

# North East Waste and Resource Recovery Implementation Plan

June 2017



North East  
Waste and Resource Recovery Group



*Front cover image: Glass falling into a pile for recovery*

*Back cover image: An old trommel (mechanical sorting equipment) with the sun shining behind*

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Potential conflicts of interest of the NEWRRG board have been considered and managed throughout the development and adoption of this publication.

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Image above: Former NEWRRG Deputy Chair, Anthony Griffiths

## Former Deputy Chair Foreword

It is with great pleasure that we release the North East Waste and Resource Recovery Implementation Plan (north east implementation plan). The north east implementation plan provides a roadmap to shape the waste and reprocessing infrastructure in the North East Waste Resource Recovery region (the region) over the next ten years.

The north east implementation plan has been developed in collaboration with our waste and resource recovery partners and in consultation with community and industry recognising the principles of environmental justice, to deliver the best waste management outcomes for the communities of the region.

The development of the north east implementation plan has considered and reflects an expectation by our communities to reduce the amount of waste going to landfill and to ensure waste and resource recovery facilities provide positive economic, community, environment and public health benefits.

Although the region already recovers 66% of its waste, there are still materials that can be viably recovered before going to landfill. We know that disposing of materials to landfill is a limited solution and while landfill is always likely to be required, easily accessible landfill space is finite. Landfills have social and environmental consequences and need to be well-managed to minimise their impact on the community. The challenge is to get the best outcomes from our waste.

Existing waste and reprocessing infrastructure within the region provides the capacity to manage current waste volumes. However, there is a need to improve operational performance, management of closed landfills, economies of scale and, in the end, minimise the costs imposed on the community and businesses.

The north east implementation plan recognises that improved waste management and reprocessing in the region can only be achieved through a culture of cooperation between industry, councils, alpine resort management boards (alpine resorts) and the state government.

Through these partnerships the north east implementation plan aims to achieve the following outcomes:

- > Infrastructure or systems that improve the recovery of materials
- > New, upgraded and expanded infrastructure that improves waste accumulation, recovery, handling and transport efficiencies
- > New and existing infrastructure operating to best practice principles or guidelines
- > A long-term strategy for landfilling adopted and being implemented by north east councils and alpine resorts
- > An integrated data system established in partnership between state and local government.

We thank local government, the alpine resorts, industry, business and the community for their valuable input in developing the north east implementation plan. We now look forward to working with all stakeholders on the delivery of the north east implementation plan.

Anthony Griffiths.

Former Deputy Chair, North East Waste and Resource Recovery Group

# EXECUTIVE SUMMARY

The north east implementation plan is a 10 year strategy to ensure the region has a practical and effective waste and resource recovery (recycling) network. The development of the north east implementation plan is a statutory requirement under the *Environment Protection Act 1970* (EP Act).

The purpose of the north east implementation plan is to identify local waste and resource recovery (recycling) infrastructure needs (facilities and equipment) and plan for how these needs will be met over the next 10 years for the region. The north east implementation plan has five main aims for the region and within these specific actions to be achieved in the next 10 years.

The region comprises seven local government and three alpine resort areas situated around the Hume Freeway in north east Victoria.

The resident population of 117,452<sup>1</sup> is expected to increase to 140,575<sup>2</sup> over the next 15 years, with the most significant growth expected in the towns of Wodonga and Wangaratta. The region is also a major tourism area, with the alpine resorts receiving around 576,000<sup>3</sup> visitors per year. An additional key challenge will be posed by climate change and climate resilience of waste and resource recovery infrastructure.

The region generates approximately 244,000 tonnes of waste annually. Around 34% is landfilled while 66% is recovered. Municipal solid waste (MSW) accounts for about one quarter of all waste, however it represents a large proportion (42%) of the material landfilled.

Consolidation and aggregation of material streams may help to achieve the volumes of quality feedstocks to support viable recovery. Other factors to demonstrate viability in resource recovery are economic feasibility and better community, environment and public health.

The recovery rates for cardboard, tyres, metal, aggregates, masonry and soil are very high. Recovery rates are lower for organics, plastic, glass, textiles, timber and low toxicity materials. These recovery rates have the potential to be improved.

In 2015, the four largest councils in the region implemented a third kerbside bin for food and garden organics in urban areas. It is anticipated these initiatives will increase the recovery rate from 66% to 70% and the recovery rate of food organics from 8% to 57%.

Approximately 200,000 tonnes of materials and waste flows into or out of the region each year, with an inflow of materials and waste of around 130,000 tonnes. For example about 20,000 tonnes of timber/wood and green organics come into the region and are combusted at two energy from waste (EfW) facilities.

Flows out of the region include materials from the region's only materials recovery facility to reprocessors in metropolitan Melbourne (15,400 tonnes); around 12,000 tonnes from the region's resource recovery centres (RRC) to sorting and processing facilities outside of the region; and 31,400 tonnes of municipal solid waste to the Albury landfill in NSW.

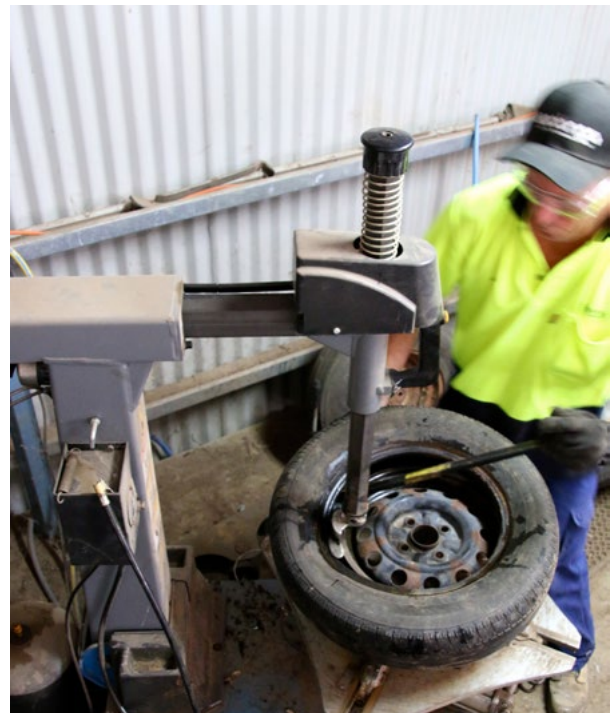


Image above: A worker at the Wodonga Resource Recovery Centre takes a tyre off a rim for reprocessing

1 Census Data by Local Government Area 2014

2 DTPLI, *Victoria in Future 2015*

3 Alpine Resorts Coordinating Council, *Annual Report 2014-2015, Visitors*

The existing RRC and landfill infrastructure provides the capacity to manage current waste volumes for at least the next 10 years.

Existing reprocessing infrastructure includes capacity for timber and garden waste, paper and cardboard and there is a materials recovery facility (MRF).

There is a need for reprocessing capacity for some material streams like plastics and electronic waste (e-waste), and an increased capacity for organics processing.

By 2042, waste generated in the region is projected to grow by 36% or 1.2% per year, meaning around 333,000 tonnes will be generated per annum; compared with the 245,000 tonnes generated in 2014.

There are currently five landfills in the region each managing relatively small quantities of waste. Looking at how we use landfill infrastructure across the region in the longer term may provide opportunities to improve cost-effectiveness. There may be opportunities to consolidate use of landfills to achieve economies of scale. The North East Waste and Resource Recovery Group (NEWRRG) therefore proposes to work with communities and local councils on a long-term strategy for landfilling in the region.

To maintain disposal to landfill at the 2013-14 level, the region would need capacity to recover an additional 89,000 tonnes; improving the recovery rate from 66% to 75%.<sup>4</sup>

During the development of the north east implementation plan a market assessment was undertaken to identify industry's strategic direction and aspirations for waste management. To better understand the issues and needs of households the community, local government and alpine resorts were also consulted with.

The ideas generated from these activities, together with the direction set in the Statewide Waste and Resource Recovery Infrastructure Plan (state infrastructure plan), have helped us develop a consultation draft which was subsequently tested with the public and industry during a five week public consultation period in May and June 2016. The outcomes of the consultation have been integrated in the north east implementation plan and are documented in Appendix G.

During the period of the north east implementation plan, together with our partners, NEWRRG will aim to work on ten priority actions:

1. Develop and support solutions to increase the recovery of priority materials including organics, plastic, glass, textiles, timber, aggregates and low toxicity materials

2. Assess and, where viable, support systems to increase recovery from mixed loads of materials<sup>5</sup>
3. Facilitate the development of regional partnerships to enable efficiencies in waste transport, disposal and resource recovery
4. Support councils, alpine resorts and industry to upgrade infrastructure and improve operations
5. Work with councils and across state government to site new infrastructure appropriately and protect existing facilities and hubs from encroachment
6. Work with councils, alpine resorts and industry to investigate innovative and technological advancements that could inform future infrastructure development
7. Facilitate work between councils and the Environment Protection Authority (EPA) to develop appropriate risk-based approaches for rehabilitation of unlicensed closed landfills
8. Develop a long-term regional strategy for landfill
9. Establish a reliable regional data system to inform waste and resource recovery decisions
10. Share information across state government on regional infrastructure and market development needs and priorities.

These actions complement the direction set out in the state infrastructure plan<sup>6</sup> and together with the six other Regional Waste and Resource Recovery Implementation Plans (regional implementation plans) being developed statewide will establish a strategic direction and framework which will inform and encourage waste and resource recovery infrastructure that meets the needs of the Victorian community now and into the future.

The north east implementation plan supports regional delivery of the Victorian Waste Education Strategy, August 2016. The strategy provides a consistent and coordinated approach to waste and resource recovery education. It supports best practice programs so that Victorians:

- > are well informed and taking practical action to reduce waste, minimise its environmental impact and maximise its value
- > understand the importance of effective waste management and recovery of valuable resources.

4 Sustainability Victoria, Regional Waste & Resource Recovery Database (RWRRD) v3; Sustainability Victoria modelled generation data

5 Unsorted loads from industrial sources which may contain unrecovered resources

6 Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan, Victoria 2015-44

# PART 1: ABOUT THE NORTH EAST WASTE AND RESOURCE RECOVERY IMPLEMENTATION PLAN

## 1.1 Purpose

Victoria's waste and resource recovery system is an essential service that manages waste and materials to minimise impacts to community, environment and public health, and supports a viable reprocessing system that reduces reliance on landfill.

The north east implementation plan will set out the waste and resource recovery infrastructure needs of the region for the next 10 years. Once it has been adopted, all decisions in relation to the generation, management and transport of waste in the region will need to be consistent with the north east implementation plan.<sup>7</sup>

The north east implementation plan has been prepared to align with the state infrastructure plan and the six other regional implementation plans from across the state. Together these plans form the Victorian Waste and Resource Recovery Infrastructure Planning Framework, as set out in the EP Act.<sup>8</sup>

While the state infrastructure plan provides the strategic direction and roadmap for investment in Victoria's waste and resource recovery system, the north east implementation plan identifies the actions required in the region to make sure the right infrastructure is in the right place, at the right time and at the right price.

## 1.2 The Victorian Waste and Resource Recovery Infrastructure Planning Framework

In 2014 legislative amendments to the EP Act established the Victorian Waste and Resource Recovery Infrastructure Planning Framework (the Framework).

As amended, the EP Act provides the legislative underpinning for the regional implementation plans.

The Framework, and the regional implementation plans, are primarily governed by the EP Act, but regard has also been given to other relevant legislation in the preparation of this document, as

appropriate, including *the Planning and Environment Act 1987 (Vic)* and *the Transport Integration Act 2009 (Vic)*.

The Framework provides the structure for strategic planning for waste and resource recovery that integrates state, regional and local planning.

The objectives of the Framework are to:

- a) ensure long-term strategic planning for waste and resource recovery infrastructure at state and regional level
- b) facilitate the integration of state-wide directions for the management of waste and resource recovery infrastructure and regional infrastructure needs
- c) enable waste and resource recovery planning to be effectively integrated with land use and development planning and policy, and transport planning and policy
- d) ensure Sustainability Victoria (SV) and the Waste and Resource Recovery Groups (WRRGs) work together to integrate the state infrastructure plan and regional implementation plans
- e) enable waste and resource recovery infrastructure planning decisions at the appropriate level of the Framework.

The Framework provides for the preparation, integration and implementation of the state infrastructure plan by Sustainability Victoria and seven regional implementation plans.

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<sup>7</sup> Environment Protection Act 1970, Section 50BH (3)  
<sup>8</sup> Environment Protection Act 1970, Section 50A



### 1.3 The North East Waste and Resource Recovery Group

The NEWRRG is one of seven statutory WRRGs in Victoria constituted under the EP Act. The NEWRRG region consists of the municipal districts of the following local governments:

- > Alpine Shire Council
- > Benalla Rural City Council
- > Indigo Shire Council
- > Mansfield Shire Council
- > Towong Shire Council
- > Wangaratta Rural City Council
- > Wodonga City Council,

as well as areas managed by the following alpine resort management boards:

- > Falls Creek Alpine Resort Management Board
- > Mount Hotham Alpine Resort Management Board
- > Mount Buller and Mount Stirling Alpine Resort Management Board.

NEWRRG is responsible for planning and facilitating the development of waste and resource recovery facilities and services across the region. Its legislative functions are to:

- > plan for future infrastructure needs while minimising the environmental and public health impacts of waste and resource recovery infrastructure;
- > facilitate efficient procurement of waste and resource recovery infrastructure and services through collective procurement;
- > integrate regional and local knowledge into statewide waste and resource recovery market development strategies;
- > educate businesses and communities within the region to reduce waste going to landfill by using waste and resource recovery infrastructure and services efficiently.
- > ensure the north east implementation plan and programs are informed by councils, business and community and inform statewide waste and resource recovery planning and programs<sup>9</sup>.

In fulfilling these functions, NEWRRG must collaborate with councils, SV, EPA, industry, business and the community.

### 1.4 How this implementation plan has been developed

The EP Act sets out the full scope and requirements of the north east implementation plan. It must include:

- > a description and analysis of waste and resource recovery infrastructure within its waste and resource recovery region
- > a description of how the long-term directions in the state infrastructure plan will be implemented to give effect to local and regional infrastructure needs within the waste and resource recovery region
- > a schedule of existing and required waste and resource recovery infrastructure within the waste and resource recovery region
- > any matters required by the *Ministerial Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and regional implementation plans*.



Image above: A worker's hands hold garden mulch at Trevor Jackson's Earthmoving and Concrete Recyclers

<sup>9</sup> Environmental Protection Act 1970, Section 50BB

**Figure 1** Process for preparing the north east implementation plan

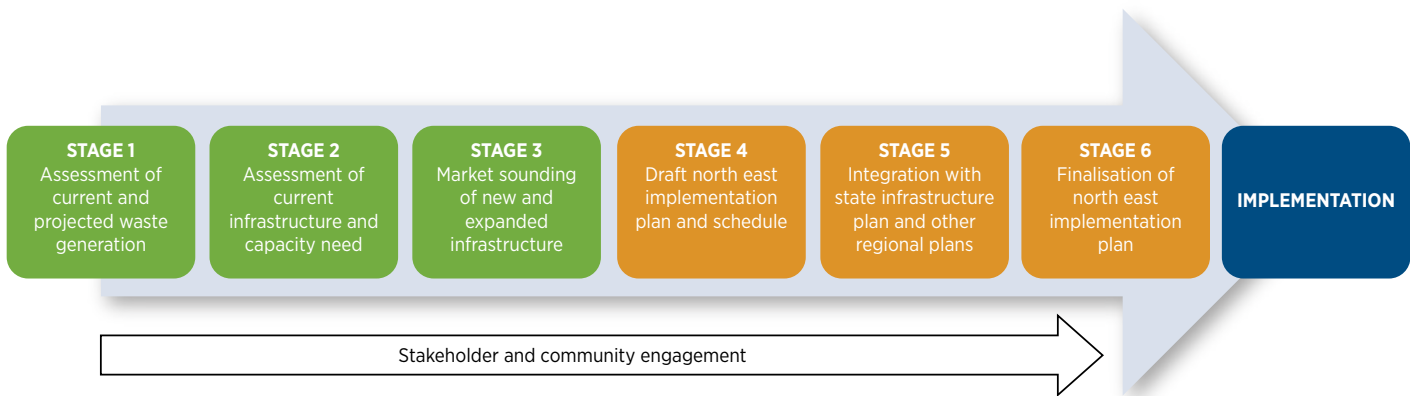


Figure 1 shows the overall process for preparing the north east implementation plan. Underpinning this approach is evidence-based analysis and assessment, principles of transparency and fairness, and engagement with stakeholders and the community. The north east implementation plan is the output from stage 6 of the process.

In stages one to five NEWRRG has undertaken extensive background work to inform the north east implementation plan, including:

- > a literature review of recent regional, state and national research
- > data collection (see Appendix B) and analysis including:
  - o detailed surveys and data collection from local government and alpine resort waste staff
  - o interviews and surveys from local government planning and economic development staff
  - o detailed surveys and data collection from the regional reprocessing industry as part of a statewide study<sup>10</sup>
  - o two detailed studies into options for future waste disposal and recovery options<sup>11</sup>
  - o detailed surveys and data collection from the commercial and industrial (C&I) and construction and demolition (C&D) sectors in the region
- > a review of local government and alpine resort waste management strategies and plans
- > consultation with the North East Local Government Waste Forum (convened by NEWRRG) and its Technical Advisory Sub-Committee to understand regional priorities for future waste and resource recovery infrastructure development
- > consultation with representatives of local government, the EPA and SV, and the WRRGs in Victoria about current and future risks to the region's waste and resource recovery system
- > consideration of the state infrastructure plan
- > in partnership with the Goulburn Valley WRRG and Loddon Mallee WRRG, market sounding and review, together with a resource recovery scheduling application and evaluation process, to understand the waste sector's capacity and infrastructure investment intentions, challenges, capacity gaps, needs and opportunities and to inform the development of an infrastructure schedule
- > the publication of a consultation paper on the NEWRRG website early in the drafting to gauge public opinion
- > surveys to gauge community aspirations and priorities around waste and resource recovery
- > close collaboration with the EPA, SV, Department of Environment Land Water and Planning (DELWP) and the other groups during the alignment and integration phase.

<sup>10</sup> Sustainable Resource Use (SRU) 2015, *Survey and Analysis of Regional Reprocessors and Material Recovery Facility Operators*

<sup>11</sup> Nolan Consulting Pty Ltd 2014, *Future Landfill Options Study*; Blue Environment 2016, *Future Landfill Options Study II*

## CLIMATE CHANGE

The Victorian Government is committed to positioning Victoria as a national and international leader in climate change action and is implementing a range of policy initiatives to deliver on this commitment, including:

- > The new **Climate Change Act 2017** - legislates a long-term target of net zero greenhouse gas emissions by 2050 and gives effect to the majority of the commitments set out in the Victorian Government Response to the 2015 Independent Review of the *Climate Change Act 2010*.
- > **Victoria's Climate Change Framework** - sets out our vision for Victoria in 2050 and the steps required across government and key sectors of the economy to commence the transition.
- > **Victoria's Climate Change Adaptation Plan 2017-2020** - sets out the priorities for the next four years for the Victorian Government to better understand and manage current impacts, and to prepare for the long-term risks of climate change.
- > **TAKE2** - Victoria's climate change pledge program for State Government, local governments, businesses, community groups, educational institutions and individuals to make public commitments to reduce emissions and build capacity between now and 2020.
- > Committing to **Victorian renewable energy targets (VRET)** of 25% by 2020 and 40% by 2025, supported by a competitive reverse auction scheme.

Asserting climate change action as a core component of public sector business is essential to delivering these climate change policy objectives.

This requires all Victorian Government agencies and portfolio entities to understand the impacts of climate change on their assets and service delivery and contribute to reducing emissions.

The impacts of climate change on Victoria's waste sector are varied and may include issues such as changes in the timing, form and amount of precipitation as well as potential increases in extreme weather events such as bushfires, flood and drought.

These impacts can affect waste infrastructure, remediation and containment strategies as well as local water quality.

Waste management authorities have a number of opportunities to contribute towards action on climate change, including:

- > Incorporating climate-resilience into the design and management of waste infrastructure.
- > Contributing to TAKE2 by taking measures to reduce emissions from operations and facilities, landfills and reprocessing of materials such as organics.
- > Assisting the development of markets for reprocessed materials, i.e. organics to compost or energy.
- > Reviewing potential risks and current assumptions about remediation and containment methods in light of climate change impacts.
- > Putting in place contingency plans to handle surges in treatment and disposal of waste generated from climate-related events (such as bushfires and floods).
- > Contributing to improvements in soil quality through the provision of compost.
- > Contributing to Victoria's renewable energy targets through use of EfW technologies.
- > Engaging with the community to increase their understanding of the challenges and opportunities presented by climate change for the waste sector, and how they can help.

*Image behind: Baled paper and cardboard material at the Wangaratta Materials Recovery Facility*

# PART 2: STRATEGIC DIRECTIONS AND PROPOSED ACTIONS

The state infrastructure plan articulates a statewide vision, purpose, goals and long term strategic directions and outcomes for Victoria's waste and resource recovery system (as shown in Figure 2).

To give effect to the long term strategic directions in the state infrastructure plan within its region in accordance with section 50BB(b) of the EP Act, NEWRRG has developed its own strategic directions, five year outcomes and priority actions to reflect the specific challenges, needs and opportunities in the region. NEWRRG is proposing 10 priority actions over the next 10 years to achieve the vision, purpose and goals. The relationship between these and the strategic directions, outcomes and priority actions are also depicted in Figure 2.

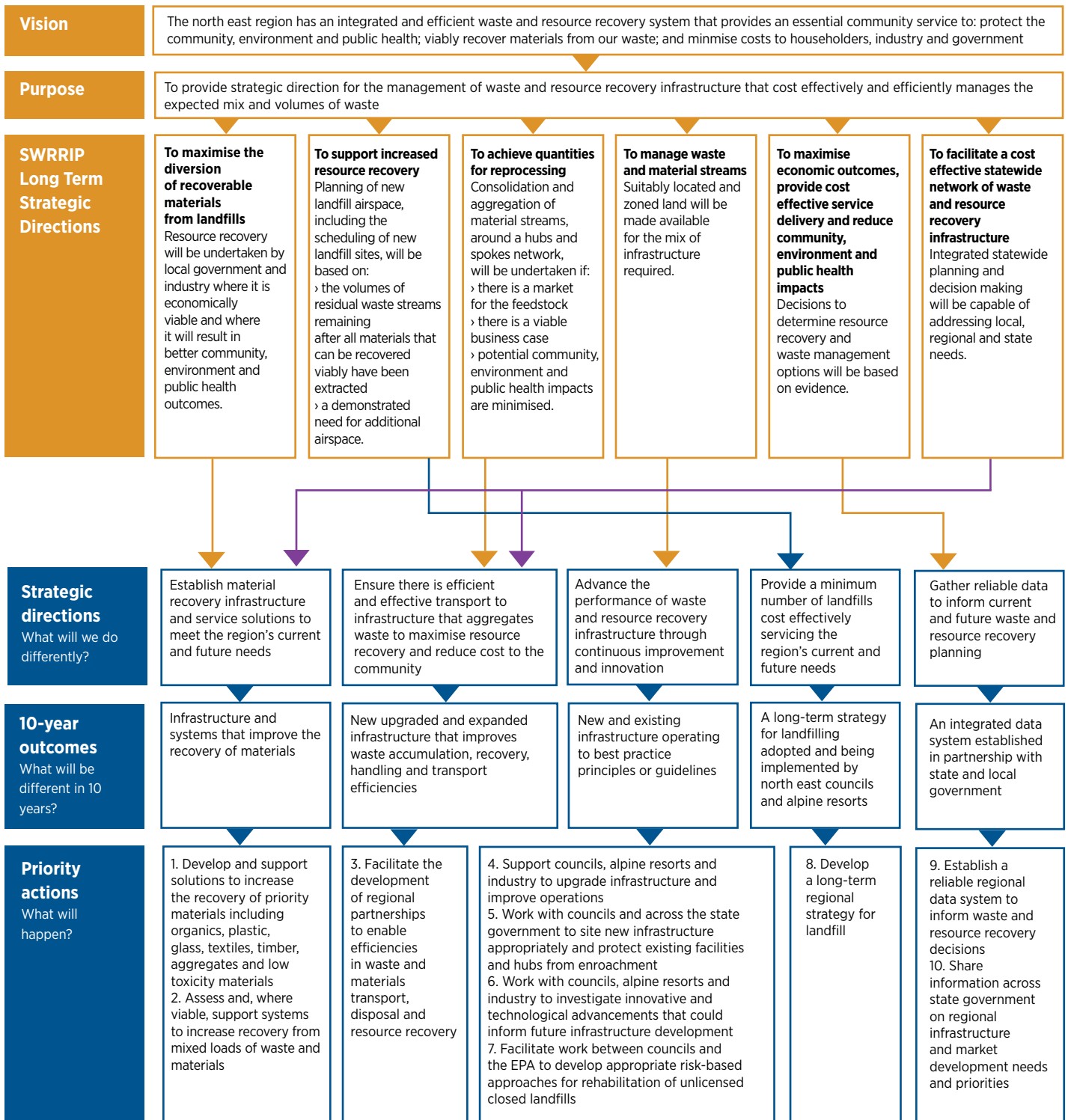
In developing Figure 2, NEWRRG has adopted the long term directions of the state infrastructure plan to give effect to local and regional infrastructure needs within the region.

The foundation of the north east implementation plan is a culture of cooperation between industry, councils, resorts and the state government to get the best outcome in waste and resource recovery.



Image above: Waste operations forklift moving baled mixed plastic

**Figure 2** North east strategic direction for waste and resource recovery in north east Victoria



## 2.1 Priority actions for the region

The rationale for the priority actions identified in the strategic direction of the north east implementation plan is provided in Table 1. A detailed discussion of the analysis underpinning these actions has been informed by internal research and analysis of materials and waste projections (Section 3), infrastructure capacity (Section 4) and a market sounding process (Subsection 4.15). NEWRRG has also undertaken intensive consultation

with local government, alpine resorts and the community; this feedback has also shaped the priority actions.

Consideration has specifically been given to meeting community expectations for resource recovery activities that improve the environment, community amenity and public health, while stimulating markets for the use of recovered materials for positive economic return.

**Table 1** Rationale for priority actions for waste and resource recovery

Priority Action	Why it is proposed?
<p>1. Develop and support solutions to increase the recovery of priority materials including organics, plastic, glass, textiles, timber, aggregates and low toxicity materials</p>	<ul style="list-style-type: none"> <li>➤ Recovery of organics, plastics, glass, textiles, timber and low toxicity materials could be improved. 2013-2014 data shows:               <ul style="list-style-type: none"> <li>○ 29,400 tonnes of organic material were landfilled in the region, representing 35% of all landfilled materials</li> <li>○ 8,500 tonnes of plastics were landfilled, representing 10% of landfilled materials</li> <li>○ 2% of textiles were recovered</li> <li>○ The glass recovery rate was 68%.<sup>12</sup></li> </ul> </li> <li>➤ A number of infrastructure or service gaps have been identified for these materials:               <ul style="list-style-type: none"> <li>○ There are no film or hard plastic reprocessors in the region and no coordinated regional hard plastics collection</li> <li>○ There are no textile recovery facilities in region</li> <li>○ There is limited collection of batteries, paint and fluorescent lights outside of Wodonga and Wangaratta.<sup>13</sup></li> </ul> </li> <li>➤ Opportunities to increase the recovery of these materials have been identified:               <ul style="list-style-type: none"> <li>○ If contamination is reduced there is an opportunity to capture organics from council resource recovery centres (RRC) to use as a feedstock in the region's two energy from waste (EfW) facilities</li> <li>○ A recent study showed there is an opportunity to increase organics recovery (food and timber) from industry<sup>15</sup></li> <li>○ There are opportunities for localised solutions for glass reprocessing which could then be used in road base or for pipe bedding <sup>15</sup></li> <li>○ There is an opportunity to reduce greenhouse gas from organics in landfills.</li> </ul> </li> <li>➤ In 2015, four councils adopted a third food/garden organics kerbside collection service. Most of this additional organic materials (14,500 tonnes) is transported and processed outside the region. A regional solution to manage food organics may be desirable as additional capacity.</li> <li>➤ The north east implementation plan aligns with the Victorian Organics Strategy by reducing the quantities of organics going to landfill by increasing the kerbside collection of food and garden organics, encouraging source separation and pre-sorting of materials and waste from the industrial sources, and by encouraging the investment in processing infrastructure.</li> <li>➤ A study into materials and waste from industrial sources in the region<sup>15</sup> identified the opportunity to promote the following:               <ul style="list-style-type: none"> <li>○ council-provided recycling services to small to medium enterprises (SMEs) with commingled recyclables</li> <li>○ kerbside food organics collection services to food services, food retail, health services, education and food manufacturing businesses</li> <li>○ the establishment of timber recovery systems that direct pallets to reconditioning and reuse, and/or systems that direct timber to high-order re-manufacturing or recovery options in the region.</li> </ul> </li> <li>➤ Delivers the potential for a market for the recovered goods and materials and improved outcomes for the community, environment and public health.</li> <li>➤ Consistent with the principles of the waste hierarchy where avoidance is the most ideal option for the treatment of waste, followed by reuse and recycling.</li> </ul>

<sup>12</sup> Sustainability Victoria Regional Waste & Resource Recovery Database (RWRRD) v3; infrastructure data provided by Waste & Resource Regional Groups (WRRGs) or Sustainability Victoria

<sup>13</sup> Blue Environment 2015, Solid Industrial Waste in North East Victoria.

Priority Action	Why it is proposed?
2. Assess and, where viable, support systems to increase recovery from mixed loads of materials and waste	<ul style="list-style-type: none"> <li>&gt; Currently, there is no sorting of mixed loads of materials and waste received at landfill or RRC sites prior to disposal, resulting in potentially recoverable resources being landfilled.</li> <li>&gt; There is an opportunity to introduce pre-sort operations for uncompacted hard rubbish, C&amp;D and C&amp;I received at RRCs and landfills from small vehicles, to recover cardboard, timber, metals, plastics and some building materials.<sup>14</sup></li> <li>&gt; Consolidating and aggregating material streams to achieve the volumes of quality feedstocks to support viable recovery where it is economically feasible and better community, environment and public health can be demonstrated.</li> <li>&gt; Consistent with the principles of the waste hierarchy where avoidance is the most ideal option for the treatment of waste, followed by reuse and recycling.</li> </ul>
3. Facilitate the development of regional partnerships to enable efficiencies in materials and waste transport, disposal and resource recovery	<ul style="list-style-type: none"> <li>&gt; Councils and alpine resorts are required to have regard to the transport system objectives and decision-making principles in the Transport Integration Act 2010 (Vic) when making decisions under their governing legislation. The transport system objectives include integrating land use and transport systems, and promoting efficient and coordinated movement of goods.</li> <li>&gt; There are no options currently for aggregation and bulking of materials and waste to reduce the cost of transport. Aggregating materials and waste volumes across the north east and transporting them to a large landfill in or out of region has been shown to be more competitive than many of the current landfilling arrangements for some facilities.<sup>15</sup></li> <li>&gt; There is an opportunity to coordinate further aggregation of materials to improve economies of scale to increase viability of resource recovery.</li> <li>&gt; NEWRRG has facilitated collaborative collection, transport and resource recovery tenders for councils that have resulted in increased recovery rates and market interest through aggregation of materials and services. There is an opportunity to build on this approach where viable.</li> <li>&gt; There is currently no collection infrastructure for electrical and electronic waste materials. The government has made a commitment to ban e-waste from landfill. Additional infrastructure, storage and regional solutions to divert banned materials from landfill will need to be considered when working with the rest of state government in design of the ban.</li> <li>&gt; Emergency events such as fires and floods have the potential to contribute to spikes in the volumes of materials and waste to be managed by regional infrastructure. Clear mechanisms need to be developed to ensure that appropriate waste systems and contingencies are in place during and following these events.</li> <li>&gt; To support viable recovery of materials.</li> <li>&gt; Consistent with the principles of the waste hierarchy where avoidance is the most ideal option for the treatment of waste, followed by reuse and recycling.</li> </ul>
4. Support councils, alpine resorts and industry to upgrade infrastructure and improve operations	<ul style="list-style-type: none"> <li>&gt; There are a number of RRCs in the region which do not meet best practice guidelines.<sup>16</sup></li> <li>&gt; Staffing levels at RRCs can limit adherence to best practice and recovery rates.<sup>16</sup></li> <li>&gt; The infrastructure is aging and there are inadequate storage facilities for timber and garden organics, at many resource recovery facilities<sup>16</sup></li> <li>&gt; Council/alpine resort owned RRCs manage 15% of the materials and waste generated and 22% of the materials and waste recovered.<sup>17</sup></li> <li>&gt; Councils and alpine resorts need staff with high level skills and expertise to plan for, design, construct, operate and rehabilitate landfills while managing them as viable businesses, to address changes in landfill regulatory requirements.<sup>18</sup></li> <li>&gt; Options to consolidate RRCs and upgrade those remaining to best practice could be considered to reduce costs and improve operational performance and recovery rates.<sup>16</sup></li> <li>&gt; There is an opportunity to develop a transfer station at the Benalla Landfill to improve recovery and reduce the safety risk of residents dropping off material on the landfill tipping face.<sup>15</sup></li> <li>&gt; Options for the future management of commingled recyclables need to be explored. For example whether to establish additional capacity in the region or to better consolidate materials for transport to Melbourne or other WRRG regions.</li> </ul>

14 Blue Environment 2015, *Solid Industrial Waste in North East Victoria*

15 Nolan Consulting, *North East Region – Future Landfills Options Study, September 2014.*

16 Blue Environment 2013, *Assessment of Resource Recovery Infrastructure in North East Victoria*

17 Sustainability Victoria 2013, *Sustainability Victoria Regional Waste & Resource Recovery Database (RWRRD) v3; infrastructure data provided by Waste & Resource Regional Groups (WRRGs) or Sustainability Victoria*

18 Blue Environment, *North East Landfill Options Study II, January 2016*

Priority Action	Why it is proposed?
5. Work with councils and across state government to site new infrastructure appropriately and protect existing facilities and hubs from encroachment	<ul style="list-style-type: none"> <li>&gt; It is important that consideration is given to protecting separation distances between existing and proposed facilities and sensitive uses when undertaking land use planning; thereby avoiding land use conflicts and providing confidence to invest in infrastructure, and long term community certainty.</li> <li>&gt; All Victorian planning schemes require planning decision-makers to consider (as appropriate) any relevant regional implementation plans. This requires planning decision-makers to consider the north east implementation plan when considering planning permit applications for the use and development of land, not only for new waste and resource recovery infrastructure, but also for other land uses. However, there is an opportunity to further integrate the north east implementation plan with applicable planning schemes, for example, through zone and overlay provisions in planning schemes.</li> <li>&gt; As well as consideration at planning permit approval stage, appropriate siting of proposed facilities and sensitive uses is undertaken through a range of mechanisms; some regulatory and some non-regulatory (e.g. education, awareness raising and community engagement on proposed sites).</li> </ul>
6. Work with councils, alpine resorts and industry to investigate innovative and technological advancements that could inform future infrastructure development	<ul style="list-style-type: none"> <li>&gt; Innovative and technological advancements are continually progressing and becoming more competitive. These could include: <ul style="list-style-type: none"> <li>o larger more efficient truck bodies</li> <li>o walking floor compactors</li> <li>o improvements in processing infrastructure</li> <li>o changes in private sector approach, for example, merchant facilities</li> <li>o anaerobic digestion facilities in collaboration with industry</li> <li>o advances in the energy from waste sector.</li> </ul> </li> <li>&gt; Monitoring changes and new opportunities and advancements could assist to inform new infrastructure development or upgrades.</li> </ul>
7. Facilitate work between councils and the EPA to develop appropriate risk-based approaches for rehabilitation of unlicensed closed landfills	<ul style="list-style-type: none"> <li>&gt; This will assist to find site appropriate risk-based solutions to the environmental/health risks of closed landfills.</li> <li>&gt; This may assist in reducing the cost of landfill rehabilitation requirements while achieving appropriate environmental and public health outcomes.</li> </ul>
8. Develop a long-term regional strategy for landfill	<ul style="list-style-type: none"> <li>&gt; Landfills play a central role in safely and effectively managing materials and waste streams. While increasing resource recovery is a priority in north east Victoria, landfills will continue to play a necessary role in the infrastructure network for at least the medium-term.</li> <li>&gt; Only waste that cannot be recovered viably should go to landfill. The long-term regional strategy for landfill will consider pre-sorting of mixed loads to minimise landfilling of waste.</li> <li>&gt; There is no current regional strategy for managing the region's residual waste.</li> <li>&gt; The quantities of materials and waste being managed by landfills in the region are relatively small and the cost effectiveness of existing landfills may continue to deteriorate with increasing resource recovery.</li> <li>&gt; Looking at how we use landfill infrastructure across the region in the longer term may provide opportunities to improve cost-effectiveness. There may be opportunities to consolidate use of landfills to achieve economies of scale.</li> <li>&gt; If appropriate, this strategy may be included in the next version of the north east implementation plan when it is reviewed in 5 years' time.</li> </ul>
9. Establish a reliable regional data system to inform waste and resource recovery decisions	<ul style="list-style-type: none"> <li>&gt; Current data systems are onerous and repetitive for local government with state government data sharing arrangements in their infancy.</li> <li>&gt; Accurate, credible and reliable data is the foundation on which councils, alpine resorts and the private sector undertake cost-benefit and business case assessment for the establishment of new infrastructure and systems.</li> <li>&gt; There is an opportunity to investigate the use of technology to decrease local government and alpine resort workload.</li> <li>&gt; The state government waste and resource recovery portfolio is currently investigating ways to share information.</li> </ul>
10. Share information across state government on regional infrastructure and market development needs and priorities	<ul style="list-style-type: none"> <li>&gt; There is a need to keep other state government agencies informed of market conditions and the challenges in the region to guide planning and programs for market development.</li> <li>&gt; There is a need to communicate specific regional infrastructure needs across state government to inform future infrastructure policy development, planning and future programs.</li> </ul>



## 2.2 Action plan

The following section outlines the short-term actions proposed for each priority action. A five year timeframe for the delivery of actions has been set to enable actions to remain relevant. A review of the implementation is required every five years.

A detailed discussion of the analysis underpinning these actions has been informed by internal research and analysis of materials and waste projections (Section 3), infrastructure capacity (Section 4) and a market sounding process (Subsection 4.15).

Some actions in the north east implementation plan are similar to those in the regional implementation plans for other WRRG regions. Where appropriate the Group will work with the other Groups to determine if a joint approach may provide opportunities to achieve better outcomes that align with those of the north east implementation plan.

**Table 2** Short-term actions, leads, stakeholders and timeframes

Priority Action	Short-term actions (5 years)	Link to SWRRIP strategic directions	Link to priority actions	Stakeholders	When
1. Develop and support solutions to increase the recovery of priority materials including organics, plastic, glass, textiles, timber, aggregates and low toxicity materials	1.1 Investigate and if viable conduct a trial to provide RRC organics as feedstock to EfW facilities	1, 3, 5	1, 6	NEWRRG, industry, councils	2018-2019
	1.2 Investigate and, where viable, facilitate opportunities to increase recovery of timber pallets	1, 3	1, 6	NEWRRG, industry, SV, councils	2016-2018
	1.3 Investigate opportunities and, where viable, facilitate linking business with existing food recovery collections	1, 3	1	Councils & alpine resorts, industry, alpine resorts, NEWRRG, other government agencies	2016-2018
	1.4 Investigate opportunities to increase the recovery of hard and film plastics and, where viable, facilitate solutions	1, 3	1, 6	NEWRRG, industry, SV, councils, alpine resorts	2016-2021
	1.5 Facilitate discussions with industry to investigate opportunities for local glass crushing and reuse	1, 3	1, 4	Industry, SV, other government agencies	2017-2019
	1.6 Facilitate discussions with local government, alpine resorts and other pipe infrastructure providers about using reprocessed crushed glass in road construction and as pipe bedding	1, 3	1, 4	Industry, pipe infrastructure providers, councils, alpine resorts, VicRoads	2017-2019
	1.7 Facilitate discussions with stakeholders to develop new local processing facilities meeting the identified needs of the north east implementation plan	1, 3	1, 3, 4, 5, 6	NEWRRG, councils, alpine resorts, industry	2017-2022
	1.8 Work with industry to identify and implement opportunities to increase the recovery of textiles	1, 3	1, 4	NEWRRG, textile industry, SV	2018-2019
	1.9 Work with local and state government to identify opportunities to expand collections of batteries, paint and fluorescent lights	1, 3, 5	1, 3, 4, 6, 10	NEWRRG, SV, councils, alpine resorts	2016-2018

Priority Action	Short-term actions (5 years)	Link to SWRRIP strategic directions	Link to priority actions	Stakeholders	When
2. Assess and, where viable, support systems to increase recovery from mixed loads of materials and waste	2.1 Conduct waste audits to inform pre-sort viability assessment	1, 3, 5	1, 2, 3, 4, 9, 10	NEWRRG, councils, SV	2016+
	2.2 Investigate viability of pre-sort infrastructure at landfills and large RRCs	1, 3	1, 2, 4, 6	NEWRRG, councils	2017-2020
3. Facilitate the development of regional partnerships to enable efficiencies in materials and waste transport, disposal and resource recovery	3.1 Develop infrastructure that enables efficiencies in materials and waste transport	1, 3, 5	3, 4, 6, 8,	Councils, alpine resorts & industry , NEWRRG, SV	2016+
	3.2 Facilitate collaborative procurements to maximise waste and resource recovery outcomes	1, 3	1, 3, 4	NEWRRG, councils, alpine resorts, SV	Ongoing
	3.3 Consider options to consolidate and upgrade landfill and RRC infrastructure	3, 5	2, 3, 4	Councils & alpine resorts , NEWRRG, SV	Ongoing
	3.4 Work across state government to consider and facilitate regional needs to facilitate diversion of e-waste to landfill in line with government commitment	3, 5	3, 4, 6, 10	NEWRRG, DELWP, councils, alpine resorts, industry	2016+
	3.5 Work with councils/alpine resorts and state authorities to develop mechanisms to appropriately manage materials and waste during and after emergency events	3, 6	3, 4, 8	NEWRRG, SV, Emergency Management Victoria, EPA, councils, alpine resorts	2017-2018
4. Support councils, alpine resorts and industry to upgrade infrastructure and improve operations	4.1 Support councils and alpine resorts to establish waste management strategies aligned with this north east implementation plan	1, 3, 5, 6	4, 5, 6, 7, 8, 9	Councils, alpine resorts , NEWRRG, SV	Ongoing
	4.2 Promote the strategic directions of the north east implementation plan to the waste and resource recovery industry in the region	1, 3, 6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	NEWRRG, industry, other government agencies	2017+
	4.3 Facilitate training opportunities to support councils and alpine resorts to continuously improve landfill and RRC operations	1, 3	1, 3, 4, 8	NEWRRG, EPA, councils, alpine resorts	Ongoing
	4.4 Investigate options to improve infrastructure and systems to collect and aggregate quantities of viable materials for reprocessing	1, 3	1, 2, 3	NEWRRG, councils, alpine resorts	Ongoing
	4.5 Establish hardstand areas to reduce contamination of organics at RRCs	1, 3	1, 4	NEWRRG, SV, councils	2017-2019

Priority Action	Short-term actions (5 years)	Link to SWRRIP strategic directions	Link to priority actions	Stakeholders	When
5. Work with councils and across state government to site new infrastructure appropriately and protect existing and proposed facilities and hubs from encroachment	5.1 Work with local government to discuss potential planning controls to protect buffers for proposed facilities and hubs	4	4, 5, 7, 8	NEWRRG, councils, industry, SV, DELWP, other government agencies	2017-2019
	5.2 Work with local government to establish a procedure to ensure that regard is given to the north east implementation plan when considering planning permit applications for new waste and resource recovery infrastructure	4	4, 5, 7, 8	NEWRRG, councils, SV, DELWP, EPA	2017-2019
	5.3 Support industry and local government to identify possible sites for new resource recovery infrastructure	1, 3, 4, 5	1, 5, 6	Industry, NEWRRG, councils, alpine resorts, other government agencies	Ongoing
6. Work with councils, alpine resorts and industry to investigate innovative and technological advancements that could inform future infrastructure development	6.1 Monitor and provide advice on opportunities and advances in the waste and resource recovery sector and consider their application and viability for the region	1, 2, 5	1, 2, 3, 6, 7, 8	NEWRRG, councils, alpine resorts, SV	Ongoing
7. Facilitate work between councils and the EPA to develop appropriate risk-based approaches for rehabilitation of unlicensed closed landfills	7.1 Facilitate work between councils and the EPA to agree on risk assessment for unlicensed closed landfills	4, 5, 6	6, 7, 9	NEWRRG, EPA, councils	2017-2019
	7.2 Facilitate work between councils and EPA in developing and implementing management strategies for unlicensed closed landfills	4, 5, 6	6, 7, 9	Councils, NEWRRG, EPA	2018-2021
8. Develop a long-term regional strategy for landfill	8.1 Work with councils and alpine resorts to develop regional strategy for landfill	2, 3	2, 3, 4, 5, 6, 8, 9	NEWRRG, council & alpine resorts, EPA, SV	2018
	8.2 Facilitate adoption of regional landfill strategy by councils and alpine resorts	2, 5, 6	8	NEWRRG, councils, alpine resorts, EPA, SV	2018-2019

Priority Action	Short-term actions (5 years)	Link to SWRRIP strategic directions	Link to priority actions	Stakeholders	When
9. Establish a reliable regional data system to inform waste and resource recovery decisions	9.1 Work across state government to agree on an integrated data system/platform	5, 6	4, 6, 9, 10	SV, NEWRRG, councils, DELWP, EPA, WRRGs	2016-2018
	9.2 Investigate low impact regional data collection systems that can feed into the statewide data platform	5, 6	4, 6, 9, 10	NEWRRG, SV, councils, alpine resorts	2018-2019
	9.3 Work with councils and alpine resorts to implement systems to enable collection of data that feeds into the statewide data platform	1, 3, 5, 6	4, 6, 9, 10	Councils, alpine resorts NEWRRG, SV, EPA, DELWP	2017+
10. Provide information to state government on regional infrastructure and market development needs and priorities	10.1 Consult with industry, councils and alpine resorts to gather information on infrastructure and market development needs and priorities	3, 6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	NEWRRG, councils, alpine resorts, SV, DELWP, industry, other government agencies	Ongoing
	10.2 Communicate market development and infrastructure needs and priorities to the state	3, 6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	NEWRRG, councils, alpine resorts, SV, DELWP, industry	Ongoing

Image page 20: Looking across a rehabilitated cell with landfill gas flare



# PART 3: 3 MATERIALS AND WASTE IN THE REGION

## 3.1 Overview of the region

### 3.1.1 Population

The region (Figure 3) comprises seven local government and three alpine resort areas (Table 3) spanning 24,700km<sup>2</sup> or about one tenth of the area of Victoria and accommodating 21% of the states population. The region is situated around the Hume Freeway in north east Victoria, making it a hub for industry and logistics companies. It also borders NSW at the Murray River and, with its snowy mountains and vineyards, is a tourist destination.

Figure 3 Map of the north east region

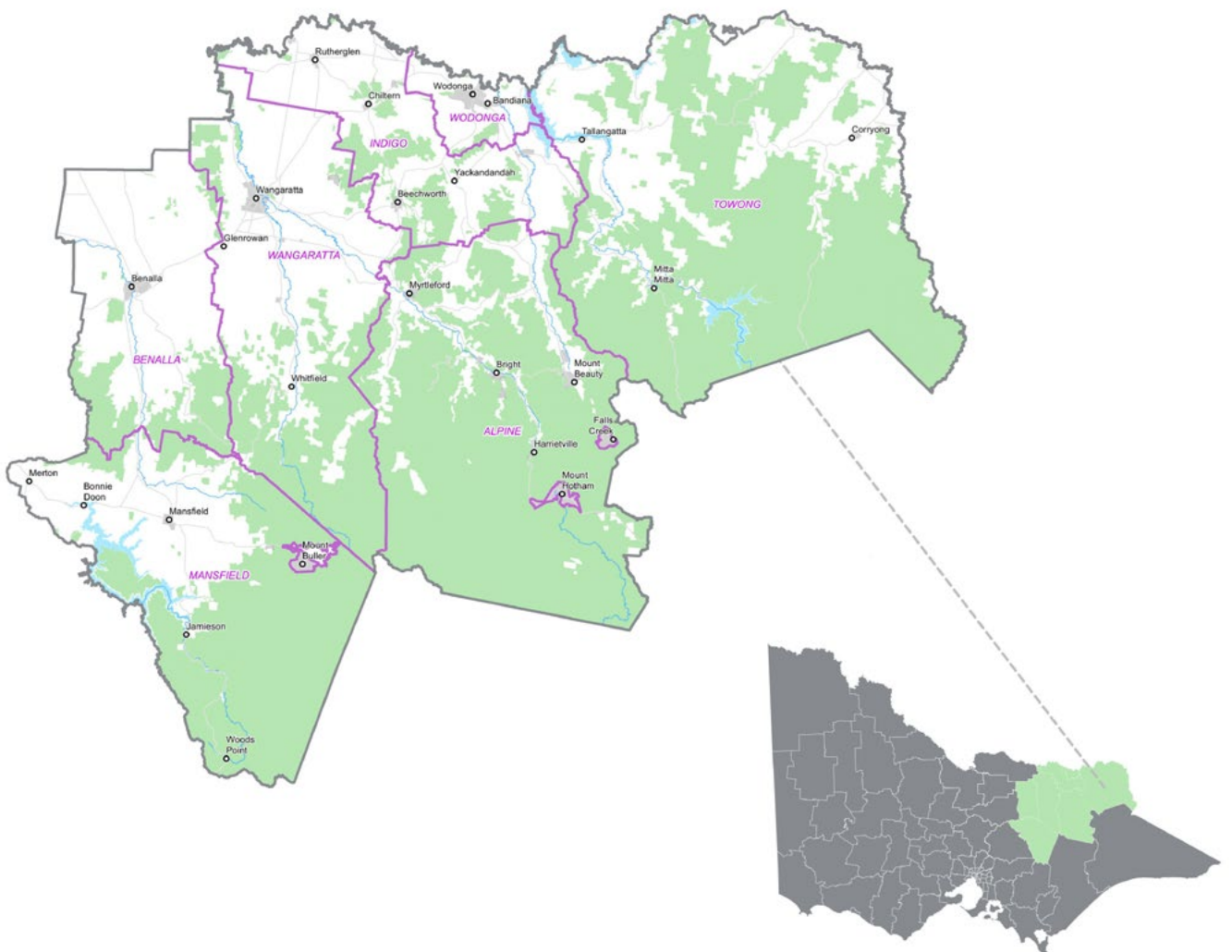




Image above: Birdlife around a leachate pond at the Wangaratta landfill

The current population for the region is 117,452<sup>19</sup>, with visitors to the alpine resorts alone totalling around 576,000<sup>20</sup> per year. In recent years there has been increased population growth. The total regional population is forecast to increase to 140,575 by 2030.<sup>21</sup> The most significant population growth is expected to be in the two main regional towns of Wangaratta and Wodonga.<sup>21</sup>

**Table 3** Population

Council/resort	Abbreviation	Main centre(s)	Permanent population <sup>22</sup>	Predicted population growth 2030 <sup>23</sup>	Seasonal population increases <sup>24</sup>
Alpine Shire Council	Alpine	Mt Beauty, Bright, Myrtleford	11,881	12,813	N/A
Benalla Rural City Council	Benalla	Benalla	13,647	14,764	N/A
Indigo Shire Council	Indigo	Beechworth, Chiltern, Rutherglen, Yackandandah	15,178	17,245	N/A
Mansfield Shire Council	Mansfield	Mansfield	7,893	9,922	N/A
Towong Shire Council	Towong	Tallangatta, Corryong	5,891	6,009	N/A
Rural City Of Wangaratta	Wangaratta	Wangaratta	26,815	29,545	N/A
City of Wodonga	Wodonga	Wodonga	35,519	50,276	N/A
Falls Creek Alpine Resort	Falls Creek	Falls Creek	225	225	137,553
Mt Buller/Mt Stirling Alpine Resort	Mt Buller	Mt Buller	161	161	317,007
Mt Hotham Alpine Resort	Mt Hotham	Mt Hotham	242	242	121,887
<b>TOTAL</b>			<b>117,452</b>	<b>141,202</b>	<b>576,447</b>

<sup>19</sup> ABS, *Census Data by Local Government Area 2014*

<sup>20</sup> Alpine Resorts Coordinating Council 2015, *Annual Report 2014-2015*

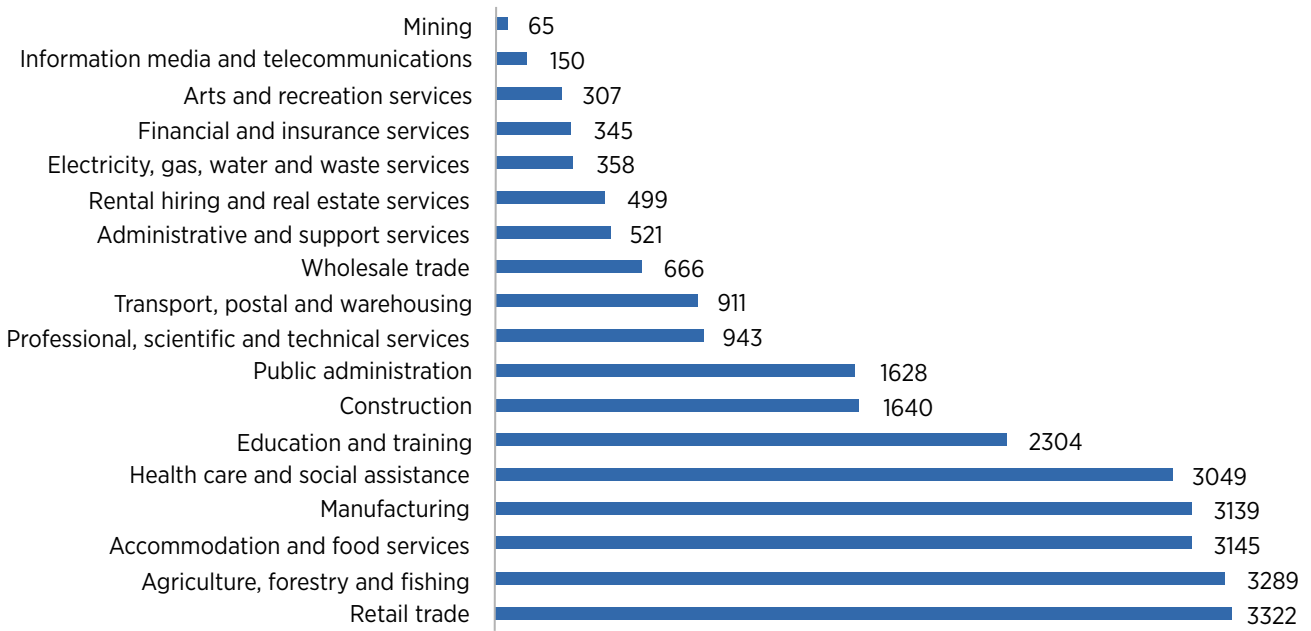
<sup>21</sup> DTPLI, *Victoria in Future 2015*

<sup>22</sup> ABS, *Census Data by Local Government Area 2014*

<sup>23</sup> DTPLI, *Victoria in the Future - Population and Household Projections 2014*

<sup>24</sup> Alpine Resorts Coordinating Council, *Annual Report 2014-2015, Visitors*

**Figure 4 Industries and fulltime employees<sup>25</sup>**



### 3.1.2 Employment

The type and volumes of waste and material streams produced are influenced by economic development, employment and industry sector type. Retail, agribusiness (including beef and dairy farming, forestry, timber and viticulture), tourism (accommodation and food services), manufacturing, health, and education and training are major industries and sources of employment in the region (Figure 4).

The ski industry is a significant contributor to the region with approximately 576,000 visitors per year passing through the region to visit the major alpine resorts at Falls Creek, Mt Hotham, Mt Buller/Mt Stirling and Dinner Plain during the winter season. Accordingly, accommodation, food services, and retail, are major employers in the Alpine and Mansfield Shires, which lie at the base of the alpine areas.

Wodonga, Wangaratta, Benalla and Indigo are key industrial zones and home to large manufacturers.

In the more rural municipalities and towns the agricultural (beef, sheep, dairy and horticulture), forestry (timber) and wine industries are the major sources of employment.

### 3.2 Data sources, limitations and handling

Please see Appendix B for a list of major data sources, major data assumptions and definitions and infrastructure categories for data collection.

The north east implementation plan is based on all available data, but there are limitations in the availability and quality of the data.

The three main data sources for the north east implementation plan are:

- Sustainability Victoria's Regional Waste and Resource Recovery Database (RWRRD) that included several data sets.
- Survey and analysis of regional reprocessors and material recovery facility operators: North East Waste and Resource Recovery Group regional report conducted by Sustainable Resource Use for Sustainability Victoria, 2015.
- North east waste and resource recovery needs analysis, NEWRRG 11/2015

NEWRRG collected the data from councils and Sustainability Victoria collected reprocessor data. Sustainability Victoria is the custodian of all the data. Sustainability Victoria's RWRRD records statewide information on waste and material streams sourced from EPA landfill levy records, surveys of reprocessors and other statewide information. Data on the waste and material streams

<sup>25</sup> ABS, *Census Data by Local Government Area 2014*



**Table 4** Waste generated, landfilled and recovered by sector in 2013–14<sup>26</sup>

Source Sector	Generated (tonnes)	Landfilled (tonnes)	Recovered (tonnes)	Recovered (%)
Municipal Solid Waste (MSW)	60,500	35,700	25,400	42%
Commercial & Industrial (C&I)	91,800	29,900	61,600	67%
Construction & Demolition (C&D)	92,500	17,500	74,800	81%
<b>Total</b>	<b>244,800</b>	<b>83,100</b>	<b>161,800</b>	<b>66%</b>

managed in the north east region was extracted from RWRRD and relies on the reliability and validity of the source data.

Data has been treated as confidential and reported in non-identifying form. Where data is used in an identifying form, written permission has been sought before publishing.

A key limitation of the RWRRD extrapolated data for the region is that it is based on 2013-14 results and does not include the current recovery of food and garden organics and data from existing reprocessors identified through the market sounding. Four of the seven north east councils have introduced a food and garden organics collection in 2015 that would not be included in the 2013-14 numbers.

### 3.3 Materials and waste generated and managed in the region

#### 3.3.1 Materials and waste generated

It is estimated that around 245,000 tonnes of materials and wastes were generated in the region in 2013/14. Whilst these originated in the region, some were managed or reprocessed or landfilled in other regions. (See 3.3.6 Cross regional flows)

It is difficult to accurately measure generation data due to the multitude of generation points and the complex ways materials enter and move within the waste and resource recovery system. NEWRRG is committed to working with SV, other WRRGs, the community and industry to increase our ability to improve the collection of generation data so we can better understand the waste and resource recovery system in the region.

While municipal solid waste (MSW) accounts for about one quarter of all materials and waste generated in the region, it represents a large proportion (42%) of the material disposed to landfill each year. In 2010 the alpine resorts began food waste

collections and in 2015 the four largest councils in the region implemented a third kerbside bin for food and garden organics in urban areas. It is anticipated that the new council systems will increase the MSW resource recovery rate from 42% to 60%, and the overall regional recovery rate from 66% to 70%.

#### 3.3.2 Material managed

It is estimated that around 460,000 tonnes of materials were managed through facilities in the region including RRC/TS, MRFs, reprocessors or landfills. As discussed in section 3.3.6 Cross regional flows some of this came from other WRRG regions.

#### 3.3.3 Material streams generated

Of the total materials and waste generated in the region, over 47,700 tonnes are organic materials (food, garden, wood/timber and other organics) with 18,300 tonnes being recovered in 2013-14 (Table 5). It is expected that the newly introduced food and garden organics collections in four municipalities will result in an increase of the recovery rate of food organics from 8% to 57%.

Many industries in the region are significant generators of organics; however, organic material once processed can be used as a business input. For example, the wine industry can benefit from compost and mulch; and forestry has attracted a timber processing and reprocessing facility in Benalla using waste timber and green organics to both produce heat and power and as a material input into the production of medium density fibreboard (MDF) boards, and a facility in Wangaratta is using green organics as a heat and power source for MDF production.

<sup>26</sup> Sustainability Victoria, Regional Waste & Resource Recovery Database (RWRRD) v3; Sustainability Victoria modelled generation data

**Table 5** Waste and material streams generated in 2013-14 (tonnes)<sup>27</sup>

Material Category		Generated	Landfilled	Recovered	Recovered (%)
Organics	Food	19,500	18,000	1,500	8%
	Garden	12,700	5,200	7,500	59%
	Wood/timber	8,500	6,100	2,500	29%
	Other <sup>28</sup>	7,000	100	6,800	97%
Paper/ Cardboard		38,800	9,600	29,100	75%
Glass		5,100	1,600	3,400	67%
Plastics		11,600	8,500	3,100	27%
Rubber (incl. tyres)		N/A	N/A	N/A	N/A
Metals		33,700	1,400	32,300	96%
Aggregates, Masonry & Soil		92,500	17,900	74,600	81%
Textiles		3,200	3,100	60	2%
E-waste		N/A	N/A	N/A	N/A
Other		12,500	7,500	12,500	0%
Total		245,100	84,000	161,660	66%

The recovery rates for cardboard, rubber, metal and aggregates, masonry and soil are high. There is potential for further recovery of textiles, glass, plastics, wood and timber. There is also potential for higher order solutions for green organics, which are currently being chipped at council RRCs and landfills to produce stockpiled mulch with limited end markets. Some councils are using the mulch in combination with soil for daily cover or landfill capping and small amounts are available to residents. Trials to use this mulch as a feedstock in local EfW facilities were unsuccessful due to the high grit content caused by a lack of hardstand areas at council RRCs.<sup>29</sup>



*Image above: Backhoe at the Wodonga RRC pushing up the garden waste pile*

<sup>27</sup> Sustainability Victoria, *Regional Waste & Resource Recovery Database (RWRRD) v3* (the material split has been estimated and is based on a range of landfill waste audits and surveys).

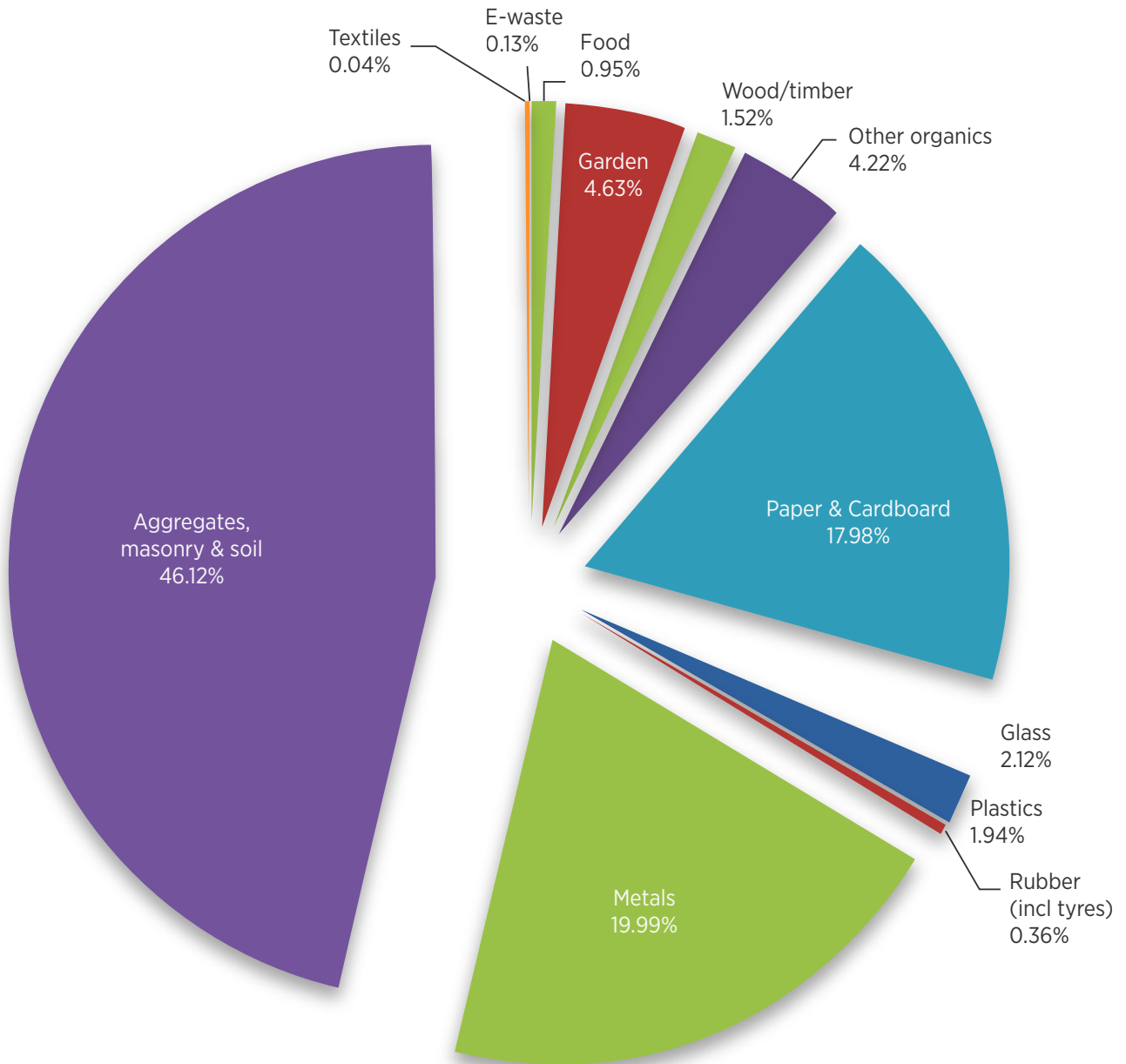
<sup>28</sup> Includes agricultural waste, abattoir waste, sawdust, bark and woodchips.

<sup>29</sup> Rural City of Wangaratta and Alpine MDF, 2011

### 3.3.4 Materials reprocessed

A range of factors influence the materials recovered and reprocessed, including the landfill levy, bulk collection contracts, composition of waste, regulations, the costs of disposal and reprocessing, the availability of resource recovery technology and infrastructure, community behaviour, viability, economies of scale and the presence of markets for recovered materials. Figure 5 shows the percentages of materials reprocessed.

Figure 5 Resource recovery by material category in 2013/14<sup>30</sup>



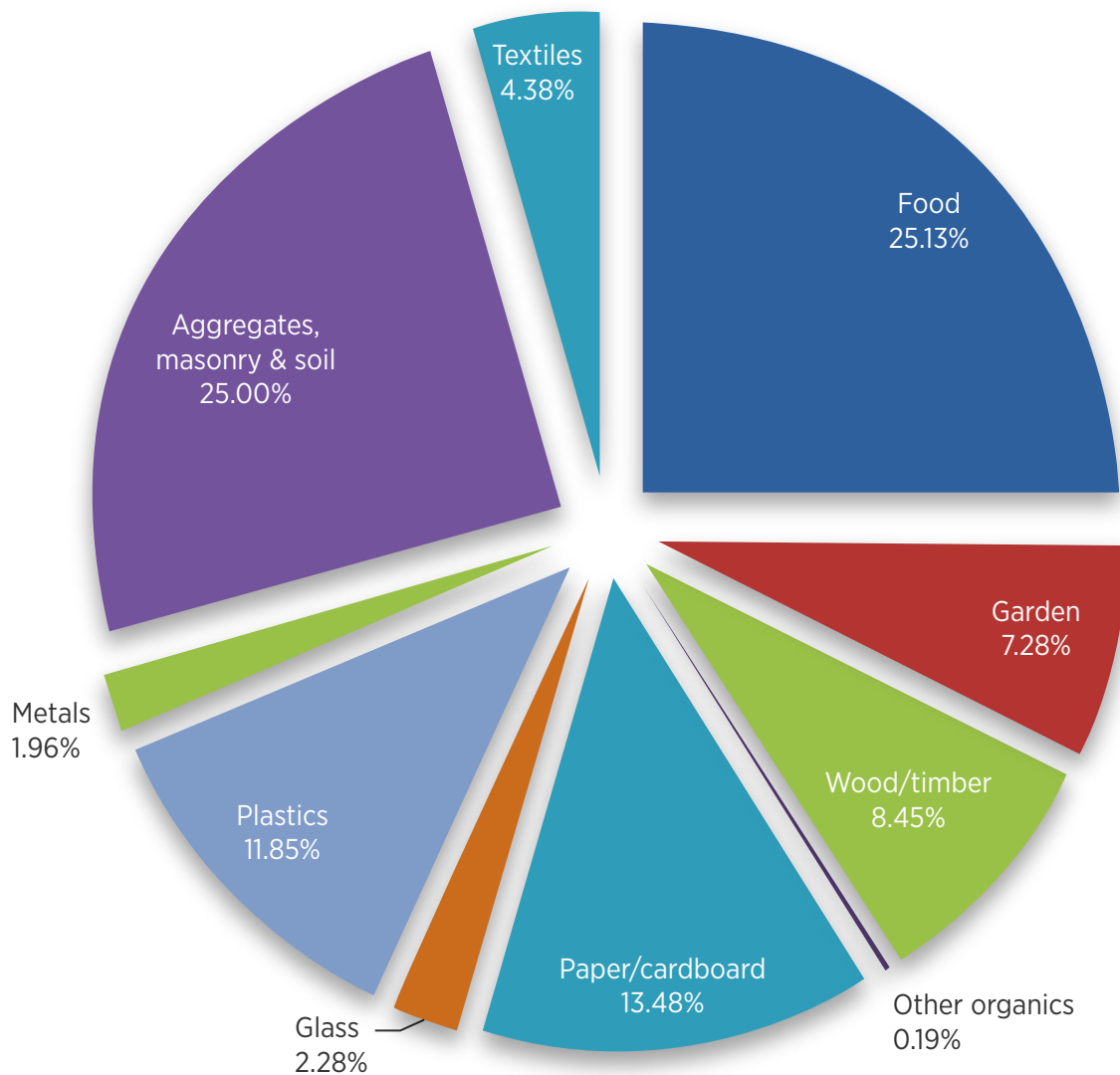
<sup>30</sup> Sustainability Victoria, *Regional Waste & Resource Recovery Database (RWRRD) v3*  
(The material split has been estimated and is based on a range of landfill waste audits)

### 3.3.5 Materials going to landfill

Food and garden organics make up 32% of the materials and waste sent to landfills (Figure 6). This is a high proportion given the risks this material presents when landfilled, such as contamination of groundwater and emission of greenhouse gases. There are opportunities to improve recovery of material sent to landfill including EfW and processing to compost. Diverting organics from landfill is a priority as indicated by the Victorian Organics Resource Recovery Strategy (VORRS)<sup>31</sup> and the Draft Victorian Market Development Strategy for Recovered Resources.<sup>32</sup>

Although the region has infrastructure capacity that could recover other materials currently being landfilled such as plastics, paper/cardboard and wood/timber, recovery of these materials is not being maximised due to a lack of pre-sorting infrastructure.

**Figure 6** Composition of waste entering landfills in 2013/14<sup>33</sup>



<sup>31</sup> Sustainability Victoria, *Victorian Organics Resource Recovery Strategy*, September 2015

<sup>32</sup> Sustainability Victoria, *Draft Victorian Market Development Strategy for Recovered Resources*, September 2015

<sup>33</sup> Sustainability Victoria, *Regional Waste & Resource Recovery Database (RWRRD) v3* (the material split has been estimated and is based on a range of landfill waste audits and surveys).

### 3.3.6 Cross regional flows

Approximately 200,000 tonnes of materials and waste flows into or out of the region each year, with an inflow of materials and waste of around 130,000 tonnes. Cross regional flows are determined by existing infrastructure and changing markets and vary over time. Table 6 shows major flows as they appeared in the 2013-14 data.

**Table 6 Cross regional flows in 2013/14**

Material type		Description of movement of material	
Recovery	RRC/TS and drop off	Outflows: around 12,000 tonnes of materials from the region's RRCs to sorting and processing facilities in the Melbourne, Goulburn Valley and Barwon WRRG regions, as well as to NSW	
	MRF	Outflows: 15,400 tonnes materials from the region's only MRF to reprocessors in metropolitan Melbourne	
	Organics	Combined	Inflows : around 20,000 tonnes of timber/wood and green organics used as feedstock at the two EfW facilities sourced from other WRRG regions in Victoria and NSW
		Other	Inflows : other organics (for example, animal rendering) (29,000 tonnes) from other WRRG regions in Victoria. <sup>34</sup>
	AM&S	Inflows : a significant quantity (68,700 tonnes) of aggregates, masonry and soil from NSW	
E-waste	Outflows: 3,000 tonnes of e-waste into Metro Melbourne		
Waste to landfill		Outflows: residual MSW waste (31,400 tonnes) from the northern councils in the region to the Albury Landfill in NSW	



*Image above: Baled plastics ready for transportation*

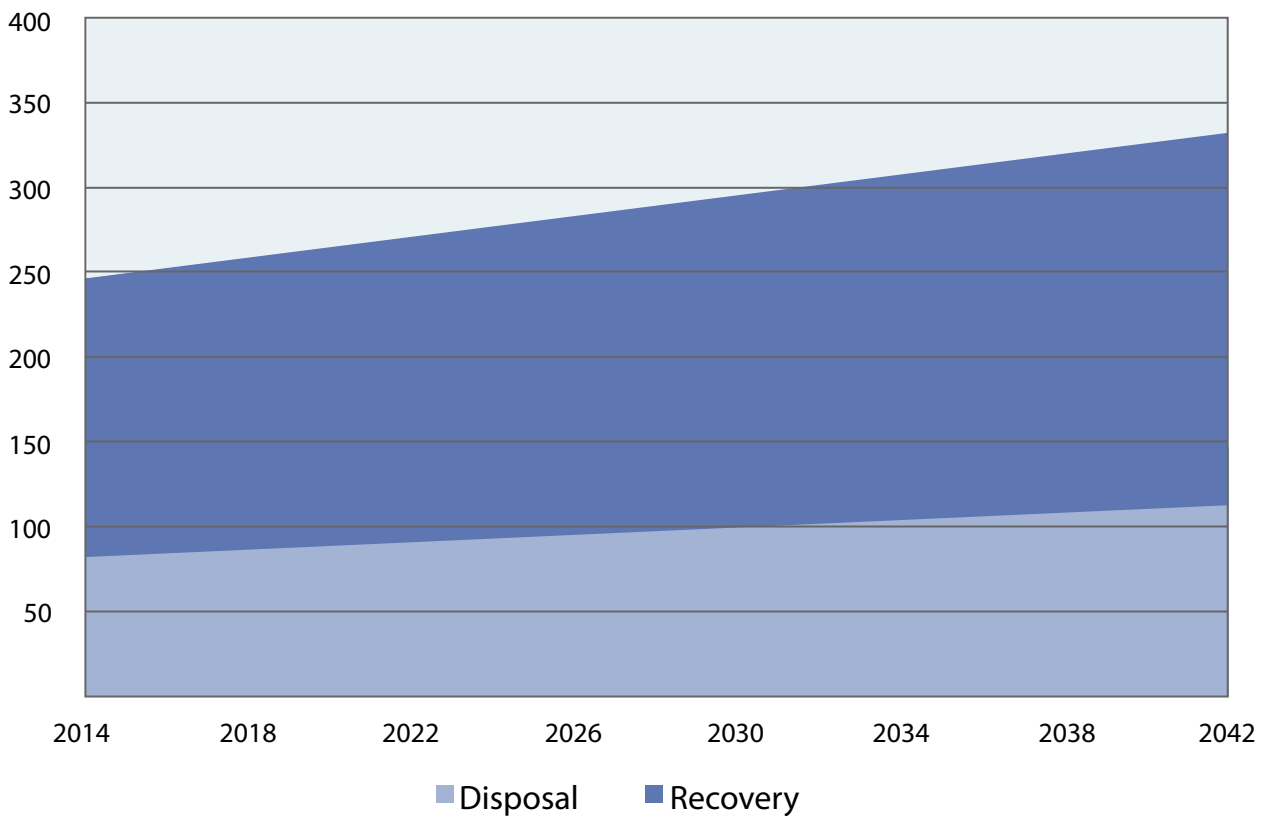
<sup>34</sup> SRU, *Survey and analysis of regional re-processors and materials recovery facility operators 2015*

### 3.4 Materials and waste generation projections

As the region's population grows and with further economic development, the amount of waste generated in the region will grow by 89,000 tonnes or 36% by 2042. A total of around 333,000 tonnes is suggested to be generated each year compared with the 244,000 tonnes managed in 2014 (Figure 7).

If disposal to landfill is maintained at the current levels to 2042, the increase in recovered materials will be 89,000 tonnes per annum and the equivalent resource recovery capacity will need to be provided either inside the region or nearby. In this scenario, the recovery rate would inherently increase from 66% to 75% per annum.

**Figure 7** Projected waste to be managed<sup>35</sup>



<sup>35</sup> Sustainability Victoria, *Regional Waste & Resource Recovery Database (RWRRD) v3*

*Image page 30: Planted eucalypt trees*



# PART 4: WASTE AND RESOURCE RECOVERY INFRASTRUCTURE

## 4.1 Municipal kerbside collection

Municipal kerbside collections provide an essential community service through the regular removal of waste materials from households and some businesses. They also form part of the supply chain for recovered materials by providing a secure supply of feedstock for processors of organic waste and commingled recyclables.

### 4.1.1 Current status

The waste services provided by each council and alpine resort in the region are outlined in Table 7. All provide waste and recycling services, four provide food and garden organics collections to residents, and the three alpine resorts provide a food organics collection service to businesses, lodges and apartments.

### 4.1.2 Future needs and opportunities

The opportunity to extend organics services to residents in council areas that do not currently offer a kerbside service should be tested through procurement processes.

**Table 7** Council/alpine resort kerbside collection arrangements

Council/alpine resort	Kerbside collections					
	Garbage		Recyclables		Food/Garden	
	Litres	Description	Litres	Description	Litres	Description
Alpine	80/240	Weekly	140/240/360	Fortnightly	No service	
Benalla	120/240	Fortnightly	80/120/240/360	Fortnightly	80/120/240	Weekly (no rural service)
Indigo	140/240	Fortnightly	240/360	Fortnightly	240	Weekly (no rural service)
Mansfield	120/240	Weekly	240	Fortnightly	No service	
Towong	140/240	Weekly	240	Fortnightly	No service	
Wangaratta	140 (240 for special needs)	Fortnightly	140/240/360	Fortnightly	140/240	Weekly (no rural service)
Wodonga	140/240	Fortnightly (weekly for special needs)	140/240/360	Fortnightly	140/240	Weekly (no rural service)
Falls Creek	Bagged garbage	Daily collection in season. As needed out of season.	Bagged recyclables	Daily collection in season. As needed out of season.	Bagged food organics	Daily collection in season. As needed out of season.
Mt Buller						
Mt Hotham						



## 4.2 Commercial collection

Collection services for commercial materials and waste generators are privately arranged and funded. C&I sector waste is generated from commercial and industrial activities, including from the government, education and health sectors. It also includes waste from offices, factories, manufacturers, restaurants/cafes, and other small to medium enterprises (SMEs). Commercial collections may include skip bins provided by a private contractor to collect and remove bulk waste from households, businesses, schools and commercial premises.

C&D waste is generated on building and demolition sites. It consists of construction materials like timber, concrete, bricks, soil, steel and other materials used in the construction industry. It is usually collected in skip bins or in tipper trucks and transported to a nearby landfill.

### 4.2.1 Future needs and opportunities

A study into C&D and C&I waste in the region<sup>36</sup> identified the need for promotion of the following:

- > council-provided recycling services to small to medium enterprises (SMEs) with commingled recyclables
- > kerbside food recovery collection services to food services, food retail, health services, education and food manufacturing businesses
- > the establishment of timber recovery systems that direct pallets to reconditioning and reuse, and/or systems that direct timber to high-order re-manufacturing or recovery options in the region.

There may be an opportunity to provide larger or additional recycle bins to businesses on a 'user pays' basis. This is particularly appropriate for retail premises, but could be extended to industrial estates. Over the term of the north east implementation plan NEWRRG will develop supporting solutions linked to priority action 1 to address this.

## 4.3 Litter and illegal dumping

Litter and illegal dumping poses a significant problem for communities in terms of environmental and amenity impacts, clean up and collection costs. Litter also has a negative impact on local communities' feelings of safety and wellbeing.<sup>37</sup>

Litter and illegal dumping is managed through a wide range of infrastructure, education and enforcement actions across state and council authorities. The Victorian Community and Business Waste Education Strategy identifies regional litter plans as a key mechanism to identify and prioritise regional litter issues and develop targeted, measurable and evidence based litter prevention activities.

The region has a strong tourism component. Many visitors visit national parks in the region. Parks Victoria has a "Carry In Carry Out" approach to litter management for its parks. Parks Victoria is working with councils with a shared approach to managing rubbish generated by both residents and park visitors, in the form of residential waste and camping or day visitor waste. Additional to that, business waste such as dumping of building materials and asbestos on public land is a statewide concern.

### 4.3.1 Future needs and opportunities

NEWRRG will play a role in supporting SV, the Victorian Litter Action Alliance (VLAA), Parks Victoria and councils in facilitating the development and implementation of best practice litter prevention programs by:

- > Leveraging our strong relationships and partnerships to influence best practice litter prevention practices among our stakeholders and delivery partners
- > Supporting participation (and retaining membership) with VLAA and utilising existing resources, research and tools developed by VLAA to ensure a consistent approach to litter prevention and clean up
- > Supporting stakeholder engagement, knowledge sharing, capacity and capability building through state government and council partnerships, and with other land managers, where relevant
- > Supporting the development of consistent litter data collection and reporting practices (e.g. VLAA's Local Litter Measurement Toolkit) that can be shared and used by all stakeholders for strategic program implementation and evaluation
- > Supporting the development of cohesive state, regional and council litter strategies
- > Working collaboratively with Parks Victoria and the councils in a partnered approach, including joint applications to grant programs that may assist in meeting shared goals.

## 4.4 Resource recovery centres

Resource Recovery Centres (RRCs) represent an important link in the infrastructure chain. RRCs receive a range of material streams including organic and residual waste and commingled recyclables. They focus on recovering, sorting and/or consolidating recyclable materials for transport to reprocessing/recycling facilities or MRFs and consolidating residual waste for transport to landfills. They provide community and business access to disposal and recycling options for items not suitable for kerbside collection, for example, 'hard rubbish'. Some RRCs provide infrastructure for problematic waste like e-waste and household chemicals.

<sup>36</sup> SRU, *Solid Industrial Waste in the North East Victoria, October 2015*

<sup>37</sup> Gladwell, M. 200015 and Kelling, G. 198216

**Table 8** RRCs in 2013-14<sup>38</sup>

Council/Resort	Resource Recovery Centre/ Drop Off Point	Quantity managed in 2013-14 (Range in tonnes)
Alpine	Dinner Plain	<200
	Myrtleford	>1000
	Porepunkah	<1000
	Mt Beauty	<1000
Benalla	Benalla	>1000
Indigo	Beechworth	<500
	Rutherglen	<300
Mansfield	Mansfield	>1000
	Woods Point	<60
Towong	Tallangatta	<1000
Wodonga	Wodonga	>2000
Wangaratta	Boorhaman	<10
	Eldorado	<40
	Wangaratta	>1500
	Glenrowan	<20
	Markwood	<50
	Moyhu	<30
	Springhurst	<20
	Whitfield	<30
Falls Creek	Falls Creek	<500
Mt Buller	Mt Buller	<1000
Mt Hotham	Mt Hotham	<200

**4.4.1 Current status**

As shown in Table 8, there are 19 standalone RRCs in the region, 16 of which are managed by councils and alpine resorts, and three of which are council owned but privately managed. Another three RRCs are co located at landfills and there is one small drop-off facility. The facilities usually accept materials from households. Collectively these sites have installed annual capacity of 116,000 tonnes; however, in 2013-14 they managed approximately 36,000 tonnes per annum (15% of all waste generated and 22% of waste recovered). These facilities are mapped in Appendix A.

**Table 8a** Metal RRCs

LGA	RRC metal yard	Quantity managed in 2013-14 (Range in tonnes)
Wangaratta	Thomo's Cash For Scrap	N/A
	D&M Scrap Metal	N/A
	John Turner Metal Recyclers Pty Ltd	N/A

There are several small metal yards, most of which are small operations that sort, consolidate and aggregate metal and sell on to bigger metal RRC outside the region.

*4.4.1.1 Nearby RRC outside the region*

- > SIMS Metal Management, Albury, NSW

**4.4.2 Future needs and opportunities**

There are approximately 80,000 tonnes of underutilised capacity in the existing facilities. This surplus capacity will provide for the region's requirements for at least the next 10 years.

However, many centres need to consider upgrades to improve function, safety, recovery rates and operational performance so that they meet best practice guidelines.<sup>39</sup> For instance, the number with hardstand areas for storing organics needs to be increased, and stockpiling needs to be improved to meet duration, size, volume and spacing operational requirements. Benalla is planning to upgrade to a modern RRC co-located with the landfill to improve public safety and increase recovery rates.

In some areas there is also a need to rationalise and consolidate RRCs to create viable economies of scale to reduce costs, while improving operations, service and viable resource recovery.

There is limited collection of batteries, paint and fluorescent lights outside of Wodonga and Wangaratta. There are opportunities to broaden collection of household chemicals, batteries, paint and fluorescent lights beyond these cities through improvements to RRC/TS.

The Victorian Government has committed to banning e-waste from landfill and is currently considering how this ban will be implemented. It may include requirements for additional infrastructure at RRCs to support the ban. NEWRRG is supporting these improvements through priority actions 1, 2, 3 and 4.

<sup>38</sup> Sustainability Victoria 2013/14, North East WRRG Local Government Survey

<sup>39</sup> Sustainability Victoria 2009, Guide to Best Practice at Resource Recovery Centres



Image above: A worker on the paper and cardboard line at the Wangaratta Material Recovery Facility, sorts for contamination

## 4.5 Materials recovery facilities

MRFs receive commingled recyclables from MSW and C&I waste streams collected by local government or private contractors, and sort and send them to reprocessors. Materials leaving the facility bulked or bailed can include:

- > aluminium
- > steel (ferrous metals)
- > plastic – sorted by plastic type 1-7
- > plastic – mixed
- > glass – mixed cullet
- > paper and cardboard

These materials usually originate from packaging. MRFs are not commonly designed to recover non-packaging materials like steel or plastic from toys or furniture or soft plastic like foils or plastic bags.

The majority of their feedstocks are collected by local government kerbside collections and private contractors servicing business and industry. Sorted material streams are sent to reprocessors for recovery or, if contaminated or unable to be recovered, to landfill for disposal.

**Table 9** Materials recovery facility

Business name	Location	Facility type
Endeavour Foundation Recycling	Wangaratta	MRF – Commingled

### 4.5.1 Current status

There is one operational MRF in the north east region (listed in Table 9 and mapped in Appendix A). This facility, which has a low level of automation, has a capacity of 20,500 tonnes per year and managed 15,400 tonnes in 2013-14.

### 4.5.2 Future needs and opportunities

The MRF has enough capacity to meet the need in the short term but future requirements are influenced by a range of factors including:

- > factors that may increase capacity need such as:
  - closure and consolidation of landfill sites, further increasing the need for accessibility to local aggregation, sorting and transit points
  - pre-sorting of residual waste prior to disposal
  - the facility winning new contracts
  - upgrading of existing RRCs
- > factors that may increase capacity like:
  - upgrades such as optical plastic sorting and glass crushing
  - expansion in material types

Possible strategies for future management of commingled recyclables are set out in the north east implementation plan. In addition, further options for the future management of commingled recyclables, for example whether to establish additional capacity in the region or to better consolidate materials for transport to Melbourne may become apparent as a result of procurement processes.

## WHAT ARE REPROCESSING AND RECYCLING FACILITIES?

### **Organic reprocessing facility:**

- > A facility that biologically reprocesses organic matter, yielding a variety of products including stabilised organic residues for use as a soil additive, heat and renewable energy. › Includes both windrow and in-vessel technologies.

### **Energy from waste facility:**

- > A facility that uses waste or refuse derived fuels as a feedstock to produce a useful end product with market value such as heat and electricity.
- > Technologies can include anaerobic digestion and heat processing such as pyrolysis and gasification.

### **Other reprocessors:**

- > A facility that changes the physical structure and properties of a waste material that would otherwise be sent to landfill adding financial value to the processed material. Without reprocessing, the beneficial use of the material would be lost.

*Image behind: The top of waste and recycling mobile bins*

There are also opportunities to:

- > decrease contamination and therefore the waste from the facility to landfill through improvements in education.
- > use baling capacity at the facility to bulk soft plastics from industry and agriculture if markets are viable.
- > increase viability by improving the value of the glass output which is currently taken to Melbourne as mixed colour cullet usually at a cost to the MRF. Investment in a glass crusher could produce a bedding sand which may have a local market.

Where there are relatively small quantities of certain types of sorted materials, this can create a barrier to economic viability, as markets demand minimum quantities. In these circumstances, aggregation over long periods of time may be required to reach marketable quantities. Priority action 1 to increase recovery of priority materials will help address this need.

## 4.6 Reprocessing and recycling facilities

Reprocessing facilities in the region manage a range of materials from the C&I, C&D and MSW sectors, including:

- > paper/cardboard
- > organic waste
- > wood/timber
- > aggregates, masonry and soil.

### 4.6.1 Current status

There are currently eight private reprocessing facilities in the region (listed in Table 10 and mapped in Appendix A).

Overall, 28% of the materials accepted at these facilities are from within the region, 12% from Melbourne, 32% from elsewhere in Victoria, and 28% from NSW. The major products recovered and sold on include compost/mulch, crushed concrete, asphalt, bricks, glass, metal, oils and fats, bone and meat meal, and paper and cardboard. Additional capacity is planned for some of these facilities.

**Table 10** Reprocessing or recycling facilities

Business name	Location	Facility type
D&R Henderson	Benalla	Reprocessor – Organics
Greenchip	Baranduda	Reprocessor – Organics Reprocessor – Prescribed Industrial Waste (PIW)
Jackson's Earth-moving	Wodonga	Reprocessor – Aggregates, masonry & soil, garden mulch, bitumen and glass
Mansfield Crushing	Mansfield	Reprocessor – Aggregates masonry & soil
Oztek Holdings	Barnawartha	Reprocessor – Organics (Rendering)
Visy Board	Wodonga	Reprocessor – Paper and cardboard
AR Fuels	Barnawartha	Reprocessor – Organics (Oils and fats)
Wodonga Rendering	Wodonga	Reprocessor – Organics (Rendering)

#### 4.6.1.1 Organics

Currently organics facilities in the region produce a range of composts, soil conditioners and bio diesel.

The region has a total installed capacity of 222,000 tonnes per year of garden organics but currently manages only approximately 170,000 tonnes per year.<sup>40</sup>

There is a lack of capacity to process food and garden organics in the region. In 2010 the three alpine resorts introduced a food organics collection and in 2015 four of the region's seven councils introduced a collection of food and garden organics. Currently the kerbside collected material goes to Wagga Wagga in NSW (from Wodonga and Indigo) and to Shepparton (from Wangaratta, Benalla and Falls Creek). Mt Buller and Mt Hotham are processing organics on mountain. A regional processing facility for food and garden organics, operating to EPA guidelines would increase viability of kerbside organics collections.

#### 4.6.1.2 Metals

There are no metal reprocessors in the region. There are several small metal dealers and wreckers that sort and consolidate prior to transport to reprocessors in either Albury or Melbourne. They are not usually involved in council or commercial waste contracts and are too small to be considered a hub.

40 SV, Regional Waste & Resource Recovery Database (RWRRD) v3; infrastructure data provided by Waste & Resource Regional Groups (WRRGs) or Sustainability Victoria

#### 4.6.1.3 Rubber and textiles

There is no regional reprocessing of rubber and textiles. Councils in the region collaboratively procure tyre collection and processing services with tyre reprocessors in Melbourne.

Post-industry and retail textiles are mainly reprocessed via charities although some, such as faulty rolls (exact quantities are not known), go to landfill.

#### 4.6.1.4 Nearby reprocessors outside the region

Other nearby facilities that process materials from the region include:

- > Norske Skog in Albury NSW (paper and cardboard)
- > Carbonmate in Gregadoo NSW (organics)
- > AP Delaney & Co. in Albury NSW (aggregate, masonry and soils)
- > Shoalhaven Recycling (mobile chipper) in Bombaderry NSW (organics)
- > Plastic Forest in Strathmerton VIC (soft plastics).

### 4.6.2 Future needs and opportunities

The future needs and opportunities in this section are considered in the priority actions 1,2,3,4 and 6.

#### 4.6.2.1 Food and garden organics

In 2015, four councils adopted a third food/garden organics kerbside collection service. The additional organic waste which has been collected in Wodonga and Indigo is transported and processed in NSW.

The organics collected in Benalla and Wangaratta are being transported to Shepparton for processing.

High cost of transport and low value of the commodity can result in high cost for the community. A solution based in the region to manage part or all of the food and garden organics may be desirable and can help reduce cost.

The establishment of an anaerobic digestion facility to produce biogas, energy and compost could also be explored given an ideal setting and industry or water authority partnership.

#### 4.6.2.2 Wood and timber

There is sufficient reprocessing and treatment capacity in the region with two private reprocessors and energy from waste (EfW) facilities. Improved aggregation and transport of timber to reprocessing facilities is required to increase viability and recovery of wood and timber.

All council RRCs in the region are currently receiving timber and garden waste which is chipped on site. Timber and garden mulch is often contaminated due to storage on gravelled ground. Upgrades at council RRCs are needed to improve separation of timber and wood, reduce contamination, improve leachate control and improve product marketability.

There is a need to promote existing timber reprocessing services to industry and develop viable and sustainable local mulch markets.

#### 4.6.2.3 Glass

Currently there is no local reprocessing/crushing of glass in the region. The cost versus benefit of smaller scale glass crushing needs to be evaluated, as there may be opportunities for viable products to use this material such as pipe bedding and in road base. Further trials of local reprocessing options for glass are required.

#### 4.6.2.4 Plastics

Currently, no local facilities recycle or process plastic silage film and there are not enough plastic balers for managing this product in the region. There is no coordinated hard plastics collection or a solution for polystyrene recovery currently in the region. The cost versus benefit of options to collect plastic silage film and regional solutions to manage hard plastics and polystyrene need to be evaluated. If viable, separation of soft and hard plastics could be trialled at RRCs and in kerbside recycling collections. It may create a need for plastic reprocessing capacity in the region to minimise transport cost of this low density, low value commodity.

#### 4.5.2.5 Aggregates, masonry and soil

There is adequate processing capacity in the region to manage aggregates, masonry and soil, which are mainly reprocessed or managed through non-landfill means. There is further market opportunities for VicRoads certified reprocessed products like road base from crushed concrete.

## 4.7 Energy from waste facilities

EfW facilities convert waste to heat, electricity or gas using combustion, gasification or anaerobic digestion technologies. EfW facilities contribute to Victoria's renewable energy target by converting waste to heat and power. Feedstock for EfW facilities should consist only of residual waste from which all recoverable materials have been extracted. The technologies suited to MSW treatment require large amounts of waste to justify the large capital outlay involved, generally involving annual throughputs in excess of 100,000 tonnes to warrant capital investment of over \$30 million for most systems. Small-scale technologies targeted to particular waste streams with high calorific value (e.g. anaerobic digesters treating wet organics, energy generation from combustion/gasification of dry organics) may suit the region. Both large and small-scale technologies are likely to be more feasible when considered on a regional scale, where access to sufficient feedstock allows economies of scale to be achieved.

#### 4.7.1 Current status

There are two private EfW facilities in the region (listed in Table 11 and mapped in Appendix A). Both facilities use high moisture content chipped plant, timber and wood material for energy production and heat, and to produce MDF. The D&R Henderson facility at Benalla uses some local material (from Benalla and Mansfield) with the remainder imported from surrounding WRRG regions. The Alpine MDF facility in Wangaratta facility uses some post industry and post forestry material from the local area, or imports green/wood waste for combustion from NSW.<sup>41</sup>

**Table 11** Energy from waste facilities

Business name	Location	EfW Facility type
Alpine MDF	Wangaratta	EfW combustion facility (garden waste and waste timber)
D&R Henderson	Benalla	EfW combustion facility (garden waste and waste timber)

#### 4.7.2 Future needs and opportunities

Opportunities exist to co-locate small scale energy from waste technologies with water treatment plants that are also an essential service located with established buffer distances and often with available land.

The existing facilities could accept garden organics from RRCs, however this material is generally contaminated by grit and stones because it is not stored on sealed hardstand areas. If contamination can be eliminated this material would be viable feedstock. There may be an opportunity for EfW plants to use other high calorific materials that have no other viable market like some plastics and textiles as feedstock. This would require upgrades to the facilities and EPA works approval.

A facility that uses residual waste as feedstock for EfW as an alternative to sending it to landfill is unlikely to be viable in the near future due to low tonnages. However, in the medium term (5-10 years) there may be opportunities to combine residual waste with another WRRG region, NSW, or industry to justify the development of another viable facility by the private sector, or an upgrade to existing facilities. Technological advances within the waste and resource recovery sector should be monitored. Priority actions 1 and 6 will help to address this.

## 4.8 Operating landfills

Landfills play a central role in safely and effectively managing waste materials. Although the State government and NEWRRG aim to maximise resource recovery and explore options other than landfills, landfills will continue to play a necessary role in the region infrastructure network for at least the medium-term. In the long-term there will still be a need for some landfill capacity to safely dispose of residual material for which alternative uses cannot be found.

Landfills can impact public health, the environment and amenity if they are not located and managed properly. For landfills receiving putrescible material, best practice rehabilitation and post closure management may extend beyond 30 years after a landfill stops receiving waste.

The assessment of the status, future need and scheduling of landfilling considers:

- > the goals and strategic directions of the state infrastructure plan, which includes the goal of landfill disposal only where materials have been viably extracted for reuse or reprocessing
- > the Waste Management Policy (Siting, Design and Management of Landfills) 2004<sup>42</sup>
- > Best Practice Environmental Management (Siting Design Operation and Rehabilitation of Landfills) 2015<sup>43</sup>

#### 4.8.1 Current status

There are five operating putrescible landfills in the region (listed in Table 12 and mapped in Appendix A).

The Benalla, Bowser and Myrtleford landfills are licensed by the EPA whilst the Corryong and Cobungra landfills are exempt from licensing. Of municipal solid waste generated in the region, 44% is sent to the region's landfills. The other 56%, and a significant volume of industrial waste, is landfilled outside of the region – in Albury or Shepparton.<sup>44</sup>

The Alpine Shire Council has announced that the Myrtleford landfill will close in 2017.

The Bowser and Benalla landfills receive the largest amount of waste. Their projected operating costs are lower than the Corryong, Myrtleford and Cobungra landfills. Corryong and Cobungra landfills offer landfilling options to isolated communities where transport costs hinder the adoption of alternative disposal options.

Currently there is no pre-sorting of mixed loads of waste received at landfill sites prior to disposal and no options for aggregation and bulking to reduce cost of transport of waste to these facilities.

41 SRU, Survey and Analysis of Regional Reprocessors and Material Recovery Facility Operators 2015

42 EPA, Waste Management Policy (Siting, Design and Management of Landfills) No. S264, Gazette 14/12/2004

43 EPA, Siting, design, operation and rehabilitation of landfills, Best practice environmental management, Publication 788.3\* August, 2015

44 Nolan Consulting, North East Region – Future Landfills Options Study, September 2014

**Table 12** Operating putrescible landfills (2013–14)

Landfill	Council/alpine resort responsible	Tonnes managed [per year/in 2013-14] <sup>45</sup>	Estimated remaining capacity (tonnes) <sup>46</sup>
Myrtleford	Alpine	3,100	80,000 (closing in 2017)
Benalla	Benalla	11,000	750,000
Corryong	Towong	1,700	29,500
Bowser	Wangaratta	21,600	195,000
Cobungra	Mt Hotham	220	4,500

**4.8.2 Future needs and opportunities**

Priority actions 5 and 8 will support addressing the needs in this section.

NEWRRG intends to review the landfill needs assessment in 3-5 years. This will ensure that any gap in the availability of landfill airspace to meet the needs of the region will be identified and addressed with adequate time to determine the most appropriate solution(s), schedule new infrastructure in accordance with the statewide process (if required) and allow sufficient time for planning and construction.

Other factors which could trigger an earlier review or change to the schedule include:

- > a direction from the Minister for Energy, Environment and Climate Change
- > unexpected closure or filling of a landfill resulting in an immediate need
- > a request from another WRRG region to manage residual waste in one of the landfills in the region
- > a scheduled landfill not receiving approvals for scheduled expansions.

In addition there will be a high level contingency review undertaken by the regional waste and resource recovery groups across the state every 12 months. This will include consideration of the impact of emergency events.

**4.8.3 Landfill airspace needs assessment**

Landfills are part of Victoria’s waste and resource recovery infrastructure system. The Waste Management Policy (Siting, Design and Management of Landfills) requires that the development and use of landfills be minimised, but it is a role of the north east implementation plan to ensure sufficient landfill airspace to meet the requirements of the region for the disposal of residual waste.

Many factors impact on how much landfill airspace will be required to meet the north east region’s needs. A key factor is the north east implementation plan’s objective to increase resource recovery so that only materials that cannot be viably recovered are disposed of to landfill. With changes in technologies and improved markets for goods made from recovered materials, many of the materials currently going to landfills may be recovered in future.

To achieve this NEWRRG undertook a process in accordance with the document titled 'Guideline Making, amending and integrating the State-Wide Waste and Resource Recovery Plan and Regional Waste and Resource Recovery Implementation Plans', which assessed and determined the region’s landfill airspace needs. As part of this process, NEWRRG has committed to undertake regular future reviews of the north east implementation plan in accordance with the EP Act and relevant guidelines.

To determine landfill airspace needs the Group considered:

1. Projected tonnages of residual waste likely to need landfilling in the next 30 years taking into consideration:
  - a. The region’s population and catchment growth
  - b. Business as usual (BAU) recovery rates combined with the loss of landfill contracts with Albury landfill as worst case scenario
  - c. Potential impact of recovery initiatives that could divert material from landfills (which are most likely to go ahead or have commenced since the baseline data year)
  - d. Information from the waste and resource recovery industry
  - e. Future of other existing landfills (including consideration of capacity need to compensate for landfills planned for closure)
2. Information from the owners and operators of individual existing landfill sites including:
  - a. Compaction rates (if not available then a default low compaction rate was used)
  - b. The amount of daily cover
  - c. Site survey results, where available
  - d. Local knowledge
  - e. Future plans
  - f. Airspace availability
  - g. Land use planning and EPA works approval status of the available airspace

45 SV, Regional Waste & Resource Recovery Database (RWRRD) v3; infrastructure data provided by Waste & Resource Regional Groups (WRRGs) or Sustainability Victoria

46 Tonnes estimated by local government waste officers



3. Tonnes currently going to individual landfills including:
  - a. Landfill levy and council sourced data
  - b. Specific factors that may have influenced the data collection year (e.g. a major event such as a flood that caused more waste to be landfilled than in a typical year)
  - c. Tonnages expected to be landfilled under contracts and duration of these contracts
  - d. Flows to or from other WRRG regions or interstate (including feedback from the generating WRRG in relation to long term prospects of these flows continuing)
4. Contingency requirements including:
  - a. Natural disasters
  - b. Unexpected closure of facilities including those that may be in another WRRG region and provide a service (landfill or recovery) to the region
5. The management, accuracy and verification of information provided by third parties and impact of data gaps on the assessment. If data was unavailable, a conservative approach was taken.

#### 4.8.4 Findings

NEWRRG has developed a model to assess whether the region will need additional landfill airspace within the 10 year timeframe of the north east implementation plan. The model was developed using MSW, C&D and C&I data from 2013–14, projected population growth, and the assumption that an organics collection would reduce MSW by 25%.<sup>47</sup>

**The modelling showed that there is ample airspace in the region – under Option 2, worst case scenario, airspace would last for more than 30 years, or more than 20 years beyond the timeframe of the north east implementation plan.**

Two options have been tested.

#### Option 1: Business as usual

This scenario models the current status assuming that councils will continue to use and operate the currently available landfills for the planning period of ten years.

- > Benalla Landfill receives MSW and C&I from Mansfield, Strathbogje and Benalla
- > Bowser Landfill receives MSW and C&I from Wangaratta
- > Myrtleford Landfill continues operating (at the time of modelling Myrtleford landfill was to continue its operation)
- > Wodonga and Indigo MSW is landfilled in Albury
- > Wodonga, Wangaratta, Benalla, Strathbogje and Indigo provide kerbside food and garden organics collections.

#### Option 2: Myrtleford Landfill is closed, and Wodonga and Indigo MSW is landfilled in Benalla

This scenario tests whether the region can provide sufficient airspace for the duration of the ten-year planning period if Albury landfill becomes unavailable and Myrtleford closes.

- > Benalla Landfill receives MSW and C&I from Mansfield, Strathbogje and Benalla
- > Bowser Landfill receives MSW and C&I from Wangaratta
- > Myrtleford Landfill closes in 2016 and sends its waste to Bowser Landfill (at the time of modelling Myrtleford landfill was to continue its operation. 2016 was chosen for modelling purposes only)
- > Wodonga and Indigo give notice to Albury in 2016 (terminating rolling five-year contracts) and send waste to Benalla Landfill in 2021
- > All C&D and C&I currently going to Albury goes to Benalla in 2016.

Option 2 recognises that waste streams currently being sent to the Albury Landfill may be redirected to a Victorian landfill if Albury City Council implements its commitment to increase the gate fee by 10% per year until 2019, with the result that it may be more cost effective to use a Victorian landfill. If the NSW government implements a landfill levy on the waste sent to the Albury Landfill, the gate fee would increase further.

Data sources include:

- > Victorian local government area survey by Sustainability Victoria (average bin weight, transfer station waste)
- > Data supplied by the local government landfill authorities (MSW, C&I, C&D, available airspace)
- > Victoria in the Future 2015 population figures and individual local government area growth rates.

On this assessment, there is sufficient airspace available (approximately 1,000,000 tonnes) to last throughout this planning period. Therefore, no new airspace is provided for in Part B of the Infrastructure Schedule.

Notwithstanding the results of the modelling, in the unlikely event that the Benalla or Bowser landfills had to close prematurely because of regulatory, amenity, safety or political reasons, there are several viable options outside the region, including the Ellwaste Landfill at Patho, the Cosgrove Landfill at Shepparton, and the Hanson Landfill at Wollert. Their lower gate fees could largely offset the increased transport costs.

This assessment informs Section 6.2 Infrastructure Schedule (Part B) Table 22 Proposed Sequence of filling. Section 50BB(c)(iv) of the EP Act sets out a required minimum timeframe for a landfill scheduling table of 10 years. Whilst the north east implementation

<sup>47</sup> Blue Environment 2011, NevRwaste Organic Services Review

<sup>48</sup> Nolan Consulting, North East Region – Future Landfills Options Study, September 2014

<sup>49</sup> URS, A Risk Assessment of Selected Landfill Sites in the North Eastern Waste Management Region 2006

<sup>50</sup> Pollution Abatement Notices are a regulatory tool to regulate the rehabilitation of closed landfills

plan is for a 10 year period, the Schedule provides an indication of the extent to which the existing landfills may contribute to meeting the needs of the region for a 30 year period. This is to provide clarity to operators, decision-makers and the community. The Schedule will be reviewed at the time of the next review of the north east implementation plan.

#### 4.8.5 Landfill Cost

Increasing community expectations and statutory requirements for landfill design, operation, rehabilitation, gas management, annual monitoring and post closure management mean there is a high cost for landfill operation. The landfill levy is now indexed to inflation. In the future, councils and alpine resorts will need to fund significant liabilities associated with rehabilitation and post closure work for operating and closed landfills.

Costs have been and will continue to be affected by changes in economies of scale. The quantities of waste being managed by most of the landfills in the region are relatively small and are declining due to increasing recovery rates. While this is reducing overall landfill costs, it is having a significant effect on the cost per tonne and the efficient operation of facilities.

The recent rollout of food and garden organics services by four councils and reduced frequency of garbage bin collection has reduced kerbside waste by 30–40% by weight, and waste to landfill by 15–20% by weight. Increased recovery of C&I and C&D wastes will also have an effect on the quantities of waste that need to be transferred, transported and landfilled resulting in an expected further deterioration in the economies of scale, cost effectiveness and efficiency of existing landfills.

There are currently five landfills in the region each managing relatively small quantities of waste. Looking at how we use landfill infrastructure across the region in the longer term may provide opportunities to improve cost-effectiveness. There may be opportunities to consolidate use of landfills to achieve economies of scale. As outlined in priority action 8, NEWRRG therefore proposes to work with communities and local councils on a long-term strategy for landfilling in the region.

Increases in landfill regulatory requirements has also increased the need for skills and expertise within councils and alpine resorts to plan for, design, construct, operate and rehabilitate landfills while managing them as a viable business.<sup>48</sup>

A region wide plan or strategy would assist to create a residual waste collection, transfer, transport and landfill disposal network that optimises economies of scale, cost effectiveness and operational efficiency. Pre-sorting at landfills also needs to be considered to improve resource recovery along with the assessment of opportunities to collaborate and aggregate waste.

## 4.9 Closed Landfills

### 4.9.1 Current status

In 2006, 39 landfill sites in the region were identified as having been closed within the past 30 years.<sup>49</sup> It is estimated that at least

26 of these sites have not been rehabilitated. The EPA has issued Pollution Abatement Notices<sup>50</sup> for two closed licensed landfills in the last two years; rehabilitation is now under way or planned at these sites.

### 4.9.2 Future needs and opportunities

The high cost of rehabilitation and ongoing post closure management to the standards required by the EPA are mostly unfunded liabilities, particularly for closed unlicensed sites. Delays are expected while councils allocate funding for this remedial work.

NEWRRG proposes to assist this process by facilitating work between councils and the EPA to develop risk-based assessments for closed landfills in the region that take into account the local context. This may help reduce overall landfill rehabilitation costs, as there may be locally-appropriate approaches that effectively reduce environmental and human health risks of these landfills more efficiently than current approaches that are aimed at landfills more broadly. This is reflected in priority action 7.

## 4.10 Asbestos

Asbestos is a silicate mineral made up of tiny fibres that form a dust when disturbed. Asbestos fibres breathed into the lungs can cause a range of health problems including lung cancer and mesothelioma. Asbestos was previously used extensively in building products in Australia. All use, import or manufacture of asbestos was banned completely in Australia by 2003.

Table 13 lists the landfills that accept asbestos in north east Victoria. Managing asbestos safely is a major regional and statewide priority.

### 4.10.1 Current Status

The relative scarcity of disposal locations for domestic asbestos is further compounded as each of the three available disposal locations within the region each have some conditions upon the receipt of asbestos:

- > Benalla landfill: domestic quantities of asbestos from within the Benalla Rural City Council only
- > Porepunkah RRC: domestic quantities of asbestos from within the Alpine Shire only
- > Bowser Landfill: appointment 24 hours prior to delivery. The landfill has in the past experienced temporary closures for asbestos.

In many instances the distance from population centres within the region to an unrestricted disposal site is more than 100 km. The closest asbestos disposal location to the region in case of temporary closure for asbestos disposal at Bowser landfill would be in Wollert, near Craigieburn north of Melbourne.

48 Nolan Consulting, North East Region – Future Landfills Options Study, September 2014  
49 URS, A Risk Assessment of Selected Landfill Sites in the North Eastern Waste Management Region 2006  
50 Pollution Abatement Notices are a regulatory tool to regulate the rehabilitation of closed landfills

**Table 13** Landfills that accept asbestos in north east Victoria

Type of asbestos accepted	Location of landfill	Additional info
Domestic	Benalla landfill	Receives generally small quantities of asbestos that a householder doing a DIY job may encounter (e.g. bathroom renovation where asbestos sheeting is present). The asbestos needs to be packaged correctly and may be transported in a householders own vehicle to a licensed landfill for disposal without transport certificates or a permitted vehicle.
	Porepunkah, Mt Beauty and Myrtleford RRC	
Commercial and domestic	Bowser Landfill	The landfill is able to receive asbestos from both domestic (as above) and commercial sources.

The Domestic Asbestos Working Party on behalf of the former Association of Victorian Regional Waste Management Groups (AVRWGM), with representation from EPA, WorkSafe Victoria, SV, Department of Health and Human Services, Municipal Association of Victoria, Gippsland Asbestos Related Diseases Support Incorporated and the Gippsland Trades and Labour Council developed the 2011 Managing domestic non-friable asbestos at resource recovery centres guidelines. They were for facilities receiving non-friable asbestos from domestic sources and subsequent transfer to a licensed landfill for disposal.

NEWRRG supports greater availability of responsible and accessible disposal options for asbestos bearing material through appropriate infrastructure, education and training, as well as councils obtaining appropriate insurance coverage.

NEWRRG has helped improve established receival facilities by supporting the development of procedures and training.

#### 4.10.2 Future needs and opportunities

More work needs to be done to provide greater coverage and opportunity for the public to appropriately dispose of asbestos from domestic sources. Providing such facilities should reduce the level of inappropriate disposal, such as illegal dumping and concealment of asbestos materials in domestic waste, and therefore the risk to the community and to landfill or transfer station staff.

The appropriate safe work practices are required to be developed at RRCs to ensure that, if asbestos waste arrives at the RRC, it is managed, transported and disposed of in a manner that protects employees, customers, the community and the environment from harm.

The illegal dumping of asbestos is a significant issue and represents a substantial annual cost to councils. Local government has specific responsibilities in emergencies such as bush fires that are outlined in municipal emergency management plans. Municipalities should have a public health emergency management sub-plan for asbestos management that outlines specific public health issues that could arise in the municipality and how to manage them.

Following an asbestos-related emergency, councils are the lead agency for all domestic or non-workplace locations. In addition to management of post incident issues on-site, councils may also need to distribute information to residents and handle public health enquiries.

Local government involvement in an asbestos incident may include:

- > assessing the structural safety of the building
- > assessing the affected site to determine whether an offsite public health risk/nuisance exists, or is likely to exist, under the Public Health and Wellbeing Act 2008 (Vic)
- > providing advice/enforcement for clean-up of the site and safe disposal of materials
- > distributing public health information to address community concerns.

When receiving construction waste at resource recovery facilities, councils are required to comply with the WorkSafe industry standard *Recycling Construction and Demolition Material -Guidance on Complying with the Occupational Health and Safety (Asbestos) Regulations 2003*.

#### 4.11 Hazardous waste

Hazardous wastes are wastes that pose significant environmental and/or human health risks if not managed or disposed of safely. Under Victoria's current hazardous waste management framework, many hazardous wastes are 'prescribed' through Victoria's Environment Protection (Industrial Waste Resource) Regulations.

The Victorian Government is committed to the protection of human health and the environment from the possible harms of hazardous wastes. A review of Victoria's hazardous waste management framework has commenced. This review will consider the infrastructure needs to appropriately manage these waste streams, including the potential to integrate this information into the state infrastructure plan and regional implementation plans.

## 4.12 Financial and environmental performance

Many factors, as outlined in Table 14, influence the financial and environmental performance of infrastructure.

**Table 14 Financial and environmental factors affecting performance of infrastructure**

Infrastructure category	Environmental and financial performance in the region	Opportunities
RRCs	<p>Councils operate RRCs from a service focus rather than a profit motive. Larger RRCs such as those in Benalla, Wangaratta and Wodonga are likely to be financially more viable. The RRCs are however still a cost centre for councils.</p> <p>Materials get aggregated at RRCs and bulk transported to re-processors. Viability is determined by quantity, quality, market fluctuations and transport distance to re-processors.</p> <p>Low value materials with long transport distances may be more viably disposed of in landfill which can pose a barrier to the development of collection systems.</p>	<p>There is a need to consolidate materials through collective tendering of services and voluntary rationalisation of infrastructure by councils where economies of scale are low, operations are challenging and the cost per tonne of waste managed is high or rising. This will lead to better economies of scale.</p> <p>There is an opportunity to explore social enterprise for the management of RRCs and re-use shops to increase environmental and financial performance and to create jobs.</p> <p>There is an opportunity to consolidate waste at larger (and fewer) central RRC facilities spaced throughout the region.</p> <p>Smaller local solutions may be preferable for organics recovery to increase viability.</p> <p>Priority actions: 1, 3, 4</p>
MRF	<p>The MRF operating in the region is small and is run by a nonprofit social enterprise. It produces two to three manually sorted plastic streams and the rest of the plastic goes to recycling facilities in the metropolitan WRRG region for machine sorting.</p> <p>The MRF provides jobs for disadvantaged employees rather than focusing on sorting technology.</p> <p>Glass fines cannot be sorted and currently end up in landfill.</p> <p>Mixed colour glass cullet has no viable market and is transported at cost to reprocessors in the metropolitan area.</p> <p>Material output quantities are usually too small to attract a good price on the market.</p> <p>Commodity price fluctuations can limit viability.</p>	<p>Infrastructure upgrades could improve the range of output materials and increase recovery.</p> <p>Glass crushing infrastructure could produce bedding sand for the region's pipe infrastructure installers like water authorities.</p> <p>Priority actions: 1, 3, 4, 5, 6, 9</p>

Infrastructure category	Environmental and financial performance in the region	Opportunities
Organics processing	<p>Long transport distances and food transport regulations for organics may be prohibitive to the viability of organics recovery.</p> <p>A significant barrier to the growth of the organics waste industry has been the absence of mature markets (for example, broad-acre agriculture, viticulture, horticulture) and sustainable prices for products.<sup>51</sup></p>	<p>Smaller local solutions may be preferable for organics recovery to increase viability.</p> <p>There is a need to develop sustainable and viable markets for organics, rather than stockpiling material.</p> <p>There is an opportunity to use compost and mulch as landfill rehabilitation, and for some material to be used as feedstock for EfW facilities.</p> <p>In the market sounding a local covered windrow operation was suggested.</p> <p>Priority actions: 1, 3, 4, 5, 6</p>
Wood/timber processing	MDF industry is using some recovered timber in fibre board.	
Paper /cardboard processing	<p>Well-developed collection systems for commercial and kerbside sources.</p> <p>Leakage of paper and cardboard to landfill is a lost opportunity.</p> <p>Vertically integrated industry with mature markets and well developed collection systems.</p>	<p>Increase the capture of up to 12% by weight of paper and cardboard in the domestic and C&amp;I residual stream.</p> <p>Priority actions: 1, 2</p>
Plastic processing	<p>High volume, low value commodity. A lot of soft plastics go to landfill due to high transport cost.</p> <p>Hard plastics often require disassembly to sort materials.</p> <p>Commodity price directly correlates to oil prices.</p>	<p>Local plastic re-processor would reduce transport cost and increase the recovery rate and create jobs in the region.</p> <p>Priority actions: 1, 2, 4, 5</p>
Metal processing	Market price fluctuations resulting in material stockpiling and/or export.	
Aggregate, masonry and soil processing	<p>Low margin material markets, competing with cheap virgin materials or product imports.</p> <p>There is no market for low quality not certified product.</p>	<p>Support re-processors to produce better quality certified product.</p> <p>Priority actions: 1, 2</p>
Energy from waste	<p>Regulatory gaps prolong approval times and costs.</p> <p>Sourcing the large capital necessary for investment in infrastructure and equipment.</p> <p>The ability to attract sufficient and consistent material volumes to reach viable economies of scale.</p> <p>Small scale co-generation plants are operating, however can't use locally sourced materials due to quality issues</p>	<p>Assess potential to development of small scale technologies targeted to particular waste streams with high calorific value.</p> <p>Investigate improvement of the quality of local garden waste to enable use in co-generation plants</p> <p>Priority actions: 1, 4, 10</p>

<sup>51</sup> Sustainability Victoria, Victorian Organics Resource Recovery Strategy September 2015

Infrastructure category	Environmental and financial performance in the region	Opportunities
Operating Landfills	<p>Changes in regulation over time such as Landfill Best Practice Environmental Management (BPEM) and stricter licence conditions have gradually increased the cost of landfill operations.</p> <p>Financial assurance - relating to provisions that must be maintained by landfill operators to cover the cost of remediation, rehabilitation and site aftercare and ensure that these costs are not borne by the community. The amount of money being set aside by councils in north east Victoria may be insufficient given the increasing costs of rehabilitation and site aftercare.</p> <p>Reliance on a single landfill in the region carries the risk of closure due to regulatory or other circumstances.</p> <p>Landfills pose significant environmental risks that need to be managed carefully:</p> <p>Greenhouse gas emissions generated from landfill sites</p> <ul style="list-style-type: none"> <li>- Currently only one landfill has gas capture and flaring</li> <li>- Odour, particulate and litter matter from landfills</li> <li>- Noise as a result of operation hours or truck routes</li> <li>- The discharge of trade waste needs to be managed in accordance with licence specifications</li> <li>- Leachate which can cause groundwater pollution if not properly managed, and can promote landfill gas generation.</li> </ul>	<p>Investigate opportunities to pre-sort materials prior to landfilling.</p> <p>Strategically plan landfill airspace in the region.</p> <p>Plan contingencies with neighbouring WRRG regions to be prepared for the possibility of temporary landfill closure.</p> <p>Priority actions: 1, 2, 3, 4, 5, 6, 8, 9</p>
Closed landfills	<p>Some closed landfills were sited and built to standards that, although acceptable at the time, would not be acceptable today.</p> <p>EPA is responsible for overseeing landfill owners' compliance and has implemented a better practice risk-based regulation model.</p> <p>However, localised risks to the environment and surrounding community amenity can be better managed, particularly at older sites. The Victorian Auditor-General commented on improvements needed to address these risks, which the EPA and councils are currently undertaking.</p> <p>Increased compliance cost due to the higher post closure standards.</p>	<p>There is an opportunity to work with liable parties to support greater understanding of the complexity and costs associated with addressing these issues and to work with the EPA to propose new ways to implement a risk-based approach that better suit the individual site needs.</p> <p>Assist councils to address the recommendations of the Victorian Auditor General's Managing Landfills Report, September 2014.</p> <p>Priority action: 7</p>

### 4.13 Waste and resource recovery hubs

Hubs are strategically important locations where materials are managed. Together, they form a system that supports the aggregation of materials within a network for efficient resource recovery and management of waste materials.

According to the state infrastructure plan<sup>52</sup> the region has no existing hubs of state importance. However, the Visy Board facility in Wodonga that reprocesses cardboard from across the state, and the Wangaratta MRF that accepts commingled

recyclables for the region and Goulburn Valley WRRG region, are classified as hubs of regional importance that accept significant cross-regional flows.

Hubs are locations where materials are managed, with supporting spokes that enable materials to be transported. Together they form a system that supports the aggregation of materials within a network for efficient resource recovery and management of waste materials. The region's waste and resource recovery hubs are listed in Table 15.

**Table 15 Waste and resource recovery hubs**

Hub	State	Regional	Local	Current status	Needs and opportunities
Benalla Landfill, Benalla		✓		<p>The hub is surrounded by Industrial 2 zoned land to the north and to the south east. There is minimal risk of residential development within the buffer. It is appropriately zoned for its purpose. It has a lifespan of 40 years at current filling rates.</p> <p>Benalla is considering an amendment to the planning scheme to add an Environmental Significance Overlay to add buffer protection in regard to one vacant block of land to the south of the facility.</p> <p>A small RRC is located at the site.</p> <p>The public has direct access to the landfill face, which creates safety risks that need to be managed.</p>	<p>Potential to become a cost competitive landfill for the region.</p> <p>Need to develop transfer facility for residual waste at the RRC.</p> <p>Opportunity to consider pre-sort prior to disposal.</p> <p>The siting and zoning allows co-location with other facilities.</p> <p>With further expansion, additional traffic and heavy vehicles, changes in access and the road network may be warranted.</p> <p>Priority action: 8</p>
MRF, Wangaratta		✓		<p>Situated in an industrial area with no risk of residential encroachment.</p>	<p>Further upgrades to automated equipment and potentially glass crushing are needed.</p> <p>Upgrades are an opportunity to increase capacity and lower costs.</p> <p>Priority action: 1</p>
AR Fuels & Oztek, Barnawartha		✓		<p>Receives waste oils from throughout Victoria. Zoned appropriately. No sensitive land uses surrounding.</p>	
Visy Board, Wodonga		✓		<p>Reprocessing and manufacture of cardboard boxes and associated products. The hub is situated in an industrial precinct surrounded by industrial zoned land.</p>	
D & R Henderson, Benalla			✓	<p>The hub is located away from sensitive receptors (for example residential development, schools, hospitals and kindergardens) and appropriately zoned.</p>	<p>With upgrades to eliminate the grit/sand contamination at RRCs, north east councils could supply garden organics to this hub.</p> <p>Priority action: 1</p>

<sup>52</sup> Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan, Victoria 2015-44

Hub	State	Regional	Local	Current status	Needs and opportunities
Greenchip, Baranduda			✓	Organics processing in an Industrial 1 zone. A buffer distance greater than 500m is in place. Leachate management has been recently upgraded to meet licence requirements. Co-located with a wastewater treatment plant.  Other activities include oil separation and sludge drying of liquid industrial waste and the treatment of a range of prescribed waste.	Upgrade to in-vessel composting plant to manage kerbside food and garden organics are an opportunity to increase licensed capacity.  Priority actions: 3, 4 and 5
Alpine MDF, Wangaratta			✓	Waste timber and garden organics combustion to produce heat and power and high quality MDF. Zoned Industrial 1. Next to water treatment plant. Protected from residential encroachment.	With upgrades to eliminate the grit/sand contamination at their RRCs, north east councils could supply garden organics.  Priority action: 1
Wodonga Rendering, Wodonga			✓	Co-located with an abattoir. Adjacent to a pet food producer. Space constraints that limit expansion. No access or transport constraints.	
Wangaratta RRC, Wangaratta			✓	Space for co-location of compatible industry like C&D reprocessor. Protected due to the current industrial zoning of the area around the hub. Includes household chemical collection site.	This site requires improvements to its garden organics and timber storage areas; and modernisation with roofed areas for storage and increased sorting.  There may be a future need to increase the capacity if smaller RRCs close.  Priority action: 1
Wodonga RRC, Wodonga			✓	RRC in an Industrial 1 zone. Separation distance greater than 500m are in place. Co-located with Jacksons Earthmoving. Space for further co-location. Includes household chemical collection.	Options for pre-sorting of mixed waste need to be considered.  Priority action: 2
Bowser Landfill, Wangaratta			✓	Appropriately zoned. There are two residences and a motel within 500m of the site fence. Risk of further encroachment is low. Airspace availability for a further 19 years. Only landfill in region to accept asbestos as well as low level contaminated soil (other options for disposal of these wastes are outside the region).	There is an opportunity to install organics processing capacity on the site.  If this landfill closes prematurely or if the airspace is exhausted, a transfer station may be required.  There are opportunities in this area to cluster land for industrial and waste purposes.  There is an opportunity to consider pre-sorting of waste prior to disposal.  Priority actions: 1, 2, 4 and 8
Jacksons Earthmoving Wodonga			✓	Located next to the Wodonga transfer station allowing material transfer. Located within an industrial area.	There is potential for increased use of crushed glass in road base, and reprocessed bitumen products, and options to cooperate with MRFs in the region to source the material.  Priority action: 1

Image page 48: An excavator breaks up large concrete blocks for reprocessing







Image above: A truck weighs in on the Wangaratta weighbridge before entering the landfill

## 4.14 Land use and transport planning

### 4.14.1 Land use planning

#### 4.14.1.1 Current status

It is important that the north east implementation plan aligns with planning policies, statutory planning controls, and strategic planning documents.

The alignment of waste and land use policy promotes consistent decision making by state and local government, and helps to ensure that waste and resource recovery facilities and hubs are planned and protected so they can meet the waste and resource recovery needs of the region into the future.

The Victoria Planning Provisions (VPPs), upon which all Victorian planning schemes are based, require all involved in planning, including councils, to consider a number of relevant statutory policies such as State Environment Protection Policies and Waste Management Policies, and state government policies relating to, or impacting on, waste management and resource recovery.

Clause 19.03-5 of the VPPs, which relates specifically to waste and resource recovery, identifies that it is an objective of planning in Victoria to avoid, minimise and generate less waste, to reduce damage to the environment caused by waste, pollution, land degradation and unsustainable waste practices. This clause states that planning must consider any relevant regional waste management plans, which includes the north east implementation plan.

Key waste and resource recovery strategies are outlined in the clause, and include:

- > Establishing new sites and facilities to safely and sustainably manage all waste.
- > Encouraging facilities that can maximise the amount of resources recovered.
- > Encouraging waste generators, resource generators and resource recovery businesses to locate in close proximity to enhance sustainability and economies of scale.
- > Ensuring separation distances for waste and resource recovery facilities be defined, protected and maintained.

#### 4.14.1.2 Future needs and opportunities

NEWRRG has examined state and local government strategic planning documents to identify the challenges, needs and opportunities for new and existing infrastructure (Table 16).

**Table 16** Strategic implications for new and existing infrastructure

Council	Current Situation	Challenges, needs and opportunities
Wodonga	<p>Wodonga’s municipal strategic statement (MSS) shows future residential development in the Killara area and north of Baranduda close to industrial zoned land.</p> <p>The strategic planning directions focus on the urban growth areas and recently developed industrial areas which are expected to be a catalyst for economic development and provide 9,000 new jobs.</p> <p>The industrial zone provides direct access to the Hume Highway which connects Sydney and Melbourne.</p>	<p>In the next ten years, the residential growth corridors identified in Wodonga’s urban growth strategy and the MSS, may impact on WRR facilities.</p> <p>To mitigate the risk of community complaints there is a need to maintain adequate separation distances between incompatible land uses. Likewise, the waste industry needs to operate at a ‘best practice’ level to ensure off-site impacts are minimised.</p>
Wangaratta	<p>Wangaratta’s growth area planning focuses on an area that will not affect any of the current infrastructure and is situated away from industrial zones.</p>	<p>Bowser Landfill, in Wangaratta is the largest landfill in the region and its special use zoning is appropriate, however there are two houses and a motel within 500m. Bowser landfill is surrounded to the north by farming zone and to the south by a large industrial area.</p> <p>The Rural City of Wangaratta has confirmed that it has plans in place to develop a composting facility to service the municipality’s food &amp; garden organics collection on the site.</p>
Indigo and the alpine resort areas	<p>The Indigo Planning Scheme and the Alpine Resort Planning Schemes both have Municipal Strategy Statements (MSS) outlining how future growth is to be managed.</p>	<p>No encroachment of sensitive uses on waste and resource recovery infrastructure is expected over the next 10 years.</p>
Benalla	<p>Benalla Landfill is the second largest landfill in the region. It is zoned appropriately and has good separation distances to existing developments. A vacant block in the rural living zone to the south may introduce one rural residence within 500 m of the site border.</p> <p>Additional Industrial 2 zoned land is available around the site.</p> <p>Benalla RRC is co-located with the landfill and landfill siting and zoning comments apply to the RRC as well.</p>	<p>Benalla Rural City Council is considering introducing an Environmental Significance Overlay in respect of Benalla landfill in order to protect the site from encroachment by sensitive land uses.</p> <p>Additional Industrial 1 zoned land is available around the site and co-location with other waste and resource recovery industries like organics processing has been identified as an opportunity.</p>
Mansfield, Alpine and Towong	<p>The rural facilities are generally situated in farming or special use zones and are often sited on former landfills. They service a relatively small rural population.</p>	<p>The rural facilities are appropriately zoned, and no encroachment on infrastructure is expected over the next 10 years.</p> <p>There are no opportunities for co-location.</p>

## 4.14.2 Transport planning

### 4.14.2.1 Current status

Most facilities in the region have access to an efficient road network, with little or no congestion. Local transport strategies do not include any major transport projects that could compromise an existing or new facility. However, transport and freight combined are a key economic factor affecting facilities in the region, with transport and freight costs in Victoria having risen at about 0.6% above inflation in recent years.<sup>53</sup> These costs often result in materials being stockpiled on site.

Transport costs are especially critical in markets for timber, recycled organics, heavy C&D materials and tyres. The transport cost may exceed the cost of reprocessing or the value of outputs once the distance exceeds 50 km.<sup>54</sup> Lighter or bulky materials such as polystyrene and mattresses, suffer similar transport inefficiencies. Gate fees charged (or paid) by re-processors are generally by tonne and not volume making the transport of a truckload of polystyrene from north east Victoria to Geelong (for example) most often unviable.<sup>55</sup>

Rail may not be an option for reducing transport costs, as it would require significant investment to set up the appropriate infrastructure and logistics.<sup>54</sup>

### 4.14.2.2 Future needs and opportunities

Heavy freight transport through the region along the Hume highway is likely to provide competitive cost of transport of both sorted and consolidated materials to access national and international markets and potentially making it more viable to haul directly to Melbourne for sorting and reprocessing.<sup>54</sup>

There are opportunities to reduce transport costs through compaction and consolidation, as well as new technologies such as walking floor compactors at RRCs and the shredding and/or baling of specific material streams such as cardboard, plastic and tyres.

There is also an opportunity to rationalise smaller local landfills and RRCs and establish larger regional resource recovery, disposal and transport hubs. This would need to be accompanied by regional partnerships and collaborative procurement to establish adequate tonnages of materials to minimise transport costs.

## 4.15 Market sounding and infrastructure scheduling application process

The Loddon Mallee, North East and Goulburn Valley Groups undertook a regional market sounding, together with a resource recovery scheduling application and evaluation process, to inform the development of this plan (including the infrastructure schedule). In total, 26 organisations made submissions, with eight applicable to the north east region. Following a detailed evaluation process two proposals (Table 17) were recommended for inclusion in the infrastructure schedules (Section 6).

The inclusion of these facilities indicates that the proposals may be suitable for meeting future resource recovery needs in the region. The scheduling of this infrastructure does not guarantee that the proposals will be granted necessary regulatory approvals, or will be granted contracts by members of NEWRRG. It is noted that both proposals are for composting facilities; amongst other things, the facilities should meet EPA Guideline: Designing, constructing and operating composting facilities (Publication 1588, March 2015).

**Table 17** Infrastructure scheduling application process - Recommended proposals

Proponent	Municipality	Type of proposal	Description	Products
Greenchip Recycling	City of Wodonga	Existing facility with changed or expanded waste and/or resource recovery. Covered and in-vessel windrow processing. Organic drying plant.	Increase composting capacity at existing facility from 5,000 tonnes per year to 20,000 tonnes. Organics sourced from MSW, C&I, C&D and bio-solids.	Soil improver, pelletised soil enhancer, soilless soils, soil blend, erosion control products, waterway filter material and odour control filters.
Rural City of Wangaratta	Rural City of Wangaratta	New waste and/or resource recovery facility (at existing landfill). Covered windrow composting technology.	Diversion of 5,000-10,000 tonnes of kerbside collected food and garden organics for composting.	Compost material to Australian Standard.

<sup>53</sup> Blue Environment 2016, Future Landfill Options Study II

<sup>54</sup> Blue Environment 2015, Solid Industrial Waste in North East Victoria

<sup>55</sup> Sustainable Resource Use (SRU), Survey and Analysis of Regional Reprocessors and Material Recovery Facility Operators, 2015

## MARKET SOUNDING

A number of proposals were consistent with the needs and opportunities of the region, but did not put forward proposals which were adequately progressed or did not provide enough detail in their submissions and have therefore not been specifically included in the schedule at this time. Other proposals submitted:

- > Diverting 50,000 tonnes of C&I and C&D by targeting aggregates, masonry and soil, glass, ferrous metals and timber. Timber would be gasified (EfW) to produce syngas.
- > Diverting 5,000 tonnes of various materials within the MSW, C&I and C&D waste streams to produce energy and recyclables.
- > Production of organic pellets, syngas and soil conditioner from 25,000 tonnes of MSW, 75,000 tonnes of garden organics, 25,000 tonnes of food organics, 10,000 tonnes of timber, 5,000 tonnes of paper and cardboard, 10,000 tonnes of hard and flexible plastics and 75,000 tonnes of waste timber from the C&I stream.
- > Production of compost, refuse derived fuel and recyclables from MSW residual waste (>50,000 tonnes), garden organics (>20,000 tonnes) and food organics (more than >10,000 tonnes).
- > Diversion of 60,000 tonnes of food waste from the C&I stream to produce energy and compost from anaerobic digestion.
- > Increase in capacity efficiency and capability of an existing RRC.
- > Increase in capacity of an existing landfill/hub from 12,000 tonnes to 40,000 tonnes per year to create a regional landfill facility.

*Image behind: A worker operating a forklift loads baled cardboard onto a truck for transport to Melbourne for reprocessing*



# PART 5: RISKS TO THE EXECUTION OF THE NORTH EAST IMPLEMENTATION PLAN AND CONTINGENCY PLANNING

NEWRRG has conducted a thorough risk assessment process to identify key risks that could affect the successful execution of the north east implementation plan. Mitigation strategies have also been identified and have informed the priority actions and action plan for the north east implementation plan.

**Table 18** North east implementation plan risk register

Risk	Cause(s)	Potential impact	Mitigation strategy	Mitigation addressed in the north east implementation plan	Risk ranking (likelihood of risk eventuating)
Changing or no markets for diverted waste and material streams	Immature markets; low viability and demand	Cost; recovery rate; compliance action; environment; reputation	Work with industry and state government to develop local markets; monitor use of new technologies	Y	Medium
Insufficient infrastructure in place to manage waste and materials	Incorrect or insufficient data or projection; changes in waste generation and market circumstances; emergency event or natural disaster	Cost; recovery rate; compliance action; environment; reputation	Improve data collection and monitoring to ensure accurate data is available to plan for infrastructure requirements; allow for emergency events and sufficient redundancy	Y	Medium
A piece of infrastructure closes unexpectedly or is no longer available	Biohazard; regulatory issue; business failure; market failure; emergency event or natural disaster	Cost; recovery rate; compliance action; environment; reputation	Encourage contingencies to be established in council/ alpine resort waste strategies and plan arrangements to cope with emergency events.	Y	Medium
Key facilities shut down or operational throughput reduced or cannot expand	Encroachment of sensitive uses; community complaints and inappropriate zoning	Cost; recovery rate; compliance action; environment; amenity; health; reputation	Work with local government to address zoning and encroachment issues; support proactive community engagement; ensure the north east implementation plan is referred to in planning schemes.	Y	Medium
Significant increases in transport costs	Increased fuel prices; taxes or freight fees	Cost; market failure; stockpiling; recovery rate decreases	Identify alternative options where possible if this occurs. Improve waste aggregation and transport arrangements to improve efficiencies.	Y	Medium

Risk	Cause(s)	Potential impact	Mitigation strategy	Mitigation addressed in the north east implementation plan	Risk ranking (likelihood of risk eventuating)
Failure of organics processor(s)	Business failure; legislative change; fluctuating supply and demand; market failure	Cost; recovery rate; compliance action; environment; amenity; health; reputation; stockpiling or increased cost of sending waste elsewhere	Support new organics infrastructure; support new market development; build in contingencies for alternative facilities (other WRRG regions and NSW); state government is working to implement the Victorian Organics Resource Recovery Strategy and the Victorian Market Development Strategy which will help to reduce barriers and improve the market.	Y	Medium
Lack of competition for organics processing	Only one licensed facility in the region	Cost; reputation; inadequate capacity	Encourage additional organics facilities to set up in the region and continue to develop local markets; support competition within and from outside the region.	Y	Medium
Major landfill no longer accepts waste	Decision by owner; loss of financial viability; state border restrictions; works approval not granted	Cost; reputation	Establish long term landfill strategy for the region.	Y	Medium
Landfills fill up faster than expected	Increased cross-regional flows; failure of resource recovery systems; increase in waste generation	Cost; reputation	Improve data collection and monitoring to ensure accurate data is available to plan for infrastructure requirements; Establish long term landfill strategy for the region.	Y	Medium
Dependency on one landfill in the region may limit cost-effective contingencies	North east implementation plan objectives drive closures; market-driven, regulatory or policy pressure; agricultural epidemic (biohazard)	Cost; recovery rate; compliance action; environment; amenity; health; reputation.	Establish long term landfill strategy for the region.	Y	Medium
Oversupply of landfill airspace	Greatly increased diversion of material, or loss of population and economic development	Recovery rate; environment; reputation	Plan for a landfill solution for the region. Establish long term landfill strategy for the region.	Y	Low
Industry does not support the north east implementation plan objectives	Lack of industry consultation, and engagement; change in circumstances	Needs and opportunities not met	Consult with industry and the community during the preparation of the north east implementation plan. Brief industry on the final north east implementation plan	Y	Low

Risk	Cause(s)	Potential impact	Mitigation strategy	Mitigation addressed in the north east implementation plan	Risk ranking (likelihood of risk eventuating)
Conflict between north east implementation plan, NEWRRG board and councils/alpine resorts	Lack of alignment between the north east implementation plan and council direction and communication during preparation and meetings with council/resort technical officers and Board	Potential conflict/dispute; failure to meet strategic directions	Maintain constant communications with these stakeholders through the Board, North East Local Government Waste Forum, Technical Advisory Sub-Committee; targeted engagement with staff at councils and alpine resorts. Encourage the development of council and alpine resort strategies which align with the north east implementation plan.	Y	Medium
Stakeholders and community do not support the north east implementation plan objectives	Not engaged enough at the right times; community not adequately informed; wrong communities targeted; wrong questions	Priority actions and strategic directions not met or only partially met	Consult with community and stakeholders throughout the development of the north east implementation plan.	Y	Medium
Lack of market interest to support key infrastructure developments	Insufficient investments	Lack of investment in new or upgraded infrastructure	Investigate all funding opportunities to support the development of infrastructure; work closely with DELWP and SV to ensure any statewide funding programs to leverage private investment in infrastructure take into account infrastructure needs in the region; work closely with SV's Investment Facilitation Service to ensure industry has the assistance and information it requires to invest.	Y	Medium
Emergency events  Emergency events include but are not limited to: natural disasters such as flood, fire, chemical spills, and biosecurity challenges.	Fire, Flood, Storm, etc	Emergency events can impact the waste system and services at a sub-regional, regional or even state wide level: additional landfill airspace for the short-term disposal of waste following an event is typically required - the utilisation of this airspace can impact on capacity availability in the region beyond the event.	State Emergency Plans, prepared by the Victoria State Emergency Service, could consider potential waste needs and agreed options for management and be informed by statewide annual contingency planning process.  Municipal Emergency Management Plans (MEMPs) should include local responses for waste management and disposal options as they are updated.	Y	Medium



Risk	Cause(s)	Potential impact	Mitigation strategy	Mitigation addressed in the north east implementation plan	Risk ranking (likelihood of risk eventuating)
		Emergency events can also lead to restriction of access to a facility for an extended period of time.	Following emergency events, changes to the projected fill rate of utilised landfills should be monitored and inform discussions with operator re changes to timing of applications for approvals and annual contingency planning, as relevant.  Neighbouring WRRG regions with potential contingency landfills need to be informed about their inclusion in emergency planning.		
Adaptiveness of infrastructure and services to climate change	Climate change will place additional pressure on the waste and resource recovery system with more extreme weather events, such as heat waves that may restrict opening hours of facilities, reduce the functionality of facilities or impact on collection systems	Cost; recovery rate; compliance action; environment; amenity; health; reputation	Potential impacts on the system to be understood and managed.	Y	Medium
Inadequate social license to operate	Planned or existing facilities are impacted by changing community attitudes and inadequate social license to operate, reducing capacity to operate, expand or establish. This can occur due to encroachment of sensitive uses into buffers resulting in impacted communities, changes in operations that don't meet regulatory requirements, changes in expectations etc.	Cost; recovery rate; compliance action; environment; amenity; health; reputation	Operators undertake effective community engagement at key facilities and in other facilities during periods of change.  Adequate buffers appropriately reflected in local planning schemes to maintain required distances and reduce impacts on community.	Y	Medium

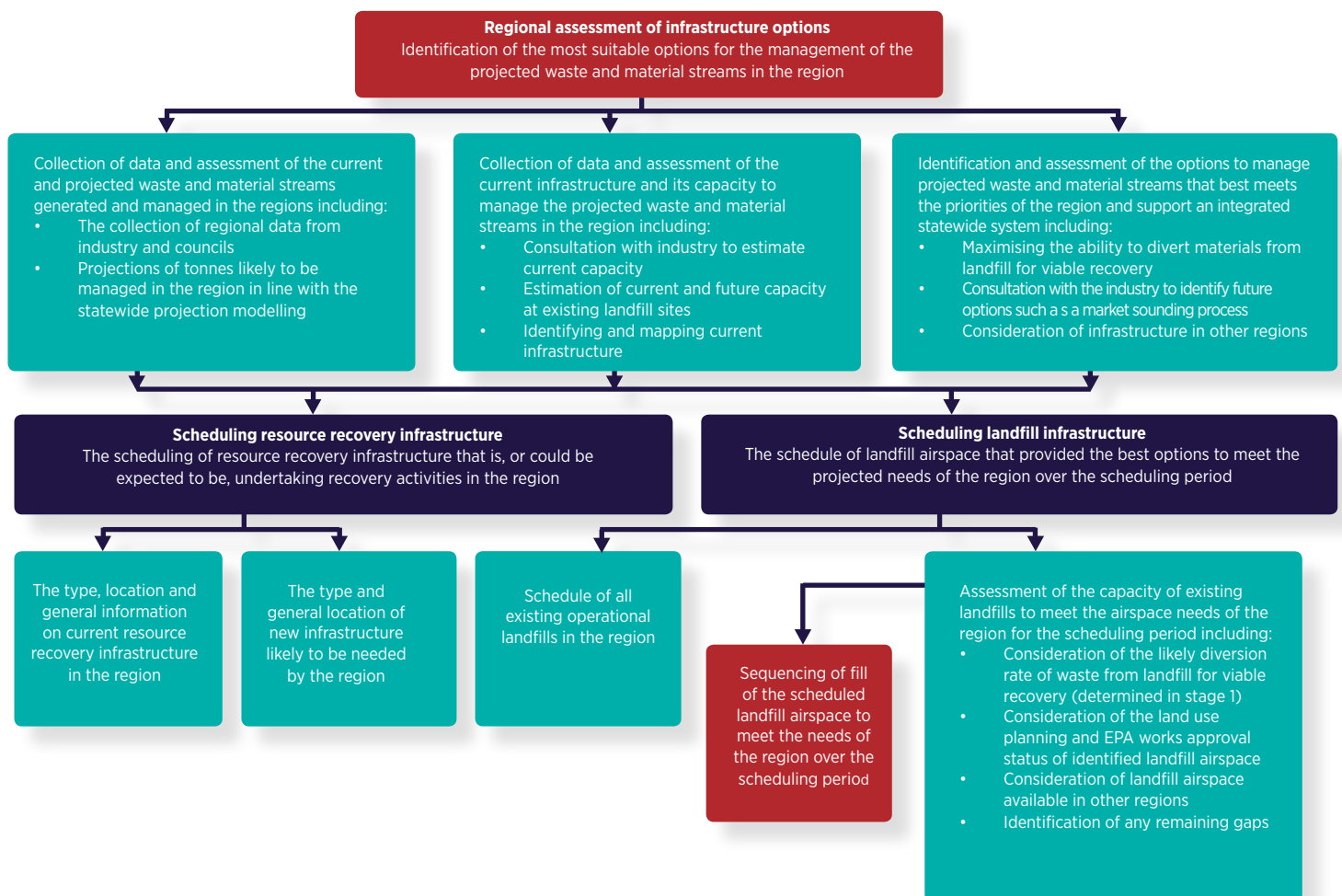
# PART 6: INFRASTRUCTURE SCHEDULE

This schedule enables the identification of gaps in the infrastructure required to meet the strategic directions for the region based on the current status, constraints, and future needs and opportunities (Section 4). In developing this schedule NEWRRG has worked with other waste and resource recovery groups to ensure consistency and alignment with the infrastructure schedules across the state.

This schedule is a list of existing or proposed facilities. It does not reflect whether appropriate operational practices are maintained or whether works and planning approvals are in place. If appropriate approvals are not in place, the onus is on the site owner/operator to obtain them.

Figure 8 shows the process that was employed to develop the infrastructure schedule

**Figure 8** Infrastructure scheduling process <sup>56&57</sup>



56 Guideline: Making, amending and integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Waste and Resource Recovery Implementation Plans

57 Supporting Guideline: Statewide infrastructure scheduling process (SV 2015)

## 6.1 Aligning the infrastructure schedule with planning schemes

The schedule consists of two parts:

**6.2 Part A: Resource Recovery Infrastructure:** Lists the current resource recovery and reprocessing infrastructure (Table 20) improvement needs to existing resource recovery infrastructure (Table 21) and the new infrastructure requirements (Table 22).

**6.3 Part B: Landfill infrastructure:** Lists the current and future landfill needs, including where current landfill activities are undertaken (Table 23) their intended or likely date of closure and the proposed sequence of filling of available landfills (Table 24) along with closed landfills (Table 25).

Aligning the north east implementation plan with relevant local planning schemes is important to achieve the objectives of the Framework. (Table 19) To facilitate this alignment NEWRRG must:

- > **Inform local governments**  
Advise councils in the region that the north east implementation plan (and its Infrastructure Schedule) is the plan referred to in clause 19.03-5 of the Victorian Planning Provisions and that councils should give it due consideration when exercising its planning functions.
- > **Facilitate planning approvals**  
Work with relevant local government and proponents to facilitate planning approvals, where required, to implement new or expanded infrastructure.
- > **Facilitate effective buffers**  
Work with local government to resolve encroachment of sensitive uses into buffers for existing infrastructure.

**Table 19** Land use planning and Waste Planning Framework infrastructure categorisation

SWRRIP and north east implementation plan infrastructure type	Victorian Planning Provision (VPP)	
	Definitions (Clause 74)	Clause 52.10
REPROCESSING INFRASTRUCTURE Other reprocessors	INDUSTRY - Materials recycling  Land used to collect, dismantle, treat, process, store, <u>recycle</u> , or sell, used or surplus materials	Advanced resource recovery technology facility
REPROCESSING INFRASTRUCTURE Organic reprocessing facility		Commercial and Industrial materials recycling
		Construction and demolition materials recycling
		Used metals treatment or processing
		Used paper and cardboard treatment or processing
		Used plastics treatment or processing
Other resource recovery or recycling operations		
REPROCESSING INFRASTRUCTURE Waste to energy facility	Renewable energy facility Land used to generate energy using resources that can be rapidly replaced by an ongoing natural process. Renewable energy resources include the sun, wind, the ocean, water flows, <u>organic matter</u> and the earth's heat. It includes any building or other structure or thing used in or in connection with the generation of energy by a renewable resource. It does <u>not</u> include a renewable energy facility principally used to supply energy for an existing use of the land	Combustion, treatment or bio-reaction of waste to produce energy

SWRRIP and north east implementation plan infrastructure type	Victorian Planning Provision (VPP)	
	Definitions (Clause 74)	Clause 52.10
RESOURCE RECOVERY INFRASTRUCTURE Resource Recovery Centres/ Transfer Stations (RRC/TS)	INDUSTRY – Transfer station  Land used to collect, consolidate, temporarily store, sort or recover refuse or use materials before transfer for disposal or use elsewhere	Refuse and used material storage, sorting and recovery in a transfer station:  - Accepting organic wastes  - other
RESOURCE RECOVERY INFRASTRUCTURE Materials recovery facility (MRF)		
DISPOSAL INFRASTRUCTURE - Landfill	INDUSTRY – Refuse disposal  Land used to dispose of refuse, by landfill, incineration or other means	Sanitary and garbage disposal in landfill
DISPOSAL INFRASTRUCTURE - Incinerator		

Note:

- > Clause 74 of the VPP lists terms used in relation to the use of land. All WRR activities are nested under the headline use of 'Industry'
- > Clause 52.10 lists uses with amenity impacts, some of which are relevant to the WRR activities

## 6.2 Part A: Resource recovery infrastructure schedule

**Table 20** Existing resource recovery and reprocessing infrastructure

Site Name	Owner/Operator	Suburb	LGA	GIS location		Principal waste stream <sup>58</sup>
<b>Dropoff Facility</b>						
Woods Point – Dropoff	Mansfield Shire	Woods Point	Mansfield	-37.5725	146.2564308	Household waste
<b>Resource Recovery Centre (RRC) or Transfer Station (TS)</b>						
Beechworth – TS	Indigo Shire	Beechworth	Indigo	-36.374737	146.679658	Household waste, SIW
Benalla Landfill – RRC	Benalla Council	Benalla	Benalla	-36.511326	146.001273	Household waste, SIW, domestic Asbestos
Boorhaman – TS	Wangaratta Council	Boorhaman	Wangaratta	-36.228517	146.273657	Household waste, SIW
Corryong Landfill – RRC	Towong Shire	Corryong	Towong	-36.220985	147.890697	Household waste, SIW
Eldorado – TS	Wangaratta Council	Eldorado	Wangaratta	-36.301597	146.637923	Household waste, SIW
Glenrowan – TS	Wangaratta Council	Glenrowan	Wangaratta	-36.465707	146.208254	Household waste, SIW
Kane Rd – TS	Wodonga City	Wodonga	Wodonga	-36.1177	146.9059227	Household waste, SIW
Mansfield – RRC	Mansfield Shire	Mansfield	Mansfield	-37.0831	146.0906082	Household waste, SIW
Markwood – TS	Wangaratta Council	Markwood	Wangaratta	-36.467864	146.475917	Household waste, SIW

<sup>58</sup> Further information on the wastes and material streams accepted at the facility can be found at the appropriate Council or Company website

Site Name	Owner/Operator	Suburb	LGA	GIS location		Principal waste stream <sup>58</sup>
Moyhu – TS	Wangaratta Council	Moyhu	Wangaratta	-36.637271	146.351227	Household waste, SIW
Myrtleford Landfill – TS	Alpine Shire	Myrtleford	Alpine	-36.543607	146.761577	Household waste, SIW
Mt Beauty – TS	Alpine Shire	Mt Beauty	Alpine	-36.7293	147.174674	Household waste, SIW
Porepunkah – TS	Alpine Shire	Porepunkah	Alpine	-36.69481	146.958276	Household waste, SIW, household asbestos
Rutherglen – TS	Indigo Shire	Rutherglen	Indigo	-36.069791	146.493703	Household waste, SIW
Springhurst – TS	Wangaratta Council	Springhurst	Wangaratta	-36.187934	146.48096	Household waste, SIW
Tallangatta – TS	Towong Shire	Tallangatta	Towong	-36.2236	147.163442	Household waste, SIW
Wangaratta – TS	Wangaratta Council	Wangaratta	Wangaratta	-36.366943	146.290232	Household waste, SIW
Whitfield – TS	Wangaratta Council	Whitfield	Wangaratta	-36.778142	146.391438	Household waste, SIW
Falls Creek Village TS	Alpine Resort Board	Falls Creek	Alpine	-36.863472	147.284417	Household waste, SIW
Mt Buller – TS	Alpine Resort Board	Mt Buller	Alpine	-37.1363	146.45306	Household waste
Mt Hotham – RRC	Alpine Shire	Mt Hotham	Alpine	-36.89811	147.063437	Household waste
Dinner Plain – RRC	Alpine Shire	Dinner Plain	Alpine	-37.024717	147.243721	Household waste
<b>Material Recovery Facility (MRF)</b>						
Endeavour Foundation – MRF	Wangaratta Council	Wangaratta	Wangaratta	-36.361462	146.297678	Kerbside recyclables
<b>Re-processor</b>						
Greenchip	ILEOWL Pty Ltd	Baranduda	Wodonga	-36.1547906	146.9528339	Organics, liquid industrial waste, PW
D&R Henderson	D&R Henderson Pty Ltd	Winton	Benalla	-36.525239	146.042209	Wood/timber
Wodonga Rendering	Wodonga Rendering Pty Ltd	Wodonga	Wodonga	-36.114852	146.875318	Abattoir waste – rendering
Visy Board	Visy Board Pty Ltd	Wodonga	Wodonga	-36.10785	146.829532	SIW – Paper and cardboard
Oztek	Oztek Holdings Pty Ltd	Barnawartha	Indigo	-36.1181375	146.6983558	Abattoir waste – rendering
Mansfield Construction	Mansfield Construction Pty Ltd	Mansfield	Mansfield	-37.0799819	146.0872461	SIW- Aggregate, masonry and soils.
Jackson's Earth Moving and Concrete Recyclers	Trevor Jackson Pty Ltd	Wodonga	Wodonga	-36.1784092	146.8421497	SIW – Aggregate, masonry and soils.
AR Fuels	AR Fuels Pty Ltd	Barnawartha	Indigo	-36.1181375	146.6983558	Waste oils and fats
<b>Energy from waste facility (EFW)</b>						
Alpine MDF	Alpine MDF Pty Ltd	Wangaratta	Alpine	-36.1784092	146.8421497	Waste timber post industry and post consumer
D&R Henderson	D&R Henderson Pty Ltd	Winton	Benalla	-36.4879264	146.0075801	Waste timber post industry and post consumer

**Table 21** Potential future resource recovery infrastructure – formal proposals yet to be identified

Infrastructure type	Category	Material to be managed	Timeframe (start)	Reason (see further details in section 4)
RRC and TS	Consolidate and upgrade infrastructure	E-waste, mattresses, mixed metals, recyclables, waste oil, gas bottles, MSW, building/demolition, timber, paint, batteries, fluorescent lights and garden organics	2016	Need to improve cost effectiveness, efficiency, service levels and performance of the RRC and TS network Need to improve safety at sites still allowing public access to landfill face
MRF	Upgrade infrastructure	Kerbside commingled recyclables	2016	The region's only MRF would benefit from improved sorting facilities to increase output and recovery rate and reduce costs
Organics Processing	New or upgraded infrastructure	Kerbside food organics and potentially from C&I stream.	2016	Limited capacity to process food organics in the region
Collection, transport and aggregation	New or upgraded services.	Wood and timber	2016	Current recovery rate (29%) would increase if material could be more effectively collected and aggregated
Glass Processing	New or upgraded infrastructure	Glass (excluding MSW comingled recyclables)	2016	Limited or no glass processing in the region from C&I and C&D streams
Plastic Processing	New or upgraded infrastructure	Plastics (excluding MSW comingled recyclables)	2016	Limited or no plastic processing in the region
Pre-sorting	New or upgraded infrastructure	Mixed uncompacted waste	2017	Opportunity to recover additional resources from waste prior to disposal
Energy from waste	New or upgraded infrastructure	Garden organics, wood, timber and other materials that cannot be viably reprocessed in other ways	2017	Mulch at RRC and TS could be used as feedstock
Waste aggregation	New or upgraded infrastructure	Residual waste	2016	To improve transport efficiency and allow rationalisation, aggregation and bulking infrastructure is required

**Table 22** Potential future resource recovery infrastructure – proposals identified

Infrastructure type	Category	Location	Material streams	Timeframe (start)	Reason	Other
Rural City of Wangaratta – Reprocessor (organics, food and garden)	Proposed new infrastructure at existing landfill site	Colocation with Bowser landfill	Kerbside food and garden organics	2016	Lack of organics processing capacity in the region	Works approval application is in process
Greenchip Recycling – Reprocessor (Organics, combined)	Existing facility with changed or expanded infrastructure	Colocation with water treatment plant on industrial land	Post industry and post consumer organics	2016	Lack of organics processing capacity in the region	Subject to EPA approval requirements, including works approval requirements.

All infrastructure technologies considered in this schedule will not be inconsistent with those detailed in the SWRRIP.

## 6.3 Part B: Landfill infrastructure schedule

**Table 23** Existing landfills

Licensed Landfills							
Landfill name	EPA Licence	Address & LGA	GIS location	Land owner (and operator if different)	Waste types able to be accepted under current licence	Likely closure date	Additional considerations
Benalla Landfill	12560	Old Farnley Road Benalla Rural City Council	-36.511326 146.001273	Benalla Rural City Council	Asbestos waste of domestic origin, putrescible waste, solid inert waste, tyres shredded into pieces < 250 mm	>2045	Formerly ES 503
Bowser Landfill	20025	5 Coleman Road Rural City of Wangaratta	-36.318789 146.369829	Rural City of Wangaratta	Asbestos waste of commercial and domestic origin, putrescible waste, solid inert waste, tyres shredded into pieces < 250 mm, Category C contaminated soil, Foundry sands containing PIW	2034	
Myrtleford Landfill	13111	Morrison Lane Myrtleford	-36.543607 146.761577	Alpine Shire Council	Asbestos waste of domestic origin, putrescible waste, solid inert waste, tyres shredded into pieces < 250 mm	2017	Myrtleford is not accepting asbestos. Myrtleford landfill is closing in 2017.
Landfills exempt from licensing							
Landfill name	Address & LGA	GIS location	Land owner (and operator if different)	Waste types able to be accepted	Likely closure date*	Additional considerations	
Cobungra Landfill	Great Alpine Road Cobungra	-37.083484 147.378663	DELWP, Mt Hotham Alpine Resort Management Board	Putrescible and solid inert waste	2031		
Corryong Landfill	Sugarloaf Road Towong Shire	-36.2214 147.892134	Private, Towong Shire	Putrescible and solid inert waste	>2045		

**Note:**

- > Likely closure dates reflect the year in which the site is likely to cease receiving waste. They are estimated based on modelled tonnage projections and airspace available and may include potential void space at quarry based landfill sites as identified by owners and operators. These timeframes will depend commercial decisions of site operators and the site achieving the appropriate approvals. A listing in this table does not indicate that all available space will be sequenced or approved.
- > Landfills exempt from licencing are landfills operated by a council, serve less than 5,000 people but more than 500 people, which are the exemption categories specified in the Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic). They can accept a range of wastes including putrescible and solid inert as per Waste Management Policy (Siting, Design and Management of Landfills) 2004 and the EP Act.
- > For the avoidance of doubt, private landfills which are privately owned and will only receive wastes that consist of substances owned by the owner of the site (before the substances became wastes) referred to in section 50C(3) of the EP Act are not included in the above table. Any need for a works approval for these sites will be assessed by the EPA without reference to the north east implementation plan, in accordance with section 50C(3) of the EP Act.
- > The region has no need for additional landfill airspace during the period of the north east implementation plan (Section 4.8). Expressions of interest were therefore not sought for landfill infrastructure.

Table 24 contains the proposed sequence for the filling of available landfill sites for a 30-year period. It includes only existing landfill sites. The table shows the potential lifespan; site operators may decide to close a landfill earlier. Subject to limited exceptions, EPA must refuse to consider an application for a works approval in relation to any new landfill not included in this table under section 50C(2) of the EP Act.

**Table 24** Proposed sequence of the filling of available landfill sites

This table should be read in conjunction with the description of the landfill needs assessment outlined in section 4.8.3.

Landfill	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	Likely closure date		
Benalla 12560																																		2045+
Bowser 20025																																		2034
Cobungra LEFL																																	2031	
Corryong LEFL																																		2045+
Myrtleford 13111																																	2017	
<b>Key</b>																																		

EPA works approved or other relevant approval for operation as landfill (Health Department Planning approval prior to 1984) and/or land use planning approved.

Land use planning approved (still needs EPA works approval)

Airspace available subject to planning approval

Note:

- > LEFL = Landfill exempt from licencing
- > The landfill airspace detailed in the above table has been classified according to its land use planning and works approval status at the time of preparation of the north east implementation plan. Only sites with landfill airspace having the appropriate approvals are permitted (and, where applicable, licensed) to receive waste. Inclusion of airspace still requiring either land use planning or EPA approvals is based on an assessment of the need and suitability in line with the statewide process. Where further approvals are required, the appropriate processes to achieve such approvals, must be undertaken and inclusion in the above table does not guarantee the granting of these approvals.
- > Licensed landfills are sequenced to indicate their potential to accept the wastes allowed under their current EPA licence over the 30 year sequencing period.
- > Landfills exempt from licencing are sequenced to indicate their potential to accept wastes as per Waste Management Policy (Siting, Design and Management of Landfills) 2004 and the EP Act over the 30 year sequencing period.



- > Sites exempt from licensing are those which are occupied by a municipal council, serve less than 5,000 people and accept a range of wastes including putrescible and solid inert as per Waste Management Policy (Siting, Design and Management of Landfills) 2004, the Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic) and the EP Act.
- > Sites which are exempt from a requirement to obtain a works approval under the Environment Protection (Scheduled Premises and Exemptions) Regulations 2007 (Vic) and the EP Act are those which are occupied by a municipal council and which serve less than 500 people. Those sites are not included in the above table.
- > For the avoidance of doubt, private (own waste) landfills which are privately owned and will only receive wastes that consist of substances owned by the owner of the site (before the substances became wastes) referred to in section 50C(3) of the EP Act are not included in the above table. These sites are not approved to accept waste from external sources. Any need for a works approval for these sites will be assessed by the EPA without reference to the north east implementation plan, in accordance with section 50C(3) of the EP Act.
- > Likely closure dates reflect the year in which the site is likely to cease receiving waste. They are estimated based on modelled tonnage projections and airspace available.

- > Additional airspace may be sequenced in the future, if an assessment of airspace requirements in the region identifies a need in line with the statewide scheduling process. A listing on the above table does not guarantee the airspace will be scheduled in the future.
- > When Landfills close they must go through a decommissioning phase which includes working with the EPA to establish a long term rehabilitation plan. During this time they will cease to accept waste, but may continue to receive clean fill and soils to undertake appropriate capping and contouring. The actual time required for this process may vary from site to site.
- > Sequencing in this table has been done pursuant to the requirements of section 50BB (c)(iv) of the EP Act.

There are 39 closed landfills in the region (Table 25) and thirteen of these have been rehabilitated. Note that landfills that are yet to be rehabilitated will be considered under priority action 7 of the north east implementation plan, which involves facilitating work between councils and the EPA to identify if there are more localised risk-based approaches to rehabilitation of unlicensed closed landfills.

Information about the rehabilitation status is based on information from council officers and is not verified.

**Table 25** Closed landfills

Name	GIS location		Liable party	Material received	Municipality	Closure date	Rehabilitation Status	On site Infrastructure
Bungeet	-36.316681	146.04003	Benalla Council	Putrescible and Solid Inert	Benalla City	1985	Complete	None
Devenish	-36.344357	145.90610	Benalla Council	Putrescible and Solid Inert	Benalla City	Late 1980s	Complete	None
Thoona	-36.356515	146.05944	Benalla Council	Putrescible and Solid Inert	Benalla City	Late 1980s	Complete	None
Mansfield Landfill (Riflebutts)	-37.082041	146.08772	Mansfield Shire	Putrescible and Solid Inert	Mansfield Shire	2008	Commenced	None
Paps Tip	-37.246492	145.59927	Mansfield Shire	Solid Inert	Mansfield Shire	1990	Not yet commenced	None

Name	GIS location		Liable party	Material received	Municipality	Closure date	Rehabilitation Status	On site infrastructure
Bethanga Tip	-36.113658	147.09857	Towong Shire	Putrescible and Solid Inert	Towong Shire	2001	Complete	None
Dartmouth Tip	-36.546693	147.49564	Towong Shire	Putrescible and Solid Inert	Towong Shire	2000	Complete	None
Eskdale Tip	-36.486488	147.34110	Towong Shire	Putrescible and Solid Inert	Towong Shire	2000	Complete	None
Granya Tip	-36.115586	147.31801	Towong Shire	Putrescible and Solid Inert	Towong Shire	2000	Complete	None
Tallangatta Tip	-36.223607	147.16344	Towong Shire	Putrescible and Solid Inert	Towong Shire	2000	Complete	None
Walwa Tip	-35.955264	147.71401	Towong Shire	Putrescible and Solid Inert	Towong Shire	2000	Complete	None
Whorouly	-36.531191	146.57278	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	Late 1980s	Not yet commenced	RRC
Whitfield	-36.780811	146.39289	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1994	Not yet commenced	RRC
Tarrowingee	-36.405078	146.48933	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	Early 1970s	Not yet commenced	None
Springhurst	-36.19078	146.48125	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1990	Not yet commenced	RRC
Oxley	-36.44365	146.38417	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1979	Not yet commenced	None
Moyhu	-36.62484	146.37059	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1960	Not yet commenced	RRC
Milawa	-36.45003	146.43532	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1967	Not yet commenced	None
Markwood	-36.46795	146.47718	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1999	Not yet commenced	RRC
Hansonville	-36.59332	146.28641	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1995	Not yet commenced	None
Glenrowan	-36.46521	146.20850	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1997	Not yet commenced	RRC
Eldorado	-36.32047	146.53634	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1994	Not yet commenced	RRC
Boorhaman	-36.228662	146.27326	Wangaratta Council	Putrescible and Solid Inert	Wangaratta City	1994	Complete	RRC
Bowser East	-36.32936	146.37493	Wangaratta Council	Putrescible, Solid Inert and Prescribed	Wangaratta City	2001	Not yet commenced	None
Former Bowser landfill	-36.31553	146.36571	Wangaratta Council	Unknown	Wangaratta City	1980	Not yet commenced	Sheds

Name	GIS location		Liable party	Material received	Municipality	Closure date	Rehabilitation Status	On site infrastructure
	-36.36127	146.29150						
Osboldstone Road	-36.36127	146.29150	Wangaratta Council	Putrescible, Solid Inert and Prescribed	Wangaratta City	1985	Not yet commenced	None
Showgrounds Barr Reserve Tip	-36.34365	146.31713	Wangaratta Council	Putrescible, Solid Inert and Prescribed	Wangaratta City	1986	Completed	None
Vincent Road	-36.36437	146.31068	Wangaratta Council	Putrescible, Solid Inert and Prescribed	Wangaratta City	1982	Commenced	Sheep pound
Wilson Road	-36.35720	146.33141	Wangaratta Council	Unknown	Wangaratta City	1960	Not yet commenced	None
Former Beechworth Landfill	-36.37473	146.67965	Indigo Shire	Putrescible, Solid Inert and Prescribed	Indigo	1995	Not yet commenced	RRC
Former Chiltern Landfill	-36.144052	146.59772	Indigo Shire	Putrescible, Solid Inert and Prescribed	Indigo	1995	Not yet commenced	None
Former Rutherglen Landfill	-36.06979	146.49370	Indigo Shire	Putrescible, Solid Inert and Prescribed	Indigo	1995	Not yet commenced	RRC
Former Yackandandah Landfill	-36.32168	146.83764	Indigo Shire	Putrescible, Solid Inert and Prescribed	Indigo	1995	Completed	None
Former Wahgunyah Landfill	-36.00472	146.42739	Indigo Shire	Putrescible, Solid Inert and Prescribed	Indigo	1990	Not yet commenced	None
Former Wodonga Landfill	-36.16820	146.88333	City of Wodonga	Putrescible, Solid Inert and Prescribed	Wodonga	2005	Ongoing monitoring and maintenance	None
Harrietville Landfill	-36.89240	147.06830	Alpine Shire	Putrescible, Solid Inert and Prescribed	Alpine Shire	1988-1998	Not yet commenced	None
Old Myrtleford Landfill	-36.55490	146.74099	Alpine Shire	Putrescible, Solid Inert and Prescribed	Alpine Shire	1988-1990	Not yet commenced	None
Mt Beauty Landfill	-36.72932	147.17495	Alpine Shire	Putrescible, Solid Inert and Prescribed	Alpine Shire	1994	Not yet commenced	RRC
Porepunkah Landfill	-36.69517	146.95842	Alpine Shire	Putrescible, Solid Inert and Prescribed	Alpine Shire	2008	Not yet commenced	None



# APPENDIX B - Data

**Table B 1** Major data sources

Data source	Description
Victorian Local Government Annual Survey (VLGAS)	Annual data on materials collected through local government kerbside collection systems and published by SV. All local governments in Victoria participate. The survey provides trending data on recyclables, organics, residual waste, hard waste and litter.
Victorian Recycling Industries Annual Survey (VRIAS)	The state infrastructure plan uses survey data from the financial year 2011-12, which is available on the SV website at <a href="http://www.sustainability.vic.gov.au">www.sustainability.vic.gov.au</a> . Annual data collection measuring tonnages of materials diverted from landfill by major re-processors in Victoria. This is used to measure progress against Victorian waste reduction targets, and trends in the recovery of waste materials. The survey is voluntary and although the return rate is relatively constant, contributors can vary from year to year. VRIAS is available on the SV website at <a href="http://www.sustainability.vic.gov.au">www.sustainability.vic.gov.au</a> .
EPAs landfill levy returns	Unpublished information provided by EPA on a confidential basis.
Australian Bureau of Statistics (ABS) population data	ABS Catalogue Number 3101.0 - Australian Demographic Statistics, Sep 2014.
Victorian landfill audits	SV's disposal-based waste survey, 2009.
EPA Rural Landfill Risk Assessment 2013	A visual waste audit of eight metropolitan landfills, one regional landfill and one transfer station, covering 2003 separate inbound loads. Unpublished report provided by EPA.
Regional Waste and Resource Recovery Database	SV's purpose-built database for data storage, analysis and projection to assist development of regional implementation plans and alignment with the state infrastructure plan.

**Table B 2** Major data assumptions and definitions

Landfill tonnages	Tonnes landfilled are derived from landfill levy data supplied by EPA and do not include prescribed industrial waste (PIW). There has been no allowance for daily cover which must be considered when comparing figures with those in earlier drafts of the state infrastructure plan. Previously landfill figures were adjusted to remove a 15% allowance for daily cover.
Existing operating landfill	Landfills that are accepting waste for disposal or have recently ceased to accept waste but are yet to receive their post closure pollution abatement notice (PC PAN) from the EPA.
Landfill available airspace	Calculating landfill airspace is based on information from WRR region landfill owners, local governments and EPA. It reflects the estimated amount of airspace void and the amount of works approved airspace.
Closed landfill	Landfill that is no longer accepting waste. If in the case of licensed landfills it should have received its PC PAN from the EPA. If it is exempt from licensing then there should be reassurance that closure process have commenced or are in place.
Landfill likely closure dates	An estimate of the likely year of closure of the landfill based on consideration of modelled tonnage projections and land available under current EPA works approval, planning and permit requirements and potential void space that may eventuate at quarry based landfill sites as identified by owners and operators. A closure date of beyond 30 years should be represented as >30 years.
Rounding of data	As a general rule, all of the data is rounded to the nearest thousand. This may result in minor discrepancies between totals and line items. Graphs, charts and modelling were generated using non-rounded data. Any exceptions are referenced.
Recovered tonnages	Unless stated, these are tonnes of materials entering reprocessing facilities. This is not a direct correlation to how much was reprocessed as there is no data on tonnes stockpiled by reprocessors or tonnes landfilled by reprocessors. For this reason, quantities are referred to as recovered, rather than reprocessed.
Current capacity of infrastructure	An estimate of the installed capacity of an existing facility or infrastructure type.



**Table B 3** Infrastructure categories for data collection

Infrastructure type	
Resource Recovery	Resource Recovery drop off
	Resource Recovery RRC/TS, stand alone
	Resource Recovery RRC/TS, collocated at landfill
	Resource Recovery MRF
Reprocessor Organics	Reprocessor Organics, food
	Reprocessor Organics, garden
	Reprocessor Organics, wood/timber
	Reprocessor Organics, organics
	Reprocessor Organics, other
Reprocessor Paper cardboard	
Reprocessor Glass	
Reprocessor Plastics	
Reprocessor Rubber incl tyres	
Reprocessor Metals	
Reprocessor Aggregate, masonry & soils	
Reprocessor textiles	
Reprocessors other	
Disposal	Disposal landfill , licenced
	Disposal landfill, exempt from licencing

**Table B 4** Types of infrastructure that support the waste and resource recovery system

Type	Characteristics
Collection infrastructure: Infrastructure to collect and transfer waste materials at the point of generation	
Kerbside bins and collection	<p>Collections from households of residual waste, garden organics and commingled recyclables; hard waste collections; and kerbside collection from businesses and other commercial premises.</p> <p>Includes services provided by local governments and their service and commercial providers.</p>
Skip bin	Large bin provided by a private contractor to collect and remove bulk waste from households, businesses, schools, commercial premises and hospitals.
Tip truck	Truck used to remove large amounts of mainly commercial and industrial waste.
Resource recovery infrastructure: Infrastructure to facilitate recovery of materials and resources	
Drop-off centres and charity bins	<p>Recovers selected materials and goods mainly dropped off by householders for recycling and reuse.</p> <p>May include aggregation for transport to a resource recovery centre or transfer station.</p>
Resource recovery centres/ transfer stations (RRC/TS)	<p>Receives, sorts and/or consolidates a range of material streams (depending on the facility) including hard, organic and residual waste and commingled recyclables for transport for materials recovery, processing or disposal to landfill.</p> <p>Accepts materials from all sectors and can be publically or privately owned and operated.</p> <p>May include a resale centre.</p>
Materials recovery facility (MRF)	<p>Sorting, consolidation and transfer.</p> <p>Receives and sorts household and business commingled recyclables.</p> <p>Compacts and bales, or consolidates materials and sends to reprocessing facilities.</p> <p>May include a resale centre.</p>
Reprocessing infrastructure: Infrastructure to recover materials and resources	
Organic reprocessing facility	<p>A facility that biologically reprocesses organic matter, yielding a variety of products including stabilised organic residues for use as a soil additive, heat and renewable energy.</p> <p>Includes both windrow and in-vessel technologies.</p>
Waste to energy facility	<p>A facility that uses waste or refuse derived fuels as a feedstock to produce a useful end product with market value such as heat and electricity.</p> <p>Technologies can include anaerobic digestion and heat processing such as pyrolysis and gasification.</p>
Other reprocessors	A facility that changes the physical structure and properties of a waste material that would otherwise be sent to landfill adding financial value to the processed material. Without reprocessing, the beneficial use of the material would be lost.
Disposal infrastructure: Infrastructure established as the final repository of waste materials	
Landfill	<p>A site for the disposal of waste into the ground.</p> <p>May include a RRC/TS or resale shop.</p>
Incinerator	<p>Disposal by burning.</p> <p>A site that disposes of waste by burning it, without producing a useful end product.</p>



# APPENDIX C - Key references

- Alpine Resorts Coordinating Council 2015, Annual Report 2014-2015
- Blue Environment 2011, NevRwaste Organics Services Review
- Blue Environment 2013, Assessment of Resource Recovery Infrastructure in North East Victoria
- Blue Environment 2015, Solid Industrial Waste in North East Victoria
- Blue Environment 2016, Future Landfill Options Study II
- Department of Environment, Land, Water and Planning 2014, Victoria in the Future - Population and Household Projections
- DEPI 2014, Guideline: Making, Amending and Integrating the Statewide Waste and Resource Recovery Infrastructure Plan and Regional Waste and Resource Recovery Implementation Plans
- DTPLI 2015, Victoria in Future 2015
- EPA Victoria, Waste Management Policy (Siting, Design and Management of Landfills), 2004, and the associated Policy Impact Assessment
- EPA Victoria, Best Practice Environmental Management: Siting, Design, Operation and Rehabilitation of Landfills, Publication 788.2 EPA Victoria, October 2014
- Hyder Consulting 2015, Impacts of Economic and Environmental Drivers on WRR Infrastructure
- NEWRRG October 2015, Need and Priorities Analysis
- NevRwaste 2009, North East Victorian Regional Waste Management Plan
- Nolan Consulting Pty Ltd 2014, Future Landfill Options Study
- Sustainable Resource Use (SRU) 2015, Survey and Analysis of Regional Reprocessors and Material Recovery Facility Operators
- Sustainability Victoria 2015, Draft Victorian Market Development Strategy for Recovered Resources
- Sustainability Victoria 2015, Regional Waste and Resource Recovery Implementation Plan, Development Workbook
- Sustainability Victoria 2015, Regional Waste and Resource Recovery Implementation Plan Template
- Sustainability Victoria 2015, Fact Sheet: Statewide Waste and Resource Recovery Infrastructure Scheduling
- Sustainability Victoria 2015, Statewide Waste and Resource Recovery Infrastructure Plan, Victoria 2015-44
- Sustainability Victoria 2015, Victorian Organics Resource Recovery Strategy
- Sustainability Victoria 2015, Victorian Market Development Strategy for Recovered Resources
- Sustainability Victoria 2015, Waste Data Governance Framework
- Sustainability Victoria 2015, Survey of Regional Reprocessors and Materials Recovery Facility Operators – North East
- The Victorian Auditor General's Office 2014, Managing Landfills Report September 2014
- The Victorian Government 1970, Environment Protection Act 1970
- The Victorian Government 2010, Climate Change Act 2010
- The Victorian Government 2013, Victorian Climate Change Adaptation Plan
- The Victorian Government 2016, Climate Change Framework to 2050
- The Victorian Government 2010, Transport Integration Act 2010
- The Victorian Government 1987, Planning and Environment Act 1987
- URS 2006, A Risk Assessment of Selected Landfill Sites in the North Eastern Waste Management Region

# APPENDIX D - Regulatory and policy context

Document	Summary
<p>Environment Protection Act 1970 (EP Act)</p>	<p>The overarching Act for waste management and the environment in Victoria. In August 2014, it was amended to establish the Victorian Waste and Resource Recovery Infrastructure Planning Framework. The framework facilitates strategic planning for waste and resource recovery at both the state and local level for regional communities. The framework, as articulated in section 50CA of the EP Act, is constituted by the following:</p> <ul style="list-style-type: none"> <li>&gt; State-wide Waste and Resource Recovery Infrastructure Plan</li> <li>&gt; Regional Waste and Resource Recovery Implementation Plans</li> <li>&gt; Any guidelines made under section 50CA in relation to the State-wide Waste and Resource Recovery Infrastructure Plan and Regional Implementation Plans</li> <li>&gt; The formal integration process of the state and regional plans as outlined in section 50BD of the Environment Protection Act.</li> <li>&gt; Pollution abatement notices (which are issued by the EPA Victoria to direct a person to prevent further pollution or environmental risk by controlling on-site processes and practices) (EPA Victoria 2013c).</li> </ul> <p>The preparation and content of Regional Waste and Resource Recovery Implementation Plans are outlined in Section 50BB.</p>
<p>Environment Protection (Scheduled Premises and Exemptions) Regulations 2007</p>	<p>Stipulates the premises that are subject to and/or exempt from works approval and/or licensing by EPA. Under the EP Act and the EP Premises Regulations, EPA Victoria administers:</p> <ul style="list-style-type: none"> <li>&gt; Works approvals (which are necessary for the establishment or expansion of industrial and waste management activities that could potentially have a significant environmental impact).</li> <li>&gt; Licences (which regulate waste acceptance and treatment, air and water discharges, and noise and odour, and which are required for scheduled premises).</li> <li>&gt; Research development and demonstration approvals (similar to works approvals, however applicable to projects of a smaller size, timeframe and environmental impact. These approvals could be useful in the development of emerging markets as they may provide an opportunity for trial research projects with approvals that are simpler and at a lower cost than works approvals, are decided in 30 days, provide legal certainty and thereby encourage development of new technologies).</li> </ul>
<p>Environment Protection (Industrial Waste Resource) Regulations 2009</p>	<p>Replaced the Environmental Protection (Prescribed Waste) Regulations 1998 (the 1998 Regulations). The 1998 Regulations set out administrative and reporting requirements for businesses in relation to waste (for example exemption applications, permits/certificates for transport of prescribed industrial wastes (PIWs), and annual reporting requirements). The 2009 Regulations increased the responsibility of waste producers, transporters and receivers for waste management. The objectives are to:</p> <ul style="list-style-type: none"> <li>&gt; Assist industry to implement the principle of the wastes hierarchy.</li> <li>&gt; Prescribe requirements for assessing, categorising and classifying industrial waste and PIW.</li> <li>&gt; Encourage industry to use industrial waste as a resource by exempting material from categorisation as PIW if a secondary beneficial reuse is established.</li> <li>&gt; Establish the requirements for the transport and management of prescribed industrial waste including requirements for the tracking of PIW (Victorian Government 2009).</li> </ul>

Document	Summary
EPA Victoria, Best Practice Environmental Management Publication – Siting, Design, Operation and Rehabilitation of Landfills 2015	<p>In 2010, the EPA changed the requirements for environmental management of landfills as part of its license reform program and this resulted in clearer identification of the responsibility of license holders and stricter, less flexible requirements as part of the license. The Landfill Best Practice Environmental Management (BPEM) is the guiding document for the management of licensed landfills in Victoria. The document outlines the requirements of landfill operators in the design, construction, operation and long term rehabilitation of landfill facilities. Two supporting guidelines - the Closed Landfill Guidelines 2012 and the Landfills exempt from licensing Guideline 2014 – work with the Landfill BPEM to provide the framework for operators on how to meet best practice requirements. The EPA monitor compliance through inspections, annual license performance statements, investigations and audits. The BPEM on its own is not enforceable. It is given legal force through the licence conditions. Compliance with the Landfill BPEM and its amendments in recent years has required the industry to invest in considerable improvements to the development of new landfill cells, and in the management of closed landfills which pose a risk to the community</p>
Sustainability Victoria, Statewide Waste and Resource Recovery Infrastructure Plan 2013-2043, approved by the Minister for Environment pursuant to section 50AD of the EP Act	<p>This document provides Victoria with the long-term vision and roadmap to guide future planning for waste and resource recovery infrastructure. It describes the current waste and resource recovery system at the state level and models projections for future trends in waste generation, recovery and landfilling over the next 30 years. The goals are:</p> <ul style="list-style-type: none"> <li>&gt; Landfills will only be for receiving and treating waste streams from which all materials that can be viably recovered have been extracted</li> <li>&gt; Materials are made available to the resource recovery market through aggregation and consolidation of volumes to create viability in recovering valuable resources from waste</li> <li>&gt; Waste and resource recovery facilities including landfills are established and managed over their lifetime to provide the best economic, community, environment and public health outcomes for local communities and the state and ensure their impacts are not disproportionately felt across communities.</li> </ul> <p>Targeted information provides the evidence base to inform integrated statewide waste and resource recovery infrastructure planning and investment at the state, regional and local levels by industry, local government, waste and resource recovery groups, government agencies and the broader community.</p>
EPA Victoria, Energy from Waste Guidelines	<p>Provides guidance for industry, government and the community on the EPA's expectations for energy from waste projects. In particular, the document focuses on the siting, design, construction and operation of such facilities. The guidelines, however, are high level. The document outlines how the Environment Protection Act 1970 and associated statutory policies and regulations are applied to the assessment of energy from waste proposals. The guidelines closely mirror the standards set for emissions in the EU opening the door for existing technologies to be considered.</p>
EPA Victoria, Designing, Constructing and Operating Composting Facilities (Composting Guidelines)	<p>Provides information on composting operators' obligations under laws administered by the EPA and provides suggestions on how to comply. Specifically, it:</p> <ul style="list-style-type: none"> <li>&gt; Provides composting operators with advice on how to design, construct and manage composting facilities in a manner that protects human health and the environment in Victoria.</li> <li>&gt; Will be used to inform EPA decision making for facilities that require research, design and demonstration approvals, works approvals and licences.</li> <li>&gt; Will be used by EPA as a guide for how premises could resolve issues of non-compliance.</li> </ul> <p>Whilst not explicitly restricting the use of open windrow technology in metropolitan areas, the Composting Guideline does set conditions that suggest only in-vessel processing facilities are acceptable.</p>
EPA Victoria, State Environmental Protection Policy (Control of Noise from Commerce, Industry and Trade)	<p>State environment protection policies (SEPPs) are subordinate legislation made under the provisions of the Act to provide more detailed requirements and guidance for the application of the Act to Victoria. SEPPs aim to safeguard the environmental values and human activities (beneficial uses) that need protection in Victoria from the effect of pollution and waste.</p> <p>The Noise SEPP aims to protect people from the effects of industrial and commercial noise in neighbouring residential zones. This is particularly relevant in Melbourne and regional urban centres where residential development occurs close to or within the buffer zones of industrial facilities such as waste MRFs and reprocessors.</p>

Document	Summary
EPA Victoria, State Environment Protection Policy (Ambient Air Quality & Air Quality Management)	The Air SEPP aims to protect air quality in Victoria and sets goals, monitoring and reporting protocols for six common pollutants: carbon monoxide (CO), nitrogen dioxide (NO <sub>2</sub> ), photochemical oxidants (as ozone), sulphur dioxide (SO <sub>2</sub> ), lead and particles as PM <sub>10</sub> . The SEPP also includes a separate objective for visibility reducing particles, which is not included in the National Environment Protection Measure (NEPM).
North East council and resort waste management plans and strategies	Currently each council has a Council Plan, and each resort has a Management Plan that outlines its future direction and commitments. Each plan details a number of objectives, goals and strategies that relate to waste management either directly or indirectly.
Waste Management Policy (Siting, Design and Management of Landfills)	<p>Landfills are an important part of Victoria's waste management infrastructure. While disposal of materials to landfill is the least preferred management option, they will continue to be required to manage those wastes that cannot currently be practicably removed from the waste stream. The Waste Management Policy applies to all landfills in Victoria receiving solid non-prescribed waste and/or Category C prescribed industrial waste.</p> <p>The policy clarifies and strengthens the existing framework through promoting best practice and continuous improvement in the way we plan, site, design and manage landfills in Victoria. The policy also promotes waste minimisation and resource recovery infrastructure that will in turn encourage market opportunities for recycling. It provides a transparent assessment and consultation process to investing banning specified wastes from landfill disposal where a high waste management option is practicably available.</p> <p>This policy was gazetted as the Waste Management Policy (Siting, Design and Management of Landfills) No. S264, Gazette 14/12/2004</p>
Landfill Best Practice Environmental Management (BPEM) – Siting, Design, Operation and Rehabilitation of Landfills	The Landfill BPEM (publication 788) is used by the EPA, industry and others in relation to works approval applications and compliance activity. Applicants for a works approval or licence for a landfill must meet the objectives and required outcomes set out in the landfill BPEM.

# APPENDIX E – Glossary

**Aerobic Composting** – The controlled biological decomposition of organic materials under aerobic (in the presence of oxygen) conditions, accomplished in open or enclosed windrows or piles.

**Anaerobic Composting** – The controlled biological decomposition of organic materials under anaerobic (in the absence of oxygen) conditions, accomplished in enclosed vessels producing combustible methane gas and compost.

**Avoidance** – The first step in the waste hierarchy. Indicates practices whereby waste generation is circumvented.

**Beneficiation** – An optical sorting process used to separate different colours of container glass to produce cullet for reprocessing and mixed fines.

**Bio-solids** – Organic solids derived from sewage treatment processes that are in a state that they can be managed to sustainably utilise their nutrient, soil conditioning, energy, or other value (achieve minimum EPA standards for classification as T3 and C2 bio-solids). Solids that do not meet these criteria are defined as sewage sludge.

**Biogas or Syngas** – A gas generated by breaking down organic matter in the absence of oxygen, such as occurs in landfills. Typically comprised of 60% methane and 40% carbon dioxide, and can be used as an energy source.

**Biomass** – Biological material that is not fossilised, including forest and mill residues, agricultural crops and waste, wood and wood waste, animal waste, livestock operation residues, aquatic plants and fast growing trees and plants.

**Clean fill** – Material that has no harmful effects on the environment. A natural soil material that does not contain any chemicals or other materials such as concrete rubble. Also called fill material.

**Closed landfill** – Landfill that is no longer accepting waste. If a licensed landfill, it should have received a post closure pollution abatement notice (PAN) from the EPA. If exempt from licensing, there should be reassurance that the closure process has commenced or is in place.

**Collection system** – System for collecting materials from the kerbside, including bin type and collection frequency.

**Commercial and industrial (C&I) waste** – Solid inert waste generated from trade, commercial and industrial activities including the government sector. Includes waste, for example, food waste, from offices, manufacturing, factories, schools, universities, state and government operations and small to medium enterprises.

**Commingled recyclables** – Materials combined generally for the purposes of collection, mainly through municipal collection services. Includes plastic bottles, other plastics, paper, glass and metal containers. Commingled recyclable materials require sorting after collection before they can be reprocessed. Can also be called commingled materials.

**Composting** – The controlled breakdown or decomposition of organic materials under aerobic (that is with air) or anaerobic (that is without air) conditions.

**Construction and demolition (C&D) waste** – Solid inert waste, for example, bricks and concrete generated from residential and commercial construction and demolition activities.

**Cullet** – Sorted glass feedstock resulting from the beneficiation process of mixed container glass. Generally consists of sorted streams of amber, flint and garden glass of particle size greater than 5–10 mm depending on the capacity of the beneficiation plant.

**Current capacity of infrastructure** – Estimate of the installed capacity of an existing facility or infrastructure type.

**Daily cover** – Layer of compressed soil or earth laid on top of the day's deposition of waste on an operational landfill site. Helps prevent interaction between waste and air, reducing odours and litter, and creating a firm base for vehicles to work on.

**DELWP** – The Department of Environment, Land, Water and Planning. A Victorian government department tasked with creating liveable, inclusive and sustainable communities. DELWP forms part of the Waste and Resource Recovery Portfolio of state government.

**Drop-off centre/site** – Facility where households can drop off selected materials and household items for recycling and reuse. Also called drop-off facility.

**E-waste** – Electronic equipment with a plug or battery that requires a current to operate and that has reached end of life. Includes televisions, computers, monitors and whitegoods such as fridges and washing machines.

**Energy from waste** – ‘Energy recovery from waste’, ‘waste to energy’ or ‘energy from waste’ can be used interchangeably to describe a number of treatment processes and technologies to generate a usable form of energy from waste materials. Examples of usable forms of energy include electricity and heat, and transport fuels.

**Environment Protection Authority Victoria (EPA)** – Established under the Environment Protection Act 1970. The environmental regulator and an influential authority on environmental impacts.

**Environmental Justice** – The principles of environmental justice are based on the concepts of equity and participation. The principles require that environmental benefits and impacts should be distributed proportionately and affected communities should be able to participate in decision making.

**Existing operating landfill** – Landfills currently accepting waste for disposal or have recently ceased to accept waste but are yet to receive a post closure PAN from the EPA.

**Feedstock** – Raw material used to manufacture products. Material varies depending on what is being produced.

**Fines (glass)** – Unsorted sub 5–10 mm glass material left over from the glass beneficiation process. Can contain contamination including plastics and small pieces of metals. Can be further processed to produce a glass sand product which has a number of uses.

**Food organics** – Food waste from households or industry, including food processing waste, out-of-date or off-specification food, meat, fruit and vegetable scraps. Excludes liquid wastes.

**Garden organics** – Organics derived from garden sources, for example, grass clippings, tree prunings. Also known as green organics.

**Gasification** – Thermal technology that converts material into combustible gases by partial oxidation under the application of heat, leaving an inert residue.

**Generation tonnages** – The sum of the state landfill tonnes and state tonnes reprocessed using VRIAS data. Because this modelling uses landfill data, generation tonnages differ from those in previous drafts of the state infrastructure plan due to no allowance being made for daily cover.

**Garden organics or green organics** – See garden organics.

**Greenhouse Gases** – Gaseous constituents of the atmosphere, both natural and from human activity that absorb and re-emit infrared radiation. Water vapour (H<sub>2</sub>O) is the most abundant greenhouse gas. Greenhouse gases are a natural part of the atmosphere.

**Hard waste** – Household garbage that is not usually accepted into kerbside garbage bins by local governments, for example, old fridges and mattresses.

**Hazardous wastes** – See Prescribed waste and prescribed industrial waste (PIW).

**Hubs** – The concentration of reprocessing facilities where there is sufficient waste derived feedstock to support viable reprocessing options. Location of hubs varies for individual material streams.

**Illegal dumping** – The deliberate and unauthorised dumping, tipping or burying of waste on land that is not licensed or fit to accept that waste.

**In-vessel composting** – Composting technology involving the use of a fully enclosed chamber or vessel in which the composting process is controlled by regulating the rate of mechanical aeration provided to the chamber by a blower fan that can work in a positive (blowing) and/or negative (sucking) mode. Rate of aeration can be controlled with temperature, oxygen or carbon dioxide feedback signals. (Aeration assists in heat removal, temperature control and oxygenation of the mass.)

**Inert Waste** – Inert waste is neither chemically nor biologically reactive and will not decompose. Includes glass, sand and concrete.

**Kerbside Collection** – A regular, containerised collection services (often using a wheelie bin) where the waste or recycling is collected from outside a resident’s dwelling. Can apply to recycling (yellow lid), garden (green lid) or general waste (red lid).

**Landfill** – Discharge or deposit of solid wastes onto land that cannot be practically removed from the waste stream.

**Landfill available airspace** – The estimated amount of available airspace and the amount of works approved airspace. (Calculating landfill airspace is based on information from the WRRG region landfill owners, local governments and EPA.)

**Landfill BEPM** – Siting, design, operation and rehabilitation of landfills as prescribed in the EPA Best Practice Environmental Management publication.

**Landfill Capping** – An impermeable geo-membrane and/or clay materials with, possibly a further layer of soil placed over the capping. Capping allows greenhouse gases to be captured and creates a ‘dry tomb’, protecting groundwater. (Once a landfill cell is filled, the waste matter must be covered with landfill capping.)

**Landfill Levy** – A levy applied at differential rates to municipal, C&I and prescribed wastes disposed of at licensed landfills in Victoria. (Levies are an incentive to minimise the generation of waste, sending a signal to industry that the government supports efforts to develop alternatives to disposal to landfill.)

**Landfill likely closure dates** – An estimate of the likely year of closure of the landfill based on consideration of modelled tonnage projections and land available under current EPA works approval, planning and permit requirements and potential void space that may eventuate at quarry-based landfill sites as identified by owners and operators.

**Landfill tonnages** – Tonnes landfilled derived from landfill levy data supplied by EPA. Do not include prescribed industrial waste (PIW). (There has been no allowance for daily cover which must be considered when comparing figures with those in earlier drafts of the state infrastructure plan. Previously landfill figures were adjusted to remove a 15% allowance for daily cover.)

**Leachate** – Contaminated water that has percolated through or drained from a landfill.

**Litter** – Any small, medium or large item placed inappropriately.

**Materials reprocessed** - Materials that have passed through reprocessing facilities

**Materials or wastes generated in the region** - Materials or waste originating from the region

**Materials or waste managed in the region** - Materials or wastes that have passed through or been managed at a waste and resource recovery facility in the region including, RRC/TS, MRFs, reprocessors or landfills. They may have been generated in another region and or they ultimately be reprocessed or disposed of outside the region.

**Materials Recovery Facility (MRF)** – A centre for the receipt, sorting and transfer of materials recovered from the waste stream prior to transport to another facility for recovery and management. At a MRF materials may undergo mechanical treatment for sorting by characteristics such as weight, size, magnetism and optical density and may include cleaning and compression. Materials may be received as mixed streams such as commingled recyclables from households and businesses or single streams such as metals

**Merchant facilities** – are emerging as an attractive way forward where the private sector establishes a waste facility with a variety of waste supply agreements, and therefore accepts waste supply risks .

**Municipal solid waste (MSW)** – Solid waste generated from municipal and residential activities, and including waste collected by, or on behalf of, a municipal council. (In the north east implementation plan, MSW does not refer to waste delivered to municipal disposal sites by commercial operators or waste from municipal demolition projects.)

**Optical sorting** – Sorting of glass by colour type, and plastics by polymer type using technology.

**Organic material** – Plant or animal matter, for example, grass clippings, tree prunings and food waste, originating from domestic or industrial sources.

**Organic waste** – Separated food and/or green/garden waste, for example, grass clippings or vegetation prunings.

**Pollution Abatement Notice** - Pollution abatement notices are issued under section 31A of the Environment Protection Act 1970 (EP Act). They aim to prevent further occurrence of pollution or potential environmental risk through installation of risk controls and changes to on-site processes and practices.

**Prescribed waste and prescribed industrial waste (PIW)** – These wastes are defined in the Environment Protection (Industrial Waste Resource) Regulations 2009. (EPA closely regulates these wastes because of their potential adverse impacts on human health and the environment. There are special handling, storage, transport and often licensing requirements for prescribed wastes which attract substantially higher disposal levies than non-prescribed solid wastes. Also known as hazardous waste.)

**Processing facilities** – Facilities that either receive materials directly from collection systems or from recovery facilities for further sorting and/or processing to provide material for use in the generation of new products.

**Product stewardship** – A concept of shared responsibility by all sectors involved in the manufacture, distribution, use and disposal of products, which seeks to ensure value is recovered from products at the end of life.

**Public place recycling** – Recycling facilities in public areas, such as parks, reserves, transport hubs, shopping centres and sport and entertainment venues, that allow the community to recycle waste when away from home.

**Putrescible waste** – Waste capable of decomposition such as food organics, garden organics, manures, paper and cardboard.

**Re-use** – Recovering value from a discarded resource without processing or remanufacture, for example, garments sold through opportunity shops.

**Recovered tonnages** – Unless stated otherwise, tonnes of materials entering reprocessing facilities. No direct correlation to how much was reprocessed as there is no data on tonnes stockpiled by re-processors or tonnes landfilled by re-processors. Therefore, referred to as ‘recovered’, rather than ‘reprocessed’.

**Recovery** – In the context of the waste hierarchy, recovery means energy recovery, typically via a waste to energy facility.

**Recovery Rate(s)** – Used generally to describe material recovery, that is recycling, and energy recovery.

**Recyclables** – All materials that may be reprocessed. However, in the north east implementation plan generally used to refer to the recyclable containers and paper/cardboard component of kerbside waste and excludes garden organics.

**Recyclable Materials** – Waste collected separately and sent for recycling. For the purposes of the north east implementation plan incorporates container glass, plastic, ferrous and non-ferrous metals, paper, cardboard and garden organics.

**Recycling** – A set of processes (including biological) that converts solid waste into useful materials or products.

**Refuse derived fuel (RDF)** – A fuel produced after basic processing to increase the calorific value and remove recyclable materials and contaminants.

**Reprocessing** – Changing the physical structure and properties of a waste material that would otherwise have been sent to landfill to add financial value to the processed material. (Without reprocessing, the beneficial use of waste materials would be lost.)

**Residual waste** – Residual material that remains after any source separation or reprocessing activities of recyclable materials or garden organics. Generally means the environmental or economic costs of further separating and cleaning the waste are greater than any potential benefit of doing so.

**Resource Recovery Centre/transfer station (RRC/TS)** – A facility whose primary purpose is to aggregate, sort, and consolidate reusable and recyclable materials prior to transport to another facility for recovery or management. It may include a resale centres. They may be designed to receive specific material streams such as metals or organics or to receive multiple streams such as those from households including residual waste.

**Reuse** – Recovering value from a discarded resource in its original state without reprocessing or remanufacture (for example, clean sand moved from one construction site to another). Can also apply to the replacement of a disposable item with a more durable item.

**Rounding of data** – As a general rule, all of the data is rounded to the nearest thousand. This may result in minor discrepancies between totals and line items. Graphs, charts and modelling were generated using non-rounded data. Any exceptions are referenced.

**Separation Distance** – Area set aside to maintain an adequate distance between the facility and sensitive land uses such as residential development, so those uses are not adversely affected by noise, odour or dust. The land may or may not be owned by the facility owner. Residences and businesses in a rural or industrial zone are not classified as sensitive land uses.

**Solid Industrial Waste (SIW)** – Defined as waste that is generated by businesses from an industrial or manufacturing process or waste generated from non-manufacturing activities that are managed as a separate waste stream.

**Source Separation** – Separation of recyclable material from other waste at the point and time the waste is generated. Includes separation of recyclable material into its component categories and may include further separation within each category.

**Sustainability Victoria (SV)** – Statutory authority established in October 2005 under the Sustainability Victoria Act 2005 with the key objective of ‘facilitating and promoting environmental sustainability in the use of resources’. Works across the areas of energy, waste and water with communities, industries and government to enable change in environmental practices.

**Transfer Station (TS)** – Facilities where collection vehicles deposit waste and/or recyclables collected from elsewhere. (Waste or recyclables are then put into larger transfer vehicles for transport to a landfill site, MRF or resource recovery facility.) Transfer stations may be used by both individuals and vehicles and may include recycling facilities and facilities for compacting and baling waste and recyclable materials.



**Waste** – Any discarded, rejected, unwanted, surplus or abandoned matter including material intended for recycling, reprocessing, recovery, purification or sale. In this document, the term ‘solid waste’ refers to non-hazardous, non-prescribed, solid waste materials ranging from municipal garbage to industrial waste.

**Waste and Resource Recovery Group (WRRG)** – Statutory authority established under the Environment Protection Act 1970 responsible for preparing the regional implementation plan for their region.

**Waste generation** – The sum of products and materials that are reprocessed, recovered for energy or disposed to landfill.

**Waste hierarchy** – A concept promoting waste avoidance ahead of recycling and disposal. Recognised as promoting management of waste in the order of preference: avoidance, reduce, reuse, recycle and disposal.

**Waste minimisation** – Concept of, and strategies for, waste generation to be kept to a minimum level to reduce the requirement for waste collection, handling and disposal to landfill. Also referred to as waste avoidance.

# APPENDIX F - Collaboration during the development of the north east implementation plan

This annexure documents the process undertaken by NEWRRG to collaborate with other Groups to achieve a coordinated approach to planning for Victoria's waste and resource recovery system.

NEWRRG collaborated with the waste and resource recovery portfolio agencies, comprising the other six WRRGs, DELWP, EPA and SV. Collaboration over the two years occurred both as a collective and through collaboration with individual groups.

NEWRRG collaborated with the portfolio through:

- > A statewide regional working group, which met monthly throughout the development process. It facilitated a consistent approach to interpret and apply the legislation and guidelines, inform the development of documented guidance material, consistent definitions and approach to data analysis and enabled groups to collectively solve problems and devise practical solutions.
- > A shared approach to establish a data system to capture and analyse data from a range of sources, a study to identify consistent financial and environmental performance factors and a survey to capture re-processor information
- > A risk workshop identified common and shared risks, which informed the high level approach to contingency plans
- > An integration conference addressed final alignment issues, including cross-regional flows and contingency measures
- > An industry forum to engage collectively regarding the six regional implementation plans
- > Sharing of information and draft material throughout local, state government and industry
- > A monthly WRRG debrief meeting to ensure collaboration between the groups
- > Meetings with EPA to clarify data used in the schedules

NEWRRG also collaborated with individual groups. This included:

- > Cross checking information with specific regional groups (adjacent or otherwise) in relation to cross-regional flows
- > Shared market assessment activity with Goulburn Valley WRRG and Loddon Mallee WRRG
- > Formal correspondence with other groups

As a result of the collaborative approach, the following outcomes were achieved:

- > Efficiencies in the engagement with the waste and resource recovery sector
- > Comprehensive data set using the same methodology, represented consistently in the regional implementation plans and which will also be reflected in the statewide plan
- > Consistent terminology used throughout the regional implementation plans
- > Infrastructure schedules which are consistent across the state
- > Consistent response to statewide policy
- > Cross-regional flows and opportunities considered
- > Commitment to annual contingency planning across the state
- > Commonality of priority actions, including statewide priorities

# APPENDIX G – Response to comment

The consultation process for the draft north east implementation plan included a range of opportunities for state government, councils, industry, business and the community to all participate and provide feedback.

The public consultation process with stakeholders and community was conducted throughout May 2016 and into June 2016. The objective of the official consultation period was to validate and improve the draft north east implementation plan and increase the engagement of stakeholders.

Consultations included briefings for all local government and Alpine Resort leadership teams (ten in total). A two hour 'open house' session was conducted in each local government area. Open houses were not held at the three Alpine Resorts.

The public consultation, consultation sessions and opportunities for providing feedback were extensively publicised in local and regional media as well as through industry and government networks and online.

Feedback was received through:

- > the consultant and NEWRRG staff attending the seven open house sessions
- > individual community members and/stakeholders contacting NEWRRG directly
- > individual community members and/stakeholders contacting consultant directly
- > individuals completing an online survey
- > individuals making written submissions.

The feedback provided on the north east was welcomed as evidence that overall the north east implementation plan addressed the waste and resource recovery infrastructure needs for the next ten years. The constructive feedback on the draft added significant value to the final north east implementation plan and ensures that it is a robust and considered document.

A total of 18 survey responses were received and feedback from the open house sessions was recorded from 12 individuals with consultant notes and written submissions. Within these, 52 separate comments were made relating to the north east implementation plan. Of these comments 26 were related to minor factual corrections and spelling and grammatical errors, which have since been amended. All submitters were informed how their comments were addressed. These submissions are not individually summarised because each of them was minor and didn't impact the plan in any material way.

The remaining comments are summarised in Table G1. The table also provides responses to these comments from the NEWRRG.

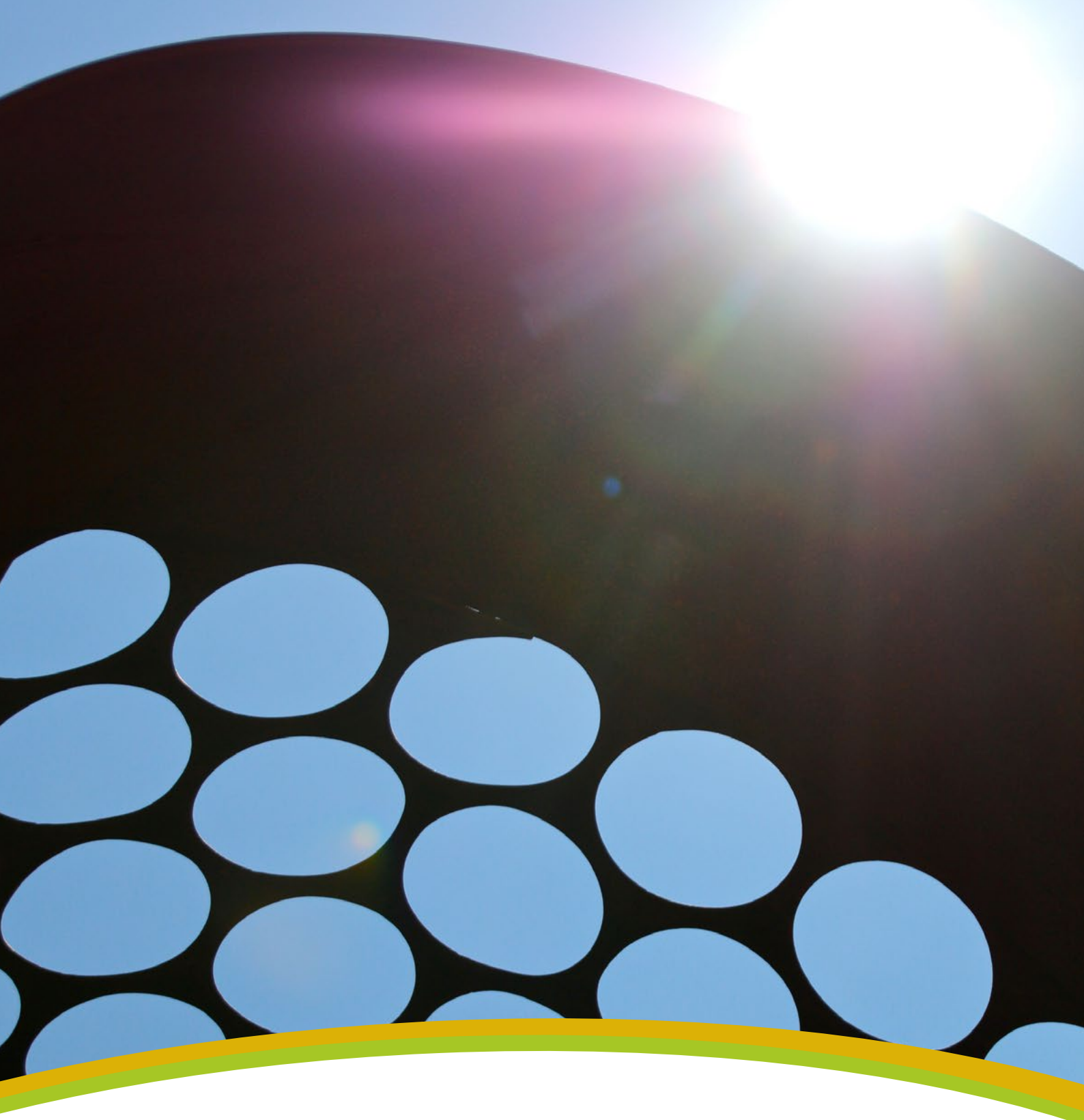
**Table G1 Key themes from the responses of public and industry**

Theme	Key issues for	Feedback	Response from NEWRRG
Strategic direction	Industry	<ul style="list-style-type: none"> <li>&gt; That priority action 5 should have stronger wording.</li> <li>&gt; That increasing the efficiency and reducing the cost of recycling is extremely important</li> <li>&gt; The region's waste and resource recovery data is already 3 years old and data collection is very important</li> <li>&gt; The goal to reduce landfills within 30 years is inadequate and landfills should be eliminated completely and replaced with existing technology that provide beneficial use of resources. Access to waste streams for new and innovative approaches is difficult for new enterprises due to long term contracts with landfill operators. Furthermore the north east implementation plan does not consider pricing and as a result loses and opportunity to significantly improve incentivising industry to achieve a beneficial use outcome.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; The plan adequately describes this priority. No changes are required.</li> <li>&gt; All strategic directions are equally important and do not work in isolation so no change was made to the north east implementation plan.</li> <li>&gt; Priority 9 identifies that there is a need for a data system to collect new data to inform waste and resource recovery decisions in the region. No change was made to the north east implementation plan.</li> <li>&gt; Priority action 1 is to develop and support solutions to increase the recovery of materials and in table 1 under supporting priority action 8 it is stated that only waste that cannot be recovered viably should go to landfill. The plan also adheres to the principles of the waste hierarchy where avoidance, reduction and reprocessing are preferable to landfilling. Current and future strategies relating to landfilling are based on what is currently viable whilst adhering to community tolerances and state government direction. The North East Needs and Priorities analysis reviewed the needs of the region as well as current alternative technologies and pricing in detail. It informed the market sounding process which was an opportunity for industry to put forward solutions for managing material streams in the region. All of these submissions have been included in the plan under section 4.15. Thus no changes have been made to the north east implementation plan.</li> </ul>
Priority Actions	Industry	<ul style="list-style-type: none"> <li>&gt; That the tonnes of organic material listed as landfilled in the region is a significant under-estimate</li> <li>&gt; There is no appropriate priority action that addresses the issue of lack of hard and film plastic reprocessing</li> <li>&gt; There is limited use by councils for glass as a road base for technical and economic reasons</li> <li>&gt; As some councils are into the fourth year of a 12 year contract of a food/garden organics kerbside collection service there is diminishing opportunity to pay for a better solution from the existing contract. Thus the statement "a regional</li> </ul>	<ul style="list-style-type: none"> <li>&gt; This is a modelled figure and may not be correct, it is however the best data available. No change was made to the north east implementation plan.</li> <li>&gt; The wording 'to address the lack of re-processors and collections in the region' was added in Action 1.4 in the north east implementation plan.</li> <li>&gt; Glass use is not limited to councils or the use in roadbase and this paragraph is representing the expressed need of industry. No change was made to the north east implementation plan.</li> <li>&gt; The comment relating to this in priority action 1 relates to Wodonga and Indigo's Kerbside contracts only. There is still a need for organics processing in the region and thus no change was made to the north east implementation plan.</li> </ul>

Theme	Key issues for	Feedback	Response from NEWRRG
Priority Actions (cont)	Industry	<p>solution to manage food organics may be desirable as additional capacity” needed to be stronger and more urgent.</p> <ul style="list-style-type: none"> <li>&gt; There is no pre-sorting under the explanation around priority action 1 however Wangaratta do pre-sorting, at landfill and transfer station. Suggested changing the wording to limited presorting.</li> <li>&gt; Statements about community expectations need to be supported by evidence.</li> <li>&gt; Comment that encroachment from developers needed to be to a point made for priority action 1.</li> <li>&gt; Concern that in the priority actions and associated reasoning there should be a statement saying that if people want to develop in established buffer zones they have to accept pre-existing activity.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; No changes were made to the north east implementation plan as in this instance the presorting statement relates to mixed loads rather than sorting of kerbside organics.</li> <li>&gt; The north east implementation plan has since been reviewed to ensure all statements relating to community expectations are cited.</li> <li>&gt; The action states encroachment which can be from any kind of development. No change was made to the north east implementation plan.</li> <li>&gt; Buffers are defined in guidelines published by the regulator. The proposed priority actions are aimed to work with the relevant authorities to put planning protections in place. No change was made to the north east implementation plan.</li> </ul>
Action Plan	Industry	<ul style="list-style-type: none"> <li>&gt; There may be opportunities to explore Wangaratta as a regional hub for organics processing.</li> <li>&gt; In the action plan table need to add industry (those producing waste) as group to consult.</li> </ul>	<ul style="list-style-type: none"> <li>&gt; The north east implementation plan cannot elect one area as a preferred area for certain activities without proper process. An action was included as recommended in ‘possible action’ in the north east implementation plan.</li> <li>&gt; The term industry isn’t used since decisions about who is a stakeholder should be made on a case by case basis which may include waste producers as well as reprocessors. No change was made to the north east implementation plan.</li> </ul>
Waste and Resource Recovery Infrastructure	Industry	<ul style="list-style-type: none"> <li>&gt; That an organics facility in the region was not listed as region hub.</li> <li>&gt; There was a comment about a facility’s increasing capacity. The facility has an EPA license to operate at the higher capacity. Capacity would not be increased, operational capability may increase.</li> <li>&gt; That in Table 17 - Land use planning and Waste Planning Framework infrastructure categorisation: <ul style="list-style-type: none"> <li>o reasoning should be included</li> <li>o the risk rating should be high for key facilities shutting down/ failure of organics processors</li> <li>o causes should include lack of markets and market corruption.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>&gt; Only those facilities that met the requirements of a regional hub as defined in the SWRRIP were listed in the north east implementation plan as regional hubs. No change was made to the north east implementation plan.</li> <li>&gt; The sentence that this comment related to has been removed form the north east implementation plan.</li> <li>&gt; The risk is correctly called planning encroachment. The risk rating is determined regionally by likelihood and impact and therefore considered medium. Market failure was added to causes in the north east implementation plan.</li> </ul>

Theme	Key issues for	Feedback	Response from NEWRRG
Infrastructure Schedule	Industry	<ul style="list-style-type: none"> <li>&gt; Concern that in Table 19: Needs to improve existing resource recovery infrastructure, Kerbside food organics and organics from C&amp;I should be regarded as separate categories. A regional facility has capacity to process more food waste if it is received directly as industrial waste</li> <li>&gt; Boorhaman, has a clay cap, and rehabilitated. Needs to have more definition around rehabilitation status, ie. councils need to develop a management plan that recognises local issue for each landfill site</li> </ul>	<ul style="list-style-type: none"> <li>&gt; The statement relating to this is a statement for the whole region and not facility specific. No change was made to the north east implementation plan.</li> <li>&gt; Boorhaman has been marked as complete and statement has been added in the north east implementation plan.</li> </ul>
Glossary	Industry	<ul style="list-style-type: none"> <li>&gt; That the definition of hazardous waste is inaccurate</li> </ul>	<ul style="list-style-type: none"> <li>&gt; This was checked and was consistent with the SWRRIP and EPA definition. No change was made to the north east implementation plan.</li> </ul>





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