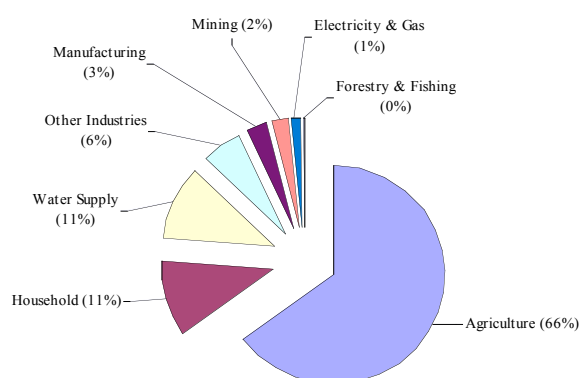


## Urban Water Supply and Use

Water scarcity is a serious issue facing Australia's major cities. Planning for our water future is a necessary, and in many cases urgent, task. A Morgan poll from February 2006 found that 68 per cent of Australians believed that governments are not doing enough about water conservation. Australian Bureau of Statistics figures show that 82 per cent of households now use some sort of water conservation device in their home.

Australia's water resources are most plentiful in areas where population is sparse. The regions north of the Tropic of Capricorn and Tasmania receive in excess of 50 per cent of the nation's divertible water resources, but contain a small proportion of the population. By comparison, approximately 65 per cent of the nation's population live in the coastal regions of Victoria, New South Wales and Queensland, an aggregate area which receives 23 per cent of the nation's divertible water resources. Climate change will aggravate water shortages in major population centres as drought increases in duration and frequency.



**Figure 1: Australian water use 2004-05.**

(Source: ABS Water Account, 2004-2005; <http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4610.02004-05?OpenDocument>, accessed on 16 March 2007).

In 2004-05, Australians consumed more than 18,767 gigalitres (GL) of water each year: 12,191 GL (65 per cent) for irrigation; 2,108 GL (11 per cent) for households; 2,083 GL (11 per cent) for water supply industry; 589 GL (3 per

cent) for manufacturing; 413 GL (2 per cent) for mining; and 271 GL (1 per cent) for electricity and gas. This is a 14 per cent reduction from 2000-01 largely due to drought. Figure 1 provides an illustration of typical water use by specified sector for the year 2004-05.

### Household water use in Australia

In 2004-05, households used 11 per cent of water in Australia, a decrease of 8 per cent from 2000-01. The majority of households receive their water from mains supply and a growing number from rainwater tanks. Ninety-three per cent of Australians have access to a reticulated water supply and 90 per cent have a connection to reticulated sewage. Household water use in 2004-05 was:

- New South Wales: 573 GL
- Queensland: 493 GL
- Victoria: 405 GL
- Western Australia: 362 GL
- South Australia: 144 GL
- Tasmania: 69 GL
- Northern Territory: 31 GL
- Australian Capital Territory: 31 GL

In March 2004, approximately 17 per cent of households sourced their water from rainwater tanks (9 per cent in capital cities and 31 per cent of all other households). South Australia has the biggest percentage of rainwater tanks (48 per cent); followed by Tasmania (20 per cent); Queensland (17 per cent); Victoria (16 per cent); New South Wales (13 per cent); Western Australia (12 per cent); Northern Territory (5 per cent) and ACT (3 per cent). A large proportion of household water is used for purposes other than human consumption such as watering gardens, washing cars, and other household activities. Outdoor water use is the major form of water use in households.

Over the last twenty years urban water consumption has increased overall while decreasing per person. In 2004-05, for example, Australian householders used an average of 103 kilolitres (one kilolitre = 1,000 litres) per person, compared to 120 kilolitres per person in 2000-01. This has been achieved through water pricing reforms, education programs, and technological changes such as water efficient washing machines and dual flush toilets. The reduction in per capita water use has allowed the populations of the major urban areas to increase without the need for new water storages.

## Water supply and management options

Integrated Catchment Management can be used to ensure that water supply and water demand is managed sustainably within an urban water catchment. Demand management means reducing the amount of water needed to perform the same functions, for example improving the water efficiency of taps and showers or changing the water use habits of people.

Supply management means increasing the supply of water. This can be done in a variety of ways. Harvesting rain water, stormwater, and recycling household water for uses such as toilet flushing or watering the garden are ways of replacing drinking water supply from catchments. These options have potential to reduce water use by 50 per cent without loss of quality of life. Neighbourhood and regional scale recycling plants can also provide an alternative supply of water. Other options include dams and desalination plants. Dams, however, affect natural river ecosystems and do not solve the problem of future changes in rainfall patterns. Desalination plants (removing salts from sea water) are energy intensive and, unless they are powered by renewable energy, will contribute to climate change and thus to further urban water shortage.

## Water supply and management in Australia's major cities

The situation in each of Australia's capital cities is as follows:

- Sydney: Rainfall in the Sydney region is higher in volume but less frequent than in other metropolitan areas. Sydney stores more water per head of population in massive storage dams than many other cities in the world. Currently the eleven dams are below capacity with 61.1 per

cent of water available (at 11th June 2009). To reduce the pressure on Sydney's storage capacity, the 2004 and 2006 Metropolitan Water Plan includes recycling and conservation strategies with plans to increase the volume of recycled water and to build new pumps to reach deep water in the dams. Sydney currently recycles 15 billion litres of treated wastewater each year. Sydney Water is building a desalination plant at Kurnell, powered by renewable energy, which will supply 250 million litres of drinking water a day. While drought has affected Sydney for several years, in the last year it has experienced significant rainfall.

- Melbourne: Most of Melbourne's drinking water comes from pristine Mountain Ash forests in the Yarra Ranges that have been closed to public access for almost 100 years. Melbourne is currently experiencing its tenth consecutive drought (2008). In 2004, the Victorian Government unveiled a comprehensive plan with 110 water saving initiatives to secure water supplies in the future. In 2005, Permanent Water Saving Rules were introduced with penalties for non-compliance (e.g. restrictions on manual watering). Melbourne's water storages have a total capacity of 1,773 gegalitres and are currently at 25.9 per cent full (at 14th June 2009).
- The catastrophic floods of February 2009 ended what had been the worst drought in the last 100 years in Brisbane. The combined regional water supply from dams is currently 74.5 per cent (at 14th June 2009), and Brisbane is under medium level water restrictions. The Brisbane City Council is investigating alternative water supply options such as desalination and the use of recycled water.
- Adelaide: Adelaide extracts water from two sources – the River Murray and the Mt Lofty Ranges catchment within the Adelaide Hills. In drought years the Murray provides up to 90 per cent of urban water in South Australia. It is projected that water demand in the city will exceed supply within 20 years. High salinity levels in water drawn from the Murray are a significant problem. The South Australian Government's strategy has three key goals: (1) to better manage existing resources; (2) to encourage responsible water use; and (3) to develop additional water supplies. The strategy aims to ensure a security of supply of high quality water until 2025 and beyond.

**Table 1: Current and future water use for Australian capital cities.**

	Population	Available water	Consumption	Total
<b>Current</b>	12.8 million	2,175 (GL)	2,063 (GL)	+ 111 (GL)
<b>Future (2030)</b>	17.3 million	1,631 (GL)	2,811 (GL)	- 1,180 (GL)

(Source: WSAA Position Paper No. 01, October 2005).

- **Perth:** Perth's water comes from two major sources: surface water from storage reservoirs on rivers in the Darling Range, and groundwater pumped from huge natural reservoirs. In the past eight years, average stream flows in Perth have been 64 per cent down from flows prior to 1974. Perth's dams are currently 28.1 per cent full (at 11th June 2009). In 2006, the Perth Sea-water Desalination Plant in Kwinana was commissioned to supply Perth 17 per cent of its water needs (at a cost of \$387 million with an annual running cost of just less than \$20 million). It is the first plant in the world to use electricity generated from a wind farm to avoid the use of fossil fuels and their climate change impacts.

Table 1 above illustrates how the water requirements of the capital cities may change over the next twenty five years. The table shows available water reduced by 25 per cent to account for climate change. Consumption by 2030 is based on per capita usage in 2004. New and alternative sources of water combined with water efficiency measures will be needed to overcome the projected deficit of 1,180 giganlitres in 2030.

## National policy

In 2004, the Council of Australian Governments (COAG) agreed on the National Water Initiative as a national blueprint for water reform. The Initiative includes objectives to improve water planning and over-allocated water systems, and to develop better and more efficient water management in urban areas. In the same year, the National Water Commission was established under the National Water Commission Act 2004 as an independent statutory body to drive the national water reform agenda. In 2006, a National Water Summit was held to discuss means of dealing with the drought and the over-extraction of water from Australian rivers. The Summit ordered emergency work to protect urban water supplies. In March 2008, Prime Minister Kevin Rudd announced that the states had

agreed to establish a new basin-wide plan for the Murray-Darling Basin. Under the plan, the Australian Government will have the power to set a new sustainable cap on water extraction. In addition, the Government announced a commitment of \$50 million to purchase water entitlements in the basin, which will help reduce the extent of overuse of water, allowing more water to flow to the environment. These measures, although a preliminary step only, are of vital importance for the protection of Adelaide's water supply.

The Australian Government Water Fund is a \$2 billion program to invest in water infrastructure, improved water management and better practices in the stewardship of Australia's scarce water resources. The Fund has three programs: Raising National Water Standards; Water Smart Australia Programme; and the Community Water Grants Programme. The Water Efficiency Labelling Scheme aims to decrease water consumption through labelling all showerheads, washing machines, toilets, dishwashers, urinals and some types of taps according to water efficiency.

## Useful Sources

Australian Bureau of Statistics, (2006). *Water Account for Australia 2004-05*,

<http://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/4610.02004-05?OpenDocument>

This ABS publication, released in November 2006, provides the latest information on water supply and use in Australia for 2004-05.

National Land and Water Resources Audit 1997-2002.

<http://nlwra.gov.au/>

The Audit was established in 1997 to provide assessments of the effectiveness of land and water degradation policies and programs. The reports from the audit are available on this site. For an overview of water resources in Australia, see [http://audit.ea.gov.au/ANRA/atlas\\_home.cfm](http://audit.ea.gov.au/ANRA/atlas_home.cfm)

# T H E A U S T R A L I A N C O L L A B O R A T I O N

Australia State of the Environment (SOE) Report (2006),  
“Human Settlements”,  
[http://www.environment.gov.au/soe/2006/publications/  
report/pubs/soe-2006-report-chapters-1-3.pdf](http://www.environment.gov.au/soe/2006/publications/report/pubs/soe-2006-report-chapters-1-3.pdf)

The latest SOE report documents serious issues facing  
major Australian cities, including issues relating to the  
management of urban water resources.

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