Victorian Government White Paper

Securing Our Water Future Together

Our Water Our Future
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These actions will help us improve water management from the moment rain falls in our catchments, enters aquifers and rivers, and moves to homes, farms and business, to the recycling plant.
Australia is the driest inhabited continent in the world and yet, per capita, we are among the highest users of water in the world. As a nation we are facing one of the biggest challenges of our time: to maintain and sustain water supplies for tomorrow’s Australia.

In Victoria, water is at the top of our agenda.

Victoria has established a $320 million Victorian Water Trust to rebuild our irrigation systems, revive our waterways and make our water systems more efficient. We have also introduced groundbreaking water saving legislation to become the first State in Australia to ensure water saving measures are integrated into all new homes.

In recent years Victoria has become a state of water savers as homes, businesses and farmers rise to meet the challenge of a dwindling water supply.

Victoria continues to lead the nation in sustainable water management.

Victoria is acting on the agreement it secured with the Commonwealth and New South Wales Governments to return flows to the iconic Snowy River. Future generations will be able to enjoy the beauty of one of the country’s most famous rivers.

The River Murray is the nation’s next challenge. Victoria will continue to be a driving force in deliberations at the Council of Australian Governments and interstate forums, such as the Murray-Darling Basin Ministerial Council to ensure the health of the River Murray is improved.

There are more challenges ahead.

Business, agriculture and exports are growing and need secure supplies of water. Victoria’s population is growing too. By 2030, Melbourne alone will accommodate more than one million additional people and regional Victoria another 350,000.

As a Government we are preparing for this population increase and growing our economy, while protecting our unique environment, recognising that a healthy water supply is pivotal to our future.

The White Paper – Securing Our Water Future Together – represents one of the most innovative, integrated water strategies in Australia, indeed the world. The strategies in the White Paper, summarised here, have been formed in consultation with all sectors of the Victorian community. These actions will help us improve water management from the moment rain falls in our catchments, enters aquifers and rivers, and moves to homes, farms and business, to the recycling plant.

The strategies will ensure that we all play our part in securing our water future together, as we grow as a State.

Together we will continue to be diligent in our management of water so that we can continue to enjoy the vital benefits it brings.

Steve Bracks
Premier of Victoria
Victorians should be proud of what we have achieved so far in conserving our most precious resource. We will now continue to secure our water future, together.
Over recent years it has become increasingly clear that our current water use is not sustainable. Our rainfall is becoming less reliable and, as we experience our eighth year of drought, Victorians understand that we need to change the way we use and value water so we protect our supplies for future generations.

Victorian communities have responded quickly to our water challenges and have made many water savings through smarter, more efficient water use in homes, farms and businesses.

As part of the ongoing process to address our wider water challenges, last year the Bracks Government released a discussion paper – Securing Our Water Future – outlining more than 80 proposals to reform the way we use and manage our water.

Victorian communities, organisations and individuals have come to the table giving their views and ideas as to how we should shape our water future. After months of consultation, more than 60 meetings across the State and 670 submissions, we are ready to take the next step, together.

Water is essential to our everyday lives: we use it for drinking, washing and watering – the very basic human needs. Our communities thrive on it, our economy relies on it and our environment survives on it.

The White Paper – Securing Our Water Future Together – is a comprehensive, integrated approach to using our water wisely to ensure that Victoria can continue to have healthy water resources to support growing communities and a thriving economy over the next 50 years:

- We will support smarter urban water use across Victoria with a range of initiatives including education and incentive programs, regulations and legislation, and smarter water pricing to reduce demand and increase recycling.
- We will ensure that our water management provides security for agriculture and other businesses that rely on water with reliable, secure entitlements, the flexibility and option to trade water for financial return and investment into more efficient irrigation systems and on-farm water use.
- We will also put water back into our waterways. Rivers and groundwater are the lifeblood of our economy and underpin our communities, economy and environment. By recognising environmental water rights we will in turn secure the long-term health of our irrigation industry and tourism and recreation activities.

Victorians should be proud of what we have achieved so far in conserving our most precious resource. We will now continue to secure our water future, together.

John Thwaites
Minister for Water
Chapter One:

Water supports our everyday lives – at home, at work or play, water is fundamental to our way of life.
A Secure Water Future for Victoria

1. Key Challenges
   >> Secure, reliable water supplies for our homes, our farms and industry while meeting the needs of the environment.
   >> Sustainable water management.

2. Fundamental Principles for Water Management in Victoria
   >> The management of water will be based on an understanding that a healthy economy and society is dependent on a healthy environment.
   >> The Government will maintain overall stewardship of all water resources irrespective of source, on behalf of all Victorians.
   >> Water authorities will be retained in public ownership.
   >> Users of the services our water systems provide should, wherever practical, pay the full cost, including infrastructure, delivery and environmental costs associated with that service.
   >> The water sector, charged with managing our water systems, will be capable, innovative and accountable to the Victorian community.

3. Sustainable Outcomes
   >> Reliable and safe urban water and sewerage services as demanded by customers.
   >> A high value, low impact irrigation industry supported by robust rural and regional communities.
   >> Healthy rivers, aquifers, floodplains, estuaries and catchments capable of delivering a wide range of water services.
   >> Communities that truly appreciate all the services water provides, that are able to make considered choices about how those services are delivered.
   >> Communities that have a stronger ethic of water conservation.
   >> A water sector with increased efficiency and accountability, delivering diverse water services in an innovative way.
Introduction

Sustainable water resources are vital to Victoria’s long-term prosperity.

Not only is water necessary for drinking, it is essential to the health of our natural environment, which supports everything we do.

Water supports the State’s economy. Our agricultural, manufacturing, tourism and mining industries, all depend on secure water resources.

Water also supports our everyday lives – at home, at work or play, water is fundamental to our way of life.

Water holds great cultural value and is important to many groups in society, particularly indigenous communities. Rivers are an important part of the cultural heritage of Aboriginal people. Many waterways have traditional stories relating to their creation and other related natural features which form part of the tradition of Aboriginal people.

Despite the importance of water to a healthy future, we have not valued water in the past as the precious resource it is.

Victoria is in its eighth year of drought and many towns across the State are on water restrictions. The low water levels in our reservoirs are a striking indicator of the dry times we are experiencing. Lake Eildon’s water levels over the past eight years demonstrate how it has struggled to support the water needs of irrigators, and the recreation and tourism industry, so important to the local economy.

Figure 1.1 Lake Eildon viewed from right abutment: mid-October 2000 (42% capacity)

Photo courtesy of Goulburn Murray Water.

Figure 1.2 Old dam wall emerging from Lake Eildon viewed from right abutment: June 2003 (8.9% capacity)

Photo courtesy of Goulburn Murray Water.
In the future, Victoria is projected to get drier. Climate change is predicted to create more hot days, more dry days and more storms. This compounds our need to be smarter with available water supplies. In the Murray-Darling Basin, annual temperatures are projected to increase by up to two degrees by 2030 and up to six degrees by 2070.

Up to five per cent (1,100 billion litres) less water is estimated to flow into the Murray-Darling system by 2023.

Figure 1.3 Projected rainfall and temperature changes in the Murray-Darling Basin

In addition, Victoria can expect demand for water to grow over coming years. Melbourne’s population is expected to grow by more than one million people by 2030, and regional Victoria’s is set to grow by another 350,000 people.

Melburnians’ rate and pattern of consumption is also a driver for change. If Melburnians continue to use water in the future at the same rate and in the same way as they have in the 1990s, the city may approach its supply limits within 15 years.

The State’s rivers – the lifeblood of Victoria – are under strain. One third of Victoria’s major streams and two thirds of wetlands are in poor or very poor condition. Nearly half of its major estuaries have been damaged.

The poor health of our rivers has contributed to significant losses in the fish, birds and other animals and plants that depend on water. These issues are also a concern from a cultural heritage management perspective.

These facts overwhelmingly indicate that we must act swiftly to change the way we consume, manage and allocate water resources, to ensure a sustainable future for the environment, economy and society.
CHAPTER ONE – A SECURE WATER FUTURE FOR VICTORIA

Meeting the Challenge

Recognising the challenge, the Government announced a 10-year plan in 2002 to invest in a secure water future for Victoria. The plan is backed by a $320 million Victorian Water Trust. The $320 million Victorian Water Trust provides a secure source of funding for Victoria’s precious water resources over the next ten years and will help address the need for innovative approaches to sustainable water resource management in Victoria. The Trust is to provide seed investment and seeks leverage investment from other sources.

In April 2003, the Minister for Water, John Thwaites delivered a ‘Ministerial Statement on Water’ in Parliament, which set out the key tenets of the Government’s vision for improving the way we manage our water resources.

This was followed by the release of the ‘Securing Our Water Future’ Green Paper for Discussion in 2003, which outlined over 80 proposals for better water management.

Victorians showed strong interest in the discussion, with many hundreds of people turning out at the dozens of information sessions held across the State. Feedback also came in the form of submissions, with over 670 received from a variety of authorities, community organisations, industry groups and individuals.¹

An Expert Advisory Task Force, chaired by Professor Bill Russell, and including Professor Barry Hart, Stephen Mills and Rowan Tuckfield, played a key role throughout the public consultation process, in analysing the submissions received and providing advice to the Government.

The public feedback and advice significantly shaped the direction and detail of the water reform package outlined in this document. The overwhelming response of Victorians has reinforced the Government’s commitment to reform outdated water policies and achieve a robust water management system to secure Victoria’s water future.

The reform package also forms an important step for a continued dialogue with indigenous communities of Victoria regarding water resources. The Government will continue to engage the knowledge and perspective of indigenous Victorians on land and resource management through its Indigenous Partnerships Strategy.

Our traditional approach to managing water has been to exploit rivers and aquifers, create dams to supply towns, industry and irrigation, and then dispose of the ‘waste water’ back into rivers or the ocean. This is not sustainable.

The Government has already committed $160 million to ten projects:

- Water Smart Gardens and Home Rebate – $10 million over four years;
- Water Smart Farms – $10 million over four years;
- Healthy Rivers – $16 million over four years;
- Research into Water Conservation and Water Recycling – $2 million over two years commencing 2004-05;
- Water Conservation Assistance Pilot Program – $2 million over two years;
- Country Town Water Supply and Sewerage – $30 million;
- Vision for the Werribee Plains – $10 million;
- Gippsland Lakes and Macalister River – $20 million;
- River Murray Sunraysia/Mildura – $20 million; and
- Goulburn/Broken Rivers – $40 million.

¹ All public submissions can be viewed at www.dse.vic.gov.au/water.
A Pathway to Sustainable Water Management

The White Paper sets out an action plan to secure Victoria’s water future over the next 50 years.

The Victorian Government is aiming to achieve the sustainable management of water, but this will mean everyone changing their water behaviour.

We need to immediately change the way we think about water. Our traditional approach to managing water has been to exploit rivers and aquifers, create dams to supply towns, industry and irrigation, and then dispose of the ‘waste water’ back into rivers or the ocean. This is not sustainable.

Securing Our Water Future Together aims to change this view through the following consistent themes:

We can’t create more water – we need to use it more wisely

We can’t expect more rain to fall, and we can’t generate more water by building dams, so water efficiency, conservation and reuse are necessary key actions.

All water resources are valuable

The water cycle is not limited to converting rainwater into drinking water. We can put water to better use by recycling and reusing it. We can also capture the potential of stormwater to ease the pressure on our rivers.

Our prosperity relies on the health of our environment

Water is critical to the environment and also supports many activities associated with our lives. Therefore, the environment needs its own allocation of water.

Water is a precious resource and its value needs to be properly reflected

The price we place on water influences how we use it. Prices need to reflect the cost of providing sustainable water services. This will increase awareness and contribute to water conservation, reliable supplies and efficient services.

Through the framework laid out in the White Paper, the Government aims to achieve the sustainable management of water, to allow all the benefits of water to be enjoyed today, while protecting the needs of future generations. Sustainable water management will mean:

- reliable and safe urban water and sewerage services as demanded by customers;
- a high value, low impact irrigation industry supported by robust rural and regional communities;
- healthy rivers, aquifers, floodplains, estuaries and catchments capable of delivering a wide range of water services;
- communities that truly appreciate all the services water provides, that are able to make considered choices about how those services are delivered;
- communities that have a stronger ethic of water conservation; and
- a water sector with increased efficiency and accountability, delivering diverse water services in an innovative way.
The following five fundamental principles for sustainable water management have been developed to spell out the framework for this White Paper.

**Fundamental principles for water management in Victoria**

1. The management of water will be based on an understanding that a healthy economy and society is dependent on a healthy environment.
2. The Government will maintain overall stewardship of all water resources irrespective of source, on behalf of all Victorians.
3. Water authorities will be retained in public ownership.
4. Users of the services our water systems provide should, wherever practical, pay the full cost, including infrastructure, delivery and environmental costs associated with that service.
5. The water sector, charged with managing our water systems, will be capable, innovative and accountable to the Victorian community.

**Pricing for sustainability**

The price of water is a critical part of this water reform package that affects all Victorians.

It is generally recognised that water is too cheap and this supports wasteful uses of water.

From 1 October 2004, the Government will introduce ‘rising block tariffs’ for domestic customers in Melbourne – a tiered pricing system that rewards water conservation and discourages excessive use.

Regional urban authorities will adopt pricing structures that provide incentives for water conservation by 1 July 2005.

From 1 October 2004, water authorities will be required to contribute funding towards water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use. (Further details of the reforms can be found in Chapter 6.)

In the first four-year period, about $225 million will be provided from water authorities to the Government to directly fund water-related initiatives. This is likely to result in an average five per cent price rise for urban water users and two per cent for rural water users (in recognition of the drought and irrigators’ role in working toward better environmental outcomes).

The maximum concession will be raised from $135 to $146 from 1 October 2004 and to $150 from 1 July 2005, and will then be indexed for inflation, annually. (Further details of the reforms can be found in Chapter 6.)

**Investing in a secure water future**

All of the $225 million raised will be used for funding water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use.

Priority programs to be funded from initial contributions will include:

- delivering our national commitments to the River Murray;
- protecting and repairing our rivers and aquifers;
- investing in smart urban water projects and recycling programs;
- sustainable irrigation practices; and
- ensuring water security for cities and towns, environment and industry.

**Future legislative program**

A broad legislative change program will be developed by the Government to support the implementation of the wide-ranging reforms in the White Paper.
National water reform

The management of water is a State responsibility. The Victorian Government, along with other State and Territory Governments, recognises the need to increase the productivity and efficiency of water use and ensure the health of river and ground water systems. Victoria is actively contributing with other States and Territories and the Australian Government, to develop and implement a National Water Initiative to:

- improve the security of water access entitlements;
- ensure ecosystem health;
- ensure water is put to best use by encouraging the expansion of water markets; and
- encourage water conservation in our cities.

By committing to the policies in this White Paper, Victoria is taking the lead towards achieving many of the objectives of the National Water Initiative.

Victoria shares water resources with bordering States, and as such our sustainable water management will generate shared benefits. The Murray-Darling Basin surrounding the iconic River Murray is the food-bowl of the nation. Victoria, South Australia, the Australian Capital Territory and New South Wales share the water in the River Murray. Victoria is committed to the work of the MDB Ministerial Council to properly manage the water resources, and the environment and the communities they sustain. The Victorian Government is taking the lead to restore the health of the River Murray, and its actions to deliver this are outlined later in Chapter 3.

The structure of the White Paper

This White Paper Securing our Water Future Together is structured around seven chapters covering the following policy themes:

**Chapter 1 – A Secure Water Future for Victoria**

**Chapter 2 – Water Resources and Their Allocation**

**Chapter 3 – Restoring Our Rivers and Aquifers for Future Generations**

**Chapter 4 – Smarter Use of Irrigation Water**

**Chapter 5 – Smarter Water Use in Our Cities and Towns**

**Chapter 6 – Pricing for Sustainability**

**Chapter 7 – An Innovative and Accountable Water Sector**

Read on to find out how Victoria can deliver a more efficient, secure and sustainable water system.
Chapter Two:

The Government manages the allocation of water resources across Victoria. In doing this it needs to find the right balance between its economic, environmental and social values.
Water Resources and Their Allocation

1. Key Challenges
   >> To develop a water allocation system that recognises all water services and balances the needs of the environment with the needs of water users.
   >> To restore and protect the health of Victorian rivers.
   >> To facilitate future economic growth.

2. Government Initiatives
   >> Bring all the State’s water resources under a sustainable water allocation regime.
   >> Create Environmental Water Reserves for surface water and groundwater.
   >> Deliver programs for sustainable water management, including completion of bulk entitlement conversions, establishment of sustainable diversion limits and permissible annual volumes for groundwater and caps in fully-allocated catchments.
   >> Only allocate further entitlements within sustainable limits and through public processes.
   >> Improve monitoring and compliance with entitlements including metering all significant extractions.
   >> Establish a public register of entitlements and regularly report.
   >> Establish Sustainable Water Strategies for long-term State and regional planning.
   >> Manage future risks from climate change, bushfires and forestry.

3. Sustainable Outcomes
   >> Improved efficiency in managing Victoria’s urban and irrigation supplies and use for continued economic and population growth.
   >> Protection and improvements to environmental health and security of entitlements through the establishment of an Environmental Water Reserve.
   >> Firm reliable water entitlements for water authorities and users.
   >> Improved accountability that ensures water users operate within their entitlements.
   >> Allocation system for new entitlements to best maximise the community benefit.
   >> Capacity to anticipate and manage risks to our water resources.
Our water system provides a wide range of services for all Victorians.

It delivers economic value by allocating water to towns, irrigation, agriculture and industry, while healthy rivers and aquifers provide environmental, cultural and recreational value.

The Government manages the allocation of water resources across Victoria. In doing this it needs to find the right balance between its economic, environmental and social values.

Failure of the water allocation system to provide this balance would lead to a decrease in security of supply of water for cities and towns, further degradation of rivers and aquifers, increased costs to consumers, higher competition for water and potential loss of productivity and income for the State.

The reforms set out in this chapter will improve Victoria’s water allocation system by:

- developing a comprehensive allocation system across all types of water;
- allocating a share of the water resource to the environment;
- planning for the future with Sustainable Water Strategies (SWSs);
- providing clarity in the ability to vary water entitlements; and
- managing future risks to the total water supply for Victoria.

The Government considers that the reforms set out in this chapter are of national importance and should be recognised as a major contribution to the National Water Initiative.

**Policy**

The Government will work to strike the right balance between allocating water for consumption, the environment and other non-consumptive uses.
The Great Dividing Range, which normally receives 900 millimetres or more of rain, divides Victoria in two. On the inland side, the rivers flow into the River Murray, which meanders north-west through increasingly arid country. On the coastal side, there are many separate rivers running directly into the sea.

Most of the rainfall is taken up by plants or evaporates. Just 16 per cent, or about 23,000 gigalitres a year on average, flows into our streams, and another one per cent, or 1,500 gigalitres, filters through to recharge groundwater aquifers.

About a third of the stream flow (6,600 gigalitres) and a half of the groundwater recharge (850 gigalitres) is extracted for community use – for irrigation, for domestic use, for industry and for other urban purposes.

Our annual rainfall and stream flow are markedly more variable than Northern America and Europe. Both extreme flood years and long periods of drought are established experiences across Victoria.

**Figure 2.1**

**Consumptive uses of water in Victoria, 1996-1997**

- 77% Irrigation
- 8% Melbourne
- 9% Regional urban
- 6% Rural domestic and stock

Victoria leads the nation in water management, primarily through its progressive water allocation and entitlement system.

The Government will build on this to continue to foster and attract the high value investment that results from our secure and reliable water allocation system.

The key strengths of Victoria’s current water allocation framework include:

- relatively reliable entitlements. Care is taken to ensure that the volume of entitlements granted relates to the available water. Each season, water is kept in reserve to ensure entitlements can be met in the following season. The granting of any extra ‘sales’ water by the Government depends on first securing entitlements. As a result, entitlements on major systems are fully met in nearly every year. Reliable supplies of water support investment in high value enterprises such as dairy, vines and fruit trees;
- the allocation system can adapt to changing conditions and emerging requirements. In effect, entitlements are shares of the available resource, so in a drought there is an understanding that less water is available; and
- overriding powers in the Water Act 1989 allow entitlements to be reduced.

Although the system has strengths there is room for improvement, particularly in addressing:

- the legacy of over-allocation. Too much water is now being taken out of many of our rivers and aquifers;
- the lack of safeguards to ensure that we do not over-allocate in the future;
- the lack of clear protection and responsibility for environmental allocations;
- effective management of emerging risks to future inflows and river health; and
- the system does not cover all water resources, such as recycled water and stormwater, leading to the sub-optimal management of the total resource.

Creating a new sustainable framework

A new, sustainable water allocation framework will be built on the understanding of the interdependency between the services water provides and the environmental condition of our water resources.

The new framework is guided by the following policy principles:

**Principles for sustainable water allocation**

- The Government will be responsible for:
  - the sustainable management of the State’s water resources;
  - the allocation of water resources for irrigation, urban use, the environment and for all other purposes; and
  - establishing and maintaining the integrity of the State’s water allocation system.
- The State’s water allocation system will encompass all water resources, including surface water, groundwater, recycled water and stormwater.
- Water will be set aside in an Environmental Water Reserve (EWR) that will:
  - maintain the environmental values of the water system and the other water services that depend on environmental condition;
  - sustain biodiversity, ecological functioning and water quality; and
  - have legal status and be held by the Crown.
- In establishing the initial Environmental Water Reserve, the rights of existing entitlement holders will be recognised.
- Water entitlements for consumptive uses will:
  - have secure tenure;
  - aim to provide reliable water supplies;
  - link the entitlement to a share of the total amount of water available for consumption at any time;
  - specify the obligations associated with holding the entitlement; and
  - be allocated by market mechanisms, wherever possible, and be allowed to trade between entitlement holders.
- All water allocation decisions will take into account the availability of water for the diversity of non-consumptive water uses valued by the community.
- Management of the water allocation system will be adaptive – responding to changing demands, community expectations and new knowledge, whilst ensuring the objectives of Environmental Water Reserves are being met.

The adoption of these principles for sustainable water allocations should be recognised as a major contribution to the National Water Initiative. The Environmental Water Reserve is a key reform, underpinning the objectives of the National Water Initiative to provide water for the environment that is accounted for and will have the equivalent legal status to water allocated for consumption.
Victoria's new water allocation system is based on three tiers, as shown in Figure 2.2.

**Figure 2.2**
**Victoria’s new water allocation system**

**Tier 1**
Rights held by Crown

- Surface water, groundwater, stormwater and recycled water

**Tier 2**
- Rights granted to the environment and authorities
- Water for non-consumptive uses
- Caps

- Caps and bulk allocations for consumptive use – includes benefits for tourism, recreation, and other values
- Environmental water reserve – includes benefits for tourism, recreation, and other values

**Tier 3**
Individual rights

- Licences
  - surface water
  - ground water
- Irrigation
  - water rights
  - new water product
- Supplies by agreement
- Supplies to urban customers
- Private rights
  - rainfall
  - riparian
Tier one

In the first tier, as shown in Figure 2.2, the Government retains the overall right to the use, flow and control of all surface water and groundwater on behalf of all Victorians. The rights held by the Crown will be extended to include stormwater and recycled water. In 1989, the Water Act did not anticipate recycled water would become a valuable resource and did not provide for it in the State's allocation framework. The Water Act should provide for all water, regardless of its source, to be managed within a single framework. This would encourage efficient use of all water resources by providing opportunities to integrate their management, for example, by allowing trading and substitution of water from different sources.

Action

2.1 The Government will extend the water allocation framework to provide for secure, tradeable entitlements to recycled water and urban stormwater.

Tier two

In the second tier, the Minister for Water makes large-scale or bulk allocations for both consumption and for the environment. It is at this level that the right balance between these two uses will be determined.

This tier incorporates the allocation of water:

- for consumption through bulk entitlements (BEs) and limits (caps) on total water use from catchments or aquifers; and
- for the environment through new Environmental Water Reserves. The Environmental Water Reserve will be a legally recognised share of water to be set aside to maintain the environmental values of a water system.

Within both of these bulk water allocations, provision will be made for other non-consumptive services, such as recreational use.

Action

2.2 The Government will amend legislation to establish Environmental Water Reserves to set aside a share of water in rivers and aquifers across the State for the environment.

Policy

For rivers and aquifers that are currently not over-allocated, the Environmental Water Reserve will be established using a precautionary approach, establishing how much the environment needs and setting a sustainable limit on diversions from that water system.

For rivers and aquifers that are fully or over-allocated, the Environmental Water Reserve will be established by initially setting caps that recognise the rights of existing water entitlement holders and then determining whether further action is required.
**Tier three**

The third tier of the new water allocation framework comprises the rights that are allocated to private individuals for consumption. These include water entitlements such as water rights, licences and private rights and allocations for households and for rural domestic and stock use.

In tier three, the Government will introduce a new form of water entitlement for irrigators, initially in the regulated supply systems in northern Victoria.

‘Sales’ water was previously allocated to irrigators annually from the water available to the rural water authorities under their bulk entitlements but in excess of the amount needed to supply water rights.

The water previously available as ‘sales’ water will now be converted into an independent, legally recognised entitlement. It will have ongoing tenure, be a share of the consumptive water pool and be tradeable. It will retain the lower reliability of the original ‘sales’ water, and will be a share of the available resource leading to its volume fluctuating in line with seasonal conditions.

The introduction of this new entitlement will provide irrigators in northern Victoria with a more secure title to this water compared with the past, as well as the flexibility provided from a new separately tradeable water product. It will provide a firmer basis for farm planning, financing and future investment.

(Refer to Chapter 4 for the outline of the initiative within the context of *Smarter Use of Irrigation Water.*

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<th>Bulk entitlements (ML)</th>
<th>Diversion licences (ML)</th>
<th>Private right (ML)</th>
<th>Total consumptive allocation (ML)</th>
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<td>Surface water</td>
<td>5,851,700</td>
<td>231,800</td>
<td>555,700</td>
</tr>
<tr>
<td>Groundwater</td>
<td>825,100</td>
<td>24,400</td>
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<td><strong>Total</strong></td>
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<td><strong>1,056,900</strong></td>
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</table>

**Notes**
1. Some of the water authority supply bulk entitlements for the large supply systems include other types of entitlement, including:
   - licences within regulated supply systems (501,000 ML);
   - irrigation water rights (1,937,000 ML);
   - irrigators’ sales allocation (to be converted to the new lower security irrigation entitlement);
   - supply by agreement entitlements; and
   - bulk entitlements for towns supplied from the works of other authorities (93,000 ML).
2. The surface water private right is an estimate of domestic and stock farm dam use only, and does not include direct pumping from waterways.

**Action**

2.3 The Government will create a new lower reliability water entitlement, initially in northern Victoria, by converting the current ‘sales’ allocations into an independent, legally recognised, tradeable entitlement.

The total amount of water allocated for consumptive use under Victoria’s new allocation framework is described in Table 2.1.
Regulated rivers

Regulated rivers have their flows managed through the operation of large dams or weirs.

In regulated systems, water resources will be allocated by bulk entitlements issued to rural and urban water authorities for consumptive use.

Rural water authorities' (RWAs) bulk entitlements will generally include water allocated to individuals under licence, water right and supply by agreement. They may also include some subsidiary urban bulk entitlements.

Over the next two years the Government will complete the bulk entitlement system across the entire State. On completion of the remaining entitlements, 78 per cent of all water used for consumptive purposes in Victoria will be covered and managed under water authorities' bulk entitlements.

In regulated systems it will be possible for the Environmental Water Reserve to include a bulk entitlement allocated specifically for environmental purposes.

Bulk entitlements for the environment will be established in systems where the decision is made to recover water to enhance the Environmental Water Reserve.

In evaluating whether the initial Environmental Water Reserve is adequate in a regulated river, the main criterion will be the river's ecological health, recognising that large water supply infrastructure and valuable urban and rural development have fundamentally changed these rivers. Specific actions to enhance the Environmental Water Reserve in regulated rivers are outlined in Chapter 3.

Action

2.4 The Government has established the Wimmera-Mallee system bulk entitlements, which includes a specific bulk entitlement for the environment as part of the Environmental Water Reserve for the Wimmera and Glenelg Rivers.

2.5 The Government will finalise all incomplete bulk entitlements of water authorities including:

- bulk entitlement conversions for the Ovens and Broken Rivers, which are currently well-advanced, and are to be completed by September 2004;

- a bulk entitlement for the mid-Loddon system, which is currently in progress and is to be completed by June 2005;

- bulk entitlements for the Yarra system, which are to be completed by December 2004, and will include a cap on the water Melbourne uses from the Yarra River, which will not be greater than an average of 420,000 megalitres per year; and

- bulk entitlements for the Tarago system, which are to be completed by December 2004.

The amount of water Melbourne uses from its Yarra catchments varies from year to year depending on climatic conditions. Over the past 15 years, Melbourne has used as much as 451,000 megalitres in 1993 and as little as 201,000 megalitres in 1997 (this was a very dry year when Melbourne used a large volume of water from the Thomson Reservoir).

The bulk entitlements will immediately ensure that Melbourne's use from the Yarra River is not greater than an average of 420,000 megalitres per year, which is about 35 per cent of the total Yarra flow. They will also include the regime of environmental flows recently developed for the upper Yarra and tributaries.

Once flows are capped, the Government will continue to work to improve all aspects of the Yarra's health, including carrying out a review of the Yarra Environmental Water Reserve by the end of 2005. Projects worth $8 million were undertaken last year to improve the Yarra's health.

The health of the Yarra River has been maintained through the last seven years of very severe drought conditions in the Yarra valley. This was achieved through Melbourne Water's drought operating plan for the Yarra River. The plan maintains a base environmental flow in the river and links falling river flow to increasing levels of restrictions on private diverters (mainly irrigators) as well as on its own pumped diversions from the river at Yering. Augmentations to supply water for Melbourne from the Yarra River will not happen until appropriate environmental assessments show that a healthy river can be maintained.
Unregulated rivers are those that have no major upstream reservoirs. These rivers make up most of the stream length across Victoria but provide less than 10 per cent of the water used. On these streams, water is allocated by bulk entitlements to urban water authorities supplying towns, and by licences to farmers who want to irrigate their land.

Most towns pump all year round, but have obligations under their bulk entitlements to provide flows for the environment. Many irrigators have licences to pump water out in summer, while others take their water out in winter and hold it in dams for summer use. Depending on the number of diverters on a river or stream and the volume they are extracting, the river may be stressed in summer while the flow regime for the rest of the year is relatively natural.

In unregulated rivers, the Environmental Water Reserve comprises the water available after accounting for water taken out under existing bulk entitlements and licensed diversions plus any additional water available under the sustainable diversion limits.

Unregulated rivers that are highly stressed and have high environmental value will be managed according to a Stream Flow Management Plan (SFMP). These plans are developed under the Water Act 1989 and will be used to enhance Environmental Water Reserves.

The Government will act to ensure that unregulated rivers and streams, which are currently not significantly stressed, remain this way by:

- recognising the ecological stress caused by summer diversions and banning the issuing of new licences which allow diversion of water during the period November to June inclusive. This extends the existing policy that currently applies to irrigation and commercial use to new domestic and stock licences and also extends the period of applicability;
- only issuing new licences for the July to October period where there is spare water under the sustainable diversion limit for the catchment;
- introducing statewide management rules for licencees who take their water in summer to protect the Environmental Water Reserve.

Detailed rules will be released by December 2004.

The new allocation system for regulated and unregulated rivers will contribute towards the National Water Initiative outcomes of secure entitlements and integrated environmental management of water.
Groundwater

Groundwater is a significant and valuable component of Victoria’s water resources.

The last eight years of below average rainfall has not only reduced water levels in dams but also the water levels in groundwater systems.

Where an aquifer is highly connected to surface water, a decline in groundwater levels will affect users of both the groundwater and the connected surface water. The groundwater contribution to river flow is also reduced. It also impacts on wetlands and other dependent ecosystems like native vegetation.

In groundwater systems, the initial Environmental Water Reserve will comprise the water available after accounting for existing licences and private rights, plus any additional water available under the cap on entitlements for an aquifer, known as permissible annual volumes (PAV). As with the approach taken for allocating surface water, in systems that are not fully allocated, the Environmental Water Reserve will be set using a precautionary approach. Where the aquifer is either highly allocated or stressed, a water supply protection area will be declared and a Groundwater Management Plan (GMP) will be prepared.

In broad terms, there are three types of aquifer systems:

- **aquifers that are not highly connected to surface water systems** – in these cases, the Environmental Water Reserve will be set at a level which protects the integrity of the aquifer itself and any ecosystem that relies on the groundwater. This ensures that the aquifer is not damaged or is not polluted by salt water intrusion or other poor quality water;

- **aquifers that are highly connected to surface water** – in these cases, the Environmental Water Reserve will be set at a level which protects the integrity of the aquifer and minimises the risk of too much groundwater extraction affecting rivers, wetlands and other dependent plant and animal communities. It will be important to ensure that both surface water and groundwater are managed together; and

- **aquifers containing non-renewable groundwater** – in these cases, recharge of the aquifer ceased thousands of years ago. An example is the so-called ‘fossil’ groundwater resources in the Mallee. As these aquifers are non-renewable resources it is likely progressive limits will be required on a case-by-case basis.

In some areas where salinity requires the encouragement of groundwater extraction, special rules will be established.

A formal sharing arrangement is in place between South Australia and Victoria where aquifers straddle the State borders. Groundwater sharing arrangements also need to be considered along Victoria’s border with New South Wales.

The extraction of Victoria’s offshore oil and gas reserves also has significant implications for the management of groundwater in Gippsland. This activity can cause groundwater levels to drop both at the point of extraction and also along the coast. Management of this issue requires a cooperative effort between the Commonwealth and State.

**Action**

2.7 The Government will:

- establish Environmental Water Reserves for aquifers which take into account:
  - the need to protect the integrity of the aquifer; and
  - interaction between surface water and groundwater, and the needs of groundwater dependent ecosystems where appropriate;

- manage the use of groundwater through the licensing regime, and when necessary, restrict use to maintain groundwater levels to meet the requirements of the Environmental Water Reserve;

- establish water supply protection areas and prepare Groundwater Management Plans in highly allocated aquifers, stressed aquifers and aquifers with strong interconnections with stressed surface water systems;

- complete a statewide project to better understand the interaction between groundwater and surface water systems;

- where there is a high degree of connectivity between groundwater and surface water:
  - ensure that allocation of new groundwater licences does not undermine the Environmental Water Reserve or surface water allocations; and
  - develop trading rules between surface water and groundwater systems;
Allocating new entitlements
In a limited number of catchments and aquifers in the State there is additional water available for consumption after taking account of the needs of the environment. In order to maximise the value and benefit of this water the Government will allocate the water via an auction or tender process.

Action 2.7 continued
• manage non-renewable groundwater resources to ensure that extractions are ecologically acceptable and progressively reduce the mining of such resources;
• consult with the New South Wales Government on the sustainable management of shared groundwater resources; and
• consult with the Commonwealth Government on the impact of offshore oil and gas extractions on Victoria’s groundwater resources.

Action
2.8 In catchments or aquifers where water is available after taking the Environmental Water Reserve and other water entitlements into account, the Minister for Water will offer new entitlements for consumptive use.

2.9 For significant new water allocations, the Government will establish an auction or tender process that allocates water resources by:
• public advertisement of the sale; and
• setting of a reserve price.
The Government will complement the reforms to the water allocation framework by undertaking continual long-term water resource planning to ensure Victoria’s water security over time.

**Policy**

Long-term planning is essential if Victoria is to provide security of supply for cities and towns, industry and the environment.

The White Paper forms the first step in a long-term water resource plan. The next step of Government will be to publish a Statewide Water Inventory of current water resources (groundwater, surface water, recycled and stormwater, etc) and associated condition, pressures and trends.

From the statewide overview, the Government will prepare five regional Sustainable Water Strategies which will focus on particular problems and opportunities for management of the region’s water resources. Depending on the regional situation, the strategies may set priorities for water infrastructure investment, re-allocation of water and/or directions to enhance water supply systems across authority boundaries.

**State Water Inventory**

The State Water Inventory will provide a high level inventory of Victoria’s water resources. The inventory would report in line with Clause 22 of the Water Act 1989. It will identify emerging pressures and trends across the State and be updated every five years.

Existing Government information sources such as the Water Data Warehouse, Index of Stream Condition and other sources will play a large part in collation of the statewide inventory.

The initial State Water Inventory will also establish guidelines and terms of reference for regional Sustainable Water Strategies. Measurement and monitoring systems are essential to support public and investor confidence in Victoria’s water allocation framework. This principle is expected to be adopted by the National Water Initiative.

**Regional Sustainable Water Strategies**

The Government will plan for water security in regions across the State.

Regional strategies will be developed in order to:

- identify and manage arising threats to the supply and quality of water for cities and towns or industry or rivers and aquifers;
- exploit emerging opportunities to improve water security and/or the health of rivers and aquifers; and
- communicate to regional communities what their water situation looks like over the long-term, and actions they can take to improve it.

The regional strategies will further the National Water Initiative’s outcomes of reflecting regional differences in the variability of water supply and the state of knowledge underpinning regional allocation decisions.

Sustainable Water Strategies will have planning horizons of 15 years and beyond. However, they will be flexible instruments. Where new challenges arise the strategy may need to be revised, or new ones developed, after shorter intervals.

Five regional strategies will be prepared over the next four years:

1. **Central region** (encompassing West Gippsland, Port Phillip, Westernport, Western, Central Highlands, and Barwon regions), to start in 2004;
2. **Wimmera and Glenelg region**, timing is dependent on the proposed Wimmera-Mallee Pipeline Project;
3. **Northern Victoria** (River Murray and its tributaries), to be completed prior to the end of the ‘First Step’ of the Living Murray process;
4. **Gippsland region**, starting in 2006; and
5. **South West region**, starting in 2006.

The first strategy, for the Central region, will need to specifically address water supplies and river health issues in the area of the State that forms an arc round Melbourne (including Geelong, Ballarat, the Macedon area and West Gippsland). A significant amount of work required for this strategy has already been completed by way of Melbourne Water Resources Strategy and planning by regional urban water authorities.

While regional strategies will progressively commence over the next two years, action will start immediately as water authorities and catchment management authorities (CMAs), in particular, continue their water demand and supply planning and river health strategies.

Sustainable Water Strategies will be developed through an open consultative process, within a statewide policy and resource context. The Department of Sustainability and Environment will develop the strategies in collaboration with catchment management authorities, local government, water authorities, other stakeholders and the community. Dialogue with indigenous communities will be a key input to these strategies.

Specific information inputs will be required to inform these strategies from water authorities, catchment management authorities and other organisations as required. The main types of inputs to a regional Sustainable Water Strategy are shown in Table 2.2.
Table 2.2 Sustainable Water Strategies, stakeholders and inputs

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSE and other agencies</td>
<td>Overarching management of the State’s water resources and requirements to meet State priorities and interstate and national obligations. Undertake the State Water Inventory.</td>
</tr>
<tr>
<td>Catchment Management Authorities</td>
<td>Priority areas for enhancement of the Environmental Water Reserve in regulated and unregulated rivers, potential large-scale land-use changes in the catchments, water quality issues, outlook for regional development, Regional River Health Strategies (RRHSs).</td>
</tr>
<tr>
<td>Urban Water Authorities</td>
<td>Water Supply and Demand Strategies identifying measures to be used to maintain the long-term (50 year) balance between demand for water and available supply. These strategies will identify the utilisation of a range of water resources (including stream flow, groundwater, urban stormwater, recycled water, and adjacent water systems). They will identify water conservation, infrastructure and investment proposals necessary to meet these and foreshadow whether a new bulk entitlement is needed.</td>
</tr>
<tr>
<td>Rural Water Authorities</td>
<td>Future changes to the water supply networks to meet customer requirements. Measures to improve the efficiency of delivery and use of irrigation water and the infrastructure and investment proposals necessary to implement these measures.</td>
</tr>
<tr>
<td>Local government</td>
<td>Regional development issues.</td>
</tr>
<tr>
<td>Community</td>
<td>Issues and feedback on proposals.</td>
</tr>
</tbody>
</table>

The regional Sustainable Water Strategies will further the National Water Initiative’s outcomes of reflecting regional differences in the variability of water supply.
2.11 The Government will develop five regional Sustainable Water Strategies to plan for secure and affordable water supplies and healthy rivers and aquifers across the State.

The strategies will set priorities and directions for:

- managing changes in the demand for water from urban, irrigation and other consumptive and non-consumptive uses;
- investment in water supply systems across water authority boundaries;
- investment in major infrastructure for water recycling and re-use to utilise alternative water sources and replace potable water use;
- Stream Flow Management Plans for unregulated streams; and

Through these strategies Government can decide to vary or enhance the Environmental Water Reserves in response to new and better information and community expectations.
Varying Water Entitlements

A strength of Victoria’s water allocation system has always been the stability and security of its water entitlements. Water entitlement holders in Victoria can have confidence that a major input to their business is secure.

Victoria does well out of its stable and secure entitlements – irrigators in northern Victoria achieve twice the production per megalitre compared with their NSW counterparts. The Government is determined to retain this advantage.

At the same time, the water allocation system has to be adaptable. Water markets and investing in improvements to water use efficiency are the two staple mechanisms for adjusting entitlements preferred by the Government and available to be used at any time.

But the Government must also be in a position to intervene if the assumptions, upon which our current water entitlements are based, are shown to be no longer valid. For example, the Government may choose to adjust entitlements to share more equitably the impact of a long-term reduction in the resource base caused by climate change, or to change the balance between consumptive entitlements and the Environmental Water Reserve in response to a discernible downward trend in river health.

The Council of Australian Governments (COAG), in developing the National Water Initiative, agreed that there is a need to better assign the future risks of decline in the consumptive pool due to long-term changes in climate, and periodic natural events such as bushfires. COAG considered a risk assignment framework to apply to future reductions in the availability of water for consumptive use. Victoria’s risk assignment framework is consistent with the COAG approach – in fact, it provides greater certainty for water users.

Bulk entitlements and the Environmental Water Reserve share up the total resource between water users and the environment, but modelling shows that the split may not stay the same under all conditions. For example, if Goulburn inflows were to undergo a long-term decline of 20 per cent, modelling indicates that the environment’s share of the smaller total drops from 43 per cent to 37 per cent. The environment has some minimum releases from storages, which are insensitive to changes in inflows, however much of its water comes as spills from storages, which would be significantly reduced if inflows to storages declined. It may be possible, in the future, to redesign entitlements (e.g. by giving the environment a share of the inflows to storages) so that the environment automatically has the same proportion of total resource, without the need to make periodic adjustments.

We can achieve both stability and adaptability in our water allocation system by:

- ensuring storage operating rules, seasonal allocation processes etc that determine the volume of water made available for consumption each year are public and firm, but can be changed through a transparent, consultative process;
- assessing the status of the resource base and river health, and whether either is suffering a decline, at regular 15 year intervals;
- where there has been a decline in river health, or in the resource base with a disproportionate impact on one group, conducting an open review to determine how to restore an acceptable balance, including the last resort option of the Government adjusting entitlements using its reserve powers; and
- having a minimum interval of 15 years between consecutive adjustments of entitlements using the Government’s reserve powers.

**Action**

2.12 The Government will amend legislation to require that an expert assessment of the State’s water resources be made at 15 year intervals to determine whether:

- the resource base has suffered a decline, and if it has fallen disproportionately on the environment or water users; and
- river health is deteriorating for flow-related reasons.

If either is the case, the Minister will establish an open, consultative review of the balance between the water available for consumption and the Environmental Water Reserve, and of necessary corrective action.

The amendments to the legislation will ensure an assessment is made in the twelfth year of each 15 year period. If a review is necessary, it would begin shortly after the assessment, with its recommendations being implemented at the end of the 15 year period.

The assessments will be undertaken by DSE on behalf of the Minister using expert scientific advice, be independently audited and be available to the public. The initial State Water Inventory and Sustainable Water Strategies will set the benchmark against which future resource assessments will measure long-term changes to the resource base and river health.
If the assessment triggers a review, the review will be conducted in a balanced way that reflects the different interests, and in consultation with the Minister for Environment.

The review’s purpose is to recommend a way of achieving (as soon as possible and certainly within 15 years):

- a full restoration of the relativity between the environment’s and water users’ shares of the total resource where this has been altered by a long-term change in inflows; and

- a level of river health acceptable to the community. The review must demonstrate a pathway to return overallocated systems to sustainable allocation levels.

The review will include a scientific report on the risks to river health if the proposed corrective action does not achieve the scientifically recommended environmental flows.

In establishing a review, the Minister may clearly set down some parameters about how the costs of any changes are to be borne.

The existing reserve powers in the Water Act 1989 that allow water entitlements to be qualified will continue. This is an ultimate power, which is consistent with Victoria’s statutory, rather than judicial, system of allocating water resources. The reserve powers are likely to be rarely invoked, but Government needs to be sure that, as a last resort, they can be used to change the Environmental Water Reserve or the water available for consumption.

While these powers will always be available for emergencies and temporary shortages, the Government will only consider making permanent adjustments to entitlements on account of long-term changes to inflows or river health under the following circumstances:

- the adjustment is a recommendation arising from an expert water resource assessment and an open consultative review; and

- adjustments are made no more frequently than once in 15 years (in line with the 12 year period for the water resource assessment).

Where there has been a long-term change to inflows as a result of natural events such as climate change or bushfire, the Government will restore the relative shares of the total resource held by the environment and water users, without any payment. In restoring the environment’s share of the total resource, flow regimes will need to be developed to maximise benefits to the environment from the available water.

If river health is deteriorating for flow-related reasons, then the legislation will allow the Government to decide on a fair allocation of the burden in light of the circumstances.

The current policy for regulated surface-water supply systems is to use Government investment in savings, system management and the water market to make adjustments. Such investment can be made at any time.

In other, not so well understood or controlled systems – unregulated waterways and groundwater – the Government will need to adopt a case by case approach that takes account of the legal rights, history of allocations, and nature of impacts. With groundwater, for example the adverse impacts of overuse fall mainly on the users themselves, who would thus be the main beneficiaries of adjustments.

**Action 2.13** The Government will clarify the reserve powers of the Water Act 1989 to ensure the powers can effectively qualify rights in times of water shortage, including where river or aquifer health is not sustainable.
As demands for water increase, water must be managed with a high degree of accountability for both its use and management. This requires:

- better monitoring and compliance of water use;
- improved resource monitoring; and
- greater public access to information.

**Better monitoring and compliance**

All water users must operate within their entitlements to ensure that the integrity of entitlements is maintained, including entitlements for the environment.

Improved metering and compliance are necessary to sustain a fair and equitable system of water allocation.

**Policy**

For both surface and groundwater licences:

- all significant water use will be metered;
- all new licences for commercial and irrigation use will be metered;
- new water users will be responsible for the full cost of metering their diversions; and
- the Government will contribute to the cost of metering the diversions of existing water users.

**Action**

2.14 From 1 September 2004, the Government will provide funding to the licensing authorities equivalent to a rebate up to $400 per meter for the installation of authorised meters on existing, un-metered, water bores, pumps or other diversions.

‘Significant use’ is defined as any commercial and irrigation use and any other use designated as significant by water authorities.

Meters must be installed within two years for all licences in groundwater management areas and in areas prioritised for Stream Flow Management Plans, and within three years for all other licences.

Meters will not be required where a registration licence has been issued for an existing irrigation or commercial farm dam, unless specified in a Stream Flow Management Plan.

Metering of domestic and stock licences will not be required except in rivers or aquifers where the amount taken for domestic and stock use can significantly impact on the water available to other consumptive users and the Environmental Water Reserve.

**Compliance with entitlements**

To maintain a fair and equitable system of water entitlements, users must comply with their licensed volumes.

**Policy**

All users and water authorities must comply with entitlement volumes and other obligations regarding the taking of water.

**Action**

2.15 In catchments and aquifers where over-use has occurred, the Government will require water authorities to enforce licences conditions, by:

- requiring users to purchase additional entitlements or adjust their business operations in fully allocated catchments and aquifers; and
- in catchments and aquifers not fully allocated, requiring users to apply to licensing authorities for additional allocations, purchase additional entitlements, or adjust their business operations.
The Minister for Water will address exceptional circumstances where:

- overuse can be demonstrated to be the result of previous authorised allocation policies; and
- there is no reasonable prospect of access to alternative sources of water or increasing efficiency of use.

To date, dairy wash licences are the only allocations that meet this criterion and a program of transition to full compliance will be put in place.

**Water resource monitoring and public reporting**

Keeping up-to-date records of how much water is allocated, used and where it is used is a fundamental input to preparation of the Statewide Water Inventory and regional Sustainable Water Strategies.

Public access to this information will give entitlement holders and others in the community, confidence that the water allocation framework is being managed responsibly.

The Government will create a web-based register of irrigation water rights, licences and bulk entitlements for all water in Victoria including regulated and unregulated rivers, groundwater, farm dams, recycled water and stormwater.

The register is an integral part of the unbundling of water entitlements discussed in *Smarter Use of Irrigation Water* (Chapter 4).

The register will provide information such as ownership of the water share, where the water can be used, how much can be used at any one time and how much water was used. The register will keep track of all water trades and update accounts accordingly. The creation of a robust water accounting system, through the register, public accounts and metering initiatives, will assist to protect the integrity of Victoria’s water entitlements. A robust water accounting system is expected to be a key part of the National Water Initiative.

**Action**

2.17 The Government will invest additional funds in monitoring water resources, and will:

- monitor the quality and quantity of both surface water and groundwater;
- monitor the environmental condition of Victoria’s rivers, including the status of our fish communities;
- report on the second benchmarking of river condition across Victoria by February 2005; and
- provide funding support to upgrade and maintain the State’s network of over 2,500 groundwater observation bores, and install 30 new bores across the State.

The Government will fund and establish a public register of water rights, licences and bulk entitlements for all water in Victoria.
All data collected through the State surface water and groundwater monitoring networks and the statewide benchmarking of river condition will be made available through the Victorian Water Resources Data Warehouse (www.vicwaterdata.net), allowing public access to current and historic water resource information, including the water accounts.

A public web-based water accounts database will be set up to report annually on compliance with water entitlements at the bulk supply (bulk entitlements, licences and other forms of entitlement) and caps at the catchment or aquifer levels.

The initial set of accounts will be prepared manually in time for completion in early 2005. The web-based system is scheduled for completion twelve months later, and will be developed in close consultation with water authorities.

When fully developed, the public register of entitlements and the water accounts will be linked electronically.

**Action 2.18** The Government will:
- establish public web-based water accounts by early in 2006; and
- produce the water accounts annually to provide a complete picture of water allocation and use across Victoria.
Managing Future Risks

The water allocation system deals with year-to-year variation by entitlements effectively being a share of the available resource pool. However, long-term changes in the hydrology of a water system can occur as a result of:

- climate change – which changes the total available resource pool and potentially affects both the Environmental Water Reserve and consumptive entitlements; and
- changes in land use within a catchment (e.g. due to the introduction of large scale plantations in the catchment or changed logging regimes) which affect the quantity of surface run-off and groundwater recharge.

**Impacts of climate change**

The CSIRO predicts that water resources will be reduced through hotter weather and increasing evaporation, compounded by lower rainfall especially in winter and spring. More widespread and longer-term changes could come about as a result of the greenhouse effect or other climate change.

The Government will vary water entitlements and the Environmental Water Reserve if future long-term reductions in water availability occur.

Victoria will participate in a three-year, collaborative research program, covering a large part of Australia, which will focus on improving the understanding and predictability of key climate parameters for specific regions over a range of time scales (e.g. short-term, seasonal, multi-seasonal, annual, inter-annual).

The research will build on contemporary climate research, such as that already carried out in the Western Australian Climate Initiative. It will determine the key factors affecting climate for different regions in Victoria. The researchers will identify the causes of climate variability (including the extended drought we are currently experiencing), and distinguish such variability from climate change trends.

Collaborators in this research program will include key climate researchers, climate-dependent industries and organisations and agencies involved in natural resource management.

This research will be used to develop the triggers that tell us when we need to adjust water entitlements in response to long-term climate change or bushfire.

**Action 2.19** The Government will:

- participate in a three-year collaborative research program with key national climate researchers, to better understand the risk of climate variability and climate change for Victoria; and
- use the outputs of the collaborative research program to develop triggers for determining if the resource base has changed in response to long-term climate change.
Addressing Impacts of Catchment Land Use

Different land use changes can affect the water balance of a catchment by intercepting and using rainfall that would otherwise become surface runoff or recharge to groundwater.

The initiatives below seek to address the impacts of catchment land use in order to protect the future integrity of water entitlements and to achieve environmental objectives for water systems.

There is a significant difference in the effect of different land uses, and research shows that the magnitude of the effects of forests is potentially much greater than that of grazing, agriculture or horticulture.

This significant issue is also being addressed at a national level as part of the National Water Initiative.

Impacts of new plantation forestry

The Government encourages private forestry investment in Victoria with a view to delivering economic, environmental and regional development benefits for the State. However, the potential impacts of plantations on water resources must be understood and recognised in the planning frameworks within which these developments take place.

The project also will assess the impact of other significant land use changes on the water resource. The current mix of land uses will act as the baseline – so existing land uses will not be affected by the new planning arrangements.

Setting up plantation development zones and controls will provide essential information to catchment managers to assist in balancing the environmental and economic benefits from plantations (i.e. for salinity control or forestry activities) against the impact on water resources.

As a first step, the Government will undertake a statewide assessment to identify high, medium or low hydrologic impact zones where new plantation development would potentially have a high, medium or low impact on current water availability and the Environmental Water Reserve. Appropriate tools and controls will then be developed, in consultation with stakeholders, to account for the impact of new plantations on water resources, water salinity, greenhouse and other environmental benefits and costs of plantations. Tools could include planning provisions, incentives and pricing systems.

Action

2.20 The Government will:

- undertake a statewide assessment to identify high, medium or low hydrologic impact zones for new plantation developments;
- develop appropriate tools, for example planning provisions, incentives and pricing systems, in consultation with stakeholders to account for the impact of new plantations on water resources, water salinity, greenhouse and other environmental benefits and costs of plantations; and
- apply existing planning arrangements until the new arrangements are in place.

Policy

Sustainable forest and timber management remains a priority for the Government. As part of this commitment, the water resource impacts of new plantations need to be considered.

Any significant water resource impacts from new plantations will be managed within the context of the environmental benefits of plantation development.


These provide for the protection of natural resources including water, and are particularly directed towards protection of water quality. However, apart from a few minor exceptions, they do not address the impacts of plantations on the quantity of surface water and groundwater resources.

Victoria’s new water allocation framework is premised on water users and the environment having access to safe and secure entitlements that are not eroded by the actions of third parties.
Harvesting timber in Melbourne catchments

The policy framework, Our Forests Our Future, provides for significant adjustments to the timber industry and the sustainable management of Victoria’s forests.

It seeks to balance communities, jobs and the environment. It also recognises the many roles our forests play – in protecting biodiversity, as water catchments, as sources of timber and non-timber products, as the generator of employment in many small rural communities, in nature conservation, in recreation and eco-tourism and as carbon sinks.

The Melbourne Water Resources Strategy, 21st Century Melbourne; a WaterSmart City, 2002 raised an important issue in regard to the inter-relationship between logging in the State Forests that supply water to Melbourne, and the available water yield from these catchments.

Melbourne’s original water catchments are closed catchments and are managed as national parks. Melbourne also harvests water from State Forests, which are managed for timber production under strict guidelines based on the Code of Forest Practices for Timber Production (DNRE 1996). These State Forests provide around 40 per cent of the annual sawlog harvest, important for the production of high-quality timber products.

Action 2.21

The Government will:

- undertake hydrological studies on the impact of logging on water yield of catchments in State forests supplying water to Melbourne;
- develop options aimed at improving the water yield, including potential changes to management practices and phasing out logging in these areas;
- assess the feasibility of establishing plantations outside State forests to offset any reductions in timber availability. This will be informed by the results of modelling and mapping work on high, medium and low-impact zones for plantations (refer Impacts of new plantation policy above); and
- investigate the economic, social and environmental benefits and costs of these options.

Once they have been completed, the Government will report on the findings of these studies and begin consultation with the timber industry, the community, and other stakeholders to develop a long-term plan that will aim to improve water yield outcomes for Melbourne’s catchments, while continuing to meet timber supply commitments.

Policy

Melbourne’s original water catchments are closed catchments and are managed as national parks. Logging will continue to be banned in those catchment areas.

Improved water yields within catchments supplying water to Melbourne are important in securing Melbourne’s water supplies.
Until the logging and water investigations have been completed, the Government will ensure that logging rates in the State forests supplying water to Melbourne do not exceed the rates specified under existing arrangements between the Department of Sustainability and Environment and Melbourne Water. Once these studies have been completed and reported on, agreements between the Department and Melbourne Water will be formalised accordingly.
Chapter Three:

The Government’s aspiration is to have healthy rivers, floodplains, estuaries and catchments.
Restoring Our Rivers and Aquifers for Future Generations

1. Key Challenges
   - One third of Victoria’s rivers are in poor or very poor condition.
   - State of the River Murray is a national issue.
   - Some stressed rivers need more water to achieve sufficient Environmental Water Reserves.
   - Need to balance water use in ways that acknowledge:
     - the full range of services our water systems provide;
   - the entitlements of existing water users; and
   - the need for healthy rivers and aquifers.
   - Clarifying roles and responsibilities for river health.
   - Establishing a capable manager of the Environmental Water Reserve.

2. Government Initiatives
   - Working to restore the River Murray and the Snowy River
     - delivering an average of 120,000 megalitres of lower security water and 25,000 megalitres of high security water to the River Murray, in the Living Murray initiative; and
     - water savings from returning Lake Mokoan to a wetland.
   - Investing in water savings and providing extra water for the Thomson River, Macalister River and Gippsland Lakes.
   - Give operational management of the Environmental Water Reserve to catchment management authorities, enhancing their role as caretakers of river health.
   - Significantly improving funding for integrated management of rivers.
   - Establishing ecologically sustainable water reserves in 21 priority unregulated rivers.
   - Establishing a new environmental bulk entitlement for Wimmera and Glenelg Rivers and enhancing this over time through piping the Wimmera-Mallee stock and domestic supply system.

3. Sustainable Outcomes
   - Achieve significant improvements in the ecological condition of Victoria’s rivers by 2010.
   - Clearly defined roles and responsibilities for river health.
   - The protection of a wide range of other water services.
   - Dynamic and capable management of all aspects of river health.
Victoria is built around rivers and waterways. Most of them, including the iconic River Murray and the Snowy, support our communities by providing water for farms, towns and industry.

Victoria’s natural waterways also have recreational and cultural significance. The State’s lakes, estuaries and wetlands include the beautiful Mallacoota Inlet and the Gippsland Lakes, the internationally significant Barmah Forest and numerous settings for anglers, water sports and houseboats.

Our reliance on Victoria’s rivers and aquifers (ground water) has taken its toll. Today, one third of Victoria’s major streams and two thirds of wetlands are in poor or very poor condition. Nearly half of all estuaries have been damaged and the health of the River Murray, into which many northern rivers flow, is severely compromised with flows at the mouth reduced on average by two thirds.

Poor river health has contributed to significant losses of fish, birds and other animals and plants dependent on water.

• of 420 plants and animals listed as threatened in Victoria, 20 per cent of plants and 35 per cent of animals depend on aquatic ecosystems;

• Victoria has 40 species of native fish. At least one is extinct and 18 are now threatened, including the iconic Murray cod; and

• studies show that many red gums along the River Murray are on the verge of dying due to rising salinity levels and less frequent flooding.

When the health of waterways deteriorates, so does the quality of services they provide for our communities and the economy. For example:

• the Gippsland Lakes now experience algal blooms each summer and major blooms every four or so years, causing major losses both to tourist revenue and the commercial fishing industry;

• Lake Boga, a recreational and tourist attraction, now experiences regular algal blooms at a cost to the region of $600,000 per bloom; and

• water treatment costs are significantly higher in Bendigo which has poorer quality source water than Ballarat which has good quality source water (an additional approximate $9 million in capital works and $700,000 per annum in operating costs).

The message is clear: degrading rivers, aquifers and floodplains seriously affect regional and urban communities and economies.

The health of rivers, wetlands and lakes is the result of the cumulative impact of a multitude of factors including:

• significant alteration of flow regimes by major storages, diversions, groundwater extractions, catchment dams and urbanisation;

• poor water quality caused by pollution, rubbish dumping, catchment run-off, stormwater, rising groundwater tables and cold water releases from dams;

• clearing and inappropriate management of riverside and catchment lands;

• weeds and foreign species such as carp or blackberries;

• erosion, sedimentation or de-snagging practices that harm channel form and habitats;

• barriers such as weirs that impede fish movement and migration; and

• reduced links with the floodplain, e.g. arising from wetland drainage, levee banks or development.
Improving the health of Victoria’s rivers and wetlands requires an integrated approach dealing with all the major causes of river stress. The reforms set out in this chapter will enable us to restore our rivers and aquifers by:

- tackling all aspects of river health through the Victorian River Health Strategy;
- substantially increasing resources to implement the Strategy;
- enhancing the Environmental Water Reserve in stressed rivers over time;
- investing in water recovery via a range of mechanisms including water savings projects, water reuse and the water market;
- advancing the Government’s significant investment in the recovery of the Snowy and Murray Rivers through the decommissioning of Lake Mokoan, the allocation of 20 per cent of the new lower reliability water product in northern Victoria and a further 25,000 megalitres of high reliability water as part of Victoria’s participation with other States and the Commonwealth Government in the Living Murray process;
- restoring the stressed Thomson, Macalister, Wimmera and Glenelg rivers by improved environmental flows; and
- giving catchment management authorities (CMAs) the task of managing Environmental Water Reserves in their local areas.

The reforms set out in this chapter provide for the integrated management of water for environmental and other public benefit outcomes that are being proposed in the National Water Initiative.

**Figure 3.1 Proportion of the length of major streams in excellent or good condition**

Tackling All Aspects of River Health

Improving the health of Victorian rivers will only be achieved by addressing environmental flows, declining water quality and degraded riverine habitats in an integrated way. The Government’s framework for this is the Victorian River Health Strategy released in 2002.

**Policy**
The Government will significantly improve the health of Victoria’s rivers, floodplains and estuaries by 2010 to ensure that they are capable of delivering a wide range of services to the community.

**Action 3.1** The Government will improve the health of Victoria’s rivers, floodplains and estuaries through:

- the integrated policy framework provided by the Victorian River Health Strategy;
- using regional river health strategies and catchment management authorities to establish regional priorities and integrated programs for river protection and restoration within a statewide policy context; and
- adaptive management of Environmental Water Reserves.

The Victorian River Health Strategy provides a statewide policy framework for managing the health of Victoria’s rivers, floodplains and estuaries. The Strategy aims to restore stressed rivers and protect healthy waterways by collectively treating the problems of environmental flows, declining water quality and degraded riverine habitats.

Within this statewide context, community management objectives and management targets are set in the regional river health strategies. These regional strategies identify the environmental, social or economic water services (or assets) in each area, their value to the State and the region, and all the issues threatening the provision of these services. They also establish priority areas for restoration, identify areas needing extra water to enhance the Environmental Water Reserve, and provide an integrated program for river restoration at the regional level.
The Government will invest $100 million to repair rivers and aquifers over the next four years to protect and repair our water sources. The additional funding will give a necessary boost to the implementation of the Victorian River Health Strategy. The funding program will seek to redress the environmental degradation of river systems and aquifers and deliver significant improvement by 2010.

**Funding will be available for:**
- enhancing and managing the Environmental Water Reserve in priority stressed rivers and aquifers;
- restoration measures to improve water quality, habitat and flows in rivers and wetlands;
- reconnecting floodplain and river linkages;
- monitoring programs to assess progress and adjust programs where necessary;
- building capability to manage Environmental Water Reserves; and
- improving our understanding of environmental flows and river health.

**Action 3.2** The Government will invest an extra $100 million over the next four years to protect and repair the health of our rivers and aquifers.
CHAPTER THREE – RESTORING OUR RIVERS AND AQUIFERS FOR FUTURE GENERATIONS

The Environmental Water Reserve: From Concept to Reality

As mentioned previously, flow is one of the major factors affecting river health. Each component of the flow regime plays an important role in river ecology. For example, high flows stimulate fish breeding and maintain estuary openings, whereas groundwater provides base flows in many waterways maintaining pools as fish refuges in summer and floods replenish the floodplain and flush organic material into the river.

The Government is establishing Environmental Water Reserves in all river and groundwater systems. The concept of the Environmental Water Reserve was outlined in Chapter 2 as the share of water set aside for the environment.

In setting up the initial Environmental Water Reserve, the Government will ensure that the rights of existing consumptive entitlement holders are recognised.

As a result, for rivers and aquifers that are currently not over-allocated, the Environmental Water Reserve will be established using a precautionary approach by setting a sustainable limit on diversions to ensure environmental values of a particular river or aquifer are protected.

For rivers and aquifers that are fully or over-allocated, the initial Reserve will recognise existing entitlements. Further action may be required to maintain a healthy river or aquifer. How this decision will be made and methods of water recovery are discussed later in this chapter.

As a result of this approach, a substantial part of the Environmental Water Reserve is provided by limiting the volume of water made available for consumption. These limits take various forms – conditions on bulk entitlements, surface and groundwater licences, rules established in water management plans, and caps on water use such as permissible annual volumes and sustainable diversion limits.

In some regulated rivers, the Environmental Water Reserve may include a bulk water entitlement specifically for the environment.

Figure 3.2 and Table 3.1 show how the Environmental Water Reserve is provided in river basins across Victoria. In addition, there is one existing environmental bulk entitlement for the Murray wetlands. Three new environmental bulk entitlements are announced as part of the White Paper reforms later in this chapter.

<table>
<thead>
<tr>
<th>River basin</th>
<th>How the Environmental Water Reserve will be set</th>
<th>Is the Environmental Water Reserve adequate?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Victoria</strong></td>
<td></td>
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</tr>
<tr>
<td>Upper Murray</td>
<td>The Environmental Water Reserve will be set by capping the consumptive use of water under the Murray-Darling Basin cap. This cap has applied in northern Victoria since 1996 and is now understood and accepted by water users. The objective of the cap is to prevent any further growth in diversions above the level that applied in the basin in 1993-94.</td>
<td>The Environmental Water Reserve is not adequate on a number of these rivers with the collective impact of these and other rivers in the Murray-Darling Basin having a major impact on the River Murray itself. Initiatives of the Victorian Government, in some cases acting in concert with the Commonwealth and other State Governments, to improve the reserves in the Murray, Broken, Goulburn, Campaspe, Loddon and Wimmera rivers are announced later in this chapter.</td>
</tr>
<tr>
<td>Kiewa</td>
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<td>Ovens</td>
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<tr>
<td>Broken</td>
<td></td>
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<tr>
<td>Goulburn</td>
<td></td>
<td></td>
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<tr>
<td>Campaspe</td>
<td></td>
<td></td>
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<tr>
<td>Loddon</td>
<td></td>
<td></td>
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<tr>
<td>Avoca</td>
<td></td>
<td></td>
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<tr>
<td>Wimmera</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Southern Victoria – fully allocated catchments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Snowy</td>
<td>The Environmental Water Reserve will be set by capping the consumption of water in each of these catchments. The exact nature of the caps will be worked through with the relevant water authorities. A moratorium on new diversions will apply until the Environmental Water Reserve is put in place.</td>
<td>These river basins are fully allocated and the Environmental Water Reserve needs to be enhanced as a high priority in some cases. Initiatives to improve the reserve for the Snowy and Werribee are announced later in this chapter. A study will be undertaken to determine the environmental needs of the Yarra and confirm the Environmental Water Reserve.</td>
</tr>
<tr>
<td>Yarra</td>
<td></td>
<td></td>
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<tr>
<td>Werribee</td>
<td></td>
<td></td>
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<tr>
<td>Moorabool</td>
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<tr>
<td>Barwon</td>
<td></td>
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<tr>
<td>Bunyip</td>
<td>The Environmental Water Reserve is to be established by capping existing entitlements at their current levels. A moratorium on new diversions will apply until the Environmental Water Reserve is put in place.</td>
<td>The Environmental Water Reserve will be enhanced under the initiatives to prepare management rules and stream flow management plans for unregulated streams, as described in Chapter 2 and later in this chapter.</td>
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<tr>
<td>Maribyrnong</td>
<td></td>
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<tr>
<td>Hopkins</td>
<td></td>
<td></td>
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<tr>
<td>Glenelg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.1 Continued

<table>
<thead>
<tr>
<th>River basin</th>
<th>How the Environmental Water Reserve will be set</th>
<th>Is the Environmental Water Reserve adequate?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gippsland Lakes catchments</strong></td>
<td>The Environmental Water Reserve will be set by capping the consumption of water in each of these catchments.</td>
<td>These river basins are fully allocated and the Environmental Water Reserve needs to be enhanced as a high priority in the Thomson/Macalister.</td>
</tr>
<tr>
<td>Thomson/Macalister</td>
<td>The exact nature of the caps will be worked through with the relevant water authorities.</td>
<td>Initiatives to improve the reserve in these rivers are announced later in this chapter.</td>
</tr>
<tr>
<td>Latrobe</td>
<td>A moratorium on new diversions will apply until the Environmental Water Reserve is put in place.</td>
<td></td>
</tr>
<tr>
<td><strong>Nicholson Tambo Mitchell Avon</strong></td>
<td>The Environmental Water Reserve will be set on these catchments by capping entitlements at their current levels plus an additional amount of 2,000 megalitres across the four basins.</td>
<td>The amount of water currently allocated in each of these river basins is less than their sustainable winter diversion limits.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>However, the size of the Environmental Water Reserve needed to ensure the health of the Gippsland Lakes as a whole needs to be confirmed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The Government will undertake an assessment to determine the impact of further river extractions on the Gippsland Lakes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The allowance of 2000 megalitres will accommodate new development until such time as the assessment has been completed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>These limits constitute a diversion cap for the Gippsland Lakes.</td>
</tr>
<tr>
<td><strong>Southern Victoria – remaining river basins</strong></td>
<td>The Environmental Water Reserve is to be established by capping entitlements at their current levels plus any additional allocation available under their sustainable winter diversion limits.</td>
<td>While water for new development is available for allocation for winter extractions, some catchments within these river basins may be stressed by existing levels of summer extractions.</td>
</tr>
<tr>
<td>East Gippsland</td>
<td>In these catchments, existing winter commitments are below the sustainable diversion limits and there is water available for new allocations.</td>
<td>To enable the summer stress to be addressed, an additional allowance will be made for these rivers so some entitlements can convert from summer to winter extraction.</td>
</tr>
<tr>
<td>South Gippsland</td>
<td>The allocation of new water entitlements will take sustainable diversion limits into account.</td>
<td>The Environmental Water Reserves will be enhanced under the initiatives to prepare management rules and Stream Flow Management Plans for unregulated streams, as described in this chapter.</td>
</tr>
<tr>
<td>Otway Coast</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portland</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In groundwater systems, the Environmental Water Reserve is established by recognising existing entitlements and setting limits to extraction (permissible annual volumes).

The map below shows the status of Victoria’s groundwater resources. In 35 of the State’s 62 groundwater management areas, the Environmental Water Reserve will be set through the declaration of permissible annual volumes (PAVs) in accordance with Appendix A. In addition, PAVs have also been gazetted for the eleven zones along the South Australian/Victorian border which are subject to a water sharing agreement with South Australia. Appropriate PAVs are being determined for a further five groundwater management areas.

Twenty-three of the State’s groundwater management areas are currently either highly allocated or are stressed. In these cases, Groundwater Management Plans are either in preparation or being implemented.

**Figure 3.3 Groundwater management areas**

**Action 3.3** The Government will extend the current moratorium on the issuing of new water entitlements to all fully allocated river basins and aquifers across the State until legislation puts in place permanent arrangements through the creation of Environmental Water Reserves. Other basins and aquifers will be managed using sustainable diversion limits or permissible annual volumes (refer to Table 3.1).
In establishing the initial Environmental Water Reserves outlined in Table 3.1, the rights of existing consumptive entitlement holders have been recognised. This means that in a number of river and aquifer systems which are over-allocated, the initial Environmental Water Reserve may not be adequate to prevent further degradation. In these stressed systems, the Government must determine the volume of water needed to build a satisfactory Environmental Water Reserve.

**Action**

3.4 The Government will, through regional River Health Strategies and regional Sustainable Water Strategies, identify:

- the priority *regulated* rivers where the Environmental Water Reserve will be enhanced;
- the volumes of water to be recovered and the most effective combination of projects to achieve this; and
- the future priority *unregulated* rivers and aquifers where the Environmental Water Reserve will be enhanced.

3.5 For priority *unregulated* rivers and aquifers, the Government will:

- require the development of a Stream Flow or Groundwater Management Plan which will provide a water regime to sustain agreed ecological objectives within ten years; and
- co-invest in implementing a Stream Flow or Groundwater Management Plan where it seeks to provide the enhanced Environmental Water Reserve in a shorter timeframe.

**Policy**

The Environmental Water Reserve in stressed rivers and aquifers of high community value and priority will be enhanced.

In priority *regulated* rivers, the Environmental Water Reserve will be enhanced by recovering water through the most effective combination of:

- investing in distribution system savings;
- investing in water reuse and recycling;
- changing system management;
- enabling water donations to be made;
- investment in reconfiguring irrigation systems and other local adjustment projects providing long-term environmental and social or industry benefits; and
- water purchase through the water market.

In priority *unregulated* rivers and aquifers, the Environmental Water Reserve will be enhanced by requiring existing licences to be managed to provide an environmental water regime that will sustain agreed ecological objectives within ten years.

All water recovered by the Government to enhance the Environmental Water Reserve will be owned by the State and will be returned to the environment. Where additional outcomes are sought, such as regional development or social outcomes, recovered water will be directed accordingly and transparently.
Sustainable Water Strategies

Future decisions about enhancing Environmental Water Reserves will be made within Sustainable Water Strategies (SWS). These strategies will become the Government’s new planning framework for deciding on large-scale, long-term changes in water use. As part of this process, the Minister for Water will determine priorities and select projects for water recovery, set volumes and methods of recovery and investment levels. Immediate river health and aquifer priorities will be acted upon as outlined in this Chapter.

Catchment management authorities (CMAs) will advise on regional priorities and required flows, based on scientific evidence. CMAs will aim to supply enough water to achieve community management objectives, maintain important environmental assets and ensure basic ecological health.

Enhancing the Environmental Water Reserve in regulated rivers

Water can be recovered for the State’s regulated rivers through a variety of methods. Of these, water savings measures are initially the most attractive. However, while water saving projects will be implemented (where cost effective), other means to recoup water will be necessary to improve environmental flows and meet the challenge to provide for healthy Victorian rivers.

As a result, the Government intends to complement efficiency improvements with other means of recovering water including purchasing water for our river systems.

Investment in distribution savings

Water losses in water supply and distribution systems can be significant. Northern Victoria loses on average about 770,000 megalitres, or 25 per cent, of the water diverted for irrigation out of the Murray and Goulburn systems due to leakage, seepage, evaporation, and in some cases, degraded infrastructure.

New technology for channel automation is likely to be one of the most cost effective water savings measures in irrigation systems. The Government invested in a pilot project for this technology near Tatura and is now extending this further in the Tatura and Macalister regions. Interim results are favourable, indicating channel automation will provide a long-term option for moving towards sustainable irrigation in the wide-spread gravity irrigation distribution systems of south-east Australia. In addition, pipelining of open channels can also achieve savings but may only be an economic option in specific systems. Table 3.2 outlines water savings projects that have been completed, commenced or are being considered by the Government for northern Victoria.

Table 3.2 Potential savings in Victoria’s Murray and Goulburn irrigation systems

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Savings (ML)</th>
<th>Cost to Gov’t ($/ML)</th>
<th>Cumulative Saving (ML)</th>
<th>Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipeline Woorinen horticultural area^</td>
<td>2,000</td>
<td>4,500</td>
<td>2,000</td>
<td>Completed</td>
</tr>
<tr>
<td>Pipeline Normanville domestic and stock system^</td>
<td>3,600</td>
<td>1,000</td>
<td>5,600</td>
<td>Completed</td>
</tr>
<tr>
<td>Measure small unmetered outlets (mainly domestic and stock)</td>
<td>16,000</td>
<td>700</td>
<td>21,600</td>
<td>Commenced</td>
</tr>
<tr>
<td>Decommission Lake Mokoan and associated projects*</td>
<td>44,000</td>
<td>1,300</td>
<td>65,600</td>
<td>Due to commence</td>
</tr>
<tr>
<td>Progressive implementation of channel automation</td>
<td>350,000</td>
<td>1,500</td>
<td>415,600</td>
<td>Pilot nearing completion; next project commencing</td>
</tr>
<tr>
<td>(300,000 – 400,000)</td>
<td></td>
<td>(1,200 – 1,800)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pipeline small run-down channels</td>
<td>30,000</td>
<td>4,000</td>
<td>445,600</td>
<td>Under consideration</td>
</tr>
</tbody>
</table>

^ A Snowy River project

* Associated projects will be undertaken to maintain the supply reliability to Broken System licensed diverters and to allow a proportion of the savings to be transferred to the Snowy River. Projects include:
  - Pipeline Casey’s Weir Domestic and Stock system;
  - Supply Casey’s Weir Domestic and Stock from Murray/Goulburn system;
  - Channel Automation on Broken Creek and River;
  - Pipeline East Shepparton Domestic and Stock supplies;
  - Raise Lake Nillahcoote dam wall;
  - Purchase water entitlement from Goulburn/Murray systems to negate lost regulated flow; and
  - Incorporation of Lake Boga into the Murray supply system (this component of the project is still under investigation).
Water recycling and reuse and demand management

In urban systems, the Environmental Water Reserve can be enhanced by substituting water used for consumptive purposes with recycled or reused water, or by using recycled water, of adequate quality, to boost environmental flows. Further water can be saved and returned to the environment through demand management and water conservation strategies.

Changes in system management

Changing the way our water systems are managed can also recover water for the environment. In line with this approach, system management will be changed in northern Victoria.

As outlined in Chapter 2, the Government will legally recognise 'sales' water in northern Victoria as a new form of lower reliability entitlement. This reform provides significant benefits to the irrigation community, with ongoing, tradeable entitlements for water previously allocated annually as sales water. However, recognising the substantial economic gains this provides for irrigators, the Government considers this reform should be accompanied by some benefit for the environment.

This decision is a landmark change for water management across Australia. It provides improved security and choice for irrigators, a substantial increase in Environmental Water Reserves and the capacity to significantly improve environmental flows in several northern Victorian rivers. More details are outlined in Chapter 4.

Catchment management authorities along the River Murray will jointly oversee the development of an operating strategy for the management of this new environmental entitlement.

When implementation is complete, the benefits of introducing similar arrangements into southern areas of the State will be discussed with water authorities and their customers.

Reconfiguring irrigation services

Chapter 4 outlines the Government’s approach to establishing a sustainable, high value irrigation industry. One of the key areas which it discusses in detail is the need for water authorities to upgrade and rationalise irrigation distribution systems where:

• the land is not suitable for irrigation, perhaps due to poor, salinised soil;
• large volumes of water have been traded out of the system, making it uneconomic to continue to supply; and
• an area is flood prone, has outdated infrastructure or is experiencing urban incursion.

The primary aim of system reconfiguration is to ensure a financially viable and sustainable irrigation system. Reconfiguring these systems will also create opportunities to recover water for the environment. The Government will co-invest in irrigation reconfiguration programs to recover water for the environment in areas where this will also provide clear benefits to the community and to industry.

Purchasing water through the water market

The Government will purchase water for the environment where this is the most efficient and appropriate means of recovering water. The Government recognises that there is concern about its involvement in the water market and is aware of the potential socio-economic side-effects of directly purchasing large volumes of water on the market. However, there are a number of ways in which the Government could buy water in addition to standing in the market. These include targeting priority areas, offering tender processes or local group solutions where the Government may enter into agreements with rural water authorities or water service committees to return water over a set period for payment with the method of water recovery to be determined locally.

In making a decision on how to purchase water, the Government, as far as possible, will seek to provide long-term, environmental, social and/or industry benefits in the region.

Where the Minister decides that water will be bought on the market, this will be coordinated by the Department of Sustainability and Environment (DSE).
Enabling donations

Water can be provided for the environment through enabling private donations. Some community members have expressed interest in donating water to the environment. The Government will facilitate permanent or temporary water donations and the Environmental Water Reserve will be adjusted accordingly. DSE will establish processes for the temporary donation of water to the environment in time for the 2005-06 irrigation season.

On-farm water savings

The Government recognised that the ability for irrigators to utilise their water savings from on-farm investments is a major reason for their willingness to adopt more environmentally friendly irrigation practices. In return, these improved irrigation practices can provide direct environmental benefits to our river systems. For example, in the potato growing area in the Victorian Central Highlands north of Ballarat, the adoption of improved irrigation systems has been shown to reduce water use by between 30 per cent and 50 per cent. This has the potential to significantly reduce the reliance on the Moorabool River.

The Government will boost funding for the Water Smart Farms and Sustainable Irrigation Land Management programs.

Enhancing the Environmental Water Reserve in unregulated rivers and aquifers

The Government aims to provide ecologically sustainable Environmental Water Reserves for all unregulated rivers. In most cases, this will be achieved through better management of existing diversions and the introduction of sustainable diversion limits for the winter months. However, a number of rivers are stressed because too much water is taken during summer, or because aquifers directly contributing groundwater to them are over-allocated.

In stressed unregulated rivers one of the key actions required is changing the pattern of diversions, moving diverters from taking water in summer to diverting water in winter when in most instances this will cause less ecological damage.

Decisions on where this will be necessary will be made in a Stream Flow Management Plans (SFMPs). SFMPs set out clear objectives and actions for achieving sustainable Environmental Water Reserves. In many cases, this will be through cost-sharing with farmers on off-set measures such as building off-stream winter-fill dams. Plans will also clarify levels of security for water users and include rules for rostering, trading and the granting of any new licences.

Stressed aquifers will be managed in a similar way through Groundwater Management Plans (GMPs). The SFMPs or GMPs will identify the impact on current commercial or irrigation users and define appropriate cost shares based on the public and private benefits of any offset measures.

The plans will be based on a scientific understanding of the flow regime and groundwater levels needed to sustain the agreed ecological objectives, and will be endorsed by the Minister for Water. Rural water authorities will be required to manage licensed extractions to achieve the Environmental Water Reserve within ten years of the completion of the plan.

In these streams, enhancement of the Environmental Water Reserve will be complemented by habitat and river restoration works identified in the associated regional River Health Strategy. In three river systems, the Upper Ovens River, Kiewa River and Woori Yallock Creek catchments, Stream Flow Management Plans will be developed and implemented. However, due to the size of the catchments, the scale of water use and the adjustment required to implement a sustainable Environmental Water Reserve, these may take longer than five years to implement.

Action

3.7 The Government will boost funding for:

- Water Smart Farms programs by $5 million over four years; and
- the Sustainable Irrigation Land Management program by $8 million over four years.

The boost in funding will accelerate improvements in: the security of irrigators’ water; reductions in adverse impacts of irrigation; addressing the legacy of history; and securing water for environmental flows.

Where the Government uses any of these approaches outlined in this section to recover water for environmental purposes, this water will be used to enhance the Environmental Water Reserve. Where investments are made in projects for multiple benefits or other benefits such as regional development, and/or social outcomes, water savings will be directed accordingly and transparently.
Action 3.8

Over the next five years the Government will provide ecologically sustainable Environmental Water Reserves in the 21 priority unregulated rivers shown in Figure 3.4 through:

- the development of Stream Flow Management Plans;
- moving diverters from taking water in summer to diverting water in winter when in most instances this will cause less ecological damage; and
- co-investing with farmers to assist them to build off-stream dams and harvest their water in winter.

Figure 3.4 Unregulated rivers scheduled for a Stream Flow Management Plan
Table 3.3 Investing to enhance the Environmental Water Reserve

<table>
<thead>
<tr>
<th>Task</th>
<th>Regional roles</th>
<th>State roles</th>
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<tbody>
<tr>
<td>Recovering water for the environment</td>
<td>CMAs set regional priorities to:</td>
<td>DSE establishes a Sustainable Water Strategy process for the region which includes:</td>
</tr>
<tr>
<td></td>
<td>• determine ecological objectives and water requirements for rivers and wetlands;</td>
<td>• assessment of regional priorities against criteria;</td>
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<tr>
<td></td>
<td>• establish regional priorities for:</td>
<td>• identification of options for water recovery;</td>
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<tr>
<td></td>
<td>- water recovery in regulated systems;</td>
<td>• consideration of environmental, economic and social costs and benefits; and</td>
</tr>
<tr>
<td></td>
<td>- Stream Flow Management Plans in unregulated rivers; and</td>
<td>• development of recommendations for water recovery.</td>
</tr>
<tr>
<td></td>
<td>• input regional priorities to Sustainable Water Strategy process.</td>
<td></td>
</tr>
<tr>
<td>Implementing water recovery projects</td>
<td>Water authorities implement water savings projects in regulated river systems</td>
<td>DSE oversees and audits water recovery projects</td>
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<td></td>
<td>CMA sets Stream Flow Management Plan implementation</td>
<td>DSE organises purchase of water</td>
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<td></td>
<td>CMA sets implementation of Groundwater Management Plans</td>
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<td></td>
<td>Water authorities and CMA jointly manage structural adjustment projects</td>
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<tr>
<td>Adjusting water entitlements and</td>
<td>Minister adjusts water entitlements</td>
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<td>Environmental Water Reserve</td>
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<tr>
<td>Management of the enhanced Environmental</td>
<td>CMA manages enhanced Environmental Water Reserve</td>
<td>DSE oversees and audits</td>
</tr>
<tr>
<td>Environmental Water Reserve</td>
<td></td>
<td>The Murray-Darling Basin Ministerial Council will have a role in coordinating the use of the environmental water reserve in northern Victoria to achieve agreed outcomes for the River Murray</td>
</tr>
</tbody>
</table>

Where investments are made in projects for multiple benefits or other benefits such as regional development, and/or social outcomes, water savings will be directed accordingly and transparently.
Recovering water in northern Victorian rivers

The Government is strongly committed to collective action between governments to restore the health of the Snowy and Murray Rivers. Victoria has secured commitment from the New South Wales and the Commonwealth Governments to return 21 per cent of the original flow (212,000 megalitres) to the Snowy River and 70,000 megalitres of water to the River Murray over 10 years. This will be supported by a total Government investment of $375 million ($150 million each from Victoria and New South Wales and $75 million from the Commonwealth Government).

Ultimately, the inter-governmental commitment aims to return 28 per cent of original flow levels (294,000 megalitres) to the Snowy River.

The Victorian Government has also committed $115 million towards the joint $500 million investment through COAG to address water over-allocation in the Murray-Darling Basin. This investment will underpin Victoria’s strong commitment towards the Living Murray which aims to recover 500,000 megalitres of water over five years to improve environmental flows at six icon sites along the River Murray.

Meeting this commitment will require firm targets for water recovery and a cooperative effort between governments. Investment in water recovery for the Living Murray is being worked through on a multilateral basis, with Victoria, New South Wales, the Commonwealth, South Australia and the ACT sharing responsibility for investment.

The Government considers that this ‘first step’ will advance the health of the Murray, but is keen to look in the future at what needs to be done as a second step to ensure a healthy river.

The Government acknowledges that meeting these requirements will require significant adjustments in water use within Victoria and the Murray-Darling Basin over the next decade.

Policy

In meeting obligations to the Snowy and Murray Rivers, the Government will also aim to:

- provide improved environmental flows in other Victorian tributaries and wetlands;
- assist the transition to a high value, low impact, sustainable irrigation industry in Victoria;
- maintain security of Victoria’s water entitlements;
- ensure Victoria’s irrigation industry is not competitively disadvantaged;
- maintain its role as the manager of the environment;
- invest in projects with social, environmental and industry benefits for Victorian communities, in the most cost-effective way; and
- ensure water recovery processes for the Snowy and Murray Rivers are integrated to achieve the best outcome for northern Victoria.

In the Living Murray process, the Government’s approach in the first instance will be to take action to recover water via water savings projects, system management changes and strategic water purchases in Victoria to provide improved flows to the Murray via Victorian tributaries.

The Government expects that the water recovered by Victoria for the Murray will be recognised within the Living Murray process and co-funded by the Commonwealth and other States.

Investment to recover water for the environment, under the Living Murray process, will be managed, where possible, to ensure improved environmental flows in Victorian tributaries and wetlands as well as the six icon sites along the River Murray. To achieve this CMAs will jointly oversee the development of long-term operating strategies for water recovered and held in storage to optimise use of the water within Victoria and at the icon sites. The Murray-Darling Basin Ministerial Council will coordinate activities and refine operating strategies before they are finalised.
Final arrangements for the management of water recovered for the Living Murray will reflect a tiered approach, marrying regional objectives and management programs overseen by the CMAs, with State objectives provided through DSE and the MDBC taking a coordination role, ensuring that Basin-wide objectives are met.

Over the last three to four years the Victorian Government has investigated potential water savings projects within northern Victoria, environmental flow requirements of Victorian rivers and has identified the issues in implementing water recovery. This work includes:

- environmental flow assessments of the Ovens, Broken, Goulburn, Campaspe and Loddon rivers;
- assessing the watering requirements of Barmah, Gunbower, Lindsay/Wallpolia and Hattah Lakes wetland complexes and implementing effective environmental management;
- extensive analysis of the potential for water savings in the irrigation distribution systems and headworks systems of northern Victoria;
- review of water supply infrastructure and operations within the Goulburn-Murray Irrigation District;
- the Woorinen and Normanville pipeline projects, which respectively have provided 2,000 megalitres and 3,600 megalitres of water savings;
- a pilot project into the introduction of new channel automation technology near Tatura; and
- detailed examination of options and associated works to achieve water savings from Lake Mokoan in north-east Victoria.

There is significant potential for water savings and environmental improvement in northern Victoria. However, an initial analysis based on this detailed experience suggests that providing the required volume of water within the agreed timeframes will require more than just investment in water savings projects. It will also require changes in system management and the purchase of water, either directly from the water market or through targeted adjustment projects.

The Government will begin recovering water to meet its commitments to the Snowy and Murray Rivers through allocation of 20 per cent of the new lower reliability entitlements, 25,000 megalitres of high reliability water (this is described in Chapter 4), and decommissioning Lake Mokoan, where significant investigation and consultation work has already been undertaken and which has been shown to be highly economic.
Decommissioning Lake Mokoan

Following a comprehensive 18-month study and extensive community and industry consultation, the Government will decommission the man-made Lake Mokoan, rehabilitate the Winton wetlands system and recover water for the environment.

This landmark decision represents the first time a Victorian Government has ever decommissioned a major reservoir.

The Government believes it will deliver a win for the environment and a win for irrigators in the Goulburn Murray Irrigation District.

As a water storage reservoir, Lake Mokoan is inefficient. It loses 50,000 megalitres per year through evaporation, which is more than five times the annual water supply to Shepparton.

High evaporation from Lake Mokoan is a result of its large surface area (approx 7,800 ha) and warm climatic conditions in the north of the State. Unlike water storages, such as Lake Eildon that deliver high level benefits to irrigators, Lake Mokoan is inherently inefficient given the high volume of water diversions required from the Broken River simply to replace water lost through evaporation.

In addition, since the mid-1980s, in most years the Lake has been affected by toxic blue-green algal blooms and high levels of turbidity have increased water treatment costs for Shepparton.

The Lake’s annual operating costs of more than $600,000 are largely paid by irrigators outside the region who derive little benefit from it. This operating cost does not include the cost of fish stocking in the lake or water quality improvement works.

Figure 3.6 Blue-green algal bloom on Lake Mokoan

Photo courtesy of Goulburn-Murray Water.

Action

3.9 The Government will begin meeting its commitments to the Snowy and Living Murray projects by:

- providing on average 120,000 megalitres of lower reliability water and 25,000 megalitres of high reliability water for environmental flows in the River Murray and its tributaries;
- decommissioning Lake Mokoan, delivering 44,000 megalitres in water savings annually to improve environmental flows for the Snowy and Murray Rivers whilst maintaining irrigators’ reliability of supply and delivering increased efficiencies for water supply by undertaking a range of works; and
- undertaking a Sustainable Water Strategy for northern Victoria prior to the end of the first step for the Living Murray to inform any further action on the River Murray.
Over the last 18 months, a comprehensive study of Lake Mokoan’s future has been completed. Extensive community consultation has included input from a community reference group and two opportunities for the public to make submissions. This process examined six options for the future of the lake, ranging from retention to decommissioning. For each option, full consideration was given to the social, economic and environmental impacts on both the local and broader community.

Based on the study findings, the justification for decommissioning Lake Mokoan is compelling. Irrigators and townships downstream of Lake Mokoan will benefit from improved water quality. For irrigators outside the region, the decision removes the inequity of them paying the lake’s high operating costs. Decommissioning will also remove the future cost of upgrading dam safety.

In making its decision to decommission Lake Mokoan, the Government is making a commitment to irrigators that their existing reliability of water supply will be unaffected. To this end, the Government will commission a major works program to reduce losses, provide alternate sources of supply and increase the operating efficiency of the Broken basin water supply system. The implementation of this program will be phased such that the works are in place and effective before the Government will complete the lake’s decommissioning.

The 44,000 megalitres of water recovered each year will significantly boost the environmental flow and ecological health of the Broken, Goulburn, Murray and Snowy Rivers. In addition, the Winton wetland system will be rehabilitated in full consultation with the local community.

Native fish stocking programs will be enhanced throughout the region. Lakes Eildon, Nillahcootie, Buffalo, Hume, and the Lower Ovens River will provide comparable experiences for boat-based anglers. Shore-based anglers will find alternative locations on the Broken and Goulburn Rivers, the Broken Creek, Lake Kerford and Sambell, among others. Fisheries Victoria is accelerating the development of alternative fisheries with Lake Buffalo receiving an extra 50,000 golden perch since 2000 and Lake Nillahcootie receiving an extra 35,000 golden perch and 131,100 Murray cod.

Native fish habitat in the Broken River will also be improved through river health works to complement increased environmental flows. Riparian and instream activities at a number of sites throughout the Broken catchment will improve stream health and water quality. Several weirs currently impeding fish migration will be remodelled or removed to improve fish passage.

Lake Mokoan is used for other recreational pursuits, including duck hunting, boating, yachting, picnicking and camping. In recognition of the changes associated with decommissioning the lake, recreation and tourism strategies, based on the new land use will be developed in conjunction with Regional Development Victoria and the Benalla Rural City Council. The plans will consider alternate sites for yachting and development of the recreational and tourism potential of the rehabilitated site.

Figure 3.7 Schematic of Lake Mokoan and the original Winton Wetlands
Irrigator community  
Remove an inefficient water storage, which will save Goulburn Murray Water and their customers about $676,000 each year in operation and maintenance costs.  
Avoid dam safety costs, which would be imposed on Goulburn Murray Water customers, in the order of $20 million in the next ten years.  
Improve the water supply efficiency of irrigation and domestic and stock water in the Broken River system. Lower River Murray irrigators will have supplementary supply available through the use of Lake Boga.  
Maintain reliability of supply to water users in the Broken, Goulburn or Murray irrigation systems. Such measures may include:  
- piping of Casey’s Weir and Major Creek Waterworks District (Tungamah) system;  
- supply Tungamah system (above) from the Goulburn or Murray rivers;  
- implementing new channel automation system technology on the Broken River and Broken Creek;  
- raise Lake Nillahcootie;  
- supply diverters on the Broken River from the East Goulburn Main Channel; and  
- pipeline East Shepparton Water Works District.

Environmental  
Significantly improve the ecological health of the Broken and lower Goulburn rivers through the provision of more natural flow regimes and improved water quality.  
Restore the Winton wetland complex to a significant natural asset for the community of the Broken region. DSE will work closely with the local community to develop and implement the vision for the recovered land.  
Through the improved ecological health of waterways, enhance native fisheries in the Snowy River, River Murray, and the Broken Basin.  
Significantly improve the health of the Snowy River, providing up to 20,000 megalitres of water as environmental flows.  
Deliver 24,000 megalitres in additional flows to the River Murray below Barmah Choke.

Table 3.4 Benefits of decommissioning Lake Mokoan

Native fish stocking programs will be enhanced throughout the region. Recreation and tourism strategies, based on new land use, will be developed.
The Thomson and Macalister Rivers are West Gippsland’s most significant waterways. Removing water to supply Melbourne and the Macalister Irrigation District has degraded the health of these rivers. The Thomson Reservoir, with a capacity of more than one million megalitres, is capable of diverting up to 73 per cent of all inflows to Melbourne. This has a significant impact on the flows and environmental health of the Thomson River. The Thomson Reservoir provides about 60 per cent of Melbourne’s total system storage capacity and safeguards Melbourne’s water supply during drought.

A variety of native fish, including the threatened Australian grayling, inhabit these river systems. These rivers provide significant freshwater flows into the Gippsland Lakes and regularly inundate the internationally recognised fringing wetlands. Both rivers’ upper reaches are relatively uncleared and in good ecological condition and the Thomson River from the reservoir to Cowwarr Weir is a designated Heritage River based on ecological, historical and recreational features. The upper Thomson River is also a popular spot for canoeing and rafting.

Rehabilitating and improving the health of the lower reaches of these two rivers will create a valuable habitat corridor connecting the uncleared upper catchments with the Gippsland Lakes and wetlands.

The Minister for Water convened the Thomson Macalister Environmental Flows Task Force to assess environmental flows of the Thomson and Macalister Rivers. The Task Force has recommended:

- increased environmental flows in both the Thomson and Macalister Rivers to protect and sustain ecological health;
- provision of the necessary water through water savings from Melbourne and the Macalister Irrigation District distribution systems;
- an integrated river restoration program to improve all aspects of river health; and
- monitoring and assessment of the ecological benefits associated with increased environmental flows.

The Government, on the basis of the Task Force report, will return water to the Thomson and Macalister Rivers to improve environmental flows. Over the next ten years, the Government will work with the local community to address and improve all aspects of the health of these two rivers. Reliability of water supply to irrigators in the Macalister Irrigation District and the residents of Melbourne will be maintained.

Figure 3.8 Key actions to restore the health of the Thomson and Macalister Rivers
**Policy**

The Government, in line with the Thomson Macalister Environmental Flows Task Force report, will progressively restore the health of the Thomson and Macalister Rivers by improving environmental flows and reinstating river habitat.

The Government will ensure that improving environmental flows in these rivers will not reduce:

- the current reliability of water supply for irrigators; and
- the capability to meet Melbourne's water needs given the introduction of permanent water savings measures and the availability of a modest supply surplus.

The Task Force report was also an outcome of National Competition Policy water environmental flow requirements. Federal funding through the National Water Initiative should be provided to help restore the Thomson and Macalister Rivers.

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**Action**

### 3.10

Over the next ten years, the Government will aim to provide an average of 25,000 megalitres* of additional environmental flows to improve the health of the Thomson River, Macalister River and Gippsland Lakes. The Government will also restore critical river and wetland habitat.

The additional environmental flows will be provided in two stages:

1. In the short term an additional:
   - 10,000 megalitres will be provided for the Thomson River as a bulk entitlement for the environment, three months after current water restrictions in Melbourne are lifted and permanent water savings measures are introduced; and
   - 5,000 megalitres will be provided for the Macalister River, by the end of 2006. This will be recovered through a $5 million project to improve distribution infrastructure in the Macalister Irrigation District,

2. Within the next ten years a further:
   - 8,000 megalitres will be provided for the Thomson River. This will be recovered from system savings. The process and schedule for recovery of this water will be determined in the 2005 Central Region Sustainable Water Strategy; and
   - 2,000 megalitres will be provided for the Macalister River. This will be recovered through water efficiency savings and the Government has committed $3 million (in addition to the $5 million discussed above) to the recovery of this water through improvements and modernising the water supply system of the Macalister Irrigation District.

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* The 25,000 megalitres and the subsidiary volumes described are the estimated average annual volumes that are required to provide for the environmental flows described in Appendix B.
The long-term aim of the Government is to provide sufficient environmental flows to sustain the ecological objectives described by the Task Force as the desired end point for a healthy river ecosystem for the Thomson and Macalister Rivers. An adaptive approach to maximise the ecological benefits of the environmental flows and a ten year monitoring program will be undertaken to inform the effective management of the Environmental Water Reserve. Within ten years, the restoration program will be reviewed against the ecological objectives and if necessary further action will be considered.

The additional environmental flows will provide the flow regime outlined in Appendix B. For the Macalister River the flows described will be provided in 85 per cent of years.

The further 8,000 megalitres of water required for the Thomson River as part of Stage Two will be recovered through water savings. The process and schedule for the recovery of this water will be identified in the 2005 Central Region Sustainable Water Strategy (SWS). The SWS will also examine Melbourne’s progress in meeting water conservation targets, including major water recycling initiatives, and the volumes of water recovered through the Macalister Irrigation District Upgrade Projects. An expert task force will advise on the appropriate water conservation targets for Melbourne. On the basis of this information the most effective means of recovery will be determined and a detailed implementation schedule defined.

The West Gippsland Catchment Management Authority will manage, monitor and assess the adequacy of the improved Environmental Water Reserve. The Government has provided an initial $1.4 million in 2004-05 to improve all aspects of the health of the Thomson and Macalister Rivers. The West Gippsland CMA will:

• develop an operating strategy for management of the Environmental Water Reserve. This will be submitted to the Minister for Water and Environment for endorsement by March 2005;
• undertake a habitat improvement program;
• assess, and if necessary negotiate, the undertaking of works to enable the dams and weirs to pass the required environmental flows; and
• formulate and implement a ten year monitoring program to determine the benefits associated with the increases in flow.

The Government will review the health of the Thomson and Macalister Rivers against the Task Force objectives (Appendix B), within ten years.

### Action

#### 3.11

The Government will enhance the Environmental Water Reserve of Wimmera and Glenelg Rivers by establishing a bulk water entitlement specifically for the environment. This will be held by the Minister for Environment and managed by the Wimmera and Glenelg-Hopkins Catchment Management Authorities. The entitlement has the potential to be progressively amended to include additional water for the environment recovered through the proposed Wimmera-Mallee Pipeline Project.

The Government has already committed $77 million towards the pipeline project, subject to funding from the Commonwealth and the completion of a detailed business case. The Government will consider increasing its funding commitment depending on the outcomes of the joint government review of the business case.
The Northern Mallee Pipeline Project (constructed between 1992 to 2001) piped the northern section of the open channel supply system. This is saving 49,500 megalitres of water per year, of which 34,690 megalitres per year is available for the environment. Most of the environment's share will be stored in the Wimmera-Mallee reservoirs in the Grampians. The secure water entitlement means the water can only be used for the environment and will be used to improve summer base flows and boost winter base and fresh flows. The Wimmera and Glenelg-Hopkins Catchment Management Authorities will jointly manage the Environmental Water Reserve.

Despite this significant boost to the Environmental Water Reserve, additional flows are required to provide a healthy aquatic ecosystem in the Wimmera and Glenelg Rivers. The Government would provide more water for a sustainable Environmental Water Reserve if piping of the remaining 75 per cent of the Wimmera Mallee Domestic and Stock system proceeded.

The system delivers in the order of 17,000 megalitres to landholders across 10 per cent of the State and piping the system should save about 103,000 megalitres of water, which is currently lost in transit through seepage and evaporation.

The Werribee River

**Action**

3.12 The Government will enhance the Environmental Water Reserve in the Werribee River through implementation of the Werribee Irrigation District Recycled Water scheme.

3.13 In enhancing the Environmental Water Reserve, it will ensure that the provision of increased environmental flows in these rivers will not impact on water users’ reliability of supply.

The Werribee, Moorabool and Barvon Rivers, to the west of Melbourne, have highly variable flows. The Werribee River now has an environmental flow provision of one megalitre per day, below the Weir. This is not enough to sustain a healthy river. In droughts, the river can remain at this one megalitre flow for several years, harming gums, platypus and fish as well as the river’s social values for the community.

Substitution of irrigation water from the Werribee River with recycled water from the Western Treatment Plant could potentially recover water to supplement environmental flows.

In January 2004, the Government announced the implementation of a 55 megalitres per day Class A recycled water scheme for the Werribee Irrigation District. When implemented, it will deliver up to 6,800 megalitres of recycled water a year to about 130 farmers. This frees up to 2,000 megalitres per year, previously used as sales water. The extra water will be held in a ‘sales water trust’ for five years until salinity levels of the recycled water are reduced. At this point, the majority of these water savings will be made available to the environment to enhance flows in the Werribee River.

The Government has committed $77 million towards the Wimmera-Mallee Pipeline Project and will enhance the Environmental Water Reserve of the Wimmera and Glenelg Rivers.
Managing the Environmental Water Reserve

Where water is recovered to improve environmental flows, it will be formally added to the Environmental Water Reserve. It is vital to manage the reserve within a broader integrated river restoration program to ensure we achieve healthy rivers, floodplains, estuaries and catchments.

The Government will adopt the following principles for management of the Environmental Water Reserve.

**Action**

3.14 The Government will:

- give catchment management authorities responsibility for the operational management of the Environmental Water Reserve, enhancing their role as caretakers of river health;
- ensure bulk entitlements for the environment are held by the Minister for Environment with the management of any new environmental bulk entitlements delegated to CMAs;
- allow limited trading of bulk entitlements for the environment where this complements ecological objectives for the Environmental Water Reserve;
- require water authorities to work closely with catchment management authorities to maximise Environmental Water Reserve benefits and ensure changes to water supply systems do not diminish the effectiveness of the reserve;
- amend legislation to broaden the waterway management function to include management of the Environmental Water Reserve and implementing integrated management of river health; and
- strengthen governance and funding frameworks for CMAs to include improved performance monitoring and evaluation (this is discussed in Chapter 7).

**Policy**

Management of the Environmental Water Reserve will:

- be aimed at achieving ecological objectives for the protection and/or restoration of priority river, wetland and aquifer assets;
- be undertaken as one key component of an integrated program of river, wetland and aquifer restoration aimed at achieving ecological objectives (e.g. covering land management, water quality, habitat restoration and groundwater management);
- aim to achieve the most effective use of environmental water, achieving the greatest level of environmental benefits possible and minimising as far as possible any adverse impacts on water users; and
- engage communities, particularly where these are likely to be affected by the water management regime.

It is also recognised that the manner in which other water users manage their allocations can impact on the effectiveness of the Environmental Water Reserve and on the ecological assets of the system.
CMAs – Managers of the Environmental Water Reserve

Catchment management authorities (CMAs) were established by the Government in 1997, as community-based organisations responsible for integrated planning and coordination of land and water management in each of the State’s catchment-based regions and which, in regional Victoria, would provide integrated river and floodplain management.

The Victorian River Health Strategy (2002) extended their role from waterway and floodplain management to ‘caretakers of river health’ as the first step in establishing institutional arrangements to deliver integrated river protection and restoration.

The Government considers that CMAs are best placed to manage the operational delivery of the Environmental Water Reserve in regional Victoria. In the metropolitan area, Melbourne Water, as the waterway manager, will undertake this role.

CMAs, in taking on this function, will have to ensure that environmental flows are managed as part of an integrated river and wetland restoration program. The allocation of this role is consistent with the CMAs’ existing roles in regional and catchment planning and coordination, and will benefit from their community consultation linkages.

CMAs will manage any new bulk entitlements for the environment but these entitlements will be formally held by the Minister for the Environment. Current arrangements for the existing environmental bulk entitlement will remain. As CMAs evolve as active managers of the Environmental Water Reserve, the Government may consider it appropriate for them to hold specific bulk entitlements for the environment. Consequently, in amending legislation, an enabling provision will be included to allow this to happen. However, this will not be brought into operation without a clear policy decision by the Minister and a formal process.

The functions associated with managing the Environmental Water Reserve will differ depending on how the Environmental Water Reserve is provided.

Where there is an environmental bulk entitlement held in storage, CMAs will be required to develop a long-term operating strategy for the allocation. This will define the target ecosystems that may be watered (e.g. river reaches, individual wetland areas), how and under what conditions they will be watered, how much (if any) of the allocation is tradeable and the circumstances under which it could be traded. In developing an operating strategy, CMAs will liaise with the ecosystem managers, neighbouring CMAs, DSE and other key stakeholders and will require the approval of the Minister for the Environment and the Minister for Water.

Trading Environmental Water

Where there is a bulk entitlement for the environment held in storage, the Government will allow for all or part of it to be traded on the temporary water market where this does not affect the achievement of the objectives of the Environmental Water Reserve.

Trading will only be allowed within the constraints outlined in the operating strategy for the allocation and for that part of the entitlement deemed tradeable.

Each year, in line with the operating strategy:

- the environmental condition of each of the target ecosystems will be assessed, or a decision made on whether conditions for temporary trading are met and consultation undertaken with local groups;
- advice will be provided to the Secretary of the Department of Sustainability and Environment (DSE), on the volume available for trade or required on the temporary market; and
- the Secretary will approve the trade which occurs through an independent broker.

Funds from temporary trading will be used, according to statewide guidelines and priorities prepared by DSE, for environmental water management costs, works to improve the effectiveness of environmental flows, or the temporary purchase of water when necessary.
The full responsibilities associated with the operational management of the Environmental Water Reserve are listed in Appendix C and the full set of functions and responsibilities for a CMA are outlined in Appendix D. In addition to these functions is the role of CMAs and other agencies in the management of fish kills which will be outlined in a statewide protocol that is currently being developed.

Amendments will be made to legislation to better recognise the functions and activities required to manage river health, including the management of the Environmental Water Reserve and to assign this function to CMAs.

Water authorities and the Environmental Water Reserve

The Government recognises the way a water authority manages its entitlement and undertakes its licensing functions can have a significant impact on the effectiveness of the Environmental Water Reserve. This is because the Environmental Water Reserve is not just a volume of water but a flow regime and water level in groundwater management areas.

By changing water management procedures, a water authority can significantly change the river flow regime or groundwater levels and therefore affect aquatic ecosystems.

Conversely, there is scope for water authorities to fine-tune the operation of their water supply systems and improve the effectiveness of the Environmental Water Reserve without impacting on existing entitlements.

For these reasons, the Government will require water authorities to liaise with the relevant CMA to develop the most effective delivery pattern for the Environmental Water Reserve while still meeting their obligations to customers. Any change to the use of their entitlement, which could have a negative impact on the Environmental Water Reserve, will require the endorsement of the relevant CMA.

Charges associated with managing the Environmental Water Reserve

There are several cost allocation issues associated with the management of the Environmental Water Reserve, particularly when part of the Environmental Water Reserve is an allocation held in storage. These issues include:

- whether a charge should be imposed where water authority infrastructure is used to deliver environmental flows;
- whether the Environmental Water Reserve manager should pay a headworks charge; and
- who should bear the cost when an existing structure requires modification to deliver appropriate environmental flows.

The Government recognises that the primary purpose of water infrastructure is to supply water for towns and irrigation. In providing for these uses, there has been a negative impact on the environment. Even where decisions are taken to enhance the Environmental Water Reserve in a regulated system, the purpose and balance of the water system will still be in favour of consumptive use.

The Government’s policy on the charges associated with managing the Environmental Water Reserve recognises that:

- the primary purpose of water supply infrastructure is to supply firm, reliable entitlements for consumptive users;
- generally environmental entitlements can be managed with more flexibility than consumptive entitlements and therefore the environment can be provided with different levels of service to irrigators and other consumptive users; and
- water authorities have a duty to manage water resources in a sustainable manner and minimise the environmental impacts of their activities.

Policy

Costs associated with the management of the Environmental Water Reserve will reflect:

- the nature of the environmental entitlement in a particular water system;
- the level of service from the water supply infrastructure required to supply the Environmental Water Reserve to meet ecological objectives; and
- additional costs to a water authority business to provide this service.

The Government has developed a series of rules covering charges for costs associated with the Environmental Water Reserve.
Charges for the management of the Environmental Water Reserve

**In relation to headworks charges:**
- where the Environmental Water Reserve is provided as a bulk entitlement for the environment through a bulk entitlement conversion process, there will be no headworks charge;
- where the Environmental Water Reserve is provided as a non-tradeable entitlement or through conditions or rules attached to a consumptive bulk entitlement, there will be no headworks charge;
- where the manager of the Environmental Water Reserve holds a tradeable entitlement which is the same as a consumptive entitlement, in general, the manager will pay the same headworks costs as other users except where there is significant Government investment in recovering water for the environment. In these cases, the headwork charges may be varied to take into account the full range of benefits and costs associated with the investment; and
- where a headworks charge does apply to the Environmental Water Reserve, the manager may choose to pay either the annual headworks charge or a once-off capitalised equivalent.

**In relation to distribution systems:**
- where natural waterways are used as part of the distribution system, the Environmental Water Reserve will be given a reasonable share of capacity at no charge;
- if the Environmental Water Reserve manager requires water to be delivered when the distribution system is running at full capacity, it will pay a charge equivalent to irrigation distribution costs;
- if the Environmental Water Reserve manager requires water when there is spare capacity within the distribution system, it will pay the out-of-pocket expenses of the water authority in supplying the service; and
- in the development of the operating strategy for the environmental entitlement, the CMA will consult with the water authority to ensure, as far as possible, complementarity of use.

**In relation to capital costs of system modification to provide the Environmental Water Reserve:**
- where water authority assets are due for renewal or refurbishment, this will be undertaken by the authority to the best environmental practice of the day, including any requirements to better provide the Environmental Water Reserve. Where the Government wishes to accelerate this, it will contribute to the cost of system modification.
Irrigation is easily the predominant user of water in Victoria. It generates substantial – and growing – economic and regional benefits.
Smarter Use of Irrigation Water

1. **Key Challenges**

   For the irrigation sector to:
   - Prosper in a competitive, global environment by:
     - moving water to higher-value uses;
     - reconfiguring irrigation infrastructure; and
     - innovating and adopting new technology.
   - Adjust to changing community expectations about the environment by:
     - improving on-farm water use;
     - reducing losses in distribution systems; and
     - returning water to the environment.

2. **Government Initiatives**

   - Enlarging irrigator choice and improving the water trading system by unbundling water rights into a water share, a share of delivery capacity and a licence to use water on land.
   - Providing additional certainty for irrigators by turning ‘sales’ water into a legally recognised, independently tradeable entitlement.
   - Dealing with stranded assets by supporting annual charges for shares of delivery capacity that are tied to land.
   - Providing new processes and tools to help authorities rationalise and upgrade infrastructure.
   - Providing clearer rights to irrigate while ensuring practices are environmentally sound.

3. **Sustainable Outcomes**

   - A confident, profitable and adaptable irrigation sector that generates wealth for regional communities and Victoria.
   - An increase in the efficiency of irrigation systems across the State of 25 per cent by 2020.
   - Responsive irrigation supply systems that are effective and economic.
   - Lower salinity and nutrient side-effects of irrigation.
   - Freeing up of water for better environmental flows.
Introduction

Irrigation is easily the predominant user of water in Victoria, using more than 75 per cent of water harvested. It generates substantial – and growing – economic and regional benefits.

Irrigation-based produce like cheese and butter, fruit and wine, for which Victoria is rightly renowned, must play a key role in the achievement of the Government’s target of $12 billion a year in food and fibre exports.

The Government’s aspiration is for irrigation to be increasingly productive, with lower environmental impact.

The Government recognises that irrigated agriculture has been steadily improving its use of water. This improvement has been developing as individual farm businesses strive to contain costs and boost output in highly competitive, global marketplaces. Businesses have also been responding to caps on the water taken from rivers and to the worst drought in a century.

The Victorian Government has contributed to this progress by opening up trade in water entitlements, keeping these entitlements firm and reliable, supporting technological advances, assisting irrigators to develop regional land and water plans, and providing training and incentives.

This chapter maps out five areas where further reforms will now be carried out to maintain the drive to smarter use of water:

- refining water entitlements to widen choice;
- simplifying and providing more certainty about water shares;
- dealing with channel congestion and stranded assets;
- upgrading and rationalising authorities’ water distribution services; and
- helping water use on farms to be sustainable.

These reforms will further Victoria’s national leadership in improving the performance and value of the country’s irrigation sector.

In setting out its reforms, the Government is aware that the drought and other factors have hit many irrigators severely. The long-term reduction in dairy farm numbers in the northern irrigation areas of 1.2 per cent a year, accelerated in the three years to 2003 to 6.5 per cent a year.

The Government is supporting local solutions, providing certainty about water entitlements, and implementing change gradually. Dairying accounts for over half of Victoria’s irrigation-based exports: it is an important part of our State’s prosperity into the future.
Refining Water Entitlements to Improve Choice

The market in water entitlements has been creating opportunities for farm businesses and has been a powerful driver for water to be put to better use. The Government is now lifting the water market to a new level.

The ‘unbundling’ of entitlements into their components will create benefits for irrigators. It will:

• make trade easier, by separating tradeable elements from other elements;
• reduce borrowing costs, by providing for mortgages directly over water;
• assist leasing, by recording the shares of delivery capacity of both people leasing out and people leasing in;
• enable a brokering body to offer products tailored to irrigator demand; and
• make it easier for irrigators to adjust either the reliability of their water supplies, or the timeliness of having water delivered, to suit their individual enterprises.

There is concern in the irrigation community that non-irrigators could buy up much of the water and drive up its price. The Government believes this risk is more imagined than real. No water will be available to buy unless irrigators choose to sell. In the long-term, the price of water will be based on the value people generate from actually using it.

Nevertheless, the Government will establish safeguards so people can be reassured that ‘water barons’ will not monopolise the market.

An initial idea was to place a limit on the holdings by any non-irrigator, of five per cent of the water entitlement in a supply system (e.g. the Goulburn supply system). However, many farmers doubt such a measure's effectiveness, saying it would mean just 20 businesses could own all the water.

The Government will develop legislation to enable unbundling of water entitlements into their main components. A limit will be placed on the total volume of water that can be held by non-water users in each supply system (e.g. the Goulburn system) equal to 10 per cent of the system’s entitlement.

It is unlikely that this limit will be reached in the near future. All the permanent trade that has ever taken place in the 12 years since it began has not yet amounted to 10 per cent of entitlement. Moreover, much of the permanent trade will continue to be from one irrigation business to another.

Figure 4.1 Components of a water entitlement
The opportunities opened up by unbundling

Allowing this limited portion of water to be held by non-water users will offer more choices to farmers in how they deploy their capital and manage their risks.

A share farmer, for example, could start building equity in an irrigation business by buying water.

An irrigator wishing to have a particular lease over water (e.g. 45 megalitres for six and a half years with special conditions such as an option to buy at a certain price at the end) is far more likely to obtain this deal through a specialised financing or brokering body, than from another irrigator.

Lease-back arrangements could even be a way of keeping alive some farm businesses that might otherwise be forced to sell off all their water – as a result of the cumulative financial pressures of severe drought and the current retreat in world commodity prices.

Unbundling offers two other important benefits. First, it would permit farmers to hold a higher volume of entitlements than is normally required, so that they have enough water when allocations are low. How much they use will be governed by a separate licence (they will often have excess water, which they could sell on the temporary market).

Second, if rights to delivery capacity are separate, farmers will be able to arrange more timely delivery without having to buy additional water (as is presently required). This will help those with sensitive crops and watering systems, who rely on obtaining water at precise times.

For the majority of irrigators, the proposed refinements to rights will make no difference. They can choose to stay exactly as they are now. The reforms are about creating opportunities and choices (and so the potential for efficiencies and broad economic gains for regions and the State), not about compelling changes.

When water trading was being debated two decades ago, the full benefits could only be surmised. Similarly, the gains from these reforms will unfold over time. Much of the water market’s potential has already been achieved, but the additional steps being taken will reinforce the dynamism of this State’s irrigated agriculture, helping to ensure a positive future.

Improving registers and paying for the changes

To handle the newly separated entitlement components, a more elaborate register of water titles is needed, and as noted in Chapter 2, the Department of Sustainability and Environment is working with rural water authorities to design an appropriate system – drawing on its experience with land titles registration.

The authorities are already required under section 230 of the Water Act 1989 to keep registers of water rights in their districts. An irrigator’s rights come from having an entry in such a register, i.e. it is a Torrens-title system. But significant upgrading is needed, e.g. to include licences and to record mortgages.

Most importantly, and unlike a land titles register, the new system will need to keep track of links between unbundled rights, as well as continuing to be the basis for recording metered use, for billing, and other day-to-day administration.

Each authority will be responsible for parts of the register, but the register will need to have central supervision and control. It must be able to handle trade between authorities and generate statewide information.

Action

4.2 The Government will:

- legislate to establish a single, web-based public register of all water-related entitlements;
- contribute up to $7 million over four years to the costs of instituting the legal framework for unbundling, building the new register, connecting the register to authorities’ administrative systems, and defining the new entitlements that the register will record (including the transfer of mortgages from land to water); and
- regularly report on ownership and trading of water entitlements.
Implications for local government rates

Several local councils are concerned about the impacts of unbundling on their rate revenue. At present, water rights are included with land in property valuations. This arrangement will be hard to sustain once the rights are no longer legally tied to land. Already licences (which have a looser tie to land) are excluded from valuations.

The current situation leads to distortions. For example, some farmers have reduced their rate burden by selling their water rights, in some cases to licence holders, and obtaining water on the temporary market.

Moving carefully to an unbundled system

Owners of water shares will be able to nominate some land (with a current water-use licence and delivery entitlement), where their seasonally-allocated water can be used as a matter of course, without any transfer. This will simplify the matching up of allocated water with metered water use. At the start, all water shares will be taken to stay linked in this way to the land where they were before unbundling.

Some owners may choose not to point their water shares to any land in this way, but to have flexibility (at a fee), to transfer water to various places each year. These shares must at least be tied to a supplying authority (for collection of bulk water charges).

In this way unbundling will mean minimal change to the system of bulk entitlements, or to the role of supplying authorities in overseeing water use and collecting revenue.

Trading rules usually relate to one or other of the three main components of water entitlements. When unbundling is implemented, existing trading rules will need to apply with appropriate modifications.

Unbundling will be put into effect system by system. For unregulated streams and for groundwater, it will be worth having a licence to use water on land. Whether there is benefit in separating out a delivery right will depend on the system.

Limiting total non-water user water shares to 10 per cent

After unbundling, the Valuer-General intends that valuations take into account the capacity of land to be irrigated (covering such matters as the existence of a delivery service, on-farm irrigation works, and access to drainage). This will capture some of the value presently derived from water rights, though not all.

Councils will be able to maintain rate revenue by adjusting rates in the dollar, but without other action the rate burden would shift slightly from irrigated properties to dryland farms and towns.

Shire councils have managed to spread rate burdens equitably by striking differential rates. At present, some councils strike a special, lower rate for irrigated farms. When water rights are not in valuations, they may in some cases decide that a higher rate is fair.

Water shares will be counted as being held by water users if they are linked to land that can be irrigated (or can in some other way utilise the water, e.g. for a piggery) and that is in the same ownership. Otherwise, they will be counted as being held by non-water users.

Water that is acquired by the Government for the environment will not be counted as part of the 10 per cent – even where it is traded temporarily to water users in some years. This water is definitely not being held as an investment for permanent resale.

As noted above, irrigators may wish to hold more water shares than they normally need for their land, so they have enough water in a bad drought when seasonal allocations are low. To allow for this, the volume of water shares able to be held on the land will be twice the volume permitted to be used under the water-use licence.

Water shares linked to land could still have their seasonal allocations traded off to other land every year – exactly as happens now.

When the 10 per cent limit is reached, people will not be allowed to buy water shares unless they can link them to land they own with a water-use licence. Irrigators will not be allowed to sell their land and keep their water shares (in the same way as this is not allowed now for licences).

The 10 per cent limit will be able to be reviewed and modified. For example, it may be that the limit should be higher in a small supply system. Or it may be that a lease to an irrigator with an option to buy (i.e. more of a financing arrangement than an investment) should be counted as the water being held by an irrigator.
Simplifying and Providing More Certainty about Water Shares

Irrigators feel their hold over water, especially ‘sales’ water (the extra water allocated once high-reliability rights are met), has been made uncertain by the moves to establish better environmental flows, such as the Living Murray exercise. Security of water entitlements is what many farmers most want to see. The Government has decided to address this as part of a package that achieves other aims too.

Water rights (which oblige a rural water authority to deliver water to the farms in a district) and licences on regulated streams (for individual irrigators to pump water out), differ primarily because of their delivery elements. The water shares that are separated out will be almost the same, the only differences being in:

1. Tenure: Water rights have ongoing or indefinite tenure, while licences on regulated streams usually have 15-year terms. To date these licences have almost invariably been renewed, and the Water Act allows for them to be given unlimited tenure (although under Section 59 the Minister can, at intervals of not less than 15 years, amend them to comply with a management plan). Trade from licences to water rights and back again assumes no difference in tenure; and

2. ‘Sales’ provisions: Water rights mostly attract ‘sales’, and licences on regulated rivers usually attract a lesser amount of ‘sales’ (though in Sunraysia neither water rights nor licences attract any ‘sales’ water).

A basic simplification is for the water shares within water rights and regulated-stream licences to formally be given the same tenure. In line with the Council of Australian Government’s direction announced in August 2003, this will be ongoing tenure. Ongoing tenure is appropriate given that water shares are already shares of the water available for consumption. This was shown in 2003 when Goulburn irrigators were allocated only 57 per cent of their water rights. Their rights are expressed as a volume, but 300 megalitres really means 300 / 1,200,000 (total Goulburn entitlement), or 0.025 per cent, of the available water. The use of the term ‘share’ does not call for a drastic recasting of existing rights.

As well, reserve powers exist in the Water Act 1989 (Section 13 in conjunction with Section 7), that enable entitlements to be reduced. These powers can be seen as allowing changes, not to water shares, but to the long-term resource to be shared (i.e. to the caps etc. which draw a line between consumptive water and the Environmental Water Reserve). As stated in Chapter 2, a clear and open process will be established when using these powers.

The Government has decided to make a further, more fundamental simplification, by breaking off ‘sales’ water allocations into an independent, lower-reliability product.

The combined package (outlined below) will lead to significant benefits for water users:

- entitlements will be simpler, with just two kinds of water shares in each supply system, high-reliability and lower-reliability ones;
- users will have the choice they need, without the risks and costs of relying heavily on the temporary market; and
- users will gain the certainty of having ongoing, tradeable rights, including for licences and ‘sales’ water.

The package also confirms and clarifies that the boundary between consumptive and environmental water can, as a last resort, be modified, but in a way that rules out abrupt changes.

In return for the extra value created for water users, the package restores significant river flows for the Environmental Water Reserve. This water will be able to called out by the environmental manager at times when it will have the most benefits.

Victoria has profited from having water entitlements that are highly secure, and the Government is adamant that entitlements should be kept this way.
Action

4.3 The Government will put in place the following combined package for regulated surface-water systems, in the first instance in northern Victoria, consulting with stakeholders about implementation details. The Government will:

- provide for the water shares that are separated out from licences to have ongoing tenure – noting that, just like water rights at present, they will be shares of the water available for consumption;
- make ‘sales’ water into separate, legally-recognised, independently-tradeable entitlements. These will also have ongoing tenure, and be shares of the water available for consumption.

‘Sales’ will remain a lower-reliability product that will bear most of the impact of low water availability in line with existing seasonal allocation policy;
- allocate 20 per cent of the new ‘sales’ entitlements to the environment. This is expected to provide an average volume of environmental water of 120 gigalitres a year when it is kept in rivers.
- secure a further 25 gigalitres of water, with high reliability, by investing $50 million in upgrading and rationalising distribution infrastructure. In total the package delivers 145 gigalitres a year to go towards a clearly defined Victorian share of the 500 gigalitres being aimed for under the Living Murray initiative.
- continue the existing reserve powers in the Water Act 1989 that allow consumptive water and rights to be adjusted, but (to reinforce the stability of Victoria’s entitlements), establish a clear process that would be followed before the powers were used to make adjustments because of gradual, long-term changes to inflows or river health.

In line with the policy in Chapter 3 on annual charges to be paid for environmental water:

- a headworks (or bulk water) charge will be payable for this environmental entitlement, since it can be called out at any time and is tradeable; and
- where the entitlement is delivered through an authority’s distribution system to wetlands, the authority’s out-of-pocket expenses must be covered, including any extra losses incurred.
Assistance in making the transition

In consideration of the agreement with farmers to release 20 per cent of the ‘sales’ water, the Government has agreed to the following parcel of measures:

- The Government will make a new payment of $30 million towards dam safety and improvement.

- For upgrading and rationalising channels and other infrastructure, the Government will provide:
  - $6 million in seed funding to develop overviews of infrastructure in irrigation areas and then pilot reconfiguration plans; and
  - $50 million to help implement the reconfiguration plans and to generate around 25,000 megalitres of savings for return to the environment.

- The Government will provide an extra $5 million over four years for the Water Smart Farms Initiative to encourage innovative farm practices. It will provide an additional $8 million over four years for the Sustainable Irrigated Agriculture and Land Management Program, offering incentives and training to reduce off-site impacts and improve on-farm efficiency of water use.

- The Government will waive the environmental contribution for Goulburn-Murray Water for three years, and then set it (along with the contributions for other rural water authorities) at two per cent of the authority’s revenue, rather than the standard five per cent. (These two steps together are expected to make a difference to Goulburn-Murray Water of $14 million over five years.)

The water being recovered is a part of Victoria’s contribution to restoring River Murray flows, and the funds will come from Victoria’s share of the $500 million available for this purpose.
Changing ‘sales’ water into an independent entitlement

‘Sales’ entitlement (based on 100 megalitres for 100 megalitres of water right, 70 megalitres for 100 megalitres of licence), and modelled, long-term annual average diversion for ‘sales’, are shown below (in megalitres, subject to refinement) (there is also ‘sales’ on smaller systems like the Broken):

The average diversion figures are at river off-takes, and include variable losses in distribution systems. The environment’s share of about 120,000 megalitres includes some 27,000 megalitres of losses (subject to checking that this is all variable loss) – so the amount of water being given up by farmers is actually just over 90,000 megalitres. This farmgate amount would be the basis for any temporary selling to irrigators. The environment could only obtain 120,000 megalitres if it was kept in the rivers.

The proposal is to provide 20 per cent of average ‘sales’ diversion to the environment. The environmental entitlement may be utilised more heavily than that of irrigators, because of more interest in calling out water in wet years. It may be necessary to have some mechanism to keep usage at 120,000 megalitres on average, or the impact on irrigators will be greater than intended.

On the other hand, utilisation of ‘sales’ by irrigators is likely to rise. This is particularly because it is proposed to abolish the current rule that says that only the first 30 per cent of ‘sales’ can be temporarily traded.

Because of the Murray-Darling Basin cap, average ‘sales’ diversion cannot rise above about 600,000 megalitres. As utilisation of seasonally allocated ‘sales’ rises, seasonal allocations will need to drop (it has always been known that this would happen in the long term).

In practice this may mean that Goulburn-Murray Water assigns less than 100 megalitres of the new ‘sales’ right for every 100 megalitres of water right, to enable seasonal allocations to reach 100 per cent of entitlement with reasonable frequency.

Given that the record amount of water ever used equals water right plus 60 per cent of ‘sales’, 20 per cent of this ‘sales’ (i.e. 12 per cent) would amount to 7.5 per cent of the water used in that year. However, considerably less ‘sales’ is used on average:

- on the Murray, total farmgate usage by those qualifying for ‘sales’ water averages 851,000 megalitres, and the proposed 20 per cent reduction in ‘sales’ would amount to 3.3 per cent of this usage; and
- on the Goulburn, total farmgate usage averages 1,276,000 megalitres, and the proposed 20 per cent reduction in ‘sales’ would amount to 4.7 per cent of this usage.

The Murray-Darling Basin cap will be reduced because of the entitlement being granted to the environment. Rather than it being cut by 120,000 megalitres every year (including drought years), it is more appropriate to cut the cap by the amount of water the environment calls on. This cut will keep the extra flows in the river.

In the future, consideration will be given to allowing the environmental entitlement to be carried over for a maximum of 12 months. This would only be agreed to after consultation with irrigators and under rules (e.g. that it would be the first water to spill), that meant there was no adverse effect on irrigators’ entitlements.

With respect to off-quota water (irrigators have been allowed to take water that flushes down a regulated river and cannot be harvested in public storages, on top of the water that is allocated to them based on water in the storages):

- off-quota water is no longer being made available on the Murray – though in sub-100 per cent water right years irrigators can divert from flushes as an advance that is paid back when allocations reach 100 per cent; and
- the Government will maintain this situation and extend it to the Goulburn; but it has decided, as part of the ‘sales’ package, that the cap should not be pulled down on account of off-quota’s abolition. The average volume of water involved is small (in the order of 20,000 megalitres), and hard to calculate.

Distribution of the new ‘sales’ entitlements between district irrigators and licence holders will be decided during the implementation phase of the White Paper. The decision will be made with input from the relevant authority and will take account of the substantially lower ‘sales’ entitlements associated with licences.
Market instruments to manage delivery capacity

Policy

Irrigation water distribution systems that offer more responsive services with lower costs and water losses can be achieved, not just from engineering upgrades but from trading or pricing of shares of delivery capacity.

It is crucial that irrigators have more flexible and timely water deliveries, because they are increasingly relying on finely-tuned watering methods (for example, drip systems and controlled parching techniques) to grow higher-value crops.

Irrigators are presently required to order water four days in advance in the large-gravity supplied districts. Due to channel congestion, the timing of actual delivery can be haphazard and the volume ordered might be cut back.

There is considerable interest in using delivery rights to achieve a better level of service. When the existing water rights are unbundled, shares of delivery capacity will be separately identified. This will be a process of recognising rights that already exist, and gradually defining them more clearly – initially focusing on key congestion points.

Considerable work will be required to define rights. At present, an authority may work to a fairly loose standard, such as delivery of 10 per cent of water rights in 10 days.

Congestion can be made worse simply by a lot of farmers changing from annual pasture (watered in autumn and spring), to permanent pasture or fruit trees (which require extensive watering in summer).

One way to manage congestion is to offer a higher-priced, premium delivery right (e.g. delivery at one day’s notice). Authorities must be cautious in following this path. It may work where new infrastructure is installed, but for existing infrastructure it could allow some irrigators to jump the queue at the expense of other irrigators.

Instead of offering premium and standard services, the preferred method of managing congestion is making delivery rights tradeable. This method is complicated and will have to be developed gradually:

- as just noted, in some irrigation districts, shares of delivery capacity are not tightly defined, exclusive rights. Eventually it may be helpful to define shares for different times of the year, such as summer or autumn (if this is practicable). In the meantime, buyers need to be told exactly what they are buying; and

- trade in the rights to publicly-owned infrastructure should not be a source of windfall profits. Authorities must retain the right both to enlarge capacity, and to sell entitlements to surplus capacity. An authority’s ability to manage the system must not be unduly impeded.

Action

4.4 Rural water authorities will, for key congestion points, more clearly specify individual irrigators’ shares of delivery capacity.

The Government will develop legislation to allow properly specified shares of delivery capacity to be traded.
Sharing capacity at Barmah Choke

Perhaps the most significant congestion point for Victoria is Barmah Choke. If water spills out of this narrow part of the River Murray in late summer and autumn (when the River is naturally low), it degrades the surrounding red gum forests.

To avoid this, deliveries must occasionally be restricted, including those to horticulturalists in the Sunraysia region who rely heavily on timely supplies. It is important to guard against the risk of such restrictions becoming worse.

An initial report indicates that the Choke has long been a problem, and finds no evidence that all the water that is trading downstream to Sunraysia makes things worse.

No water is allowed to trade there from above the Choke: it is all coming out of the Torrumbarry and Goulburn systems, which are both below the Choke. In Sunraysia water use is more concentrated in summer than it is in Torrumbarry, but the difference is declining as farms within Torrumbarry move from annual to permanent pasture.

An independent review by consulting firm Sinclair Knight Merz is testing these conclusions and is due to report by the end of 2004.

Action

4.5 The Government will consider the results of an independent review of Barmah Choke’s constraints on delivery. To prevent the constraints getting worse, or to reduce existing constraints, the Government proposes to:

- use delivery capacity shares to manage this congestion point; or
- hold 20,000 megalitres in the Eildon account (from Snowy savings and trade out of the Goulburn) as a back-up supply for dry years; or
- use Lake Boga as a storage (this is being investigated as part of saving water lost at Lake Mokoan for the Snowy River); or
- investigate building a canal to carry water from the Murray to the Goulburn system, by-passing the Choke.

Instead of offering premium and standard services, the preferred method of managing congestion is making delivery rights tradeable.
Dealing with a surge in trade out of districts

Policy

Victoria’s relatively open water trading regime is delivering more productive use of water and generating new enterprises, investment and employment.

At the same time, when water leaves an area the extra delivery costs on the remaining irrigators and the flow-on effects to wider communities are issues that need to be properly managed.

Applying a charge for the right to have water delivered, fixed to the land, can be a sound way of stopping excessive costs falling on the remaining irrigators when water trades away to land elsewhere.

Trading of water is generating immense benefits for Victoria, revealing water’s worth and allowing and encouraging its best use. Each year’s permanent trade to high-value enterprises has a net present value of over $100 million.

During droughts, temporary trade (i.e. of the current year’s water) makes up as much as 15 per cent of total water use – offering income to those choosing to sell, while enabling high-value plantings and stock to survive.

Figure 4.2 Permanent trade into, within and out of areas and river groups, 1991-1992 to 2000-2001
Most irrigators see some merit in the water market, having seen how it has led to a flourishing of activity, and taken advantage of it themselves at some stage. However, water has recently been trading away from apparently good farms, resulting in uncertainty for neighbouring properties.

Trade out of gravity districts has surged since mid-2003. The two per cent annual limit on water trading out of certain areas has been reached – or is close to being reached – for four out of Goulburn-Murray Water’s six areas.

On the selling side, this surge reflects the accumulated financial pressure of the drought, especially in the Goulburn system. As well, currency movements have helped to depress prices for exports, putting added pressure on the dairy industry.

The surge in trade is also being driven by large new irrigation developments – almonds, olives and wine grapes – between Nyah and Robinvale. One developer alone is looking for 50,000 megalitres.

The pattern of trading has changed since the 1990s, when most trade was within regions, dairy farmers did much of the buying, and the rate of change was moderate. Now, dairy farmers are joining mixed farmers as sellers. In past downturns, farmers had to stay on their farms until things improved; now they can sell their water and move away.

The trade surge has made it more pressing to consider alternatives to the two per cent rule, notably the policy of tying delivery charges to land. This would mean landowners would have to keep paying the charges even after they sold off their water – though they could pay the charges off as a lump-sum ‘exit fee’.

Irrigators should not be free to escape from costly communal supply systems; the existence of a supply system adds to the value of a property even when no water is taken. At the same time it is vital to avoid limiting people’s choices and blunting the drivers for sensible adjustment.

**Action 4.6** The Government will support rural water authorities where they wish to introduce land-tied charges for access to delivery infrastructure, but stipulates that such charges not become a barrier to trade. The Government requires that:

- delivery access charges must be based on reasonable estimates of the costs to the authority in having the service available, and there must be the option of paying the charges as a lump-sum exit fee; both annual charges and exit fees will be subject to scrutiny by the Essential Services Commission;
- delivery access charges must not be applied if a farmer has stopped irrigating and has no wish to keep a right to be supplied, in a place where it has been formally decided to phase out irrigation;
- delivery access charges must not be applied if a landowner or the authority finds a new customer to take over the delivery capacity share, or if terminating the delivery capacity share would relieve over-commitment; and
- if charges have been applied to unirrigated properties for 10-years and the owners have no wish to retain the right to be supplied, then the authority should make a reassessment to decide whether the existing situation should continue, or the remaining irrigators should take on responsibility for paying for the service, or consideration should be given to closing it down via a reconfiguration plan.
When entitlements are unbundled, the two per cent rule will not work in its current form, since water shares will not always be tied to particular areas. It would be possible for a two per cent a year limit to be applied to water shares that were either delinked from land or sold to land outside an area, but this would be administratively cumbersome (one problem being that links to land will no longer be tight legal ones). It is considered there is a more appropriate way of achieving the rule’s purpose.

Slowing down abandonment of infrastructure is the prime purpose of the two per cent rule. Charges for access to delivery infrastructure (paid annually or as a lump sum), will take the place of the rule, in softening the effect of trade on remaining irrigators.

### Trading of water between States

**Policy**

Victoria is and will continue to be a leader in the implementation of an effective water trading market.

The Government will continue to press for expanded open water markets with consistent trading rules across state and district boundaries.

The Government does not believe that Victoria should lose water in a one-way flow to other States, which have not created water markets that are as open as in Victoria. Interstate trade requires a level playing field.

The Murray-Darling Basin Agreement presently allows interstate trade on a permanent basis along the Murray below Nyah, and on a temporary basis more widely across the southern Basin. The playing field for this trade is reasonably level.

While about 7,000 megalitres has traded permanently out of Victoria (mainly to South Australia, and there are some concerns about that State’s salinity controls), this is just 0.3 per cent of the entitlement in northern Victoria. For several years there was almost no water coming in, but, so far in 2003/04, Victoria has made a net gain of over 1,000 megalitres.

The overall direction of temporary trade has been into Victoria, as the table below shows. (Interstate trade is overshadowed by trade within Victoria; e.g. total temporary trade in 2002-03 exceeded 300,000 megalitres.)

<table>
<thead>
<tr>
<th>Year</th>
<th>NSW to Victoria</th>
<th>SA to Victoria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997-98</td>
<td>9,199</td>
<td>5,020</td>
</tr>
<tr>
<td>1998-99</td>
<td>11,098</td>
<td>4,445</td>
</tr>
<tr>
<td>1999-00</td>
<td>- 4,571</td>
<td>- 348</td>
</tr>
<tr>
<td>2000-01</td>
<td>- 633</td>
<td>50</td>
</tr>
<tr>
<td>2001-02</td>
<td>231</td>
<td>- 990</td>
</tr>
<tr>
<td>2002-03</td>
<td>- 12,804</td>
<td>2,852</td>
</tr>
<tr>
<td>2003-04 (to 31 Jan)</td>
<td>- 390</td>
<td>- 2,979</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,130</strong></td>
<td><strong>8,050</strong></td>
</tr>
</tbody>
</table>

The entitlement below Nyah is a small portion of all the entitlement in the southern Murray-Darling Basin. In looking at how permanent trade could be extended, a major problem arises. Most of the water across the border is in irrigation districts now run by private companies or trusts, and is not allowed to be sold out of those districts.

The Victorian Government is looking to the National Water Initiative to overcome these barriers, and create a level playing field for expanded trade.

There has been some concern that unbundling, and in particular allowing water to be held without land, would lead to Victoria’s water moving to other States. This is overstated. South Australia already allows water to be held without land, and New South Wales has passed legislation to this effect.

It is important to note that, just because water is owned by a person in another State, does not mean it has been transferred there or is allowed to be used there.

On the other hand, the present restriction of permanent trade to below Nyah will be awkward to administer with full unbundling (when water shares will not need to be tied to a particular stretch of the River). When unbundling is implemented, it may be that entitlement in other States is still locked up in districts.

**Policy**

When water entitlements are unbundled, the Government will permit permanent trade to another State only where water entitlements in that State (including entitlements in communally-supplied irrigation districts) can move here as freely as Victoria’s can move there.
Implementing shares of delivery capacity

Delivery access charges tied to land can be applied under the current Water Act (and they are being applied, for example at Woorinen). However, the ability to capitalise them as an exit fee is not clear. It is proposed to prepare an amendment to make the legal powers clearer.

It is expected that delivery access charges would be applied more generally by authorities from 1 July 2005. The two per cent rule will be lifted when unbundling is put in place, which will be after delivery access charges are in place and is likely to be two years away.

The Government has decided to legislate to give water authorities flexibility, within a defined statewide framework, to:

- recognise delivery capacity shares on properties within their districts;
- define property owners’ obligations (e.g. fees) in regard to these capacity shares, and fees for casual use of delivery capacity;
- define the circumstances and payments where owners wish to increase or to give up shares (provided this imposes no undue barriers to trade); and
- allow trade in delivery capacity shares within districts (subject to authority approval, and accepting the authority’s job to manage, fund, and sometimes close down infrastructure).

Where farmers have sold off their water under the existing, bundled-up entitlement regime but wish to keep the option of irrigating in the future, they will be given a window of opportunity to take up a share of delivery capacity, subject to availability.

Delivery capacity shares will be tied to particular properties – though able to be untied and moved to other properties. They will have ongoing tenure, except that there will now be various avenues (such as reconfiguration plans) for them to be ended.

Delivery capacity shares must be able to be partitioned, with shares recorded at a number of different congestion points (e.g. along a channel, and at Barmah Choke).

Taking account of the Choke’s significance, it is proposed that Murray water shares be initially distinguished and labelled as above or below Barmah. This approach will be followed because, while the Choke is a delivery issue, rights to its capacity will not at first be well enough defined to stop, on their own, extra use below the Choke if water can trade there.

Irrigators’ individual claims on Choke capacity cannot be defined in detail for some time. The first step is to agree on how Victoria, New South Wales, South Australia and the environment are to share the capacity of this congestion point.

There has been some concern that unbundling would lead to Victoria’s water moving across the border. This is overstated.
Old distribution systems need to be upgraded to cope with the demands of irrigated farms in the twenty-first century. But, if parts of distribution systems are becoming unviable, consideration must be given to phasing them out. Rationalisation of services is primarily an issue for north-central Victoria. Goulburn-Murray Water and its water service committees realise that some parts of existing distribution systems need to be closed down. They were constructed in an era of bold development and in some places are just too spread out, as well as being on land that has turned out to be unsuited to irrigation.

Goulburn-Murray Water closes some six kilometres of channel each year, at a cost of $1 million, saving $4 million in asset renewal. This effort shuts down small parts of the system as opportunities arise. A more strategic approach is required.

**Action**

4.7 The Government will require rural water authorities to adopt the following approach to reconfiguring their water supply (or drainage) systems:

- in developing reconfiguration proposals, an authority must share information with and work in partnership with its customers, and consult with key parties in the broader community;
- the authority has to be commercial in providing services that will be paid for by customers. Where the customer base is declining and the cost of keeping up a particular service is becoming unaffordable, the authority needs to consider phasing out that service;
- if the remaining customers have viable businesses, the authority must make every effort to identify feasible water supply options;
- options that the authority discusses with the customers will include the customers meeting more of the costs of their local service rather than those costs being spread over a wide customer base, and the customers taking over the service. Charging proposals will be subject to scrutiny by the Essential Services Commission; and
- when an authority agrees to upgrade a service or install a new service, it will look at a range of potential pricing and delivery arrangements, including more contractual ones, to allocate the costs and risks.
Change to the water distribution systems will not be driven simply by irrigators selling their water. The few irrigators left using a channel or pipeline will keep paying much the same charges, in line with the practice of having ‘postage-stamp’ pricing (i.e. the same price in an area with up to 3,000 irrigators, regardless of dispersion).

In some situations there could be a role for more local groups of customers paying the full costs of their particular channel or other service. For example, this opens up the possibility of one or two customers choosing to pay extra in order to keep a particular service going, which would otherwise be a burden on the whole area’s finances.

Market signals and choices will be part of the impetus for change, but it will be essential also to have planning and targeting. Otherwise, customers scattered over a wide area may stop irrigating, which further undermines overall viability, as well as community cohesion.

Local involvement in creating solutions is crucial, carefully balanced with wider considerations and leadership. Lessons can be drawn from some pioneering exercises in reconfiguring supply systems, to help people design planning processes so they are likely to be efficient and productive.

A plan to alter or build infrastructure may need support from land-use controls under the Planning and Environment Act, since infrastructure viability can be undermined by a conflicting land use (e.g. urban encroachment or hobby farm development).

It is essential that rural water authorities’ distribution systems provide efficient, responsive supplies of water and be viable.
**Action 4.8** The Government will require authorities to use the following process for reconfiguring water supply (or drainage) systems. The Government will amend legislation to enable lifting of supply obligations accordingly.

An authority may stop providing a service, either:

i) by agreement with all the customers directly affected; or

ii) through an infrastructure reconfiguration plan that is prepared consultatively by the authority, and is endorsed by the Minister.

If a locally-developed solution is not forthcoming within a reasonable period of time, the Minister will appoint an expert panel to recommend a plan.

A reconfiguration plan will set out what is to happen to each channel or service, ranging from upgrade to closure, including the timeframe. If a service is not viable and has to be closed:

- properties which do not have and do not pay for an ongoing share of delivery capacity (either for current irrigation, or to keep open the option of irrigation recommencing), will be recorded as no longer having a right to be supplied;

- a service could be kept going for a set number of years on a minimum maintenance basis;

- the authority may offer rebates or other inducements in seeking the agreement of owners of properties still being irrigated to give up their rights to delivery and forgo other compensation; and

- where agreement is not reached, the authority must pay an irrigator compensation under Section 155 of the *Water Act 1989* and in accordance with other relevant laws for any loss of value as a result of supply being ended.

The Government will contribute seed funding to help develop the guidelines and methodology for reconfiguration plans.

Where there are major flow-on effects to a local community from closure of parts of a system, the Government will consider, in consultation with the affected community, what assistance it should provide that will be effective in helping the community to adjust.
Domestic and stock rights

About five per cent of water entitlements in irrigation districts are designated as domestic and stock allowances. As long as these rights are barred from being traded, the farmer is denied choices about what minimum volume of water to hold, and rationalisation of irrigation supply channels is more difficult.

Along the Murray, where domestic and stock rights are already restricted in severe droughts in the same way as water rights, allowing domestic and stock rights to trade will make them indistinguishable from water rights (except that they will not qualify for extra, ‘sales’ water).

The whole entitlement structure can be simplified by converting domestic and stock rights in irrigation districts into water rights (without ‘sales’). (In systems such as the Goulburn, they will need to become subject to restrictions in severe droughts, but this will mean extra water is available to allocate to the rest of the water rights.)

Action

4.9 The Government will develop legislation to allow domestic and stock rights in irrigation districts to trade permanently. Taking the opportunity to make the entitlement structure simpler, the Government will merge these rights with water rights.

The Government will require that, if irrigation channels are to be closed through a reconfiguration plan, the plan must set out how domestic and stock needs will be met subsequently, after considering the relative costs of different options.
Implementing reconfiguration of delivery infrastructure

In more detail, it is proposed to handle reconfiguration of delivery (or drainage) infrastructure as follows:

a) Where only a few farms are affected, an authority may be able to make changes by agreement (as it does now); but, whenever recourse may be needed to a power to be relieved of the duty of supply, a more formal process must be followed.

b) A rural water authority should proceed within a strategic view of its assets, to be endorsed as part of its corporate plan.

c) The process for developing a detailed, infrastructure reconfiguration plan will suit the particular situation:
   • the water authority will always be the proponent, because of its commercial interest in viable distribution services; and
   • the process may be co-led by a second agency (e.g. the catchment management authority if a major aim is to restore a floodplain, or local government if extensive economic and social adjustment will be needed).

d) Development of a reconfiguration plan will be initiated through a proposal to the Minister for Water, diagnosing the problem or the potential and seeking the Minister’s endorsement for a consultative process.

e) The Minister will be able to set guidelines for the preparation of the plans. These guidelines will eventually allow the authority itself to approve a small-scale plan.

f) At the outset of a planning process, the Minister will clarify the ground rules and funding parameters, so local interests have a framework within which to develop solutions.

g) The reconfiguration plan:
   • will be formulated after considering the implications for annual charges of both upgrading and closing infrastructure;
   • may determine an alternative arrangement for managing infrastructure;
   • may define development or upgrading zones as well as retirement zones, and propose steps to make corresponding changes to planning schemes;
   • could include, for each channel or pipeline, a declaration about the period for which supply would be continued or the time at which it would stop;
   • will set out delivery pricing arrangements for the remaining period of supply (e.g. reducing or discontinuing renewals allowances);
   • where irrigation supplies are to be phased out, must propose a way of domestic and stock needs being met, after assessing various options (and could propose other action to help viable dryland farms to emerge); and
   • must address the impacts of change and matters of justice in implementing change (e.g. what financial or other assistance should be given to help the broader community to adjust).

The reconfiguration plan must address the impacts of change and matters of justice in implementing change.
Helping Water Use on Farms to be Sustainable

Policy
High environmental standards must continue to be enforced for new irrigation.
The adverse side-effects from long-established irrigation areas must be progressively reduced. Though incentives and training have been successful in improving many farmers’ practices, more vigorous action is needed in order to eliminate the worst practices in long-established areas.

Assessing the range of pollution-reducing tools
Strict rules exist to ensure new irrigation developments do not have adverse side-effects, but salinity, drainage and nutrient problems arising from established irrigation areas are still significant.
While recognising the progress that has been made in reducing these problems – through incentives and training under the umbrella of land and water management plans – the Government has examined the need for smarter or tougher measures.
It has considered three alternative instruments: pollution charges, tradeable pollution permits, and regulation. The Government believes there is potential for a scheme of tradeable permits for saline discharges in some places, but will also use carefully framed regulation.
Because it is difficult to measure an individual farm’s discharge to groundwater, any control instrument usually has to focus on inputs, such as how much water is applied, as indicators of discharges.
In Sunraysia, applying water has a different impact on Murray salinity depending on movements in underlying groundwater. Controls can be based on the average impacts from applying water in different zones.
This approach is already in place to some extent. If 1,000 megalitres were to be brought into the designated ‘high impact zone’ this would increase the salinity of the River by 0.6 EC; water is barred from trading in. The same water brought into the various divisions of the ‘low impact zone’ has between 0.01 and 0.2 EC impact; the water can trade in, but attracts a levy to pay for offsetting measures.
These arrangements could be turned into a system of tradeable discharge permits, for that part of Victoria. Thus, someone in the high impact zone could sell their salinity permit to someone in the low impact zone, where, with the same impact, it could support up to 60 times the amount of irrigation.

While recognising the potential of such a scheme, the Government is aware of several issues that need to be worked through. Issues include:
• within a zone, actual salinity impacts can vary a lot around the average depending on watering methods;
• reduction in salinity impacts is to some extent happening anyway, resulting in salinity impact credits under the Murray-Darling Basin Agreement accruing to the Victorian Government; and
• a tradeable permits scheme would provide windfalls to irrigators having the largest impacts, and would make it harder to introduce other tools.

Action
4.10 The Government will continue to investigate a scheme of tradeable permits for saline drainage – based on average impacts – with a view to possible trial and adoption.
The Government will maintain its commitment to training and incentives within the framework of locally-developed plans, in order to promote best practice and to generate models that encourage other irrigators.
The Government will, when water entitlements are unbundled, create ‘water-use licences’ to maintain and reinforce the use conditions within existing water entitlements.

The Government’s decision to settle for some minimal regulation through water-use licences, partly reflects its awareness that strong drivers for environmentally-sound water use are already in place. These are much the same as are propelling more production from each megalitre: for example, the labour to be saved from pressurised watering systems, and the price water is trading at on the market.
Setting basic standards for existing irrigation

The Government believes water-use licences will be of value to irrigators. They will:

- affirm that government-approved environmental standards are being met;
- improve marketing opportunities; and
- offer greater certainty over what farmers can do.

The licences will complement the environmental management systems being set up by some food processors. These systems oblige farmers to meet certain standards, so food can be marketed as being ‘clean and green’. They help to lift some farmers’ practices, but do not apply to everyone.

Action 4.11 continued

Or else:

ii) Standards and obligations brought across from pre-existing diversion licences or from conditions of an earlier transfer of water rights. These conditions are likely to be specific to the site, so a hard-copy licence must be issued.

Licences will have ongoing tenure, rather than being for a set period (though a new one will be needed if existing operations are redeveloped); moreover, they will transfer with the property.

The water-use standards and other conditions applied via a licence will be able to be altered during the course of the licence, but only after a locally-drafted plan endorsed by the Minister proposes new standards.
### Implementing water-use licences

In more detail, separate water-use licences will be introduced as follows:

- **a)** Water-use licences will be administered by rural water authorities under the *Water Act 1989*. These authorities have a customer relationship with the irrigators, and need to read the meters that record water going on to the farms for other reasons, too.

  In response to the claim that the authorities will have a conflict of interest (they may favour lax standards to attract development and avoid getting their customers off-side) it is important to note that the standards in licences will not be set by the authority.

- **b)** The licences will cover use of all water on a farm, including groundwater. Conditions will be able to be set on maximum water use per hectare, taking account of watering methods, re-use systems, and drainage provisions. The licences will be developed bearing in mind they could form the basis for market-based tools down the track.

- **c)** The content of water-use licences will be based on existing locally-developed land and water management plans. These are existing tools that already provide effective guidance on irrigation and drainage issues, being a vehicle for farmers themselves to develop solutions to issues. Catchment management authorities take the lead in preparing them. The water-use management aspects will need to meet any guidelines prepared by the Minister for Water.

  - **d)** Once a plan has been approved by the Minister, particular conditions will apply to existing water-use licences, and also the authority will be able to amend licences to ensure compliance with the plan. The authority will have to give proper notice of any changes to the licence-holder. Lead-times of several years may be appropriate for actually implementing improvements.

  - **e)** The authority will be required to give effect to the approved plan in considering an application for a use licence for a new development, or a redevelopment (this is either an increase in the water allowed to be used, or a substantial change to what is being produced with alteration to the watering or drainage system).

  - **f)** At the outset, or at any subsequent time in the absence of a plan that covers water-use management, the Minister may, after consultation with relevant authorities, approve the standards for application.

    - **i)** For new irrigation, the initial standards will be based on the standards now being applied across northern Victoria (these standards need to be extended to southern Victoria).

    - **ii)** For existing irrigation, the initial generic standards will be based on the water-use limits governing permanent transfer of water rights, but with provision made to recognise cases where recent usage has been higher than this level.

- **g)** The charges to be applied to cover the basic costs of monitoring water-use and otherwise administering water-use licences are already largely in place as part of existing usage charges and the existing fees associated with applications for transfers.

### In conclusion: smarter irrigation water use for a more sustainable industry

Irrigated agriculture is a mainstay of Victoria’s economy and society, generating billions of dollars worth of direct output, processed goods, and exports.

The Government believes the action now being taken will support the steady advances being made in irrigated agriculture’s use of water. It will accelerate progress to efficient watering of high-value crops. Investment will be encouraged by secure rights, a vibrant water market, and economical, responsive delivery of water.

At the same time, irrigation’s adverse impact on the environment will be minimised. The sector’s sustainable development will be ensured well into the future, bringing lasting benefits to irrigation communities and all Victorians.
Chapter Five:

Victoria’s cities and towns will have safe, secure and reliable supplies and provide for growing populations into the future, while managing environmental impacts.
## Key Challenges

- **Safe, secure and reliable urban water supplies.**
- **Reliable sewerage services.**
- **To balance our demand for water with the available supplies.**
- **To reduce our demand for drinking water (for uses other than drinking).**
- **To be water smart at home, play and work.**
- **To use water that is fit-for-purpose while protecting public health and the environment.**
- **To secure our water supplies by using our existing infrastructure more effectively.**

## Government Initiatives

- **Water Supply-Demand Strategies** – balancing demand with supply.
- **Pricing for water conservation.**
- **Permanent water savings measures.**
- **Water smart bills and labelling.**
- **An aspirational 25 per cent water savings target for new subdivisions.**
- **Industry and local government water conservation plans.**
- **Urban recycled water projects.**
- **Investigation of proposal to pump recycled water from Melbourne to Gippsland.**
- **Country Towns Water Supply and Sewerage Program.**

## Sustainable Outcomes

- **Safe, secure and reliable urban water supplies.**
- **No new dam for Melbourne in the next 50 years.**
- **Water sensitive urban development.**
- **Reduced demand for drinking water (for uses other than drinking).**
- **Fit-for-purpose supplies.**
- **Strategic investment in water recovery and recycling projects.**
- **Reduced effluent disposal via ocean outfalls.**
- **The right planning framework and regulation.**
Introduction

Seventeen per cent of Victoria’s water is used in urban areas. Almost half of this is used by households and industry in Melbourne, with the rest used in regional cities and towns.

Many of our urban populations are increasing, stretching our water resources. By 2030, Melbourne alone will accommodate more than one million additional people and regional Victoria another 350,000.

The demand for urban water will grow over time, yet our ability to divert more water from our rivers and aquifers is extremely limited.

Many rivers have reached and others have exceeded the sustainable limits of diversion. Climate change is likely to further reduce our available water.

Yet there is still much that we can do to reduce our demand for water through avoiding unnecessary use and using it more efficiently.

An average Melbourne household continues to pour 30 per cent of its drinking water onto the garden and flush 20 per cent down the toilet. Alternative supplies, such as recycled water, rainwater and stormwater would be fit for these purposes.

Victorians need to be smarter about how we use water in our cities and towns.

Policy

Victoria’s cities and towns will have safe, secure and reliable supplies and provide for growing populations into the future, while managing environmental impacts. This will be achieved through sustainable urban water management.

The reforms set out in this chapter will enable us to have enough water for our future and manage our urban water sustainably by:

- balancing water supply and demand;
- reducing water consumption;
- recycling and using alternative water supplies;
- securing our drinking water supplies;
- providing safe and reliable drinking water and sewerage services; and
- getting the right planning framework and regulation.

The reforms are consistent with and will drive the development of the National Water Initiative’s outcomes in relation to sustainable urban water management.
Policy Framework for Sustainable Urban Water Management

Everyone has a role to play in improving urban water management – individuals, households, community groups, industry (from plumbers to manufacturers), developers, local councils and the Government. Therefore, it is important that everyone works to a common purpose and objective.

To create this common direction, a policy framework for sustainable urban water management has been created.

A range of tools will be used to achieve sustainable urban water management – public education, incentives, regulation, planning provisions, technical change, pricing and investments.

The Government will adopt the following policy framework (Figure 5.1) for sustainable urban water management and encourage the ‘water decisions’ of stakeholders to be guided by it.

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**Figure 5.1 Policy framework for sustainable urban water management**

<table>
<thead>
<tr>
<th>1 BALANCING WATER SUPPLY AND DEMAND</th>
<th>2 REDUCING WATER CONSUMPTION</th>
</tr>
</thead>
</table>
| To achieve sustainable urban water management, our demand for water in our cities and towns will be balanced with the available supply. The balance between water supply and demand will be achieved taking into consideration:  
- a long-term outlook;  
- the total water cycle;  
- social, environmental and economic; costs and benefits; and  
- risks, such as climate change. | The priority action for sustainable urban water management is to use our traditional water supplies more wisely, reducing demand for drinking water (for uses other than drinking). This will be achieved by a range of measures, including education and awareness, pricing, regulation, rebates and water sensitive urban development. |

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**SUSTAINABLE URBAN WATER MANAGEMENT**

<table>
<thead>
<tr>
<th>3 RECYCLING AND USING ALTERNATIVE SUPPLIES</th>
<th>4 SECURING OUR URBAN WATER SUPPLIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban water supplies can be drawn from all available water resources including recycled water, rainwater and stormwater. We will use water that is fit-for-purpose – many uses of water do not require treatment to drinking water standard. We will use recycled water and alternative water supplies for non-drinking uses where there is a net benefit to the urban community and to minimise detrimental discharges to the environment.</td>
<td>Our urban supplies will be secured by using our existing water supply infrastructure more effectively and by developing new innovative approaches.</td>
</tr>
</tbody>
</table>
Our cities and towns need to ensure our demand for water does not exceed the available supply. Towns in many parts of the State are facing water shortages that are highlighted during the current drought. Stage 2 or higher restrictions are currently in place in many towns across Victoria.

Climate change is predicted to further reduce water supplies as a result of higher temperatures and lower rainfalls. The Murray-Darling Basin Commission has estimated that by 2023 there will be five per cent, or 1,100,000 megalitres, less water flowing into the Murray-Darling system.

The CSIRO is carrying out work for Melbourne Water on the effect of climate change on Melbourne’s water supply. This work is not yet complete, but the preliminary findings indicate that there will be less water available for Melbourne within the next 30 years.

Melbourne’s population is projected to increase by up to one million by 2030. If per capita demand for water stayed at the average for the 1990s, the demand for water would increase from 480,000 megalitres per year to about 659,000 megalitres per year. However under our current system, reliable water yield is estimated at only 566,000 megalitres per year.

In other words we will run out of water in the future unless we use water more efficiently. If Melburnians continue to use water in the future at the same rate and in the same way as they did in the 1990s, the city may be approaching its supply limits within 15 years.

It is possible to increase Melbourne’s water supply by reconnecting the Tarago Reservoir. However even with this upgrade we will need to reduce our demand for drinking water if we are to have enough water for the future.

In any event, it makes sense to be more efficient with water which will defer the need for expensive engineering works.

The urban water authorities will play a key role in ensuring that our urban water demand is balanced with the available supplies.

**Action 5.1** The Government will require all urban water authorities to prepare Water Supply-Demand Strategies that identify the best mix of demand measures and supply options.
Water Supply-Demand Strategies will be a critical input to the Government’s new Sustainable Water Strategy process (detailed in Chapter 2). The Water Supply-Demand Strategies will be prepared every five years with a fifty-year outlook to identify measures to maintain a balance between demand for water and available supply over the medium and longer term.

In preparing the Strategies, urban water authorities will take into consideration:

- the total water cycle;
- the social, environmental and economic costs and benefits of options;
- the financial impacts of options; and
- risk management, including climate change, deviations from predicted population growth, environmental impacts and public health requirements.

The Water Supply-Demand Strategies will form part of the urban water authorities’ normal business approvals processes, such as Water Plans and/or annual Corporate Plans.

The urban water authorities will be required to report on progress against their Water Supply-Demand Strategies on an annual basis.

### New dams are not the solution

Upgrading dam and pipeline infrastructure is appropriate in some locations. However, new dams are not the solution. New dams do not create any new water. They simply take it from somewhere else – either from farmers who currently rely on it or from the environment.

North of the Divide, there is a cap on further allocations from the Murray-Darling river system. As a result, if new dams are built or existing dams expanded for towns, water would have to be purchased from somewhere else, most probably from farmers.

If a new dam were built for Melbourne, it would need to be filled with water that is currently used by rural and regional communities and the environment:

- a new dam for Melbourne would take water from Gippsland or Goulburn Valley farmers who depend upon irrigation for their livelihoods;
- it would also take water from our rivers that are already stressed. This would not only harm the habitat of our native plants, fish and animals, but also threaten our waterways tourism and recreation industry. Taking more water for Melbourne from Gippsland is also likely to harm the Gippsland Lakes, which are vital for Gippsland’s economy;
- a new dam for Melbourne would be expensive, costing Victorians up to one billion dollars. These costs are not justified when there are great opportunities to use the water already available to Melbourne more wisely. The cost of saving water through sensible water conservation is far less than the cost of building a new dam; and
- there is existing water supply infrastructure that can be used to harness increased supplies for Melbourne (refer Securing Our Drinking Water Supplies).
Reducing our demand for water is the priority action because:

- all Victorians can conserve water – simply turning the tap off while brushing your teeth can save up to nine litres of water for every minute of brushing;
- measures to reduce our water use are generally less costly than substituting our drinking water with alternative supplies;
- it reduces discharge of effluent into the environment;
- it reduces energy used for treatment and pumping and hence greenhouse gas emission; and
- it reduces extraction of water from the environment.

The Victorian public has demonstrated widespread support for water conservation measures in the past two years.

**Water consumption targets**

The Government has set a target to reduce per capita drinking water consumption in Melbourne by 15 per cent by 2010 compared to the 1990s average. This requires a permanent reduction from 423 to 360 litres per person per day.

In the past two years, Stage 1 and Stage 2 restrictions have been in place in Melbourne leading to significant water savings. Over and above this, the Government has supported a behavioural change campaign *Our Water Our Future* and provided rebates for water saving devices. Melburnians have demonstrated an enthusiasm to reduce water consumption. It is forecast that for 2003-04, Melburnians will have reduced their annual water consumption by 22 per cent in comparison with the 1990s average (refer Figure 5.3). Twelve per cent has been achieved through water restrictions and the remaining ten per cent has been achieved through the water savings efforts of Melburnians over and above the restrictions.

The real challenge will be to maintain reduced levels of water consumption after the drought ends. Melbourne’s water authorities have prepared a water conservation strategy to achieve the 15 per cent reduction in consumption by 2010. The strategy contains a number of initiatives designed to reduce water consumption by customers and distribution losses. The expected water savings as a result of these initiatives are summarised in Figure 5.4. Additional water conservation will be achieved through the initiatives contained in the water authorities’ water recycling plan.

![Figure 5.3 Melbourne’s average water use per capita per day](image-url)
With the introduction of permanent water saving measures for Melbourne, it is possible to achieve more than 15 per cent reduction in consumption in the years following 2010.

Given the risk of climate change, and the need to provide additional environmental flows into the Thomson River which are currently taken by Melbourne, it is proposed to set up an expert committee to examine whether Melbourne can achieve greater than 15 per cent reduction in water consumption beyond 2010.

It is important that this expert committee integrates its work with the work of the metropolitan water authorities in developing their Water Supply-Demand Strategy.

The Government will also require all regional urban water authorities to develop water conservation targets. The targets will be developed at the local level and will be suitable for local conditions. They will be implemented through specific water conservation programs and be incorporated into the urban water authority Water Supply-Demand Strategies.

**Action**

5.2 The Government will establish an expert committee to advise on an appropriate target for reduction in per capita drinking water consumption for Melbourne beyond 2010.

5.3 The Government will require all regional urban water authorities to develop water conservation targets within 12 months. These targets will be incorporated into the water authorities’ Water Supply-Demand Strategies.
The Government in partnership with water authorities will support actions to deliver water savings through:

- pricing to encourage water conservation;
- introducing permanent water saving measures;
- education and water awareness campaigns;
- regulatory support for water efficient appliances;
- a rebate scheme to encourage water smart gardens and homes;
- water sensitive urban development;
- encouraging and supporting industry to reduce water consumption; and
- working with and supporting local government to promote water conservation.

### Pricing to encourage water conservation

One key factor in conserving water is how it is priced. Currently, water is not priced to reflect its true cost, in particular the environmental cost associated with water use. There is scope to structure prices to further encourage the smarter use of water.

The Government proposes that the structure of prices should encourage water conservation by charging more as water use increases.

The Government will introduce rising block tariff pricing for domestic customers in Melbourne from 1 October 2004. The rising block tariffs will reward water conservation and discourage excessive use.

The Government will require regional urban water authorities to introduce pricing structures that provide incentives for water conservation by 1 July 2005.

The details of the pricing proposals are set out in Chapter 6.

### Permanent water saving measures

The introduction of permanent water savings measures recognises that there are currently unacceptable uses of our precious water resources.

A number of regional urban water authorities have already introduced permanent water saving measures. In 2003, Barwon Water was the first authority to introduce such measures to limit the use of sprinklers and prohibit the hosing down of paved areas.

Other regional water authorities including Goulburn Valley Water and Lower Murray Water have already introduced permanent water saving measures, and North East Water will soon follow suit.

#### Action 5.4

The Government will require all urban water authorities to introduce permanent water savings measures. These measures will be developed at the local level and will be suitable for local conditions.

Proposed permanent water saving measures for Melbourne to apply all year round are presented in Table 5.1. The permanent water saving measures will apply once water restrictions are lifted.

These draft measures will be formally advertised for a period of public comment until 15 August 2004. Public comment will be considered prior to finalisation of the measures. (For further information, contact the Department of Sustainability and Environment’s Customer Service Centre on 136 186).
The draft permanent water savings measures for Melbourne are based on the Barwon Water measures, but are seeking to provide some additional savings, in particular by further limiting the hours of operation for watering systems and by requiring automatic watering systems to be fitted with a rain sensor or soil moisture sensor.

The proposed requirement for a sensor is to ensure that automatic sprinkler systems do not operate while it is raining or when the soil is very wet. The cost of a rain sensor is around $60.

With the introduction of daytime garden watering restrictions, some householders will purchase automatic irrigation systems for night watering. However, the use of these systems can lead to water wastage if they continue to operate as programmed during wet weather. This has been experienced in Perth. The recommendation to require rain or soil moisture sensors for automatic watering systems has been proposed to ensure that this does not occur.

### Table 5.1 Draft permanent water savings measures for Melbourne

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Private Gardens (including lawns)</strong></td>
<td>• A sprinkler, microspray or drip system or any other watering system must not be used to water a garden or lawn except between the hours of 8.00 pm and 8.00 am.&lt;br&gt;• A hand-held hose fitted with a trigger nozzle, a watering-can or a bucket can be used at any time.&lt;br&gt;• All automatic watering systems installed from 1 December 2004 must be fitted with either a rain sensor or soil moisture sensor as part of the control system.&lt;br&gt;• All existing automatic watering systems must be fitted with either a rain sensor or soil moisture sensor as part of the control system by 1 December 2005.</td>
</tr>
<tr>
<td><strong>Public Gardens and Sports Grounds/Recreational Areas</strong></td>
<td>• A sprinkler, microspray or drip system or any other watering system must not be used to water a garden or lawn except between the hours of 8.00 pm and 8.00 am.&lt;br&gt;• A hand-held hose fitted with a trigger nozzle, can be used at any time.&lt;br&gt;• All automatic watering systems installed from 1 December 2004 must be fitted with either a rain sensor or soil moisture sensor as part of the control system.&lt;br&gt;• All existing automatic watering systems must be fitted with either a rain sensor or soil moisture sensor as part of the control system by 1 December 2005.</td>
</tr>
<tr>
<td><strong>Fountains</strong></td>
<td>• A fountain, which does not recycle water, must not be operated.</td>
</tr>
<tr>
<td><strong>Motor Vehicle Cleaning (all vehicles)</strong></td>
<td>• A hose used to clean a vehicle by hand must be fitted with a trigger nozzle.</td>
</tr>
<tr>
<td><strong>Paved Areas – Cleaning</strong></td>
<td>• A paved area must not be cleaned with water from a hose unless cleaning is required as a result of:&lt;br&gt;  - an accident, fire, health hazard or other emergency;&lt;br&gt;  - an identified safety hazard has developed over time and a high pressure water cleaning device is used; and&lt;br&gt;  - construction or renovation work to the surface.</td>
</tr>
<tr>
<td><strong>Construction Industry</strong></td>
<td>• Any hose used must be fitted with a trigger nozzle.</td>
</tr>
<tr>
<td><strong>Swimming Pools</strong></td>
<td>• Before a pool or spa with a capacity of 2,000 litres or greater is filled for the first time, an application which includes details of measures that will be undertaken to provide water savings to offset the volumes used in filling, must be lodged with and approved by the water authority.</td>
</tr>
</tbody>
</table>
Education and water awareness

Opportunities exist for the whole community at home, work and play to contribute towards sustainable urban water management by conserving water. To do this, communities need to be well informed on key water issues, and individuals must have the ability to recognise the value of their own individual contribution.

In recent years, both metropolitan and regional water authorities have actively engaged with their communities regarding water conservation. During the drought there has been a particular focus on community education and awareness about water restrictions.

There is a need to move public awareness beyond saving water during droughts, towards saving water all the time.

The Government has already recognised the need for informed communities through the implementation of the Our Water Our Future behavioural change campaign in metropolitan Melbourne.

The campaign has increased the awareness of the need to save water. The program will continue and similar community education programs will be undertaken in regional and rural Victoria. These campaigns will help make Victorians better water savers and inform them about the total water cycle.

Victorians are not very aware of how much water they use, or even how much they pay for it. Water bills can provide more information to help Victorians save water.

Water authorities also have a responsibility to keep the community informed about how the community is progressing on meeting its water conservation targets.

Action

5.5 The Government and water authorities will undertake community education and information programs to encourage water saving.

5.6 The Government will require water authorities to make water bills more informative. This will enable households to better monitor their water use over time, and compare their consumption with households in their local area.

5.7 The Government will require the urban water authorities to report to the community on a regular basis regarding their progress towards meeting water targets.

During 2003, most Victorians experienced water restrictions. Through their Drought Response Plans, the water authorities have managed the introduction of restrictions effectively with a high level of community acceptance and cooperation.

Historically, water restrictions across the State have differed. In some areas there are ten-step restrictions, in others there are four. This has led to some community confusion regarding varying levels and types of water restrictions across the State. A consistent system of drought restrictions is required, one that allows for local variation to ensure that restrictions are suitable for local conditions.
Regulatory support for water efficient appliances

To change water consumption behaviour it is important that water users are aware of how much water their household appliances use. Victoria is participating in a national approach to compulsory water efficiency labelling for household appliances including washing machines and dishwashers.

Water efficient plumbing measures such as efficient shower roses and toilets are cost-effective ways to reduce water use. Efficient shower roses are relatively cheap and can save around 13 kilolitres per household per year.

Washing machines and dishwashers that are ranked highest for Australian water efficiency standards allow consumers to make substantial savings in water use, water heating and detergent use.

The Government will encourage their use by requiring suppliers to label their products with information about water efficiency.

Action 5.8 The Government and water authorities will develop, prior to 1 December 2004, uniform water restriction guidelines for drought response which will set out a recommended four-stage restriction policy for the whole of Victoria.

Action 5.9 The Government, in partnership with the Commonwealth and other State and Territory Governments, is developing national mandatory water efficiency labelling for appliances, fixtures and fittings. Victoria proposes to introduce legislation to implement the national scheme by Autumn 2005.
CHAPTER FIVE – SMARTER WATER USE IN OUR CITIES AND TOWNS

5.10 The Government will introduce mandatory water efficient plumbing measures such as water conserving shower roses and taps (AAA equivalent) for all new houses and other buildings and for new fittings within existing buildings from 1 July 2004.

5.11 The Government will encourage use of water efficient washing machines and dishwashers through the water efficiency labelling scheme but does not propose to make them mandatory at this stage.

Complementing these actions, Central Highlands Water is working with the University of Ballarat to understand the current level of adoption of water efficient appliances within the community, what barriers exist to uptake and how the level of uptake can be increased.

Water Smart Gardens and Homes Rebate Scheme

The Government has committed $10 million over four years to provide rebates to households that are ‘water smart’ in their gardens and homes.

There has been an overwhelming response to the rebate scheme since it commenced in January 2003. In that time, over 63,000 rebates have been approved. During October and November 2003, over 13,600 rebates were provided to customers for the purchase of AAAA washing machines.

The results of the rebate scheme are shown in Table 5.2.

The rebate scheme also distributed 50,000 flow control valves to Victorians requesting the Our Water Our Future water saving kits.

Estimated water savings from the uptake of water saving products through the rebates program is in the order of 680 megalitres per year.

Table 5.2 Rebate uptake – 1 January 2003 to 13 May 2004 (Phases 1 and 2)

<table>
<thead>
<tr>
<th>Products</th>
<th>Rebate Amount ($)</th>
<th>Rebates Approved</th>
<th>Total Water Savings (ML)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA Dishwashers</td>
<td>100</td>
<td>5,744</td>
<td>17.2</td>
</tr>
<tr>
<td>AAAA Washing Machines</td>
<td>150</td>
<td>13,666</td>
<td>218.7</td>
</tr>
<tr>
<td>AAA Shower Rose</td>
<td>10</td>
<td>1,932</td>
<td>25.1</td>
</tr>
<tr>
<td>Dual-flush Toilet</td>
<td>50</td>
<td>1,803</td>
<td>23.4</td>
</tr>
<tr>
<td>Greywater Permanent Tank System</td>
<td>500</td>
<td>115</td>
<td>2.9</td>
</tr>
<tr>
<td>High Pressure Cleaning Device</td>
<td>30</td>
<td>19,064</td>
<td>24.8</td>
</tr>
<tr>
<td>Rainwater Tank to Toilet System</td>
<td>150</td>
<td>117</td>
<td>4.0</td>
</tr>
<tr>
<td>Rainwater Tank</td>
<td>150</td>
<td>6,034</td>
<td>99.8</td>
</tr>
<tr>
<td>Water Conservation Audit</td>
<td>30</td>
<td>45</td>
<td>0.5</td>
</tr>
<tr>
<td>Rebate when Purchasing $100 worth of goods</td>
<td>30</td>
<td>15,141</td>
<td>75.7</td>
</tr>
<tr>
<td>(Water Saver Kits)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow Control Valves</td>
<td>–</td>
<td>50,000</td>
<td>195\textsuperscript{a}</td>
</tr>
<tr>
<td>Overall Total</td>
<td></td>
<td>63,331\textsuperscript{a}</td>
<td>687.1</td>
</tr>
</tbody>
</table>

A – Assuming 30 per cent installation rate of flow control valves. B – Excluding flow control valves.
The Water Smart Gardens and Homes Rebates Scheme will continue to support households to use water more wisely, over the next two years until 30 June 2006.

Rebates will also be made available to the following not-for-profit organisations that are eligible for the Water and Sewerage Rebate on service charges: sporting clubs, housing and accommodation, preschools and kindergartens and churches.

This not-for-profit component of the Water Smart Gardens and Homes Rebate Scheme will commence 1 October 2004. It will provide funding to these not-for-profit organisations on a dollar-for-dollar basis up to a maximum of $250 per eligible assessment for water efficiency improvements (the maximum rebate of $250 is available when $500 or more is spent by the organisation). The rebate will be provided back to the organisation on its water bill, as with the domestic rebates.

Rebates for these groups will be provided for:

- water audits and retrofitting;
- water efficient shower roses, flow regulators or flow control valves and dual flush toilets;
- maintenance work on leaking taps, toilets and showers; and
- maintenance on irrigation and watering systems to improve water efficiency.

(Note: The Water and Sewerage Rebate on service charges is administered by the water authorities and provides a rebate of up to $260 per year to eligible community organisations on the fixed service charge component of their water bill issued by their water authority. For metropolitan water and sewerage rebates, the scheme is administered under the ‘Metropolitan Rebates for Eligible Organisations Order 1998’ made under section 26 of the Water Industry Act 1994. For non-metropolitan rebates, the scheme is administered under the ‘Non-Metropolitan Water and Sewerage Rebates for Eligible Organisations Orders 1998’ made under section 283 of the Water Act 1989.)

The Government is also investigating opportunities for schools to participate in a water audit and retrofitting program aimed at improving the water efficiency of the schools. Work conducted by Yarra Valley Water has demonstrated that there are substantial water savings that can be made in schools.

A similar water audit and retrofitting program will also be investigated for hospitals.

Water sensitive urban development

New developments provide opportunities for smarter water management.

Adoption of a total water cycle approach and water sensitive urban design can reduce demand for water and use alternative supplies in new residential, commercial and industrial developments and redevelopments.

The Green Paper proposed a target of 25 per cent water savings in all new developments. However, further work is required to determine how the 25 per cent target should be measured and achieved.

There are good examples of water sensitive urban design. For example, VicUrban’s Aurora residential development at Epping North has developed a system that will provide water savings of over 60 per cent. This will be achieved through the use of a third pipe system for recycled water for toilet flushing, and watering gardens and open spaces. The use of rainwater for hot water purposes is also being considered.

There are a number of ways in which developers can reduce water demand including:

- water efficient plumbing and appliances within new homes;
- water efficient gardens and landscaping, including the use of drought resistant plants and water efficient irrigation systems;
- water sensitive urban drainage across subdivisions;
- rainwater tanks connected to sanitary (toilet) systems; and
- use of stormwater as a resource within new residential developments.)
The Government is leading by example in improving water efficiencies in its building and operations.

All Government departments are required to develop environment management systems aimed at improving environment performances, including reduced water consumption. Each department is required to report annually on progress.

The Department of Sustainability and Environment has developed Environmentally Sustainable Design and Construction Principles and Guidelines. These guidelines include measures for increased water efficiencies.

**State Government buildings**

The Government is demanding high office standards. New Government accommodation in the following locations have been designed for water and energy efficiency:

- the Southern Cross Building, Melbourne;
- the Department of Treasury and Finance’s offices at 50 Lonsdale Street, Melbourne;
- the new Department of Human Services Building, Bendigo;
- the new EPA Victoria building in Dandenong;
- the Department of Sustainability and Environment consolidation project at 8 Nicholson Street, Melbourne;
- the Department of Primary Industries fit-out of 1 Spring Street, Melbourne;
- the new Department of Sustainability and Environment office building at Bairnsdale; and
- water recycling and efficiency initiatives are being implemented in Ministry of Housing accommodation.

**Action**

5.13 The Government will set an aspirational target for new development to achieve at least 25 per cent savings in water use.

5.14 The Government will prepare Water Sensitive Urban Development guidelines to assist developers, industry and local government in achieving the target, further developing existing work by Councils, water authorities, developers and others.

5.15 The Government will provide funding to support smart urban water use initiatives which encourage innovative approaches to demand management, recycling and stormwater management.

5.16 The Government will require the urban water authorities to plan for new growth areas in the development of their Water Supply-Demand Strategies.

**Encouraging industry to reduce water use**

Industry and commerce accounts for almost one third of Melbourne’s use of drinking water supplies. This can be much higher in regional towns.

In Melbourne, the top 200 water users alone account for the use of 10 per cent of the city’s drinking water supply. The retail water authorities have launched Pathways to Sustainability, a voluntary program that encourages Melbourne’s top 200 water users to prepare a water management plan. These plans will provide a complete analysis of a business’ total water cycle, and provide the framework for improvements in water conservation.

Some plans have already been completed. As an example of the program, Yarra Valley Water has worked with the Chadstone Shopping Centre to achieve water saving of 30 megalitres per year through increased washroom efficiencies.

Many regional urban water authorities also have a history of working with local industry to achieve improved water management. For example, Goulburn Valley Water has been working with local industry to upgrade water supply and wastewater management facilities. Campbell’s Soups, working with Goulburn Valley Water, has achieved water savings of 18 per cent per year (or 163 megalitres per year) and a reduction in effluent discharge of 27 per cent.

Melbourne’s retail water authorities estimate that the top 200 industrial water users will have completed water management plans within three years. As the water authorities progress work
with these high water users, they will expand the Pathways to Sustainability program to other significant water users across metropolitan Melbourne.

The Government and water authorities will work with local government to achieve more efficient water use for parks, gardens and sporting fields.

Action 5.18 The Government will require all urban water authorities to work with industry towards improved water management outcomes, including opportunities for water conservation, recycling and waste minimisation.

5.19 The Government will require all urban water authorities to report annually on their water conservation programs with industry and details of water saved.

5.20 The Pathways to Sustainability program within metropolitan Melbourne will be extended by the water authorities to other industrial water users within the metropolitan area as soon as the initial program has been completed for the top 200 industrial water users.

Working with local government to reduce water use

Local government plays an important role in water management and many councils are leading the drive towards more sustainable water practices. Councils are not only role models and community educators, they also manage drainage and stormwater, regulate planning and building policies and are themselves significant water users.

Our public parks and gardens, sporting fields and other open spaces form a vital part of our social fabric. The Government and water authorities will work with local government to achieve more efficient water use for parks, gardens and sporting fields.

Local councils in Melbourne are working with the metropolitan water authorities to develop water conservation plans. The Government proposes to extend this initiative to regional Victoria in partnership with regional urban water authorities.

Action 5.21 Funding will be provided to support the extension of local government water conservation plans across regional Victoria.

5.22 The urban water authorities will be required to work with local government in the preparation of these plans.

5.23 Local government will be eligible for funding support for water conservation and recycling demonstration projects including use of recycled water on sporting grounds and in parks.

5.24 The Government has committed to supporting improved water management of country football grounds with $1 million over the next two years.
Recycling and Alternative Water Supplies

Increasing the use of alternative water supplies, such as recycled water, stormwater, rainwater and greywater, can have numerous benefits – improving the reliability of our water supplies, freeing up water for the environment or growth and reducing the amount of treated effluent discharged into our rivers, bays and oceans.

We use drinking water for a number of purposes that do not require drinking water quality. This includes agricultural/horticultural irrigation, watering parks and recreational areas, some industrial processes, toilet flushing and garden watering.

Regional urban areas are moving forward with recycling projects. In Geelong, Barwon Water has adopted a strategy to recycle 25 per cent of all treated effluent by 2015. Coliban Water supplies recycled water to irrigate crops and pastures and a local golf course. Glenelg Water is planning a high quality recycled water plant in Hamilton to provide a secure water supply of 350 megalitres per year for industry. Central Highlands Water’s SmartCycle program sets a vision for managing water resources in the Ballarat region, including a major works program by 2005 which will enable 2,000 megalitres of recycled water per year to be used for a range of purposes.

In Melbourne, two very large sewage treatment plants at Werribee and Carrum treat about 96 per cent of Melbourne’s sewage, with the remainder treated in smaller local plants. This makes it more difficult and expensive to recycle water that has to be transferred relatively long distances from the two major treatment plants.

Treated water from the Western Treatment Plant has relatively high salt levels, with almost half the salt produced by industry and commerce. This makes it more difficult and costly to recycle the treated water and a mix of measures will be required to reduce salt in the treated water over time.

Reducing ocean outfalls

All effluent discharges from Victoria’s ocean outfalls are treated to secondary standard to meet EPA Victoria’s licence requirements and to ensure that environmental impacts are reduced. Victoria leads Australia in this achievement. Under the State Environment Protection Policy (Waters of Victoria) all water authorities must have programs to assess the impact of discharges on the environment and manage environmental impacts.

Some small coastal treatment plants (Aireys Inlet, Lakes Entrance and Mallacoota) have ceased discharge to the ocean by recycling the treated effluent generated. This process will continue where recycling of all the treated effluent is practicable.

Further, the Government and water authorities are working to reduce discharges from other ocean outfalls through water conservation and recycling initiatives.

Policy

Urban water supplies comprise all available water resources including recycled water, stormwater, rainwater and greywater.

In our urban communities, we will use water that is fit-for-purpose – many uses of water do not require drinking water standards.

We will use alternative water supplies for non-drinking uses where there is a net benefit to the urban community and to minimise detrimental discharges to the environment.

Policy

To protect the amenity and health of the marine environment, water authorities will continue to improve the quality and reduce the quantity of effluent discharged from ocean outfalls.

The Government and water authorities will vigorously pursue opportunities for water conservation and recycling to reduce discharges from ocean outfalls and to increase the feasibility of ceasing discharge.

EPA Victoria will continue to work with industry and coastal water authorities to reduce pollutant loads and concentrations and will review existing discharge licences on a case by case basis to progressively reduce discharge impacts.

At present, ocean outfalls are necessary to manage the treated effluent generated from our larger coastal urban centres, including Melbourne. The only current alternative for Melbourne would be to place treated water in our drinking water supply system. This is not acceptable.
It will take major water recycling projects to reduce ocean outfall discharges sufficiently to have measurable environmental benefits for larger urban centres like Melbourne and Geelong. Major water recycling projects present many challenges including:

- securing markets for large volumes of recycled water;
- establishing infrastructure for recycled water;
- managing environmental (including energy use) and social impacts of construction and operational activities; and
- high capital and operating costs, and hence the issue of financing of such projects. Such large-scale projects would present the opportunity for private sector participation in infrastructure provision in line with the Government’s Partnership Victoria principles.

Examples of major recycling projects that would result in reductions in discharges to the marine environment include the Major Recycling Scenarios for Gippsland and West of Melbourne (refer: Strategic investment in recycling and alternative supplies). The Gippsland scenario would reduce the discharge from Eastern Treatment Plant’s ocean outfall to Bass Strait by 80 per cent.

Regardless of the potential for major water recycling projects, currently ocean outfalls remain necessary for managing treated effluent generated from our larger coastal urban centres. At a minimum, ocean outfall capacity will need to be retained to manage wet weather flows. Over time the Government and the water authorities will work progressively to reduce the volume of treated effluent discharged to the ocean.

**Targets for recycling**

The Government has previously announced a water recycling target of 20 per cent by 2010. The metropolitan water authorities are making progress towards this target. In 2002-03 they achieved 11 per cent water recycling (36,000 megalitres) mainly for irrigation purposes and on-site process recycling.

Since then, two significant water recycling projects have been announced by the Government. These are the Werribee Irrigation District Recycled Water Scheme and the Eastern Irrigation Scheme in the Cranbourne/Five Ways area. Together, these two projects will supply up to 13,000 megalitres of recycled water per year to agricultural and horticultural customers, and to the Sandhurst residential development in the Carrum area.

Individual developers are also introducing recycling. For example, VicUrban at its Aurora development at Epping North is implementing a local treatment plant to produce recycled water for toilet flushing and garden watering. This substantial development will eventually house 25,000 people in up to 8,500 homes and will be a model for water recycling and environmentally sustainable designs.

There are eight existing committed projects that will count towards achieving the target. These projects are summarised in Table 5.3. Together with the 11 per cent recycling already achieved, these projects will achieve a recycling rate of 20 per cent. These projects will be funded through the normal water authority planning process. Chapter 6 outlines the Government’s principles for water authority investment in recycled water and alternative supply projects.
### Table 5.3 Committed recycling projects

<table>
<thead>
<tr>
<th>Projects</th>
<th>Use</th>
<th>Benefits</th>
<th>Estimate Volume (ML/yr) by 2010</th>
<th>Estimate Volume (ML/yr) by 2030</th>
</tr>
</thead>
</table>
| Werribee South (Southern Rural Water and Melbourne Water) | Recycled water for horticulture. | • Reduced use of surface water and groundwater, freeing up water for the environment  
• Allows for growth.  
• Security of supply.  
• Reduced discharge to Port Phillip Bay. | 8,500 | 10,600 |
| Eastern Irrigation Scheme (Melbourne Water) | Recycled water for horticulture. | • Reduced use of surface water and groundwater.  
• Security of supply.  
• Water for growth.  
• Reduced discharge to Bass Strait. | 4,400 | 4,400 |
| Western Treatment Plant On-Site Recycling (Melbourne Water) | Recycled water used on-site on 11,000 hectares of land for pasture production. | • More sustainable on-site farming and land management practices.  
• Reduction in nitrogen loads to Port Phillip Bay. | 19,615 | 19,615 |
| Whittlesea Scheme (Yarra Valley Water) | Recycled water from Whittlesea Treatment Plant for irrigation of a new Council golf course and potentially TAFE horticulture program. | • Removal of treated waste discharge to waterway.  
• Security of supply. | 285 | 365 |
| Kooringal Golf Club (City West Water) | Recycled water from Altona Sewage Treatment Plant for irrigation of Kooringal and Sanctuary Lakes golf courses. | • Drinking water substitution.  
• Security of supply.  
• Reduced discharge to Port Phillip Bay. | 500 | 500 |
| Aurora Development (Yarra Valley Water) | Recycled water from local treatment plant for toilet flushing, garden watering and open space irrigation in new development. | • Demonstrate use in urban development in the north of Melbourne.  
• Reduction in rate of growth in drinking water consumption due to urban growth.  
• Security of supply. | 335 | 1,070 |
| Sandhurst Club (South East Water and Melbourne Water) | Recycled water for irrigation of golf course and residential use. | • Reduction in rate of growth in drinking water consumption due to urban growth.  
• Security of supply. | 380 | 380 |
| Inkerman Delux Development (South East Water) | Apartment development in St Kilda incorporating on-site recycling of stormwater and greywater for toilet flushing and irrigation. | • Demonstrate use in a multi-unit development in Melbourne.  
• Reduction in rate of growth in drinking water consumption due to urban growth. | 6 | 6 |
Examples of additional projects that are currently being investigated and that would contribute to the recycling target are summarised in the Table below. Implementation of these projects would take the level of recycling in Melbourne beyond the Government's 20 per cent target and provide significant drinking water substitution. These projects will be fully assessed through the water authority planning process.

**Table 5.4 Recycling projects currently under investigation**

<table>
<thead>
<tr>
<th>Projects</th>
<th>Use</th>
<th>Benefits</th>
<th>Estimate Volume (ML/yr) by 2010</th>
<th>Estimate Volume (ML/yr) by 2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand Belt Scheme in south-east Melbourne (South East Water and Melbourne Water)</td>
<td>Recycled water for golf courses and council reserves. Potential to supply market gardens and industry.</td>
<td>• Drinking water and groundwater substitution. • Security of supply/drought proofing. • Reduced discharge to Bass Strait.</td>
<td>1,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Wyndham Residential Development at Werribee (City West Water and Melbourne Water)</td>
<td>Recycled water from Western Treatment Plant for toilet flushing, garden watering and open space irrigation in new development.</td>
<td>• Demonstrate use in urban development in the west of Melbourne. • Reduction in rate of growth in drinking water consumption due to urban growth. • Reduced discharge to Port Phillip Bay.</td>
<td>655</td>
<td>1,560</td>
</tr>
<tr>
<td>Princes Park Water Recycling Project (City West Water)</td>
<td>Local treatment and recycled water for open space and landscape watering.</td>
<td>• Demonstrate local water mining and use of recycled water treated fit-for-purpose. • Drinking water substitution. • Security of supply.</td>
<td>1,000</td>
<td>1,100</td>
</tr>
<tr>
<td>Cranbourne East Residential Development in south-east Melbourne (South East Water and Melbourne Water)</td>
<td>Recycled water from Eastern Treatment Plant for toilet flushing, garden watering and open space irrigation in new development.</td>
<td>• Demonstrate use in urban development in the east of Melbourne. • Reduction in rate of growth in drinking water consumption due to urban growth. • Security of supply.</td>
<td>315</td>
<td>1,365</td>
</tr>
<tr>
<td>Cranbourne West Residential Development in south-east Melbourne (South East Water and Melbourne Water)</td>
<td>Recycled water from Eastern Treatment Plant for toilet flushing, garden watering and open space irrigation in new development.</td>
<td>• Demonstrate use in urban development in the east of Melbourne. • Reduction in rate of growth in drinking water consumption due to urban growth. • Security of supply.</td>
<td>105</td>
<td>1,050</td>
</tr>
</tbody>
</table>

Regional urban water authorities are also investigating recycling opportunities which will be fully assessed through the water authority planning process. For example, Barwon Water is examining a range of options for achieving their 25 per cent target by 2015. Possible projects include an industrial project in northern Geelong which would provide recycled water from a water reclamation plant for industrial use and a potential third pipe scheme using recycled water from Black Rock Water Reclamation Plant for toilet flushing, garden watering and open space irrigation in new development at Torquay. Coliban Water is investigating a major recycling project with Bendigo Mining that could boost Bendigo's water supply by 20 per cent.

A summary of recycling across Victoria for 2002-03 is provided in Figure 5.5 overleaf.
Planning for recycling and alternative supplies

**Action 5.25** The Government will require all urban water authorities to assess opportunities for the use of recycled water and other alternative supplies in the development of Water Supply-Demand Strategies.

In developing Water Supply-Demand Strategies, urban water authorities will be required to consider opportunities for:

- high technology local treatment plants that enable local recycling;
- the use of recycled water near recycled water sources;
- the use of third pipe systems;
- environmental uses of recycled water, for example, environmental flows;
- rainwater and stormwater use and greywater reuse; and
- the use of alternative water supplies accessed via water mining and aquifer storage and recovery.

The Water Supply-Demand Strategies will establish water recycling targets.
The Government will seek to maximise the use of recycled water and alternative supplies where they are fit-for-purpose and their use is justified on economic, environmental and social grounds. As part of this process, the Government and water authorities will continue to evaluate a range of water recycling projects for introduction around the State.

The Government and metropolitan water authorities are investigating a range of opportunities for recycling including larger-scale projects that, if implemented, would significantly increase recycling of Melbourne’s wastewater. The Green Paper Technical Report No.1 – Water Recycling Scenarios for Melbourne (September 2003) provides 19 alternative supply scenarios. The Government’s response to each of these scenarios is provided in Appendix E.

One of the scenarios was to use recycled water as a source of drinking water. In some parts of the world recycled water is used as a source for drinking water supplies.

It is possible to augment treatment at Melbourne’s Western and Eastern Treatment Plants and then pump high quality recycled water into reservoirs such as Cardinia Reservoir. However, such measures are unnecessary. By reducing our water consumption and using supplies that are fit-for-purpose, we have sufficient water supplies for drinking purposes for the foreseeable future.

**Policy**

The Government will not mandate third pipe systems in all new greenfield residential developments. In new housing and industrial developments near existing treatment plants, third pipe systems are more likely to be economic. The Government will work with local government, water authorities and developers in these areas to support the introduction of third pipe systems for recycling. This may include mandating third pipe systems in a particular development through a planning scheme amendment or other mechanism.

Planning by urban water authorities, in particular through the development of Water Supply-Demand Strategies, may identify recycled water distributed by third pipe systems as the best solution for balancing overall supply and demand. Regulation would then mandate developers to adopt these measures, enabling retailers to offer consumers an integrated water supply package (drinking water plus alternative supply in dual supply systems).

This will allow developers to offer ‘drought proof’ gardens, parklands and recreational areas. The Government does not support the compulsory retrofitting of third pipe systems to distribute recycled water in the existing suburbs of Melbourne due to the prohibitive costs and disruption involved.

**Urban third pipe systems**

A third pipe system is generally used to deliver recycled water to urban areas. New residential, commercial and industrial developments provide the greatest opportunities for the distribution of recycled water via third pipe systems. However the cost of a third pipe system may be significant, particularly where a new development is a long distance from treatment plants.

**Action 5.26**

The Government will not place recycled water directly into the drinking water supply system. However, technical development and implementation elsewhere will be monitored.
Strategic investment in recycling and alternative supplies

Water recycling projects are core business for the water authorities. However, Government support may be required to deliver strategic recycling and water recovery projects that provide significant community benefits at a State or regional scale.

Policy

The Government will support strategic recycling and water recovery projects that provide significant community benefits at a State or regional scale.

Action

5.27 Over the next four years, the Government will consider investment in strategic water recovery and recycling programs that:

• are of State or regional significance;
• deliver multiple benefits – social, economic and environmental;
• involve a cooperative approach; and
• are larger scale projects or initiatives.

Examples of strategic investment opportunities are outlined below.

5.28 The Government will further investigate the Major Recycling Scenario – Gippsland.

Recycled water could provide for a major shift in the way we manage urban water resources south of the Divide. Availability of alternative water supplies in the Melbourne and Gippsland regions provides an opportunity to reconsider management of drinking water resources. It could provide greater security of supply, extra water resources for Gippsland and increase environmental flows to stressed rivers.

A proposed scenario for water management across this area is illustrated in Figure 5.6.

The key elements of this ‘big picture’ scenario include:

• recycled water transferred from Melbourne’s Eastern Treatment Plant via a 135 kilometre pipeline to the Latrobe Valley;
• a new water reclamation plant to treat water sourced from the Latrobe Valley sewerage system. The treated water would be mixed with recycled water from Eastern Treatment Plant and supplied to the Latrobe Valley’s power stations, paper industry and new industries in the region, substituting the use of surface water from the catchment. Return flows from power stations would be retreated in the reclamation plant;
• freshwater currently taken from Gippsland’s rivers for use in industry will be ‘freed up’ for environmental flows and extra drinking water; and
• use of appropriately treated recycled water in the Macalister Irrigation District for agricultural expansion and substitution.

Potential long-term benefits include:

• closure of Gippsland’s Regional Outfall Sewer for transfer of sewage;
• extra water available for agriculture or industrial expansion in Gippsland;
• additional environmental flows of freshwater in the Latrobe, Thomson and Macalister Rivers, and assisting with the revitalisation of the Gippsland Lakes;
• potentially providing extra drinking water throughout the region; and
• significantly reducing treated wastewater discharges (80 per cent reduction) to the marine environment at Gunnamatta on the Mornington Peninsula.

Melbourne Water and Gippsland Water are currently progressing a pre-feasibility study of the economic, social and environmental costs and benefits of the scenario.
Figure 5.6 Major Recycling Scenario – Gippsland
Major Recycling Scenario – West of Melbourne

The lack of water in the west is a constraint on growth in the major urban centres of Geelong and Ballarat. The rivers to the west of Melbourne – the Werribee, Moorabool and Barwon Rivers - are stressed due to extractions. High value agricultural production and industry development in the area is limited as a result of lack of water.

The Western Treatment Plant in Werribee has the potential to generate large volumes of high quality, recycled water. This water could be used for irrigation in the Moorabool and Bacchus Marsh areas, freeing up water for Geelong and Ballarat and for environmental flows. Recycled water from other treatment plants in the west is small in comparison, but could also offer a range of existing and potential recycling opportunities.

The proposed scenario for water management west of Melbourne will take a ‘big picture’ approach. The key elements of the scenario will include:

- a strategic water resources plan for the west encompassing Ballarat, Bacchus Marsh, Greater Geelong, Surf Coast and the west of metropolitan Melbourne;
- an expanded Balliang business case, to include Bacchus Marsh and Moorabool Valley as priorities, investigating the beneficial use of up to 35,000 megalitres of recycled water;
- a commitment to reduce salt loads in recycled water at the Western Treatment Plant through desalination technology, innovation and cleaner production; and
- release of an action plan for the Werribee Plains Vision which details initiatives and projects using recycled water to create a major green region west of Melbourne.

The scenario is shown in Figure 5.7.

Action

5.29 Building on the significant work already undertaken, the Government will:

- as part of the Sustainable Water Strategy for the Central region, assess the Major Recycling Scenario – West of Melbourne to secure water supplies for Ballarat, Geelong and agriculture, and to improve environmental flow; and
- further to the implementation of the Werribee District Recycled Water Scheme, examine recycled water opportunities in Moorabool Valley, Bacchus Marsh and the Wyndham growth area through third pipe development.

In assessing the Major Recycling Scenarios, the Government will adopt a triple-bottom-line approach. While recycling offers significant water saving opportunities, the significant economic and environmental costs associated with piping and providing energy to pump water need to be considered.
Figure 5.7 Major Recycling Scenario – West of Melbourne
In the past, urban water authorities focussed on the treatment and disposal of waste products (domestic, commercial and trade) which were released into their sewerage networks. However, sustainable water management means new and innovative ways of managing the residuals from the treatment process. These residuals include treated water suitable for recycling, plus a by-product called ‘biosolids’.

Biosolids are a valuable resource, containing essential plant nutrients and organic matter. They can be used as a natural fertiliser to improve agricultural soils and stimulate plant growth. Alternatively, the organic matter in biosolids may be used as a substitute for fossil fuels.

Victoria currently produces 67,000 dry tonnes of biosolids every year. Another 2,000,000 tonnes is currently stored at sewage treatment plants pending identification of suitable recycling or beneficial use opportunities. Melbourne’s two major treatment plants have around 95 per cent of the State’s biosolids and account for 60 per cent of the on-going production.

To progress towards sustainable management and reuse of biosolids, EPA Victoria requires all holders of sewage treatment licences to prepare biosolids management plans.

Managing trade waste to sewer

The waste that we discharge to sewer, at home and work, can impact upon our ability to use recycled water as an alternative water supply.

Industry and commerce contribute significantly to levels of salt and other pollutants, such as heavy metals, to treated effluent and biosolids respectively. For example, at Melbourne’s Western Treatment Plant, industry and commerce contribute 40-50 per cent of the salt load and limit the use of recycled water from the treatment plant.

Policy

The Government supports sustainable beneficial uses for biosolids.

Trade waste management will be consistent with an ethic of water conservation, and facilitate water and biosolids recycling.

Trade wastes will be managed to reduce the impacts of discharges from wastewater treatment plants on the environment.

Historically, trade waste has been managed to protect public and worker health, sewerage systems and the environment. Today, management of trade waste also must consider objectives of waste minimisation and resource efficiency, including use of recycled water and biosolids.

Issues in trade waste management include:

- inconsistencies between water authorities leading to a non-level playing field for industry;
- poor linkages between trade waste management and use of recycled water and biosolids; and
- lack of a whole of system approach to waste management.
Salt Reduction at the Western Treatment Plant

A key constraint on recycling in the western metropolitan region is the salt levels of recycled water from the Western Treatment Plant. Melbourne Water and City West Water have assessed a range of options to reduce the salt levels from source to ‘end of pipe’. Melbourne Water and City West Water are jointly developing a salinity reduction strategy which will recommend a detailed program to reduce the salt content of recycled water by 40 per cent by 2009 at the latest.

Options currently under consideration include:

- on-site treatment at the Western Treatment Plant;
- separate treatment of highly saline streams at the Western Treatment Plant;
- separate treatment of highly saline streams at the Altona Treatment Plant;
- treatment of highly saline streams at, or close to, the source; and
- trade waste cleaner production strategies.

Urban stormwater

Urbanisation has lead to increased volumes of stormwater being discharged into the environment. Stormwater is currently managed from a drainage perspective rather than as an alternative water supply. However progress has been made in the development and implementation of water sensitive approaches to stormwater management.

Potential uses of stormwater include water substitution for golf courses, racecourses, sporting grounds and public open space, watering gardens and toilet flushing.

Action 5.33 As part of the Government’s support for smart urban water initiatives it will provide specific funding for projects to manage and harvest urban stormwater as a resource.
Aquifer storage and recovery

Storage is a key issue to enable local use of alternative water supplies such as stormwater runoff, river diversions and/or recycled water. Aquifer storage and recovery provides a temporary storage option for later recovery and reuse.

Given the limited knowledge about, and interest in, aquifer storage and recovery, its potential within the Melbourne region will be assessed and mapped in consultation with the waterway manager. Any feasible sites for pilot projects will be identified. The feasibility of extending mapping to regional centres will also be evaluated. If preliminary investigations are positive, a pilot project for aquifer storage and recovery will be established.

Smart Water Fund

The Smart Water Fund was established in 2002 by the four metropolitan water authorities and Government. The Fund has provided $4 million per year to support innovative water conservation, water recycling and biosolids management projects in the metropolitan area.

The Smart Water Fund provides a vehicle for:

- research and development entities or joint venturers to pursue innovative projects that support the Fund objectives;
- community-based entrepreneurs and good environmental citizens to respond to the water industry and Government’s call to change behaviour in relation to water usage through innovative initiatives in line with the Fund’s objectives; and
- adding research and development value to the water industry that otherwise may not have occurred.

The Smart Water Fund has supported a number of innovative water initiatives in Melbourne and the Government will extend its benefits to regional Victoria.

Action

5.34 The Government, water authorities and local government will investigate the potential for aquifer storage and recovery for Melbourne.

5.35 The metropolitan water authorities will continue to support the Smart Water Fund. The metropolitan water authorities will provide up to $4 million each year for the next four years for investment in projects across metropolitan Melbourne and the Government will provide $1 million each year for investment across regional Victoria.
Securing Our Drinking Water Supplies

As well as demand reduction and recycling measures, the Government and water authorities will implement measures to secure our urban water supplies.

Interconnected systems

There are opportunities to use existing water supply infrastructure more effectively to secure our urban water supplies. In particular, interconnection can increase flexibility in balancing water supply and demand and use of available capacity within the existing water supply system. An example of improved system performance through interconnection is Western Water’s pipeline connecting Sunbury-Melton to Melbourne’s water supply.

Interconnection can be a cost-effective way of supplementing existing supplies in certain areas and generally leads to greater equity in security of supply between interconnected water authorities. Interconnection does not, however, take away from the fact that our water supplies are limited, nor does it not relieve us of the need to conserve our drinking water supplies.

Policy

Interconnected systems between rural, regional and metropolitan water authorities are an option to provide for greater security of supply for Victoria.

Securing supply in regional urban areas

The regional urban water authorities are using innovative approaches to meet short- and long-term drinking water security challenges.

The water pressures in the Central region are reflected in the establishment of the Macedon Ranges Water Resource Review – Community Reference Group. The Group has been established to advise Western Water on the community’s views concerning the options for water supply security in the event of the continuation of the current drought.

The communities affected by the review include the area supplied by Rosslynne (Gisborne, Macedon), Mt Macedon and Riddells Creek and the towns of Romsey, Lancefield, Woodend which all have their own sources of water supply. These communities are suffering the impact of drought with the towns serviced by Rosslynne Reservoir having been on modified stage 4 restrictions since December 2003.

For the Geelong area, Barwon Water has set challenging targets to meet future water supply and demand requirements. It has set a 15 per cent water conservation target for 2023 and a 25 per cent water recycling target by 2015. Key initiatives to meet these targets include the proposed Northern Water Reclamation Plant, which will have the potential to convert sewage and wastewater from industry into high quality recycled water. This project has the potential to achieve drinking water substitution of 5,500 megalitres per year.

For Ballarat, Central Highlands Water is currently reviewing long term resources management to manage drought and provide for future urban growth. This review will focus upon the Upper Moorabool catchment, interactions with the major recycling opportunities for increased use of recycled water in the Werrinbee, Bacchus Marsh and Moorabool areas and opportunities for use of groundwater. Central Highlands Water will consult with its local community and other relevant water authorities in the development of the plan.

In northern Victoria, 2004 had the driest start on record, with Bendigo receiving just over one quarter of its normal rainfall. Stage 4 water restrictions were introduced on 1 June 2004 for towns in the Bendigo, Castlemaine and Kyneton areas. These are the most severe restrictions applied in these towns for the last 20 years. Additionally, water supplied to rural areas in the Bendigo region have been restricted to less than 70 per cent of licence volume for the last three years.

A 50 per cent increase in population over the next 30 years is predicted for Bendigo. This is an added challenge for water resource management in the region.

To meet these challenges, Coliban Water has plans in place to safeguard future water supply by reducing water use by 15 per cent over the next ten years and substituting alternative water supplies and recycled water for five per cent of total water used by 2010. Proposed measures to achieve these targets include the introduction of permanent water savings measures and community education and assistance programs. Additionally, Coliban Water is investigating use of Bendigo Mine water as an additional water source and the use of recycled water from the Bendigo Water Reclamation Plant to free up water for agricultural use.

These innovative approaches will be incorporated into the regional Sustainable Water Strategies (refer Chapter 2).

Harnessing supplies for Melbourne

The Melbourne Water Resources Strategy (2002) recommended investigation into the following opportunities to harness increased water supplies for Melbourne:

- Reconnecting Tarago Reservoir. This reservoir, which does not have a closed catchment, was taken offline because of poor water quality. It can be reintroduced and contribute significantly to meeting projected demands (21,000 megalitres per year) by incorporating a new treatment plant. The costs of this are approximately $50 million.

- Duplicating O’Shannassy Reservoir pipeline. This involves duplication of the pipeline from the reservoir to increase water transfer capability so that an extra 22,000 megalitres per year can be harvested from the O’Shannassy River. The costs of this are approximately $11 million.

- Increased use of Sugarloaf Reservoir. This involves increased pumping of water from the Yarra River at Yering Gorge (downstream of Yarra Glen) into Sugarloaf Reservoir, and increasing the capacity of Winneke treatment plant by 72,000 megalitres per year.

The Melbourne Water Resources Strategy recommended that a small increase in supply would be required to provide for Melbourne’s annual water use by 2050. This could be achieved by reconnecting the Tarago Reservoir.

However through water conservation measures, Victoria can defer or avoid the need for such augmentation works.
The O’Shannassy Reservoir pipeline duplication and the increased use of Sugarloaf Reservoir would involve increased extraction from the Yarra River. The environmental costs of this would need to be fully investigated, prior to consideration of any augmentation.

Distribution losses including leakage

While it is low by international standards, about ten per cent of Victoria’s urban water is lost through leakage from water authority pipes and client pipes.

The level of distribution losses has been reduced in Victoria over recent years. Water authorities have undertaken a number of initiatives including sophisticated leak detection programs to reduce distribution losses. The water authorities will continue to use acoustic equipment to determine leak location. They forecast savings of 7,000 megalitres a year by 2010.

Water authorities have undertaken a number of initiatives including sophisticated leak detection programs to reduce distribution losses.

Desalination

Desalination also offers the potential to develop large-scale alternative and renewable water supplies, which could lead to a reduction in water sourced from rivers and aquifers. It also offers further potential to reduce salinity within salt affected rivers and streams in northern Victoria.

At this stage, smaller-scale application of desalination is core business for water authorities. For example, Grampians Water has been using small-scale desalination plants to improve the quality of local water supplies.

However, the Government has committed to investigating large-scale applications, for the supply of bulk water. This analysis will determine whether Victoria should pursue initiatives to tap into this alternative water source.

Action

5.36 Tarago Reservoir will be reconnected to provide water for growth in Melbourne. The timing, costs and environmental impacts of reconnection will be investigated.

Action

5.37 Water authorities will implement leakage reduction programs and use cost-effective technology such as water pressure reduction to reduce distribution losses.

Action

5.38 The Government will investigate the environmental, social and economic costs and benefits of large-scale application of desalination. The investigation is expected to be completed by 2006.
Providing Safe and Reliable Drinking Water and Sewerage Services

Victoria’s urban water authorities provide safe and reliable drinking water and sewerage services to their customers. Recent or current projects that have been undertaken to improve water and sewerage services include:

- North East Water’s innovative non-chemical water treatment processes at Myrtleford and Mt Beauty;
- the Melbourne to Wallan pipeline to improve the security of supply around Wallan; and
- South Gippsland Water’s regional wastewater treatment plant to improve the performance of dairy wastewater treatment at Korumburra and Leongatha.

The discussion outlined above has focussed on the provision of reticulated water services in cities and towns by urban water authorities. However, there are many areas that are not served by reticulated water and sewerage but utilise rainwater tanks and septic systems instead.

In the southeastern and eastern suburbs of Melbourne, over 42,000 property sites are of insufficient size to adequately treat domestic wastewater on-site via septic systems. These properties will require sewerage infrastructure.

In country Victoria, there are approximately 22,000 properties in towns of greater than 100 properties that do not have access to reticulated sewerage services. A lesser number do not have access to reticulated water supply. Unlike urban areas, these smaller towns have the opportunity to use innovative, smaller-scale water supply and sewerage service approaches. Indeed, for some of these towns, the best water supply will be via rainwater tanks and the best sewerage treatment will be via on-site treatment including septic tanks. For other communities however, the best water supply and sewerage services will be via reticulated systems.

The Government has recently completed funding of the New Town Sewerage initiative. This $22.5 million initiative involved the sewering of over 50 towns across rural and regional Victoria.

The Government will build upon this process with the Country Towns Water Supply and Sewerage Program.

**Policy**

All Victorians will be provided with safe and reliable drinking water and sewerage services that protect public health and the environment.

In the southeastern and eastern suburbs of Melbourne, over 42,000 property sites are of insufficient size to adequately treat domestic wastewater on-site via septic systems. These properties will require sewerage infrastructure.

In country Victoria, there are approximately 22,000 properties in towns of greater than 100 properties that do not have access to reticulated sewerage services. A lesser number do not have access to reticulated water supply. Unlike urban areas, these smaller towns have the opportunity to use innovative, smaller-scale water supply and sewerage service approaches. Indeed, for some of these towns, the best water supply will be via rainwater tanks and the best sewerage treatment will be via on-site treatment including septic tanks. For other communities however, the best water supply and sewerage services will be via reticulated systems.

The Government has recently completed funding of the New Town Sewerage initiative. This $22.5 million initiative involved the sewering of over 50 towns across rural and regional Victoria.

The Government will build upon this process with the Country Towns Water Supply and Sewerage Program.

**Action**

5.39 The Government will continue to work with the metropolitan water authorities to implement the Metropolitan Backlog Sewerage Program.

5.40 In country Victoria, the Government will contribute $42 million over the next eight years in the new Country Towns Water Supply and Sewerage Program to assist in providing sewerage and water supply solutions to small country towns.

The Program will include:

- priority investment in those towns with critical public health and environmental needs;
- a range of projects that will allow the water authorities, local government and the community to explore alternative approaches to meet water supply and sewerage needs; and
- $2.3 million in funding to local government to assist in the development of municipal wastewater management plans.

Water authorities will continue to work with local councils to identify areas where the provision of infrastructure is necessary to ensure that further development does not result in a health or environmental impact. These water supply and sewerage schemes will be implemented by the water authority largely on a cost recovery basis to minimise the impact of any price rises on their broader customer base.
The planning and regulatory framework will be aligned to support water conservation and to ensure that the use of recycled water and alternative supplies is consistent with environmental and public health protection requirements.

**Statutory planning and building approvals**

In our cities and towns, the statutory planning and building approvals systems are important tools that will be used to help us move towards sustainable urban water management.

**Guidelines for the use of recycled water and alternative water supplies**

As recycled water and alternative water supplies become more widely used throughout the community, there is a need to update the regulatory framework and associated guidance to ensure protection of public health and the environment.

**Action 5.42** EPA Victoria, in partnership with the Department of Human Services, will review the public health and environmental framework supporting alternative urban water supplies, including recycled water, greywater, stormwater and rainwater. For each alternative water source, the review will consider:

- the level of regulatory oversight that is needed;
- the most efficient approaches for assessing and approving the use of individual alternative water supplies; and
- the necessary reporting and auditing requirements so that the community retains confidence in the safety of alternative water supplies.

The review will be completed by mid 2005.

User-friendly tools, training and education, including Water Sensitive Urban Development Guidelines, will be developed to support the implementation of these changes.
Action
5.43 EPA Victoria will work in partnership with the Department of Human Services to build from the existing Guideline for Environmental Management: Use of Reclaimed Water (EPA, 2003) and establish a broad suite of guidance for alternative water supplies. The guidelines will establish water quality standards and appropriate management controls to expand the use of alternative supplies, including:

- the use of recycled water in urban third pipe networks;
- the use of recycled water to provide environmental flows for waterways;
- the use of greywater in individual households;
- the use of stormwater for urban recycling;
- the use of aquifer storage and recovery in water recycling; and
- the use of industrial process water for industrial and urban recycling.
Chapter Six:

Water pricing should support the sustainable management of the resource we use.
Pricing for Sustainability

1 Key Challenges
>> To ensure prices recover the full costs of sustainably managing our water resources.
>> To structure water prices to provide incentives to use water conservatively and carefully, and where possible, to use water of a quality that matches the purpose for which it is used.
>> Need for smooth transition to new pricing regime being established under the Essential Services Commission (ESC).

2 Government Initiatives
>> Introducing a smarter pricing system in Melbourne, the rising block tariff, to reward efficient users and penalise excessive use.
>> Requiring water authorities to contribute funding towards water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use.
>> Increasing concessions from 1 October 2004.
>> Set cost recovery principles to provide sustainable revenue to water authorities to carry out services, operations, maintenance and management.
>> Extend role of ESC to regulate and monitor pricing and services of all water authorities.

3 Sustainable Outcomes
>> Pricing structures which reward water conservation and encourage the efficient and beneficial use of the most sustainable, fit for purpose, source of supply.
>> Water authorities contributing funding towards initiatives to improve water resource management across Victoria.
>> Water prices that fully recover service delivery costs and ensure authorities are financially viable.
Introduction

Extracting water from rivers and aquifers; whether it be for drinking, watering the garden, flushing the toilet, supporting industry, or agriculture; carries a cost to the environment.

This cost, however, is not included in the price we pay for the water. Water pricing has generally indicated that the resource is plentiful and is readily available at a relatively low cost to consumers.

Victorians understand that this is not the case and that they must recognise the true value of the resources they use.

By ‘pricing for sustainability’, our limited water resources can be safeguarded and consumers can be encouraged to be more prudent in their use.

The Government recognises that price setting must be fairly and independently managed, and vulnerable groups in the community must be afforded protection when prices rise.

The Government will undertake five key reforms to support the sustainable management of Victoria’s water resources. These are:

• structuring water prices to reward water conservation and encourage efficient use of alternative, more sustainable, sources of supply;

• funding initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use;

• ensuring prices recover the cost of delivering the full range of water services;

• protecting the interests of customers by appointing the Essential Services Commission (ESC) as the economic regulator of the entire water industry; and

• introducing revised concession arrangements with increased benefits and less complexity.

These actions will further advance the delivery of Victoria’s COAG commitments and lead the way for the National Water Initiative to adopt pricing outcomes that promote the sustainable use and provision of water.
Structure and Design of Prices
Driving Sustainable Use

**Policy**
Water and sewerage prices will be structured to encourage all consumers to use water conservatively and carefully, and where possible, to use water of a quality that matches the purpose for which it is used.

**Action**

6.1 The Government will introduce ‘rising block’ tariffs, which reward water conservation, for domestic users in Melbourne from 1 October 2004.

6.2 Outside Melbourne, in consultation with their customers, water authorities will design pricing structures that provide incentives for sustainable use by providing signals to water users about:

- the costs of providing the services, including costs associated with future supplies and periods of peak demands and or restricted supply; and
- choices regarding the use of alternative supplies for different purposes.

**Rising block tariffs for domestic customers in Melbourne**

The Government will introduce rising block tariffs for domestic customers in Melbourne from 1 October 2004. This reform (as illustrated below) will clearly demonstrate to customers the need to conserve water and to consider alternative, sustainable sources that can be supplied efficiently.

This reform is made in recognition of the overwhelming support for tariff structures that reward water conservation and in light of the customer consultation on tariff changes already undertaken by the three metropolitan retail water authorities.

In terms of the block levels of consumption, the first step in the blocks (40 kilolitres per quarter) is based on an estimate of essential indoor use. The second step (80 kilolitres per quarter) indicates more discretionary use, with roughly 80 percent of quarterly bills being less than 80 kilolitres per quarter.

The use of quarterly block consumption levels rather than annual block consumption levels introduces a seasonal element into the pricing framework. Many customers are likely to consume more than 80 kilolitres during the summer months and they will pay the third block tariff for every kilolitre above 80 kilolitres.

The tariffs have been set to take this seasonal element into account.

The use of quarterly block levels of consumption rather than annual block levels of consumption also sends more frequent signals to customers about their water consumption and the impact on their bill.

**Figure 6.1 Rising block tariffs for Melbourne**

**Different pricing structures**

Rising block tariffs, where a higher price per kilolitre applies above a specified level of consumption, are widely regarded as the fairest and most effective way to price water for conservation. Not only do they encourage water conservation, but they also recognise the need to provide water for essential domestic use at an affordable price.

Seasonal tariffs, which increase tariffs over a certain season of the year, have also been considered but are not favoured as they do not encourage year-round water conservation.

The Government acknowledges rising block tariffs may not be appropriate for water-intensive industries and therefore water authorities will be required to consult widely with these businesses and other non-residential customers before any changes to the pricing structures affecting them are made.
Fixed water charges for the three metropolitan retailers will vary depending on the revenue requirements and consumption patterns for these authorities. These fixed water charges and other sewerage prices will be specified by the Minister for Water in a new Melbourne Metropolitan Water, Wastewater and Drainage Services Pricing Order 2004 prior to the introduction of rising block tariffs on 1 October 2004.

To ensure the introduction of rising block tariffs in Melbourne does not result in undue impacts on pensioners and vulnerable customers, the Government will increase the cap on water and sewerage concessions to $146 per annum (further details on concession reforms are set out below).

In addition, the Government will implement a number of measures to manage the potential impacts of rising block tariffs in Melbourne and assist customers in reducing their bills. These measures include the water conservation initiatives outlined in Chapter 5 such as the Water Smart Gardens and Homes Rebate Scheme.

The three metropolitan retail water authorities will implement specific communication strategies to advise customers of the new pricing arrangements and opportunities to conserve water and save money.

These authorities will also develop arrangements which assist large families in reducing their water consumption. Under these arrangements, families with six or more family members who are finding it difficult to pay their new bills could apply to their water authority to receive a water savings package. This measure is made in recognition that large families may be using water wisely but due to the size of their water consumption they are being priced at the top block tariff. Large families may be eligible for a water savings package that could include free water saving products, such as low flow control valves or shower roses, or free plumbing advice or services.

The details of the water saving packages for large families will be developed and launched by the three retail water authorities prior to the introduction of rising block tariffs on 1 October 2004.

Rising block tariffs are widely regarded as the fairest and most effective way to price water for conservation.

Other changes to tariff structures in 2004-05

In regional and rural Victoria, any proposed adjustments to pricing structures in 2004-05 will be subject to the Minister for Water’s approval through the normal corporate planning process. Any proposed structural adjustments in 2004-05 will be in line with changes previously discussed with customers and considered through the 2003-04 corporate planning process of the water authorities.

Framework for future changes to pricing structures

The introduction of rising block tariffs for domestic customers in Melbourne reflects the first step in developing pricing structures to drive sustainable use.

The Government will require regional urban authorities to introduce pricing structures that provide incentives for water conservation from 1 July 2005.

This will be done within a framework established by the Government. The Essential Services Commission (ESC) will be responsible for approving proposed changes to tariff structures from 1 July 2005.

The framework recognises the considerable pricing variation across the State and the need to tailor tariff structures to suit regional circumstances.

Before the ESC approves any changes to pricing structures, it must be satisfied that a water authority has undertaken sufficient consultation with:

- customers on the proposed changes and potential impacts; and
- the Minister for Water on how the new pricing structures form part of the water authority’s Water Supply-Demand Strategy (refer to Chapter 5).

The ESC’s public price review process will ensure substantial public scrutiny of any proposed changes to pricing structures.
Environmental Contribution

Policy

Water authorities will be required to contribute funding towards water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use.

Action

6.3 The Government will introduce legislation to require environmental contributions from water authorities. For an initial period commencing 1 October 2004 and ending 30 June 2008, approximately $225 million will be raised, with all of this revenue being used to fund water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use. This is likely to increase prices by an average of five per cent for urban water customers and two per cent for rural customers.

6.4 The Government will review the amount of environmental contributions prior to 1 July 2008 and every four years thereafter.

Traditionally, water as a resource has been free and water users have only been required to pay for the cost of delivery. In recent times, there has been considerable emphasis on the need for prices to reflect environmental impacts of providing water services. Implementation of the 1994 COAG Water Reform Framework has resulted in a push for prices to reflect the ‘externalities’ (the consequential impacts) associated with providing water services.

In response to the need for prices to reflect environmental impacts, the Green Paper proposed that prices be increased to better reflect the scarcity of the resource and costs related to the environmental impacts associated with the provision of water-based services.

The Green Paper recognised that some of the environmental impacts related to the provision of water services are difficult to quantify, such as those relating to ecological values. This, in turn, makes it difficult to estimate the costs associated with those impacts.

In addition, there are often other measures available for managing environmental impacts. Regulation or market mechanisms such as scheme of tradeable permits for saline drainage (refer to Chapter 4), may be more effective than pricing as a tool for reducing environmental impacts.

Another important issue for recovering environmental costs is the extent to which those using and paying for the service are responsible for environmental impacts. Some environmental impacts are a legacy of history and in some instances, it may not be appropriate for users in a particular area to pay for all of the damage caused by previous generations.

The Government believes water authorities should contribute funding towards water related initiatives that seek to promote the sustainable management of water and to address adverse impacts to the environment associated with its use.

It is proposed that each authority will be required to pay an annual environmental contribution based on a percentage of its existing revenues¹. Once this amount has been determined, this will become a fixed amount that the authority will be required to pay annually over four years.

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¹ This includes revenue generated by the provision of retail water and sewerage (including trade waste) services, irrigation services (including irrigation drainage), stock and domestic services and diversion services. It does not include revenue from developer charges, bulk water services nor Melbourne Water’s drainage and waterway services.
In determining the contribution of individual authorities some flexibility is required around the percentage to be applied. For the first four-year period from 1 October 2004 and ending on 30 June 2008 the following arrangements are proposed for payment of the environmental contributions:

- urban authorities will be required to pay an amount equivalent to five per cent of their existing revenues as an environmental contribution;
- in recognition of the ongoing impacts of the drought, rural authorities will not be required to contribute funding water initiatives until 1 July 2005;
- from 1 July 2005 to 30 June 2008, rural authorities will be required to pay an amount equivalent to two per cent of their existing revenues as an environmental contribution. This lower contribution recognises irrigators’ role in working towards better environmental outcomes, and will assist them to make the necessary adjustments; and
- in recognition of the ‘sales’ package discussed in Chapter 4 and the drought, Goulburn-Murray Water will not be required to contribute funding to environmental initiatives until 1 July 2007.

In this four-year period, it is expected that environmental contributions made by water authorities will generate approximately $225 million that will be used to fund water-related initiatives, some of which will be undertaken by water authorities.

Each authority will be able to pass on its environmental contribution through increased tariffs and charges for the provision of water and sewerage services (including trade waste services).

The Government will review the amount of funds raised through environmental contributions, and each authority’s environmental contribution, prior to 1 July 2008 and every four years thereafter.

### Water initiatives

Many of the initiatives to be funded by the environmental contributions have been discussed throughout this White Paper.

Indicative funding for categories of initiatives are:

<table>
<thead>
<tr>
<th>Water Initiate</th>
<th>Indicative Allocation Over 4 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution to COAG Living Murray</td>
<td>$35 M</td>
</tr>
<tr>
<td>Smart Urban Water Initiatives and Recycling</td>
<td>$50 M</td>
</tr>
<tr>
<td>Protecting and Repairing Our Water Sources</td>
<td>$100 M</td>
</tr>
<tr>
<td>Boosting the Water Smart Farms and Sustainable Irrigation and Land Management Initiatives</td>
<td>$13 M</td>
</tr>
<tr>
<td>Water Security for Cities, Farms and the Environment</td>
<td>$27 M</td>
</tr>
<tr>
<td>Total</td>
<td>$225 M</td>
</tr>
</tbody>
</table>

2 Where an authority provides both urban and rural services the environmental contribution will be equivalent to five per cent of the revenue derived from urban services plus two per cent of the revenue derived from rural services.

The Government will provide $115 million towards the joint $500 million investment through COAG to address water overallocation in the Murray-Darling Basin. This investment will underpin Victoria’s strong commitment to the Living Murray, which aims to recover 500,000 megalitres over five years. The $115 million will comprise funding from the environmental contribution and important Victorian Water Trust capital projects of Sunraysia and Goulburn Broken, which will bring significant benefits to the River Murray regions. Funding from environmental contribution will provide $59 million over a 5 year period, and $35 million over a 4 year period to this initiative.

Negotiations are continuing with the Commonwealth Government as to the details of its contribution to the National Water Initiative. As a result, the total funding levels for the headline initiatives for the environmental contribution are only able to be indicative at this stage.
Pricing to Recover Service Delivery Costs

The Government’s cost recovery principles require water authorities to recover their operating costs, capital expenditure to rehabilitate assets and the finance costs associated with new investments. In considering past investments, the Government has determined that it:

- will not require rural water authorities to generate a return on past investments, in recognition of the fact that the costs associated with constructing the existing rural infrastructure many years ago are largely sunk, and
- will determine the extent to which each urban water authority’s prices include a return on past investments having regard to the existing levels of return and the future revenue required by each authority as identified through the ESC’s first price review process (discussed below).

In future, prices will need to recover all financing costs associated with new investments, including the cost of debt or equity. The Government believes these costs should ideally be recovered over time rather than imposed on current users as a significant lump sum.

Dividends paid by water authorities to the Government will continue to be determined by the current governmental dividend policy. The dividend policy for regional, urban and rural authorities will be examined in conjunction with proposed changes to accounting standards, pricing and other financial policies, and proposed governance and institutional reforms discussed in Chapter 7.

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Policy
Each generation of Victorians should pay its fair share of the full cost of long-term assets required to deliver water, including infrastructure improvements.

Action
6.5 The Government has prescribed a set of full cost recovery principles with which water authorities must comply. These principles are specified in the Water Industry Regulatory Order, which requires prices, or the manner in which prices are to be calculated, to:

- provide for a sustainable revenue stream to each water authority that does not reflect monopoly rents and or inefficient expenditure by a water authority;
- allow the water authority to recover operational, maintenance and administrative costs;
- allow urban authorities to generate a return on past investments in a manner determined by the Minister for Water having regard to existing price levels and the future revenue required by each authority to recover its service delivery costs; and
- allow all authorities to recover a rate of return (i.e. the financing costs) on future investments made to augment existing assets or construct new assets.

3 These costs have either already been recovered or were not expected to be recovered because they were funded by Government (either directly or through debt forgiveness) many years ago.
Four per cent rate of return

In line with the Government’s policy to exempt rural authorities from generating a return on past investments, the current four per cent rate of return on those assets providing bulk water services to regional urban authorities will be phased out.

The revenue generated by the four per cent rate of return is currently used by rural water authorities to pay a dividend to Government and to fund a number of activities such as water quality monitoring or providing recreational facilities at storages.

Price movements in 2004-05

Requiring water authorities to pay an environmental contribution is a separate process from establishing the base cost of delivering water services.

During 2004-05 some increases to this base cost will occur to ensure all water authorities comply with the Government’s pricing principles for recovering service delivery costs.

In the urban sector, the increases required to cover the cost of ongoing service delivery are anticipated to be in the order of Consumer Price Index (CPI) to CPI plus three per cent, with the actual increases based on the financial needs of each authority.

In the rural sector, any price increases needed to recover the cost of ongoing service delivery will be worked through by water authorities in consultation with their rural customer committees and submitted through the normal corporate planning process.

The price increases for 2004-05 will be specified in the Melbourne Metropolitan Water, Wastewater and Drainage Services Pricing Order 2004 and the regional urban and rural water authorities’ corporate plans.

Pricing for recycled water

Consultation on the Green Paper revealed uncertainty as to who should pay for the cost of providing recycled water services. In particular, how costs should be shared among:

- those using recycled water;
- customers whose sewage is being treated and recycled; and
- users of potable water who receive lower bills due to the deferral of water supply improvements as a result of increased water recycling by others.

Given that there may be multiple beneficiaries of recycled water services, it has been determined that water authorities are best placed to develop pricing proposals to recover the costs of supplying recycled water services.

For example, recycled water services could be provided to:

- meet the demands of customers seeking a more reliable source of supply;
- defer the need to harness increased water supplies to secure urban drinking water supplies; and/or
- comply with regulatory requirements, such as not discharging treated effluent to an inland waterway.

Water authorities will be required to develop pricing arrangements which encourage the efficient use of the most sustainable source of supply.
The ESC price review process, discussed overleaf, will ensure an authority’s proposed prices for recycled water services are the subject of consultation with customers and relevant regulators. In addition, the ESC will seek to ensure that the manner in which prices are set to recover costs associated with recycled water projects is consistent with the principles in the Water Industry Regulatory Order.

**Policy**

The price of alternative water supplies should:

- encourage the efficient use of the most sustainable source of supply; and
- reflect the principles of user pays, polluter pays and beneficiary pays.

**Action**

**6.7** The price of recycled water services will be subject to regulation by the ESC.

**6.8** As part of the ESC price review process, water authorities will be required to demonstrate how their pricing proposals for all services encourage the efficient use of the most sustainable source of supply while reflecting the principles of user pays, polluter pays and beneficiary pays. Authorities will also be required to consult their customers and relevant regulators on these proposals before submitting them to the ESC for assessment against the criteria in the Water Industry Regulatory Order.
Chapter Six – Pricing for Sustainability

Long-Term Interests of Customers

Policy
Pricing regulation for the water industry will be managed by an independent regulator (the ESC) to protect the interests of customers by making sure:

- prices reflect the need to provide sustainable water resources and sewerage services;
- processes to set prices are transparent and consultative; and
- prices are easy to understand and fair for all members of the community.

Action
6.9 To enable the ESC to commence its role on 1 January 2004, the Government made a Water Industry Regulatory Order on 16 December 2003, which specifies the framework for ESC regulation of the water industry by:

- specifying the services for which the ESC has the power to regulate prices and service quality;
- specifying the regulatory approach the ESC must adopt; and
- conferring certain functions on the ESC for the regulation of service quality.

Regulatory approach under the Water Industry Regulatory Order

The regulatory approach under the Water Industry Regulatory Order is tailored to the specific characteristics of the Government-owned water industry and preserves the existing role of rural customer committees. It also involves each water authority developing a Water Plan for a defined regulatory period setting out:

- what the authority proposes to achieve over the period with respect to meeting future demands and complying with its regulatory requirements;
- the services to be provided and the programs to be undertaken to meet future demands and regulatory requirements;
- the authority’s revenue requirements; and
- the authority’s proposed prices, or the manner in which prices will be determined, for each of its services.

The ESC will assess each authority’s pricing proposals against the criteria in the Water Industry Regulatory Order, which include:

- procedural requirements – water authorities must undertake sufficient stakeholder consultation on their Water Plans (e.g. customers, regulators and other interested stakeholders); and
- regulatory principles – any pricing proposals in a Water Plan must comply with the pricing principles in the Water Industry Regulatory Order (e.g. principles for the pricing structures and cost recovery discussed above).

The ESC can ask an authority to revise its pricing proposals for the regulatory period. It can also stipulate the manner in which prices will be determined.

Figure 6.2 outlines the regulatory approach including the development of the Water Plan and then the review process that will be undertaken by the ESC.

It includes the new regulatory approach in terms of the development of the Plan and the decision making processes associated with the ESC’s review of the relevant pricing provisions of the Plan.
Under this approach, the current role of the rural customer committees is preserved. In order for a rural water authority’s pricing proposals to be approved by the ESC, it must consult the customer committees on price and service level trade-offs, and the prices must also comply with the Government’s cost recovery principles.

The Water Industry Regulatory Order also requires water authorities to ensure pricing proposals:

- can be readily understood by customers; and
- take into account the interests of customers, including pensioners or vulnerable customers.
Revised Concession Arrangements

The new arrangements will provide benefits to approximately 420,000 households who currently receive the concession cap. Some pensioner tenants and Health Care Cardholders will gain an additional amount through becoming entitled to a concession on their whole water and sewerage bill.

**Policy**

Fair and equitable concession arrangements improving the affordability of water and sewerage services for pensioners and vulnerable Victorian households.

**Action**

6.10 From 1 October 2004, the Government will increase the current cap on water and sewerage concessions to $146 per annum. All eligible pensioners and Health Care Cardholders will receive 50 per cent off their total water and sewerage bill to a maximum of $146 per annum, with the maximum to be increased to $150 per annum from 1 July 2005 and indexed by CPI thereafter.

**Introducing revised concession arrangements with increased benefits and less complexity**

The Government provides a range of concessions to improve affordability of key services for pensioners and vulnerable Victorian households.

In line with the Government’s commitment to building a better future for Victorian families, reform of the State’s concessions program was recently announced to ensure these benefits go to those Victorians most in need. These reforms aim to distribute concessions support more fairly, more equitably, and to more Victorians in need.

Through these reforms, the Government announced that water and sewerage concessions would be indexed from 1 July 2004 taking the concession cap from $135 to $138, and that water authorities will place a greater focus on a better-targeted delivery mechanism to Health Care Cardholders to minimise fraud.
From 1 October 2004, the Government will increase the cap on water and sewerage concessions by a further $8 to $146 per annum. All eligible pensioners and Health Care Cardholders will receive 50 per cent off their total water and sewerage bill to a maximum of $146 per annum, with the maximum to be increased to $150 per annum from 1 July 2005 and indexed by CPI thereafter. Where households are not sewered—and therefore not paying sewerage charges—the maximum would remain at half the usual cap (i.e. $73).

These changes will significantly improve the current concession arrangements.

- **An indexed cap.** Until recently when the Government announced that it would index the concession cap for 2004-05, the concession cap of $135 per annum had not been increased since 1982-83 and had not been adjusted for inflation. In the future, the cap will be indexed each year, for all concession cardholders;

- **Equitable access.** Under the existing arrangements, pensioner homeowners receive 50 per cent off fixed service and volume charges. In contrast, Health Care Cardholders only receive 50 per cent off volume charges. In the future, Health Care Cardholders will get equitable access to the concession on fixed service as well as volume charges; and

- **Simpler concession arrangements.** The 50 per cent concession up to a maximum of $146 will apply to the whole water and sewerage bill. Previously, a maximum of $67.50 applied to water charges and $67.50 applied to sewerage charges, disadvantaging some concession cardholders.

The new arrangements will provide benefits to approximately 420,000 households who currently receive the concession cap. Some pensioner tenants and Health Care Cardholders will gain an additional amount through becoming entitled to a concession on their whole water and sewerage bill.

The average concession will no longer erode with inflation. It will also be provided equitably to all concession cardholders and will be able to accommodate the diversity of pricing regimes.
Chapter Seven:

Clearer roles for organisations, increased accountability and more innovative service delivery will drive a new approach to governance in the water sector.
An Innovative and Accountable Water Sector

1. Key Challenges
   >> To develop a capable, innovative and accountable water sector to deliver the Government’s sustainability objectives for water.
   >> To foster within the water sector a culture of:
      - customer service;
      - continuous improvement;
      - strong business practice;
      - prudent and efficient financial management;
      - collaboration and cooperation;
      - innovation; and
      - excellence.

2. Government Initiatives
   >> Through legislation clarify the roles of water authorities, storage managers.
   >> Strengthen catchment management authorities and incorporate local decision-making in Boards.
   >> Change legislation to recognise recycled water services.
   >> Enable water authorities to secure entitlements to stormwater.
   >> Merge water authorities in two parts of the State for greater capability and investment in infrastructure.
   >> Establish consistent arrangements for waterway management throughout the Port Phillip and Westernport catchment.

3. Sustainable Outcomes
   >> Policy makers, regulators and service providers working towards Government’s objectives and policies.
   >> Water authorities with:
      - good business practice and financial viability; and
      - clearly defined roles and responsibilities.
   >> A capable, innovative and accountable water sector.
   >> Innovative approach to whole water cycle management.
Introduction

Many organisations contribute to the management of water and the provision of water-related services. This chapter focuses on improved arrangements for the State’s water sector institutions.

These institutions, depicted in Figure 7.1, include catchment management authorities, urban and rural water supply authorities, regulatory authorities, local government agencies, and State Government departments and Ministries.

Governance arrangements are critical to the performance of institutions and achieving the Government’s objectives for sustainably managing water resources and delivering water services.

Clearer roles for organisations, increased accountability and more innovative service delivery will drive a new approach to governance in the water sector.

These changes are part of a new framework developed to help achieve the Government’s objectives for sustainably managing Victoria’s water resources.

Figure 7.1 Institutional arrangements
Governance arrangements are critical to the performance of institutions and achieving the Government’s objectives for sustainably managing water resources and delivering water services.
Improved Clarity and Allocation of Roles and Responsibilities

A sensible allocation and clear definition of roles and responsibilities is necessary to clarify accountabilities and avoid significant conflicts of interest.

The following framework guides the allocation of roles and responsibilities in the water sector.

- The Minister for Water, supported by the Department of Sustainability and Environment, is responsible for:
  - allocating water resources;
  - collecting, analysing and publicising information on the status of water resources;
  - statewide policy and strategic planning; and
  - overseeing the performance of the water sector and catchment management authorities (corporate planning, performance monitoring and board appointments).

- The Treasurer, supported by the Department of Treasury and Finance, is responsible for ensuring the financial success and viability of water authorities. Jointly with the Minister for Water, the Treasurer has responsibilities for corporate planning, performance monitoring and board appointments in the metropolitan water sector.

- Regulation is separate from operations and service delivery. This is the role of the Essential Services Commission, the Environment Protection Authority and some other specialised regulators.

- Catchment management authorities, the caretakers of river health, have strategic planning and priority setting responsibilities for catchments, and deliver waterway, regional drainage and floodplain management services;

- Publicly owned water authorities are responsible for ensuring the delivery of water supply and wastewater disposal services.

- Private sector participation in infrastructure provision is supported in line with the Government’s Partnerships Victoria principles.

The Government does not believe that widespread change in roles and responsibilities within the water sector is required. However specific improvements are needed in the arrangements for regulation of water trading, for monitoring compliance with bulk entitlements, for managing water storages, recycled water and stormwater, and for shareholder governance of water authorities.

Regulation of water trading

Most water trading is between irrigators supplied by rural water authorities. As well, some rural water authorities have sold water to irrigators after reducing the losses incurred in supplying water, and urban authorities have bought and sold water.

Water trading is largely administered by rural water authorities, but in accordance with the Water Act 1989 and regulations, trading zones, guidelines and exchange rates set by the Governor-in-Council or Minister under the Act. The rules aim to minimise adverse impacts on other users or the environment, and are fully explained in The Value of Water: a Guide to Water Trading in Victoria (DNRE, 2001) and on the Watermove website.

As explained in Chapter 4, it is now proposed that each farm have a separate licence for water use on land. While being administered by water authorities, the standards that apply are to be set through water-use management plans developed by catchment management authorities, and endorsed by the Minister for Water. There will be input from relevant organisations like the EPA.

A key impact that is guarded against is the worsening of River Murray salinity. In this case the regulatory framework cannot be set by various State agencies (like EPAs), but is set by the Murray-Darling Basin Ministerial Council. States have obligations not to increase salinity. Victoria bars trading into the ‘high impact zone’, and applies levies to other trade to pay for off-setting measures.

The integrity of entitlements has become a critical issue as water has become so valuable, and with the proposed unbundling of entitlements. Rural water authorities have each been required to keep a register of water rights. As stated in Chapter 4, it is proposed to now build a statewide register, with high standards enforced by a new unit outside the authorities. Authorities will still be able to use relevant parts of the register for day-to-day administration like billing.

Monitoring compliance with bulk entitlements

Bulk water entitlements define the rights of water authorities to water resources, along with the associated conditions and obligations. Clear and robust compliance and monitoring arrangements are important. Current arrangements have been criticised as lacking necessary independence.

Responsibility for monitoring an authority’s compliance with a bulk entitlement currently rests with the relevant ‘resource manager’, appointed by the Minister for Water at the time the entitlement is issued. This has allowed different types of arrangements to develop – in some cases the relevant resource manager is a water authority and in others it is the Department of Sustainability and Environment.
In addition to the compliance role, a resource manager’s role typically includes:

- investigating and mediating disputes between entitlement holders in a river basin;
- preparing the water accounts for the basin;
- directing the release of water set aside for maintaining water quality; and
- investigating and controlling significant and unauthorised use of water in the catchment.

The Government will change the title of the resource manager to avoid confusion with the Minister for Water’s broad resource management role.

Recreation and water storages

Water storages and the surrounding land can provide for a range of community benefits in addition to supplying water for consumptive use. These benefits include environmental health, and recreational and aesthetic amenity.

The operation of a water storage is governed by a range of formal and semi-formal instruments. These include dam safety guidelines, bulk entitlement orders, and agreed operating rules such as target filling curves to manage flood flows and optimise yield from a system of storages.

Water legislation does not spell out the roles and responsibilities of storage managers and in the absence of any clear statement water authorities lack a defined charter for addressing broader community values. This has led to confusion and prompted debate within the community.

Policy

Recreational benefits from storages are to be recognised and considered along with other requirements such as public safety, the rights of water entitlement holders and water quality.

Action

7.2 The Government will:

- introduce legislation to recognise the role of storage manager as an important water sector management function and to set out a common set of roles and responsibilities, including recognition of the non-consumptive values of storages and processes for decommissioning dams;
- where appropriate, require storage managers to prepare management strategies to address recreational uses in consultation with local government, local communities and other affected parties. The strategies will require approval by the Minister for Water; and
- review, after three years, whether there have been improvements in the management of storages for multiple benefits and decide whether further changes in management arrangements are required.
Responsibilities for recycled water services

Water legislation has lagged behind the rapid growth in the provision of recycled water services by water authorities. Explicit legislative arrangements are required to ensure clear accountabilities and the efficient management of these services.

Policy
Recycled water forms an important part of the State’s water resources.
As for any other water service, publicly owned water authorities will be responsible for ensuring the delivery of recycled water services that use wastewater from public sewerage systems.
An authority can enter into private sector arrangements relating to the delivery of recycled water provided the authority retains responsibility for ensuring a service is delivered. However, the authority will not be bound by the commercial terms and conditions of any contracts entered into between the private sector and customers.

Action
7.3 The Government will introduce legislation to clarify the responsibilities of water authorities for the provision of recycled water services, and to bring recycled water within the existing water resource management framework.

Responsibilities for managing stormwater

Urban stormwater can provide a range of community benefits. Its proper management can assist river health and aquifer replenishment, and its value as a water resource will increase as traditional supplies reach sustainable harvesting limits.
Management of stormwater is a local government responsibility and traditionally has been undertaken from a drainage perspective – to protect public safety and property from flooding – and to minimise adverse impacts on waterways.
Consideration has been given to whether the current allocation of responsibilities should be changed to achieve the Government’s policy objectives. On balance and in the light of feedback received, it has been concluded that the arrangements can be improved within the existing institutional framework.

Policy
Local government (together with Melbourne Water in Melbourne) will continue to be responsible for managing drainage assets and ensuring that the quality of stormwater meets river health objectives and satisfies broad community aesthetic and amenity values.
Catchment management authorities (and Melbourne Water in Melbourne) will continue to be responsible for assessing the quality and quantity impacts of stormwater on river health at the regional level.
Water authorities will be responsible for developing stormwater as an alternative source of supply.

Action
7.4 The Government will enable water authorities to access and use stormwater, while ensuring flows for maintaining river health are protected.
7.5 Water authorities will consider the value of stormwater resources in their Water Supply – Demand Strategies. This includes working with land developers and local government to identify opportunities for stormwater use in new subdivisions.

Other actions to improve the management of urban stormwater are described in Chapter 5.
Shareholder governance of water authorities

Both the Minister for Water and the Treasurer have key responsibilities for the financial health and performance of the sector. Establishing a consistent set of accountabilities for the Minister and the Treasurer is critical for effective governance of the sector. Currently, the respective roles of the Treasurer and Minister differ significantly across different parts of the sector.

The Minister for Water and the Treasurer will retain prime accountability for matters closely aligned to their respective areas of responsibilities but each will consult the other on matters of importance such as Board appointments and dividend policy. Also, for those key water industry business planning activities, such as corporate planning, that bring together the financial and service delivery responsibilities of both Ministers, it is proposed that each ‘sign off’ on matters relating to their own responsibilities.

The proposed new arrangements involve changes in responsibilities for both the Minister and the Treasurer. In particular:

- the Minister for Water will have new responsibilities for Board appointments, corporate planning and performance monitoring in the metropolitan water sector; and
- the Treasurer will have new responsibilities for corporate planning and performance monitoring, and will be consulted on Board appointments in the non-metropolitan water sector.

The Government will legislate to establish clear accountabilities for the Minister for Water and the Treasurer which are consistent across all water authorities.

The Government is strengthening the incentives for water authorities to improve their efficiency and effectiveness.
CHAPTER SEVEN – AN INNOVATIVE AND ACCOUNTABLE WATER SECTOR

Improved Capability and Effectiveness

The capability and effectiveness of an organisation not only encompasses the financial health of the organisation but also its culture, its alignment and focus upon strategic objectives, and the depth and breadth of skills in the organisation to drive innovation and respond to changing circumstances.

There are various ways the Government can improve the capability and effectiveness of water authorities and catchment management authorities. These include:

• the structure of Board membership (including the size of the Board and the appointment of high calibre members with the necessary skills, expertise and leadership qualities);

• the implementation of agreed best practice Board and risk management procedures and processes;

• robust performance monitoring and reporting frameworks; and

• structural changes to capture economies of scale and scope.

The Government’s recent introduction of independent economic regulation and formal Statements of Obligations to the water sector will have a significant impact on the business operations of authorities, and will strengthen the incentives to improve their efficiency and effectiveness.

Regional urban water authorities and rural water authorities

Regional urban water authorities and rural water authorities need to improve the efficiency and effectiveness of their service delivery and ensure the Government’s objectives are delivered.

Structural change is one way to do this. Mergers of two or more authorities has the potential to improve the sustainable management of water supplies throughout a region by:

• enabling an integrated approach to the provision of services;

• enhancing business capability through combining the skills and expertise that exist within each of the authorities and creating a business of sufficient size to attract and keep specialist employees;

• eliminating duplication in systems, assets and equipment, giving rise to savings to support expansion and improved service delivery; and

• simplifying relationships with other agencies.

Whether these benefits justify structural change in any particular case needs to be carefully assessed in the context of the particular needs of a region.

In each of the cases in which the Government has decided that a merger is warranted it has taken the view that the changes will provide a stronger capacity to deliver benefits to the region. All staff of the authorities to be merged will be transferred to the new authorities and their entitlements will be preserved.

Policy

Continuous improvement within the water sector is essential to meeting community and customer needs and to responding to changing circumstances.

Structural change will be assessed on a case by case basis, appropriate to local circumstances.

Action

7.7 On 1 July 2004 the following authorities will merge:

• Wimmera-Mallee Water and Grampians Water; and

• Sunraysia Water and Lower Murray Water.
**The merger of Wimmera Mallee Water and Grampians Water**

Grampians Water and Wimmera Mallee Water provide a range of services within a common geographical area and both have their head offices in Horsham. Grampians Water provides water supply and wastewater services to 52,000 people in 74 towns across the Grampians and Wimmera Mallee region.

Wimmera Mallee Water supplies 70 per cent of Grampians Water’s bulk water requirements as well as stock and domestic and irrigation water to approximately 6,000 customers in the region. Merging the two authorities into a single business for the region will enable an integrated approach to service provision, leading to improved efficiencies and customer responsiveness.

The two authorities are collaborating on the planning of a major infrastructure project, the Wimmera Mallee Pipeline, which will benefit customers of both authorities and provide significant environmental savings for the whole region. The proposed Wimmera Mallee Pipeline will link the assets of both authorities and provide a totally new water delivery system to both rural and urban customers in the Wimmera Mallee region.

Creating a single, larger authority will ensure that the proposed Wimmera Mallee Pipeline project has the best opportunity to succeed. A new authority will have a greater capacity to plan for and deliver a project of the size and complexity of the proposed Wimmera Mallee Pipeline and will have a greater capacity to respond to demands for improved services and improved environmental outcomes into the future.

Creating a single authority will also enable an integrated approach to the provision of urban and rural services and promote a more cohesive approach to regional water resource management.

The merger of these two authorities is important to the economic future of the region.

**The merger of Sunraysia Water and Lower Murray Water**

The rapid expansion of large-scale horticulture development along the River Murray from Swan Hill to the South Australian border is placing new demands on the provision of irrigation and urban water services. The area also faces significant challenges in rejuvenating existing systems.

Irrigation services to Victorian irrigators need to be of high quality and at least commensurate with those in the neighbouring areas in South Australia and New South Wales. These systems typically provide on-demand pressurised supply.

The Boards of both authorities support the merger and have formally applied for a new authority to be established. A united, regional approach to infrastructure provision and the delivery of services is required. A combined Sunraysia-Lower Murray authority will be in a better position to tackle the challenges of new development and serve the interests of irrigators and urban customers.

A single authority that is able to draw on the management, business, financial, technical and customer service skills of both authorities, will have a greater capacity to upgrade existing supply systems.

The single authority will progressively move towards establishing new elected irrigation customer service committees to provide advice to the Board about the provision of services in the irrigation districts.

The merger of the First Mildura Irrigation Trust with the new Sunraysia-Lower Murray authority is encouraged by the Government, but will only take place if supported by the authorities.

It has been proposed that the Northern Mallee Pipeline district, currently part of Wimmera Mallee Water, should also form part of a merged Sunraysia-Lower Murray authority. This would require appropriate financial re-adjustments to take account of the investments in the pipeline district. The two new entities will jointly advise Government on future arrangements for the pipeline.

The Government regards effective engagement of water authorities with their customers as critical to their success. The recommendations of the Working Group for the development of a Best Practice Statement for the operation of Customer Service Committees by rural water authorities are being prepared in light of directions set out in this White Paper and are expected shortly. The Government will take appropriate action following receipt of these recommendations.

Other water authorities will be encouraged to investigate opportunities to enhance their performance in the interests of their customers and regional communities by working together more closely. Urban water authorities in the State’s southwest are currently developing resource sharing arrangements. The efforts of the Gippsland water authorities and the Northern Water Forum to develop coordinated regional planning arrangements are important. The development of regional Sustainable Water Strategies will also provide opportunities for improved joint resource planning.

**Action 7.8** The Government will facilitate continued strengthening of partnerships within the water sector in the interests of water authorities’ customers and regional communities.

**Integrated catchment management for the Melbourne area**

Current catchment management arrangements for the Port Phillip and Westernport catchments are inadequate. Gaps and inconsistencies in roles and responsibilities make it virtually impossible to take a whole of catchment approach to waterway and floodplain management and managing the effects of stormwater runoff.
There is no designated authority to manage waterways and regional drainage in the upper Maribyrnong and Werribee catchment areas and no regional drainage or waterway management services provided on the Mornington Peninsula. The unserviced areas include high urban growth areas and contain nearly 40 per cent of the region’s waterways.

The Green Paper indicated that the Government would act to remedy the gaps in responsibilities.

The Government will designate Melbourne Water as the authority responsible for waterway, regional drainage and floodplain management throughout the whole of the Port Phillip and Westernport catchment. This will provide a whole-of-catchment approach to river health and ensure the delivery of regional drainage and floodplain management services.

The Port Phillip and Westernport Catchment Management Authority will remain responsible for developing and coordinating the implementation of the Regional Catchment Strategy.

The new arrangements will reflect the unique characteristics of the region – a city of over three million people, high value agriculture and a tradition of urban drainage being a function associated with waterway and floodplain management.

Key features of the new arrangements are:

- properties within the previously unserviced areas will not become automatically liable to pay a drainage rate. Local needs will be assessed and flexible charging arrangements will be developed to reflect levels of service and to take better account of urban and rural differences; and
- exploration of opportunities to streamline water related services to developers and to involve retail water authorities in the provision of drainage infrastructure.

The Government will review arrangements for Melbourne after three years to determine their effectiveness in achieving integrated catchment management and whether further changes are required.

Melbourne’s water authorities

Water supply services to metropolitan Melbourne are provided by City West Water, South East Water and Yarra Valley Water. Each retailer operates within an assigned area. Bulk potable water supply, bulk recycled water supply, and bulk sewage disposal services are provided to the authorities by Melbourne Water.

These arrangements have delivered a high standard of customer service and business efficiency to the Melbourne community, and will be retained.

Refinements will be made to these arrangements to further clarify the respective accountabilities of the retail and bulk water authorities, and to ensure collaborative long-term water supply and demand planning for Melbourne.

Melbourne’s water authorities will jointly produce a single Water Supply-Demand Strategy for Melbourne describing the city’s long-term supply-demand balance for water.

This will be underpinned by the assignment of Melbourne’s source bulk water entitlements and capacity shares to the retail water authorities, which will be pooled for operation by Melbourne Water. Trading will be permitted between the Melbourne pool and other water entitlement owners.
The Water Supply-Demand Strategy for Melbourne, to be produced jointly by the Melbourne water authorities in consultation with the community by early 2007, will update and refine the Water Resources Strategy for the Melbourne area completed in 2002.

This joint approach, building on the local knowledge each retailer offers, will help to ensure a mix of innovative local solutions combined with integrated system-wide planning.

The Water Supply-Demand Strategy will identify the optimum mix of long-term water demand and supply management measures, including the development of alternative water resources, to ensure that Melbourne's water use needs continue to be met.

It is expected that a key feature of the Water Supply-Demand Strategy will be progressive long-term reductions in per-capita annual demand on traditional water sources. The water authorities will continue to improve the information that they provide to the community to indicate the size of the reductions needed and the progress being made.

Plans of the water authorities will be consistent with achievement of the Government's existing target to reduce per-capita water consumption by 15 per cent by 2010, as well as longer-term demand and supply management objectives.

The allocation of water resources in the Yarra, Thomson and Bunyip basins between environmental and consumptive purposes, discussed in Chapter 2, will allow the assignment of bulk water entitlements in Melbourne to be completed.

The assignment of Melbourne's source bulk water entitlements to the retail water authorities will clarify and strengthen the link between management of water supply and demand, consistent with principles that underpin the water entitlement framework. It will clearly define the volume of water allocated to the authorities from traditional sources to meet customer demand, providing a strong incentive for the water authorities to work with the community in effectively managing demand.

‘Pooling’ of the bulk water entitlements assigned to the retail water authorities will allow the integrated operation of the bulk water supply system to continue largely unchanged. However, it will be subject to improved transparency and customer engagement in critical bulk water management decisions.

Strengthened governance and funding arrangements for catchment management authorities

Chapter 3 outlines the Government's commitment to catchment management authorities (CMAs) as caretakers of river health and details their responsibility for the operational management of the Environmental Water Reserve within their boundaries.

These changes in responsibilities need to be matched by strengthened governance arrangements, improved resourcing and clearer accountabilities to the Government and Victorians.

Action

7.11 The Government will strengthen governance arrangements for CMAs by:

- establishing CMAs under one Act;
- developing formal Statements of Obligations for CMAs, as for water authorities, to clarify their accountabilities;
- improving performance monitoring and evaluation; and
- changing the structure of CMA Boards.

Current legislative arrangements for CMAs are complex. CMAs operate and are constituted under two Acts – the Catchment and Land Protection Act 1994 and the Water Act 1989. The existence of two Acts can lead to duplication and inconsistencies in governance arrangements, making the role of the CMAs unclear in some aspects.

One clear statement of responsibilities for the CMAs under one Act, would allow their roles, purpose and board functions to be clearly and consistently defined.
CHAPTER SEVEN – AN INNOVATIVE AND ACCOUNTABLE WATER SECTOR

Changes in the structure of CMA Boards

To perform the enhanced role, CMA Boards must have the right mix of skills and leadership qualities. The key features of the proposed new arrangements are:

- CMA Boards will consist of not more than nine members appointed by the Minister for Water;
- Board members of CMAs must have proven leadership skills, experience in high level decision making and an understanding of the role of Board members;
- the CMA Boards must consist of persons with relevant qualifications or experience in one or more of the following:
  - land management and water industry experience and/or strong understanding of issues impacting on natural resources and the water sector;
  - business planning, strategic planning, commercial experience and financial management;
  - technical experience, including engineering, infrastructure and project management;
  - social sciences;
  - environmental and/or natural resource management experience; and
  - demonstrated ability to introduce new ideas and innovative practices and to respond to emerging catchment management and water sector issues;
- more than half of the persons on the Board will be involved in primary production, except in the Port Phillip and Westernport region;
- the Minister will ensure appropriate regional representation on selection panels to ensure that local issues are adequately addressed taking account of:
  - the need for Boards to be recognised as leaders in land and water management across the region;
  - the need to maintain a community focus to encourage adoption of land and water management solutions; and
  - the advantages that may be offered by cross-membership with other regional bodies such as local government, urban and rural water authorities and Coastal Boards;
- the Chairperson will be appointed separately and will also participate in the selection of Board members; and
- appointments will be staggered to ensure continuity of skills and experience.

The precise timing of the changes will be determined in consultation with the CMAs.
Sustainable development requires a shared commitment by all relevant agencies to the broad resource management objectives of the State. Local decisions must consider the implications of decisions beyond the immediate borders of the institution. This can be achieved through increased collaboration between institutions.

The development of Sustainable Water Strategies, described in Chapter 2, provides a major opportunity for collaboration and joint planning.

Coordinated planning in growth areas

The sustainable development of land at the urban fringe requires innovative solutions that consider the broader impacts beyond the immediate area, and put systems and resources to their most efficient use.

Existing arrangements allow neighbouring water authorities to compete for the right to supply new subdivisions located outside assigned service areas.

While competition provides incentives for individual businesses to develop innovative and cost-effective solutions using resources available to them, it can inhibit collaboration between authorities that are potential competitors.

This collaboration is however often critical to the development of integrated solutions that fully assess future demands and the long-term financial, environmental and social cost and benefits of options.

The Government has previously committed to improve and formalise existing arrangements through the development of ‘vetted’ competition. The Government now proposes to refine this model to ensure that the collaboration required between water authorities servicing new subdivisions is not inhibited.

An improved legislative framework

The current legislative arrangements governing the activities of water authorities and catchment management authorities are complex and all submissions received on this aspect of the Green Paper supported the need for greater consistency and clarity.

These authorities are subject to multiple Acts. This creates a complex and, at times, unclear picture of the authorities’ respective accountabilities, which impedes the delivery of the Government’s sustainable water agenda. New legislation is needed to provide a coherent framework for the water industry.

A new legislative framework for catchment management authorities will establish consistent governance arrangements under one Act, while allowing the authorities to exercise powers under several pieces of legislation.

Water authorities will also be subject to a new legislative framework that recognises the diversity of the sector and provides clarity of roles and responsibilities. The new framework should include common descriptions of powers and responsibilities that would apply to any authority assigned a particular water service or catchment function, including the management of a water storage.

Action

7.12 The Government will improve the current legislative framework for water authorities and for catchment management authorities to meet the objective of an innovative and accountable water sector driving sustainable water management.
Incentives for Innovation and Improved Performance

Broad industry-wide learning initiatives are required to support ongoing improvement in water resource management.

### Policy

Sustainable water resource management requires the creation, sharing and application of relevant knowledge. Public sector institutions will be accountable to the community for their performance, providing a strong incentive for improvement.

### Research, innovation and capability building

Knowledge is a crucial resource in the management of water, for assisting authorities to regularly adopt more efficient, effective and environmentally sensitive processes.

Investing in research and capability building is the responsibility of all players in the water sector – urban water authorities, rural water authorities, the metropolitan water authorities, CMAs and the Government.

Water authorities and CMAs need to invest in research, innovation and capability building in areas where it affects the success and future directions of their businesses.

The Government’s task is to build strategically on the individual knowledge bases generated by the authorities, through supporting research that lays a comprehensive knowledge platform to support the sustainable management of our water into the future.

### Action

7.13 The Government will:

- work with water authorities and CMAs to develop a long-term research, innovation and capability program for the water and catchment industry;
- encourage water authorities and CMAs to recognise the importance of knowledge and innovation to their businesses by ensuring that this is included in their Statement of Obligations;
- enter into partnerships with leading knowledge providers to pursue areas of priority research; and
- invest in education, capability building and fundamental knowledge generation by funding five postgraduate scholarships – one in each of the areas of urban water management, rural water issues, river health, water resource systems, and the inter-relationship between water and the community.
These reforms will create an increasingly capable, innovative and accountable water sector.
Aquifer
A layer of underground sediments which holds water and allows water to flow through it.

Baseflows
The component of streamflow supplied by groundwater discharge.

Biodiversity
Biological diversity is the variety of all life forms – the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part.

Biosolids
Stabilised organic solids derived from sewage treatment processes that can be managed and used safely for nutrient, soil conditioning, energy or other value.

Bulk entitlement (BE)
The right to water held by water and other authorities defined in the Water Act. The BE defines the amount of water that an authority is entitled to from a river or storage, and may include the rate at which it may be taken and the reliability of the entitlement.

Cap
An upper limit for the diversion of water from a waterway, catchment or basin.

Carbon sinks
Area of forest or plant growth which absorbs high amounts of carbon dioxide accumulating in the Earth’s atmosphere.

Catchment
An area of land where run-off from rainfall goes into one river system.

Catchment management authorities (CMAs)
Catchment management authorities are the caretakers of river health, responsible for regional and catchment planning and coordination, and waterway, floodplain, salinity and water quality management.

Channel automation
Computerised system which automates the ordering, delivery and measurement of supply in water irrigation channels. The system involves remotely controlled regulators and gates.

COAG
The Council of Australian Governments is the peak intergovernmental forum in Australia, comprising the Prime Minister, State Premiers, Territory Chief Ministers and the President of the Australian Local Government Association (ALGA).

Desalination
The removal of salt from water sources.

De-snagging
Removal of trees and branches that fall into and lodge in rivers.

Ecosystem
A dynamic complex of plant, animal, fungal and micro-organism communities and the associated non-living environment interacting as an ecological unit.

Effluent
As applied to sewage treatment, wastewater which flows from treatment works.

Environment
Surroundings in which an organisation operates including air, water, land, natural resources, flora, fauna, humans and their interdependence.

Environmental flow
The streamflow required downstream of a water storage to maintain appropriate environmental conditions in a waterway.

Environmental Water Reserve
The share of water resources set aside to maintain the environmental values of a water system and other water services which are dependent on the environmental condition of the system.

Essential Services Commission
Independent economic regulator, established by the State Government of Victoria to regulate prescribed essential utility services supplied by the electricity, gas, water, ports, grain handling, rail freight industries and aspects of the insurance industry.

Estuaries
Zones where a river meets the sea, influenced by river flows and tides and characterised by a gradient from fresh to salt water.

Fit for purpose
Water which requires no further treatment for intended use.

Floodplain
The relatively smooth valley floors adjacent to and formed by alluviating rivers which are subject to overflow during flood events.

Greenfield residential developments
New urban development areas.

Greenhouse effect
The warming of the earth’s surface caused by greenhouse gases in the lower atmosphere. These gases regulate the earth’s temperature – making it capable of sustaining life – by retaining some of the heat that otherwise would radiate back into space.

Greywater
Household water which has not been contaminated by toilet discharge and includes water from bathtubs, dish washing machines, clothes washing machines and kitchen sinks.

Groundwater
All subsurface water, generally occupying the pores and crevices of rock and soil.

Headworks
Dams, weirs and associated works used for the harvest and supply of water.

Hydrology
The science dealing with surface and groundwaters of the earth; their occurrence, circulation and distribution; their chemical and physical properties; and their reaction with the environment.

Irrigation district
An area with definite geographic boundaries within which water is allocated for irrigation under the control of a local or State authority or other body.

Nutrient
Plant food, generally refers to nitrogen and phosphorous in water.

Outfall
The site of discharge of a liquid from a pipe. Applied particularly to the point at which a sewer discharges to a treatment works or receiving water body.
Permissible annual volume (PAV)
The volume of water that can be extracted via licences as authorised by the Minister for Water.

Pollution charges
Charges or levies applied to activities that cause pollution.

Potable
Suitable for drinking.

Recharge
Restore with new supply.

Reclaimed water
Water recovered from sources that are considered to be waste or unwanted supplies.

Recycled water
Water derived from sewerage systems, or industry processes, that is treated to a standard that is appropriate for its intended use.

Regulated systems
Those where the flow of the river is regulated through the operation of large dams or weirs.

Reticulation
The network of pipelines used to take water into areas of consumption. Includes residential districts and individual households.

Rising block tariffs
Proposed pricing structure where a higher price per kilolitre applies above a specified level of consumption and seasonal prices, or incentive schemes such as rebates, are given for using alternative sources of supply.

Riparian
Vegetated corridor along streams and rivers.

River
Large stream of water flowing to sea or lake or marsh or another river.

River basin
The land which a river and its tributaries drain.

Sales water
Lower-reliability water offered to irrigators on a seasonal basis, in proportion to their base rights, after provision has been made to meet the base rights in the following year.

Salinity
The total amount of water-soluble salts present in the soil or in a stream.

Sedimentation
Process where solid particles in water sink to the bottom, forming sediment.

Sewage
The waterborne wastes of a community.

Sewerage
A physical arrangement of pipes and plant for the collection, removal, treatment and disposal of liquid waste.

Spills
An uncontrolled release of water into river systems.

Stormwater
Untreated rainfall run-off from urban areas.

Stream
Body of water flowing in bed, river or brook.

Stream Flow Management Plan
A plan developed with community input to ensure that the water resources of the area are managed sustainably.

Sustainable diversion limit (SDL)
The maximum volume that can be diverted from a sub-catchment during winter while protecting the environment.

Third pipe systems/dual reticulation
Systems used to supply recycled water for uses such as garden watering and toilet flushing.

Tradeable pollution permits
Licences to cause pollution which are tradeable from one business to another.

Triple bottom line (TBL)
Integrated approach to the achievement of environmental, social and economic outcomes.

Unregulated system
A river system where no major dams or weir structures have been built to assist in the supply, or extraction, of water.

Water authorities
Authorities charged with supplying water to towns and cities across Victoria, for urban, industrial and commercial use. They administer the diversion of water from waterways and the extraction of groundwater.

Water cycle
The circuit of water movement from the oceans to the atmosphere and to the earth and return to the atmosphere through various stages and processes such as precipitation, interception, run-off, infiltration, percolation, storage, evaporation and transportation.

Water entitlement
The volume of water authorised to be used under a licence to take and use water or a water right.

Water mining
Process of recycling wastewater for uses such as public space irrigation.

Water right
Rights to water held by irrigators in an irrigation district.

Water supply protection areas
An area declared under Section 27 of the Water Act 1989 to protect the area’s groundwater or surface water resources through the development of a management plan which aims for equitable management and long-term sustainability.

Waterway
The Water Act 1989 defines what a waterway is and it includes a river, creek, stream, watercourse and a natural channel where water regularly flows, whether or not the flow is continuous.

Wetlands
Inland, standing, shallow bodies of water which may be permanent or temporary, fresh or saline.

Yield
The quantity of water that a storage or aquifer produces.
## Appendix A: Permissible Annual Volumes

<table>
<thead>
<tr>
<th>Groundwater Management Area</th>
<th>PAV&lt;sup&gt;1&lt;/sup&gt; (ML/yr)</th>
<th>Groundwater Management Area</th>
<th>PAV&lt;sup&gt;1&lt;/sup&gt; (ML/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandra</td>
<td>900</td>
<td>Kinglake</td>
<td>3,830</td>
</tr>
<tr>
<td>Balroolts</td>
<td>980</td>
<td>Lancefield</td>
<td>1,485</td>
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<td>Barnawartha</td>
<td>2,100</td>
<td>Leongatha</td>
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<tr>
<td>Colongulac</td>
<td>14,271</td>
<td>Little Desert</td>
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<td>Merrimu</td>
<td>450</td>
</tr>
<tr>
<td>Cut Paw Pawn</td>
<td>3,650</td>
<td>Moe</td>
<td>8,193</td>
</tr>
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<td>Mullindolingong Zone 1</td>
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<tr>
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<td>Zone 2</td>
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<td>5,000</td>
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### Notes

2. There is no PAV for Gerangamete GMA as the entitlement is managed under a Groundwater Licence.
Appendix B: Operating Strategy for the Thomson and Macalister Rivers

The West Gippsland Catchment Management Authority, will develop an Operating Strategy for the management of the Environmental Water Reserve, in consultation with Melbourne Water, Southern Rural Water, the Gippsland Coastal Board and Department of Sustainability and Environment. The Operating Strategy will be submitted for the endorsement of the Minister for the Environment and the Minister for Water by March 2005.

The strategy will allow for an adaptive approach to the provision of environmental flows where the provision of various flow components can be changed in response to new information or climatic conditions.

The Operating Strategy will:

• aim to maximise the effectiveness of the Environmental Water Reserve to achieve the ecological objectives described in Tables B.1 and B.2;
• provide, as water becomes available, the recommended environmental flows outlined in Figure B.1;
• include the revised rules for the improved effectiveness of the current minimum environmental flow provisions; and
• include the climate-based trigger rules that aim to provide the recommended flows, described in Figure B.1 for the Macalister River, in about 85 per cent of years.

West Gippsland CMA will manage, monitor and assess the adequacy of the improved Environmental Water Reserve.

Revised rules for the current environmental flow provisions

Minimum flow provisions are currently defined for the Thomson and Macalister Rivers. Based on the most recent assessment of the environment’s flow needs, the current environmental flow provisions can be rearranged to improve their ecological effectiveness. The additional water to boost the environmental flows can then be used to complement these base flows.

Southern Rural Water (in consultation with their customers), Melbourne Water, West Gippsland Catchment Management Authority and the Department of Sustainability and Environment will review and revise the rules associated with these environmental flow releases to improve ecological effectiveness. The revised rules will not impact in anyway on water available for irrigators or residents of Melbourne. They will apply from 1 September 2004 until additional environmental flows become available, at which time the environmental flows will be managed according to the Operating Strategy.

For the Thomson River, the revised rules will apply until the additional 10,000 megalitres of environmental water becomes available. On the Macalister River, they will apply until the climatic-based trigger rules are employed. However, the expectation is that where appropriate, the revised rules will be included in the Operating Strategy. For instance, in the case of the Macalister River, the revised rules will apply in the dry years when flows on the Macalister River revert back to the current entitlements.

Climatic-based trigger rules

Water resources modelling has indicated that the recommended environmental flows could be provided in many years with no impact on irrigators’ reliability of water supply. This is because Lake Glenmaggie is a relatively small dam in comparison to its inflows and will fill and spill in most years. In other words, in many years the current practice of releasing only minimum flows in autumn and winter as the dam fills could be changed to allow larger environmental flow releases without compromising the filling of the dam or affecting irrigators’ access to water.

However, in those drier years when Lake Glenmaggie does not fill, or only just fills, any prerelease of water for the environment will dramatically affect the reliability of supply to irrigators. The use of climate-based triggers will inform when water can be released for the environment and the dam will still fill.

Southern Rural Water, in consultation with their customers, and the West Gippsland Catchment Management Authority will develop climate-based trigger rules for the Macalister River for inclusion in the Operating Strategy by March 2005. The trigger rules will be based on scientific advice and will aim to provide for a flow regime described in Figure B.1. The trigger rules will be refined as water is recovered for the environment, with the intent of achieving the recommended flows in 85 per cent of years.

Bulk entitlement amendment

By March 2005, the Thomson and Macalister bulk entitlement holders will apply to the Minister for Water to amend their bulk entitlements in line with the Government’s decision. The new bulk entitlements will:

• define the new passing flow provisions;
• describe the application of trigger rules for releases from Lake Glenmaggie; and
• outline a process for altering the bulk entitlements as water is recovered for the environment.

At the same time, the Minister for the Environment will submit an application for a new bulk entitlement for the environment for the Thomson River. In the first instance the bulk entitlement will be for an average volume of 10,000 megalitres a year and will be increased to 18,000 megalitres a year as water is recovered. The entitlement will be expressed as a capacity share of Thomson reservoir that provides for an average volume of 10,000 megalitres per year and a storage volume of 10,000 megalitres per year. Environmental water will also be able to be stored using airspace in the reservoir.

(continued overleaf)
## Table B.1 Environmental Objectives for the Thomson River

<table>
<thead>
<tr>
<th>Objective</th>
<th>Flow Related Event</th>
<th>Flow Description Component</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restore or maintain natural macroinvertebrate community</td>
<td>Stream-bed habitat availability</td>
<td>Low Flow, High Flow</td>
<td>All year</td>
</tr>
<tr>
<td></td>
<td>Large woody debris inundation (habitat)</td>
<td>Low Flow, High Flow</td>
<td>All year</td>
</tr>
<tr>
<td>Maintain/enhance native fish community structure</td>
<td>Habitat availability</td>
<td>Low Flow, High Flow</td>
<td>All year</td>
</tr>
<tr>
<td></td>
<td>Large woody debris inundation (shelter and food source)</td>
<td>Low Flow, High Flow</td>
<td>All year</td>
</tr>
<tr>
<td></td>
<td>Localised fish movement between habitats</td>
<td>Low Flow Freshes High Flow Freshes</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Migration trigger</td>
<td>High Flow Freshes High Flow Freshes</td>
<td>May/June and Sep/Oct</td>
</tr>
<tr>
<td></td>
<td>Fish migration (graying) regional scale complete connectivity required between zones</td>
<td>Low Flow, High Flow</td>
<td>May/June and Oct/Nov</td>
</tr>
<tr>
<td>Exotic fish management</td>
<td>Bank/bed exposure for carp egg drying*</td>
<td>Low Flow</td>
<td>Spring/Summer</td>
</tr>
<tr>
<td>Maintain/restore distinctive riparian vegetation community and structure, with zonation up the bank</td>
<td>Habitat inundation – provision of moisture to benches</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Habitat inundation – variability to provide zonation</td>
<td>High Flow Freshes to Bankfull Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Habitat regeneration – deposition of sediments on benches</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Habitat disturbance – bank/bench inundation to provide regeneration niches</td>
<td>High Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Flows that provide higher moisture levels in soils in lower rainfall areas</td>
<td>High Flow Freshes High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Delivery of seed from upper catchment</td>
<td>High Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Replacement of exotic grasses with native shrubs and ground cover</td>
<td>Prolonged inundation of bank and benches to disadvantage terrestrial species</td>
<td>Prolonged Bankfull Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Maintain litter/carbon cycling inputs to river</td>
<td>Bank/bench inundation to provide inputs of dissolved and/or fine particulate organic matter</td>
<td>High Flow Freshes</td>
<td>Autumn or Spring</td>
</tr>
<tr>
<td></td>
<td>Periodic inundation of banks, occasionally with enough power to move woody debris</td>
<td>High Flows to Bankfull Flow</td>
<td>Anytime</td>
</tr>
<tr>
<td>Maintain stream substrate condition</td>
<td>Substrate scour to remove accumulations of fine sediment</td>
<td>Low Flow Freshes High Flow Freshes</td>
<td>Anytime</td>
</tr>
<tr>
<td></td>
<td>Scour biofilms</td>
<td>High Flows</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Improve water quality</td>
<td>Flushing of stagnant pools</td>
<td>Low Flow Freshes</td>
<td>Summer</td>
</tr>
<tr>
<td>Maintain channel form diversity</td>
<td>Disturbance</td>
<td>High Flow/ Bankfull Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Restore biodiversity of floodplain wetlands</td>
<td>Restore natural wetland hydrology and connectivity</td>
<td>Overbank</td>
<td>Winter/Spring</td>
</tr>
</tbody>
</table>

1 Earth Tech, 2003: Thomson River Environmental Flow Requirements and Options to Manage Flow Stress, West Gippsland Catchment Management Authority

* This objective was not explored further in the determination of environmental flow recommendations and needs to be reviewed in the light of current carp management research when these data become available.
Table B.2 Environmental objectives for the Macalister River

<table>
<thead>
<tr>
<th>Objective</th>
<th>Flow Related Event</th>
<th>Flow Description Component</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rehabilitate macroinvertebrate community</td>
<td>Habitat availability</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td>Disturbance</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bankfull Flow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Movement by drift</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Maintain self-sustaining populations of Flathead Gudgeon**, Southern Pygmy Perch**, Australian Smelt, Short-Finned Eel, and Tupong</td>
<td>Habitat availability</td>
<td>Low Flow; High Flow</td>
<td>All year</td>
</tr>
<tr>
<td></td>
<td>Recruitment</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Restore self sustaining populations of Long-Finned Eel and Australian Grayling and River Blackfish**</td>
<td>Habitat availability</td>
<td>Low Flow; High flow</td>
<td>All year</td>
</tr>
<tr>
<td></td>
<td>Recruitment</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Movement</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Rehabilitate submerged aquatic vegetation</td>
<td>Habitat availability</td>
<td>Low Flow; High Flow</td>
<td>All year</td>
</tr>
<tr>
<td>Rehabilitate emergent and marginal aquatic vegetation</td>
<td>Recruitment</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Disturbance</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td>Rehabilitate native riparian vegetation</td>
<td>Drying</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td>Succession/zonation</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td>Bankfull Flow</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disturbance</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bankfull Flow</td>
<td></td>
</tr>
<tr>
<td>Limit encroachment of undesirable plant species</td>
<td>Disturbance</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bankfull Flow</td>
<td></td>
</tr>
<tr>
<td>Maintain water quality in pools</td>
<td>Slowed decline</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td>Mixing</td>
<td>Low Flow Freshes</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td>Rehabilitate nutrient cycling processes</td>
<td>Drying</td>
<td>Low Flow</td>
<td>Summer/Autumn</td>
</tr>
<tr>
<td></td>
<td>Entrainment</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bankfull Flow</td>
<td></td>
</tr>
<tr>
<td>Rehabilitate channel form</td>
<td>Sediment movement</td>
<td>High Flow Freshes</td>
<td>Winter/Spring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bankfull Flow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Channel forming</td>
<td>Bankfull Flow</td>
<td></td>
</tr>
</tbody>
</table>

(continued overleaf)


** Movement component not required.
Appendix B: Operating Strategy for the Thomson and Macalister Rivers

The flow provisions (outlined in this schematic) vary from the Task Force's recommended flow provisions in two minor respects:

1. In the reach below Thomson Reservoir, the minimum base Autumn (May/June) and Spring (October/November) flows are reduced from 230 ML/d to 125 ML/d. These higher base flows, which are required for fish migration, were considered superfluous as Thomson Reservoir blocks fish passage at the top of this reach. The compromise option was independently assessed by scientists who found this option should provide for healthy native fish populations and a more generally healthy river system.

2. Based on climatic conditions, the flow provisions for the Macalister River will be provided in 85 per cent of years (wetter years). As discussed earlier the Task Force recommended such trigger rules should be developed.

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3 Copies of the Task Force report as well as a report summarising the technical information, which informed the Task Force, can be obtained from the West Gippsland Catchment Management Authority. The reports are available on their website (www.wgcma.vic.gov.au) or the CMA can be contacted directly by phone (03) 5175 7899 or by mail: PO Box 1374 Traralgon 3844.
Appendix C: Responsibilities Associated with the Operational Management of the EWR

<table>
<thead>
<tr>
<th>Type of Environmental Water Reserve (EWR)</th>
<th>Management tasks required</th>
</tr>
</thead>
</table>
| Run of the river, groundwater baseflows and flood flows provided through conditions on consumptive use | • Liaise with storage managers to negotiate most effective release pattern for EWR.  
• Negotiate with storage managers during drought.  
• Liaise with groundwater managers to negotiate most effective groundwater extraction regime.  
• Undertake complementary habitat, floodplain and water quality improvements.  
• Provide input to Sustainable Water Strategies on:  
  – high priority rivers where current EWR is inadequate; and  
  – where SFMPs and/or GMPs are required for high value, water-stressed unregulated rivers or wetlands.  
• Input to BE, GMP and SFMP processes from a river health perspective.  
• Comment on annual reports on implementation of management plans for Water Supply Protection Zones (including groundwater and surfacewater).  
• Monitor and report on environmental condition.  
• Engage with community on environmental flow issues.  
• Develop operating strategy for allocation including:  
  – liaise with key stakeholders (eg land managers, DSE regional staff, water authorities, local government);  
  – identify target ecosystems for which allocation can be used;  
  – environmental objectives for target ecosystems;  
  – environmental water requirements of target ecosystems;  
  – identify priorities for use;  
  – identify flow-sharing amongst target ecosystems;  
  – storage conditions; and  
  – identify volume that is tradeable, if any, and conditions under which this would be traded temporarily and consultation required.  
  – roles and responsibilities including:  
    – preparation of water accounts;  
    – instructions to storage manager; and  
    – operation of regulators.  
  – accountabilities.  
• Develop agreed annual environmental flow plan which will:  
  – identify target ecosystems to be watered;  
  – provide instructions to storage managers;  
  – provide instructions to relevant target ecosystem managers;  
  – identify water, if any, available for temporary trade; and  
  – identify water, if any, to be purchased on the temporary market.  
• Liaise with storage manager for provision of water according to annual EF plan.  
• Liaise with target ecosystem managers on regulator operation and management.  

Allocation for the Environment (i.e. held in storage) | (continued overleaf)
Appendix C: Responsibilities Associated with the Operational Management of the EWR

<table>
<thead>
<tr>
<th>Type of Environmental Water Reserve (EWR)</th>
<th>Management tasks required</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Provide advice to Minister through Secretary DSE on any temporary trade.</td>
</tr>
<tr>
<td></td>
<td>• Pay costs associated with the management of the EWR where required.</td>
</tr>
<tr>
<td></td>
<td>• Monitor and report on environmental condition.</td>
</tr>
<tr>
<td></td>
<td>• Provide advice on refinements to operating guidelines and whether Environmental Water Reserve is adequate.</td>
</tr>
<tr>
<td></td>
<td>• Undertake works in target ecosystems to improve the effectiveness of environmental flows.</td>
</tr>
<tr>
<td></td>
<td>• Provide input to Sustainable Water Strategies on priorities for enhancement of EWRs in high priority river and wetland systems.</td>
</tr>
</tbody>
</table>
Appendix D: Broad Functions and Responsibilities of a CMA

Note: These responsibilities apply to CMAs in regional Victoria. Different arrangements exist in the Port Phillip and Westernport Region (see chapter 7).

<table>
<thead>
<tr>
<th>Functional areas</th>
<th>Major responsibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated regional planning and coordination</td>
<td>Integrated planning and investment</td>
</tr>
<tr>
<td></td>
<td>• Review the Regional Catchment Strategy (RCS), setting priorities and targets for land and water management.</td>
</tr>
<tr>
<td></td>
<td>• Develop/review relevant substrategies for the management of priority issues identified in the RCS, including special areas plans as required (in accordance with the Catchment and Land Protection Act 1994).</td>
</tr>
<tr>
<td></td>
<td>• Develop a Regional Catchment Investment Plan and provide advice to Governments on regional priorities and programs for the implementation of the agreed RCS.</td>
</tr>
<tr>
<td></td>
<td>• Manage the relevant investment of State and Commonwealth funds in the region's natural resource management programs.</td>
</tr>
<tr>
<td>Community engagement and key stakeholder involvement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Establish processes for ongoing community engagement and input into the development and implementation of the RCS, its substrategies, investment plans and work programs including supporting Implementation Committees as a key plank in the community engagement processes.</td>
</tr>
<tr>
<td>Coordination of implementation of RCS</td>
<td>• Consult with local government in the implementation of the RCS and contribute to strategic and statutory planning undertaken by local government.</td>
</tr>
<tr>
<td></td>
<td>• Develop strategic partnerships with regional service deliverers for implementation of the RCS and coordinate the implementation of the RCS.</td>
</tr>
<tr>
<td></td>
<td>• Oversee the management of community grants to implement the RCS.</td>
</tr>
<tr>
<td>Business management and reporting</td>
<td>• Develop a corporate plan, quarterly investment reporting, provide an annual report on its activities and report on expenditure and resource condition.</td>
</tr>
<tr>
<td>Community caretaker of rivers and water resources</td>
<td></td>
</tr>
<tr>
<td>• Core functions (including statutory functions)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community engagement and key stakeholder participation</td>
</tr>
<tr>
<td></td>
<td>• Undertake community engagement and participation in river health programs.</td>
</tr>
<tr>
<td></td>
<td>• Coordinate community education programs.</td>
</tr>
<tr>
<td></td>
<td>• Implement strategic partnerships with rural and urban water authorities for implementation of the RRHS.</td>
</tr>
<tr>
<td>Liaison with local government</td>
<td>• Include waterway and floodplain requirements in statutory planning processes.</td>
</tr>
<tr>
<td></td>
<td>• Act as a referral authority for floodplain management.</td>
</tr>
<tr>
<td></td>
<td>• Provide technical advice on flooding and river health.</td>
</tr>
</tbody>
</table>

(continued overleaf)
## Appendix D: Broad Functions and Responsibilities of a CMA

### Functional areas  |  Major responsibilities
---  |  ---
Community caretaker of rivers and water resources  |  River health, floodplain and drainage management  
  - Develop detailed water quality management plans and work programs.  
  - Coordinate implementation of water quality plans.  
  - Develop regional floodplain management works programs.  
  - Undertake regional flood studies.  
  - Develop and coordinate implementation of regional plans for drainage management.  
  - Manage specific drainage schemes (where relevant).  
  - Manage gazetted waterways.  
  - License works on waterways.  
  - Manage Environmental Water Reserve (see responsibilities in Appendix C).  
  - Provide input into Sustainable Water Strategies and other water allocation processes on priorities for enhancing the Environmental Water Reserve.  
  - Administer grants for catchment dams, water resource efficiency and other water resource programs.  
  - Act as a referral authority for new irrigation and commercial dams.  
  - Liaise with DSE on licence conditions for Crown frontages.  
  - Coordinate and report on implementation of Heritage River plans (where required).  
  - Monitor and evaluate performance and resource condition monitoring and evaluation.  
  - Report on river health and river health programs, including 5-yearly benchmarking of river condition.  

On-ground river and water protection and restoration  |  In priority areas identified in RRHS, undertake activities to meet Government’s targets for river health, including:  
  - Detailed community engagement and involvement on river health programs/projects.  
  - Major innovative programs aimed at river health protection and restoration, and floodplain management. These may include but are not limited to activities including:  
    - riparian restoration including weed management, revegetation and fencing;  
    - instream habitat restoration;  
    - installation of fishways;  
    - floodplain management;  
    - stabilisation of bed, banks and gullies;  
    - improvement of environmental flows in rivers and wetlands;  
    - improving effectiveness of environmental flows in rivers and wetlands;  
    - incentive programs for landholders;  
    - extension activities;  
    - partnerships to improve stormwater management;  
    - reconnecting rivers and floodplains;  
    - management of sand and sediment; and  
    - control of exotic species.  
  - Large-scale restoration programs for rivers and water resources following natural disasters, e.g. floods and wildfires (as required).
### Scenario Analysis Summary

<table>
<thead>
<tr>
<th>No</th>
<th>Scenario</th>
<th>Scenario description</th>
<th>Decision</th>
<th>Outlook</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Retrofit third pipe systems throughout Melbourne</td>
<td>This scenario considers potable water replacement for toilet flushing and garden watering with Class A recycled water in all existing and new residential development, including the CBD, and in commercial and industrial premises by targeting the larger water consumers in industrial and recreational sectors.</td>
<td>Not to proceed throughout the whole of Melbourne. Will proceed in areas where third pipe systems are approved optimal servicing arrangement.</td>
<td>Water authorities are evaluating opportunities for third pipe systems on a case-by-case or area-by-area basis in new and existing developments, as part of growth corridor planning and in accordance with the planning framework in the White Paper.</td>
</tr>
<tr>
<td>2.</td>
<td>Mandating third pipe systems in all new growth areas</td>
<td>This scenario considers mandating the use of third pipe systems in all new residential developments within the urban growth boundaries specified by Melbourne 2030 (DOI, 2002). Recycled water would substitute potable water for toilet flushing, and garden and public open space watering.</td>
<td>Not to proceed in all new development areas. Will proceed in new development areas where third pipe systems are approved optimal servicing arrangement.</td>
<td>Water authorities to determine role as part of growth corridor planning and in accordance with the planning framework in the White Paper. Will be mandated in new developments where part of approved optimal servicing arrangements included as demonstration projects.</td>
</tr>
<tr>
<td>3.</td>
<td>Target existing high volume water users</td>
<td>This scenario examines the feasibility of targeting existing high water volume users to use recycled water in place of their existing potable source. The 200 largest users consume around 10 per cent of the total water consumption in Melbourne.</td>
<td>Further investigate.</td>
<td>Water authorities investigating in accordance with the planning framework in the White Paper. Metropolitan water authorities already facilitating top 200 users to prepare water management plans to conserve water.</td>
</tr>
<tr>
<td>4.</td>
<td>Mandating recycled water use near treatment plants and supply systems</td>
<td>This scenario explores the opportunity to mandate the use of recycled water in areas close to sources of recycled water including treatment plants and trunk recycled water infrastructure for non-potable use provided public health, safety and environmental risks are managed.</td>
<td>Use will be strongly encouraged where markets are close to supply systems of recycled water.</td>
<td>Water authorities are evaluating opportunities for third pipe systems in accordance with the planning framework in the White Paper.</td>
</tr>
<tr>
<td>5.</td>
<td>Placing recycled water into potable water supply system</td>
<td>This scenario presents the option of further treating and pumping all the discharge from the Western Treatment Plant into Greenvale and Winneke reservoirs, and from the Eastern Treatment Plant into Cardinia Reservoir. The treated water would be mixed with the existing potable water and the mixture further treated to ensure potable standards are met, and supplied to much of the western and south eastern suburbs of Melbourne.</td>
<td>Not to proceed. Not supported as not socially acceptable and sufficient water is available for drinking purposes.</td>
<td>Water authorities to continue to monitor developments elsewhere.</td>
</tr>
<tr>
<td>6.</td>
<td>Placing recycled water into the water supply system and increase use of bottled water for drinking</td>
<td>In this scenario all discharge from the WTP and ETP is pumped into reservoirs as in scenario 5, however the discharge from both treatment plants would be treated to an enhanced standard suitable for human contact but not to WHO drinking water standard (i.e. same bacterial quality as drinking water but higher nutrients, TDS, colour). Recycled water would be mixed with fresh potable water in the reservoirs and the shandy would be used for all purposes except drinking. The public would be supplied with bottled water through supermarket retail distribution outlets for drinking and cooking purposes.</td>
<td>Not to proceed. Not supported as not socially acceptable and sufficient water is available for drinking purposes.</td>
<td>Water authorities to continue to monitor developments elsewhere.</td>
</tr>
<tr>
<td>7.</td>
<td>Water mining</td>
<td>This scenario considers mining of water from severs, which is the local treatment of raw sewage to provide recycled water for nearby beneficial uses such as open space watering, industrial uses. In an urban environment the expectation is that it is treated to a Class A standard (unrestricted use).</td>
<td>Plan and implement as per respective water authority plans.</td>
<td>Water authorities currently investigating in accordance with the planning framework in the White Paper.</td>
</tr>
</tbody>
</table>

(continued overleaf)
### Appendix E: Scenario Analysis Summary

<table>
<thead>
<tr>
<th>No</th>
<th>Scenario</th>
<th>Scenario description</th>
<th>Decision</th>
<th>Outlook</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.</td>
<td>Use of greywater</td>
<td>This scenario considers the use of greywater, which is defined in a residential context as treated sewage from the kitchen, laundry and bathroom but excluding toilet wastewater. Greywater use is becoming increasingly popular with the community, particularly with the current drought.</td>
<td>Address regulatory framework and roles and responsibilities, and proceed on a case-by-case basis.</td>
<td>Developers may consider appropriate for multi-unit and high-rise developments. Individual households will implement on-site greywater recycling in accordance with regulatory requirements. With regard to internal use of alternative supplies such as greywater, gaps in regulatory framework and roles and responsibilities need to be addressed to ensure public safety.</td>
</tr>
</tbody>
</table>
| 9. | Vision for Werribee Plains: Balliang | The area north-west of the Western Treatment Plant has the potential to use recycled water for agriculture, intensive horticulture, new urban development and to improve Werribee River flows for environmental and recreational use. This scenario considers the Balliang project which investigates the provision of recycled water to the Balliang District, which is bounded by the Brisbane Ranges, the You Yangs and the Werribee River. | Further investigate. | The Government will:  
• undertake an assessment as part of the Sustainable Water Strategy for the Central region; and  
• examine recycling opportunities in Balliang, Moorabool Valley and Bacchus Marsh. |
<p>| 10. | Eastern irrigation, Cranbourne – Koo Wee Rup Corridor | This scenario considers the Eastern Irrigation Scheme which is based on the provision of recycled water from the Eastern Treatment Plant to horticultural, agricultural, manufacturing and recreational industries in the Cranbourne to Koo Wee Rup corridor. | Project (in part) being implemented. | Melbourne Water and Earth Tech will supply Class A recycled water to Cranbourne/Five Ways area for agricultural and open space customers. Supply scheduled to commence by end 2004. Residential third pipe systems are also being planned by South East Water. |
| 11. | Thomson River environmental flows | The Thomson River has been classified as an environmentally 'Stressed River' downstream of the Cowwarr Weir. This scenario considers treated water from the Eastern Treatment Plant being further treated by polishing through a dual membrane treatment plant and discharged to a location just below the Thomson Dam. | Further investigate. | A variant to this scenario, the Sustainable Water Resources Scenario – East of Melbourne, is being examined instead. It involves substitution of recycled water for non-potable use, rather than direct addition of recycled water to the waterway. The scenario would free up surface water for drinking and environmental flows. |
| 12. | Werribee Irrigation District Recycled Water Scheme | The original scenario in the Green Paper Technical Report No. 1 Water Recycling Scenarios for Melbourne was referred to as ‘Werribee River Environmental Flows’. The objective of the scenario was to substitute irrigation water with recycled water from the Western Treatment Plant (WTP) to free up surface water for the degraded Werribee River downstream of Melton Reservoir which requires environmental flows to improve the ecological health of the river. Farmers in the Werribee Irrigation District use around 11,000 megalitres to 13,000 megalitres annually sourced from the Werribee Basin and used primarily for agriculture and horticulture. The current drought has severely constrained surface water and groundwater supplies to the district which has triggered the urgent development of the scheme to provide greater long term security of supply. | Project being implemented. | Southern Rural Water and Melbourne Water are implementing the scheme to supply up to 8,500 megalitres recycled water annually from WTP commencing in 2004. Farmers have already expressed interest in most of this volume. Farmers are giving up access to sales water which will be held in trust for five years before being allocated to the environment. |
| 13. | Pumping Melbourne’s recycled water north of Divide option 1 | This scenario involves recycling 100 per cent of the suitably treated sewage from the ETP and WTP by pumping it across the Bay from ETP to combine the flow with the WTP. This combined flow would then be pumped north to the Great Dividing Range and discharged into existing irrigation channels. | No further evaluation. | Water authorities investigating other options for beneficial use. |
| 14. | Pumping Melbourne’s recycled water north of Divide option 2 | This scenario considers diverting sewage from the northern parts of Melbourne, treating the sewage to produce high quality recycled water and transferring this water into the Goulburn Valley. The recycled water would be used to supplement current irrigation schemes in the region to the north and west of the State. | No further evaluation. | Water authorities are investigating other options for beneficial use. |
| 15. | Stormwater harvesting | This scenario involves increasing the use of retard ing basins as a source of storage of stormwater and ‘harvesting’ the stormwater for use. Stormwater would be treated through combinations of pollution traps, settling ponds and environmental wetlands and where appropriate more sophisticated processes would be utilised. | Further investigate. | Water authorities will investigate opportunities as part of developing Water Supply-Demand Strategies. Greatest opportunities are likely to be in new development areas, but will need to ensure environmental flows and beneficial uses are protected. |</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Scenario description</th>
<th>Decision</th>
<th>Outlook</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Increased utilisation of rainwater tanks</td>
<td><strong>Scenario description:</strong> Rainwater tanks are a traditional source of domestic water supply for isolated properties and small communities, but they are not commonly used in urban areas. This scenario considers rainwater tanks in the Melbourne region which have the potential to provide substitutes for potable water where water is used for garden watering and/or toilet flushing. <strong>Decision:</strong> Continue with current process, and address regulatory framework and roles and responsibilities. <strong>Outlook:</strong> Some developers considering option in new residential developments. Five star home system being established which includes option of rainwater tank or solar hot water service (subject to Regulatory Impact Statement). With regard to internal use of alternative supplies such as from rainwater tanks, gaps in regulatory framework and roles and responsibilities need to be addressed to ensure public safety and savings can be delivered.</td>
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<tr>
<td>17</td>
<td>Utilisation of stormwater to reduce salinity in sewage flow to WTP</td>
<td><strong>Scenario description:</strong> High salt levels exist in the sewage that flows into the Western Treatment Plant at Werribee. This scenario considers diluting the sewage flow with stormwater flows. <strong>Decision:</strong> No further evaluation. <strong>Outlook:</strong> Melbourne Water and City West Water have completed a salinity reduction options paper and are further investigating favourable options such as cleaner production and treatment.</td>
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<tr>
<td>18</td>
<td>Desalination</td>
<td><strong>Scenario description:</strong> This scenario considers the potential for desalination in Melbourne, which involves converting seawater into potable water. <strong>Decision:</strong> Further investigate. <strong>Outlook:</strong> The Government will investigate the environmental, social and economic costs of large scale application of desalination.</td>
<td></td>
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<tr>
<td>19</td>
<td>Aquifer storage and recovery</td>
<td><strong>Scenario description:</strong> This scenario considers the use of treated recycled water for temporary storage in aquifers for later use when there is demand. Recycled water can be stored in a bubble within an aquifer with little intrusion from groundwater effectively acting as a stand-alone storage due to the different characteristics (such as salinity and density) of the recycled water and the groundwater. <strong>Decision:</strong> Further investigate. <strong>Outlook:</strong> The Government and water authorities will investigate the potential for aquifer storage and recovery of alternative supplies (e.g. stormwater and recycled water) in Melbourne.</td>
<td></td>
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</table>
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>BE</td>
<td>Bulk (Water) Entitlement</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
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<tr>
<td>CMA</td>
<td>Catchment Management Authority</td>
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<tr>
<td>COAG</td>
<td>Council of Australian Governments</td>
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<tr>
<td>CPI</td>
<td>Consumer Price Index</td>
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<tr>
<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
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<tr>
<td>CUAC</td>
<td>Consumer Utilities Advocacy Centre</td>
</tr>
<tr>
<td>D&amp;S</td>
<td>Domestic and Stock</td>
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<tr>
<td>DHS</td>
<td>Department of Human Services</td>
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<tr>
<td>DPI</td>
<td>Department of Primary Industries Formerly Department of Natural Resources and Environment (DNRE)</td>
</tr>
<tr>
<td>DSE</td>
<td>Department of Sustainability and Environment Formerly Department of Natural Resources and Environment (DNRE)</td>
</tr>
<tr>
<td>EC</td>
<td>Electrical Conductivity</td>
</tr>
<tr>
<td>EF</td>
<td>Environmental Flow</td>
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<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
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<tr>
<td>ESC</td>
<td>Essential Services Commission</td>
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<td>ETP</td>
<td>Eastern Treatment Plant</td>
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<td>EWR</td>
<td>Environmental Water Reserve</td>
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<tr>
<td>GL</td>
<td>Gigalitre = 1,000,000,000 litres or (1 million cubic metres)</td>
</tr>
<tr>
<td>GMP</td>
<td>Groundwater Management Plan</td>
</tr>
<tr>
<td>KL</td>
<td>Kilolitre = 1,000 litres (or 1 cubic metre)</td>
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<td>MDBC</td>
<td>Murray-Darling Basin Commission</td>
</tr>
<tr>
<td>ML</td>
<td>Megalitre = 1,000,000 litres (or 1,000 cubic metres) The approximate amount of water contained in one 50 metre Olympic sized swimming pool</td>
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<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>PAV</td>
<td>Permissible Annual Volume</td>
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<tr>
<td>RCS</td>
<td>Regional Catchment Strategy</td>
</tr>
<tr>
<td>RRHS</td>
<td>Regional River Health Strategy</td>
</tr>
<tr>
<td>RWA</td>
<td>Rural Water Authorities</td>
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<tr>
<td>SA</td>
<td>South Australia</td>
</tr>
<tr>
<td>SDL</td>
<td>Sustainable Diversion Limit</td>
</tr>
<tr>
<td>SFMP</td>
<td>Stream Flow Management Plan</td>
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<tr>
<td>SWS</td>
<td>Sustainable Water Strategy</td>
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<tr>
<td>TBL</td>
<td>Triple Bottom Line</td>
</tr>
<tr>
<td>TDS</td>
<td>Total Dissolved Solids</td>
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<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>WTP</td>
<td>Western Treatment Plant</td>
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</table>
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