Community Sustainable Water Management Plan

2008

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Glossary of Terms and Abbreviations

ML	Megalitre. 1 ML is equivalent to 1 million litres
KL	Kilolitre. 1 KL is equivalent to 1 thousand litres
ICLEI Oceania	ICLEI – Local Governments for Sustainability - Oceania
SEPP	State Environment Protection Policy
SWMP	Sustainable Water Management Plan
Leachate	Liquid that percolates through waste and into groundwater transferring contaminants
Stormwater	Rainwater runoff from impervious surfaces
Potable water	Water supplied through the standard water supply network of drinking quality.

Executive Summary

The Community Sustainable Water Management Plan sets out how Maroondah City Council will support and encourage the community to minimise water consumption and improve the quality of Maroondah's waterways. It provides complementary actions to the Corporate Sustainable Water Management Plan produced in 2005.

This plan is required to ensure Melbourne's water supplies are sustainable in the long-term given the pressures of population growth and climate change. It is also required to maintain and enhance the condition and quality of waterways that provide benefits to the people of Melbourne, and numerous flora and fauna species.

Community water consumption (residential and non-residential) for the baseline year of 2000/01 was 9,823,460 KL. The majority of this use (approximately 85%) is residential. The largest uses in households include showers, toilets, clothes washing and seasonal uses such as garden watering. These are also areas are where greatest potential water savings can occur.

Waterways within the Municipality are generally in a poor to moderate condition. This is due to the surrounding urban and industrial development, removal of indigenous vegetation and in-stream habitat and barrel draining of many sections of waterways.

The Community Sustainable Water Management Plan has a target of a 30 % reduction in per capita residential water use by 2020 (based on 1990's average). It also has a target of a 10 % reduction in non-residential water use by 2020 (based on 2000/01 levels). In regards to water quality the target is based on the ICLEI Water Campaign™ point system. Maroondah Council aims to undertake water quality actions equivalent to 60 points by 2015.

The actions required to achieve these targets are provided in this plan. They generally fall under the categories of Council Leadership, Education and Awareness Raising, Partnerships, Funding, Planning, and Monitoring and Reporting. The actions require a significant financial investment on behalf of Council if they are to be carried out. Targets are set for 2015 and 2020 so this is a long-term plan that aims to spread costs over the years. Many actions are reliant on community support and behaviour change that Council can assist through education and awareness raising.

1 Introduction

Water is vital to all life on earth. In particular, clean water is required for the functioning of ecosystems and the species these support, including humans. The continuing drought has highlighted that historical consumption patterns have undervalued and treated water as an infinite resource. Action is required to reduce water consumption to sustainable levels over the long-term and to improve water quality to enhance environmental, social and economic wellbeing.

Maroondah City Council has developed a Corporate Sustainable Water Management Plan that aims to achieve a 20 % reduction in council water use from 2000/01 levels by 2015. The plan also sets a target to improve water quality based on the ICLEI point system by 2015.

Council recognises that the sustainable use of water and improvements in its quality can only be achieved with the involvement of all sectors of the community. This Community Sustainable Water Management Plan (SWMP) sets out objectives and actions that Council can implement to assist the community to achieve sustainable water resources.

The Community SWMP has a target of a 30 % reduction in per capita residential water use by 2020 (based on 1990's average). It also has a target of a 10 % reduction in non-residential water use by 2020 (based on 2000/01 levels). In regards to water quality the target is based on the ICLEI Water Campaign™ point system. Maroondah Council aims to undertake water quality actions equivalent to 60 points by 2015.

Council's objectives for community sustainable water management are:

Water conservation objectives

1. To demonstrate leadership in the sustainable management of water resources
2. To reduce water demand through education and awareness raising
3. To support the community in utilising new and alternative technologies and processes to reduce water consumption
4. To work in partnership with other organisations including Melbourne Water, Yarra Valley Water and other councils to assist the community in reducing water consumption
5. To seek funding to provide financial support to the community for implementing water conservation projects
6. Monitor and report on the implementation of the plan and outcomes on a regular basis

Water quality objectives

1. To demonstrate leadership in the protection and improvement of water quality.
2. To improve the water quality of Maroondah's waterways through education and awareness raising of the community.
3. To work in partnership with other organisations including Melbourne Water, Yarra Valley Water and other councils to assist the community in improving water quality.
4. To seek funding to provide financial support to the community for implementing water quality improvement projects.

5. To monitor the water quality of Maroondah's waterways and ensure that program implementation is responsive to changes in quality.
6. To utilise the planning, regulatory and enforcement powers of local government to achieve water quality objectives.

2 Background

2.1 Environmental Context

2.1.1 Water Supply and Consumption

Melbourne has been experiencing drought conditions for the past 10 years and permanent water saving rules have now been put in place. The pressures on potable water supplies will increase as Melbourne's population grows a predicted 23.5 percent by 2031 (based on 2001 figures)[1]. In addition, the impact of climate change from increased greenhouse gas concentrations is likely to result in reduced rainfall levels and increased evaporation levels in the catchments that Maroondah and Melbourne rely on for potable water supplies[2]. Melbourne Water predicts that the 'mid range' scenario from the impact of climate change on water available to the water supply system will result in an 8% reduction in available supply by 2020 and a 20% reduction by 2050.

The State Government has indicated that developing new reservoirs is not an option, although it has recently committed to building a desalination plant to increase water supplies. However a key direction of the government and water authorities is demand management. This involves reducing demand on potable supplies through measures such as installing water efficient appliances and fixtures, employing water sensitive urban design principles, installing water efficient irrigation systems, using alternative water supplies and recycling water. Reducing demand for potable water also requires changing our behaviour so we use less.

2.1.2 Water Quality and Pollution

Stormwater is rain that runs off hard (impervious) surfaces such as the roofs of buildings, roads and car parks. This run off enters the underground drainage system and then flows into creeks, rivers and eventually Port Phillip Bay.

Waterways within Maroondah have been significantly altered in response to the pressures of urbanisation, particularly as a flood mitigation measure. This has included redirecting and concrete lining of waterways and piping water flows underground to rapidly transport stormwater away from developed areas.

Increased urban densities and associated increases in commercial and industrial activity also result in additional pressures on waterways.

In addition to the direct impacts on the landscape and biological values, urbanisation and waterway modification results in increased pollution loads and erosion in the sections of waterways that have undergone minimal or no alteration. Lining and piping of waterways increases the velocity of water resulting in increased erosion in natural waterways.

Stormwater pollution is collected as the water makes its way across impervious surfaces. Pollutants include:

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1 Department of Sustainability and Environment, Victoria in Future 2004, Melbourne Statistical Division Figures

2 Department of Sustainability and Environment, 2004, "Adapting to Climate Change: Enhancing Victoria's Capacity", Consultation Paper

- Litter in the form of plastic bottles, cigarette butts, plastic bags, etc.
- Hydrocarbons from oils and petrol.
- High Nutrient Loads in the form of Nitrogen and Phosphorus.
- Solvents and paints.
- Sediment from building activities.

Stormwater pollution has a number of negative effects on our waterways including:

- Reduced oxygen levels for plant growth caused by the decomposition of organic material.
- High sediment levels, reducing light available for the growth of plants and suffocating organisms.
- Increased human health risks from a variety of wastes.
- Poisoning of plants and fish from toxicants and heavy metals.
- Reduced aesthetic appeal.

2.1.3 An integrated approach

The purpose of the Community SWMP is to seek an integrated and holistic approach to water management, recognising the interrelated nature of water conservation and water quality issues.

Current approaches to water management have recognised that there are significant opportunities to reduce our reliance on potable water through the collection and reuse of stormwater and the recycling of wastewater. Toilet flushing, irrigation and vehicle wash down are examples of activities where potable water is commonly used, yet do not require such a high quality of water.

The substitution of potable water with alternative supplies will have positive benefits in terms of water quality, for example, reducing the amount of stormwater runoff through rainwater collection can improve stormwater quality and reduce erosion.

The Community SWMP incorporates both water quality and water conservation objectives. A number of the water quality objectives have been derived from the Maroondah Stormwater Management Plan (2001).

2.2 Water Management Programs

Council has identified water conservation as a priority as reflected by the adoption of a number of water conservation actions to date and becoming a member of the ICLEI – Local Governments for Sustainability – Oceania (ICLEI Oceania) Water Campaign™. It became a member of the Water Campaign™ in 2004.

ICLEI Oceania is an international not for profit organisation that assists local government in environmental programs, particularly water resource management and greenhouse gas reduction. ICLEI was conceived in 1989 when 35 local government leaders from North America got together to deal with environmental issues. It expanded in 1991 with the support of the United Nations. It is now a worldwide organisation assisting local governments to achieve environmental objectives.

The aims of the Water Campaign are to improve water quality and promote water conservation at the corporate, community and catchment levels. To achieve these aims

a structured milestone framework has been developed to enable councils to systematically approach water quality and conservation issues.

The five milestones are:

1. Develop an inventory of water consumption and water quality issues.
2. Establish goals for water conservation and improvement in water quality.
3. Develop a local action plan.
4. Implement water conservation and water quality actions.
5. Monitor and report progress.

2.3 Economic context

The State Government White Paper: *Securing Our Water Future Together* introduced a tiered system of pricing for residential water users with overall increases in prices per KL. The White Paper acknowledges that current pricing does not incorporate the true value of water. To encourage water saving actions a three-tiered water charge has been implemented whereby the more water is used, the higher the cost[3]. It is likely that the price of water will continue to increase to pay for new water infrastructure.

Water conservation results in cost savings and many actions to reduce water consumption also result in significant energy savings. For example, AAA showerheads can result in up to 1/3 savings in energy consumption in addition to water savings.

2.4 Study Area

2.4.1 Social and economic profile

Maroondah covers a geographical area of 61.3 sq km and is located 25 kilometres east of Melbourne CBD. It comprises a mixture of new and established neighbourhoods and is valued for its natural assets, particularly the presence of established trees, gardens and views to surrounding ridgelines.

The population of Maroondah was 100,935 in 2002 and this is predicted to increase to 127,993 by 2031. The majority of the growth in population will be in older age groups with population in many of the younger age groups declining[4].
The majority of economic activity in Maroondah is derived from Ringwood and Croydon activity centres and industrial areas to the south of the municipality.

2.4.2 Waterways profile

There are approximately 34km of waterways in Maroondah, the largest of which are the Dandenong Creek forming much of the southern boundary of the municipality and the Mullum Mullum Creek, a tributary of the Yarra River.

[3] Victorian Government White Paper "Securing Our Water Future Together"
[4] Department of Sustainability and Environment, *Victoria in Future 2004*

Maroondah also contains the headwaters to a number of waterways, including Heatherdale Creek, Andersons Creek and Jumping Creek, placing added responsibility in managing waterway health.

A number of the creeks have been modified through underground piping, channel diversion or concrete lining due to urban development and flood considerations. In conjunction with local environment groups, Council has been involved in numerous programs aimed at improving the condition of Maroondah's waterways.

2.4.3 Maroondah Rainfall

Maroondah has relatively higher rainfall compared to other parts of metropolitan Melbourne. Average annual rainfall is approximately 800mm throughout Maroondah[5].

[5] Bureau of Meteorology (Scoresby Research Institute) – www.bom.gov.au/climate/averages

3 Strategic Context

Water conservation and improving water quality has been identified by the State Government as a priority, as outlined in the strategies detailed below. These strategies and the measures and priorities contained within them provide the strategic basis for this plan.

3.1 State Policy

3.1.1 Victorian Government White Paper: Securing Our Water Future Together

The Victorian Government White Paper, "Securing Our Water Future Together", outlines strategies and actions to progress toward sustainable use of Victoria's water resources into the future.

The White Paper sets a target of reducing per capita drinking water consumption in Melbourne by 15 percent by 2010 compared with average consumption levels through the 1990's. This requires a reduction in water consumption from 423 L per person per day to 360 litres per person per day. The White Paper also contains a number of actions with relevance to local government, including:

- The introduction of permanent water saving measures (Action 5.4).
- The introduction of mandatory water efficient plumbing measures for new buildings (Action 5.10).
- The Water Smart Gardens and Homes Rebate Scheme will be made available for not-for-profit organisations eligible for the water and sewerage rebate on service charges (e.g. sporting clubs, preschools and kindergartens) (Action 5.12).
- The preparation of Water Sensitive Urban Design Guidelines and funding to support smart urban water use initiatives (Action 5.14 and 5.15).
- Funding support for water conservation and recycling demonstration projects (Action 5.23).
- Alignment of statutory planning and building approvals systems to support water conservation and enable the use alternative water supplies and recycled water (Action 5.41).

3.1.2 Sustainable Water Strategy: Central Region

The Sustainable Water Strategy flows on from the broader *Securing Our Water Future Together* document to develop targeted actions for the Central Region of Victoria, including Melbourne. It aims to secure water supplies for homes, farms, businesses, industry and the environment. Actions are aimed at improving river health and addressing water shortfalls associated with climate change and population growth. Specific actions for Melbourne include:

- Accelerating conservation and efficiency programs; and
- Supporting local re-use and recycling initiatives.

Relevant policies stated in the strategy are:

"The Government requires the metropolitan water authorities to work with their customers to achieve a 25 per cent reduction in total per capita water use for Melbourne

by 2015, increasing to 30 per cent by 2020. The basis of comparison is the 1990's average water use."

This means average residential water use needs to be reduced from 208 litres of water per person per day (current use) to 186 litres by 2015 and 174 litres by 2020.

And also:

Non-residential users *"are to contribute to water savings going forward in proportion with its contribution to overall demand for water. This should be at least 1 per cent per year of current non-residential uses."*

For the purpose of this report this has been translated to represent a 10 % reduction in non-residential water use by 2020 (based on 2005/06 levels).

3.1.3 Melbourne 2030

The Metropolitan Strategy Melbourne 2030 is the Planning and Sustainability document for the greater Melbourne metropolitan area. It includes several Directions and strategies that are relevant to the SWMP. Initiatives in relation to water resource management reflect those of the *Securing Our Water Future Together* White Paper in ensuring that demand for potable water supplies is reduced, alternative supply options are utilised and the quality and quantity of stormwater is managed sustainably.

3.1.4 Environment Protection Act 1970

The *Environment Protection Act 1970* is the main piece of legislation governing environmental protection in Victoria. The Environment Protection Authority is responsible for the administration of the Environment Protection Act, including the provision of trade waste licences and responding to pollution events.

3.1.5 State Environment Protection Policy's (SEPP)

The State Environment Protection Policies are established under the *Environment Protection Act 1970*. The SEPP's outline the beneficial uses to be protected within Victoria's waterways and the associated water quality and environmental objectives. Additionally, they may provide a management framework for achieving the objectives.

3.2 Catchment Strategies

The Port Phillip and Westernport Catchment Management Authority has produced several documents impacting on water conservation and water quality management.

3.2.1 Port Phillip and Western Port Regional Catchment Strategy

The Port Phillip and Western Port Regional Catchment Strategy 2004 – 2009 contains a suite of targets and associated actions with implications for the health of Maroondah's waterways. The strategy also contains water conservation and recycling actions.

The following targets and actions have been identified:

Targets

- Improve the condition of the regions waterways so that:

- At least 50% of all the natural waterways will be in good or excellent condition by 2015.
- All natural waterways will be in good or better condition by 2025.

- Progressive improvement in the condition of waterways across the region, as measured by the index of stream condition.
- Improve water quality in rivers and streams so that:
  - At least 80% of monitoring sites attain State Environmental Protection Policy objectives or regional targets by 2009.
  - All monitoring sites attain State Environmental Protection Policy objectives or regional targets by 2030.

Actions

- Design and implement schemes for recycling water from the Eastern and Western Treatment Plants and smaller plants in the region.
- Complete an audit of stormwater management plan implementation for all municipalities and design and implement a program to address key gaps.
- Meet best practice standards in urban stormwater discharges in new urban areas.

3.2.2 Port Phillip and Westernport Regional River Health Strategy

The Port Phillip and Westernport Regional River Health Strategy provides a background of river health in the catchment and proposes targets to be achieved in the future. The waterways of Maroondah fall into the Middle Dandenong Creek section and the Middle and Lower Yarra River section. The objectives of the strategy are to:

- Maintain the Moderate condition of the Middle Yarra through focussing actions on improving vegetation and water quality; and
- Improve the Poor condition of the Middle Dandenong Creek to Moderate through focussing actions on improving water quality, vegetation, and habitat and stability.

3.3 Local Policy

Maroondah City Council has several strategies that incorporate environmental sustainability objectives. Council has made a clear commitment to water conservation and water quality issues through its involvement in the ICLEI Water Campaign and the Melbourne Water Sustainable Water Use Program. The sections of the strategies that provide the basis for the development of the Community Sustainable Water Management Plan are included as follows.

3.3.1 Maroondah 2025: A Community Planning Together

Maroondah 2025: A Community Planning Together encompasses the long-term strategic direction for Maroondah and was developed through an extensive community consultation process.
The Vision for Maroondah 2025 states:

Maroondah will be a vibrant city. It will have an active community, a strong local economy and a diverse cultural life in a prosperous and ***sustainable environment****.*

The actions within the strategy that relate to the Sustainable Water Management Plan include:

- Protect and actively manage the quality of the municipality's air and water.

- Encourage and promote the use of new technology that will improve environmental sustainability.

3.3.2 Maroondah Council Plan 2007-2011

The Maroondah Council Plan outlines the ongoing strategies and commitments adopted to achieve the objectives identified in *Maroondah 2025: A Community planning together*. The Council Plan is reviewed and updated every 4 years. A commitment for 2007/08 in the Council Plan is to implement Milestones 2 and 3 of the Community Component of the ICLEI Oceania Water Campaign.

3.3.3 Maroondah Planning Scheme: State Policy Planning Framework

The State Policy Planning Framework (SPPF) within the Maroondah Planning Scheme refers to waterway and catchment protection in relation to land use and development proposals in Clause 15.01-2 General Implementation: Water Quality Protection primarily through reference to the Best Practice Environmental Management Guidelines for Urban Stormwater (1999). The Maroondah Planning Scheme will be particularly relevant to the development of a community water conservation and water quality action plan, focusing on water sensitive urban development principles and application.

3.3.4 Maroondah Planning Scheme: Municipal Strategic Statement

The Municipal Strategic Statement (MSS) is contained within the Maroondah Planning Scheme. The purpose of the MSS is "to provide a vision for the future development of the municipality and to express overall strategic directions" (Clause 21-01, MSS).

It is important that the corporate activities that Council undertakes are consistent with, and supportive of the objectives expressed within the MSS. Under Clause 21.11-3 Environment, objectives include:

- To minimise the physical impact and stress of development and land use on the natural environment.
- To encourage the preservation and enhancement of the natural environment including the maintenance of clean air and water and protection of canopy vegetation.

Clause 21.11-3 Strategies include:

- Improve the treatment of waterways and drainage systems, in particular through the North West Area Drainage Master Plan
- Investigate the feasibility and effectiveness of introducing litter traps in appropriate areas to restrict the flow of waste debris into waterways
- Develop wetlands and retarding basins where possible, to capture and filter stormwater, while creating habitat for aquatic life
- Identify land with drainage and flood constraints and ensure development responds to these constraints

Clause 21.11-3 Other actions include:

- Providing the community with education and training regarding environmental protection and the concept of environmental resource management
- Providing water quality improvement ponds and other devices as opportunities arise and as a result of the municipal stormwater agreement.

These measures will enhance local waterways through the protection of the quality of stormwater transferred to permanent waterways

3.3.5 Maroondah Stormwater Management Plan 2001

The Stormwater Management Plan is the main Council document responding to water quality issues in Maroondah. The Maroondah Stormwater Management Plan highlights the threats to Maroondah's waterways from the stormwater system and recommends a series of prioritised actions to improve the quality of stormwater runoff.

The major stormwater threats identified in the SWMP are:

- Runoff from poorly managed building sites.
- Industrial, commercial and residential land uses.
- Waterway degradation.

The Stormwater plan identifies several actions the council can undertake including education and enforcement, implementation of local laws, develop partnerships with other organisations and demonstration and leadership in water resource management.

3.3.6 Waterways of Maroondah Strategy 1999

The Waterways Strategy was a precursor to the Stormwater Management Plan and contains actions pertaining to the objectives of enhancing recreational, amenity, habitat and open space values along Maroondah's waterways and waterway reserves and assisting in the enhancement of water quality in Maroondah's waterways.

3.3.7 Corporate Sustainable Water Management Plan 2005

The Corporate SWMP sets out how Maroondah City Council will manage its own operations and assets to minimise water consumption and improve the water quality of Maroondah's waterways.

4 Method

The data in relation to water consumption and water quality was collected from a number of sources including Yarra Valley Water billing databases and Melbourne Water publications.

The following is an outline of the data collection process to provide consistency with future monitoring.

4.1 Water Consumption

Yarra Valley Water supplied data for community and corporate consumption. Community water consumption is only categorised as Residential and Non-residential, limiting the ability to breakdown use into commercial and industrial totals. Water totals are based on billable use, so leaks and wastage are not accounted for.

Setting and achieving targets for non-residential usage is likely to be difficult for council. Yarra Valley Water is engaged in developing strategies for large Non-residential users. Maroondah will work with Yarra Valley Water and private organisations to reduce water use where possible.

4.2 Water Quality

Information on water quality within Maroondah has been compiled using the Stormwater Management Plan, Melbourne Water data and Port Phillip and Westernport Catchment Management Authority data. Water quality data is not available for all creeks and is often tested at sites outside of Maroondah. The Maroondah Stormwater Management Plan has been used to give a description of the specific threats identified for each of Maroondah's waterways.

An internal review of stormwater issues undertaken as a requirement of the ICLEI Oceania Water Campaign also identified priority areas to be addressed in the action plan, these are detailed in the Maroondah Water Quality section.

4.2.1 Data Limitations

Water quality data in Maroondah's waterways is limited due to the following:

- Small number of test sites.
- Water quality is highly dependent on weather conditions and upstream conditions.
- Low frequency of testing.

5 Water Conservation

Different water supply types are suitable for different uses. It is not necessary to use the highest quality potable water for all applications. Potable water is supplied entirely by Yarra Valley Water within Maroondah and constitutes the majority of water used by the community. There has been a growing use of water tanks throughout the area, however detailed information is unavailable. There are a range of other state government initiatives including showerhead exchange programs and rebates for dual flush toilets and grey-water systems.

5.1 Water consumption in Maroondah

The distribution of potable water consumption across the entire Maroondah municipality, including corporate and community consumption is shown in Figure 1. A comparison with the consumption of greater Melbourne as a whole (Figure 2) shows Maroondah having a greater proportion of total use from the residential sector throughout the municipality. This demonstrates that a focus on influencing residential water users will have a greater effect on reducing Maroondah's potable water consumption than in other municipalities.

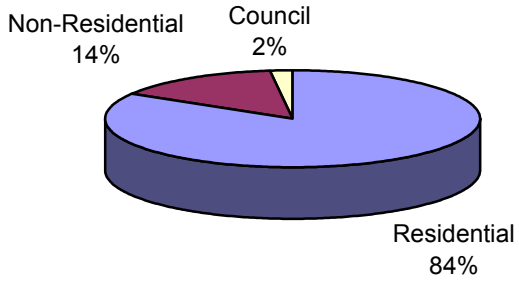

Figure 1 Maroondah Water Consumption by Sector (2005/06)

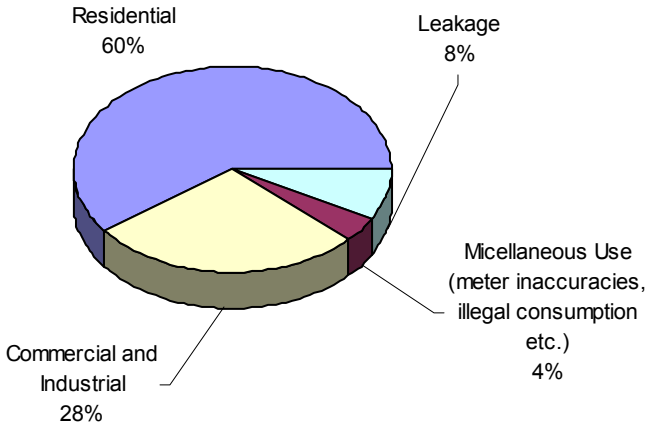

Figure 2 Greater Metropolitan Melbourne Water Consumption by Sector (2005/06)

5.2 Community Water Consumption

Total community water consumption in Maroondah is presented in Table 1.

Table 1 Community water consumption

Year	Residential (KL)	Non-Residential (KL)	Total (KL)
2000/2001	8,390,322	1,433,138	9,823,460

Residential water use for 2000/2001 equates to 229 litres per capita per day. Research by Yarra Valley Water provides an overview of household end uses[6]. Figure 3 presents the annual household use from surveyed results. Seasonal uses includes irrigation, evaporative coolers and pools, and together with the shower and clothes washer account for 66% of annual water use. Daily per capita indoor use is indicated in Figure 4, with the shower, clothes washer and toilet accounting for the majority of indoor water use. This indicates that these are the areas to target along with seasonal uses to achieve water conservation objectives. The 2004 Yarra Valley Water Study was conducted under a period of water restrictions and this is likely to have an impact on the data. Leakage was skewed due to a small sample size and a small number of houses contributing a large proportion of the total leakage.

[6] Data from "Yarra Valley Water 2004 Residential End Use Measurement Study"

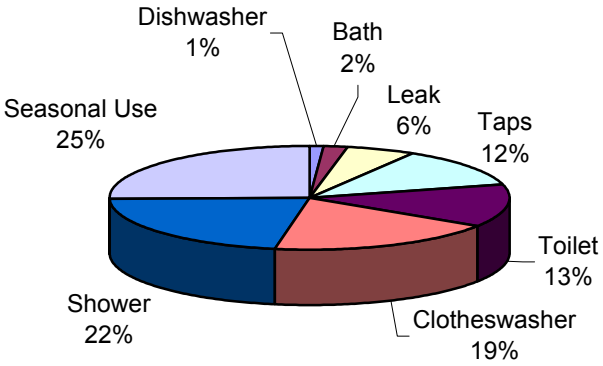

Figure 3 Annual Household Water Use (2004)

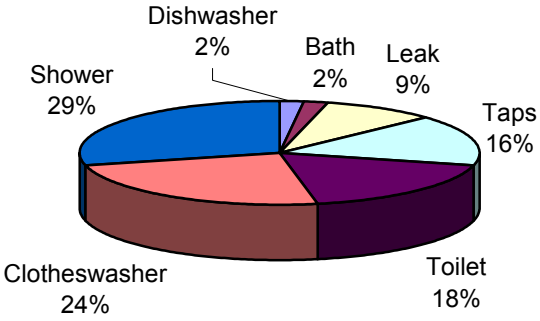

Figure 4 Daily indoor water use per Capita (2004)

5.3 Forecasting Community water use

If residential water use per capita per day of 229 litres continues, overall residential water use for the municipality will increase to 9,040,721 KL or an increase of 7.75%[7]. This assumes limited investment in water saving technology by the community.

Potential savings in residential water use will focus on uses that consume the most water. Seasonal water uses can be reduced through appropriate plant selection and location of plantings and appropriate watering regimes. Water tanks provide an easy method to reduce potable water supply in the garden. Water saving technology such as

[7] Based on population projections in "Maroondah Population and Household Projections: 2001-2031 V2 July 2006".

dual flush toilets, low-flow showerheads and efficient clothes-washers and dishwashers will contribute to most saving indoors.

It is difficult to predict water use patterns for the commercial and industrial sector as this is heavily influenced by the price of water and the price of water saving initiatives.

5.4 Community Water Conservation Target

The establishment of an overall target for water conservation is based on targets developed by the state government, particularly the *Sustainable Water Strategy: Central Region* document and *Securing Our water Future Together*. These set targets for a per capita reduction in water use of 15% by 2010, and 30% by 2020 on the 1990's average across Melbourne. Due to non-residential water use in Maroondah being lower than the Melbourne average, permanent water saving restrictions and greater community awareness in recent years, per capita community water use in Maroondah has been reduced by 37% on the 1990's average. As a result the target below has been adjusted based on per capita residential water use averages only.

The *Sustainable Water Strategy: Central Region* document sets a target specifically for residential water consumption based on current Melbourne residential water use.

The target for residential water use is to achieve a 30% reduction of water consumption by 2020 (based on Melbourne averages). This equates to 174 litres per capita per day by 2020.

This target requires a 24% reduction on current per capita water use within the City of Maroondah. Water consumption and population figures are presented in Table 2.

The *Sustainable Water Strategy: Central Region* document has a policy specifically for non-residential water consumption based on an annual reduction in current non-residential water use. This policy has been translated to the target set for Maroondah presented below.

The target for non-residential water use is to achieve a 10% reduction of water consumption by 2020 (based on 2000/01 water use).

Table 2 Residential water use and targets

Year	Population	Residential Water Use (KL)	Consumption / capita / Day (L)	Outcome	Reduction
2000/2001	100,279	8,390,322	229	Actual	-
2005/2006	103,165	7,279,492	193	Actual	16%
2020/2021	118,457	7,523,204	174	Target	24%

6 Community Water Conservation Actions

Council has already undertaken a number of actions to help the community conserve water as detailed in Table 3. Future actions (Table 4) build on this activity and ensure that actions completed are continued where appropriate.

Table 3 Water saving actions already undertaken

Action	Date implemented
Provision of brochures on water conservation	Ongoing
Support of Yarra Valley Water showerhead exchange program	Ongoing
Support and promotion of State water conservation rebates	Ongoing
Conducted 'Green Gardeners' workshop for industry professionals.	June 2006

6.1 Water Conservation Objectives

1. To demonstrate leadership in the sustainable management of water resources
2. To reduce water demand through education and awareness raising
3. To support the community in utilising new and alternative technologies and processes to reduce water consumption
4. To work in partnership with other organisations including Melbourne Water, Yarra Valley Water and other councils to assist the community in reducing water consumption
5. To seek funding to provide financial support to the community for implementing water conservation projects
6. Monitor and report on the implementation of the plan and outcomes on a regular basis.

6.1.1 Methodology for Prioritisation

The methodology for the prioritisation is based on the following criteria:

- Impact on water consumption reduction
- Cost effectiveness
- Multiple objectives
- Broad community participation

Table 4 Water conservation action plan

	Action	Priority	Cost	Responsibility
Leadership				
1.1	Implement Corporate Sustainable Water Management Plan.	High	See plan	See plan
1.2	Provide water conservation tips and council actions regularly in the *Maroondah Focus* newsletter, *Keeping in Touch* newspaper advertisement, website, and customer service centres.	High	$0	Planning and Sustainability, Public Affairs and Communication
1.3	Investigate the construction or retrofit of a 'sustainable' house or community facility to provide an example of what can be achieved.	Low	$200,000+	
Education and awareness raising				
2.1	Investigate the development of a 'sustainable homes' program on opportunities to reduce water consumption. May be integrated with greenhouse, waste and biodiversity issues.	High	$25,000 / year	Planning and Sustainability
2.2	Investigate the development of an environmental awards program to highlight successful water conservation projects in the community.	Low	$5,000 / year	Planning and Sustainability, Public Affairs and Communication
2.3	Conduct a 'sustainable garden' seminar. Focus on techniques such as irrigation, mulch, species selection and grouping and watering regimes. Species selection to include information on environmental weeds and what not to plant.	Low	$5,000	Planning and Sustainability, Parks and Works
2.4	Provide relevant brochures on water conservation techniques, technologies and government rebates in customer service centres and planning department. Develop own if necessary.	Low	$0	Planning and Sustainability, Customer Service
2.5	Promote water saving and water quality enhancement at community festivals and events in conjunction with community groups and Yarra Valley Water.	Low	$2,000	Planning and Sustainability, Yarra Valley Water

	Action	Priority	Cost	Responsibility
2.6	Promote council water conservation initiatives to community	Low	$0	Planning and Sustainability, Public Affairs and Communication
Use of new technologies				
3.1	Encourage new developments to incorporate water conservation technologies through strengthening local planning policies.	High	$0	Planning and Sustainability,
Partnerships				
4.1	Work with Yarra Valley Water to implement community and commercial programs ensuring there is no duplication.	High	$0	Planning and Sustainability
Funding				
5.1	Apply for grants with and on behalf of the community and organisations to implement water conservation projects and technologies.	High	$0	Planning and Sustainability
5.2	Assist and support community groups with funding applications	Medium	$0	Planning and Sustainability
Monitoring and reporting				
6.1	Monitor trends in water use and consumption to adapt actions	High	$0	Planning and Sustainability
6.2	Regularly report to the community on the outcome of the actions of this plan.	High	$0	Planning and Sustainability

7 Maroondah's Water Quality

Two priority areas were identified as the main contributors from community actions to reduced water quality in Maroondah. These issues identified in the Stormwater Management Plan and the Waterways of Maroondah Strategy and are:

- *Gross litter and pollution management*

  Gross litter is manufactured material ranging in size from cigarette butts to shopping trolleys. The term pollution refers to gross litter and also chemical and toxic substances from vehicle emissions, industrial, commercial and residential activities. Gross litter and pollution presents significant management problems due to the diffuse nature of the problem.

- *Erosion and sediment control*

  Erosion results in soil and other fine particles entering waterways reducing light and oxygen availability and often with other pollutants such as hydrocarbons attached to them. Sediment is also deposited via the stormwater system as a result of construction activities.

Each waterway throughout the municipality has specific threats and water quality condition. Water quality is also highly variable and fluctuates in response to changing flows as a result of changes to rainfall levels. Table 5 summarises the main threats to Maroondah's waterways as identified in the Maroondah Stormwater Management Plan and the latest water quality ratings for the wider catchment.

Table 5 Water quality assessment of waterways within Maroondah

Waterway	Threats	Water quality assessment*
Andersons Creek	Infill building site development – litter, sediment, nutrients and toxicants	Overall Condition: Moderate to Poor
Dandenong Creek	Upper Dandenong Creek Residential land use – sediment, litter and nutrient loads during runoff events Pollution events from illegal dumping and oil and surfactants Lower Dandenong Creek As with Upper Dandenong Creek Illegal discharges from industrial areas in tributaries such as Bungalook and Old Joes Creek	Overall condition: Poor
Tarralla Creek	Commercial land use, particularly from Croydon Shopping Centre – litter, putrescent waste, surfactants and particulate matter High nutrient and pathogens loads from Dorset Golf Course, particularly leachate from former landfill areas discharging to the surface Industrial runoff – paint, solvents, oils and surfactants	No data, tributary to Dandenong Ck
Bungalook Creek	Upper Bungalook Creek Residential Runoff – sediment and nutrients Lower Bungalook Creek Industrial runoff including illegal discharges – paint, surfactants, oil and toxicants Commercial activities – litter.	No data, tributary to Dandenong Ck
Heatherdale Creek	Industrial discharges directly to the creek generating high loads of hydrocarbons and toxicants Sediment runoff from site redevelopment	No data, tributary to Dandenong Ck
Mullum Mullum Creek	Commercial runoff from Maroondah highway and Eastland shops Industrial pollution from adjacent business such as panel beaters – paints, hydrocarbons, toxicants and surfactants	Overall condition: Poor
Brushy Creek	Upstream catchments contributing commercial runoff (litter and putrescent material), particularly from Mooroolbark shopping centre and high sediment loads Brushy Creek treatment plant discharges Class B waste water	Overall condition: Poor

Waterway	Threats	Water quality assessment*
Jumping Creek	Residential development – sediment, nutrients and litter Residential development resulting in altered hydrological cycles contributing to increased erosion	No data

*Information from Port Phillip and Westernport Regional River Health Strategy Draft, Port Phillip and Westernport CMA and Melbourne Water, 2004; Melbourne Water, Waterway Management Activity Plans for Dandenong Ck (draft) (2003), Andersons Ck (1998); Melbourne's Rivers and Creeks 2004, Melbourne Water, 2004.Testing sites do not necessarily fall within Maroondah Council boundaries.

7.1 Water Quality Target

The Target for water quality actions has been developed through the identification of a range of actions that reflect the priority issues identified in Milestone 1 of the ICLEI Water Campaign™ and in the Stormwater Management Plan.

Council will implement actions that will achieve a minimum of 60 points worth of actions based on the ICLEI point system (Appendix 1) by 2015.

8 Community Water Quality Actions

Council has already undertaken a number of actions to improve water quality as detailed in Table 6. Future actions (Table 7) build on this activity and ensure that actions completed are continued where appropriate. The Waterways of Maroondah Strategy, Stormwater Management Plan and outcomes from the 2007 Environment Forum have been used to develop actions.

Table 6 Water quality actions already undertaken

Action	Description	Date implemented
Education and awareness raising	Several education programs have been conducted with funding support from the EPA's VSAP program including school education, automotive industry and building site education based programs	Ongoing
Water quality monitoring	Council supports the Waterwatch program throughout the municipality	Ongoing
Revegetation and bank stabilisation works	Reduces erosion and improves water quality	Ongoing
Leadership	Council is implementing the Corporate Sustainable Water Management Plan	Ongoing
WSUD promotion to developers	Council is involved in promoting Water Sensitive Urban Design to developers throughout the planning phase	Ongoing

8.1 Community Water Quality Objectives

1. To demonstrate leadership in the protection and improvement of water quality.
2. To improve the water quality of Maroondah's waterways through education and awareness raising of the community.
3. To work in partnership with other organisations including Melbourne Water, Yarra Valley Water and other councils to assist the community in improving water quality.
4. To seek funding to provide financial support to the community for implementing water quality improvement projects.
5. To monitor the water quality of Maroondah's waterways and ensure that program implementation is responsive to changes in quality.
6. To utilise the planning, regulatory and enforcement powers of local government to achieve water quality objectives.

8.1.1 Methodology for Prioritisation

The methodology for the prioritisation is based on the following criteria:

- Impact on water quality
- Cost effectiveness
- Multiple objectives
- Broad community participation

Table 7 Water quality action plan

	Action	Priority	Cost	Responsibility
Leadership				
1.1	Implement Corporate Sustainable Water Management Plan.	High	See Plan	Council
1.2	Implement Waterways of Maroondah Strategy and Stormwater Management Plan	High	See Plans	Council
1.3	Provide updates of actions conducted by water management authorities and council regularly in the *Maroondah Focus* newsletter.	Low	$0	Planning and Sustainability, Public Affairs and Communication
Education and awareness raising				
2.1	Continue to support the WaterWatch Program and investigate possible expansion	High	$20,000 / year	Planning and Sustainability
2.2	Provide relevant information on stormwater protection techniques and correct waste disposal in customer service centres and planning department. Develop own if necessary.	Low	$0	Customer Service, Planning and Sustainability
2.3	Install signage along drains and creeks highlighting stormwater pollution issues. This includes using stencils on drains, educational signage and provision of signage with EPA contacts	Low	$5,000	Parks and Works, Planning and Sustainability, WaterWatch
2.4	Investigate the development of a litter management strategy that includes an education component and identifies hotspots.	Medium	$20,000	Waste Management, Planning and Sustainability
2.5	Investigate the need for training on WSUD for developers and contractors	High	$10,000	Planning and Sustainability
Partnerships				
3.1	Work with Melbourne Water to implement community programs ensuring there is no duplication.	Medium	$0	Planning and Sustainability, Parks and Works
3.2	Work with Waste Wise Victoria to conduct chemical collection days within the municipality.	Medium	$2,000	Waste Management
3.3	Continue to work with community groups to revegetate waterways with indigenous plants.	High	Recurrent	Parks and Works

	Action	Priority	Cost	Responsibility
3.4	Work with the EPA to ensure commercial and industrial enterprises meet water quality regulations.	High	$0	Planning and Sustainability
3.5	Work with Port Phillip and Westernport CMA to deliver 'Living Links' project.	High	Unknown	Parks and Works
3.6	Advocate for the upgrade of Brushy Creek treatment plant to Yarra Valley Water and other authorities.	High	$0	Council and Community
Funding				
4.1	Apply for grants with and on behalf of the community and organisations to implement water quality improvement projects and technologies.	High	$0	Planning and Sustainability, Parks and Works
Monitoring and reporting				
5.1	Monitor trends in water quality to adapt actions through the Waterwatch program	High	$0	Planning and Sustainability
5.2	Regularly report to the community on the outcome of the actions of this plan.	High	$0	Planning and Sustainability
Planning				
6.1	Encourage the use of Water Sensitive Urban Design in all new developments through the planning scheme. In particular through the MSS and planning permit conditions.	High	$0	Planning and Sustainability
6.2	Develop local law for sediment and litter control on building sites. This also requires staff training and enforcement.	High	$10,000	Planning and Sustainability

9 Monitoring and Review

Monitoring the implementation of the Sustainable Water Management Plan will be undertaken on an annual basis. This will allow prioritised actions to be incorporated into the development of the Council Plan and reported on in the Annual Report.

Regular reviewing of the Plan will ensure that the actions and targets remain relevant to current conditions and reflect changes in best practice and technology.

In addition to reporting on actions undertaken, Council will continue to monitor water consumption through data collected from Yarra Valley Water and monitor water quality through the development of a water-testing regime and utilising data collected by Melbourne Water using the Indicators of Stream Condition (ISC) data.

A full review of the Plan will be undertaken in 2010 in order to reassess the progress of the implementation of the action plan and review the targets.

10 References

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APPENDIX 1: ICLEI Water Campaign Community Actions

ICLEI WATER CAMPAIGN™ COMMUNITY WATER QUALITY ACTION LIST				
Water Quality Areas	**#**	**Key Initiatives**	**Category**	Points
Aim		**These actions are designed to minimise the generation and export of silts and sediments off site during council construction activities.**		
Sediment and Erosion Control	**SEC-1**	Develop a erosion and sediment control policy/guidelines/local law/planning control based on best management practices for community construction activities.	Policy	15
	SEC-2	Conduct training/staff development to assist contract managers and staff in the enforcement of the erosion and sediment guidelines.	Staff training/awareness raising	
	SEC-3	Appoint council officers to ensure that the plan/policy/guidelines/local laws are adhered too.	Implementation	
	SEC-4	Calculate Total Suspended Solids export load reduction as a result of actions undertaken	Benefit Reporting	5
	SEC-5	Deliver a sediment and erosion control community education campaign (in conjunction with stakeholders)	Community Education	5
	SEC-6	Assess the effectiveness of the community education program	Benefit Reporting	
Aim		**These actions are designed to minimise the environmental impacts of excessive use of herbicides and pesticides on receiving environments.**		
Herbicide, Pesticide and Fertiliser Use	**HP-1**	Assess the extent of herbicide, pesticide and fertiliser use and related water quality problems within your community.	Research/scoping/feasibility study	
	HP-2	Implement a herbicide, pesticide and fertiliser use community education campaign (in conjunction with stakeholders)	Community Education	5
	HP-3	Assess the effectiveness of the community education program	Benefit Reporting	
Aim		**These actions are designed to minimise exposure of Potential Acid Sulphate Prone Soils to air and therefore reduce acidification of soils, damage to constructed assets and impacts on receiving environments**		
Potential Acid Sulphate Soil Management	**PASS-1**	Map the extent of potential acid sulphate soils within your local government area.	Monitoring and Data management	5
	PASS-2	Carry out an ongoing potential acid sulphate soil monitoring plan as per state/national guidelines.	Monitoring and Data Management	5
	PASS-3	Incorporate an assessment of potential acid sulphate soil policy/guideline for council's town planning scheme	Policy	10
	PASS-4	Carry out ongoing enforcement of the potential acid sulphate soil policy/guidelines.	Implementation	
	PASS-5	Develop and implement an ongoing maintenance schedule-appropriate to the above guidelines	Maintenance	
	PASS-6	Conduct council staff training to ensure effective implementation of the above policy	Staff training	
	PASS-7	Implement a potential acid sulphate soil community education campaign (in conjunction with stakeholders)	Community Education	5

	PASS-8	Assess the effectiveness of the community education program	Benefit Reporting	
Aim		**These actions are designed to minimise the export of gross pollutants to receiving environments.**		
Gross Litter Control	**GLT-1**	Conduct a community litter audit	Monitoring and Data Management	5
	GLT-2	Gross litter management actions - **Please enter and report on specific actions below in the green sections**.	Implementation	
	GLT-2a	<eg. remove dumped rubbish immediately from public land and attempt to identify persons involved.>	Implementation	5
	GLT-2b	<eg. develop a cigarette butt education program to work with select businesses at designated smoking areas.>	Implementation	5
	GLT-2c	<eg.support local community groups to enter a "Tidy Towns" competition or similar>	Implementation	5
	GLT-3	Develop and implement an ongoing maintenance schedule- appropriate to each action implemented	Maintenance	5
	GLT-4	Conduct council staff training to ensure effective implementation of the above maintenance regimes	Staff training	
	GLT-5	Assess the amount of litter removed from water ways as a result of the implemented actions	Benefit Reporting	5
Aim		**These actions are designed to assist in developing a better understanding of and minimise the environmental impacts of excessive nutrient loads to receiving environments.**		
Nutrients				
Wastewater Treatment	**WWT-1**	Assess wastewater treatment related practices and water quality problems within the local government area - include water authority managed wastewater treatment plants and community use of sewage, septic and greywater systems.	Research/scoping/feasibility study	
	WWT-2	Wastewater treatment actions - **Please enter and report on specific actions below in the green sections.**	Implementation	
	WWT-2a	<eg.develop a greywater reuse information pack to assist community members easily identify the approvals needed to installing greywater reuse systems. >	Implementation	5
	WWT-2b	<eg.Implement a program that will see all private properties connected to sewer or the effective containment of septic systems by a target year.>	Implementation	5
	WWT-2c	<eg. offer a rebate to community members for greywater reuse technologies>	Implementation	5
	WWT-2d	<eg. in unsewered areas promote the benefits of wastewater treatment technologies that treat wastewater to a higher level than septics>	Implementation	5
	WWT-2e	<eg. work with your water authority to reuse wastewater treated by their treatment plants>	Implementation	5
	WWT-3	Develop and implement an ongoing maintenance schedule - appropriate to each action implemented	Maintenance	5
	WWT-4	Conduct council staff training to ensure effective implementation of the above maintenance regimes	Staff training	

	WWT-5	Assess the reduction in wastewater discharged to water bodies as a result of the implemented actions	Benefit Reporting	5
Water Sensitive Urban Design	**WSUD-1**	Incorporate a WSUD policy into council's planning scheme .	Policy	5
	WSUD-2	In conjunction with appropriate stakeholders obtain and calibrate an appropriate modelling tool to assist with WSUD decision making	Monitoring and Data management	5
	WSUD-3	Ensure council planners and engineers have appropriate training in WSUD modelling and engineering practices	Staff training	5
	WSUD-4	Require developers to provide an appropriate maintenance regime associated with each WSUD feature	Maintenance	5
	WSUD-5	Enforce the WSUD planning policy as required	Implementation	5
	WSUD-6	Ensure open space maintenance staff are trained in the maintenance of the WSUD features after handover from the developer	Staff Training	5
	WSUD-7	Assess the reduction in nutrient export as a result of the implemented actions	Benefit Reporting	5
Other Nutrient Actions	**N-1**	Assess the impact community activities have on the nutrient load to local water bodies. Including the nutrient export from; fertiliser application, deciduous garden trees, mulch piles, private nursery operations and private lawn mowing.	Research/scoping/feasibility study	
	N-2	Carry out an ongoing water quality monitoring program to assess the level of nutrient enrichment occurring in local water bodies (in conjunction with stakeholders)	Monitoring and Data Management	5
	N-3	Other nutrient actions - **Please enter and report on specific actions below in the green sections**.	Implementation	
	N-3a	<eg. develop an implement a subsidised/free local plant to residents scheme to encourage the planting of species that require minimal fertiliser>	Implementation	5
	N-3b	<eg. engage alternate gardening groups or council open space staff to run sessions for the community on ways to minimise fertiliser use in private gardens. Eg Green Gardener, Sustainable Gardening Australia.>	Implementation	5
	N-3c	< eg. develop a community education campaign that promotes sustainable gardening practices>	Implementation	5
	N-3d	<eg. develop a local planning policy to support the retention of native vegetation or bushland areas >	Implementation	5
	N-4	Develop and implement an ongoing maintenance schedule - appropriate to each action implemented	Maintenance	5
	N-5	Conduct council staff training to ensure effective implementation of the above maintenance regimes	Staff training	
	N-6	Assess the nutrient export reduction as a result of the above	Benefit Reporting	5
Aim		**These actions are designed to minimise the environmental impacts of aquatic centre discharges and to examine opportunities to optimise this resource**		
Private Swimming Pools	**PSP-1**	Adopt building controls that require private pools to connect backwash to sewer.	Research/Scoping Study	5
	PSP-2	Carry out inspections to ensure the pool backwash is connected to sewer.	Implementation	

Aim		**These actions are designed to reduce and mitigate the impacts of groundwater contamination**		
Groundwater Contamination	**GWC-1**	Map all potential point sources and the extent of existing groundwater contamination throughout the local government area including hydrocarbons from service stations, local industry, stockpiled chemicals, historical industrial areas etc.	Research/scoping/feasibility study	
	GWC-2	Implement an ongoing groundwater contamination monitoring program (in conjunction with stakeholders)	Monitoring and Data Management	5
	GWC-3	Groundwater contamination management actions - **Please enter and report on specific actions below in the green sections.**	Implementation	
	GWC-3a	<eg. In conjunction with appropriate stakeholders work with local industry to reduce potential of groundwater contamination through their activities>	Implementation	5
	GWC-3b	<eg. develop an education campaign to encourage community members to dispose of backyard chemicals appropriately>	Implementation	5
	GWC-3c	<eg. develop and implement an education campaign to encourage community members to dispose of oil appropriately>	Implementation	5
	GWC-4	Develop and implement an ongoing maintenance schedule - appropriate to each action implemented	Maintenance	5
	GWC-5	Conduct council staff training to ensure effective implementation of the above maintenance regimes	Staff training	
	GWC-6	Report on the results of the groundwater monitoring program	Benefit Reporting	5
Aim		**These actions are designed to reduce water recharge to the groundwater table in areas affected by salinity.**		
Salinity	**S-1**	Assess the salinity risk throughout the local government area	Research/Scoping/Feasibility Study	
	S-2	Implement an ongoing groundwater salinity monitoring program (in conjunction with stakeholders)	Monitoring and Data management	5
	S-3	Salinity Management Actions - **Please enter and report on specific actions below in the green sections.**	Implementation	
	S-3a	<eg. partner with council's local catchment body to revegetate areas of land to reduce recharge>	Implementation	5
	S-3b	<eg. implement water conservation and recharge reduction measures>	Implementation	5
	S-3c	<eg. develop a local planning policy to support the retention of native vegetation or bushland areas >	Implementation	5
	S-3d	<eg subsidise or provide free local native species to the community for the purpose of reducing recharge>	Implementation	5
	S-4	Develop and implement an ongoing maintenance schedule - appropriate to each action implemented	Maintenance	5
	S-5	Conduct council staff training to ensure effective implementation of the above maintenance regimes	Staff training	