waste from small loads.
- People reversing to unload and use the e-waste container impeded traffic flow. If the container entrance was turned around this might relieve this problem.
- Separated paint tins collected by staff were tipped into the oversize general waste bin and then tipped at the main tip face.
- With greater staff supervision greater recovery of metal and cardboard could be achieved at the transfer station.
- Almost universal support was expressed by facility users for the re-establishment of a tip shop to be implemented.
- Consider a differential pricing system to encourage waste diversion, in a similar way to Burnie or Deloraine where users at these sites can deposit recyclables prior to going to the gatehouse to pay.
- Bale-a-way deliver a large quantity of vegetation to the tip face. Perhaps they could provide residents with different colour bags to reflect greenwaste and general unsorted waste and customers pay accordingly and separate bags on delivery. Currently there is not financial incentive for this initiative.
- A handful of users hid car tyres, batteries, mattresses or building waste to avoid the additional fees for these items.
- Separation may be encouraged by having more and closer supervision of users unloading at the transfer station and oversize bin area.
- Mattresses could be separated for recovery at the over-size disposal area.
- Auditors observed that due to the type of bin provided for fluorescent tubes they were breaking as they were disposed of. Consider an alternative collection container such as standing them up in a 240lt bin and transferring them to the bulk bin or use a bin with a drop down gate so the tubes can be safely placed in without breakage.
- The oversize bin is difficult to use because of the high barriers/gate that means people need to pass materials over or through the rails. Additionally the lip could be extended for ease of unloading.
- Consider introducing a C&I price for small vehicles/utes.
- Signage on the metal recycling bin near the transfer station could be clearer.
- Appears to be an inconsistent regional policy on scavenging as scavenging is heavily prohibited at Launceston, but acceptable at most other sites.
- Separated clean fill and bricks after separation was used by staff to weigh the material down the contents of the oversize bin.



**Image 2 Photos verifying auditors observations**

Launceston – cardboard recycling full



Launceston - Bale-a-way vehicle



Launceston – green waste area – non-putrescible bin



Launceston – E Waste recycling



Launceston – transfer station greenwaste recovery potential



Launceston – transfer station – cardboard recycling potential



### 4.3 Dulverton

Five loads of quarantine and special waste that were disposed of at this site during the audit period. These have been removed from the analysis so as not to obscure the data as they are already tracked and recorded by DWM. These loads contained a total of 34.5 m<sup>3</sup> of which 24 m<sup>3</sup> was asbestos and the remainder quarantine waste.

#### 4.3.1 Dulverton – vehicles audited

Table 13 shows the number of different vehicle types delivering waste of different streams to the Dulverton facility. In total 81 loads were assessed.

**Table 13 Dulverton - number of vehicles audited by waste stream**

Vehicle Type	Domestic	C&I	C&D	Council	Regional drop off centres	Not Recorded	Total
Front lift		12					12
Not recorded		1			1		2
Rear lift		1		2		1	4
Roll-on-roll-off	2	7			11	1	21
Skip		8	1	1			10
Side lift	14				2		16
Tipper	1	3	6		6		16
Total	17	32	7	3	20	2	81

The table shows that the largest number of vehicles were RORO vehicles of which most loads came from regional drop off centres. C&I loads were the most frequent with many delivered in front-lift vehicles. Side-lift vehicles delivering domestic waste were also common.

Table 14 shows the number of vehicles delivering C&I loads recorded as originating from different industry sectors.

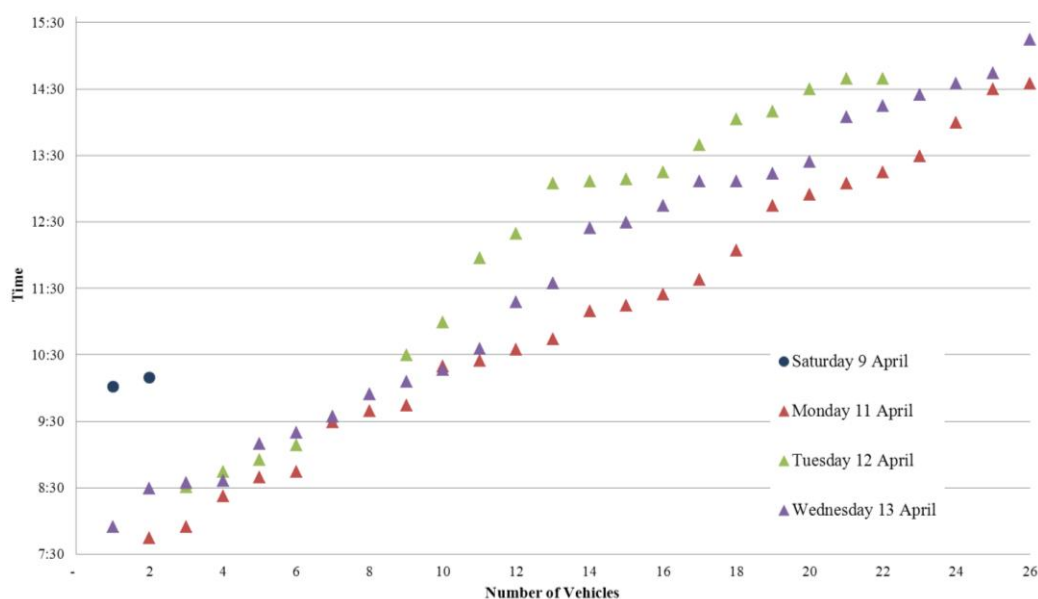
**Table 14 Dulverton - C&I loads by sector**

Sector	Number	%
Manufacturing/factories	7	21.9%
MRF Residual	5	15.6%
Mixed small businesses	11	34.4%
Not recorded	9	28.1%
<b>Total</b>	<b>32</b>	<b>100.0%</b>

The table shows that most C&I loads originated from the mixed small business sector followed by manufacturing and factories. There were also a significant proportion of materials recycling facility (MRF) residuals delivered.

Figure 15 shows the entry times of vehicles using the Dulverton site on each of the audit days.

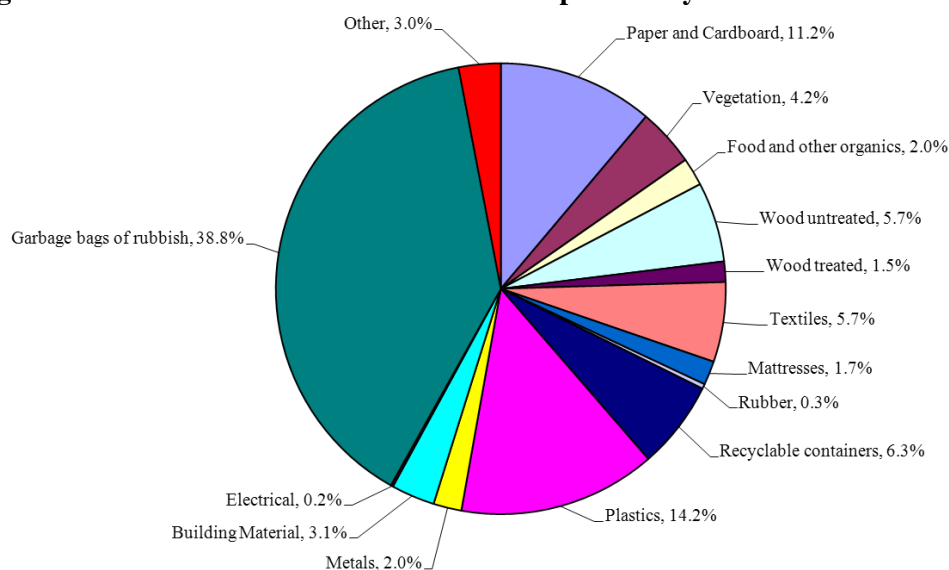
**Figure 15 Dulverton - vehicle entry times**



The chart shows that only two vehicles were recorded using the facility on the Saturday of the audit. Most vehicles entered on the Monday and Wednesday. The chart shows that the frequency of deliveries was consistent throughout each day with the exception of the period around the middle of the day when there were fewer. On Tuesday and Wednesday this period was followed by a peak of loads at around 1 pm.

Figure 16 shows the composition of the waste disposed of at the Dulverton facility by volume. The audited amounts have been consolidated into some key categories.

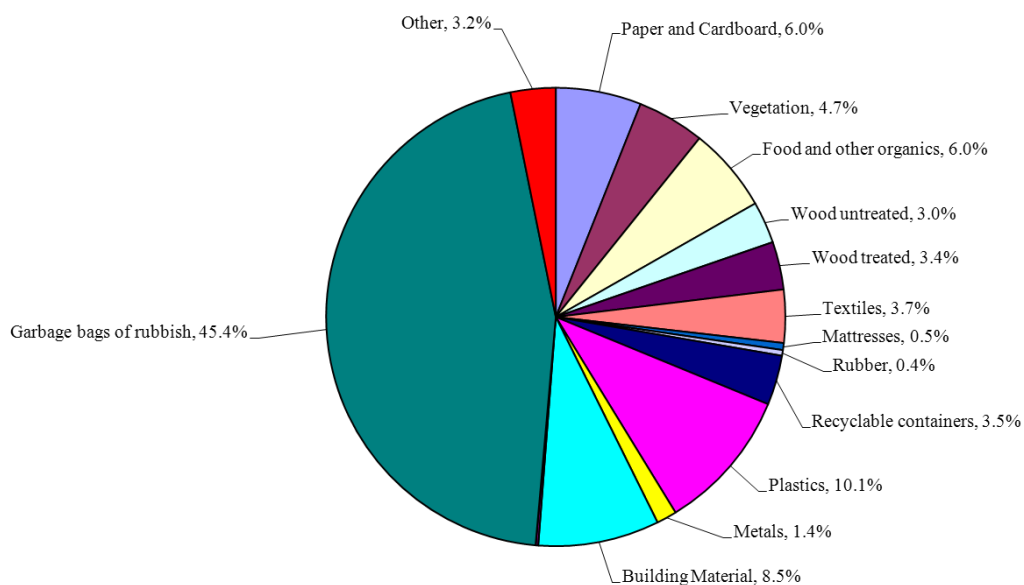
**Figure 16 Dulverton - overall consolidated composition by volume**



The chart shows that the largest proportion by volume of waste disposed of at the Dulverton site is garbage bags of rubbish at 38.8%. Other materials forming significant proportions included plastics (14.2%) and paper and cardboard (11.2%). About 40% of waste from this site could potentially be recovered.

Figure 17 shows the composition of the waste disposed of at the Dulverton facility by weight. The audited amounts have been consolidated into some key categories.

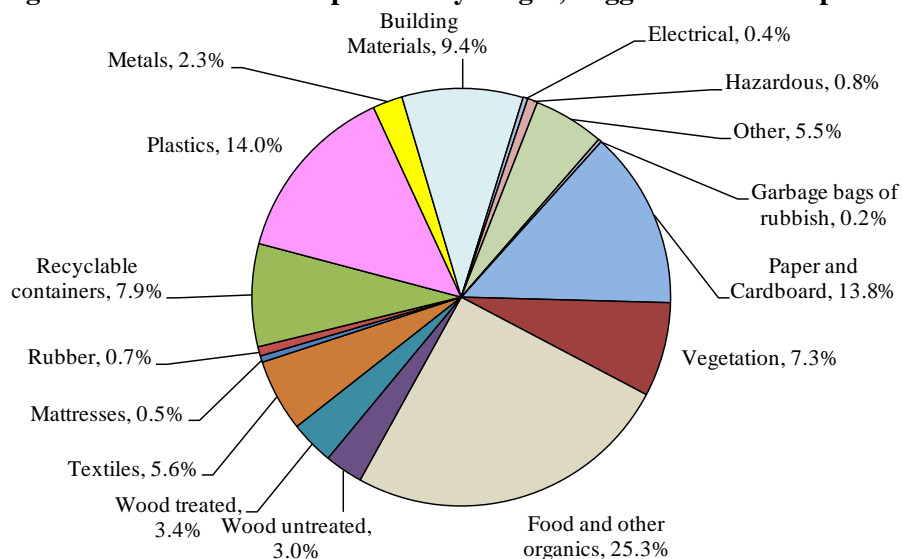
**Figure 17 Dulverton - overall consolidated composition by weight**



The chart shows that the largest proportion by weight of waste disposed of at the Dulverton site is garbage bags of rubbish at 45.4%. Other materials forming significant proportions included plastics (10.1%) and building material (8.5%). About 31% of waste from this site could potentially be recovered.

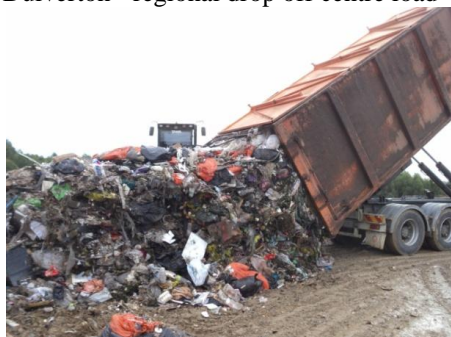
Figure 18 shows the composition of the waste disposed of at the Dulverton facility by weight. The 45% of bagged material has been dispersed into other material categories. The main components of the bagged material are food and other organics (increase from 6% to 25%), paper and cardboard (6% loose to 14% bagged). Recyclable containers and plastics have both increased by 4%. Vegetation and textiles have also increased by 2%.

**Figure 18 Dulverton - composition by weight, bagged material dispersed**



**Image 3 Dulverton – notable loads**

Dulverton - regional drop off centre load



Dulverton – mattress load Spreyton



Dulverton – C&I load with potential cardboard recovery





#### 4.4 Burnie

The data for Burnie combines the audit data collected at the small vehicle transfer station by APC as part of this audit, as well as data from the main landfill collected by APC, as a sub-contractor to Hyder, during a previous audit. The purpose of combining this data is to provide a better understanding of all waste disposed of at the site. Both audits were conducted over 5 days.

##### 4.4.1 Burnie – vehicles audited

Table 15 shows the number of different vehicle types delivering to the Burnie facility.

**Table 15 Burnie - type of vehicles tipping at the transfer station**

Vehicle Type	Number	%
Four Wheel Drive	5	2.5%
Four Wheel Drive and Trailer	19	9.4%
Car	18	8.9%
Car and Trailer	16	7.9%
Station Wagon	5	2.5%
Station Wagon and Trailer	11	5.4%
Truck	3	1.5%
Ute	78	38.4%
Ute and Trailer	29	14.3%
Van	8	3.9%
Van and Trailer	10	4.9%
Not Recorded	1	0.5%
<b>Total</b>	<b>203</b>	<b>100.0%</b>

The table shows that the most common vehicle type was the ute and, together with utes towing trailers, this type of vehicle made up with 52.7% of all vehicles entering the facility.

Table 16 shows the number of waste load types delivered to the Burnie facility. In total 290 loads were assessed.

**Table 16 Burnie - number of vehicles by waste type**

Waste type	Landfill	Transfer station
Domestic	41	136
C&I	38	29
C&D	8	36
Council	-	1
Not recorded	-	1
<b>Total</b>	<b>87</b>	<b>203</b>

The table shows that overall, almost two and a half times as many vehicles used the transfer station as used the landfill.

Table 17 shows the number of vehicles delivering C&I loads recorded at the transfer station as originating from different industry sectors.

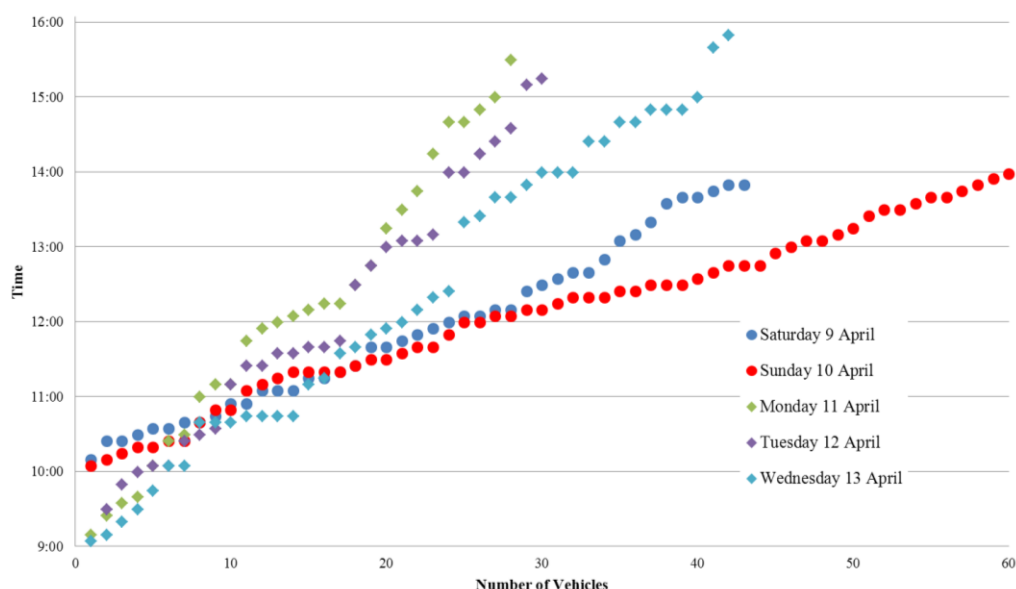
**Table 17 Burnie – C&I loads by sector at transfer station**

Sector	Number	%
Government	2	6.9%
Accommodation, cafes and restaurants	1	3.4%
Landscaper/Gardener	2	6.9%
Shopping centre/Retail Trade	3	10.3%
Trade (electrician, builder, plumber, carpenter)	7	24.1%
Mixed small businesses	13	44.8%
Not recorded	1	3.4%
<b>Total</b>	<b>29</b>	<b>100.0%</b>

The table shows that almost half the C&I loads originated from the mixed small business sector.

Figure 19 shows the entry times of vehicles using the Burnie site on each of the audit days.

**Figure 19 Burnie - vehicle entry times**



The chart shows that more vehicles entered the site on the Sunday of the audit period than any of the other days. The frequency of entries on the Saturday was reasonably consistent with a constant stream of vehicles arriving during the course of the day. Several small peaks were recorded around 11 am and 12 noon. After a peak of entries between 10 am and 10.30 am on Sunday, the number of entries slowed and after 11 am resumed a constant flow until 2 pm. The reduced weekend opening hours influenced the frequency of arrivals.

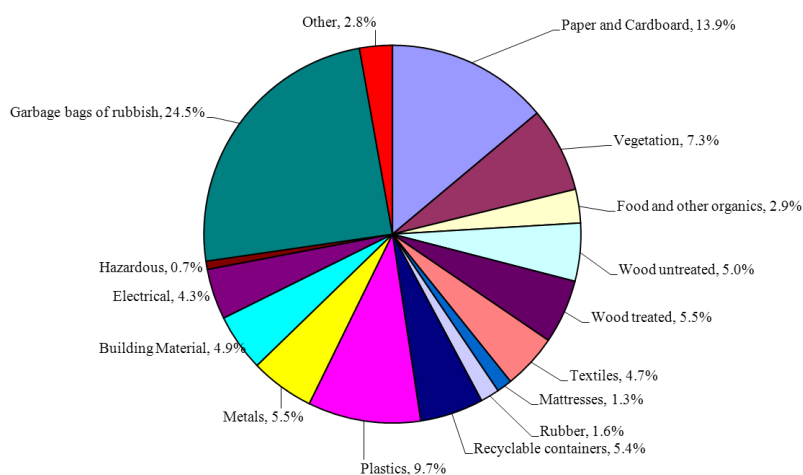
Weekday entry frequency shows greater variation compared to the weekend with irregular arrivals on Tuesday in particular. Peaks were recorded before 1 pm and at

about 2.30 pm. On Monday and Wednesday the major peaks were recorded just after 12 noon.

#### 4.4.2 Burnie - overall waste composition

Figure 20 shows the combined composition by volume of the waste disposed of at the Burnie landfill and transfer station. The audited amounts have been consolidated into some key categories. This chart includes data recorded in a separate audit of the landfill at Burnie and has been combined with the data from the transfer station that was the subject of this audit.

**Figure 20 Burnie - consolidated waste composition by volume**



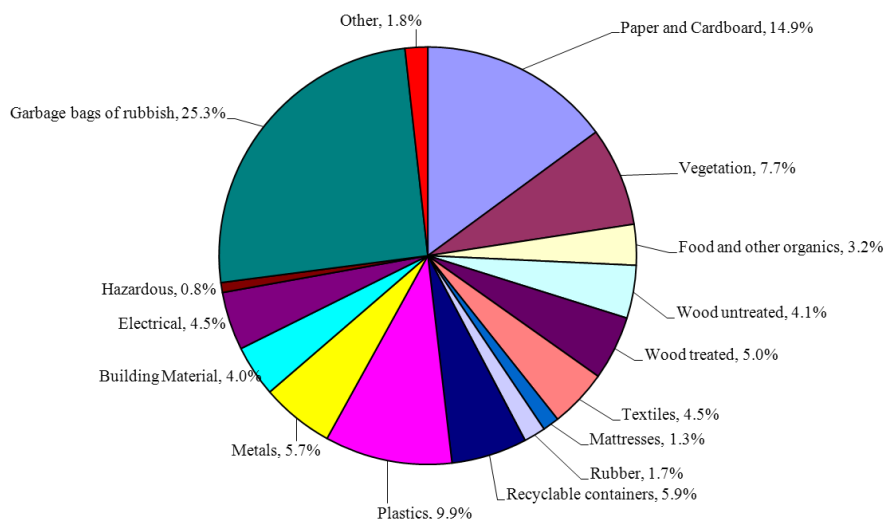
The chart shows that the largest proportion by volume of waste disposed of at the Burnie site is garbage bags of rubbish at 24.5%. Other materials forming significant proportions included paper and cardboard (13.9%), plastics (9.7%) and vegetation (7.3%). About 53% of waste from this site could potentially be recycled.



#### 4.4.3 Burnie waste composition – landfilled

Figure 21 shows the composition by volume of the waste disposed of at the Burnie landfill only. The audited amounts have been consolidated into some key categories. This chart shows data recorded in a separate five-day audit of the landfill at Burnie, not part of this project.

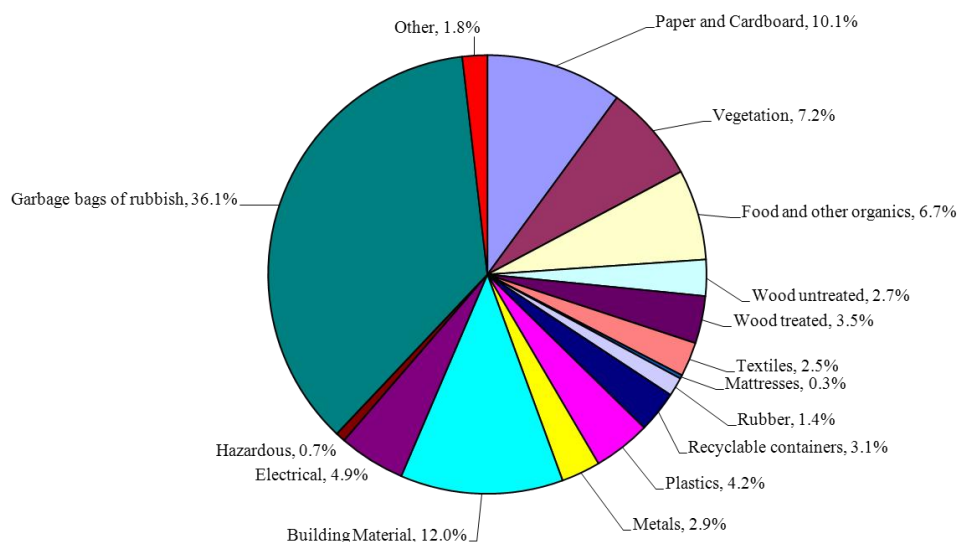
**Figure 21 Burnie - consolidated waste composition by volume at the landfill**



The chart shows that the largest proportion by volume of waste disposed of at the Burnie landfill was garbage bags of rubbish at 25.3%. Other materials forming significant proportions include paper and cardboard (14.9%), plastics (9.9%) and food and greenwaste (7.7%). About 51% of waste from this site could potentially be recycled.

Figure 22 shows the composition by weight of the waste disposed of at the Burnie landfill only. The audited amounts have been consolidated into some key categories. This chart shows data recorded in a separate audit of the landfill at Burnie, not part of this project.

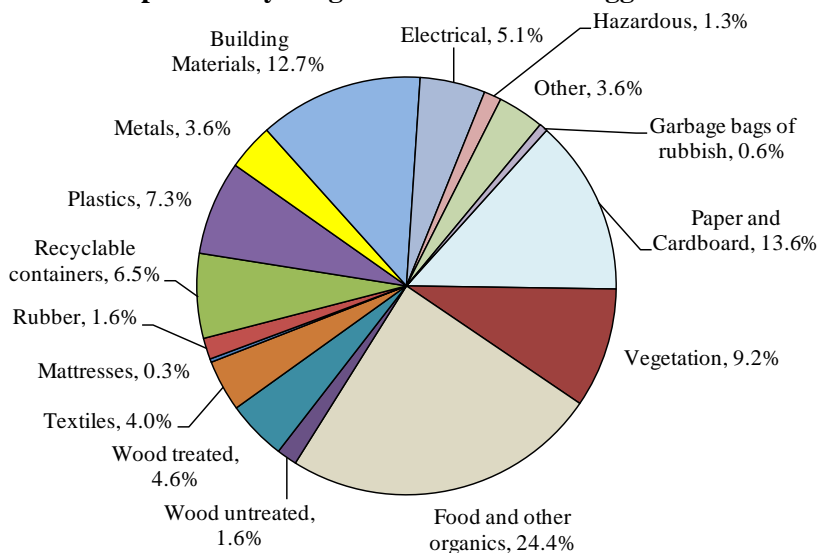
**Figure 22 Burnie - consolidated waste composition by weight at the landfill**



The chart shows that the largest proportion by weight of waste disposed of at the Burnie site is garbage bags of rubbish at 36.1%. Other materials forming significant proportions include building material (12.0%) and paper and cardboard (10.1%). About 43% of waste from this site could potentially be recycled.

Figure 23 shows the composition by weight of the waste disposed of at the Burnie landfill with the 36% of bagged material dispersed. Food and other organics have increased the most – 24% bagged from 7% loose. Paper and cardboard has increased by 4%. Recyclables containers and plastics have increased by 3%. Vegetation and have increased by 2%.

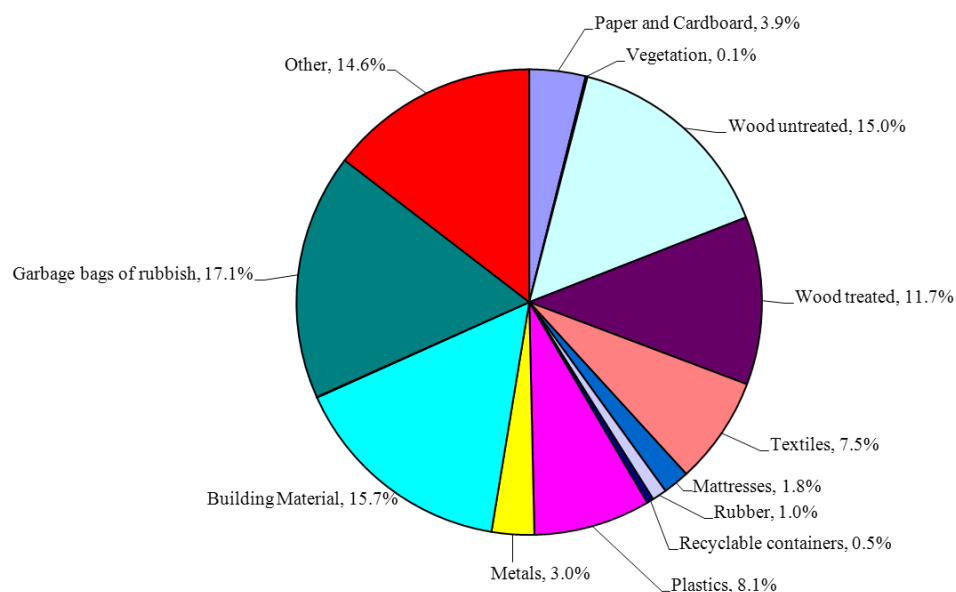
**Figure 23 Burnie - composition by weight at the landfill – bagged material dispersed**



#### 4.4.4 Burnie waste composition – small vehicles

Figure 24 shows the composition by volume of the waste disposed of by small vehicles at the Burnie transfer station only. The audited amounts have been consolidated into some key categories.

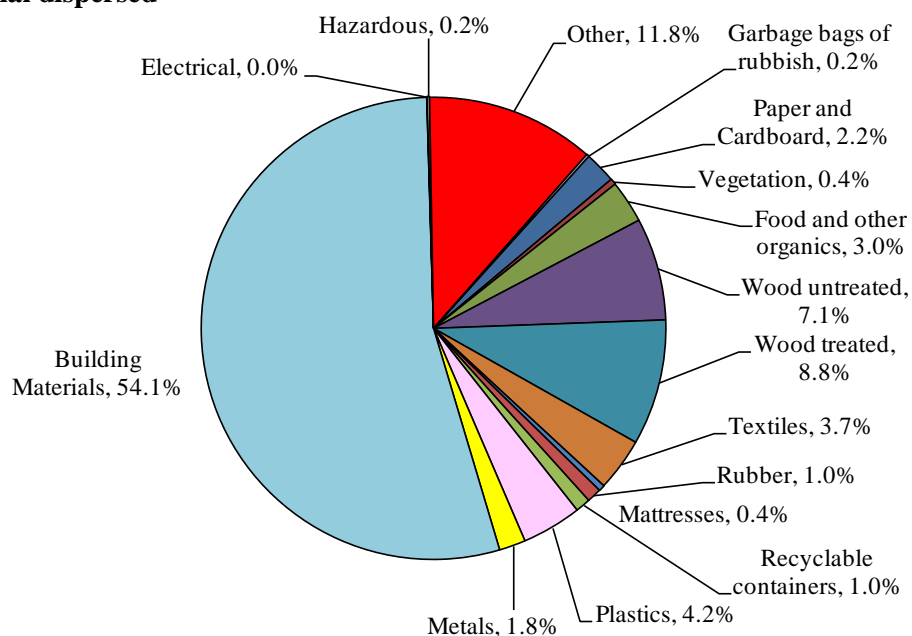
**Figure 24 Burnie - consolidated waste composition by volume transfer station**



The chart shows that the largest proportion by volume of waste disposed of at the Burnie transfer station was garbage bags of rubbish at 15.8%. Other materials forming significant proportions include building material (14.5%), untreated wood (13.9%), and treated wood (10.9%). About 51% could potentially be recycled.

Figure 25 shows the composition by volume of the waste disposed of by small vehicles at the Burnie transfer station with bagged material dispersed. Only a small fraction of this waste was in bags so the proportions by weight have not changed significantly.

**Figure 25 Burnie - consolidated waste composition by weight transfer station – bagged material dispersed**



#### **4.4.5 Burnie – recycling**

Burnie has an extensive recycling and reuse system for small vehicles to use prior to crossing the weighbridge. Common recyclables, hazardous wastes and quality unwanted household items are recovered prior to entering the disposal area. Once across the weighbridge vehicles are either directed to the small vehicle transfer station or greenwaste area (for greenwaste only loads). Some additional metals, greenwaste and other household items are recovered at this stage. This audit only included material that was disposed of passed the weighbridge at the small vehicle disposal area. Waste deposited in the metals bin was recorded however as this is only a small proportion of the total amount of waste recycled at Burnie no further analysis of this material has been reported.

#### **4.4.6 Additional observations by auditors**

The following is additional background information or observations from auditors that may assist with interpretation of results.

- Bob, the facility supervisor, seems to have effectively instilled waste diversion practices and culture into staff and facility users.
- The site has by-laws to encourage source separation and correct use of the facility.
- A large number of small vehicles enter the site over a short period of time over the weekend. Consider opening for an additional hour for small vehicles on Saturdays and Sundays if queuing becomes an issue.
- All vehicles large and small tip at the greenwaste area
- Minor separation at the tip face of tyres and metals.
- The tip shop provides monthly reports to council on the amount reused
- Records are kept of all material recycled through the transfer station
- In November the tip face will close and a transfer station is being built. Material will be sent from Burnie to Dulverton.

## 4.5 Port Latta

### 4.5.1 Port Latta vehicle movements

Table 18 shows the number of different vehicle types delivering waste from different sources to the Port Latta facility. No small vehicles or non-account customers are permitted to tip at Port Latta. This is enforced through a coded gate system.

**Table 18 Port Latta - number of vehicles audited by waste stream**

Vehicle Type	Domestic	C&I	C&D	Council	Total
Front Lift		2			2
Roll-On-Roll-Off				7	7
Skip		1			1
Side Lift				7	7
<b>Total</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>14</b>	<b>17</b>

The table shows that the largest number of vehicles were from councils, of which half were ROROs from transfer stations and half side lift from domestic kerbside collections. Only three other vehicles were recorded, of which two were front-lift C&I and one a C&I skip. Only 17 vehicles were recorded over the two days of the audit. No domestic or C&D loads appeared onsite during the audit period.

**Image 4 Port Latta – gatehouse and secure gate**



Table 19 shows the number of vehicles delivering C&I loads recorded as originating from different industry sectors.

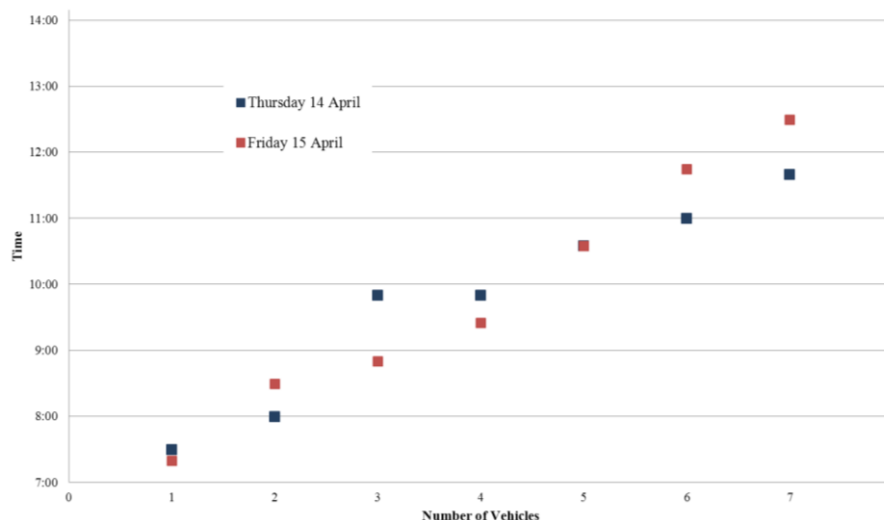
**Table 19 Port Latta - C&I loads by sector**

Sector	Number	%
Manufacturing/Factories	1	33.3%
Mixed small businesses	2	66.7%
<b>Total</b>	<b>3</b>	<b>100%</b>

Of the three C&I loads recorded, two originated from the mixed small business sector and one from manufacturing and factories.

Figure 26 shows the entry times of vehicles using the Port Latta site on each of the audit days.

**Figure 26 Port Latta - vehicle entry times**

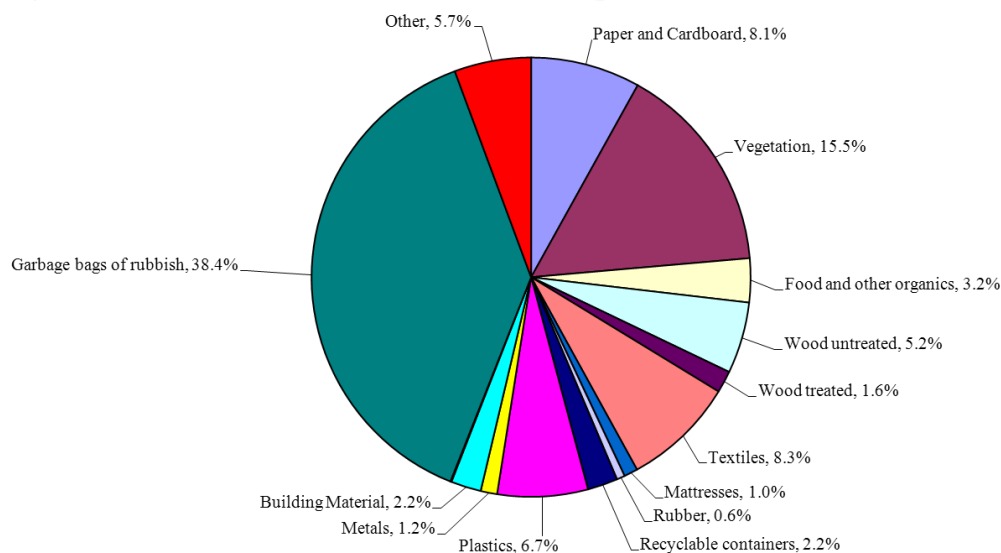


With such a small number of vehicles recorded it is difficult to identify any obvious trends, although it is clear that there were long periods on both days when no vehicles arrived for example, almost two hours on Thursday between 8 am and 9.50 am and again between 11.40 am and 1.30 pm. On Friday it appears that a vehicle arrived at almost regular half-hourly intervals during the course of the audit day.

#### 4.5.2 Port Latta waste composition

Figure 27 shows the composition by volume of the waste disposed of at the Port Latta facility. The audited amounts have been consolidated into some key categories.

**Figure 27 Port Latta - overall consolidated composition by volume**

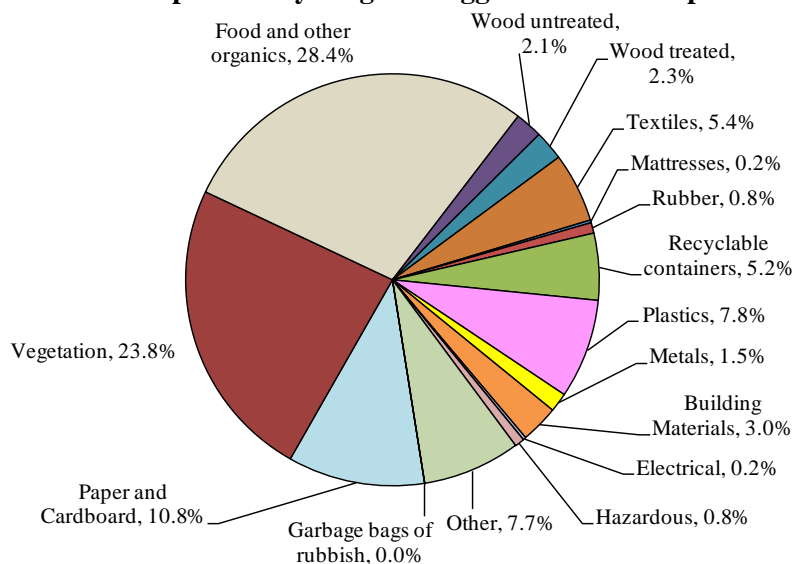


The chart shows that the largest proportion by volume of waste disposed of at the Port Latta site was garbage bags of rubbish at 38.4%. Other materials forming significant proportions included vegetation (15.5%), textiles (8.3%), paper and cardboard (8.1%) and plastics (6.7%). About 44% of waste from this site could potentially be recovered.



Figure 28 shows the composition by weight of the waste disposed of at the Port Latta facility with the 43% of bagged material dispersed. The main differences are in food waste and other organics which has increased by almost 18%. Recycled paper has increased by 7%. Most other items have increased between 0.5% - 2%.

**Figure 28 Port Latta - composition by weight – bagged materials dispersed**



## 4.6 Ulverstone

### 4.6.1 Ulverstone – vehicles audited

Table 20 shows the number of different vehicle types delivering waste of different streams to the Ulverstone facility. No large vehicles are accepted at this site.

**Table 20 Ulverstone - type of vehicle**

Vehicle Type	Domestic	C&I	C&D	Charity	Regional drop off centres	Not Recorded	Total
Car	5						5
Car and Trailer	28	1	1	1			31
Flat Bed		1					1
Four Wheel Drive and Trailer	1						1
Roll-On-Roll-Off			1				1
Station Wagon	8						8
Station Wagon and Trailer	4		1				5
Tipper	2		1		1	1	5
Truck and Trailer					1		1
Ute	23	1	1				25
Ute and Trailer	4	1					5
Van	2	3					5
Van and Trailer	5	1					6
Not Recorded						2	2
<b>Total</b>	<b>76</b>	<b>8</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>9</b>	<b>101</b>

The table shows that the most common vehicles were cars with trailers and utes, delivering domestic waste. Of the 101 vehicles recorded, cars and utes, with and without trailers made up 66% of all vehicles using the facility during the audit period. Domestic waste was also the most commonly disposed of stream.

Table 21 shows the number of vehicles delivering C&I loads recorded as originating from different industry sectors.

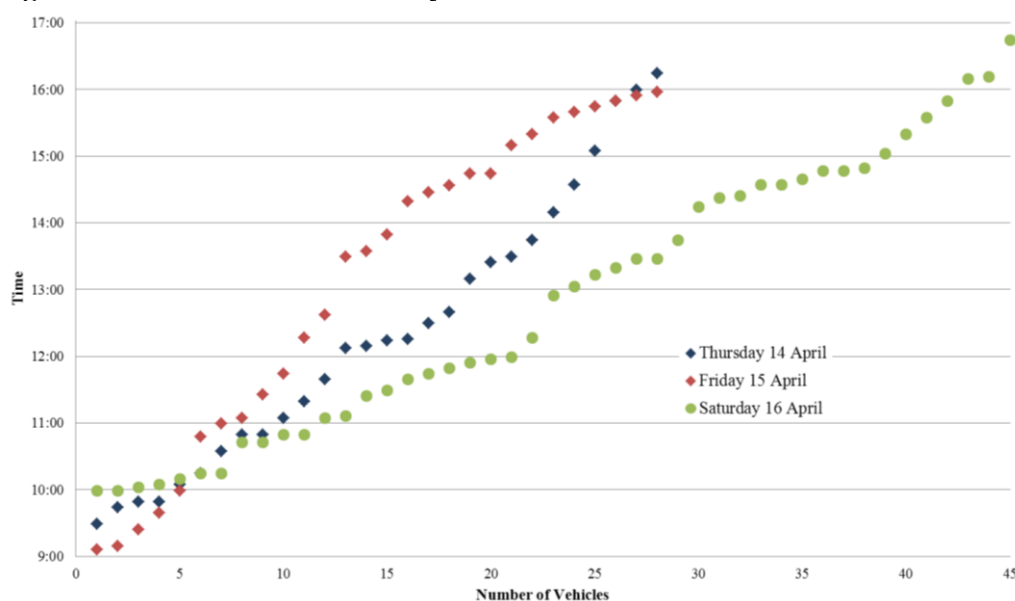
**Table 21 Ulverstone – C&I loads by sector**

Sector	Number	%
Charity	2	25.0%
Manufacturing/Factories	2	25.0%
Trade (electrician, builder, plumber, carpenter)	4	50.0%
<b>Total</b>	<b>8</b>	<b>100.0%</b>

The table shows that most C&I loads originated from the trade sector with two loads each from the charity, and manufacturing and factories sectors.

Figure 29 shows the entry times of vehicles using the Ulverstone site on each of the audit days.

**Figure 29 Ulverstone - vehicle entry times**

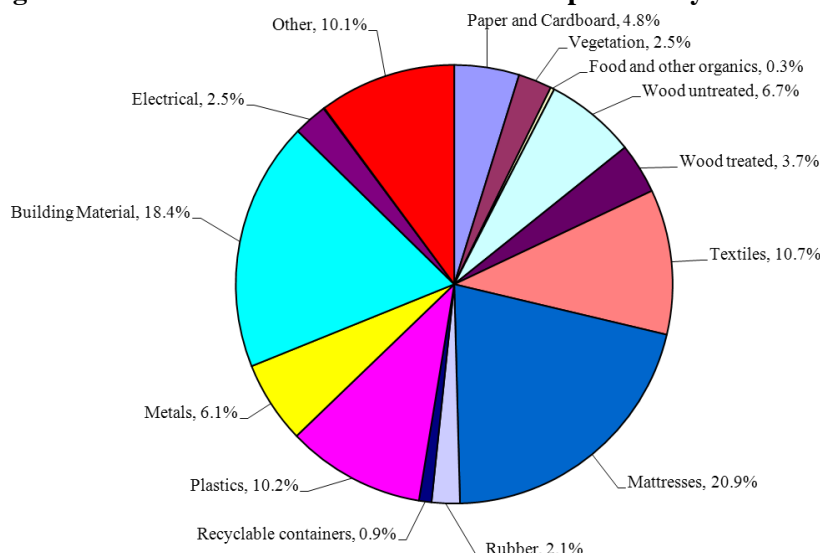


The chart shows that the frequency of vehicles entering the site was different on the Saturday compared to the week days. The arrival of loads was reasonably consistent throughout each day. Some of the smaller gaps are attributed to the auditor's brief breaks. Saturday is characterised by a peak at 10 am, when the site opened.

#### 4.6.2 Ulverstone - overall waste composition

Figure 30 shows the composition by volume of the waste delivered to the Ulverstone facility. This includes both landfilled and recycled material. The audited amounts have been consolidated into some key categories. Note these composition results are quite different to other landfill site results as Ulverstone is a non-putrescible waste facility.

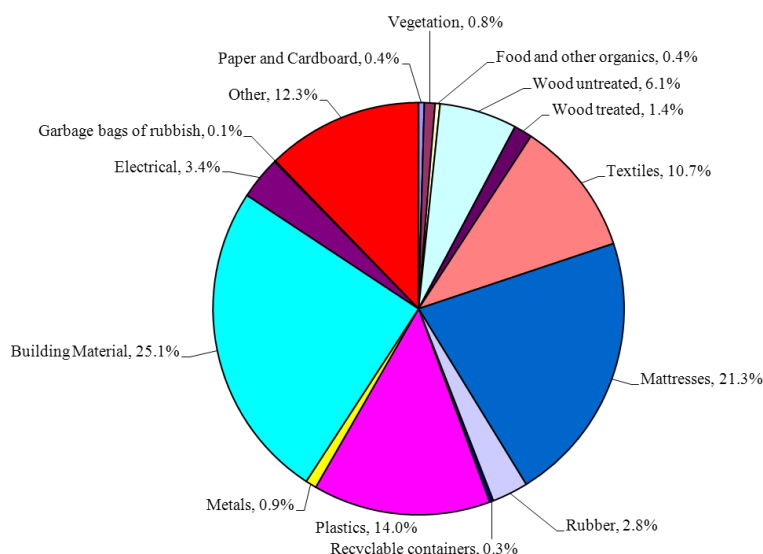
**Figure 30 Ulverstone - consolidated waste composition by volume**



The chart shows that the largest proportion by volume of waste disposed of at the Ulverstone site is mattresses at 20.9%. This quantity is essentially two large loads of mattresses delivered on Thursday 14 April. Other materials forming significant proportions include building materials (18.4%), textiles (10.7%) and plastics (10.2%).

Figure 31 shows the composition by volume of the waste disposed of to landfill at the Ulverstone facility. This does not include any recycled material. The audited amounts have been consolidated into some key categories.

**Figure 31 Ulverstone - consolidated waste to landfill composition**



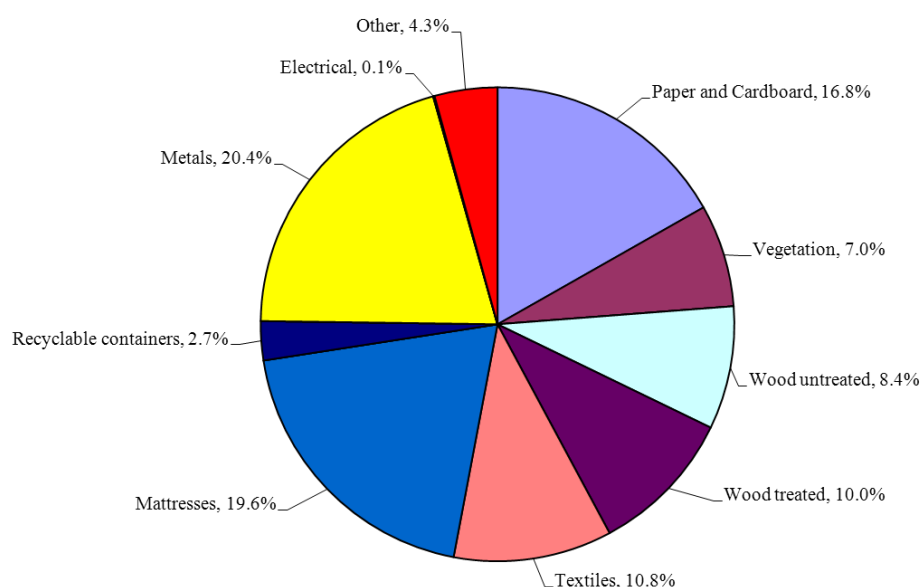
The chart shows that the largest proportion by volume of waste disposed of to landfill at the Ulverstone site is mattresses at 21.3%. Other materials forming significant proportions include building materials (25.1%), plastics (14.0%) and textiles (10.7%). About 69% of waste from this site could potentially be recovered. Mattresses were being ripped apart by operations staff so the metal could be recovered, the assumption is that 25% of the mattress is recovered for metal recycling and the remainder (75%) of textiles, fill and wood is landfilled.

As there was no bagged material at Ulverstone there has been no separate analysis undertaken for this component of the waste stream.

#### 4.6.3 Ulverstone – recycling

Figure 32 shows the composition by volume of material recycled at the Ulverstone facility. This does not include any landfilled material. The audited amounts have been consolidated into some key categories.

**Figure 32 Ulverstone - consolidated recycling composition by volume**



The chart shows that the largest proportions of materials recycled at the Ulverstone site by volume are metals at 20.4%, mattresses (19.6%) and paper and cardboard at 16.8%. Other materials forming significant proportions included textiles (10.8%), treated wood (10.0%), untreated wood (8.4%) and vegetation (7.0%).

Table 22 shows the quantities by volume and weight of currently recycled materials extrapolated over a whole year based on the results of the five day audit. Care should be taken with the data as extrapolating whole year amounts from one three day audit is likely to reduce accuracy.

**Table 22 Ulverstone - quantity of recycled materials extrapolated / year**

Material	Recycled (m <sup>3</sup> )	%	Recycled (tonnes)	%
Paper Recyclable	72.6	2.8%	4.0	0.5%
Cardboard	363.0	14.0%	33.0	4.5%
Vegetation / garden	181.5	7.0%	21.8	2.9%
Stumps, Logs (10 cm)	-	0.0%	-	0.0%
Wood - varnished/painted	60.5	2.3%	7.3	1.0%
Wood - chipboard, MDF	-	0.0%	-	0.0%
Wood - board/pole, untreated	217.8	8.4%	34.8	4.7%
Wood - board/pole, treated	198.4	7.6%	19.8	2.7%
Furniture	111.3	4.3%	10.1	1.4%
Carpet & underlay	266.2	10.3%	24.2	3.3%
Textiles - clothing/cloth	14.5	0.6%	0.7	0.1%
Mattresses spring*	508.2	19.6%	142.3	19.3%
Glass - containers recyclable	-	0.0%	-	0.0%
Plastic - containers recyclable	69.0	2.7%	1.0	0.1%
Metals recyclable containers	-	0.0%	-	0.0%
Metals - ferrous steel	529.4	20.4%	439.4	59.5%
Metals - non-ferrous	-	0.0%	-	0.0%
Concrete / cement	-	0.0%	-	0.0%
Bricks	-	0.0%	-	0.0%
Tiles	-	0.0%	-	0.0%
Computers / office equipment	-	0.0%	-	0.0%
Toner cartridges	-	0.0%	-	0.0%
Electrical large eg whitegoods	-	0.0%	-	0.0%
Electrical medium eg televisions	-	0.0%	-	0.0%
Electrical small	2.4	0.1%	0.5	0.1%
Paint	-	0.0%	-	0.0%
Oil	-	0.0%	-	0.0%
<b>Total</b>	<b>2,594.8</b>	<b>100%</b>	<b>739.0</b>	<b>100%</b>

\*Note: As mattresses are manually recovered onsite it has been assumed that 25% is recovered as metal and the remainder (75%) is landfilled.

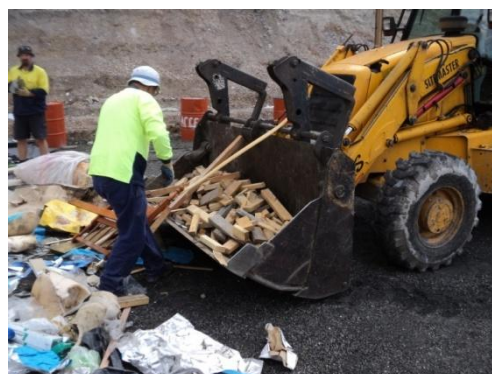
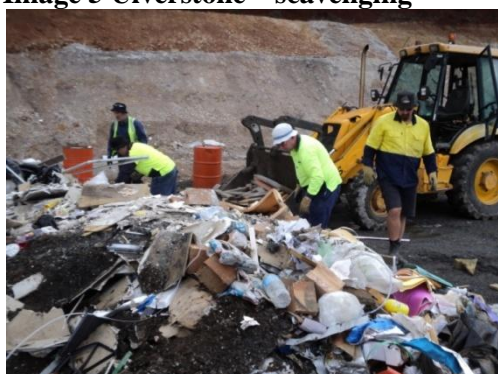
The table shows that as much as 2,594.8 cubic metres or 739.0 tonnes of material is currently being recycled per year. Most of this is ferrous metals.

#### 4.6.4 Additional observations by auditors

Some additional comments made either anecdotally to the auditor, or based on their observations, that should be considered in interpreting the results at Ulverstone include:

- The supervisor – Eddy – was very diligent at maximising recovery through encouraging staff to recover metals and other recyclables. He was also very effective at engaging site users with waste diversion principles.
- Very few commercial loads are received at Ulverstone possibly due to their higher gate fee for unsorted materials for commercial loads. Anecdotally auditors were advised that some of these loads go the transfer stations which are free.
- There was some frustration expressed by truck drivers that they pay for the size of the vehicle rather than volume it contains. Consideration should be given to introducing a weighbridge to overcome this.
- There appeared to be a charge for cardboard but not for other recyclables.
- The green waste shredder onsite is well utilised and some particleboard and timber is also shredded.

**Image 5 Ulverstone – scavenging**



#### 4.7 Westbury

Table 23 shows the number of different vehicle types delivering waste from domestic or C&I sources to the Westbury facility. In total 47 loads were assessed.

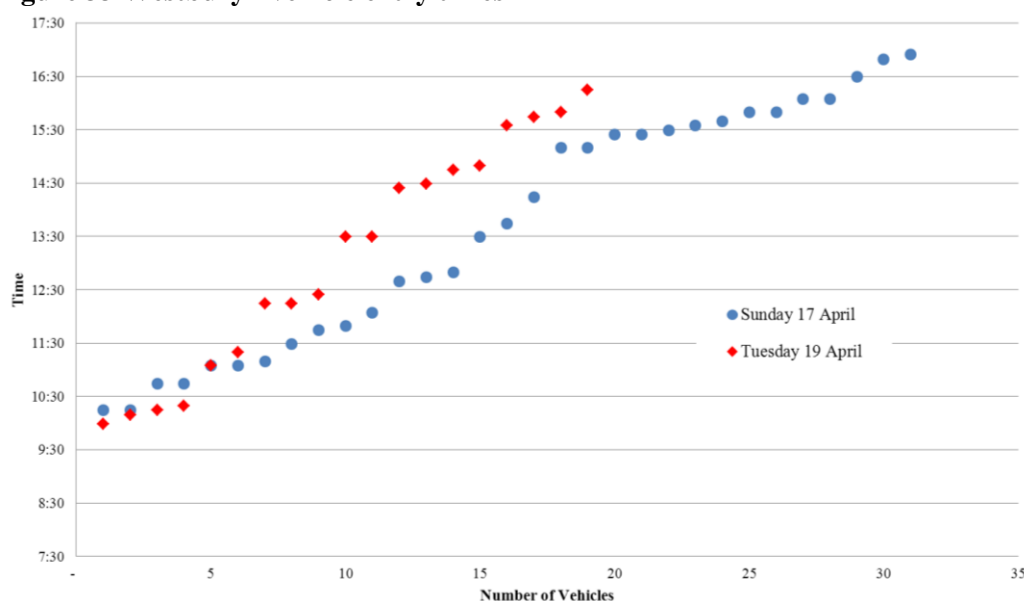
**Table 23 Westbury - type of vehicles using the facility**

Vehicle Type	Domestic	C&I
Car	3	
Car and Trailer	6	
Station Wagon	3	
Four Wheel Drive and Trailer	6	
Ute	17	
Ute and Trailer	11	1
<b>Total</b>	<b>46</b>	<b>1</b>

The table shows that all but one vehicle entering the facility during the audit period was delivering domestic waste. Of these, the most common vehicle types by far were utes, with or without trailers.

Figure 33 shows the entry times of vehicles using the Westbury site on each of the audit days.

**Figure 33 Westbury - vehicle entry times**



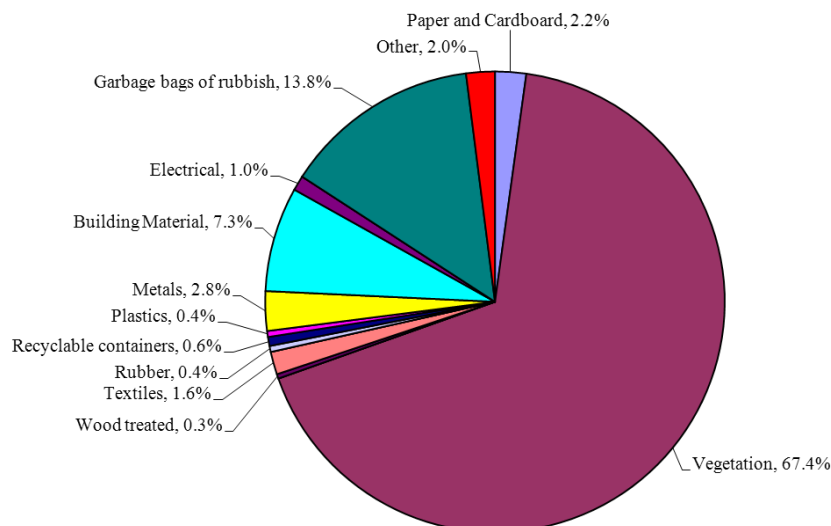
The chart shows that more vehicles entered the site on the Sunday of the audit period than on the Tuesday. The frequency of entries on the Sunday was reasonably consistent with some gaps in arrivals in the middle of the day and an increase in frequency after 3.30 pm. Tuesday arrivals were sparse with small groups of vehicles entering at about hourly intervals, at around 10 am, just before 11.30 am, 12.30 pm, 1.30 pm, 2.30 pm and between 3.30 pm and 4.30 pm.



#### 4.7.1 Westbury - overall waste composition

Figure 34 shows the combined composition by volume of waste delivered to the Westbury facility. This data includes both material landfilled and recycled. The audited amounts have been consolidated into some key categories.

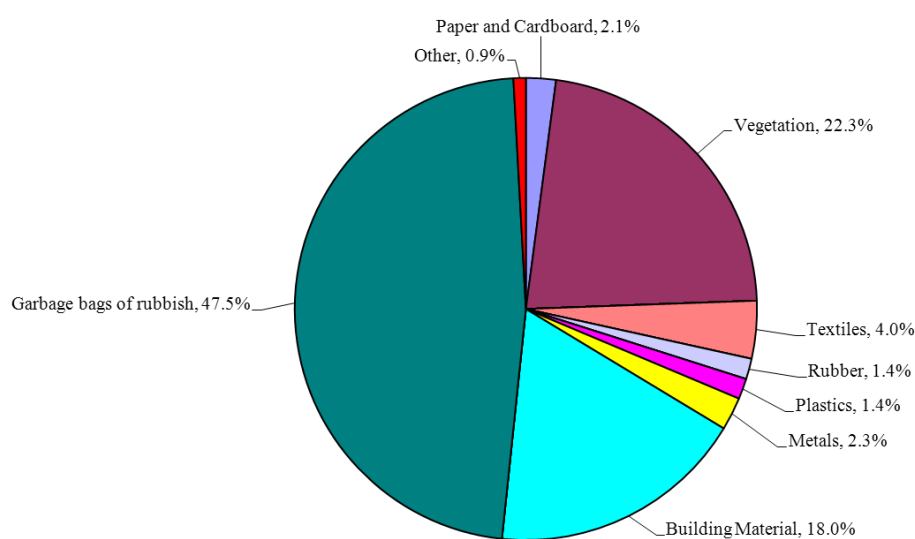
**Figure 34 Westbury - consolidated waste composition by volume**



The chart shows that by far the largest proportion by volume of waste delivered to the Westbury site was vegetation at 67.4%. Only two other materials formed significant proportions – garbage bags of rubbish (13.8%) and building material (7.3%).

Figure 35 shows the composition by volume of the waste disposed of to landfill at the Westbury facility. This does not include any recycled material. The audited amounts have been consolidated into some key categories.

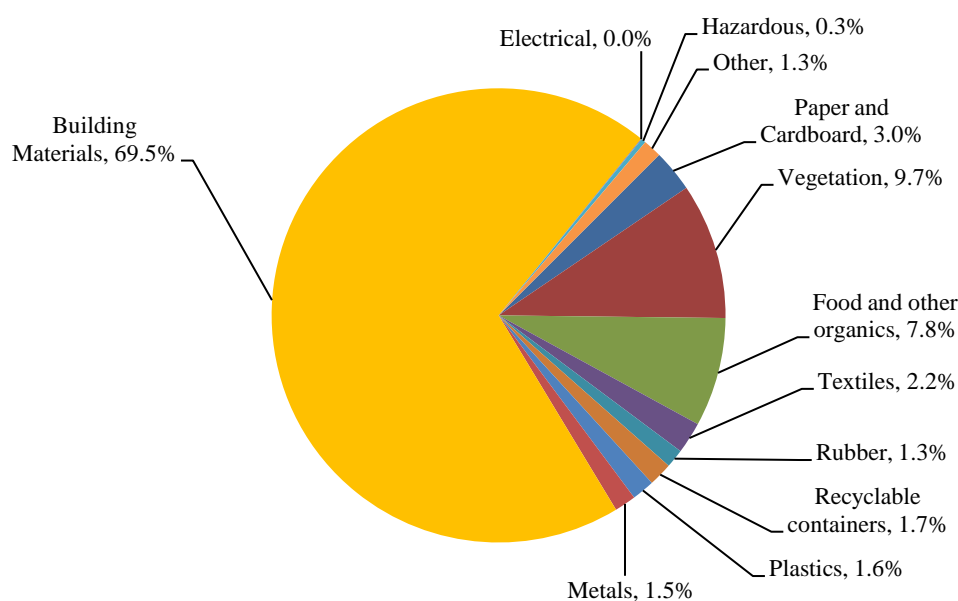
**Figure 35 Westbury - consolidated waste to landfill composition by volume**



The chart shows that the largest proportion by volume of waste disposed of to landfill at the Westbury site is garbage bags of rubbish at 47.5%. Other materials forming significant proportions include vegetation (22.3%) and building materials (18.0%). About 49% of waste from this site could potentially be recovered.

Figure 36 shows the composition by weight of the waste disposed of to landfill at the Westbury facility with bagged materials dispersed. The majority of the material by weight is building materials. Of the 17% by weight that was bagged, the majority is food and other organics (8%) and paper and cardboard (3%).

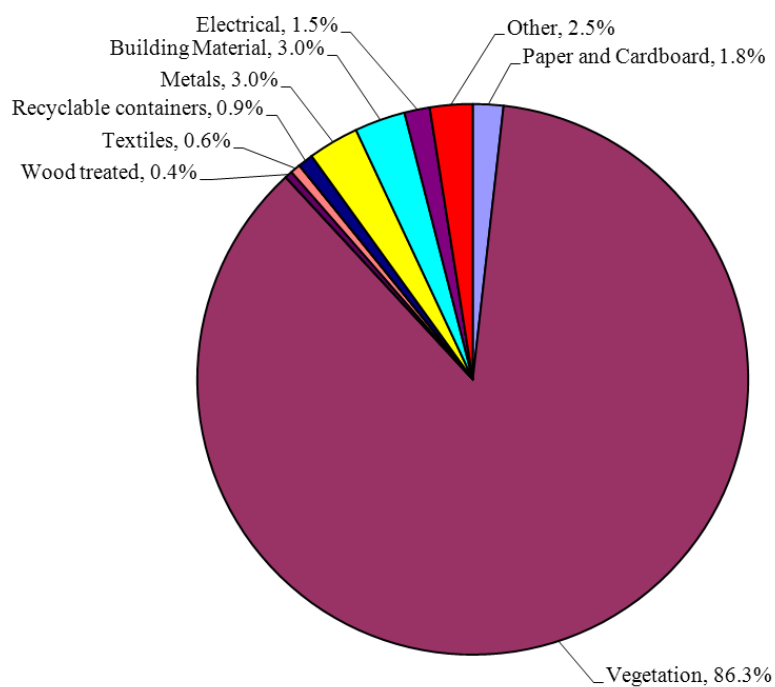
**Figure 36 Westbury - landfill composition – bagged materials dispersed**



#### 4.7.2 Westbury – Recycling

Figure 37 shows the composition by volume of material recycled at the Westbury facility. This does not include any landfilled material. The audited amounts have been consolidated into some key categories.

**Figure 37 Westbury - consolidated recycling composition by volume**



The chart shows that during the audit period, vegetation formed the bulk of the recovered material at this site at 86.3%.

#### 4.8 Deloraine

Table 24 shows the number of different vehicle types delivering waste of different types to the Deloraine facility.

**Table 24 Deloraine - type of vehicles using the facility**

Vehicle Type	Domestic	C&I	C&D	Council	Regional drop off centres	Not recorded	Total
Car	21						21
Car and Trailer	23						23
Ute	45						45
Ute and Trailer	7	1					8
Van	3						3
Van and Trailer	1						1
Station Wagon	8						8
Station Wagon and Trailer	20					2	22
Skip	1	1					2
Flat bed		2					2
Front Lift		1			1		2
Tipper	3			3			6
<b>Total</b>	<b>132</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>143</b>

The table shows that all but a few vehicles entering the facility during the audit period were delivering domestic waste. The most common vehicle types delivering domestic waste were utes, followed by cars, station wagons with trailers and cars with trailers. Out of the 143 loads delivering during the audit period, only 12 were large vehicles.

Table 25 shows the number of vehicles delivering C&I loads recorded as originating from different industry sectors.

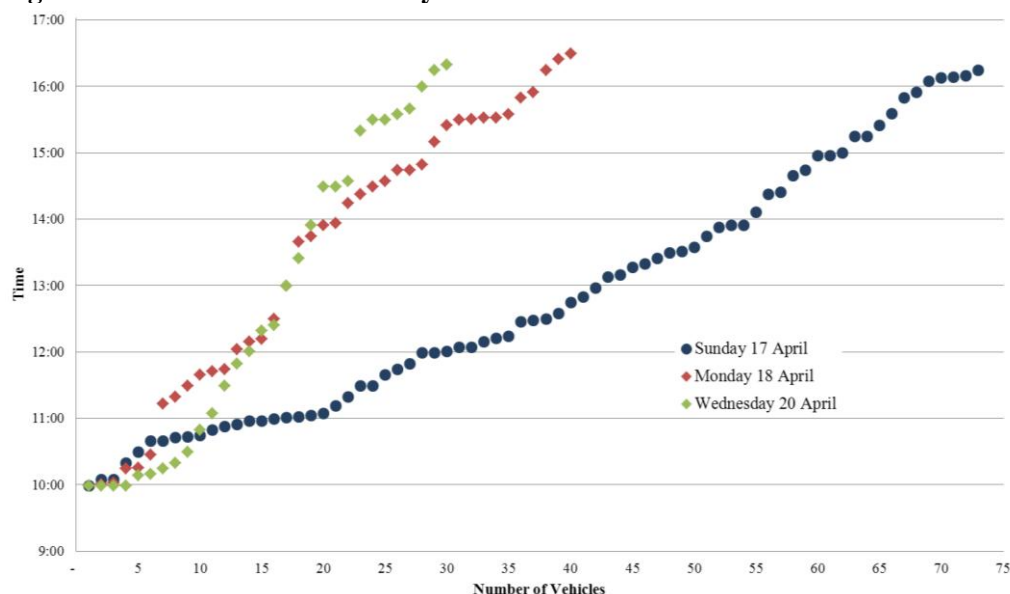
**Table 25 Deloraine - C&I load by sector**

Sector	Number	%
Landscaper/gardener	1	20%
Manufacturing/factories	1	20%
Shopping centre/retail trade	1	20%
Mixed small businesses	2	40%
<b>Total</b>	<b>5</b>	<b>100%</b>

The table shows that only five C&I loads were recorded entering the site during the audit period, of which two were from mixed small businesses and one each from landscaping/gardening, manufacturing, shopping and retail.

Figure 38 shows the entry times of vehicles using the Deloraine site on each of the audit days.

**Figure 38 Deloraine - vehicle entry times**

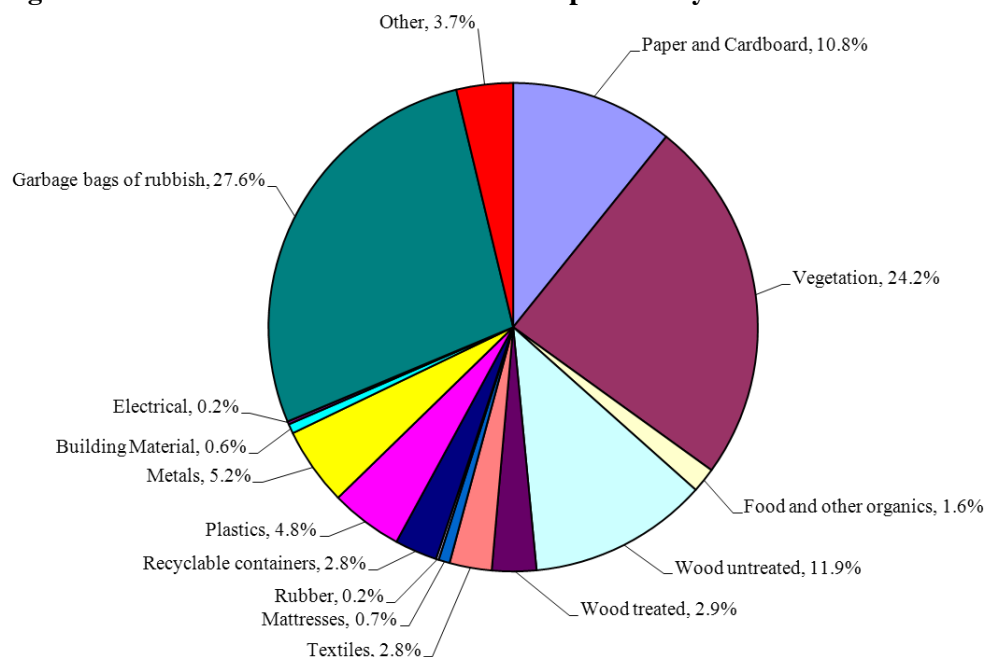


The chart shows that most vehicles entered on the Sunday and that the frequency of vehicles entering the site was different on this day compared to the week days. The frequency of arrivals on Sunday was quite consistent from about 10.45 am onwards. The busiest period was immediately before 11 am. Weekday arrivals were less consistent. On Tuesday there were peaks at 10 am and 3.30 pm. On Monday there was a peak around 3.30 pm. Small gaps may be attributed to the visual auditor taking breaks during quieter periods.

#### 4.8.1 Deloraine- overall waste composition

Figure 39 shows the combined composition by volume of the waste disposed of at the Deloraine facility. This includes both landfilled and recycled material. The audited amounts have been consolidated into some key categories.

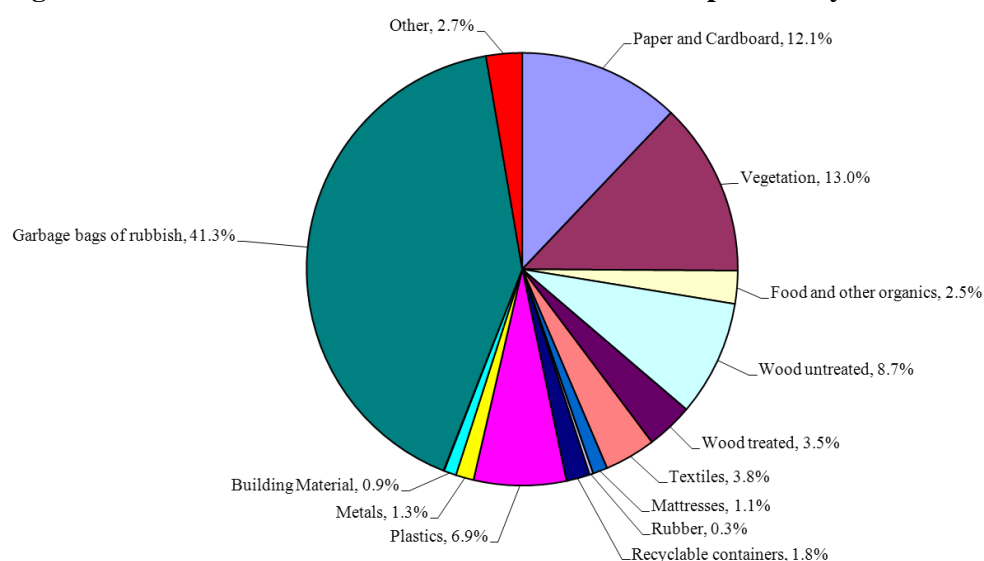
**Figure 39 Deloraine - consolidated waste composition by volume**



The chart shows that the two largest proportions by volume of waste disposed of at the Deloraine site were garbage bags of rubbish at 27.6% and vegetation at 24.2%. Other materials forming significant proportions included paper and cardboard (10.8%), untreated wood (11.9%) and metals (5.2%). About 59% of waste from this site could potentially be recovered.

Figure 40 shows the composition by volume of the waste disposed of to landfill at the Deloraine facility. This does not include any recycled material. The audited amounts have been consolidated into some key categories.

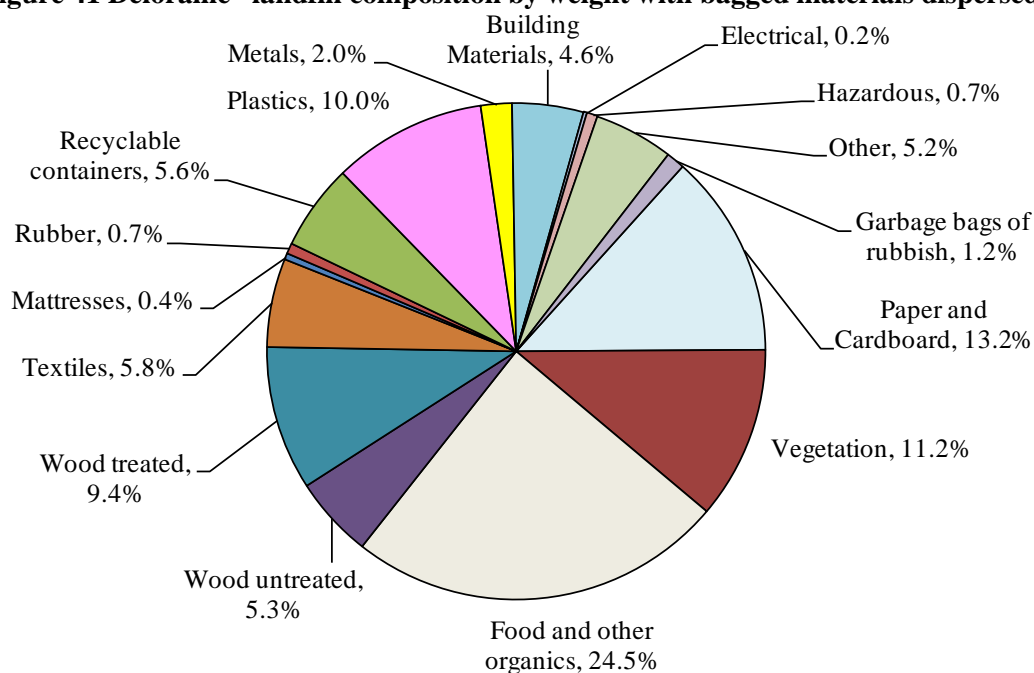
**Figure 40 Deloraine – consolidated waste to landfill composition by volume**



The previous chart shows that the largest proportion by volume of waste disposed of to landfill at the Deloraine site was garbage bags of rubbish at 41.3%. Other materials forming significant proportions include vegetation at 13.0%, paper and cardboard (12.1%) and untreated wood (8.7%). About 43% of waste from this site could potentially be recycled.

Figure 41 shows the composition by weight of the waste disposed of to landfill at the Deloraine facility with bagged materials dispersed. The majority of the bagged material was food and other organics and paper and cardboard. Most of the other materials have only increased slightly.

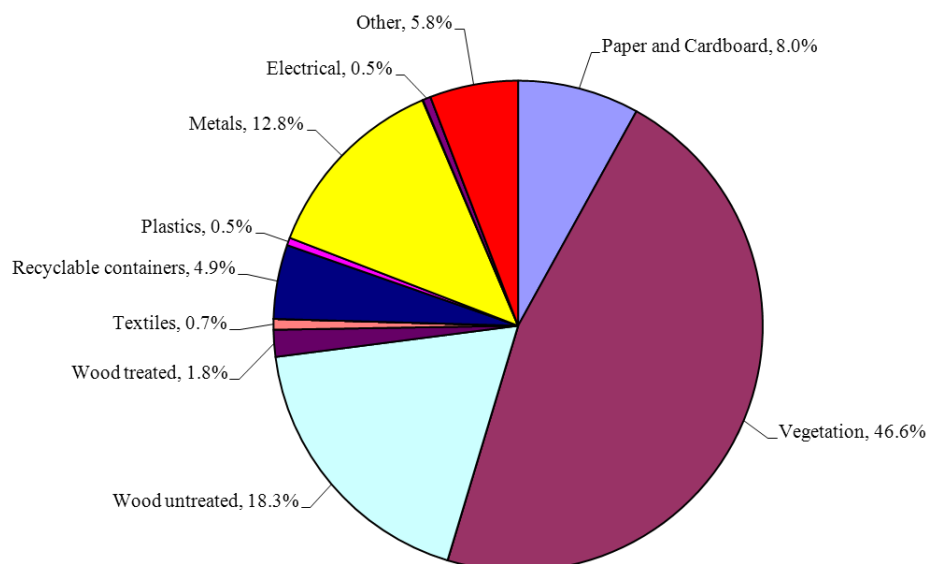
**Figure 41 Deloraine –landfill composition by weight with bagged materials dispersed**



#### 4.8.2 Deloraine – recycling and reuse

Figure 42 shows the composition by volume of material recycled at the Deloraine facility. This does not include any landfilled material. The audited amounts have been consolidated into some key categories.

**Figure 42 Deloraine - consolidated recycling and reuse composition by volume**



The chart shows that the largest proportion by far of material recycled or reused at the Deloraine site by volume was vegetation at 46.6%. Other materials forming significant proportions included untreated wood (18.3%), metals (12.8%) and paper and cardboard (8.0%).

#### 4.8.3 Deloraine - additional observations by auditors

Some additional comments to consider in interpreting the results at Deloraine include:

- Staff thoroughly scavenge through material at the landfill to recover as much as possible for recycling or the tip shop;
- Half gate fees are charged for residents that have 30%+ recyclables or reusables in their loads.
- Most users of the facility appeared to be those without a kerbside collection;
- Vegetation and non-treated timber including old furniture is crushed by a loader. The majority is used as cover material. Some is used as fire wood by patrons to the facility. Every few months a portion is pushed into landfill to reduce the stockpile therefore not all greenwaste are recycled.
- Carpet is separated for residents to reuse as garden coverings.
- Due to restricted opening hours some operators have keys to let themselves in for loads tipped on Tuesday and Thursday.



## 5 KEY FINDINGS

Overall, small vehicles (cars, utes, vans and four-wheel drives) were the most common method for waste delivery at almost all the sites. Only at Launceston and Dulverton Landfill were more large vehicles observed than small. The combined Launceston Landfill and Transfer Station was the only facility where significant numbers of vehicles were observed entering, an average of more than 200 per day. Most other sites averaged less than 50 vehicles per day and Port Latta averaged only eight per day.

The largest proportion of the landfilled waste stream at all sites was garbage bags of rubbish. These were found to comprise 28.2% by volume and 32.6% by weight. A desk top analysis was conducted using the average waste composition for relevant waste streams to determine the likely composition of the bags. This resulted in the following average composition for the region by weight:

- building material – 16%;
- food and other organics – 21%;
- paper and cardboard – 11%;
- vegetation – 10%;
- plastics - 9%;
- recyclable containers – 5%;
- treated wood – 4% and
- other – 24%.

The proportion of landfilled waste at all sites that could potentially be recycled was around 49% by volume and 46% by weight, excluding bagged material.

Many of the individual site waste streams, and overall, show a large proportion of bags of rubbish, the contents of which cannot be determined by visual audit. An educated guess can be made of what is contained in these bags and they are likely to contain significant amounts of organic matter including food.

The proportion of bags at each site is outlined in Table 26. The actual proportion of bagged material at Launceston landfill would be much higher if domestic waste loads were included in the audit. However based on this data Port Latta has the highest proportion of bags (56%) and Ulverstone has the lowest (0%). All of the bagged material at Ulverstone is directed to the putrescibles bin as patrons enter the site.

**Table 26 Proportion of landfill composition that is bagged - by site**

Site	Bags of garbage
Launceston Landfill	18%
Launceston Transfer Station	19%
Dulverton	39%
Burnie	16%
Ulverstone	0%
Port Latta	56%
Westbury	14%
Deloraine	41%
All Sites	27%

The bagged material when dispersed using desktop analysis was primarily food and other organic waste and paper and cardboard. Small fractions of most other material types, except bulky waste like mattresses, wood and electrical items were also bagged.

Table 27 indicates the proportion of material going to each landfill that could potentially be recycled. This is on the basis that the site has recovery for vegetation, timber, C&D waste, metals, common recyclables (paper/cardboard and containers), electrical waste and mattresses. Many of the sites would need to introduce some of these diversion options to maximise recycling.

Ulverstone has a high proportion (69%) of potentially recyclable material still going to landfill. This is partly because the majority of material is non-putrescible. Launceston has the next highest recovery potential at both the landfill and transfer station.

**Table 27 Proportion of landfill composition that could be recycled - by site**

Site	Recycling potential	
	By volume	By weight
Launceston landfill	56%	53%
Launceston transfer station	57%	
Dulverton	40%	31%
Burnie - Landfill	51%	43%
Burnie - Transfer Station	51%	
Ulverstone	69%	
Port Latta	44%	
Westbury	49%	
Deloraine	43%	
All Sites	49%	45%

## 6 DISCUSSION

Based on the audit findings APC recommend the following actions be considered:

- Maximise use of existing waste diversion infrastructure at each site;
- Introduce new waste diversion infrastructure in high priority areas, based on diversion potential;
- Investigate appointing a regional contractor to mulch greenwaste and chip timber on a regular basis;
- Appoint a regional contractor to crush C&D waste for use by the councils as cover material at the landfill, road making and other civil engineering purposes or to be used by the contractor and retained for sale or donation back to customers.
- Develop region wide pricing protocols, contracts, systems and enforcement across all sites.

An explanation leading to each of these recommendations is outlined below.

### 6.1 Identifying high priority materials to maximise recovery

Large proportions of waste currently being landfilled are easily recoverable. In particular vegetation makes up significant percentages of the material being landfilled. This is a material that is easily identifiable and separated and can be processed into a useful product using cheap and simple techniques and technology.

Other easily identifiable and highly recoverable materials also currently being landfilled include paper and cardboard, metals, timber and building material. Recovery of all of only these five materials alone across all sites would reduce waste to landfill by more than 36% by volume and 38% by weight.

Table 28 shows a summary of the existing recycling and reuse facilities at the seven sites. The cells highlighted in grey are opportunities where there is potential to recover at least 5% of the waste stream through improving the diversion facilities.

**Table 28 Existing and potential waste diversion services by site**

Site	Recyclable containers	Cardboard	Metals	Vegetation recovery	Building material	Timber/wood	E-waste	Mattresses	Textiles	Tip shop
Launceston	Y	Y	Y	Y			Y			
Dulverton	n/a		n/a	n/a	n/a	n/a	n/a		n/a	n/a
Burnie	Y	Y	Y	Y	Y	Y	Y			Y
Ulverstone	Y	Y	Y	Y		Y		Y		Y
Port Latta	n/a			n/a	n/a	n/a	n/a		n/a	n/a
Westbury	Y	Y	Y	Y	Y	Y				Y
Deloraine	Y	Y	Y	Y	Y	Y	Y			Y

Key: Y = yes have these facilities;

n/a = not applicable due to the type of facility or small volume of waste

Cardboard is the item by volume with the highest potential for additional recovery at most of the sites. The existing cardboard recycling infrastructure, capacity and service frequency at sites may need to be reviewed.

Many of the sites – particularly Ulverstone, Burnie, Westbury and Deloraine - have a large range of waste diversion options. However, there are additional recovery opportunities at each of these sites.

Due to the large loads of charity material that arrive at some sites, as well as small vehicles disposing of clothing, carpet and other textiles, it may be worth investigating a ragging option for the rejected textiles to reduce organics going to landfill.

As Port Latta and Dulverton only accept large vehicles there are fewer opportunities for source separated waste diversion. Any material to be recovered at these two facilities would need to be scavenged after being tipped. As there are fewer vehicles using these facilities there is more time for staff to scavenge between loads.

Launceston has the greatest range of potential to improve recovery using existing cardboard, metal and vegetation facilities. There is also potential to add new facilities for recovery of building material, textiles and timber/wood.

## **6.2 Processing of high priority materials**

Separating the material for recovery is only the first step. There needs to be established markets for the stockpiled materials. Given the volume of vegetation and building waste cumulatively accepted at the seven sites DWM could consider the feasibility of implementing a regional contractor to mulch and or compost vegetation for re-sale or use by the councils. A similar model could also be adopted for the building waste.

The existing mulcher at Ulverstone and size separator at Dulverton could be used, in addition to a C&D crusher to process some of the existing stockpiles in the region.

### **Image 6 Potential reprocessing infrastructure**



Dulverton – size separator



Ulverstone – greenwaste mulcher

### 6.3 Regional pricing policy

Feedback from site operators and users indicated the need for a regional pricing policy to encourage waste diversion. Residents and small haul commercial vehicles have access to the regional drop off centres that have minimal or no waste separation facilities. APC's understanding is that the majority of these centres are unmanned and free to use and therefore there is no incentive for users to attend the staffed facilities where they may be charged and asked to separate waste.

Additionally some of the 7 sites are located in close enough proximity to each other that users can select which site is most cost effective depending on the type of waste they are disposing of.

**Table 29 Summary of differential gate fee pricing policies by site**

Site	Differential pricing policy
Launceston landfill	No differential pricing policy for presorted loads
Dulverton	N/A - No recycling options on site
Burnie	Free drop off for recyclables
Ulverstone	Differential pricing policy for large vehicles that are pre-sorted.
Port Latta	N/A - No recycling options onsite
Westbury	Free drop off for recyclables
Deloraine	Differential pricing model for pre-sorted loads

Small vehicles make up the largest proportion of users both overall and at most of the individual sites. This is an important issue to take into account when establishing programs to increase recovery of materials delivered to the sites. It means that the message to separate loads and dispose of separated materials must be communicated to many individual users.

When deciding whether to separate materials in their loads, customers estimate the amount of time required to be invested in the separation and disposal task and compare it to the potential savings. If the amount of time required to separate and dispose of separated waste is greater than the potential savings, customers will be less inclined to separate their loads.

To move the community towards separation of loads there must be a financial incentive with cost savings for those who do the right thing and it must be easy and efficient so reducing the amount of time and effort required. Significant price differentiation encourages those customers whose loads may consist of a few or bulky materials for which a small investment of time to separate and dispose of will be rewarded by cost savings. Customers with loads that are very mixed and require a greater investment of time to separate will not be tempted by anything other than quite significant price differentiation.

## 7 SUMMARY OF RECOMMENDATIONS

### 7.1 *Regional*

These are recommendations that apply to all sites to maximise the resource recovery opportunities:

- Regional pricing policy to be implemented, encourage source separation.
- Introduce a regional mobile mulching and or composting service for sites that don't have their own mulching and composting operation
- Introduce a regional mobile crushing operation for all sites separating C&D waste.
- Investigate options with mattress processing organisations to determine the feasibility, or likelihood of a facility operating in Tasmania, or costs of transporting mattresses to the Victorian processing facilities.
- Investigate the feasibility of a ragging or textile/carpet recycling option for the region.
- Implement a standard region wide education and communication program that includes clear and standard signage and acceptance standards for all materials at all sites.

### 7.2 *Launceston*

There are a number of resource recovery opportunities for Launceston. Diversion can be achieved by focusing on the high volume, high carbon content items such as cardboard, vegetation, carpet and textiles. In addition, there is an opportunity to maximise recovery of metals which is high in value and contain embodied energy with great environmental benefit. From a community engagement point of view there is an opportunity to recover some reusable materials.

Other recommendations include:

- Improve cardboard recycling infrastructure at Launceston, for greater ease of use by the public of large oversize items i.e. a cardboard skip with cover
- Introduce a greenwaste bin in the small vehicle transfer area
- Reconfigure the recycling drop off area to encourage maximum waste diversion by providing more dedicated bulk bins for specific materials
- Provide a dedicated bin for separation of timber/pallets at oversize area
- Investigate establishing a building waste recovery area accepting at a minimum, plasterboard, concrete, bricks, tiles, soil and plate glass.
- Consider social and environmental costs and benefits of a tip shop operation.

**APPENDIX A DATA RECORDING SHEETS**

Date: \_\_\_\_\_ Auditor: \_\_\_\_\_ Site: \_\_\_\_\_

<b>Entry Time</b>								
<b>Registration Number</b>								
<b>Type of vehicle/container</b>								
<b>Max Load Capacity – m<sup>3</sup></b>								
<b>Load type - C&amp;I / Dom / C&amp;D / Council / Other</b>								
<b>Disposal Point</b>								
<b>Source (M S H O X C T L E U)</b>								
<b>Council area</b>								
	<b>Disposed</b>		<b>Recycled</b>		<b>Disposed</b>		<b>Recycled</b>	
Garbage bags of rubbish								
Paper – recyclable*								
Paper - Non-recyclable								
Cardboard*								
Food / Kitchen								
Vegetation / garden*								
Stumps, logs (10cm diameter +)*								
Wood – varnished/painted								
Wood - chipboard, MDF*								
Wood - board/pole, untreated*								
Wood - board/pole, treated								
Furniture								
Carpet & underlay*								
Textiles – clothing/ cloth*								
Textiles – composite (shoes, bags)								
Mattresses - spring*								
Rubber/foam								
Glass – containers recyclable*								
Glass – plate/other								
Plastic - containers recyclable*								
Plastic – plastic bags & film								
Plastic - Polystyrene foam								
Plastic – other								
Metals – recyclable containers*								
Metals - ferrous steel*								
Metals – non-ferrous*								
Concrete / cement								
Bricks								
Tiles								
Plasterboard								
Rock/dirt/soil								
Asphalt								
	<b>Vol (l)</b>	<b>No.</b>	<b>Vol (l)</b>	<b>No.</b>	<b>Vol (l)</b>	<b>No.</b>	<b>Vol (l)</b>	<b>No.</b>
Computers / office equipment*								
Toner cartridges*								
Electrical large eg whitegoods (no.)*								
Electrical medium televisions (no*)								
Electrical eg small blender (no.)								
Insulation								
Paint (containing liquid) (no)*								
Oil*								
Hazardous / special								
Bric-a-brac (describe)								
Other items								

## CCWMG &amp; NTWMG LANDFILL AUDIT – 2011

Date: \_\_\_\_\_ Auditor: \_\_\_\_\_ Site: \_\_\_\_\_

Entry Time						
Registration Number						
Type of vehicle/container						
Max Load Capacity – m <sup>3</sup>						
Load type C&I / Dom / C&D/ Council/ Other						
Disposal Point						
Source (M S H O X C T L E U)						
Council Area						
Compaction	H	M	L	H	M	L
Garbage bags of rubbish						
Paper – recyclable*						
Paper - Non-recyclable						
Cardboard*						
Food / Kitchen						
Vegetation / garden*						
Stumps, logs (10cm diameter +)*						
Wood - furniture, painted wood						
Wood - chipboard, MDF*						
Wood - board/pole, untreated*						
Wood - board/pole, treated						
Furniture						
Carpet & underlay*						
Textiles – clothing/ cloth*						
Textiles – composite (shoes, bags)						
Mattresses – spring*						
Rubber/foam						
Glass – containers recyclable*						
Glass – plate/other						
Plastic - containers recyclable*						
Plastic – plastic bags & film						
Plastic - Polystyrene foam						
Plastic – other						
Metals – recyclable containers*						
Metals - ferrous steel*						
Metals – non-ferrous*						
Concrete / cement*						
Bricks*						
Tiles*						
Plasterboard						
Rock/dirt/soil						
Asphalt						
	Vol (l)	No.	Vol (l)	No.	Vol (l)	No.
Computers / office equipment*						
Toner cartridges*						
Electrical large - ie whitegoods (no.)*						
Electrical medium ie televisions (no.)*						
Electrical small ie blender (no.)						
Insulation						
Paint (containing liquid)*						
Oil*						
Hazardous / special						
Bric-a-brac (describe)						
Other items						



## LAUNCESTON TRANSFER STATION WASTE AUDIT – 2011

Date: \_\_\_\_\_ Auditor: \_\_\_\_\_

<b>Entry Time</b>								
<b>Registration Number</b>								
<b>Type of vehicle/container</b>								
<b>Max Load Capacity – m<sup>3</sup></b>								
<b>Load type</b> - C&I / Dom / C&D/ Council/ Other								
<b>Disposal Point</b> <small>Green/Oversize/Rec/TS</small>								
<b>Source</b> (M S H O X C T L E U)								
<b>Council area</b>								
	<b>Disposed</b>		<b>Reusable</b>		<b>Disposed</b>		<b>Reusable</b>	
Garbage bags of rubbish								
Paper – recyclable*								
Paper - non-recyclable								
Cardboard*								
Food / Kitchen								
Vegetation / garden*								
Stumps, logs (10cm diameter +)*								
Wood – varnished/painted								
Wood - chipboard, MDF*								
Wood - board/pole, untreated*								
Wood - board/pole, treated								
Furniture								
Carpet & underlay*								
Textiles – clothing/ cloth*								
Textiles – composite (shoes, bags)								
Mattresses - spring*								
Rubber/Foam								
Glass – containers recyclable*								
Glass – plate/other								
Plastic - containers recyclable*								
Plastic – plastic bags & film								
Plastic - Polystyrene foam								
Plastic – other								
Metals – recyclable containers*								
Metals - ferrous steel*								
Metals – non-ferrous*								
Concrete / cement								
Bricks								
Tiles								
Plasterboard								
Rock/dirt/soil								
Asphalt								
	Vol (l)	No.	Vol (l)	No.	Vol (l)	No.	Vol (l)	No.
Computers / office equipment*								
Toner cartridges*								
Electrical large eg whitegoods (no.)*								
Electrical medium televisions (no)*								
Electrical eg small blender (no.)*								
Insulation								
Paint (containing liquid) (no)*								
Oil*								
Hazardous / special (describe)								
Bric-a-brac (describe)								
Other items								

**APPENDIX B VOLUME TO WEIGHT CONVERSION FACTORS**

Waste material	Density – kilograms per cubic metre		
	[L] Low	[M] Medium	[C] Compacted
Office – paper	76	152	228
Paper – all other	76	152	228
Compacted dry cardboard	130	130	130
Compacted dry cardboard production spoils	130	130	130
Compacted wet cardboard	260	260	260
Loose dry cardboard	55	55	55
Loose dry cardboard production spoils	55	55	55
Loose wet cardboard	190	190	190
Waxed cardboard	55	92	130
Food/kitchen	343	514	1029
Food – dense	514	1029	1029
Vegetation – branches/grass clips	91	227	445
Vegetation – tree stumps /logs	150	450	900
Wood – pallets/other	156	156	156
Wood – furniture	160	170	400
Wood – fencing/board/pole (treated)	180	220	260
Wood – fencing/board/pole (untreated)	120	160	360
Wood – MDF/chipboard	156	156	156
Textile – furniture	90	100	450
Textile – carpet/underlay	100	150	350
Textile – mattress	50	50	50
Textile – cloth	91	120	240
Textile – leather/other	91	120	240
Rubber – other	200	200	200
Rubber – tyres/tubes	200	200	200
Rubber – shredded tyres	200	200	400
Glass – containers/other	280	280	280
Glass – pane	411	411	411
Plastic – bags and film	39	78	156
Plastic – recyclable containers	72	72	72
Plastic – hard	170	170	360
Plastic – other	170	170	360
Polystyrene/foam	14	21	28
Garbage bags	87	170	348
Tiles	470	550	640
Metal – ferrous	120	120	120
Metal – non-ferrous	139	139	139
Soil/clean fill	922	922	922
Rock	818	828	828
Rubble >150 mm	1048	1048	1048
Clay	1150	1150	1150
Concrete/cement	830	830	830
Bricks	828	828	828
Asphalt	680	680	680
Plasterboard	227	227	227
Hazardous/special – chemical/clinical	227	227	227
Hazardous/special – light globes	285	285	285
Whitegoods – washing machine/fridges	105	113	120
Electronics/electrical television etc.	265	265	265
Toner cartridges	188.5	188.5	188.5
Computer/office equipment	265	265	265
Electrical/electronic – Sydney	265	265	265
Other	87	170	348

Source: OE&amp;H NSW (Formerly DECCW) C&amp;I Audit Methodology

## APPENDIX C DETAILED DATA

Table 30 All sites - detailed composition of landfilled waste by volume

Material	Deloraine	Burnie	Westbury	Ulverstone	Port Latta	Launceston Transfer Station	Launceston Landfill	Dulverton	All Sites (including Burnie Landfill)
Garbage bags of rubbish	41.3%	17.1%	47.5%	0.1%	38.4%	18.7%	18.0%	38.8%	28.2%
Paper Recyclable	0.7%	0.1%	0.0%	0.1%	0.0%	1.6%	0.9%	4.1%	2.8%
Paper - non-recyclable	1.2%	0.0%	0.0%	0.4%	0.4%	0.9%	1.0%	0.7%	0.6%
Cardboard	11.4%	3.8%	2.1%	0.3%	8.1%	12.7%	9.8%	7.1%	8.7%
Food / Kitchen	1.3%	0.0%	0.0%	0.0%	2.8%	0.5%	1.7%	1.3%	2.0%
Vegetation / garden	13.0%	0.1%	22.3%	0.8%	15.5%	10.8%	9.6%	4.2%	8.7%
Stumps, Logs (10 cm)	0.0%	0.8%	0.0%	0.0%	0.4%	0.4%	1.0%	0.0%	0.3%
Wood - varnished/painted	0.0%	11.2%	0.0%	0.6%	1.6%	2.7%	1.5%	1.3%	2.2%
Wood - chipboard, MDF	3.8%	2.7%	0.0%	5.1%	2.2%	3.3%	4.4%	2.5%	2.8%
Wood - untreated	4.8%	11.5%	0.0%	0.6%	2.6%	3.5%	7.7%	3.2%	4.1%
Wood - treated	3.5%	0.5%	0.0%	0.8%	0.0%	0.8%	1.8%	0.1%	1.0%
Furniture	0.4%	11.8%	0.0%	7.9%	3.0%	7.0%	4.4%	2.0%	3.0%
Carpet & underlay	1.2%	4.8%	0.9%	5.4%	2.2%	5.9%	2.1%	2.4%	2.6%
Textiles - clothing/cloth	2.0%	2.5%	1.7%	2.3%	6.1%	3.0%	1.6%	2.9%	2.8%
Textiles composites	0.6%	0.1%	1.4%	2.3%	0.0%	0.5%	0.5%	0.4%	0.3%
Mattresses spring	1.1%	1.8%	0.0%	26.6%	1.0%	0.9%	1.7%	1.7%	1.7%
Rubber/Foam	0.3%	1.0%	1.4%	2.7%	0.6%	1.7%	0.2%	0.3%	0.9%
Glass - containers recyclable	0.6%	0.2%	0.0%	0.0%	0.4%	0.5%	0.6%	0.8%	0.8%
Glass - plate	0.4%	0.4%	0.0%	0.0%	1.6%	0.4%	0.3%	0.3%	0.5%
Plastic - containers recyclable	0.7%	0.1%	0.0%	0.1%	0.0%	0.6%	0.7%	4.1%	2.2%
Plastic bags and film	2.0%	2.1%	1.4%	1.8%	4.0%	2.1%	3.4%	6.6%	4.2%
Plastic - Polystyrene foam	1.2%	2.2%	0.0%	1.0%	1.0%	2.2%	1.4%	1.3%	1.5%
Plastic - other	3.7%	3.8%	0.0%	10.3%	1.6%	4.0%	5.3%	6.4%	4.5%
Metals recyclable containers	0.5%	0.1%	0.0%	0.1%	1.8%	0.5%	0.7%	1.4%	0.8%
Metals - ferrous steel	1.3%	2.6%	2.3%	0.3%	1.0%	4.9%	2.8%	1.7%	2.8%
Metals - non-ferrous	0.1%	0.3%	0.0%	0.5%	0.2%	0.7%	0.3%	0.3%	0.5%
Concrete / cement	0.1%	6.3%	0.0%	6.0%	0.0%	0.3%	1.5%	1.2%	1.1%
Bricks	0.0%	3.1%	0.0%	1.6%	0.0%	0.4%	1.0%	0.0%	0.4%
Tiles	0.0%	0.2%	0.0%	2.1%	0.0%	0.5%	0.2%	0.0%	0.1%
Plasterboard	0.5%	3.1%	0.0%	9.7%	2.2%	3.2%	4.9%	1.9%	2.5%
Rock/dirt/soil	0.4%	2.9%	18.0%	3.9%	0.0%	1.1%	3.8%	0.0%	1.6%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Computers / office equipment	0.0%	0.0%	0.0%	0.6%	0.0%	0.0%	0.2%	0.0%	0.1%
Electrical large eg whitegoods	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.1%	0.0%	0.2%
Electrical medium	0.0%	0.0%	0.0%	2.1%	0.0%	0.4%	0.2%	0.1%	0.4%
Electrical small	0.0%	0.0%	0.0%	0.5%	0.0%	0.4%	0.1%	0.1%	0.8%
Insulation	0.7%	2.0%	0.9%	1.3%	0.6%	0.5%	0.4%	0.3%	0.4%
Paint	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Oil	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hazardous	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.5%
Bric-a-brac	0.1%	0.3%	0.0%	1.0%	0.0%	0.4%	0.1%	0.0%	0.1%
Other items	1.1%	0.1%	0.0%	1.2%	0.4%	1.2%	2.7%	0.4%	1.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Table 31 All sites - detailed composition data by weight

Material	Deloraine	Burnie	Westbury	Ulverstone	Port Latta	Launceston Transfer Station	Launceston Landfill	Dulverton	All Sites (including Burnie Landfill)
Garbage bags of rubbish	40.4%	7.0%	17.2%	0.0%	43.1%	12.8%	19.6%	45.4%	32.6%
Paper Recyclable	0.6%	0.0%	0.0%	0.0%	0.0%	0.9%	0.7%	2.2%	1.7%
Paper - non-recyclable	1.3%	0.0%	0.0%	0.4%	0.4%	0.5%	0.7%	0.5%	0.4%
Cardboard	6.4%	1.0%	0.5%	0.1%	3.5%	5.5%	4.3%	3.8%	4.6%
Food / Kitchen	6.0%	0.0%	0.0%	0.0%	9.5%	1.3%	6.9%	5.5%	6.4%
Vegetation / garden	8.8%	0.0%	8.5%	0.3%	21.3%	7.8%	6.8%	4.7%	8.8%
Stumps, Logs (10 cm)	0.0%	0.6%	0.0%	0.0%	0.8%	0.5%	0.6%	0.0%	0.3%
Wood - varnished/painted	0.0%	6.3%	0.0%	0.2%	0.8%	2.6%	0.8%	1.0%	1.4%
Wood - chipboard, MDF	4.4%	2.0%	0.0%	2.9%	1.5%	4.1%	2.9%	2.2%	2.1%
Wood - untreated	5.3%	6.5%	0.0%	0.3%	1.3%	3.3%	4.8%	3.0%	2.8%
Wood - treated	5.0%	0.4%	0.0%	0.2%	0.0%	1.2%	1.5%	0.2%	0.9%
Furniture	0.4%	9.0%	0.0%	2.3%	2.1%	8.9%	3.4%	1.9%	2.3%
Carpet & underlay	1.2%	2.3%	0.4%	2.6%	0.9%	4.6%	1.2%	1.5%	1.5%
Textiles - clothing/cloth	2.6%	1.1%	0.7%	0.4%	2.7%	2.1%	0.9%	1.9%	1.5%
Textiles composites (shoes, bags)	0.4%	0.1%	0.5%	1.5%	0.0%	0.3%	0.2%	0.3%	0.2%
Mattresses spring	0.4%	0.4%	0.0%	23.9%	0.2%	0.3%	0.4%	0.5%	0.8%
Rubber/Foam	0.4%	1.0%	1.2%	3.5%	0.5%	2.8%	0.2%	0.4%	0.8%
Glass - containers recyclable	1.2%	0.3%	0.0%	0.0%	0.5%	1.1%	0.8%	1.3%	1.1%
Glass - plate	1.2%	0.7%	0.0%	0.0%	2.8%	1.3%	0.6%	0.7%	1.0%
Plastic - containers recyclable	0.4%	0.0%	0.0%	0.0%	0.0%	0.3%	0.2%	1.7%	0.8%
Plastic bags and film	0.6%	0.4%	0.2%	1.0%	2.5%	0.6%	1.5%	2.7%	1.7%
Plastic - Polystyrene foam	0.2%	0.1%	0.0%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%
Plastic - other	6.0%	3.0%	0.0%	4.0%	1.5%	5.4%	5.7%	7.2%	4.3%
Metals recyclable containers	0.2%	0.0%	0.0%	0.1%	0.5%	0.2%	0.2%	0.5%	0.3%
Metals - ferrous steel	1.1%	1.5%	1.2%	0.8%	0.5%	4.6%	1.5%	1.1%	1.6%
Metals - non-ferrous	0.1%	0.2%	0.0%	1.3%	0.1%	0.7%	0.2%	0.3%	0.4%
Concrete / cement	0.4%	24.9%	0.0%	16.0%	0.0%	2.0%	5.4%	5.8%	4.4%
Bricks	0.0%	12.2%	0.0%	1.2%	0.0%	2.9%	3.5%	0.1%	1.5%
Tiles	0.0%	0.8%	0.0%	6.3%	0.0%	3.1%	0.7%	0.0%	0.5%
Plasterboard	0.8%	3.3%	0.0%	21.2%	2.2%	5.7%	4.8%	2.4%	3.0%
Rock/dirt/soil	2.7%	12.8%	69.1%	3.3%	0.0%	8.1%	15.0%	0.2%	6.7%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%	0.1%
Computers / office equipment	0.1%	0.0%	0.0%	0.2%	0.0%	0.1%	0.2%	0.0%	0.1%
Electrical large eg whitegoods	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.2%
Electrical medium eg televisions	0.0%	0.0%	0.0%	1.1%	0.0%	0.9%	0.2%	0.1%	0.4%
Electrical small	0.0%	0.0%	0.0%	0.4%	0.0%	0.4%	0.1%	0.0%	1.0%
Insulation	0.9%	0.0%	0.6%	4.3%	0.4%	0.7%	0.3%	0.3%	0.4%
Paint	0.0%	1.6%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
Oil	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Hazardous	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	1.3%	0.0%	0.5%
Bric-a-brac	0.1%	0.1%	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
Other items	0.7%	0.1%	0.0%	0.0%	0.2%	0.8%	1.1%	0.2%	0.7%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**APPENDIX D REGIONAL DROP OFF CENTRE COMPOSITIONS****Table 32 Detailed waste composition by regional drop off centres– by volume**

<b>Municipal Waste</b>	<b>Beaconsfield</b>	<b>Evandale</b>	<b>Exeter</b>	<b>Georgetown</b>
<b>Tip face</b>	<b>Launceston</b>	<b>Launceston</b>	<b>Launceston</b>	<b>Launceston</b>
Bags of garbage	0.0%	0.0%	0.0%	0.0%
Paper Recyclable	0.0%	0.4%	0.7%	0.0%
Paper - non-recyclable	3.7%	2.3%	1.4%	2.9%
Cardboard	12.4%	10.7%	8.6%	17.6%
Food / Kitchen	12.4%	0.0%	0.0%	0.0%
Vegetation / garden	0.0%	12.1%	2.0%	1.5%
Stumps, Logs (10 cm)	0.0%	0.0%	0.3%	0.0%
Wood - varnished/painted	0.0%	4.5%	1.4%	0.0%
Wood - chipboard, MDF	4.3%	2.3%	1.8%	0.0%
Wood - untreated	6.2%	0.0%	0.7%	0.0%
Wood - treated	9.3%	0.0%	0.5%	0.0%
Furniture	0.0%	4.5%	8.8%	16.4%
Carpet & underlay	3.7%	0.8%	27.6%	7.6%
Textiles - clothing/cloth	1.2%	3.4%	9.8%	11.7%
Textiles composites (shoes, bags)	5.6%	1.4%	2.7%	1.8%
Mattresses spring	18.6%	11.3%	2.0%	23.4%
Rubber/Foam	0.0%	0.0%	1.4%	0.0%
Glass - containers recyclable	3.1%	0.0%	0.9%	2.3%
Glass - plate	0.0%	0.0%	0.5%	0.0%
Plastic - containers recyclable	2.5%	0.0%	2.0%	1.8%
Plastic bags and film	0.0%	2.1%	6.5%	4.7%
Plastic - Polystyrene foam	0.0%	4.2%	4.0%	1.8%
Plastic - other	0.0%	26.5%	9.7%	4.7%
Metals recyclable containers	3.1%	0.0%	1.2%	0.0%
Metals - ferrous steel	7.4%	3.9%	2.2%	0.0%
Metals - non-ferrous	5.6%	2.3%	1.1%	0.0%
Concrete / cement	0.9%	0.0%	0.0%	0.0%
Bricks	0.0%	0.0%	0.0%	0.0%
Tiles	0.0%	0.0%	0.0%	0.0%
Plasterboard	0.0%	3.4%	0.7%	0.0%
Rock/dirt/soil	0.0%	0.0%	0.0%	0.0%
Asphalt	0.0%	0.0%	0.0%	0.0%
Computers / office equipment	0.0%	0.0%	0.2%	0.0%
Electrical medium	0.0%	1.1%	0.6%	1.2%
Electrical small	0.0%	0.8%	0.2%	0.7%
Insulation	0.0%	1.7%	0.0%	0.0%
Hazardous / special	0.0%	0.0%	0.0%	0.0%
Bric-a-brac	0.0%	0.0%	0.5%	0.0%
Other items	0.0%	0.5%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

<b>Municipal Waste</b>	<b>Lilydale</b>	<b>Longford</b>	<b>Nunamara</b>	<b>Scottsdale</b>	<b>Mole Creek</b>
<b>Tip face</b>	<b>Launceston</b>	<b>Launceston</b>	<b>Launceston</b>	<b>Launceston</b>	<b>Deloraine</b>
Garbage bags of rubbish	0.0%	0.0%	0.0%	0.0%	43.4%
Paper Recyclable	0.0%	3.0%	0.0%	1.3%	0.8%
Paper - non-recyclable	0.0%	4.1%	0.0%	0.0%	3.5%
Cardboard	47.2%	22.6%	10.0%	11.5%	19.0%
Food / Kitchen	0.0%	3.0%	0.0%	1.8%	3.3%
Vegetation / garden	0.0%	0.0%	2.9%	7.1%	0.0%
Stumps, Logs (10 cm)	0.0%	0.0%	0.0%	0.0%	0.0%
Wood - varnished/painted	0.0%	5.6%	0.0%	0.0%	0.0%
Wood - chipboard, MDF	2.5%	0.0%	0.0%	0.0%	2.2%
Wood - board/pole, untreated	0.0%	3.0%	0.0%	3.9%	3.3%
Wood - board/pole, treated	0.0%	0.0%	0.0%	0.0%	2.7%
Furniture	3.8%	7.1%	31.6%	17.0%	0.0%
Carpet & underlay	0.0%	2.3%	5.0%	8.6%	1.1%
Textiles - clothing/cloth	1.3%	8.7%	0.0%	1.0%	6.5%
Textiles composites (shoes, bags)	0.0%	0.0%	0.0%	0.0%	0.0%
Mattresses spring	0.0%	9.4%	0.0%	2.6%	2.4%
Rubber/Foam	0.0%	0.0%	0.0%	0.0%	0.0%
Glass - containers recyclable	3.1%	3.4%	8.6%	1.6%	0.5%
Glass - plate	0.0%	0.0%	0.0%	0.0%	2.4%
Plastic - containers recyclable	1.5%	4.0%	7.2%	2.9%	0.5%
Plastic bags and film	8.8%	1.5%	0.0%	3.7%	0.0%
Plastic - Polystyrene foam	0.0%	0.0%	0.0%	1.3%	2.2%
Plastic - other	27.1%	18.1%	11.5%	20.4%	5.4%
Metals recyclable containers	0.0%	1.1%	4.3%	1.0%	0.5%
Metals - ferrous steel	3.8%	1.3%	5.0%	1.8%	0.0%
Metals - non-ferrous	0.0%	1.1%	0.0%	0.0%	0.0%
Concrete / cement	0.0%	0.0%	0.0%	0.0%	0.0%
Bricks	0.0%	0.0%	0.0%	0.0%	0.0%
Tiles	0.0%	0.0%	0.0%	0.0%	0.0%
Plasterboard	0.0%	0.0%	0.0%	5.2%	0.0%
Rock/dirt/soil	0.0%	0.0%	0.0%	0.0%	0.0%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%
Computers / office equipment	0.0%	0.3%	0.0%	0.2%	0.3%
Toner cartridges	0.0%	0.0%	0.0%	0.0%	0.0%
Electrical large eg whitegoods	0.0%	0.0%	0.0%	0.0%	0.0%
Electrical medium eg televisions	0.9%	0.4%	2.4%	1.2%	0.0%
Electrical small	0.0%	0.0%	0.0%	0.6%	0.0%
Insulation	0.0%	0.0%	0.0%	0.0%	0.0%
Paint	0.0%	0.0%	0.0%	0.0%	0.0%
Oil	0.0%	0.0%	0.0%	0.0%	0.0%
Hazardous / special	0.0%	0.0%	0.0%	0.0%	0.0%
Bric-a-brac	0.0%	0.0%	0.0%	0.0%	0.0%
Other items	0.0%	0.0%	11.5%	5.2%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	100.0%

<b>Municipal Waste</b>	<b>Preston</b>	<b>South Riana</b>	<b>Ulverstone</b>	<b>Spreyton</b>	<b>Railton</b>
<b>Tip face</b>	<b>Dulverton</b>	<b>Dulverton</b>	<b>Dulverton</b>	<b>Dulverton</b>	<b>Dulverton</b>
Bags of garbage	13.8%	9.3%	67.4%	44.9%	69.2%
Paper Recyclable	1.1%	0.0%	1.2%	0.7%	0.0%
Paper - non-recyclable	0.0%	2.8%	1.0%	0.7%	0.0%
Cardboard	5.0%	8.3%	2.9%	5.5%	0.0%
Food / Kitchen	0.0%	0.0%	2.7%	0.3%	0.0%
Vegetation / garden	0.0%	0.0%	5.5%	7.4%	6.9%
Stumps, Logs (10 cm)	0.0%	0.0%	0.0%	0.0%	0.0%
Wood - varnished/painted	8.8%	13.0%	0.0%	2.8%	0.0%
Wood - chipboard, MDF	0.0%	0.0%	4.3%	0.7%	0.0%
Wood - untreated	0.0%	0.0%	2.2%	1.6%	0.0%
Wood - treated	0.0%	0.0%	0.0%	0.0%	0.0%
Furniture	31.3%	3.7%	0.0%	3.5%	0.0%
Carpet & underlay	0.0%	13.9%	0.7%	4.9%	0.0%
Textiles - clothing/cloth	2.5%	20.8%	0.7%	2.0%	1.2%
Textiles composites (shoes, bags)	0.0%	0.0%	0.0%	0.7%	0.0%
Mattresses spring	0.0%	0.0%	0.0%	5.0%	0.0%
Rubber/Foam	12.5%	0.0%	0.0%	0.6%	0.0%
Glass - containers recyclable	0.0%	0.0%	1.5%	0.6%	2.3%
Glass - plate	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic - containers recyclable	0.0%	0.0%	2.1%	0.8%	3.5%
Plastic bags and film	0.0%	2.3%	3.0%	5.8%	0.0%
Plastic - Polystyrene foam	25.0%	1.9%	0.2%	0.3%	0.0%
Plastic - other	0.0%	18.5%	0.9%	6.4%	15.0%
Metals recyclable containers	0.0%	0.0%	1.6%	0.5%	2.0%
Metals - ferrous steel	0.0%	0.0%	1.9%	2.4%	0.0%
Metals - non-ferrous	0.0%	0.0%	0.0%	0.3%	0.0%
Concrete / cement	0.0%	0.0%	0.0%	0.1%	0.0%
Bricks	0.0%	0.0%	0.0%	0.1%	0.0%
Tiles	0.0%	0.0%	0.0%	0.0%	0.0%
Plasterboard	0.0%	0.9%	0.0%	1.4%	0.0%
Rock/dirt/soil	0.0%	0.0%	0.0%	0.1%	0.0%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%
Computers / office equipment	0.0%	0.0%	0.1%	0.0%	0.0%
Toner cartridges	0.0%	0.0%	0.0%	0.0%	0.0%
Electrical large eg whitegoods	0.0%	0.0%	0.1%	0.0%	0.0%
Electrical medium eg televisions	0.0%	0.0%	0.0%	0.1%	0.0%
Electrical small	0.0%	0.0%	0.1%	0.0%	0.0%
Insulation	0.0%	0.0%	0.0%	0.1%	0.0%
Hazardous / special	0.0%	0.0%	0.0%	0.0%	0.0%
Bric-a-brac	0.0%	0.0%	0.0%	0.0%	0.0%
Other items	0.0%	4.6%	0.0%	0.0%	0.0%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

Municipal Waste	Sheffield	Port Sorrell	Wynard/ Waratah	Circular Head	Smithton
Tip face	Dulverton	Dulverton	Port Latta	Port Latta	Port Latta
Garbage bags of rubbish	39.8%	82.2%	22.0%	28.6%	21.9%
Paper Recyclable	0.0%	1.4%	0.0%	0.0%	0.0%
Paper - non-recyclable	0.0%	0.3%	0.0%	0.0%	0.0%
Cardboard	13.4%	2.3%	7.6%	14.3%	10.4%
Food / Kitchen	1.0%	0.0%	1.4%	0.0%	3.1%
Vegetation / garden	0.0%	3.0%	21.3%	28.6%	0.0%
Stumps, Logs (10 cm)	0.0%	0.0%	1.4%	5.7%	0.0%
Wood - varnished/painted	0.0%	0.0%	4.1%	0.0%	2.1%
Wood - chipboard, MDF	0.0%	0.7%	2.8%	8.6%	7.3%
Wood - board/pole, untreated	0.0%	0.0%	3.4%	0.0%	8.3%
Wood - board/pole, treated	0.0%	0.0%	0.0%	0.0%	0.0%
Furniture	13.7%	0.0%	4.8%	2.9%	8.3%
Carpet & underlay	2.5%	0.0%	3.4%	0.0%	6.3%
Textiles - clothing/cloth	2.5%	1.1%	16.5%	0.0%	3.1%
Textiles composites (shoes, bags)	0.0%	0.0%	0.0%	0.0%	0.0%
Mattresses spring	0.0%	0.0%	0.0%	0.0%	5.2%
Rubber/Foam	1.5%	0.1%	2.1%	0.0%	0.0%
Glass - containers recyclable	1.2%	1.5%	0.0%	0.0%	0.0%
Glass - plate	0.0%	0.1%	0.0%	0.0%	3.1%
Plastic - containers recyclable	1.4%	2.0%	0.0%	0.0%	0.0%
Plastic bags and film	1.2%	1.8%	1.4%	0.0%	0.0%
Plastic - Polystyrene foam	1.0%	0.0%	2.1%	0.0%	1.0%
Plastic - other	16.2%	1.9%	0.7%	2.9%	5.2%
Metals recyclable containers	1.4%	1.4%	0.0%	0.0%	0.0%
Metals - ferrous steel	0.0%	0.1%	0.0%	0.0%	5.2%
Metals - non-ferrous	1.1%	0.1%	0.0%	0.0%	0.0%
Concrete / cement	0.0%	0.0%	0.0%	0.0%	0.0%
Bricks	0.0%	0.0%	0.0%	0.0%	0.0%
Tiles	0.0%	0.0%	0.0%	0.0%	0.0%
Plasterboard	1.5%	0.0%	4.1%	5.7%	5.2%
Rock/dirt/soil	0.0%	0.0%	0.0%	0.0%	0.0%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%
Computers / office equipment	0.0%	0.0%	0.0%	0.0%	0.0%
Toner cartridges	0.0%	0.0%	0.0%	0.0%	0.0%
Electrical large eg whitegoods	0.0%	0.0%	0.0%	0.0%	0.0%
Electrical medium eg televisions	0.2%	0.0%	0.1%	0.0%	0.0%
Electrical small	0.2%	0.0%	0.0%	0.0%	0.0%
Insulation	0.0%	0.0%	0.7%	2.9%	2.1%
Paint	0.0%	0.0%	0.0%	0.0%	0.0%
Oil	0.0%	0.0%	0.0%	0.0%	0.0%
Hazardous / special	0.0%	0.0%	0.0%	0.0%	0.0%
Bric-a-brac	0.0%	0.0%	0.0%	0.0%	0.0%
Other items	0.0%	0.0%	0.0%	0.0%	2.1%
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100%</b>	<b>100.0%</b>

Municipal Waste	Castra	Preston
Tip face	Ulverstone	Ulverstone
Mattresses spring	100.0%	100.0%
<b>Total</b>	<b>100%</b>	<b>100%</b>



**APPENDIX E PHOTOS***Photos of tip faces*

Launceston – transfer station



Launceston – walking floor



Launceston – greenwaste recovery area



Launceston – oversize material drop off



Dulverton - landfill



Port Latta - landfill



Ulverstone – landfill



Westbury – landfill face



Burnie – Small vehicle drop off with greenwaste recovery in background



Deloraine - landfill



Deloraine – recycling drop off area



Deloraine – onsite glass crusher and baler





## Photos of signage

Launceston – signage



Launceston Waste Centre  
**DISPOSAL FEES**  
1 July 2010

DESCRIPTION	FEE (GST & Levy Included)
<b>*Cars &amp; Trailers</b>	
Car / Wagon	\$5.50
Ute / Van / Single Axle Trailer (covered load)	\$18.50
Ute / Van / Single Axle Trailer (uncovered load)	\$14.50
Tandem Axle Trailer (covered load)	\$17.50
Tandem Axle Trailer (uncovered load)	\$23.00
Motor Vehicle Bodies (2.5 ton maximum charge)	each \$24.00
<b>*Domestic &amp; Trade Waste</b>	
General Waste (max 200kg or 2m <sup>3</sup> or 10m <sup>3</sup> max charge - \$2.00)	per tonne \$61.50
Skip Bin / Bulk Bin (2.5 ton max charge - \$2.00)	per tonne \$61.50
Concrete Rubble (2.5 ton max charge - \$2.00)	per tonne \$61.50
Shredded Tyres (2.5 ton max charge - \$2.00)	per tonne \$61.50
FRI Suitable for LCC Use - Cover Material	per tonne NO CHARGE
<b>*Controlled Waste / Burials</b>	
Medical (2.5 ton max charge - \$2.00)	per tonne \$110.00
Asbestos (2.5 ton max charge - \$2.00)	per tonne \$110.00
General Controlled Waste (2.5 ton max charge - \$2.00)	per tonne \$110.00
Quarantine (2.5 ton max charge - \$2.00)	per tonne \$110.00
Disposal By Burial (2.5 ton max charge - \$2.00)	per tonne \$110.00
Low Level Contamination (Level 2)	per tonne \$110.00
Special Excavation (2.5 ton max - 4 hours charged)	per hour \$200.00
Special Treatments	COST + 50% + GST
<b>Types:</b>	
Car / Motorcycle Tyres	each \$4.50
Light Truck / and Tyres	each \$5.50
Truck Tyres	each \$22.00
Large Tyres	each \$38.00
Public Weighbridge	per entry \$15.00
Dallas Tag	
Initial Tag Provided	1 only per customer \$0
Additional / Replacement Tag	each \$40.00
<b>Miscellaneous</b>	
Waste Supply Charge (must be made receipt of hours)	per hr \$1.20
Charge for delivery not weighed or reported	\$1,350.00

\*Indicated fees include Regional Waste Levy applied to residential waste at a rate of \$2.00 per tonne.

LAUNCESTON CITY COUNCIL

Burnie – clear signage



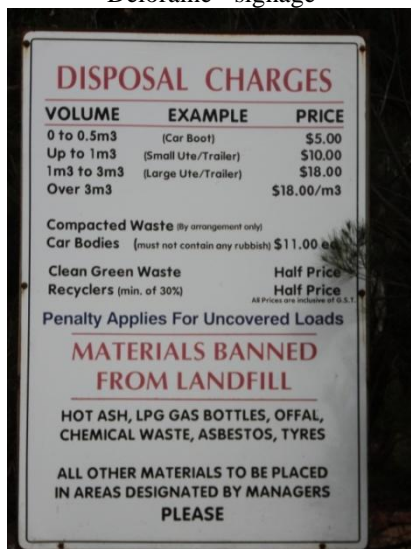
Burnie – clear signage



Westbury – entrance



Deloraine - signage



**DISPOSAL CHARGES**

VOLUME	EXAMPLE	PRICE
0 to 0.5m <sup>3</sup>	(Car Boot)	\$5.00
Up to 1m <sup>3</sup>	(Small Ute/Trailer)	\$10.00
1m <sup>3</sup> to 3m <sup>3</sup>	(Large Ute/Trailer)	\$18.00
Over 3m <sup>3</sup>		\$18.00/m <sup>3</sup>

Compacted Waste (by arrangement only)  
Car Bodies (must not contain any rubbish) \$11.00 ea

Clean Green Waste Half Price  
Recyclers (min. of 30%) Half Price

Penalty Applies For Uncovered Loads

**MATERIALS BANNED FROM LANDFILL**

HOT ASH, LPG GAS BOTTLES, OFFAL, CHEMICAL WASTE, ASBESTOS, TYRES

ALL OTHER MATERIALS TO BE PLACED IN AREAS DESIGNATED BY MANAGERS PLEASE

*Photos of tip shops*

Burnie – tip shop



Deloraine – tip shop



Ulverstone – tip shop



Ulverstone – tip shop



Westbury – re-use area





*Photos of building waste*

Launceston – greenwaste area building waste separation



Launceston – landfill building waste load



Launceston – Building waste load



Burnie – building waste stockpile



Westbury – Building waste stockpile



***Launceston – potential recycling opportunities***

Launceston – landfill potential for metal recovery



Launceston – landfill pallets



Launceston – landfill potential for cardboard recovery



Launceston – landfill potential for cardboard recovery



Launceston – load with excessive cardboard



Launceston – landfill potential for metal recovery





*Launceston – reuse opportunities*

Launceston – potential reuse shed



***Launceston – unusual loads***

Launceston – animal waste



Launceston – small vehicle drop off



Launceston – shredded tyres



Launceston – landfill tyre load

