

## Link to South Australia's Strategic Plan Objectives

Investment in infrastructure to support the sustainable use of existing water supplies and to develop alternative supplies will contribute to the achievement of the following targets:

### Objective 1: Growing Prosperity

|                                 |   |
|---------------------------------|---|
| <b>Exports</b>                  | Treble the value of South Australia's export income to \$25 billion by 2013. (T1.12)  |
| <b>Strategic infrastructure</b> | Increase investment in strategic areas of infrastructure, such as transport, ports and energy to support and achieve the targets in South Australia's Strategic Plan. (T1.16) |

### Objective 3: Attaining Sustainability

|                         |   |
|-------------------------|---|
| <b>The River Murray</b> | Increase environmental flows by 500 GL per annum in the Murray-Darling and major tributaries by 2008 as a first step towards improving sustainability in the Murray-Darling Basin, with a longer-term target to reach 1500 GL by 2018. (T3.1) |
|-------------------------|---|

### Objective 5: Building Communities

|                                   |   |
|-----------------------------------|---|
| <b>State and local Government</b> | Align State and Local Strategic Plans within 12 months of the release of South Australia's Strategic Plan and agree joint initiatives from them. (T5.7) |
| <b>Regional infrastructure</b>    | Build and maintain infrastructure to develop and support sustainable communities in regions. (T5.11)  |

## Background

The main participants in water management and delivery in the State are:

- Department of Water, Land and Biodiversity Conservation (DWLBC), primarily a regulatory and policy development agency
- SA Water, a public non-financial corporation delivering water and sewerage services under a commercial charter
- natural resources management boards
- local government
- the EPA, which regulates environmental aspects of water quality
- Department of Health, which regulates health aspects of water quality.

Operations and maintenance management of SA Water's water and sewerage service delivery has been contracted to United Water (for the operation of metropolitan Adelaide water and sewerage services), and United Utilities (for the operation of 12 country-based water filtration plants).

### The Physical System of Water Supply

South Australia's drinkable water supply strategy has, in the main, been developed with a policy of connectivity through three major transmission pipelines to the River Murray. The nearby metropolitan Adelaide water catchments and dams act as yearly storages for both the pumped River Murray supply and natural run-off.

Apart from the River Murray, some drinkable water comes from local groundwater in the South East and Eyre Peninsula, the latter requiring augmentation.

In the remote northern areas of the state water is generally sourced through access to low quality groundwater. Coober Pedy has adopted desalination technology to overcome this issue. Potential exists to enhance the use of water from the Great Artesian Basin, however this would need to be carefully managed to ensure that the sensitive dependent ecosystems are not compromised.

Approximately 2 Gigalitres (GL) per annum of stormwater and 18 GL per annum of wastewater are harvested across the state for non-drinkable use.

These systems provide South Australia with a reliable water supply. Of all water used in the state, SA Water customers account for approximately 220 GL per year.

Irrigation based on surface water and groundwater plays a significant role in South Australia's economy and represents 80% of all water used in the State. The main irrigation districts are in the Riverland, Lower Murray, Clare, Barossa, Adelaide Hills, Northern Adelaide Plains, Southern Vales, Mallee, Upper South East and the Lower South East.

Subject to the sustainable limits of a water resource, opportunities exist to improve the management and utilisation of available water resources through:

- the trade of River Murray and other water allocations between existing users both in South Australia and interstate
- more efficient use of the River Murray and Mount Lofty Ranges waters and lake storage, in conjunction with groundwater, to expand existing or develop new irrigation areas

- use of treated wastewater and effluent water
- harvesting of surface water in higher rainfall districts
- improved use of groundwater
- using SA Water's pipeline infrastructure as a water transport mechanism, subject to water quality considerations.

The South East of the state was historically characterised by land inundated with surface water. A system of surface water drainage was constructed to drain this land to make it productive. While this drainage system has not traditionally been seen as a source of water, this may change as awareness of the value of water grows. The State Government controls a strategically important and currently under-utilised reserve of water in the South East following proclamation of this resource. The application of the resource will be consistent with its highest and best use. It is likely that it will be used in secondary rather than primary production, in order to leverage regional economic development outcomes.

### The Legislative and Policy Context

Some of the most important water resources for South Australia are managed in collaboration with other jurisdictions through the Murray-Darling Basin Agreement and the more recent Council of Australian Governments (COAG) and National Water Initiative developments. It is therefore vital that South Australia continues to show strong leadership in this important area.

The Murray-Darling Basin Agreement sets out collaborative arrangements between the Australian, Queensland, New South Wales, ACT, Victorian and South Australian governments for the regulation and sharing of water within the Murray-Darling Basin. These arrangements have existed since 1914.

In 1994, COAG agreed upon a legal and administrative reform framework for rights to trade, access and use water resources. The National Competition Policy (NCP) package of water reforms, aimed at achieving environmentally sustainable and economically viable water use and management, has been substantially implemented.

An intergovernmental agreement to give effect to the National Water Initiative (NWI) was signed at the June 2004 COAG meeting. The NWI extends and builds on the 1994 national water reforms, including the progressive removal of barriers to water trade. The newly established National Water Commission will now monitor progress on both NWI and COAG water reforms.

The management of other significant water resources, for example the Lake Eyre Basin, the Great Artesian Basin and groundwater and surface water shared with Victoria, are subject to intergovernment agreements.

There are also state-based legislative frameworks that influence water resources management, with the key ones being the *Natural Resources Management Act 2004*, the *Waterworks Act 1932* and the *South Australian Water Corporation Act 1994 and the River Murray Act 2003*.

## Challenges and Opportunities

### Water Resource Management

South Australia is highly dependent on water resources from the River Murray and the Mount Lofty Ranges. Given this, the State Government has almost completed the Water Proofing Adelaide strategy to provide a blueprint for the management, conservation and development of Adelaide's water resources to 2025. There are three central themes to the Water Proofing Adelaide work: sound management of existing resources; responsible water use; and a framework for considering water augmentation options where they are required.

In terms of the River Murray, the sustainability of current water diversion practices across the whole Murray-Darling Basin is an issue. Increased withdrawal of irrigation water in other states, particularly over the last 20 years, has reduced the dilution of natural salt inputs. South Australia is committed to the Murray-Darling Basin Commission (MDBC) Salinity Management Strategy and the target of <800 EC units measured at Morgan 95% of the time. This means that further irrigation development in the state that impacts on the River Murray must be supported by salt interception schemes to generate the required salt credits. Reduced summer river flow is a contributor to toxic algae blooms.

The State Government will provide assistance packages to farmers in the Lower Murray Irrigation Areas that enable rehabilitation leading to improved water quality.

There is a clear need to determine the sustainable yield of water from the Murray-Darling Basin and then, from this point, ensure that Murray-Darling Basin diversions are reduced to this sustainable level. Market forces could then operate, in accordance with the highest and best use of the available water.

Consistent with restoring a sustainable system of water diversion from the Murray-Darling Basin, the COAG meeting of the 25 June 2004 resolved to support an additional 500 GL per annum environmental flow and has set aside \$500 million to support works to recover this volume of flow. While South Australia is a party to this agreement, it considers the 500 GL per annum the first step only. The state's commitment to improving the ecological sustainability of the River Murray has been further strengthened through the Living Murray Initiative, which makes a firm commitment to seeking a total of 1500 GL per annum environmental flow by 2018.

The current use cap and use of River Murray water in South Australia, through the Murray-Darling Basin Agreement is set out in Table 22 of the State Water Plan (Vol 2) and summarised in the following table.

| <b>Water Supply</b>                      | <b>Use limit (cap)<br/>(GL per annum)</b> | <b>Average diversion use<br/>or loss (GL per annum)</b> |
|--|---|---|
| Metropolitan Adelaide                    | 130                                       | 100   |
| Country towns                            | 50  | 40  |
| Irrigation                               | 524                                       | 452   |
| <b>Total diversions</b>                  | <b>704</b>                                | <b>592</b>  |
| Evaporation losses                       | N/A                                       | 880   |
| <b>Total diversions plus evaporation</b> | <b>704</b>                                | <b>1472</b>   |
| Entitlement flow to South Australia      | 1850                                      | 6900  |
| <b>Available for the environment</b>     | <b>N/A</b>                                | <b>5428</b>   |

With the support of the community, local government, and industry, the government will continue to implement programs aimed at reducing annual mains water demand so that by 2025 consumption will be about 35,000 Megalitres (ML) lower than it otherwise would have been. Already the government has adopted permanent conservation measures to support this target but additional measures, including support for a national water efficiency labelling program and voluntary water audits for all water users, will be adopted.

Metropolitan and town use of water is limited by the use limit (cap). This raises the question of future augmentation sources for this water supply. In considering any augmentation path for water supply, it is necessary to have regard to:

- the lowest costing augmentation method, taking account of the true cost of the water delivered (i.e. including environmental costs of water use etc.)
- the technical feasibility of the augmentation strategy, including its overall sustainability.

Alternative sources for augmentation of water supply include additional sewage water reuse or beneficial harvesting of stormwater for use on public parks and in industrial processes. The government, in conjunction with homeowners, local government and community groups, will strive to protect coastal waters and reduce demand on the mains water system by increasing rainwater and stormwater use for non-drinking purposes from an estimated 2 GL per annum in 2002 to 20 GL per annum by 2025 – a 900% increase.

The Mount Lofty Ranges is an open water catchment, meaning that urban and rural development is allowed in the catchment. As a result, the Mount Lofty Ranges watershed faces pollution risks from the various land uses within the catchment, including residential sewage treatment via septic tank effluent disposal systems, animal keeping and various other forms of land use. Overall water quality from run-off in the catchment has also been affected by development in the watershed. These activities have reduced the overall level of run-off, leading to reduced environmental flows through streams. The groundwater resource in the Mount Lofty Ranges watershed and Adelaide (i.e. particularly where there is high-value viticultural or horticultural crop activity) is highly utilised and in some cases fully committed. Metropolitan estuaries and coastal marine environments have also been impacted by polluted stormwater and effluent discharges. As for the River Murray, options for restoring environmental flow in the creek and river systems of the Mount Lofty Ranges will be evaluated.

The government has issued a Notice of Intent to Prescribe the Western Mount Lofty Ranges and has put in place a temporary moratorium on new uses. This approach prevents significant increases in the pressure on the region's water resources while public consultation occurs on whether prescription should occur and if so to what extent. If implemented, prescription would provide a mechanism for sustainable water resources planning and management, including more equitable and secure allocation of water resources. In addition, planning and environmental controls will reduce the run-off of pollutants into creeks, streams and water storages.

## Strategic Priorities

- Ensure that future irrigation developments offset their salinity impact or are located in low salinity impact areas to reduce the incremental salt effects of further irrigation development along the River Murray.
- Identify further salt interception schemes ranked by area of most effectiveness in reducing saline water flows into the River Murray.
- Educate irrigators on the highest and best use of water, identifying crop types and efficient applications of irrigation water to reduce the level of irrigation drainage water returning to the River Murray.
- Implement the Water Proofing Adelaide Strategy.
- Implement water efficiency programs for all users of water, prioritising uses that can yield the greatest savings in water for the money spent on the water use program.
- Support the return of environmental flows to the River Murray by targeting 1500 GL per annum by 2018
- Through the Murray-Darling Basin Commission, support information gathering on the management of environmental flows and how they can most economically be sourced to gain the best outcomes for the River Murray through innovative management of water flows.
- Through the Planning Strategy and associated Development Plans, in future allow only land uses in the Mount Lofty Ranges Water Catchment that have beneficial or neutral impacts upon the quality of water harvested from the catchment.
- Educate land users in the Mount Lofty Ranges water catchment on land use practices to improve water quality from the catchment, supported by regulatory intervention where necessary.
- Ensure efficient use of water in the Mount Lofty Ranges water catchment.

### Water for New Economic Activity

For a number of current areas of economic activity in the state, future growth is planned to achieve South Australia's Strategic Plan export target. Additional water supply at an appropriate cost will be needed to achieve this growth in some sectors. For example, the possible expansion of WMC's Olympic Dam mine and other mineral developments, and possible expansion of dairy production, horticulture and viticulture.

Additional water use in these sectors will need to be secured within a market context, supported by the normal assessment processes including the long-term sustainability of any use. In some areas, innovative harvesting and more efficient use of water will be key, while in others, greater reuse of wastewater flows will provide the solution.

The expansion of permanent trade in water will be achieved through implementation of the National Water Initiative. Water trading across the Murray-Darling Basin will enable South Australia to access water that is currently used for lower-value production, such as pasture, rice and cotton. This will enable water to be used in South Australia for both higher-value production and for environmental purposes.

Infrastructure will play an important role in water supply for expansion of these sectors. In some cases water may be harvested in a locality adjacent to the point of use, but in others the water may require storage or transport over some distance. Depending on the quality of storage or water required for its intended end use, pre-treatment of the raw water may be required to make it suitable. Finally, drainage management strategies for the actual use of any water will be required to be consistent with the theme of long-term sustainable use, particularly in an irrigation setting. All may require investment in new infrastructure during the planning period.

### Strategic Priorities

- Through the National Water Initiative, ensure that barriers to water trade in the Murray-Darling Basin are progressively removed.
- Assess the feasibility of aquifer storage and recovery to support reuse.

### Stormwater

Local government has responsibility for managing drainage and flood-related stormwater. The State Government provides subsidy funding for any necessary works where the catchment area exceeds 40 hectares. The nature and extent of works required are normally determined by studies on the catchment concerned, the recommendations of which have to be agreed to by both the council(s) concerned and the State Government.

State and local government have identified significant works needed to manage flooding risks from stormwater in some parts of the Adelaide metropolitan area and other areas in the state. The State Government is working with local government to develop more appropriate policies and governance arrangements for the management of stormwater, particularly where stormwater issues cross council boundaries.

Increasingly, appropriate management of stormwater is seen as an opportunity to improve amenity in new land developments through the creation of water features and water sensitive urban design (WSUD) and where the topographical features permit, to encourage the economic harvesting of the stormwater for public parks watering,

recycling within the development for non-drinkable domestic use or as a source of water for industrial purposes. Harvesting of stormwater from existing developed areas is also possible but is normally only viable on a larger scale where there is land available (for cleansing purposes) and significant demand for non-drinkable water. Where these outcomes can be economically achieved they should be encouraged.

The potential for stormwater flows to be captured in basins, allowing settlement of pollutant load for treatment in natural eco-systems, is limited by the land area required and the historic design of stormwater discharge systems. This is particularly so in the older suburbs. In some catchments, it may be possible to replicate this treatment system through use of parklands, the land adjacent the Adelaide Airport (subject to the satisfactory management of birds) and in the lower reaches of the River Torrens. Opportunities for each stormwater catchment need to be well researched; some work has been done on these locations.

The flooding of the Glenelg North area and the fish kill in the Patawalonga Lake demonstrate the need for improvements to be made to the Patawalonga system. The government believes the most significant gains will be made by improving the management of stormwater throughout the catchment, from Heathfield in the east to Glenelg in the west. While of lesser magnitude, improvements can also be made through the enhancement of infrastructure at the tail end of the system.

CSIRO climate change projections predict less total rainfall, but more intense storm rainfall for southern Australia in the future. This implies less yield but higher peak flows in stormwater systems in the future, particularly in northern areas of the state.

### Strategic Priorities

- Continue to support the program of comprehensive floodplain mapping along the natural watercourses that transverse the Adelaide metropolitan area and other significant towns in the state.
- Determine appropriate flood management standards, based on the results of comprehensive floodplain mapping and appropriate mitigation studies where the costs and benefits (damage avoided) are adequately calculated.
- The State Government, working closely with local government, is to prioritise a future work program including accounting for emerging trends of urban consolidation, and achieving improved quality of stormwater discharged to the environment supported by appropriate harvesting of stormwater flows for urban amenity or beneficial reuse, where economically feasible.

**Effluent Disposal**

In most densely populated areas of the state, sewage collection is operated by SA Water (linked to treatment of the waste stream), licensed by the Environment Protection Authority (EPA).

In recent years SA Water has undertaken a \$240 million program to upgrade the major wastewater treatment plants in order to reduce the environmental impact from discharges of treated effluent to the marine environment. Further investment is planned over the next five years to complete this work and for other environmental improvements to the plants and to commence a program to reduce wastewater overflows.

Smaller population centres, typically non-metropolitan, rely on either a stand-alone septic tank or a local government operated Septic Tank Effluent Disposal Scheme (STEDS) with a centralised water treatment pond.

**Strategic Priorities**

- Support joint State/local government action to advise on reform of STEDS, including the methodology for establishing STEDS works priorities, funding options and innovative management arrangements to improve the performance of STEDS.
- Examine further cost-effective opportunities to reuse wastewater and reduce the impact of coastal sewage treatment plants on adjacent environments.

**Desalination**

While South Australia has limited freshwater resources, it does have an extensive coastline and significant saline groundwater resources. The issue is quality of the available water and its suitability for its intended use.

Opportunities may exist, as technology develops, to construct additional desalination plants strategically around the state. These could be developed to treat water sourced from river systems, groundwater or coastal environments, where desalination represents an appropriate water augmentation option.

**Strategic Priority**

- Support further developments in desalination plants where economically feasible.

**Water Infrastructure and Population Change**

In the context of historical changes to the spatial distribution and make-up of the current population and the state objective of increasing the population, there are potential implications for the way water resources and delivery systems are managed.

In some areas of the state the constructed water (and sewerage) systems are likely to be under-utilised relative to their design capacity, due to declining populations.

Within metropolitan Adelaide, areas of urban consolidation have already occurred and the water (and sewerage) systems have generally been able to deal with this. On the water side, urban consolidation has meant smaller garden areas (traditionally a significant user of water), so more houses can be accommodated within a given water system. On the sewerage side, the trend to smaller average households has meant that although there may be denser housing development, total population has not significantly changed, which is the determinant of sewerage flow. Hence existing sewage systems have also been able to generally cope with denser development.

Urban consolidation, however, has increased the peaks of stormwater events due to denser development patterns and hence roof areas from which stormwater is rapidly discharged. It is likely that pressure for urban consolidation will increase to maintain affordable housing standards. The capacity of existing wastewater infrastructure to accommodate further urban consolidation will be monitored.

As the existing SA Water infrastructure ages there will be a need for increasing investment in asset replacement and refurbishment. In line with this SA Water is undertaking work to improve safety at its dams

There is also now an increased awareness of the importance of the security of South Australia's infrastructure assets. SA Water's forward plans include enhancements to the security of critical water and wastewater assets.

## Projects

| Project  | Priority # | 2005/6–<br>2009/10 | 2010/11–<br>2014/15 | SASP<br>Targets |
|--|------------|--------------------|---------------------|-----------------|
| Continue to implement the MDBC infrastructure program including along the River Murray for example: <ul style="list-style-type: none"> <li>■ sand dredging of the Murray Mouth</li> <li>■ operational improvement in the Murray Mouth barrages</li> <li>■ salt interception scheme construction</li> </ul> <b>* Lead – State Government</b>  | U/way      | *                  | *                   | 3.1<br>5.11     |
| Continue to enhance water management throughout the Patawalonga catchment – ‘the Pat fights back’<br><b>Lead – State Government</b>  | U/way      | *                  |                     | 1.16<br>2.1     |
| Evaluate options, to augment water supplies in regional and remote areas<br><b>Lead – State Government, private sector</b>   | U/way      | *                  | *                   | 1.16<br>5.11    |
| Consider economic opportunities for further reuse of treated wastewater from Bolivar, Glenelg, Christies Beach and other wastewater treatment plants<br><b>Lead – State Government</b>   | U/way      | *                  | *                   | 1.16<br>3.1     |
| Implement key priorities identified in Water Proofing Adelaide<br><b>Lead – State Government</b>   | 1          | *                  | *                   | 1.16            |
| Prioritise and implement high priority works arising out of the Urban Stormwater Initiative (which includes the Metropolitan Adelaide Stormwater Management Study)<br><b>Lead – State Government, local government</b>   | 1          | *                  | *                   | 1.16<br>5.7     |
| Develop water supply options to support mining developments in remote areas and implement preferred options<br><b>Lead – private sector</b>  | 1          | *                  | *                   | 1.12            |
| Implement priority regional STEDS upgrades<br><b>Lead – local government</b>   | 1          | *                  | *                   | 5.11            |
| Improve and extend water and sewerage services including: <ul style="list-style-type: none"> <li>■ water quality improvement initiatives</li> <li>■ augmentation of the sewerage program in the Adelaide Hills</li> <li>■ augmentation of the Eyre Peninsula water supply</li> <li>■ capacity upgrades to various wastewater treatment plants</li> <li>■ network upgrades, extensions and connection</li> </ul> <b>Lead – State Government</b> | 2          | *                  | *                   | 1.16<br>5.11    |

\* Lead – lead responsibility for promoting, developing and evaluating the project.

# Priority – preliminary rankings. Priority numbers do not represent a final commitment by the State Government or other lead entities. See the Delivering the Plan section for further details.