

AVON REGIONAL ORGANISATION OF COUNCILS

STRATEGIC WASTE MANAGEMENT PLAN 2015 TO 2020



Prepared for

SHIRE OF NORTHAM on behalf of the AROC member councils

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Executive Summary

The Avon Regional Organisation of Councils (AROC) is a regional grouping of six local governments. The AROC group represents a population of approximately 22,000 people, covers an area of approximately 10,600 km² and was formed in 1999.

Waste management has traditionally not been a major focus of the group, with the various members effectively undertaking waste management activities in isolation. The exceptions being, the Shires of Northam and Toodyay and the Shires of Dowerin and Goomalling, which have worked together to some degree on waste management matters.

In February 2015, the AROC appointed *IW Projects* to develop a Strategic Waste Management Plan that incorporated the complete AROC region.

In March 2012, the Minister for the Environment launched the WA Waste Strategy: *Creating the Right Environment*. The Strategy employs best practice and continuous improvement, along with target setting, as primary approaches to drive change. This document has been used as a point of reference when creating the strategic direction for the group.

In conjunction with the above WA Waste Strategy, the Waste Authority develops an annual Business Plan, the current plan (*Business Plan 2014/15*) also includes projections through to the 2018/2019 financial year; consequently, this document provides guidance to the group on the Waste Authority's likely direction for the majority of the duration of the group's Strategic Waste Management Plan.

The members of the AROC group have previously developed strategic waste management plans, either individually or in smaller groups. These plans were reviewed to assess past priority areas, priority waste streams, proposed activities and achievements.

Across the group, there was a diverse range of priorities that were previously considered. A constant theme related to improving or implementing kerbside recycling collection services and improving the management and operation of landfill facilities. Other common areas included hazardous household waste and e-waste recycling.

In recent years, there has been a dramatic improvement in the kerbside recycling collection services being offered within the region. In addition, both hazardous household waste and e-waste recovery has increased noticeably as well as an improvement in the diversion of green waste from landfill.

A review of the current waste and recycling quantities being generated within the region has indicated that there are varying degrees of accuracy surrounding the quantities of materials being generated. Consequently, it is difficult to accurately determine what waste diversion impact an active recycling program will achieve.

The focus for this Strategic Waste Management Plan is on the quantity and type of materials that are currently being landfilled. These are the materials that need to be concentrated on to, where possible, increase waste diversion from landfill. Consequently, the quantity of current recycling is not overly important, but the range and participation rates are extremely important. This becomes the indicator of how broad the recycling base is within the individual shires and also whether there is an opportunity to increase the participation rate within the existing recycling systems.

Following a review of the level of waste management services within the region, it was concluded that not all services are available to all areas within each shire. There is typically a concentration of effort in the larger town sites, with decreasing service availability as the population density decreases. The ideal is for each shire to assess the level of service provided to its community and determine the benefit of expanding the existing services into larger areas of the shire or looking at those services that are not provided and assessing the pros and cons of undertaking new services.

The focus of any improvement or new service should be around minimising the quantity of waste to landfill. Consequently, increasing only kerbside waste collection is simply improving the convenience level for a portion of the community; however, not increasing waste diversion. Any new kerbside waste collection service should ideally be in conjunction with a new recycling collection service. The ideal is that each householder that is receiving a kerbside waste collection service should also be receiving a kerbside recycling service. This should be a mandatory combination.

With regards to the service delivery mechanism, there is no strategic waste management benefit or disbenefit to operating services in-house or contracting them out. The main considerations are cost and efficiency. So long as the service mechanism delivers the least cost and most effective (compliant) solution, then this is deemed the best service mechanism.

With the current stage of development of the waste management activities within the group, it is deemed premature to consider involvement in any substantial waste processing technology. The preference at this stage would be to concentrate on improving waste diversion from landfill through small, affordable steps before the group ventures out into larger scale and more costly solutions. In time, if there is real progress achieved within the group in maximising small-scale waste diversion, then there is the opportunity to expand the group's horizons to include the more advanced waste technologies that are available.

Based on the review of the groups previous SWMP's and the progress achieved within the group, the following are considered the group's priority areas:

- Waste management activity coordination and leadership
- Data collection
- Existing recycling activities
- Additional recycling activities
- Landfill management
- Community education

- Increased participation in recycling activities.

Based on the above priority areas, the following are the group's priority wastes:

- Comingled recyclables waste
- Household Hazardous Waste
- E-Waste
- Landfilled Waste
- Organic waste (primarily green waste).

There have been a number of group synergies identified that provide the ability to contract out larger operations than would be possible for the individual councils. This would initially revolve around transport (collection) efficiencies, but in time potentially progress to materials processing activities. There is also the opportunity for the individual councils to operated their own facilities (landfill/drop-off/transfer station) while sharing knowledge and experiences to improve the standard of facility operation and encourage continuous improvement.

The following proposed activities have been identified for the group during the validity period of this Plan:

No.	Proposed Activity
2015 – 2016 Financial Year	
1	Establish a Waste Management Working Group within AROC or appointment of a dedicated Regional Waste Management Coordinator
2	Knowledge sharing within the region
3	Improve systems for the collection and recording of waste management data
4	Investigate and implement improvements to existing recycling systems
5	Improve/implement Hazardous Household Waste drop off facilities
6	Review of disposal facility gate fee structure
2016 – 2017 Financial Year	
7	Extraction of recyclables from landfill and transfer station tipping area
8	Improve compliance with landfill Registration and Licence conditions
9	Improve landfill planning and overall management
10	Regional sharing of waste management equipment
11	Investigate benefits for joint tendering
12	Local Governments lead by example

2017 – 2018 Financial Year	
13	Waste Management Working Group to undertake waste education activities or appointment of a dedicated Regional Waste Education Coordinator
14	Develop a common website structure for waste management information
15	Develop a regional waste management calendar
16	Improve participation rates in existing recycling systems
17	Increase the range of materials that can go into the comingled recycling bin
18	Increase opportunities for recycling drop off
2018 – 2019 Financial Year	
19	Green waste diversion from landfill
20	Develop/improve tip shop facilities
21	Improve staff training in waste management activities
22	Ongoing community education
2019 – 2020 Financial Year	
Continuous improvement and rollout of above activities	

With the group having numerous “grass roots” proposed activities to be undertaken during the 2015 to 2020 period, the preference is to actively pursue these basic activities before embarking on the more technologically advanced process. The group is to use this period to firmly establish the regional cooperation between the participants and implement effective waste management operations and shared contracts/activities prior to considering the more advanced technology solutions.

The individual group participants will require political and financial support from their individual councils in order to achieve noticeable improvements in waste management activities within the shires and the region. This support is essential for the future success of the group’s proposed activities. In addition, the group is to actively pursue available funding sources to supplement the financial contributions from individual member councils.

In order to achieve the group’s proposed activities for the period 2015 to 2020, it is essential that this Strategic Waste Management Plan be regularly reviewed. The review is primarily to gauge the group’s actual achievement against the proposed activities to provide direction as to where the necessary effort is required in order to achieve the desired outcomes by the end of the Plan validity period. As a minimum, this Plan should be reviewed on an annual basis, with a summary review presented to a quarterly group meeting.

1. Introduction

The Avon Regional organisation of Councils (AROC) is a regional grouping of six local governments. The AROC group represents a population of approximately 22,000 people, covers an area of approximately 10,600 km² and was formed in 1999. The six member councils include:

- Shire of Chittering;
- Shire of Dowerin;
- Shire of Goomalling;
- Shire of Northam;
- Shire of Toodyay; and,
- Shire of Victoria Plains.

The group's primary business focus includes:

- Strategic land use planning;
- Tourism management and promotion of the regional area;
- Socioeconomic, environmental and natural resource planning;
- Waste management;
- Seniors accommodation solutions; and,
- Centralised information technology and rating systems.

Waste management has traditionally not been a major focus of the group, with the various members effectively undertaking waste management activities in isolation. The exceptions being, the Shires of Northam and Toodyay and the Shires of Dowerin and Goomalling, which have worked together to some degree on waste management matters.

In February 2015, the AROC appointed *IW Projects* to develop a Strategic Waste Management Plan that incorporated the complete AROC region.

The scope of work was to include the following activities:

1. Review available waste management documentation belonging to AROC members, including waste management contracts, waste and recycling data, strategic waste plans, correspondence from Department of Environment Regulation (DER) and any other relevant waste management documentation.
2. Undertake a site visit to each shire to inspect waste management sites, discuss waste management issues, past successes and future direction.
3. Compile conceptual strategic waste management initiatives.

4. Hold a joint meeting with all AROC members to discuss strategic waste management initiatives for the individual shires and the group of shire and determine the group's future direction.
5. Based on the information reviewed and discussed, compile a Strategic Waste Management Plan for the group.

2. Strategic Waste Planning

Strategic planning should ideally incorporate the following activities:

- Determine where the group is currently – Current competencies;
- Identify what is important – Priority areas;
- Define what the group must achieve – Objectives to address priority issues;
- Define who is accountable – How the group is going to get to where it wants to go; and,
- Review, review, review – Regular formal reviews to assess progress.

This document follows these fundamental strategic steps to identify the group's strategic direction.

3. State Waste Strategy

3.1. Creating the Right Environment

In March 2012, the Minister for the Environment launched the WA Waste Strategy: *Creating the Right Environment*.

The Strategy employs best practice and continuous improvement, along with target setting, as primary approaches to drive change. The Strategy builds on existing programs and initiatives such as the Regional Funding Program, Household Hazardous Waste Program, Data Program, Waste Awards, and grants programs as well as strategic partnerships, to achieve the desired outcomes.

The amount of waste being recovered in Western Australia has been increasing steadily for a number of years, and there is evidence that increases in the landfill levy have accelerated this trend. However, the State's performance when benchmarked against other mainland states is still poor and requires a significant boost if comparable outcomes are to be achieved. In order to achieve this, the key drivers that have shaped the strategies and targets in *Creating the Right Environment* include:

- Key Driver 1 - The need to lift the effectiveness of planning for long-term waste management at a State level.
- Key Driver 2 - Access to data and information to underpin the measurement of strategies and services.

- Key Driver 3 - Significant opportunities to improve performance on construction and demolition, and commercial and industrial waste recovery.
- Key Driver 4 - Consolidation and improvement in municipal waste collection and processing performance.
- Key Driver 5 - A desire to do better on packaging waste management, litter recovery and other problematic wastes.
- Key Driver 6 - Improved landfill practices and incentives to reduce waste to landfill.

Creating the Right Environment has five strategic objectives within which strategies relating to knowledge, infrastructure and incentives have been developed to support a coordinated approach to changing the behaviour of individuals, groups and organisations:

- Strategy Objective 1 – Initiate and maintain long-term planning for waste and recycling processing, and enable access to suitably located land with buffers sufficient to cater for the State’s waste management needs.
- Strategy Objective 2 - Enhance regulatory services to ensure consistent performance is achieved at landfills, transfer stations and processing facilities.
- Strategy Objective 3 - Develop best practice guidelines, measures and reporting frameworks and promote their adoption.
- Strategy Objective 4 - Use existing economic instruments to support the financial viability of actions that divert waste from landfill and recover it as a resource.
- Strategy Objective 5 - Communicate messages for behaviour change and promote its adoption, and acknowledge the success of individuals and organisations that act in accordance with the aims and principles in the Strategy and assist in its implementation.

Targets in the Strategy are based on ambitious but achievable improvements in current recovery rates. The targets are expressed as the proportion of waste recovered compared to that generated. Recovery targets for municipal solid waste in the Perth Metropolitan Region are 50% by 30 June 2015 (up from 36% in 2009/10) and 65% by 2020 and in major regional centres 30% by 30 June 2015 (up from 15% in 2009/10) and 50% by 30 June 2020. Statewide targets for the commercial and industrial sector are 55% by 30 June 2015 (up from 46% in 2009/10) and 70% by 30 June 2020. Construction and demolition waste State wide targets are 60% by 30 June 2015 (up from 29%) and 75% by 30 June 2020.

The implementation of the Strategy is supported by funding from the Waste Avoidance and Resource Recovery Account, and initiatives and actions funded under the Strategy are contained in the Waste Authority’s annual Business Plan.

3.1.1. Impact on the Group

The Waste Strategy is a State wide strategy for improved waste management; hence, covers all regions within the State. As can be expected, the main concentration of focus is in those areas where the most waste is generated and consequently the implementation of the Strategy's initiatives will have the most impact. The focus areas are:

- The Perth Metropolitan Area.
- Major regional centres – Avon, Greater Bunbury, Albany, Geraldton, Kalgoorlie, Karratha, Peel and Busselton.
- All other areas within the State.

Due to the distribution of the member councils within AROC, the group falls into the second focus area – *major regional centre* as well as the third focus area – *other areas with the State*. The consequence of this is that there will be *Municipal Solid Waste Sector Targets* for the Avon area (Northam and Toodyay) while the remainder of the members will not have specified targets. These Strategy Targets should be used to drive the Avon portion of the group to make reasonable changes and improvements to its current level of recycling, while providing a level of encouragement to the remainder of the group to follow suit.

It is noted that the Strategy Targets refers to "*material presented for collection*" being that material that is to be accounted for when determining the group's success against the set targets. This would certainly include all kerbside collections (waste, recyclables, green waste, bulk waste etc.). It is unclear as to whether material presented at the group's transfer station, drop-off facilities, tip shops and landfills by local residents is included in the targeted quantities. According to the written word, this material would appear to be outside the targeted materials, but logically, it should be presumed that this material is also considered for diversion from landfill. In future, if reporting against the Waste Strategy Targets (which may impact future funding opportunities), the group should be mindful of this fact and separate the data into the "Targeted" material and "Other" material. The challenge in reporting success is in the accuracy of the data available.

Although the recycling targets are an important aspect of the overall Strategy, they are not the only aspect of the Strategy. As documented above, there are numerous Key Drivers and Strategic Objectives that set out a range of aspects of current waste management practice that the Waste Authority seeks to influence. Some of these Drivers and Objectives are relevant to the group and need to be considered in the group's future planning:

- **Key Driver 1 - The need to lift the effectiveness of planning for long-term waste management at a State level.** State level planning is beyond the influence of the group. However, the group should be aware of its current waste management facility capacities, primarily landfill airspace, to develop an understanding of the medium and long-term requirements within the group.

- **Key Driver 2 - Access to data and information to underpin the measurement of strategies and services.** In order to plan for the future, it is essential that the group has an understanding of the quantity of waste and recycling material that is handled. There is a need to develop a simple data collection system that enables the individual councils to gain a better understanding of their current activities. This data collection will provide valuable information for future decision making as well as reporting against the Waste Strategy Targets.
- **Key Driver 3 - Significant opportunities to improve performance on construction and demolition, and commercial and industrial waste recovery.** This Key Driver has no particular relevance to the group at this stage of its waste management development. Possibly at some time well into the future, when the group is looking for continuous improvement projects, the group may consider strategies to improve the management of construction & demolition (C&D) waste and commercial & industrial waste (C&I). It is however important to note that a single demolition project could generate a relatively significant quantity of C&D waste. The landfill operators should have contingency plans on what to do with a large quantity of C&D waste.
- **Key Driver 4 - Consolidation and improvement in municipal waste collection and processing performance.** There is an opportunity to improve on the existing waste and recycling collection systems currently in operation. This is achieved by a combination of community education to increase at-source waste sorting while reducing recyclable contamination and expanding the collection service or drop-off opportunities into additional areas.
- **Key Driver 5 - A desire to do better on packaging waste management, litter recovery and other problematic wastes.** For the group, this Driver is somewhat linked to Key Driver 4 above as well as providing improved E-waste collections and handling, hazardous household waste collections and handling and increasing the range of materials that can be collected at the verge side and diverted from landfill.
- **Key Driver 6 - Improved landfill practices and incentives to reduce waste to landfill.** This Objective is relevant to the group as there are numerous landfills in the region. Improving the management thereof is and should continue to be a priority for the group. Knowledge and experience (positive and negative) sharing will assist in raising the average level of facility management in the region. Incentives primarily relate to “gate fee” incentives. The region’s facility gate fees need to be structured to incentivise waste diversion from landfill. That is, recycling disposal should be cheaper than waste disposal. Tip passes; however, make it difficult to change behaviour based on cost of tipping.

- **Strategy Objective 1 – Initiate and maintain long-term planning for waste and recycling processing, and enable access to suitably located land with buffers sufficient to cater for the State’s waste management needs.** This Objective is not overly relevant to the group as it is more relevant to the Perth metropolitan area and its surrounds; however, when the group or individual councils are looking for future waste management sites (primarily new landfills), these issues need to be considered. The group or individual councils may review planning policies and Structure Plans to ensure that there are adequate buffers secured around existing facilities and potentially for future waste management sites.
- **Strategy Objective 2 - Enhance regulatory services to ensure consistent performance is achieved at landfills, transfer stations and processing facilities.** This Objective is relevant to the group. This Objective identifies that there is likely to be increased DER monitoring and inspections of waste management facilities in the future to ensure that facilities are managed to best practice standards. Sites not being operated appropriately will likely be encouraged to comply with best practice and in extreme circumstances penalised accordingly. The enhanced regulatory services are also likely to result in more stringent design and compliance requirements when developing new waste management facilities (mainly landfill sites). This has the potential to significantly increase the cost of developing and operating future waste management facilities.
- **Strategy Objective 3 - Develop best practice guidelines, measures and reporting frameworks and promote their adoption.** This is of limited impact to the group and is likely to be an output from the DER at some time in the future.
- **Strategy Objective 4 - Use existing economic instruments to support the financial viability of actions that divert waste from landfill and recover it as a resource.** This is seen as a direct reference to increasing the Perth metropolitan landfill levy to narrow the cost gap between recycling operations and landfill disposal costs. With the landfill levy only applying to the Metropolitan area, this is of no consequence to the group. It is important to note that in time, there is the potential that the landfill levy will be expanded into the major regional centres, of which, the Avon region is one.

- **Strategy Objective 5 - Communicate messages for behaviour change and promote its adoption, and acknowledge the success of individuals and organisations that act in accordance with the aims and principles in the Strategy and assist in its implementation.** This Objective is structured around community education and the influencing of behavioural change to achieve community buy-in to improved recycling activities. This is seen as an important aspect of any proposed changes within the group or individual council's waste management activities. It is pointed out that community education is not a one-off activity; it is an ongoing requirement to ensure continued success of the recycling activities.

Overall, the WA Waste Strategy is likely to have the following impact on the group:

- Put pressure on the group as a major regional centre to achieve the stated targets by improving waste diversion activities;
- Require the group to have a common and transparent data collection system (in order to measure the success against the Targets);
- Require improvement in current landfill operations to comply with best practice landfill management;
- Make future site development more costly due to increased regulatory requirements; and,
- Opportunity to obtain funding to achieve the objectives of the Strategy.

3.2. Waste Authority Business Plan 2014/15

Although the Waste Authority Business Plan is developed annually, this plan contains projections through to the 2018/2019 financial year; consequently, this provides guidance to the group on the Waste Authority's likely direction for the majority of the duration of the group's Strategic Waste Management Plan.

3.2.1. Strategic Objectives

This is the third Business Plan since the release of the State Waste Strategy (March 2012) and builds on the foundation of the earlier plans and includes actions relevant to the key strategic objectives identified in the Waste Strategy (above):

- **Planning** - Initiate and maintain long-term planning for waste and recycling processing to cater for the State's waste management needs.
- **Regulation** - Enhance regulatory services to ensure consistent performance is achieved at landfills, transfer stations and processing facilities.
- **Best Practice** - Develop best practice guidelines, measures and reporting frameworks and promote their adoption.

- **Economic Instruments** - Use existing economic instruments to support the financial viability of actions that divert waste from landfill and recover it as a resource.
- **Engagement** - Communicate messages for behaviour change and promote its adoption, and acknowledge the success of individuals and organisations that act in accord with the aims and principles in the Strategy and assist in its implementation.
- **Data and Measurement** - Collect and analyse data on waste and recycling services and performance across Western Australia to allow assessment of progress against Waste Strategy targets to meet reporting requirements.
- **Strategic Policy Development and Review** - Regular review and updating of the Waste Strategy elements in response to emerging issues, changing market circumstances, national waste policy development and implementation of initiatives, such as producer responsibility schemes.
- **Administrative and Program Service Provision and Support** – Administrative and program delivery staff salaries, office and management overheads, Waste Authority sitting fees, committee and sub-committee support and on-costs.

4. Review of Existing Group SWMP's

The following existing Strategic Waste Management Plans are available within the group:

- Shire of Chittering – *Strategic Waste Management Plan – Talis Consulting February 2014*;
- Shires of Dowerin and Goomalling – *Strategic Waste Plan September 2008*;
- Shires of Northam and Toodyay – *Strategic Waste Minimisation Plan 2008 – 2013 – IW Projects October 2008*; and,
- Shire of Victoria Plains – No strategic plan.

4.1. Shire of Chittering

4.1.1. Priority Areas

The Shire of Chittering Strategic Waste Management Plan sets the following priorities with regards to future waste management activities:

- Regionalisation - Regionalisation of waste management services can offer several benefits to the local governments and communities involved. These include:
 - Improved economies of scale;

- Increased recycling and landfill diversion opportunities;
- Provide services to communities that may not otherwise be possible at local level; and,
- Improvement environmental outcomes.
- Resource recovery and waste management services – Improved kerbside recycling collection services.
- Landfill opportunities – Best practise landfill facility (lined landfill), providing a disposal location for other surrounding Local Governments and also the Perth Metropolitan area.

4.1.2. Priority Wastes and Proposed Activities

The priority wastes and proposed activities associated with the above priority areas include:

- Kerbside collection services:
 - Dry/comingled recycling;
 - Organic (green waste/organics);
 - General waste*; and,
 - Commercial and industrial collection services*;
- Verge side collection:
 - Green waste;
 - Hard waste; and,
 - Skip bin services;
- Drop off services:
 - Community reuse facility;
 - Recycling centre;
 - Bulk waste acceptance (green waste, inert, scrap metal);
 - Household hazardous waste; and,
 - General waste;
- Recycling and resource recovery:
 - Material recovery facility of comingled dry recyclables;
 - Green waste mulching*;
 - Inert waste recycling;
 - Scrap metal*;
 - Hazardous waste treatment;

- Organic waste treatment (composting); and
- Energy recovery;
- Disposal:
 - Putrescible landfill*
 - Inert landfill.

* Indicates the services that were available at the time of developing the Talis SWMP.

Where there are existing waste management activities within the shire, the intention is to improve these and optimise the service and or treatment that is available.

4.1.3. Achievements

Due to the Talis SWMP only being finalised in February 2014, there plan is relatively new and hence there has not been significant advancement of the proposed activities. The most significant achievement has been the implementation of a kerbside recycling collection service, which has been contracted out as a single contract incorporating both kerbside waste and recycling collection services. The contract was signed on 29 May 2014, with a five-year contract duration until 28 May 2019. However, the waste and recycling collection services only commenced in September 2014.

4.2. Shires of Dowerin and Goomalling

4.2.1. Priority Areas

No priority areas were identified.

4.2.2. Priority Wastes and Proposed Activities

No priority wastes were identified; however, the following waste management activities were mentioned for potential improvements:

- A need for hazardous household waste facilities;
- Controlled access to landfill and having them manned;
- Charging disposal fees at the landfills;
- Improved resource recovery at landfills;
- Consolidating landfills down to a single, well managed landfill in Goomalling;
- Transporting all waste to Northam landfill;
- Kerbside recycling; and,
- Green waste shredding and reuse for landscaping.

The SWMP identified the following action items:

- Public consultation on options including landfill closure(s) and transfer station;
- Fence and manning of Dowerin landfill;
- Plan for hazardous household waste collection/disposal;
- Increase drop off facilities at landfills for collection of recyclables;
- Provide covered storage for baled cardboard at Lions depot;
- Purchase hydraulic presses for baling cardboard & plastics;
- Develop a roster involving community & sporting clubs to assist with recycling;
- Investigate the green waste issues;
- Investigate the possibility of Waste Wise Schools programs for both shires;
- Promote recycling; and,
- Adopt and implement a Sustainable Procurement Policy.

4.2.3. Achievements

The following achievements have been recorded since the development of the SWMP:

- Controlled access to the Dowerin landfill site;
- Manning of the Dowerin landfill site;
- Implementing a gate fee structure;
- Increased resource recovery at landfill sites;
- Improved operation of the landfill sites; and,
- Improved facilities at the Lions depot in Goomalling.

4.3. Shires of Northam and Toodyay

4.3.1. Priority Areas

The priority areas (in order of priority) were:

- Organic products;
- Building products;
- Chemical products;
- Packaging products;
- Electrical products; and,
- Synthetic products.

4.3.2. Priority Wastes

The group identified the following priority waste streams (in order of priority):

- Packaging waste (not currently being collected by existing recycling activities);
- Organic waste and green waste;
- Household Hazardous Waste;
- E-waste; and,
- Construction and Demolition waste.

4.3.3. Proposed Activities and Achievements

The group's SWMP identified the following suite of activities to be carried out during the period of the plan:

Table 4.3.3.1 – Proposed Activities and Achievements

Activity	Achievement
Where possible, apply local solutions to local problems.	Nothing specific identified.
Develop systems for the collection and recording of waste management data.	Improved data collection at Toodyay WMF and Old Quarry Road landfill, Inkpen Road landfill relies of rough estimations.
Improve the management of landfill facilities.	Progressive improvement on landfill operations.
Implement a household hazardous waste collection system.	Toodyay HHW facility shared by the group.
Investigate the development of kerbside recycling collections in the Region.	Both shires have implemented kerbside recycling.
Implement regular community education/information communication.	Improved community communication via website, radio, waste management calendars and visits to schools.
Implement sustainable purchasing policies.	No formal policy, voluntary participation.
Improve internal communication and knowledge sharing.	Increased participation/working between the group.
Develop links with neighbouring shires.	Participation in AROC and the development of a joint SWMP.
Investigate and implement additional recycling activities.	Increased suite of recyclables at Toodyay WMF and the Old Quarry Road landfill.
Investigate the development of organics/composting facilities.	Nil action.
Implement E-Waste collection systems.	Implemented at Toodyay WMF and both Northam landfills.
Lead by example - improve shire internal recycling activities.	Nil action.
Encourage elected members support in waste minimisation.	Nil action.
Improve transport efficiencies in recycling management.	Implementation of kerbside recycling collection.
Improve materials handling of all existing recycling activities.	Improved suite and volume of recyclable materials at Toodyay WMF and Old Quarry landfill.
Implemented planning solutions to force the developers to manage waste appropriately.	Nil action.
Assess the need to employ a dedicated regional waste management officer.	Nil action.
Continuous improvement.	Ongoing activity.
Investigate implementation of C&D waste processing.	Minimal improvement, bricks and rubble used as landfill cover material.
Improve participation rate in existing recycling systems.	Ongoing activity.
Investigate the potential for developing an "Earth Carers" group in the region.	Minimal activity through Lions Club and swimming club.

4.4. Commentary on Priority Areas

Across the group, there was a diverse range of priorities that were considered. A constant theme related to improving or implementing kerbside recycling collection services and improving the management and operation of landfill facilities.

Other common areas included hazardous household waste and e-waste recycling.

4.5. Commentary on Priority Wastes

Based on the priority areas identified, there was a concentration on trying to improve the collection and handling of materials presented at the kerbside or verge side by residents, this being seen as a captive market, where local government is able to implement services, whilst guaranteeing participation and material quantities.

Other priority wastes included improved recovery of comingled recyclables at drop off facilities, inert waste recycling and the development of both hazardous household waste and e-waste receival facilities.

4.6. Commentary on Achievements

With the relatively small population bases in most shires, the large distances between the waste generators and existing recycling facilities and the cost of establishing new recycling operations, it is typical that only the easier recycling solutions have been progressed.

There has been a dramatic improvement in the kerbside recycling collection services being offered within the region. This, although relatively expensive, is a broadly accepted means of easily achieving significant increases in recycling, as this is a tried and tested solution, which fits into an existing recycling system. Fortunately, the group is close enough to the Perth metropolitan area to be able to feed the collected recyclables into the existing material recovery facilities in Perth (currently the Southern Metropolitan Regional Council, via Avon Waste). Although there is a cost in transporting the loose comingled materials to Perth, the sorting and materials handling is highly efficient in comparison to undertaking this activity in the regional areas. In addition, the suite of recyclable materials that can be processed is also greater than would be the case in the regional areas.

Both hazardous household waste and e-waste recovery has increased noticeably. The primary activity undertaken by the shires has been to provide disposal locations for the drop off of these materials by the public. The collected materials are then simply passed on to downstream processors or recyclers. Both of these products have funded downstream solutions; hence, can be effectively carried out by the shires with minimal effort and cost.

The diversion of green waste from landfill has also improved. This has added an additional cost to the shires in having to then mulch the green waste, as opposed to the traditional solution of burning green waste, which is no longer encouraged by the DER, but on the positive side, the mulched product can be utilised locally for residential and public place landscaping, along with the associated saving in landfill airspace consumption.

5. AROC Waste Quantities

There are varying degrees of accuracy surrounding the quantities of waste materials being generated within the region. The Shire of Northam has a weighbridge at its Old Quarry Road WMF, which is used to provide accurate quantities of waste and recyclable materials entering or leaving the site. In addition, Avon Waste uses the weighbridge to weigh the kerbside recyclables collected within the Shire of Northam and the Shire of Toodyay. There is some accurate information available on the quantities of recyclables processed through the Goomalling Community Recycling Depot. This information is received from the downstream recyclers that pay for the recyclable materials. For the remainder of the waste and recyclable materials handled within the region, the material quantities are simply based on best guess estimates or typical state-wide averages per household and in some cases, simply not available.

The focus for this Strategic Waste Management Plan is on the quantity and type of materials that are currently being landfilled. These are the materials that need to be concentrated on to, where possible, increase waste diversion from landfill. Consequently, the quantity of current recycling is not overly important, but the range and participation rates are extremely important. This becomes the indicator of how broad the recycling base is within the individual shires and also whether there is an opportunity to increase the participation rate within the existing recycling systems.

Table 5.1 – Waste and Recycling Quantities provides a summary of the available data within the region.

Table 5.1 – Waste and Recycling Quantities

Material	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
Waste to landfill						
Kerbside waste collection	1,148 t	213 t	250 t	4,200 t	1,218 t	203 t
Town skip bins	0 t	0 t	0 t	254 t	0 t	0 t
Self haul - residential	6,115 t	Unknown	240 t	2,000 t	662 t ¹	Unknown
Self haul - commercial	Incl.	Unknown	Incl.	5,800 t ²	0 t	Unknown
Self haul – shire generated	Unknown	Unknown	Incl.	757 t	Unknown	Unknown
<u>Total Waste to Landfill</u>	<u>Unknown</u>	<u>Unknown</u>	<u>490 t</u>	<u>13,011 t</u>	<u>Unknown</u>	<u>Unknown</u>
Kerbside recycling collection	373 t	56 t	NA	1,200 t	290 t	22 t
Drop off facility recycling	1,313 t ³	Unknown	NA	770 t ³	26 t ³	Unknown
Volunteer drop off facility recycling	Unknown	43 t	280 t ⁴	39 t	0 t	0 t
Hazardous Household Waste	0 t	Unknown	NA	0.5 t	Unknown	Unknown
E-Waste	5.79 t	Unknown	NA	30 t	6.75 t	Unknown
<u>Total Recycled</u>	<u>Unknown</u>	<u>Unknown</u>	<u>280 t</u>	<u>2,039.5 t</u>	<u>Unknown</u>	<u>Unknown</u>
Miscellaneous						
Used Motor Oil	1.3 t	Unknown	NA	21.9 t ⁵	8.6 t ⁵	Unknown

¹ From Railway Road transfer station.

² Excludes Toodyay kerbside waste and transfer station deliveries.

³ Excludes green waste.

⁴ Excludes recyclables from Dowering and Toodyay.

⁵ Conversion factor KL to t = 0.8.

Table 5.2 – Waste and Recycling Quantities Comparison Based on State Wide Averages provides a summary of the waste quantities based on the number of households in each shire and the state wide generation averages.

Table 5.2 – Waste and Recycling Quantities Comparison Based on State Wide Averages

Material	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
No. of Households	2,100	562	574	6,177	3,100	613
Kerbside waste generation average	20 kg/household/week or 1.04 t/household/year					
Kerbside waste state average	2,184 t	584 t	461 t	5,939 t	2,288 t	638 t
Kerbside Avon Waste data	1,148 t	213 t	250 t	3,494 t	1,218 t	203 t
Kerbside recycling generation average	14 kg/household/fortnight or 0.36 t/household/year					
Kerbside recycling state average	756 t	202 t	166 t	2,224 t	1,116 t	221 t
Kerbside Avon Waste data	560 t	56 t	NA	1,022 t	290 t	22 t
Total domestic waste generation average	29 kg/household/week or 1.51 t/household/year					
Total domestic waste generation state average	3,171 t	849 t	695 t	9,327 t	4,681 t	926 t
Total domestic waste generation Shire Data	7,263 t	Unknown	490 t	8,200 t	1,880 t	Unknown

The state average kerbside waste and recycling tonnage is based on the total number of households in each shire. The intent of this is to indicate the maximum quantities of materials that could be collected from the kerbside if all households were covered by a kerbside collection service. It is however, not proposed that there be 100% kerbside collection coverage within all of the shires, as the cost of servicing the remote areas does not justify the effort. This simply gives an indication that the more of the shires that are serviced, the more material will be collected.

Increasing kerbside waste collection coverage is seen simply as a convenience service to the community; however, increasing the kerbside recycling collection is an effective means of dramatically increasing the quantity of waste diverted from landfill. The ideal scenario being that each property that is serviced with a waste collection pick-up, is also serviced with a recycling collection pick-up.

6. AROC Available Waste Management Infrastructure

The following is a list of available waste management infrastructure in the AROC region.

Table 6.1 – Waste Management Infrastructure

Location	Ownership	Current Status
Class II Landfills		
Muchea WMF	Shire of Chittering	Operational, min. 10 yrs life
Bindoon WMF	Shire of Chittering	Operational, min. 5 yrs life
Amery Road WMF, Dowerin	Shire of Dowerin	Operational, min. 10 yrs life
Waterhouse Road WMF, Goomalling	Shire of Goomalling	Operational, min. 10 yrs life
Old Quarry Road WMF	Shire of Northam	Operational, min. 10 yrs life
Inkpen Road WMF	Shire of Northam	Operational, min. 5 yrs life
Calingiri WMF	Shire of Victoria Plains	Operational, min. 5 yrs life
Bolgart WMF	Shire of Victoria Plains	Operational, min. 5 yrs life
Mogumber Landfill	Shire of Victoria Plains	Operational by arrangement
Waste Transfer Stations		
Railway Road WMF, Toodyay	Shire of Toodyay	Operational, large
Recycling Drop-Off Facilities		
Muchea WMF	Shire of Chittering	Operational, medium
Bindoon WMF	Shire of Chittering	Operational, small
Amery Road WMF, Dowerin	Shire of Dowerin	Operational, small
Cottrell Street Recycling Shed, Dowerin	Shire of Dowerin	Volunteer operation, small
Waterhouse Road WMF, Goomalling	Shire of Goomalling	Operational, small
Community Recycling Depot, Goomalling	Shire of Goomalling	Volunteer operation, medium
Old Quarry Road WMF	Shire of Northam	Operational, small
Inkpen Road WMF	Shire of Northam	Operational, small
Railway Road WMF, Toodyay	Shire of Toodyay	Operational, large
Calingiri WMF	Shire of Victoria Plains	Operational, small
Bolgart WMF	Shire of Victoria Plains	Operational, small

Location	Ownership	Current Status
Materials Recycling Facilities		
Muchea WMF	Shire of Chittering	Green waste mulching
Bindoon WMF	Shire of Chittering	Green waste mulching
Amery Road WMF, Dowerin	Shire of Dowerin	Green waste mulching
Sanders Road, Dowerin	Shire of Dowerin	Green waste mulching
Waterhouse Road WMF, Goomalling	Shire of Goomalling	Green waste mulching
Old Quarry Road WMF	Shire of Northam	Green waste mulching
Inkpen Road WMF	Shire of Northam	Green waste mulching
Railway Road WMF, Toodyay	Shire of Toodyay	Green waste mulching
Calingiri WMF	Shire of Victoria Plains	Green waste mulching
Reuse Facility/Tip Shop		
Muchea WMF	Shire of Chittering	Operational, small
Bindoon WMF	Shire of Chittering	Operational, small
Waterhouse Road WMF, Goomalling	Shire of Goomalling	Operational, small
Railway Road WMF, Toodyay	Shire of Toodyay	Operational, large

7. Available Waste Management Services

The following is a list of available waste management services in the AROC region.

Table 7.1 – Waste Management Service

Service	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
Kerbside waste collection	✓	✓	✓	✓	✓	✓
Kerbside recycling collection	✓	✓	x	✓	✓	✓
Bulk waste verge collection	x	x	x	✓ ¹	x	x
Recycling verge collection	x	✓ ²	✓ ²	x	x	x
Public bin waste collection	✓	✓	✓	✓	✓	✓
Public bin recycling collection	✓	✓	x	✓	x	✓
Public event recycling	x	✓	✓ ²	x	x	x

¹ Via a system of skip bins

² Undertaken via volunteer organisation

The above table represents the range of waste management services available within each shire. Not all services are available to all areas within each shire. There is typically a concentration of effort in the larger town sites, with decreasing service availability as the population density decreases.

The ideal is for each shire to assess the level of service provided to its community and determine the benefit of expanding the existing services into larger areas of the shire or looking at those services that are not provided and assessing the pros and cons of undertaking new services.

The focus of any improvement or new service should be around minimising the quantity of waste to landfill. Consequently, increasing only kerbside waste collection is simply improving the convenience level for a portion of the community; however, not increasing waste diversion. In reality, this may even decrease waste diversions as the householder will find it easier to simply dispose of recyclables in the green bin as opposed to recycling, which, without a kerbside recycling collection, the householder would have to take the recyclables to a drop off facility. Any new kerbside waste collection service should ideally be in conjunction with a new recycling collection service. The ideal is that each householder that is receiving a kerbside waste collection service should also be receiving a kerbside recycling service. This should be a mandatory combination.

Where there is a strong volunteer organisation which actively undertakes recycling activities, such as Goomalling and to a lesser degree Dowerin, there is often hesitation by council in implement kerbside recycling collections. Where these situations occur, the shires are to assess the effectiveness and longevity of the volunteer organisations and the extent to which recyclable materials are being diverted from landfill. The solution is not necessarily to implement kerbside recycling collection, as this could have a negative impact on the community sentiment surrounding recycling involvement. The shire should also consider what associated activities could be improved or implemented to increase waste diversion from landfill, while feeding into the volunteer operation. An example being the provision of recycling bins at the landfill for the collection of source separated recyclables at the tipping face. These collected recyclables could then be fed into the community recycling operation.

There is no green waste verge side collection offered in any of the shires. This could be a mechanism of reducing the quantity of green waste ending up in the landfills. However, this solution would only be applicable to those properties that receive kerbside waste collection, as the self-haul customers can be controlled to divert green waste at the landfills.

8. Contracted Waste Services

The following is a list of waste management services within each shire that are contracted out to external providers.

Table 8.1 – Waste Management Service

Service	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
Kerbside waste collection	✓	✓	✓	✓	✓	✓
Kerbside recycling collection	✓	✓	NA	✓	✓	✓
Bulk waste verge collection	NA	✓	NA	✓	NA	NA
Public bin waste collection	✓	✓	✓	✓	✓	✓
Public bin recycling collection	NA	✓	NA	✓	NA	✓
Public event recycling	NA	✗	✓	NA	NA	NA
Landfill operations	✗	✗	✗	✓	NA	✗
Transfer station operations	NA	NA	NA	NA	✓	NA

There is no strategic waste management benefit or disbenefit to operating services in-house or contracting them out. The main considerations are cost and efficiency. So long as the service mechanism delivers the least cost and most effective (compliant) solution, then this is the best service mechanism.

9. AROC Available Recyclable Material Drop Off

The following is a list of recyclable materials that can be dropped off in each shire within the AROC region.

Table 9.1 – Recyclable Material Disposal

Service	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
Aerosol cans	✓	✓	✓	✓	✓	✓
Aluminium, cans	✓	✓	✓	✓	✓	✓
Aluminium, foil	✓	✓	✓	✓	✓	✓
Building material, timber, C&D	✓	✓	✓	x	✓	✓
Cardboard	✓	✓	✓	✓	✓	✓
Carpets	✓	x	x	x	x	x
Cartridges, printer & photocopier	x	x	x	✓	✓	x
Ceramic, pieces	✓	✓	x	✓	✓	✓
DrumMuster	✓	x	✓	✓	x	x
E-waste	✓	✓	✓	✓	✓	x
EPIRB's (emergency position beacons)	x	x	x	x	✓	x
Fire alarms	x	x	x	x	✓	x
Fire extinguishers	x	x	x	x	✓	x
Flares	x	x	x	x	✓	x
Gas bottles	x	x	x	x	✓	x
Glass, containers	✓	✓	✓	✓	✓	✓
Glass, plate, pieces	✓	✓	✓	✓	✓	✓
Green waste	✓	✓	✓	✓	✓	✓

Service	Shire					
	Chi	Dow	Goo	Nor	Too	V/P
<u>Hazardous Household Waste</u>						
Acids	x	x	x	x	✓	x
Alkalis	x	x	x	x	✓	x
Batteries, dry cell	x	x	x	✓	✓	x
Batteries, wet cell	✓	x	✓	✓	✓	✓
Flammable liquids	x	x	x	x	✓	x
Light globes, fluorescent	x	x	x	✓	✓	x
Paint	✓	x	x	x	✓	x
Pesticides	x	x	x	x	✓	x
Solvents	x	x	x	x	✓	x
Liquid, paperboard	✓	✓	✓	✓	✓	✓
Mattresses (separated for disposal)	✓	x	✓	x	✓	✓
Medicine, expired, excess	✓	✓	✓	✓	✓	✓
Metal, cans	✓	✓	✓	✓	✓	✓
Metal, scrap	✓	✓	✓	✓	✓	✓
Mobile phones & accessories	x	x	✓	✓	✓	x
Oil, used engine	✓	✓	✓	✓	✓	✓
Paper, books and magazines	✓	✓	✓	✓	✓	✓
Paper, clean	✓	✓	✓	✓	✓	✓
Paper, newspaper	✓	✓	✓	✓	✓	✓
Plastic plant pots	✓	x	x	x	✓	x
Plastic, mixed	✓	✓	✓	✓	✓	✓
Plastic, sorted	✓	✓	✓	✓	✓	✓
Plastic, wrapping	✓	✓	✓	✓	✓	✓
Polystyrene foam	✓	✓	x	✓	✓	✓
Tyres, used vehicle	✓	x	x	✓	x	x

The above list represents the broad range of materials that are currently being recycled within the region. It is for each shire to assess how to increase the range of recyclables diverted from landfill and also how to increase the participation rate to maximise the quantity of material diverted from landfill. The starting point should be those materials that are likely to cause environmental harm if disposed of to an unlined landfill (HHW, used engine oil, e-waste).

10. Proposed Activities

10.1. Proposed Activity Descriptions

Following the review of previous strategic waste management plans, the degree of success in achieving the previously proposed activities and based on an understanding of the requirements within the group, the Proposed Activities for the period 2015 to 2020 are presented in the order of priority.

Table 10.1.1 – Proposed Activities – 2015 to 2020 provides the table of Proposed Activities in the order of priority, including related details and responsibilities.

Table 10.1.1 – Proposed Activities – 2015 to 2020

No.	Activity	Details	Responsibility/Man-hours
2015 – 2016 Financial Year			
1	Establish a Waste Management Working Group (WMWG) within AROC or appointment of a dedicated Regional Waste Management Coordinator (RWMC)	<p>To have a waste management working group within AROC or a dedicated staff member from one of the shires to “champion” waste management activities and to drive the Plan objectives.</p> <p>Initially, set up the WMWG to champion the waste management activities and if, in time, the WMWG has sufficient workload, consider appointing a dedicated staff member to take over the WMWG activities.</p> <p>If a dedicated staff member is appointed, ideally this person is an existing waste management employee within one of the group member councils that is appointed on a part-time or full-time basis as the coordinator of regional and local waste management activities to ensure that the proposed activities are actioned within a reasonable timeframe.</p> <p>Provides a dedicated focus on regional and local waste management issues.</p> <p>Responsible for coordinating regional activities.</p> <p>Responsible for coordinating similar waste management activities within individual councils.</p>	<p>Group</p> <p>Not a significant task for the group to implement, once the decision has been made to progress with this activity.</p>

		<p>Knowledge sharing between group participants to ensure efficiency in waste management activities from landfill operations through to waste minimisation activities.</p> <p>Organising, coordinating and driving regular waste management meetings amongst councils.</p> <p>Report back to AROC on a regular basis (at least six-monthly) on achievements against the Plan.</p> <p>Initially coordinating common waste education information amongst councils and developing basic waste education programs (not a primary activity).</p> <p>In time, undertake waste education activities or arrange for the appointment of a Regional Waste Education Coordinator.</p> <p>Manage the Regional Waste Education Coordinator's activities to achieve desired regional and local outcomes.</p> <p>Review gate fee pricing structure to influence disposal habits.</p> <p>Undertake or coordinate regional tendering of waste management services (kerbside waste and recycling collection, bulk waste collection, bulk recycling removal etc.).</p> <p>Undertaking regular reviews of the Strategic Waste Management Plan and Proposed Activities.</p>	
2	Knowledge Sharing within the Region	<p>Sharing of knowledge amongst the members of the region to achieve a more efficient and cost effective waste management outcome.</p> <p>Site visits within the region to observe the waste management activities being undertaken.</p> <p>Regular AROC operational waste management meetings to discuss issue of common interest and share solutions.</p>	<p>WMWG or RWMC</p> <p>No specific man-hours allocated to this task, as it will form part of business as usual activities.</p>
3	Improve systems for the collection and recording of waste management data	<p>Some accurate data is available within the region.</p> <p>Need for a common mechanism for estimating material quantities to enable reasonably accurate comparison across councils.</p> <p>Staff training will be required to ensure consistency across the region.</p>	<p>WMWG or RWMC</p> <p>Estimated 40 man-hours to set up a data collection system and then 2 hours per month to maintain.</p>

4	Investigate and implement improvements to existing recycling systems	<p>General improved participation in existing systems.</p> <p>Opportunities to extract additional packaging waste from general waste stream (which is currently being disposed of to landfill).</p> <p>Recycling bins at transfer station and landfills to enable the drop-off of packaging waste prior to the disposal of general waste. These would be positioned where the vehicles are unloaded.</p> <p>Additional recycling street bins.</p> <p>Provision of recycling bins to householders that are not on the kerbside recycling collection run and enable them to swap a full bin for an empty bin when delivered to the transfer station or landfill. The kerbside recycling collection contractor (currently Avon Waste) then empties the MGB's as part of its regular collection run.</p> <p>The above maximises the opportunities to extract packaging material from the general waste stream prior to disposal. The materials separated will fit into existing kerbside recycling collection systems (side lift collection), processing (standard MRF) and downstream product consumption.</p>	<p>WMWG or RWMC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 4 hours per month.</p>
5	Improve/implement Hazardous Household Waste drop off facilities	<p>Improve existing HHW drop off facilities and implement new drop off locations (permanent or temporary).</p> <p>Potential to purchase dedicated trailers with separate storage compartments for the storage of different types of hazardous household materials. This could be permanently located at drop off facilities (landfills/shire depots) and/or used as mobile drop off units as part of an advertised campaign of temporary collection days around the shires.</p> <p>Once sufficient HHW was collected, the trailers could then simply be towed to Toodyay where the HHW would be transferred to the Railway Road WMF HHW storage area.</p> <p>It is noted that, in order to transport any accumulated Controlled Waste, the shires will need to register as Licensed Controlled Waste Carriers, which entails the trailers or trucks and drivers to be registered with the DER.</p>	<p>WMWG or RWMC</p> <p>Estimated 40 man-hours to develop activity solutions and apply for funding, 20 hours to roll out the solutions and then 2 hours per month to maintain.</p>

6	Review of disposal facility gate fee structure	<p>Assess disposal facility gate fees to encourage/influence disposal habits. Recycling to be cheaper than landfill. Uniformity across the region to limit the likelihood of waste from an expensive landfill going to a cheaper landfill. Regular review to ensure appropriate influence. Consider the negative impact of tip passes where there is no incentive for the householders to separate their waste and recyclables.</p>	<p>WMWG or RWMC Estimated 8 man-hours to gather existing data, assess gate fee structures, propose any amendment to local or regional gate fee structures and then 1 hour per month to maintain.</p>
2016 – 2017 Financial Year			
7	Extraction of recyclables from landfill and transfer station tipping area	<p>There is a substantial amount of recyclable material being landfilled, as evidenced by an inspection of the region's landfills. This includes metal/aluminium cans/paper/cardboard/plastics/green waste etc. Increased effort in removing bulk materials from general waste. Provide more dedicated areas or bins (MGB) at off-loading points to encourage customers to separate materials prior to the disposal of general waste. Removing the recyclables from general waste (small loads). Existing site staff, when opportunities present, remove easily accessible recyclable materials and place them in bins provided above. Employ additional operational staff (new staff or increased hours for existing staff) to extract additional recyclable materials from disposed waste. Removing recyclables from landfill tipping face (large loads). Use a small excavator with grab attachment to extract larger recyclable materials from the tipping face.</p>	<p>WMWG or RWMC The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 4 hours per month.</p>
8	Improve compliance with landfill Registration and Licence conditions	<p>Although not a waste diversion activity, ensuring compliance with appropriate facility Regulations and Licence conditions is an essential activity.</p>	<p>Individual shires The man-hour allocation would be a function of the degree of effort required to achieve the necessary level of compliance. Allocate 4 hours per month.</p>

9	Improve landfill planning and overall management	<p>Although not a waste diversion activity, it is essential that each shire manage their landfill facilities so as to optimise landfill airspace availability and maximise the utilisation of the landfill site.</p> <p>Medium term (5 years) and long term (+10 years) planning is essential to ensure secure landfill disposal options into the future.</p> <p>To develop a new landfill site is an extremely expensive and time-consuming exercise (provided an appropriate site can be identified).</p>	<p>Individual shires</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 20 hours to develop a plan (one off activity).</p>
10	Regional sharing of waste management equipment	<p>The joint purchase and sharing of waste management equipment such as green waste shredder, small excavator with grab etc.</p> <p>Communal equipment needs to be well managed, accounted for and maintained or else it quickly falls into disrepair.</p>	<p>WMWG or RWMC</p> <p>The man-hour allocation would be a function of the number of pieces of equipment associated with this activity. Allocate 2 hours per month.</p>
11	Investigate benefits for joint tendering	<p>Economies of scale may be achieved by combining waste management contracts into a single tendering exercise. This would primarily relate to a combined regional kerbside waste and recycling tender/contract.</p> <p>The majority of the costs associated with these services are the travel distance and the cost of processing recyclable materials. Neither if these would change between a single contract or multiple contracts. In addition, a single contractor currently provides these individual services to the shires; hence, this single contractor currently has the economy of scale within the individual collection contracts.</p> <p>Combining all of the services into a single tender/contract, may encourage more competition from the waste collection industry and hence, the group may receive more competitive pricing.</p>	<p>WMWG or RWMC</p> <p>Estimated 40 man-hours to develop joint tender(s) and apply for funding, 20 hours to roll out the solutions and then 2 hours per month to manage.</p>

12	Local Governments lead by example	<p>Each shire to lead by example and improve its own internal recycling activities, including sustainable purchasing policies etc.</p> <p>The shires can only expect the community to actively participate in recycling activities if the shires are demonstrating by leading by example.</p> <p>Associated activities start with sustainable purchasing, office comingled recycling, possibly composting of parks and garden waste through to reuse and recycling of road construction materials.</p>	<p>Individual shires</p> <p>No group involvement, man-hours provided by individual shires as part of their normal staffing arrangements.</p>
2017 – 2018 Financial Year			
13	Waste Management Working Group (WMWG) to undertake waste education activities or appointment of a dedicated Regional Waste Education Coordinator (RWEC)	<p>To have the Waste Management Working Group or a dedicated staff member from one of the shires to “champion” waste management education activities to drive public participation in recycling initiatives.</p> <p>If the WMWG did not take on this role, then ideally an existing employee within one of the group member councils be appointed on a part-time basis as the coordinator of regional and local waste management education activities. This person could also be the RWMC; however, combining both activities would require a unique individual and possibly a full time appointment to take on these two roles.</p> <p>Take direction from the WMWG or RWMC.</p> <p>Coordinate waste education activities.</p> <p>Coordinate the development of annual waste management calendars and ensure website information consistency across the region.</p> <p>Generally the same message across the region, but may be some local variants to suit local situations.</p> <p>Work with downstream recyclers to improve the feedstock quality that they receive. Result in cost savings that could be passed back to the region/Local Government or at least an increased willingness to receive the recyclable materials.</p> <p>Work with the WMWG or RWMC to influence community perception/habits to fall inline with regional recycling direction.</p> <p>Encourage local community involvement (Lions Club etc.).</p>	<p>WMWG or RWMC</p> <p>Estimated 20 man-hours to develop a job description and conduct interviews, 4 hours per month to manage the employee.</p>

14	Develop a common website structure for waste management information	<p>Due to all kerbside recycling collection within the region being carried out by a single collection contractor, there can be a common web-based information package that provides information to the community on the “do’s and don’ts” of kerbside recycling.</p> <p>For all other common waste management activities, a common message can be posted on the individual shire websites, or common links to the appropriate location to obtain the necessary information. Consistency of message will assist the community in increased participation in recycling activities.</p>	<p>WMWG or RVEC</p> <p>Estimated 20 man-hours to develop website and 2 hours per month to maintain and update.</p>
15	Develop a regional waste management calendar	<p>Northam as developed a useful waste management calendar in conjunction with the SMRC. This calendar can be modified each year and be used in each shire as the main source of waste management information for the community.</p> <p>The greatest expense associated with the annual calendars will be the printing cost. It is not seen as necessary to provide a hard copy to each household. Electronic copies can be made available on the shire websites. However, there should always be a few hard copies available at the shire officers for those in the community that are not able to access the shire web-based system.</p>	<p>WMWG or RVEC</p> <p>Estimated 20 man-hours per year to develop a group calendar, upload onto website and arrange printing of a few copies for each shire.</p>
16	Improve participation rate in existing recycling systems	<p>No specific targeted activity.</p> <p>Part of continuous improvement of existing systems.</p> <p>Ongoing review of existing systems and improvement as necessary.</p> <p>Continuous community education to increase participation in recycling activities.</p>	<p>WMWG or RWMC or RVEC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 5 hours per month for each of the two coordinators.</p>
17	Increase the range of materials that can go into the comingled recycling bin	<p>With Avon Waste utilising the SMRC materials recovery facility, there is a wide range of materials that can be recycled, more than the traditional comingled material types. This information need to be disseminated into the community and ongoing education strategies rolled out to ensure that the appropriate materials are placed in the appropriate bins.</p> <p>In future tenders, increase the range of materials in the yellow bin (forced solution) or get a pricing structure for various additional material types (assess the economic viability of increasing the range of materials).</p>	<p>WMWG or RVEC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 5 hours per month.</p>

18	Increase opportunities for recycling drop off	<p>Provision of recycling bins to householders that are not on the kerbside recycling collection run and enable them to swap a full bin for an empty bin when delivered to the dedicated drop off locations such as transfer station, landfill, shire depot, volunteer recycling facilities etc. The kerbside recycling collection contractor (currently Avon Waste) then empties the MGB's as part of its regular collection run.</p> <p>There will however be a need to manage the number of yellow lidded bins involved in this scheme as there is the likelihood that many bins could simply go missing.</p>	<p>WMWG or RWMC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 5 hours per month for each of the two coordinators.</p>
2018 – 2019 Financial Year			
19	Green waste diversion from landfill	<p>Green waste is currently recycled in all shires; hence, there is an existing mulching system into which the additional green waste can go.</p> <p>Separate from general waste stream at landfills and transfer station.</p> <p>Separate and mulch - product provided to local residents or council for garden improvement products (as currently occurs).</p> <p>Separate and compost – possible future regional activity.</p>	<p>WMWG or RWMC and RWEC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 2 hours per month for each of the two coordinators.</p>
20	Develop/improve tip shop facilities	<p>Improve the facilities at existing tip shops to enable an increased range of materials to be displayed for reuse, primarily protection from the elements.</p> <p>Consider developing additional tip shops where the material is available and there is the community to participate in a reuse scheme.</p>	<p>WMWG or RWMC and RWEC</p> <p>The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 40 hours for the WMWG or RWMC to propose solution, raise funding and implement solutions and 2 hours per month for each of the two coordinators.</p>

21	Improve staff training in waste management activities	<p>Knowledge sharing amongst the group. Specific group training for facility operators. Involvements of specialist trainers for specific activities.</p>	<p>RWMC and RWEC The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 2 hours per month for each of the two coordinators.</p>
22	Ongoing community education	<p>Community education is an ongoing activity. The same/similar message needs to be regularly sent out to the community. As recycling activities change or new systems are implemented, there is a need to communicate the desired message to the community.</p>	<p>RWMC and RWEC The man-hour allocation would be a function of the degree of effort applied to this activity. Allocate 2 hours per month for the WMWG or RWMC and 5 hours per month for the WMWG or RWEC.</p>
2019 – 2020 Financial Year			
Continuous improvement and rollout of above activities.			

10.2. Proposed Activity Timing

The proposed activities have been listed in order of priority; however, to provide some guidance on the potential timing of the proposed activities, they have been split into the first four years of the five-year plan, with the last year being available for continuous improvement and to undertake any activities that have been delayed or are lagging behind the proposed timeline.

There are six activities proposed for the each of the first three years, with the remaining four activities in the fourth year. Should the group or individual shires opt not to undertake all of the proposed activities, then the annual workload will be reduced proportionally.

The potential timing of the proposed activities is simply a guide to the group. Following consideration of the proposed activities, the group may change the timing of activities to suit its specific needs.

10.3. Proposed Activity Man-hours

In addition to providing the potential timing for the proposed activities, an estimation of the man-hours required to undertake each activity has also been provided. The actual man-hours required would be a function of the effort put in to each of the activities. The vast majority of the estimated man-hours have been allocated to the Waste Management Working Group, Regional Waste Management Coordinator and/or the Regional Waste Education Coordinator; however, depending on how the individual projects are managed, some of the effort may be passed on to various shire officers involved in the activities; hence, reducing the involvement of the coordinators.

Based on the estimated man-hours, **Table 10.3.1 – Man-hour Summary** provides the annual, accumulated man-hours required to undertake all of the proposed activities.

Table 10.3.1 – Man-hour Summary

Year	WMWG/RWMC	WMWG/RWEC	Shires
2015 – 2016 Financial Year	13.5 days & 9 hrs/month	0 hrs	0 hrs
2016 – 2017 Financial Year	7.5 days & 17 hrs/month	0 hrs	2.5 days & 4 hrs/month
2017 – 2018 Financial Year	2.5 days & 31 hrs/month	5 days & 17 hrs/month	4 hrs/month
2018 – 2019 Financial Year	5 days & 38 hrs/month	2.5 days & 28 hrs/month	4 hrs/month
2019 – 2020 Financial Year	38 hrs/month	2.5 days & 28 hrs/month	4 hrs/month

As can be seen from the above, should the group opt to undertake all of the proposed activities, the Waste Management Working Group the Regional Waste Management Coordinator and/or the Regional Waste Education Coordinator man-hours will steadily increase to approximately 5 days per month and 3.5 days per month respectively. Should the same person undertake both of the roles, it is reasonable that the workload could be carried out in approximately 1.5 weeks per month, as there would be some man-hour savings in communication and management between the two positions.

Although there has been a constant monthly man-hour allocation, it is likely that there will be some spikes in the workload that will require more intense effort for a short period; however, on average, the man-hours should balance out as represented above.

11. Suitable Waste Management Technology

11.1. Waste Management Technology

The waste industry has progressed significantly in recent time in developing a wide range of technologies available to treat or process waste and recyclable materials. These technologies range from simple windrow aerobic composting of organic materials through to elaborate waste to energy solutions, which are able to receive the vast majority of municipal and commercial & industrial (C&I) waste streams.

Typically, the application of any technological solution as a substitute to simple landfilling (the cheapest solution) results in the cost of waste management increasing, often significantly in comparison to landfilling. When considering the option of utilising suitable waste management technologies, the group or an individual council needs to be certain that they have control the waste stream that is proposed to be processed. Without direct control of the waste stream, there is a real chance that as the cost of disposal increases to cover the cost of the new technology, the uncontrolled waste (typically self haul domestic and commercial waste) will go to a cheaper location for disposal, which is usually the next closest landfill facility or transfer station.

Consequently, the group or individual council should only consider processing municipal waste that is collected from the kerbside/verge side and to a lesser degree other municipal waste delivered to landfill by self-haul residents. All other waste will be highly reactive to market forces and simply be diverted to the cheapest disposal location.

The exception being if the technological solution can be implemented at a lesser or equal cost in comparison to landfill disposal fees. Then a similar quantity of incoming waste can be relied on irrespective of its source. There is always the possibility that waste generation habits will change over time; hence, the waste stream is likely to change accordingly.

Based on the above, the group is to be careful when determining what waste stream is proposed for processing.

Processing of municipal waste is a real possibility as the community is usually comfortable to pay a little more for waste disposal in order to achieve a more environmentally friendly solution.

C&I waste is difficult to process and usually costs significantly more than landfill disposal (otherwise commercial operators would currently be processing the material); hence, the associated cost increase is likely to drive the waste elsewhere.

C&D waste is relatively easy to process (sorting and screening) and can potentially be carried out at a similar cost to landfill. The establishment cost of this type of operation is relatively affordable and if it were economically viable based on waste volumes, commercial operators would already be offering this service.

11.2. Available Waste Management Technology

Considering only municipal waste, there are the following available waste processing technologies (not an exhaustive list, but a spread of available technologies):

- Composting:
 - Requires a relatively clean source separated feed stock;
 - A variety of processes – aerobic or anaerobic;
 - Windrow, in-vessel, enclosed;
 - Manual, fully automated;
 - Product quality highly dependent on feedstock quality;
 - Relatively low processing cost; and,
 - Odour management can be an issue.
- Manual sorting of mixed waste streams:
 - Can process mixed waste;
 - Produces a range of sorted products;
 - Mechanical (excavator/loader) sorting for larger items;
 - Manual (hand) sorting for smaller items;
 - Flexible to handle changing waste stream;
 - Slow process, low throughput; and,
 - Relatively low processing cost.
- Mechanical sorting (MRF type solution):
 - Designed based on a defined waste stream;
 - Cost proportional to infrastructure requirements and processing complexities;
 - Sorts predetermined material types;
 - Unable to process general waste;
 - Relatively inflexible to accommodate changing waste stream;
 - High throughput (depending on design); and,
 - Relatively high processing cost.

- Specific Material Processing (eg. E-waste, glass)
 - Requires a single waste stream, either source separated or sorted by one of the above operations;
 - Low process throughput;
 - Dedicated waste stream;
 - Inflexible process (depending on design); and,
 - Cost highly dependent on process.
- Waste to Energy:
 - Range of commercial solutions available;
 - Usually requires large throughput tonnage to make economically viable, but can be developed for site specific solutions;
 - Receives a large range of waste materials;
 - Relatively new technology in Australia and not readily accepted by the environmental regulators (however, this is changing);
 - Community concerns about emissions (more a perception than a real concern with the modern facilities);
 - Expensive processing cost; and,
 - Produces a product (power or energy) that has a ready and reliable market and of high value.

11.3. Way Forward

The selection of the type of waste management technology is highly dependent on the type of waste that the group or individual council is proposing to process. The type of technology should not drive the selection process. The type and quantity of waste needs to be determined and thereafter, the range of suitable processing technologies can be investigated. Typical decision factors include:

- Waste type;
- Waste quantity;
- Control of waste stream;
- Affordability level of processing (upper cost that is palatable);
- Process location (transport, impact on neighbours, space availability, environmental restrictions);
- Likely recyclable product(s);
- Availability of downstream use for recycled product(s);
- Reliability of downstream use for recycled product(s);

- Consequence of losing the downstream customer(s) over the short-term (Global Financial Crisis had a significant influence on the recycling industry for a number of years);
- Business structure (in-house operation or contracted out); and,
- Duration of operation.

The above list of decision factors provides a basic list for the initial consideration of possible technologies. This is not an all inclusive list, as there will be a number of additional factors that will emerge as the options narrow down to the detail of what is being considered or is available.

The primary consideration should be caution about the true cost of implementing a technological solution and the consequences if the costs blowout beyond the reasonable expectation of the group (locked in contract or option to terminate or modify the activity).

Based on the knowledge of the type and quantity of material being managed by the group, any reasonably sized process will require the involvement of the Shire of Northam. With the shire having the majority of the waste material, the facility location will be comparatively closer to Northam than the other shire town sites; hence, the other shires will have the added expense of the additional transport cost to consider.

With the current stage of development of the waste management activities within the group, it is deemed premature to consider involvement in any substantial waste processing technology. The preference at this stage would be to concentrate on improving waste diversion from landfill through small, affordable steps before the group ventures out into larger scale and costly solutions.

In time, if there is real progress achieved within the group in maximising small-scale waste diversion, then there is the opportunity to expand the group's horizons to include the more advanced waste technologies.

12. Regional Waste Strategic Plan 2015 - 2020

12.1. Vision

The AROC group of councils will strive to maximise waste diversion from landfill in an efficient, cost effective and environmentally sustainable manner.

12.2. Priority Areas

Based on the review of the group's previous SWMP's and the progress achieved within the group, the following are considered the group's priority areas:

- Waste management activity coordination and leadership
- Data collection
- Existing recycling activities
- Additional recycling activities
- Landfill management
- Community education
- Increased participation in recycling activities.

12.3. Priority Wastes

Based on the above priority areas, the following are the group's priority wastes:

- Comingled recyclables waste
- Household Hazardous Waste
- E-Waste
- Landfilled Waste
- Organic waste (primarily green waste).

12.4. Regional Synergies

Table 12.4.1 – Regional Synergies lists the potential synergies between the group participants during the 2015 to 2020 validity period of the Strategic Waste Management Plan.

Table 12.4.1 – Regional Synergies

No.	Activity	Synergy
1	Kerbside waste and recycling collection	Joint contracts
2	Bulk verge collection	Joint contracts
3	Waste disposal	Knowledge sharing
4	Recycling management	Knowledge sharing
5	Drop-off facilities	Knowledge sharing
6	Minor recycling activities	Joint operation/Joint contracts
7	Equipment sharing	Joint utilisation

The majority of the synergies come with the ability to contract out larger operations than would be possible for the individual councils. This would initially revolve around transport (collection) efficiencies, but in time progress to materials processing activities.

There is also the opportunity for the individual councils to operated their own facilities (landfill/drop-off/transfer station) while sharing knowledge and experiences (through the Regional Waste Management Officer) to improve the standard of facility operation and encourage continuous improvement.

12.5. Proposed Activities

Table 12.5.1 – Proposed Activities 2015 to 2020 provides a list of the proposed activities for the duration of this Plan. The activities are listed in the order of priority.

Table 12.5.1 – Proposed Activities 2015 to 2020

No.	Proposed Activity
2015 – 2016 Financial Year	
1	Establish a Waste Management Working Group within AROC or appointment of a dedicated Regional Waste Management Coordinator
2	Knowledge sharing within the region
3	Improve systems for the collection and recording of waste management data
4	Investigate and implement improvements to existing recycling systems
5	Improve/implement Hazardous Household Waste drop off facilities
6	Review of disposal facility gate fee structure
2016 – 2017 Financial Year	
7	Extraction of recyclables from landfill and transfer station tipping area
8	Improve compliance with landfill Registration and Licence conditions
9	Improve landfill planning and overall management
10	Regional sharing of waste management equipment
11	Investigate benefits for joint tendering
12	Local Governments lead by example
2017 – 2018 Financial Year	
13	Waste Management Working Group to undertake waste education activities or appointment of a dedicated Regional Waste Education Coordinator
14	Develop a common website structure for waste management information
15	Develop a regional waste management calendar
16	Improve participation rates in existing recycling systems
17	Increase the range of materials that can go into the comingled recycling bin
18	Increase opportunities for recycling drop off
2018 – 2019 Financial Year	
19	Green waste diversion from landfill
20	Develop/improve tip shop facilities
21	Improve staff training in waste management activities
22	Ongoing community education
2019 – 2020 Financial Year	
Continuous improvement and rollout of above activities	

Section 10, Table 10.1 - Proposed Activities – 2015 to 2020 above provides detail on the breakdown of the individual proposed activities.

12.6. Sustainable Waste Management Technologies

With the group having numerous “grass roots” proposed activities to be undertaken during the 2015 to 2020 period, the preference is to actively pursue these basic activities before embarking on the more technologically advanced process.

The group is to use this period to firmly establish the regional cooperation between the participants and implement effective waste management operations and shared contracts/activities prior to considering the more advanced technology solutions.

12.7. Funding

The individual group participants will require political and financial support from their individual councils in order to achieve noticeable improvements in waste management activities within the shires and the region. This support is essential for the future success of the group’s proposed activities.

As a regional grouping of Local Governments and being located within one of the Waste Authority identified major regional centres (Avon), there is the opportunity to access significant funding from the Waste Authority to implement some of the proposed activities, so long as the activities are in line with the Waste Authority strategic direction.

The group is to actively pursue available funding sources to supplement the financial contributions from individual member councils.

12.8. Review

This Strategic Plan sets out the group’s proposed activities for the period 2015 to 2020. In order to achieve this it is essential that this Strategic Waste Management Plan be regularly reviewed.

The review is primarily to gauge the group’s actual achievement against the proposed activities to provide direction as to where the necessary effort is required in order to achieve the desired outcomes by the end of the Plan validity period.

A secondary component of the review is to assess the validity of the Strategic Waste Management Plan direction in comparison to the group’s and the Waste Authority’s direction. It is acknowledged that during the five-year validity period of this Plan, there is the possibility that some aspects of this Plan may lose relevance and may need to be amended to suit the latest group or Waste Authority direction.

As a minimum, this Plan should be reviewed on an annual basis, with a summary review presented to a quarterly group meeting.