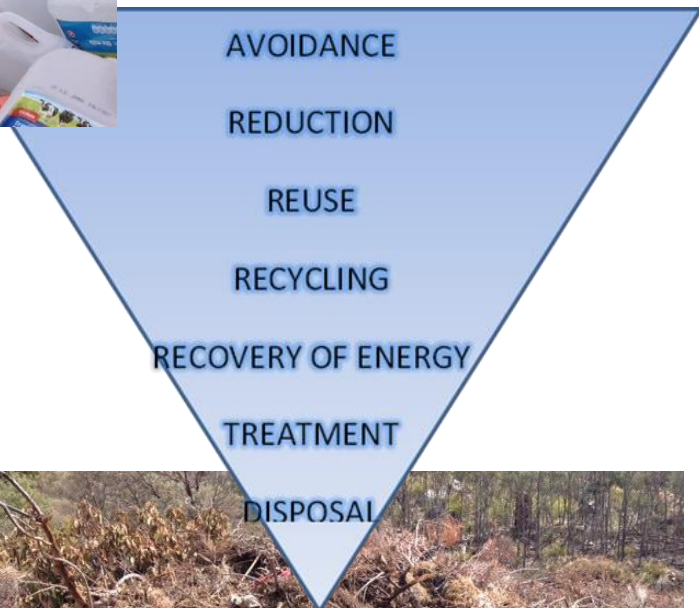


# Waste Management Strategy

## 2020 Review



**Document version:**

- First Draft – Southern Midlands Waste Management Strategy Review – 24/5/20 – Graham Green
- Second Draft - Southern Midlands Waste Management Strategy Review – 27/05/2020 – David Cundall
- Second Draft v3 – 9/6/20 - Graham Green
- Second Draft v4 – 17/6/20 - Graham Green
- Final Draft – 23/6/20 – Graham Green
- Post Council Workshop Draft – 15/9/2020 – David Cundall
- Post Council Meeting Final version – 1/10/2020 – David Cundall

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## Key Considerations

### Actions achieved since 2016

The following changes to waste management operations have been implemented since the previous draft of this Strategy:

- rationalisation of waste transfer station staffing and opening times, largely to achieve better OHS outcomes;
- move to fortnightly roadside collection throughout the municipal area;
- upgrade of all rubbish bin sizes from 140 L to 240 L;
- replacement of recycling crates with 240 L wheelie bins;
- tender for roadside collection contract run - in light of schedule changes and bin upgrade – awarded to Thorpe Waste.
- Commence tender for a new contract for the provision of waste bins and the collection and disposal of waste from the three waste transfer stations

### Changes in the broader 'waste' landscape since 2016

There has been significant change to the broader waste management landscape since the last draft of this Strategy, particularly in relation to regional governance and in global logistics for the handling and processing of recyclables. This has resulted in significant changes to local operations and fee structure. The following changes have had implications for Council's waste management budget:

- Increase in fees for waste disposal from \$70/tonne at the gate to \$90/tonne at the gate;
- a substantial fee increase for recyclables from \$32/tonne to \$139/tonne. SKM operations in Tasmania collapsed and after a period of uncertainty and was taken over by Cleanaway – cardboard, which used to attract a credit, is now \$70/tonne to recycle;
- demise of the Southern Waste Strategy Authority and replacement by Waste Strategy South (a sub-committee of the STCA) and then in early 2020 the abandonment of Waste Strategy South;
- formulation by LGAT of the Southern Tasmanian Waste Management Group - with the aim of streamlining logistics and service standard regionally, and to work towards improved waste management options. This group effectively replaced the Waste Strategy South but continues much of the strategic work to date;
- State Government Waste Strategy was released in 2019, the primary initiatives proposed being a waste levy and a container deposit scheme.

### Changes in waste disposal volumes

Waste Transfer Station volumes are up considerably (119%) since 2016, which is remarkable given the relatively stable population in the Southern Midlands. The increase coincides with increase in waste disposal costs at other southern regional sites – it is possible that Southern Midlands sites are now being targeted by people from out of area as it is viewed as a 'free' waste disposal option as fees are mostly not enforced by Council WTS staff.

Roadside collection volumes for waste are down. This coincides with an increase in recyclables collected - a likely consequence of the move from crates to wheelie bins.

### ***Change in waste volume***

<b>WASTE</b>	<b>2016</b>	<b>2020</b>	<b>% Change</b>
Roadside Collection (tonnes/annum)	840	700	-17%
Waste Transfer Stations (tonnes/annum)	760	1664	+119%
TOTAL volume sent to landfill (tonnes/annum)	1600	2364	+48%

### ***Change in volume of recyclables***

<b>RECYCLABLES</b>	<b>2016</b>	<b>2020</b>	<b>% Change</b>
Roadside Collection	160	249	55%
Waste Transfer Stations	90	108	+20%
TOTAL volume sent to Cleanaway for recycling	250	357	+42.8%

## **1.0 Introduction**

Waste management is a significant logistics operation for Southern Midlands Council – an operation that manages in the order of 2360 tonnes of waste annually plus recyclables (around 360 tonnes/year). On a per-capita basis, Southern Midlands Council manages around 444 kg/person/year of municipal waste. These excludes scrap metals and green waste which is stockpiled at each of the three waste transfer stations.

Council currently operates three waste transfer stations and a roadside collection service (waste and recyclables) for most towns and settlements in the municipality. The waste management service is operated on a cost recovery basis with a current annual budget in the vicinity of \$900,000 (Table 1). The cost of running the waste management operation is increasing steadily which is primarily due to: the increasing cost of waste disposal; increasing amount of waste; and increasing cost burden associated with managing recyclables. Combined waste and recyclables cost council in the order of \$380/tonne to manage.

Table 1: Waste management budget summary

		Actuals to 31.03.20	PROPOSED
<b>BUDGET:</b>	<b>2019/20 Est.</b>	<b>2019/20 Actual</b>	<b>2020/21 Budget</b>
<b>REVENUE:</b>			
Waste Transfer Stations - Disposal Fees / Sale of Recyclables	30,000	12,144	15,000
Waste Transfer Stations & Sale of Recyclables	0	0	0
Rates (Est Rates based on \$178 per collection point - prev \$170)	285,600	289,460	304,736
	0	0	0
Waste Management Levy (Est based on \$180 & \$60 - prev \$165 & \$55)	525,140	530,312	581,460
	0	0	0
<b>Total Revenue:</b>	<b>840,740</b>	<b>831,917</b>	<b>901,196</b>
<b>EXPENDITURE:</b>			
Household Collection Service	253,970	182,164	277,788
Operating Expenses - Oatlands WTS	222,526	163,947	263,763
Operating Expenses - Campania WTS	209,687	156,673	268,867
Operating Expenses - Dysart WTS	206,721	172,675	213,264
Other Expenditure	0	4,694	0
Waste Management Plan (incls. Regional Group etc)	0	0	4,500
Land Tax Payable	0		0
Interest Charges	0		0
Depreciation	22,000	0	27,500
Budget Reduction/Adjustment	-13,355	0	0
<b>Total Expenditure:</b>	<b>901,549</b>	<b>680,153</b>	<b>1,055,682</b>
<b>(Surplus)/Deficit:</b>	<b>60,809</b>	<b>-151,764</b>	<b>154,486</b>

## 1.1 Regional governance

Southern Midlands Council is a member of two regional bodies tasked with improving waste management and generating new initiatives:

- Waste Strategy South (formerly SWSA), a working group with a focus on regional solutions to reducing waste volumes, a sub-committee of the Southern Tasmanian Council's Authority. This was superseded by the Southern Tasmanian Waste Management Group formed by LGAT which will represent all councils of the southern region with the exception of Central Highlands Council.
- Southern Tasmanian Waste Management Group (STWMG) – aims to streamline logistics and service standard regionally, and to work towards improved waste management options. Short term aims are: streamlining contracts; improved collaboration and coordination; better management of green waste & FOGO; and a waste education plan for the region. The STWMG is convened by the Local Government Association of Tasmania – a Project Officer will develop a work plan and assist with progressing projects.
- State Waste Strategy – a proposed container deposit scheme and waste levy will determine to some extent the key focus areas of the Southern Tasmanian Waste Management Group.

## 1.2 Strategic Waste Management Objectives

Council's objectives in relation to waste management are listed in the Strategic Plan 2018-2027:

- 1.10.1 Maintenance and improvement of the provision of waste management services to the Community.
  - 1.10.1.1 Continue to be an active participant in the Waste Strategy South and continue to educate people on reducing waste.
  - 1.10.1.2 Continue to review the on-going operational arrangements for waste management including cooperation with other local government authorities.
  - 1.10.1.3 In conjunction with the Waste Advisory Council seek to identify suitable markets for recyclable products.
  - 1.10.1.4 Undertake a review of the whole waste management service delivery system.

## 1.3 Objectives of this Strategy

The objectives of this strategy are aligned with Council's strategic direction for waste management and are as follows:

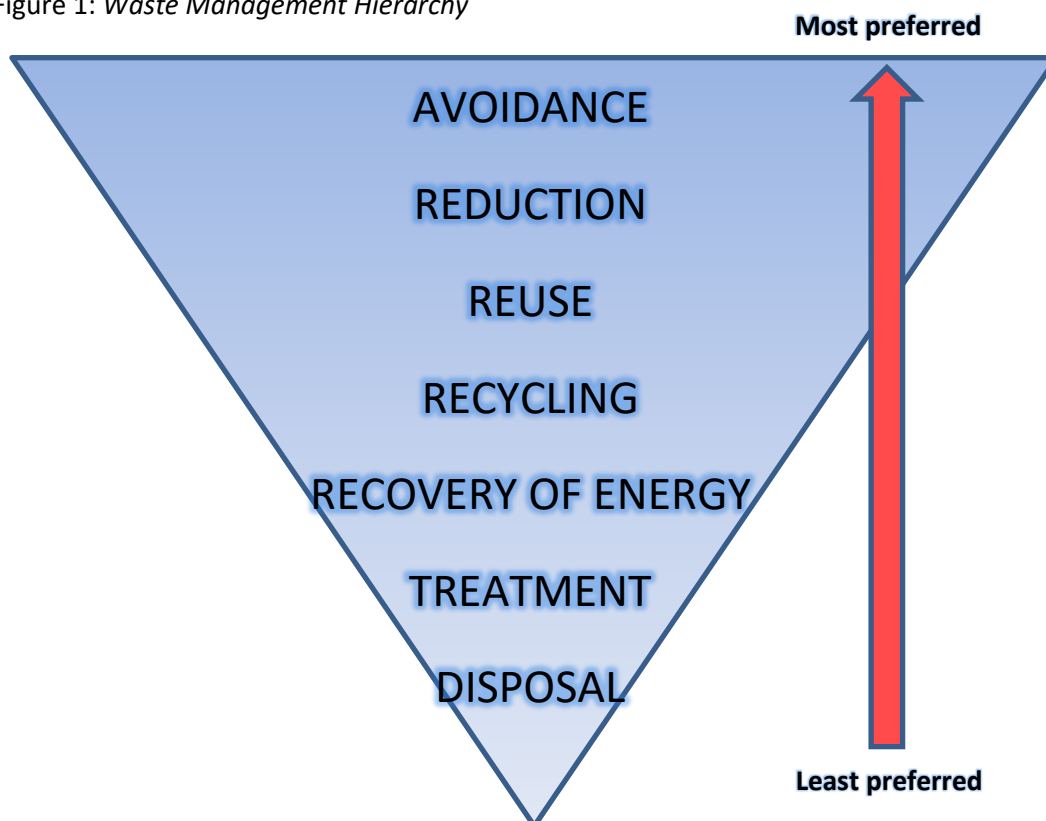
- Provide a current snapshot of Council's waste management operations (including costs and volumes);

- Review current waste management costs and service delivery system;
- Identify opportunities for efficiencies whilst maintaining service level to the community;
- Identify ways to make the waste management system more efficient, including exploration of resource and operational sharing opportunities with neighbouring councils;
- Identify options for management of organics and green waste to create a useful product and reduce emissions; and
- Identify options for greater recovery and re-use of resources from Council’s waste stream, thereby reducing the volume of waste going to landfill.
- Encourage alternative waste management practices such as “waste to energy” plants or other innovative industries that process re-usable materials or recyclables in the Southern Midlands Local Government Area.

## 1.4 Outcomes of this Strategy

The outcome of this strategy is for council to achieve progress according to the underlying principle of waste management in Australia, the ‘waste management hierarchy’ (Figure 1), which is to: maximise the useful life of materials; reduce, reuse and recycle waste; recover as much energy out of what is left, and dispose of the remainder sensibly.

Figure 1: Waste Management Hierarchy





### 1.4.1 Measures of success

Successful implementation of this strategy will be judged by:

- 1 The volume of materials diverted or avoided from landfill through the above principles. This may be measured by:
  - monitoring the weight of waste taken to landfill;
  - the weight of materials recycled;
  - estimated recovery of materials (e.g. timber, bricks, roofing iron, household goods etc) through new initiatives; and
  - estimated volume of organic / green waste processed.
  
- 2 Rationalisation of waste management activities and costs through regional or sub-regional partnerships.

## 2.0 Waste

### 2.1 Roadside Collection Service

Southern Midlands Council's roadside collection service currently consists of fortnightly collection of both waste and recyclables for 1700 households throughout the municipal area. The roadside collection service is operated by a contractor (Thorp Waste). Collected waste is delivered to Southern Waste Solutions' Lutana waste transfer site where waste is compacted and then transported to the Copping Landfill Facility (also managed by Southern Waste Solutions).

### 2.2 Waste Transfer Stations

Southern Midlands Council operates three waste transfer stations (Figure 2):

- Oatlands (Tunnack Road);
- Campania (Brown Mountain Road); and
- Dysart (Huntingdon Tier Road).

Rate payers pay an annual 'waste management levy' enabling residents to utilise the waste transfer stations for waste disposal, recycling, green waste, and some hazardous material disposal. Non-residents of Southern Midlands Council may also utilise the facilities, however disposal fees apply for them.

Recyclable materials (plastics, glass, cardboard and metals) are separated out as best as possible at the waste transfer stations and transported to appropriate facilities for subsequent processing. Most recyclables are taken to Cleanaway at Derwent Park where there is a current fee of approximately \$139/tonne, except for cardboard which is processed for \$70/tonne.

Metals collected from the Dysart and Campania sites are collected by Thorp Recycling and currently taken to Real Metal Recyclers at Bridgewater. Sims Metal collect scrap metal from the Oatlands waste transfer station. The price paid for scrap metal fluctuates and is currently around \$30/tonne. In 2019 receipts for scrap metal were \$15,814 combined from Sims Metal, One Stop and Real Metal (In 2018 total receipts were \$24,614 - \$14,290 from Sims and \$10,324 from One Stop Metal).

Waste collected at the waste transfer stations is currently taken to Southern Waste Solutions' Lutana waste transfer site where the disposal fee is currently \$90 per tonne (GST inclusive). The fee is inclusive of transport to the Copping Landfill Facility.

Also collected at the waste transfer stations are hazardous materials such as chemicals (Drum Muster Program), waste oils, and tyres. There is a fee to residents for disposing of tyres which covers the cost of transport and shredding.

Figure 2: Waste transfer station locations



### 2.2.1 Oatlands Waste Transfer Station

A summary of monthly operational costs at the Oatlands waste transfer station is given in Table 2.

Table 2: Oatlands WTS, monthly operating costs as at May 2020

Detail	Monthly Cost*
9 x 6.5m <sup>3</sup> front lift bins – rental, compaction and disposal	\$6,936
1 x 30m <sup>3</sup> hook bin – hire, tip and return \$322.65 (average 4 collections per month)	\$1,290
30m <sup>3</sup> (large) bins – disposal fee \$102 per tonne	\$1,067
Waste transfer station 2019 Management Costs:	\$9,082
<ul style="list-style-type: none"> <li>• Council - Wages &amp; On-Costs \$6,101.30</li> <li>• Caretaker - Wages &amp; On-Costs \$85,700.20</li> <li>• Plant - Internal \$14,571.45</li> <li>• Materials \$7.86</li> <li>• Portaloo Hire \$345.82</li> <li>• Other \$878.98</li> <li>• Depreciation \$353.28</li> <li>• Land Tax \$1,034.67</li> </ul>	

Barwicks Tyre collection and disposal	\$547
Collection and transport of Recycling (steel, cardboard and comingled recycling) – price does not include disposal costs	\$940
Cardboard, comingled recycling (glass, plastics, aluminium etc) disposal costs at Derwent Park Facility	\$161
Veolia Drum Muster	\$200
<b>Total</b>	<b>\$20,223</b>

\*This is the average monthly cost based upon the 2019 data excluding GST.

Figure 3: Oatlands waste transfer station bins



### Construction waste

Construction waste at the Oatlands waste transfer station can become a management problem in terms of the large volume of material that accumulates at times (Figure 5). As there is reusable material in the stockpile, a solution is required to improve recovery prior to disposal. It is an action proposed in this Strategy to develop a ‘materials reuse centre’ at the Oatlands site to provide a mechanism for salvage and reuse of as much material as possible.



Figure 4: Oatlands waste transfer station construction waste



### Operating Times

Current operating times at the Oatlands waste transfer station are:

- Tuesday 8.00 am - 12.00
- Friday 11.00 am - 3.00 pm
- Saturday 8.00 am - 12.00
- Sunday 1.00 pm - 5.00 pm

### 2.2.2 Campania Waste Transfer Station

A summary of monthly operational costs at the Campania waste transfer station is given in Table 3.

Table 3: Campania WTS, monthly operating costs as at May 2020

Detail	Monthly Cost*
8 x 6m <sup>3</sup> front lift bins – rental, compaction and disposal	\$7,166
1 x 20m <sup>3</sup> hook bin – hire, tip and return \$247.20 (average 6 collections per month)	\$1,483
20m <sup>3</sup> (large) bins – disposal fee \$85 per tonne	\$1,484
Waste transfer station 2019 Management Costs:	\$9,982
• Council - Wages & On-Costs \$3,870.92	
• Caretaker - Wages & On-Costs \$93,233.81	
• Plant \$16,631.87	
• Materials \$192.14	
• Portaloo Hire \$669.64	
• Sundry Allowance \$-	
• Other \$5,187.47	
• Depreciation \$-	
• Land Tax \$-	

Barwicks Tyre collection and disposal	\$151
Collection and transport of Recycling (steel, cardboard and comingled recycling) – price does not include disposal costs	\$806
Cardboard, comingled recycling (glass, plastics, aluminium etc) disposal costs at Derwent Park Facility	\$161
Veolia Drum Muster	\$200
<b>Total</b>	<b>\$21,433</b>

\*This is the average monthly cost based upon the 2019 data excluding GST.

The Campania waste transfer station is the most vulnerable of Council’s sites in terms of its viability. Council has no tenure over the site i.e. freehold or lease arrangement. The site also receives significant usage from out-of-area-users due to its proximity to the municipal boundary. The nearest alternative waste transfer station is at Mornington (Clarence City Council) where users are obliged to pay a minimum gate fee of \$10 and a disposal fee of \$97/tonne. This provides an incentive for people to travel to Campania to dispose of their waste where they are able to exploit council and potentially do so for free. It is difficult for staff to enforce the fees that out-of-area-users are obliged to pay, particularly during busy times. This situation is not financially sustainable and will be rectified as a short term action of this Strategy.

Figure 5: Campania waste transfer station small bins



### Campania Waste Transfer Station

Current operating times

- Tuesday 1.00pm - 5.00pm
- Thursday 1.00pm - 5.00pm
- Saturday 1.00pm - 5.00pm
- Sunday 8.00am – 12.00

### 2.2.3 Dysart Waste Transfer Station

A summary of monthly operational costs at the Dysart waste transfer station is given in Table 4.

Table 4: Dysart WTS, monthly operating costs as at May 2020

Detail	Monthly Cost*
8 x 6m <sup>3</sup> front lift bins – rental, compaction and disposal	\$5,715
2 x 20m <sup>3</sup> hook bin – hire, tip and return \$247.20 (average 9 collections total per month)	\$2,224
20m <sup>3</sup> (large) bins – disposal fee \$90 per tonne	\$2,382
Waste transfer station 2019 Management Costs:	\$5,593
<ul style="list-style-type: none"> <li>• Council - Wages &amp; On-Costs \$7,950.75</li> <li>• Caretaker - Wages &amp; On-Costs \$44,514.08</li> <li>• Plant \$7,071.55</li> <li>• Materials \$2,467.64</li> <li>• Portaloo Hire \$1,098.00</li> <li>• Other \$2,200.86</li> <li>• Depreciation \$302.40</li> <li>• Land Tax \$1,517.52</li> </ul>	
Barwicks Tyre collection and disposal	\$109
Collection and transport of Recycling (steel, cardboard and comingled recycling) – price does not include disposal costs	\$537
Cardboard, comingled recycling (glass, plastics, aluminium etc) disposal costs at Derwent Park Facility	\$161
Veolia Drum Muster	\$200
<b>Total</b>	<b>\$16,921</b>

\*This is the average monthly cost based upon the 2019 data excluding GST.

Figure 9: Dysart waste transfer station



### **Dysart Waste Transfer Station**

Current operating times

- Tuesday 1.00pm - 5.00pm
- Saturday 1.00pm - 5.00pm
- Sunday 1.00pm - 5.00pm

## **2.3 Waste disposal costs and volumes**

Council's waste is currently taken to either the Southern Waste Solutions waste transfer station in Derwent Park or direct to their Copping Landfill Facility. The disposal fee is currently \$90 per tonne (GST inclusive). The cost of disposal has been subsidised to varying degrees in the past but this ended in 2018. The cost of disposal at Southern Waste Solutions has risen each year.

- Total municipal waste generated is approximately **2360 tonnes/year**;
- Roadside waste volume collected averages approximately **700 tonnes/year**;
- Waste transfer station amounts (managed by Veolia) is **1660 tonnes/year**;  
(based on data for 2019)



## 2.4 Waste Stream Issues & Options

Table 5: Southern Midlands Council waste stream issues and options

Issue	Option(s)	Pros	Cons	Timeframe/Outcome	
<b>1 Rising cost of waste management</b> – both contractor fees and waste disposal charges	<b>1-1a Investigate an alternative disposal site</b> This issue is most effectively progressed through involvement with the regional waste management forums as regional solutions are required to improve efficiency and environmental outcomes of waste management.	Possible reduction in costs.	Does not address the issue of waste volumes – should be a priority for council to reduce the volumes of waste going to landfill.	Short term	
	<b>1-1b Go to tender on waster transfer station collection and disposal services</b> The timing is right to test the market for a better deal as Council has used Veolia for some time and there are other players in the market.	Potential to achieve a cost saving on waste collection and disposal services from our waste transfer stations.		<b>RECYCLABLES</b>	<b>2016</b>
	<b>1-2a WTS bin volume management</b> As bin handling fees at the waste transfer stations are high, it is pertinent to develop an on-site procedure to ensure that bins are as full as possible before disposal to maximise the value of the handling fees.	More efficient use of resources – small reduction in costs.	Not always easy to schedule the optimal time of bin cartage with the contractors.	Roadside Collection	160
	<b>1-3 Investigate weekly to fortnightly collection for all residents</b> Formerly, eight of council's thirteen towns/settlements were serviced weekly, the balance fortnightly. Investigate/discuss changing the frequency of waste collection to fortnightly for all towns whilst expanding the service to capture all residents.	Potentially lower contractor costs for roadside waste collection.	Reduction in service level for ratepayers that were on a weekly service. The cost of issuing larger bins..	Waste Transfer Stations	90
	<b>1-4 Have WTS operating staff identify out-of-area-users and to enforce fees for waste disposal.</b>	Increase in revenue; reduction in waste volumes, reduction in disposal fees.	Cost of setting up electronic payment system	TOTAL volume sent to Cleanaway for recycling	250

Issue	Option(s)	Pros	Cons	Timeframe/Outcome
	<p><b>1-5 Rationalise the number of waste transfer stations</b> Investigate/discuss reducing the number of waste transfer stations or relocating to a more centralised site in the south of the municipality. The most obvious site to close is Brown Mt (Campania) as council has no tenure over the site and is the site most afflicted by out-of-area-users.</p> <p><i>It may be possible to negotiate a resource sharing arrangement with a neighbouring council whereby sub-regional facilities could be investigated. Brighton Council has expressed interest in sharing a waste transfer station at the Brighton Industrial Estate.</i></p>	<p>Reduction in costs, particularly if resource sharing with Brighton.</p> <p>More convenient for some residents if a new site is established near the Midland Hwy in the south.</p>	<p>Reduced convenience for some residents if the Campania and/or Dysart sites were to close.</p> <p>Potential increase in roadside dumping of rubbish.</p>	<p>Medium-term (next 5 years)</p>
<p><b>1 a Lack of resource sharing – high unit cost</b> Council currently operates its own waste management operation and therefore isn't capitalising on potential benefits of resource sharing, joint tenders or group pricing. The unit cost per tonne is not optimised by operating in isolation.</p>	<p><b>1-6 Investigate (and implement) resource sharing</b> Initiate a cooperative approach to waste management with other councils – e.g. joint tenders for recyclables – group pricing – shared waste transfer stations. Potential options and new contracts could be explored through direct discussions with neighbouring councils or through the regional waste management group.</p>	<p>Rationalisation of operation by determining new ways of working together - joint contracts, sharing of services and infrastructure. Likely to result in lower operational costs.</p>	<p>Possibly difficult to implement due to the dispersed nature of southern rural councils and the logistics changes that may be required.</p>	<p>Medium-term (next 5 years)</p>
<p><b>2 Inefficient waste transfer station operations</b> Councils waste transfer stations need to be managed more effectively to streamline processes, to cope with peak waste delivery times, allow for increased segregation of reusable materials and to improve OH&amp;S for workers at the sites.</p>	<p><b>2-1 Rationalise the WTS operating times</b> Investigate changing the operating hours schedule so that at least 2 operators are present at each WTS to enable more efficient sorting and segregation of materials and management of customers. For example, operators could spend a morning at one site and then move to another site for the afternoon. This also opens up the potential to shift materials (e.g. green waste) from one site to another for collection or processing – refer to 2-2.</p>	<p>Greater efficiencies in the management of the WTS, enhanced resource recovery, lower waste disposal costs for council.</p> <p>Safer workplaces due to more staff on the ground at any given time – covers off on the OH&amp;S issue (Issue 4)</p>	<p>Likely increased cost in running the WTSs.</p>	<p>PARTLY ACHIVED IN 2019, IN TERMS OF 2 OPERATORS AND OPENING TIMES ADJUSTED</p>
	<p><b>2-2 Make it mandatory for WTS operating staff to enforce fees for disposal to bring fees and charges in line with other waste disposal sites in the region</b></p>	<p>Increased revenue for Council, reduced volumes of waste to handle.</p>		<p>Immediate</p>

Issue	Option(s)	Pros	Cons	Timeframe/Outcome
	<p><b>2-3 Rationalise WTS logistics</b> Further to 2-1, investigate streamlined logistics, for example, with the view to concentrating all green waste at one WTS so that potential processing options are more viable.</p>	<p>Greater efficiencies in the management of the WTS, enhanced resource recovery &amp; processing options.</p>	<p>Potential increased running costs of the waste transfer stations.</p>	<p>Medium-term (next 5 years)</p>
<p><b>3 Waste volumes</b> There is a direct relationship between the amount of waste that council manages and the cost of handling logistics and disposal. There has been an increasing trend in the volume of waste managed by council and no internal strategy, beyond recycling, to reduce waste amounts.</p>	<p><b>3-1 Reduce waste amounts by increasing recovery effort</b> Ensure there is on-site rigour with segregation of green waste from comingled, recyclables from waste, and any re-useable materials for potential re-sale (related to Issue 2). Ensure that WTS's are set up fit-for-purpose to enable efficient segregation and storage of recovered items/materials.  Case Study – Huon Valley Southbridge site (Section 2.5)</p>	<p>Reduction in the waste stream - reduced disposal fees for council.  More organised, streamlined operation at the WTSs.  New opportunities with recovered materials - improved environmental outcomes.</p>	<p>The cost associated with planning &amp; implementation of new initiatives.</p>	<p>Immediate</p>
	<p><b>3-2 Review the fee structure for out-of area users and have WTS operators rigorously enforce fees.</b></p>	<p>Increased revenue for council, reduction in out of area users, reduction in waste volumes</p>		<p>Immediate</p>
	<p><b>3-3 Implement new waste reduction initiatives</b> Investigate the potential of setting up new initiatives to divert waste from landfill, for example:  <ul style="list-style-type: none"> <li>• A pilot 'tip shop' style operation at the Oatlands WTS</li> </ul> Resale centres in southern Tasmania have proven to be very successful and are established profitable operations (Refer to Case Studies).</p>	<p>Reduction in the amount of waste to landfill &amp; hence lower disposal costs.  'Tip shops' are a recognised business model in southern Tasmania.  New employment opportunities.</p>	<p>The cost associated with the planning, implementation and promotion of new initiatives.</p>	<p>Immediate</p>

Issue	Option(s)	Pros	Cons	Timeframe/Outcome
	<p><b>3-4 Reduce waste amounts through community education</b> Highlight the importance of reusing materials where possible; sorting recyclables and placing them out for collection; and segregating organic waste for processing at the WTSs.</p> <p>Inform and involve residents in new initiatives such as a small resource recovery tip-shop style operation. This would enable anything that has value to be sold on and reused.</p> <p>Highlight achievements in reduction and recovery of waste to raise awareness of waste issues and opportunities (in newsletters and/or on Council's web site)</p> <p>A community education program is an objective of the regional waste management group – a coordinated approach with this action is the most logical way to progress.</p>	<p>Well informed residents are likely to change behaviour leading to smarter resource use, change in consumption patterns, reduction in waste volume and involvement in new initiatives e.g. organic waste processing and tip shop style operations.</p> <p>Well informed residents are more likely to understand reasons for increases in waste rates i.e. as the need for more recovery and re-use in waste management increases, costs rise.</p>	<p>Cost of developing and running the education program – unless undertaken as 'regional' action</p>	<p>Medium-term (next 5 years)</p>
<p><b>4 OH&amp;S</b></p> <p>More than one operator present at any given time, safety equipment, safety briefings, firefighting equipment.</p>	<p><b>4-1a Review OH&amp;S procedures at the WTSs</b></p> <p>Ensure there is a protocol in place for employees to manage an emergency situation such as personal injury or a threatening situation – e.g. a press button alert system.</p>	<p>A safer workplace for employees operating alone in a field based location.</p>		<p>PARTLY ACHIEVED IN 2019, IN TERMS OF 2 OPERATORS, FIRST AID, WATER AND FIRE FIGHTING</p>
	<p><b>4-1b Handling hazardous materials</b></p> <p>Ensure staff and contractors have the means to avoid handling waste that may contain hazardous materials and also understand appropriate protocols e.g. for dealing with syringes.</p>	<p>Reduced risk of injury to employees and contractors</p>		<p>OHS PROCEDURES UPDATED IN 2019</p>

## 2.5 Case Studies – waste stream reduction

### 2.5.1 ‘Recovery Centre’ tip shop’ recycling centre, Southbridge, Huonville

Huonville’s Southbridge waste transfer station (Figures 12-14) was overhauled and remodelled in 2011, particularly to incorporate into the site a resource recovery ‘tip shop’ style operation. The combined purpose built shed and toll booth, together with site development cost in the order of \$200 000.

The waste transfer station is operated by two staff: one at the resource shop/toll booth and the other overseeing the waste operations. There is also a roster of volunteers that assists at the site.

The resource recovery centre has been very successful. Turnover at the shop is increasing and the price customers are willing to pay at the shop is increasing. The success of the operation has lead council to consider opening another resource recovery tip shop in Cygnet.

Figure 12: Layout of Huon Valley Council’s Southbridge waste transfer station

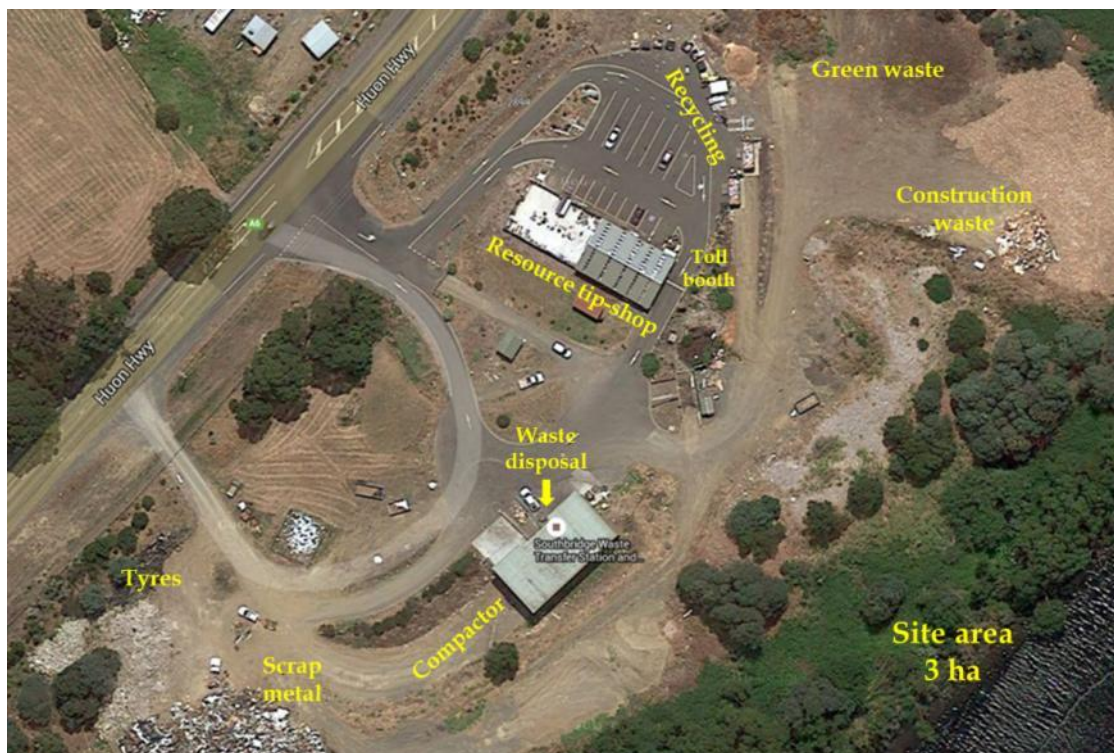




Figure 13: Huon Valley Council's Southbridge resource tip shop



Figure 14: Huon Valley Council's Southbridge resource tip shop



### ***Transferability to the Southern Midlands***

There are a number of questions that arise in consideration of a resource tip shop operation at, for example, the Oatlands waste transfer station:

- Population - the population of Huon Valley municipal area is 16 000 versus 6,000 in the Southern Midlands, hence does the Southern Midlands have the critical mass to support such an operation in terms of customer numbers? Also, does council have the resources to set up a similar operation?

- Socio-economic factors – are any socio-economic factors at play that may affect the quality of goods received at a midlands site, and the price people are willing to pay for goods?
- Location – The Huon Valley site is very well located on the Huon Highway just south of Huonville and is easily visible from the road. Current waste transfer station sites in the Southern Midlands are located at sites with far less passing traffic, a factor that will affect business viability.

These questions emphasise the fact that development of a business case and risk analysis would be required to analyse the viability of a resource tip shop style operation in the midlands.

### 2.5.2 ‘Recovery Centre’ tip shop recycling centre, Jackson Street, Glenorchy

Recovery Tas, is a family owned company that operates the Recovery Centre & Shop in Glenorchy which has been in operation for nearly 30 years. The business procures items for resale by the following means: salvaging from landfill; receiving ‘drop offs’ from residents; and undertaking ‘pick-ups’ from the community. The Recovery Centre was the first tip shop in Tasmania and is a thriving business which is highlighted by the following statistics:

#### Statistics for the 2014 calendar year:

- over **138,000** customers visited the centre;
- **8,000 drop-offs** from residential and commercial sources were received and processed by recovery crews deferring an estimated **527 tonnes** of products from landfill;
- salvage operations retrieved based on conservative figures in excess **400 tonnes** from the landfill;
- conservatively estimates that over **550,000 products and parts** were put back in circulation;
- estimated annual total savings of **\$165,000** to Glenorchy City Council from reduction in landfill volume.
- estimated that the activities of Recovery Tas and the Glenorchy City community extended the life of Jackson Street landfill by **four percent**.

#### Statistics for the 3 month period August to October 2015:

- **36,000** customers visited the centre;
- **74,000** products and parts being reused through the work of the centre;
- **700** cubic metres of materials were saved from disposal at the landfill.

#### Economic Benefits 2014

- sixteen permanent jobs were funded from business activities;
- revenue was increased and directly reinvested back into the Centre and the local economy;
- better than ever savings to the rate payer were delivered through reduction in landfill volumes and extension to landfill life;
- new expanded sale spaces were opened to increase business revenue;
- other small businesses continued to rely upon the Recovery Shop for their supply; and
- the Glenorchy community continued to have access to affordable goods that improves people’s quality of life.

### Environmental Benefits 2014

- a second generation of Glenorchy residents were provided with reliable, safe access to opportunities to participate in waste minimisation and materials re-use;
- four new sale spaces were created to maximise product recovery from the waste stream;
- awareness of alternatives to disposal continues to rise and another 550,000 plus products and parts were put back into circulation; and
- available landfill space was increased thereby extending the potential lifespan of the site.

### Social Benefits 2014

- the Recovery Centre provides a 'feel-good factor' with members of the community feeling satisfaction when dropping off items of potential re-use rather than throwing them away.
- the centre's birthday celebration was held in recognition of outstanding community results in public participation in waste minimisation; and
- the unique sustainability education trail was enhanced to be an informative and enjoyable education initiative.

The Recovery Centre offers a broad range of second hand goods for sale inclusive of: building materials (e.g. tiles bricks, timber, metal, mesh, plumbing, roofing, doors, windows, perspex, glass), electrical goods and spare parts, outdoor furniture, gates, pallets, containers (plastic, wooden or metal), toys, bric-a-brac, washing machines (working or for parts), tumble dryers, refrigerators, exhaust fans, vacuum cleaners, lighting, microwaves, TVs, DVD and CD players, gaming consoles, switches and knobs, motors, cords and cables, power packs and chargers, beds, mattresses, paint, pet cages and carriers, hardware, pots, pans, cutlery, automotive, curtains, books for all ages, stationary, hand bags, backpacks and suitcases, baskets, collectables, pictures and frames, glass wear, eye wear, jewellery, bikes, sportswear and equipment, exercise bikes, bikes, garden tools and pots, jars, shop fittings, mirrors, lawn mowers, BBQs, aquariums and terrariums, heaters, kitchen electrics, computers and attachments, hard drives, fencing, wire and more.

### **2.5.3 Garage sale trail**

Garage Sale Trail is a not-for-profit social enterprise whereby thousands of garage sales are held across the country on one day. It is a national program that promotes reuse, waste education and community building. It is delivered locally by around 160 councils and state governments in partnership with Garage Sale Trail.

Taking part in the Garage Sale Trail means that residents contribute to reduction in the amount of reusable materials put out for council collection or disposed of at council waste transfer stations. This in turn reduces the amount of waste the community is sending to landfill.



## 3.0 Recyclables

### 3.1 Current Situation

Council manages recyclables as part of its roadside collection service and at each of its three waste transfer stations (Table 6). Roadside collection includes: glass, plastics, tins and aluminium cans - collected by Thorpe's contracting at the same time as the rubbish collection service. Additional recyclables collected at the waste transfer stations include cardboard and scrap metal.

Recyclables, with the exception of scrap metal, are taken to Cleanaway (formally SKM) at Derwent Park where they incur a gate fee of currently \$139/tonne, with the exception of cardboard for which incurs a gate fee of \$70/tonne.

The volume of recyclables managed by council and its contractors is variable - in the vicinity of 30 tonnes per month. At a current annual amount of 357 tonnes, recyclables are approximately 15% by weight compared to the waste stream generated by Council (2364 tonnes). This amount compares to the southern Tasmanian regional recycling rate of 22%, suggesting that there is potential for greater resource recovery from the waste stream by improving participation in recycling.

Although the recyclables industry is problematic in terms of: lack of local processing; questionable end usage for some products; logistics difficulties with sorting co-mingled products; issues related to contamination and broken glass - the value of community participation and waste stream reduction cannot be understated.

*Table 6: Contractor's recycling fees for Council's waste transfer stations*

<b>Detail</b>	<b>Monthly Cost*</b>
Oatlands WTS Recycling fee	\$941
Campania WTS Recycling fee	\$806
Dysart WTS Recycling fee	\$537

## **Southern Midlands Council**

### **Recyclables Overview**

#### *Metals*

Scrap metal collected at Council's WTSs is currently taken by Sims Metal (Oatlands site) and Real Metal (Campania and Dysart). The price council receives for scrap metal varies considerably – as at June 2020 it was around \$30/tonne.

#### *Plastics and Glass*

Various plastic and glass recyclables are sorted and sent interstate by Cleanaway for recycling. A cost to Council (approx. \$139/tonne) is incurred for recycling these products.

#### *Cardboard & Paper*

Cardboard and paper is collected at the waste transfer stations and recycled at a cost of \$70/tonne.

#### *Chemicals*

Southern Midlands Council utilises the services of the 'Drum Muster' program to dispose of waste chemicals. Used drums of chemicals (required to be triple rinsed) may be dropped-off by residents at the Oatlands and Campania waste transfer stations.

#### *Oil*

Waste oils, both sump oil and cooking oil, are collected at the waste transfer stations and re-cycled.

#### *E-waste*

The National Television and Computer Recycling Scheme is regulated by the Australian Government under the *Product Stewardship Act 2011* and is a key component of Australia's National Waste Policy. The scheme provides Australian households and small businesses with access to free recycling services for televisions and computers. Recycling services are provided through collection events, which are made available across metropolitan, regional and remote areas. The scheme aims to lift television and computer recycling rates from the low rate of around 17 per cent in 2010 to 80 per cent by 2021–22. Details at [www.recyclingnearyou.com.au](http://www.recyclingnearyou.com.au)

Figure 16: Oatlands waste transfer station recycling area



Figure 17: Campania waste transfer station recycling area



Figure 18: Campania waste transfer station cardboard recycling



### 3.1.1 Scrap Metal

Council contractors manage scrap metal collected at both Campania and Dysart. The gate fee for recycling scrap metal is variable, as are the companies that are willing to receive it. Metal is currently taken to Real Metal at Bridgewater

Scrap metal stockpiles at the Oatlands waste transfer station can reach significant proportions (Figure 19). This is largely due to metal collection contractors such as Sims Metal preferring to handle large volumes. As the price of scrap metal fluctuates it is pertinent to closely monitor the price to avoid making a loss on the collection and handling of metal.

The price received by Council for scrap metal is currently around \$30/tonne (as at June 2020). In 2019 receipts for scrap metal were \$15,814 combined from Sims Metal, One Stop and Real Metal. This compares to \$24,614 in 2018 - \$14,290 from Sims and \$10,324 from One Stop Metal). The price received for metal in 2018 was closer to \$70/tonne.

*Figure 19: Oatlands waste transfer station scrap metal collection area*



Figure 20: Campania waste transfer station scrap metal collection





## 3.2 Recyclables Issues & Options

Table 7: Southern Midlands Council recyclables issues and options

Issue	Option(s)	Pros	Cons	Timeframe/Outcomes
<p><b>5 Increase resource recovery – reduce waste volume</b> Southern Midlands Council recycling program recovers approximately 15% of materials that would have gone to the waste stream. This is lower than the southern regional average of 22% - suggesting there is potential for recovery of more material from the waste stream.</p>	<p><b>5-1 Upgrade from crates to bins</b> Council to consider the potential to upgrade the recycling service in order to make an impact on reducing waste volume. This could entail upgrading bin size from the 55 L crates to large wheelie bins.  Discussions would be required with the current contractors in terms of their capacity to revamp their operation to cope with recyclables in wheelie bins.</p>	Highly likely that there will be an increase in materials recovered from the waste stream therefore resulting in reduced volume of waste and lower associated fees.	Cost of replacing crates with bins.	ACHIEVED IN 2019
	<p><b>5-2 Expand the range of plastics collected</b> Expanding the range of plastics recovered from (1 to 3) to (1 to 7) will reduce the volume of waste going to landfill. Council to explore the pros and cons of restructuring council's recycling operation.</p>	Same as for Option 5-1.	Same as for Option 5-1.	Short-term
<p><b>6 Lack of resource sharing – high unit cost</b> Council currently operates its own waste management operation and therefore isn't capitalising on potential benefits of resource sharing, joint tenders or group pricing. The unit cost per tonne in the operation is not optimised by operating in isolation.</p>	<p><b>6-1 Commence discussions regarding resource sharing with a view to rationalising the operation</b> Initiate a cooperative approach to waste management with other councils – e.g. joint tenders for recyclables – group pricing – shared waste transfer stations. Potential options and new contracts could be explored through direct discussions with neighbouring councils.</p>	Rationalisation of the service through joint contracts, sharing of services and infrastructure. Likely to result in lower operational costs.	Higher levels of coordination between participating councils would be required – although this may be viewed as a positive, it requires a time commitment.	Medium-term
<p><b>7 Scrap metal logistics</b> Scrap metal has become a management issue for council, specifically at the Oatlands waste transfer station. This is partly related to the fluctuating price in scrap metal.</p>	<p><b>7-1 Arrange for collection of scrap metal when the metal price is higher .</b></p>	An unsightly, large stockpile cleaned up.		Ongoing

Issue	Option(s)	Pros	Cons	Timeframe/Outcomes
	<p><b>7-2 Implement a revised procedure at the Oatlands waste transfer station</b></p> <p>Increased attention and focus on sorting and removal of scrap metal at the Oatlands waste transfer station is required so that volumes remain manageable and do not exceed a defined limit or volume. A re-occurrence of the current situation needs to be avoided.</p>	<p>Streamlined management of scrap metal from on-site segregation through to delivery to the scrap metal dealer.</p>		<p>Short term</p>
	<p><b>7-3 Identify and implement a short-term scrap metal storage site</b></p> <p>Discuss this option if Options 7-1 and 7-2 aren't achieved - identify options for a scrap metal storage site so that collected metal may be stored until the market or price for scrap metal improves.</p>	<p>Avoidance of incurring a disposal cost when scrap metals prices are low.</p>	<p>Scrap metal would incur a handling and transportation cost for storage.</p>	<p>Short-term</p>

## 4.0 Organic Waste

### 4.1 Current Situation

Approximately 60% of material (by weight) currently disposed of to landfill in Tasmania is organic waste<sup>1</sup>. Organic waste is a broad term that comprises: woody waste such as garden clippings, pruned material and lopped material; light garden waste such as weeds and grass clippings from lawn mowing; and kitchen waste such as fruit, vegetables, bread etc.

Southern Midlands Council endeavours to segregate as much of the coarse woody organic material as possible from the waste stream by providing organic waste drop-off points at each of its waste transfer stations (Figures 21-23). However, there is currently no means provided for residents to segregate putrescible kitchen and light organic garden waste, so if residents are not composting this material or feeding it to animals, it most likely ends up in the waste stream. Not only does this dense and often heavy material incur a disposal cost to council, it's rapid decomposition results in the release of greenhouse gases such as methane into the atmosphere.

Council currently has not employed a consistent methodology for dealing with the coarse woody organic material dropped off at its waste transfer stations. Impediments to primary processing of organic waste (e.g. shredding for mulch) include:

- Cost.
- Variability in quantity and quality. Organic waste can comprise of anything from grass clippings, food waste or woody material of varying size.
- Potential contamination with metals and other materials that have the potential to foul or damage mulching machinery.

*Figure 21: Woody green waste at Dysart waste transfer station*



<sup>1</sup> Waste Management 2020 and beyond (2011) – Blue Environment for SWSA



Figure 22: Woody green waste at Oatlands waste transfer station



Figure 23: woody green waste at Campania waste transfer station



## 4.2 Organic Waste Issues & Options

Table 8: Southern Midland Council organic waste issues and options

Issue	Option(s)	Pros	Cons	Timeframe
<p><b>8 Woody green waste stockpiles</b> Council's woody green waste stockpiles are awaiting a cost-effective and appropriate solution. Management of green waste is an issue for all smaller councils and a regional solution that serves all rural councils would be an effective way forward.</p>	<p><b>8-1 Mulching/chipping – generating a value-added, saleable products from woody green waste (Potential regional collaboration project)</b> Improve management of green waste such that practices are environmentally compliant. Currently Barwick's are able to provide a chipping service for \$10 m<sup>3</sup> cut + approximately \$2500 to transport their machinery to the site. Approx. 1000 m<sup>3</sup> can be done in a day – so once per year may be feasible.</p>	<p>Woody green waste stockpiles reduced. Relatively low capital outlay. Saleable product (mulch) created &amp; hence a new revenue stream generated. Mulch useable by council in its own operations, thereby avoiding cost of purchasing mulch. Produces a beneficial product for soil improvement &amp; moisture conservation. Good public relations outcome for council.</p>	<p>Capital outlay required for mulcher to be leased or purchased (unless a contractor is used). Potential for feedstock contamination with wire or metal means that organic waste pre-screening or cleaning may be necessary, dependent upon machinery. Mulched material produces methane, a potent greenhouse gas.</p>	<p>Immediate to Short-term</p>
	<p><b>8-2 Pelletisation for fuel (potential regional collaboration project)</b> Woody green waste is chipped/shredded, pulverised, dried and compacted into briquettes or pellets for use as fuel.</p>	<p>Useful, saleable product produced – although market analysis / business case would need to be undertaken. Reduction in future greenhouse gas emission liability.</p>	<p>Likely high capital and operating cost. Large throughput of feedstock required for economy of scale. Feedstock resource reliability needed to justify capital outlay.</p>	<p>Long-term</p>
	<p><b>8-3 Thermal treatment 1 – combustion (potential regional collaboration project)</b> Burning of mixed woody waste to produce energy in the form of heat which may be utilised directly or coupled to a turbine to generate electricity.</p>	<p>Useful products – heat and energy. Reduction in future greenhouse gas emission liability.</p>	<p>High capital and operating cost. Air emission controls necessary. Would need to be located strategically to utilise heat energy. Ash disposal issue.</p>	<p>Long-term</p>

Issue	Option(s)	Pros	Cons	Timeframe
	<p><b>8-4 Thermal treatment 2 – pyrolysis</b></p> <p><b>(regional collaboration project)</b></p> <p>For pyrolysis to occur, organic matter is heated to between 400° - 800°C in the absence of oxygen to produce: heat, gas, liquid and a solid char outputs – the relative proportions of which are dependent upon the method of pyrolysis and processing parameters.</p> <p>Pyrolysis plants can be constructed according to needs: i.e. small mobile units that can be easily transported to the feedstock; or large scale fixed facilities for processing a variety of waste streams at a regional scale.</p>	<p>Useful, saleable product produced e.g. heat, syngas, biodiesel, charcoal and biochar.</p> <p>Opportunity for collaboration in shared regional infrastructure.</p> <p>May attract grant funds and investment.</p> <p>Size flexibility e.g. ‘back of a truck’ sized infrastructure able to be transported easily to a number of sites to process smaller volumes of materials. This is potentially the most appropriate option for a small rural council and is ideally suited as a shared resource between dispersed rural councils.</p> <p>Refer to Case Study:</p> <p>Reduction in future greenhouse gas emission liability.</p>	<p>Expensive for one council to implement due to high capital costs e.g. at least ~480 K for a small mobile CharMaker unit – potentially more suited as a regional or sub-regional project.</p> <p>For larger fixed-location facilities a high throughput of feedstock is required for economies of scale.</p> <p>Feedstock resource reliability not guaranteed.</p> <p>Detailed planning and business case development required before investment may be considered.</p> <p>Specific technical expertise required for development, commissioning and operation.</p> <p>Guaranteed market for products not yet established.</p> <p>Large scale facility must be located strategically to: minimise feedstock transport; to be near powerlines; minimise environmental impact in terms of nearby residents; and ideally co-located with a business able to utilise the heat energy produced.</p>	<p>Long-term</p>

Issue	Option(s)	Pros	Cons	Timeframe
	<p><b>8-5 Thermal treatment 3 – gasification</b></p> <p><b>(regional collaboration project)</b></p> <p>In gasification waste is heated to over 900°C in the absence of oxygen to produce a fuel (gas) which can be used to generate electricity.</p>	<p>Useful, saleable product produced, e.g. fuel gas.</p> <p>Opportunity for collaboration in shared regional infrastructure.</p> <p>May attract grant funds and investment.</p> <p>Reduction in future greenhouse gas emission liability.</p>	<p>Prohibitively expensive for one council to implement due to high capital costs – more suited as a regional project.</p> <p>Large throughput of feedstock required for economy of scale – gate fees of at least \$130/tonne.</p> <p>Specific technical expertise required.</p> <p>Feedstock resource reliability not guaranteed.</p> <p>No guaranteed market for products.</p> <p>Large scale facility must be located strategically, as per a pyrolysis plant.</p>	<p>Long-term</p>
<p><b>9 Food organics (FOGO)</b></p> <p>Food organics can comprise up to 50% by weight of the domestic waste stream<sup>2</sup>, hence, diversion of this organic material to alternative processing can significantly reduce the cost of waste disposal.</p> <p>In rural Tasmania the issue of food organics in the waste stream is assumed to be lower than average due to the higher likelihood of feeding to chickens, stock, dogs, or composting for vegetable gardens.</p>	<p><b>9-1 Undertake a waste audit</b></p> <p>Engage a specialist to audit council’s waste stream to determine the relative composition of materials, particularly to ascertain whether disposing of food organics is an issue that needs to be addressed.</p> <p><b>FOGO management is a potential regional collaboration project</b></p>	<p>Clearer information about the nature of council’s waste stream.</p> <p>Provision of a basis for decision making in regard to determining future approaches and options in waste management.</p>		<p>Short-term</p>

<sup>2</sup> Waste Management 2020 and beyond (2011) – Blue Environment for SWSA

Issue	Option(s)	Pros	Cons	Timeframe
	<p><b>9-2 Community education &amp; awareness (regional collaboration project)</b></p> <p>Undertake an awareness raising program whereby residents are informed of waste management issues, particularly in relation to keeping food organics and garden waste out of the waste stream. The campaign would focus on the positive options available for composting / processing organic matter.</p>	<p>A better informed community leading to a reduction in food organics and garden waste entering the waste stream.</p> <p>Lower waste disposal costs for council.</p>		Short-term
	<p><b>9-3 Provide residents with a compost bin (potential regional collaboration project)</b></p> <p>Based upon the results of the waste audit (9-1) if food organics are a significant component of the waste stream consideration needs to be given to issuing residents with a compost bin (opt-in basis) together with an information kit or community presentations about how to compost organics effectively.</p>	<p>Reduction in, or elimination of, food waste from the waste stream.</p> <p>Lower waste disposal costs.</p>	<p>If the cost benefit analysis of issuing the bins adds up, then there are no negative aspects to this action.</p>	Short term

#### 4.2.1 Case Study - Earth Systems mobile pyrolysis unit

Australian company Earth System developed the CharMaker – Mobile Pyrolysis Plant (Figure 24) for Victoria’s North East Catchment Management Authority. The CharMaker is a transportable batch pyrolysis technology applicable to any log or stick sized woody biomass – a feature of which is that pre-processing (e.g. chipping) of the feedstock is not required. Pyrolysis is the high temperature treatment of woody waste in a low oxygen environment. Pyrolysis converts woody waste into either standard charcoal or a special form charcoal known as biochar which has a number of useful applications.

Biochar is a soil amendment product that: improves soil structure; nutrient availability; microbial activity; and moisture holding capacity. Biochar is also a stable form of carbon that enables long term storage of organic carbon in the soil profile, which is a useful proposition in the face of likely future liabilities that will be incurred regarding carbon emissions to the atmosphere. Biochar has applications at a variety of scales, for example: improving soil in the home garden; as an admix to horticultural products such as potting mix or composts; application in broad-scale agriculture as a means to improve soil properties and productivity.

The CharMaker has successfully trialed over 20 feedstocks, including: wattle, eucalypts, mixed green waste, old grape vines, pine plantation residue waste, railway sleepers, straw bales, timber waste (from waste transfer stations), and willows.

*Figure 24: The Earth Systems mobile pyrolysis unit for the processing of woody or green waste*



The CharMaker technology is particularly ideal where: transport issues make processing of green woody waste unviable; processing of small dispersed volumes of material are desired; chipping costs are expensive, or a process is needed for green woody waste treatment without smoke emissions (e.g. urban environment).



The Charmaker transportable pyrolysis furnace has the following key parameters and benefits:

- Easily transported unit with access to most remote areas.
- Batch processing with 19 m<sup>3</sup> internal volume per batch for the CharMaker MPP 20, and 38 m<sup>3</sup> for the CharMaker MPP 40.
- Pyrolysis converts biomass to ~1 to 2 tonne biochar per batch for the CharMaker MPP 20, or ~2 to 4 for the CharMaker MPP 40.
- Processes larger wood feedstocks, including logs. Minimal feedstock pre-treatment is required (no chipping required). To process larger woody feedstocks in a suitable time, the maximum recommended woody dimensions are: no greater than 150 mm diameter (6") and 1.8 metres (6 feet) in length.
- Batch processing takes a few hours – normally 4-5 hrs per batch depending on moisture content and wood feedstock diameter.
- Targeted processing temperature range can be selected from 300-550°C.
- Destruction of all pathogens.
- Biochar product has very high fixed carbon content.
- Very low emissions.
- High thermal energy output.
- No smoke: the high after-burner temperature minimises volatile emissions. When operating there are no visible smoke emissions – the technology can therefore be operated in an urban environment.
- Designed for farm, forestry and waste management operations.
- The biochar product is screened, crushed and packaged at the end of the process on site.
- A sophisticated control system with multi-sensory input operates the CharMaker MPP. Once the CharMaker MPP has ignited, operator input requirements are minimal. It can be operated unattended, and will quench and shut itself down at the conclusion of the process. This allows unattended operation overnight. The CharMaker MPP can then be unloaded the following day during work hours – thereby increasing the number of batches per work day.
- Optional heat recovery for drying / space heating.
- Optional wood vinegar and bio-oil recovery system.
- Optional small-scale power generation.
- No site works required.
- No on-site power requirements.
- No lengthy set-up and commissioning required.

The cost of the CharMaker mobile pyrolysis units is in the vicinity of \$480 000. The units can be set up to be operated remotely and unattended overnight operation is possible. Approximately 50 litres of diesel is required for each batch to ignite the process.