5

5 Delivering the Strategy

This Strategy is about planning and delivering on–ground improvements in the way we use water, and setting up monitoring and reporting regimes to track our progress. This chapter outlines how the Strategy will evolve to meet water needs in the Central Region over the next 50 years.

Implementation responsibilities

Many organisations contribute to water management and provide water–related services in the Central Region, and will have a part to play in implementing this Strategy. Actions identified in the Strategy fall into two categories:

- policy, regulations, performance obligations and targets determined by the Government and enforced by its regulatory agencies such as EPA Victoria
- projects, services and targets delivered by water authorities and catchment management authorities.

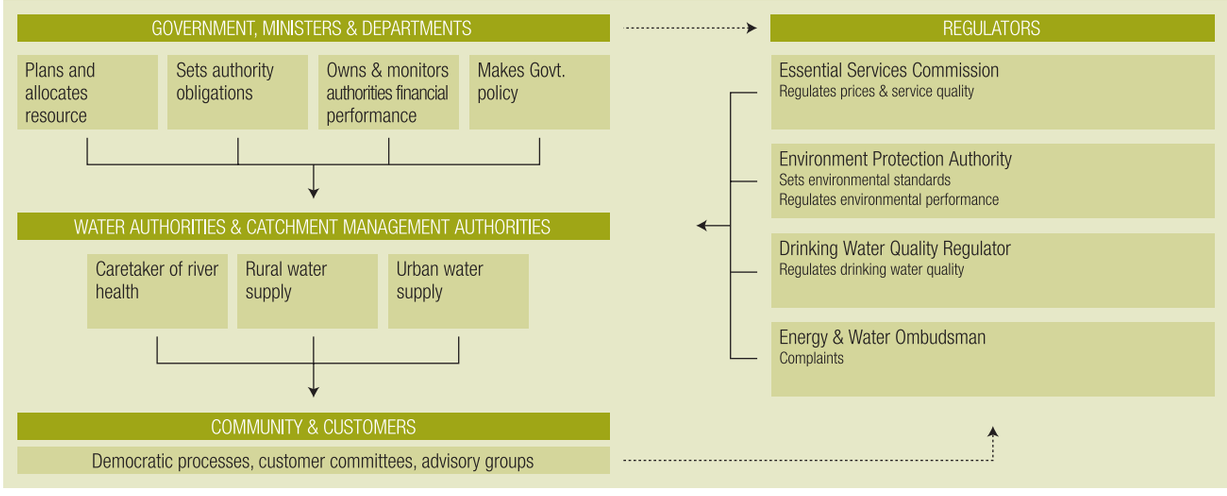
Implementation of the Strategy will become part of the existing governance structure for the water sector. This structure is summarised in Figure 5.1.

The Minister for Water, with the support of the Department of Sustainability and Environment, will coordinate the development and implementation of the policy and legislative initiatives outlined in the Strategy.

Water authorities and catchment management authorities will be required to deliver some of the projects and services outlined in the Strategy. This requirement, which will be clearly specified in the authorities' formal Statements of Obligations, will ensure that:

- Strategy initiatives are incorporated into their day–to–day activities
- costs are built into water authority pricing proposals
- the Essential Services Commission scrutinises water authority prices to ensure services are delivered efficiently.

Figure 5.1 Roles and responsibilities in the water sector



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Who: Dept of Sustainability and Environment
Timeframe: 2007

Action 5.1

The Government will specify in water authorities' and catchment management authorities' Statements of Obligations a requirement to deliver projects and services in accordance with actions in the Central Region Sustainable Water Strategy.

Who: Water authorities
Timeframe: Ongoing

Action 5.2

Water authorities will be required to:

- manage their demand and supply balance to ensure they can provide safe reliable water supplies
- develop a program of works and initiatives to conserve water and secure water supplies for the future.

Who: Catchment management authorities and Melbourne Water
Timeframe: Ongoing

Action 5.3

Catchment management authorities and Melbourne Water will be required to:

- manage the environmental water reserve to optimise environmental outcomes
- develop a program of works and initiatives to provide for healthy rivers.

Projects will be subject to the Government's existing procedures and processes including:

- feasibility studies
- business cases and gateway reviews (short, structured reviews at key decision points of a project)
- planning applications and environmental impact statements
- regulatory impact statements
- construction and execution of works.

Paying for the Strategy

Our Water Our Future states that each generation of Victorians should pay its fair share of the cost of long–term assets required to deliver water, including infrastructure improvements.

Key elements of the Government's approach for funding the implementation of the Strategy include:

- future costs associated with actions designed to secure consumptive use of water will be borne by water authorities and recovered as appropriate through water and sewerage prices subject to the approval of Victoria's independent pricing regulator, the Essential Services Commission
- the Government will, on a case by case basis, contribute funding where the forseeable impacts on customers are deemed to be unacceptable
- the Government may assist in funding the cost of major water reforms and feasibility studies and business cases for large scale augmentation options
- water authorities will be required to fund initiatives that seek to promote the sustainable management of water and to address adverse water–related environmental impacts
- the Government has appointed the Essential Services Commission as the independent economic regulator of the entire water industry to protect the interests of customers
- water authorities will be required to continue to structure water prices to reward water conservation and encourage efficient use of alternative, more sustainable sources of supply.

In addition to projects funded directly by the water authorities, the Government will consider contributing to the cost of initiatives that support sustainable water management. Most of these funds will be sourced from the Environmental Contributions that water authorities are required to make under the *Water Industry Act 1994*.

Who: Dept. of Sustainability & Environment
Timeframe: July 2008 – July 2012

Action 5.4

The Government will provide funding to support sustainable water management and improve the environmental health of rivers as outlined in actions contained in this Strategy. This funding will continue through the next stage of the Environmental Contribution, which will be determined in accordance with the requirements of the *Water Industry Act 1994* and will begin on 1 July 2008.

In addition to initiatives funded by Environmental Contributions, Melbourne Water will continue to fund initiatives to improve the environmental health of rivers in the Port Phillip and Westernport region through the waterways and drainage charge.

Impact on water prices

The level of impact on average customer water bills is dependent both on the costs of the projects selected and the cost sharing between customers and the State and Commonwealth Governments.

It is reasonable to expect that water prices will increase as a result of implementing the actions in the Central Region Sustainable Water Strategy.

Actual price increases associated with the Strategy will be approved by Victoria's independent price regulator, the Essential Services Commission, through a public price review process that involves:

- each authority preparing a water plan which sets out its proposed projects and service levels, revenue requirements and prices for a defined pricing period
- consulting Government, technical regulators (eg. EPA) and customers on a draft water plan before submitting a final plan to the Essential Services Commission
- the Essential Services Commission publicly reviewing the pricing proposals in those plans to ensure they reflect the efficient cost of providing the services demanded by customers.

This process recognises that future price changes need to be considered in an open and consultative manner. Price movements need to be balanced with the ability of all Victorians, particularly low income and vulnerable consumers, to afford essential water and sewerage services.

The Essential Services Commission's next major review of the entire water industry will begin later this year, and will set prices to take effect from 1 July 2008.

Monitoring implementation

The implementation of the Strategy will be monitored to ensure:

- actions deliver estimated volumes to meet consumptive needs
- targets to increase environmental flows and reduce residential water use are achieved
- increased environmental flows achieve key environmental objectives.

The Government has recognised the importance of monitoring and reviewing the progress of regional strategies by placing a statutory requirement in the *Water Act 1989* that:

- strategies include an implementation plan that sets out timelines or targets for implementing key actions
- the Minister reviews the strategies
- the Department of Sustainability and Environment report on the implementation of strategies in its annual report, which is tabled in Parliament.

In accordance with these statutory requirements, the Department of Sustainability and Environment will report annually on implementing the Strategy.

The delivery of projects and services will be reported annually by water authorities through their annual report to Parliament and by catchment management authorities through their Regional Catchment Investment Plan/Regional Catchment Strategy Annual Report to the Minister for Water.

Other actions to improve monitoring are outlined in Table 5.1.

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Table 5.1 Actions to monitor implementation of the Strategy

Action	Implementation
Action 5.5 The Government will continue to monitor the health of river systems in the Central Region and build understanding of the relationship between changes in the health of rivers and changes to environmental flow regimes. Monitoring includes: • the Index of Stream Condition (ISC): conducted for the first time in 1999, the ISC is a five–yearly index used to benchmark the environmental condition of Victoria's major rivers and tributaries. Among other things, the ISC provides a consistent approach to the identification of river values and threats and a way to assess the long–term effectiveness of river rehabilitation programs. • Statewide Water Quantity and Quality Monitoring Network: a continuous monitoring of streamflow volumes, rainfall, lake levels and surface water quality throughout the State.	Who: Dept of Sustainability and Environment, catchment management authorities and water authorities Timeframe: Ongoing
Action 5.6 The Government will continue existing monitoring of groundwater through the State Observation Bore Network, which monitors groundwater depth in groundwater management areas, and examine opportunities to expand coverage of the network to include groundwater dependent ecosystems and rivers/wetlands.	Who: Dept of Sustainability and Environment Timeframe: Ongoing
Action 5.7 The Government will continue to implement and improve its existing water accounting system for Victoria. The following specific categories will be addressed: • water in reservoirs (existing) • water in rivers (existing) • water in small catchment dams (new) • groundwater (existing) • stormwater (new) • recycled water (existing) • irrigation drainage (existing) • changes to the above resulting from specific land–use changes (new).	Who: Dept of Sustainability and Environment Timeframe: Ongoing
Action 5.8 The Government will continue to monitor water consumption and population trends to enable comparison with forecasts and progress in meeting conservation targets.	Who: Dept of Sustainability and Environment and water authorities Timeframe: Ongoing
Action 5.9 The Government will maintain water supply models across the region and upgrade where necessary to: • inform the annual review of the Strategy supply and demand assumptions • provide a basis for the legislative 15 year resource review • provide a basis for long term water resource planning.	Who: Dept of Sustainability and Environment and water authorities Timeframe: Ongoing
Action 5.10 The Government will keep abreast of the results of climate change studies occurring nationally and internationally, as well as studies examining the drivers of current climatic patterns. This data will inform the legislative 15 year resource review and long–term water resource planning.	Who: Dept. of Sustainability & Environment Timeframe: Ongoing
Action 5.11 To understand the greenhouse neutrality of the Strategy, the Government will: • establish simple accounts to track the change in greenhouse gas production from the initiatives implemented under this Strategy • conduct a detailed analysis of the greenhouse impact of the supply options and the abatement potential of water conservation measures • quantify the amount of greenhouse gas emissions that need to be offset to achieve greenhouse neutrality • investigate a carbon offset tender process to identify the most cost effective way to achieve greenhouse neutrality • develop monitoring and reporting protocols to report on progress in achieving greenhouse neutrality.	Who: Dept of Sustainability and Environment and water authorities Timeframe: Ongoing

Reviewing the Strategy – adaptive management

The legislation allows the Minister to review the Strategy at any time, but also requires that a review be undertaken at least every 10 years.

In light of the risk of continuing low inflow conditions and to ensure preparedness, the Department of Sustainability and Environment will complete an annual review (covering the period 1 July – 30 June) of water availability and demand compared to the predicted forecasts. This will include an evaluation of progress in meeting targets. River flows and progress in meeting environmental targets will also be monitored.

The Minister for Water will make the outcomes of the annual review of water availability and demand (including the need for any change to targets or the timing of actions) publicly available before the end of the calendar year.

A review of the Strategy will occur every seven to 10 years, as required by the *Water Act 1989*.

It is proposed that the first review of the Strategy should occur in seven years. However, this could be required sooner if significant new information, particularly about our existing dry conditions and climate change, becomes available.

A further legislative requirement under the Act is an assessment of water resources at 15–year intervals. This assessment will determine if there has been a decline in water resources and whether this has fallen disproportionately on the environment or water users. It will also determine if river health is deteriorating for flow–related reasons. If either is the case, expert advice would be sought on appropriate corrective actions.

Options may need to be brought forward or delayed as the future unfolds, depending on how systems respond. By taking an adaptive management approach, we can select the most appropriate water conservation and supply options, and timing of these options. Adaptive management evaluates the performance of new management approaches and changing practices over time as experience is gained. Data collected while implementing the Strategy will guide ongoing management.

Work will continue on developing medium to long–term actions to ensure they are ready to implement when they are needed, as well as monitoring emerging technologies for options that are not currently feasible and any new options that may come to light before the Strategy review. Actions to meet these needs are outlined in Chapters 2 and 3.

Regularly reviewing the Strategy means decisions will be based on an ever–increasing evidence base. It also enables us to capture future technology gains and take full advantage of options for the future.

The investigations and research projects in Table 5.2 will be initiated to provide information for the next review.

Table 5.2 Research and investigation actions to support future Strategy reviews

Demand modelling	
Action 5.12 The Government will work with water authorities to improve their demand modelling and forecasting ability by: • monitoring the adoption of water conservation measures and subsequent water savings • better understanding demand and influencing factors • disaggregating water uses (ie. residential, open space, various industry sector use) and spatial distribution of these uses • quantifying water savings under different stages of water restrictions • understanding the biggest water–using industry sectors and the setting of sector benchmarks.	Who: Dept. of Sustainability and Environment and water authorities Timeframe: Ongoing
Action 5.13 Based on an improved understanding of demand modelling and forecasting ability, the Government will investigate whether the adoption of water conservation measures reduces the effectiveness of water restrictions during drought periods.	Who: Dept. of Sustainability and Environment and water authorities Timeframe: Dec 2008
Environmental needs	
Action 5.14 The Government will review and enhance the methodology behind environmental flow studies, including: • understanding of the underlying ecological assumptions • estimating the environmental flow requirements of estuaries • targeted studies to fill knowledge gaps.	Who: Dept. of Sustainability and Environment and catchment management authorities Timeframe: Ongoing
See Action 2.10 The Government will develop climate change and drought response plans for the environment, which include: • protocols for determining environmental risks • protocols for identifying drought refuges (deep shaded pools) and opportunities for the targeted watering of key environmental assets • contingency actions to apply during drought conditions to maintain refuges and protect environmental values of rivers.	Who: Dept. of Sustainability and Environment and water authorities Timeframe: Ongoing
Climate change and variability	
Existing action from Our Water Our Future (Action 2.19) The Government will complete the three–year collaborative research program on climate variability and change (with the Murray –Darling Basin Commission, the Australian Greenhouse Office, Land & Water Australia, CSIRO and the Bureau of Meteorology) to: • improve our understanding of the key drivers influencing climate over a range of timescales and their interactions • examine changes in our historical climate and the likely reasons for these changes, including causes of the dry conditions affecting the State over the past decade • define the current climate baseline and establish criteria to determine whether shifts in this climate baseline have occurred or are likely to occur • develop improved methods for assessing the likely impacts of climate change over the next 65 years, including improved local and regional projections • develop triggers to determine if water supplies have changed as a result of climate change • determine whether improved methods can be developed for forecasting climate, streamflows and crop yields 3–12 months ahead.	Who: Dept. of Sustainability and Environment, Murray–Darling Basin Commission, the Australian Greenhouse Office, Land & Water Australia, CSIRO and the Bureau of Meteorology Timeframe: Dec 2008
Action 5.15 The Government will improve our understanding of the impacts on rainfall and streamflow of interactions between the El Nino–Southern Oscillation and fluctuations in the Indian Ocean.	Who: Dept. of Sustainability and Environment Timeframe: Dec 2008
Land use change	
Existing actions from *Our Water Our Future* The Government will complete studies on the impacts of land use change on water resources, including: • the impacts of new plantation forestry and the development of triggers in accordance with NWI requirements (*Our Water Our Future*, Action 2.20) • harvesting in State Forests supplying water to Melbourne (*Our Water Our Future*, Action 2.21).	Who: Dept. of Sustainability and Environment and Dept. of Primary Industries Timeframe: Dec 2008
See Action 2.5 The Government will undertake further work on documenting the volume and use, and understanding the impacts and ways of mitigating impacts of small catchment dams in the Maribyrnong, Barwon and Moorabool catchments. This work will be completed in consultation with affected communities.	Who: Corangamite Catchment Management Authority Timeframe: June 2007

Further Information

Further information regarding the Central Region Sustainable Water Strategy can be obtained from the Department of Sustainability and Environment Customer Service Centre, telephone 136 186.

The Victorian Government's June 2004 *Our Water Our Future* action plan to secure Victoria's water resources can be found at www.dse.vic.gov.au/water

Information regarding water authority water resource planning, including how to contribute to the development of your local water supply demand strategies can be obtained from the water authority:

Barwon Water
www.barwonwater.vic.gov.au
1300 656 007

Central Highlands
www.chw.net.au
(03) 5320 3100

City West Water
www.citywestwater.com.au
13 16 91

Gippsland Water
www.gippswater.com.au
(03) 5177 4600

Melbourne Water
www.melbournewater.com.au
131 722

South East Water
www.southeastwater.com.au
(03) 9552 3000

Southern Rural Water
www.srw.com.au
(03) 5139 3100

Western Water
www.westernwater.com.au
1300 650 422

Westernport Water
www.westernportwater.com.au
1300 720 711

Yarra Valley Water
www.yvw.com.au
131 721

Information regarding regional river health strategies can be obtained from:

Corangamite Catchment Management Authority
www.ccma.vic.gov.au
(03) 5232 9100

Melbourne Water
www.melbournewater.com.au
131 722

West Gippsland Catchment Management Authority
www.wgcma.vic.gov.au
Traralgon telephone 5175 7800
Leongatha telephone 5662 4555

Glossary

Aquifer	A layer of underground sediments which holds water and allows water to flow through it.
Augmentation	Increase in size and/or number.
Australian Paper	An Australian paper manufacturer.
Baseflows	The component of streamflow supplied by groundwater discharge.
Bulk Entitlement (BE)	The right to water held by water and other authorities defined in the *Water Act 1989*. 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.
Carbon offset	Any human induced activity that deliberately removes carbon dioxide from the atmosphere (such as revegetation) or avoids carbon dioxide emissions (such as installing more efficient appliances). The activity must be in addition to a "business as usual" situation.
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.
CSIRO	Commonwealth Scientific and Industrial Research Organisation.
Desalination	The removal of salt from water sources.
Ecosystem	A dynamic complex of plant, animal, fungal and micro-organism commuities and the associated non-living environment interacting as an ecological unit.
Ecosystem services	The processes and conditions by which natural ecosystems sustain and fulfil human life. Services such as clean air, water cycling and purification, nutrient cycling, soil formation, biomass production, waste disposal, crop pollination, provision of food and minerals, and the maintenance of genetic diversity result from functioning ecosystems.
Effluent	Treated sewage that flows out of a sewage treatment plant.
Environmental flow regime	The streamflow required 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.
EPA Victoria	Environmental Protection Authority Victoria.
Estuaries	Zones where a river meets the sea, influenced by river flows and tides and characterised by a gradient from fresh to salt water.
Exploration licence	Granted to investigate groundwater or other subsurface occuring material such as minerals or petroleum.
EWR	Environmental Water Reserve.
Fit for purpose	Water which requires no further treatment for intended use.
Floodplain	Lands which are subject to overflow during floods. Often valuable for their ecological assets.
Freshes	The first seasonal "flush" of water through a waterway.
Groundwater Management Area (GMA)	Discrete area where groundwater resources of a suitable quality for irrigation, commercial or domestic and stock use are available or are expected to be available. Generally these areas are suitable for ecologically sustainable development and in most cases some degree of development has already taken place.
Greywater	Household water which has not been contaminated by toilet discharge and includes water from bathtubs, dishwashing machines and clothes washing machines.
Groundwater	All subsurface water, generally occupying the pores and crevices of rock and soil.
Non-residential	Water use in industry, commercial/institutional buildings, open spaces (parks and gardens) and the water distribution system.
NWI	National Water Initiative – agreed to and signed at the 2004 meeting of the Council of Australian Governments (COAG), with the agreed imperative of increasing the productivity and efficiency of water use and the health of river and groundwater systems in Australia.
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 (such as river, creek or bay).

PCV or permissible consumptive volume	The volume of water permitted to be allocated in discrete groundwater management areas. Previously called permissible annual volumes (PAVs).
Potable	Suitable for drinking.
Ramsar	Internationally recognised wetlands (based on the Convention on Wetlands, signed in Ramsar, Iran, in 1971).
Recycled water	Water derived from sewerage systems or industry processes that is treated to a standard appropriate for its intended use.
Regional River Health Strategy	The key strategy for the protection of river values in each catchment management region in Victoria.
Regulated systems	Systems where the flow of the river is regulated through the operation of large dams or weirs.
Residential use	Water use in private housing.
River basin	The land which a river and its tributaries drain.
Run-off	Precipitation or rainfall which flows from a catchment into streams, lakes, rivers or reservoirs.
Salinity	The total amount of water-soluble salts present in the soil or in a stream.
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.
Stormwater	Rainfall runoff from urban areas. In this Strategy, it is defined as net increase in runoff and decrease in groundwater recharge from the increase in impervious surfaces such as roofs and roads that occur within urban development.
Stream Flow Management Plan	A plan developed with community input to ensure that the water resources of the area are managed sustainably.
Triple-bottom-line (TBL)	Integrated approach to the achievement of environmental, social and economic outcomes.
Unincorporated groundwater areas	Areas with limited groundwater resources which are not defined as groundwater management areas and do not have a defined permissible consumptive volume.
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 Supply Protection Area (WSPA)	Area that has been or is proposed to be proclaimed under the *Water Act 1989* for the purpose of establishing a management plan.
Water right	Rights to water held by irrigators in an irrigation district.
Werribee Plains Vision	A project involving major, innovative public works to provide new ways to use recycled water to develop a greener western suburbs. The Action Plan aims to upgrade treated wastewater from Melbourne Water's Western Treatment Plant to a standard suitable for use in agriculture, gardens and industry across the Werribee Plains.
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.

End Notes

1. Based on Victoria in Future 2004 estimates.
2. Water quality has been assessed against current Victorian environmental objectives within State environment protection policies prepared by EPA Victoria and endorsed by Government.
3. Source for figures up to 1998: Watersmart - Planning for the Future of our Water Resources - 21st Century Melbourne: A Watersmart City (2002).
4. Source for figures 1998-2005: Water Services Association of Australia.
5. Source: OECD Environment Policy Committee - Working Party on National Environmental Policy (2002).
6. Source: Water Services Association of Australia Facts 2005.
7. Source: Water Supply Demand Strategy for Melbourne 2006-2055: Draft Strategy.
8. Forecast shortfalls for the Inner West in 2015, 2030 and 2055 have been revised since the publication of the Draft for Community Comment – Central Region Sustainable Water Strategy as a result of improved modelling which better represents the interconnection with Melbourne.
9. Forecast shortfalls, including potential transfers, for Melbourne in 2030 and 2055 have been revised since the publication of the Draft for Community Comment – Central Region Sustainable Water Strategy due to adjustments to the likely transfer volumes to the Inner West. This was a result of improved modelling. Also, it has been assumed that the Melbourne-Geelong link will not be needed.
10. Population figures for West Gippsland have been revised since the publication of the Draft for Community Comment – Central Region Sustainable Water Strategy. This is due to populations in small communities (outside of large supply systems) not being included originally.

Appendix 1

The Independent Panel

An Independent Panel was formally appointed by the Minister for Water to consider comments made on the draft Strategy (ie. public submissions). Panel members, and their credentials, and listed below. The Panel was appointed on 28 February 2006 under section 22F(1) of the *Water Act 1989*. Under this legislation, the Panel may include in its report any recommendations at its discretion. The Panel's final report was submitted to the Minister on 19 July 2006 and was considered during the development of the Final Central Region Sustainable Water Strategy. As required by legislation, the Minister made the final report publicly available.

A copy of the report and all public submissions is available from www.dse.vic.gov.au

This appendix outlines the Government's response to the key points of the Panel's report.

Panel Member	Credentials
Peter Cullen (chair) AO, FTSE	Prof. Cullen is a recognised leader in river health, and water and land management. He was the founding Chief Executive of the Cooperative Research Centre for Freshwater Ecology at the University of Canberra. He is a Commissioner of the National Water Commission, Chair of the Victorian Water Trust Advisory Council, a member of the Natural Heritage Trust Advisory Council and a Director of Land and Water Australia. Prof. Cullen is an Emeritus Professor at the University of Canberra.
Sally Farrier	With a background in engineering, general management consulting, corporate advisory and utility reform, Ms Farrier specialises in issues of economic regulation, risk allocation, market development and pricing in water and energy. Currently, she is a director of Farrier Swier Consulting, a director of Hydro Tasmania, a director of Western Power Networks, and a member of the Victorian Water Trust Advisory Council. Ms Farrier has a Bachelor of Chemical and Process Engineering (First Class Honours), a Masters of Business Administration, a Post Graduate Diploma in Finance and Investment Analysis. She is a Member of the Australian Institute of Company Directors, a Fellow of the Financial Services Institute of Australia, and a Member of the International Water Association.
Christine Forster, AM	Mrs Forster became a Member of the Order of Australia in 2006 in recognition of her service to the environment in the area of water resource management through a range of consultative and advisory roles. She is a member of the Victorian Catchment Management Council and chairs the Independent Advisory Panel for the National Action Plan for Salinity and Water Quality and the Natural Heritage Trust. Mrs Forster is Deputy Chair of the Victorian Water Trust Advisory Council. She is a Director of Vic Super Pty Ltd, a member of the Grampians Pyrenees Regional Development Board and a former Board member of the Co-operative Research Centre for Catchment Hydrology. Mrs Forster has wide-ranging experience on a number of other bodies related to water, irrigation and Landcare. She is also a wool producer in Western Victoria and has been actively involved with rural adjustment and regional development issues.
John Langford, AM	Prof. Langford is a Professorial Fellow at the University of Melbourne and Director of the Melbourne Water Research Centre. He is a member of the Victorian Water Trust Advisory Council. Prof. Langford has a long history in water resource management and has an impressive list of achievements in the water industry. Prof. Langford was inaugural Executive Director of the Water Services Association of Australia, the peak body of the Australian urban water industry from 1994 to 2003. He was the Managing Director of the Rural Water Corporation, Victoria's statewide irrigation and rural water authority, from 1989 to 1994. Prof. Langford was the Manager Water Supply Headworks and Distribution for the Melbourne and Metropolitan Board of Works for 16 years. He is a former Chairman of the Co-operative Research Centre for Catchment Hydrology, the Co-operative Research Centre for Freshwater Ecology and the Murray Darling Freshwater Research Centre.
Barry Steggall	Mr Steggall is the former State Deputy Leader of the National Party and Member for Swan Hill (1983–2002), as well as Shadow Minister for Agriculture, Water Resources and Technology (1999-2000). He was Chair of the Murray Bulk Water Entitlements Committee (1996-1998), Swan Hill City Councillor (1973 to 1983 and Mayor (1980-1982). As a Member of Parliament, Mr Steggall held several important positions. including Secretary of the Liberal/National Coalition (1992 -1999), Senior Parliamentary Secretary to the Premier (1992 - 1996), Parliamentary Secretary to State Development (1996 - 1999), Convenor of Food Victoria 1993-1999 and Secretary Liberal/National Partnership (1999 - 2000). Mr Steggall is a member of the Victorian Water Trust Advisory Council.

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Government Response:

- The Minister for Water welcomes the Final Report of the Independent Panel for the Central Region Sustainable Water Strategy.
- The Government believe it is important to seek independent review and advice on the Strategy given the significance of this work. It values the extensive experience and insights of the Panel members.
- The Government considered the findings of the Independent Panel during finalisation of the Strategy.
- Responses to the key points raised by the Panel in their report are outlined in the table below.

Topic	Independent Panel Views	Specific Response:
Cap on river water diversions (refers to Proposals 5.4, 5.5, 6.1 and 6.5 in the Strategy Public Draft)	The Panel considers the establishment of a cap on river water diversions and the definition of environmental water reserves for each major river in the region are very important steps. However, it finds that the Government should move to express the proposed cap and environmental water reserves as a share of the water resource rather than a volume. In addition, the cap should be extended to groundwater and surface water runoff captured in small dams.	Environmental Water Reserves (EWRs) are described as a share (percentage) of the water resource (Glossary – Chapter 5). The same model is used to calculate both the consumptive entitlements and the environmental water reserve. (Refer Action 2.1). Legislation is in place to enable shares to be adjusted if climate change has a disproportionate impact on the EWR. Note that the water shares in any year will depend on the amount of flow in that year. Permissible Consumptive Volumes (PCVs), cap the amount of groundwater that can be extracted in groundwater management areas. (refer Action 2.12)
Robust water accounting system (refers to Proposals 5.4 and 5.5 in the Strategy Public Draft)	The Panel finds that:	
	• The draft Strategy's proposal to develop a robust water accounting system, and the proposed categories of water for inclusion in this system are appropriate.	The Government will continue to implement and improve its existing water accounting system for Victoria (refer Action 5.7)
	• The Government should give the development a robust water accounting system and enhanced water metering immediate priority	The Government places a high priority on metering, as set out in Our Water Our Future.
	• The Government should develop a comprehensive sampling and measurement strategy to better evaluate the impact of small catchment dams on downstream users and river health.	Small catchment dams are recognised as a priority (refer Action 5.18).
Environmental Water Needs (refers to Proposal 6.4 in the Strategy Public Draft)	The Panel finds that:	
	• Further work and significant investment is required to increase the knowledge of river ecology. This knowledge is critical for more accurately defining environmental water needs and delivering the water allocated to the environment in the most effective way	Ongoing monitoring of river health and improvements to the environmental flows study methodology will be undertaken (refer Actions 5.5 and 5.14)
	• The environmental allocations in the draft Strategy are a good first step. However, it is too early to determine a final position on sustainable environmental water needs. Improving the knowledge base will assist the community in making informed decisions and trade-offs between river health and consumptive water needs.	Future reviews of this Strategy will incorporate improved knowledge to inform decision-making and trade-offs.

Topic	Independent Panel Views	Specific Response:
The requirements of the National Water Initiative (refers to Proposals 5.4 and 6.5-6.12 in the Strategy Public Draft)	The Panel finds that the draft Strategy does not fully meet the requirements of a Water Plan in accordance with the National Water Initiative.	The final Strategy has been amended to meet the requirements of the NWI.
	None of the plans in the draft Strategy for maintaining and improving the health of individual rivers clearly identify the specific environmental assets (such as pools and wetlands) to be protected. Victoria does have river health plans that identify these assets, and the Strategy should appropriately cross reference these plans	This information is contained in Regional River Health Strategies and environmental flow studies referenced in the Strategy. The Government commits to providing 66,000ML to enhance environmental flows by 2015 (refer Action 2.6) and are supported by clear plans and timelines in Chapter 4.
	The plans for the Latrobe, Thomson and Macalister, Maribyrnong and Werribee, and Moorabool rivers (all of which are currently over-allocated) do not set out a firm pathway for returning each river to environmentally sustainable levels of extraction, or indicate that substantial progress towards this goal will be made by 2010.	The Strategy also outlines potential long-term water recovery options to meet environmental flow recommendations for the Latrobe, Thomson and Macalister, Maribyrnong and Werribee, and Moorabool Rivers (refer Table 2.2).
	While some heritage rivers are identified, actions to protect and manage systems of high conservation value are not specified.	These actions are addressed in Regional River Health Strategies
	There is no evidence that the plans for maintaining and improving river health incorporate indigenous social, spiritual and customary objectives, or strategies for achieving these objectives	An objective of the Strategy is to "protect the indigenous and other heritage values associated with the region's rivers and catchment areas" (refer Chapter 2).
	There is no evidence that, in fully allocated systems, all interception activities (eg small catchment dams and plantations) above an agreed threshold will require a water access entitlement, and actions to address interception issues are not specified.	Small catchment dams are recognised as a priority (refer action 2.4). The impacts of new plantation forestry will be investigated (refer Table 5.4)
	There is no clear process for reducing over-allocated groundwater systems to sustainable levels.	Action 2.14 outlines steps to reduce over-allocation and ensure aquifers are sustainably managed.
More efficient water use	Water conservation targets should be extended to all regional urban centres The Panel endorses the draft Strategy's emphasis on maximising water efficiency and conservation efforts by all water users, but finds that the approaches for achieving more efficient water use need to be strengthened. Stronger incentives for efficient water use should be created for all water users, and for water authorities.	Water conservation targets have been set for all water authorities in the Central Region (refer Figure 3.4 and 3.5). The strategy also sets out market based mechanisms to provide further incentives to encourage conservation (refer Action 3.25)
	Performance against all water conservation targets should be monitored, communicated, and used to guide implementation and adaptive management	Agree (refer Action 5.8)
	Mandatory water efficiency measures should be explored now, and should be considered as part of the adaptive management approach	Agree - mandatory water efficiency measures will be pursued through the national Water Efficiency Labelling and Standards Scheme (refer Action 3.6) and the reform of the 5 star standard for buildings (refer Action 3.5)
	A rigorous monitoring and benchmarking program of all major components of water consumption in the Central Region (including industry, regional urban centres and irrigation) should be established, as a powerful tool for driving continuous improvement in water efficiency.	Agree – (refer Action 5.12)
State Planning Policies	The Panel finds that the State's planning policies should be revised to complement the Sustainable Water Strategies, including taking account of the cost and availability of water and the cost of wastewater removal and treatment in approving urban subdivision.	Agree – refer Chapter 2 "Aligning water planning with statutory planning"

A1

Topic	Independent Panel Views	Specific Response:
Strategic planning for water – sensitive urban development	The Panel finds that: • a metropolitan-wide study of water and sewer networks should be undertaken to identify areas where the cost of development using conventional systems is high and water-sensitive urban development is potentially economic	Agree – refer Chapter 2 "Aligning water planning with statutory water planning"
	• an evaluation of existing water-sensitive urban developments should be undertaken to identify more cost-effective and sustainable designs and support adaptive management.	Agree – refer Chapter 2 "Aligning water planning with statutory planning"
	Potential locations for stormwater storages should be identified ahead of urban development, so that land can be put aside for this purpose Current institutional and regulatory arrangements are inhibiting the use of the stormwater resource and should be included in a wider review of the arrangements governing water-sensitive urban development.	Agree - refer Chapter 3 "Building alternative water supplies into Victoria's water allocation policy"
Water Trading	The Panel believes that water trading within the Central Region and with other regions is an important strategy for proceeding, and finds that: • there is an urgent need to undertake a study to clarify how water trading will operate in the Central Region	The Strategy outlines actions to expand water markets within the Central Region (refer Actions 3.14, 3.24 and 3.25).
	• water trading into or out of the Central Region should be explored and considered as part of the adaptive management approach.	Central Highlands Water will purchase water in northern Victoria to meet future demand.
Rigorous decision-making based on a wider range of options	The Panel finds that:	
	• It is prudent for Government to develop a diverse portfolio of options for new sources of water and augmentations and interconnections.	Agree –a range of actions have been identified and will be refined through the Strategy review process.
	• When selecting between alternatives, it is desirable to assess a variety of options rather than focus on a single iconic project	Sustainability assessment methodologies will be reviewed and utilised in subsequent Regional Sustainable Water Strategies as appropriate.
	There is a need to develop improved tools for assessing the technical, economic, environmental and social effects of each short and long term options on a risk-adjusted basis option For Melbourne, these options should include desalination, indirect potable recycling, pumping of stormwater at Dights Falls and trading water with the irrigation community north of the Divide	Desalination and the reuse of stormwater (including at Dights Falls) will be subject to detailed feasibility studies and if appropriate, business cases, over the next two years (refer Actions 3.23 and 3.26).
	For Ballarat, Geelong and other regions, they should include the options identified in the draft Strategy	Noted.
	A study of an interconnected water supply system servicing the Central Region should be undertaken to better understand the potential advantages of an interconnected system during prolonged droughts.	The Government commits to progressively interconnect water supply systems in the Central Region to meet the needs of all water users, including large industrial users and the environment (Action 3.24)
Institutional accountability and resources	The Panel finds that a single organisation with appropriate resources and technical capability should be given the mandate and be held accountable for: • coordinating and managing the implementation of the detailed actions associated with the Strategy • improving the information and knowledge base required to effect proper adaptive management and implementation • annually reporting progress to the Minister and public.	The Minister for Water, through the Department of Sustainability and Environment, will be responsible for overseeing implementation of the Strategy (refer Chapter 5 – "Implementation responsibilities").
Community engagement and water literacy	The Panel finds that a strategy should be developed for ongoing engagement of the community and increasing water literacy.	Noted - the Government is currently considering how to strengthen water authorities engagement with their customers. The Government will use the Strategy as a platform for improving water literacy.
Socio-economic impact of the strategy	The Panel finds that the implementation plan should explicitly provide for analysis of its socio-economic impacts on primary and secondary industries, and on low-income domestic users.	Noted - the Essential Services Commission process for reviewing water authority pricing proposals considers customer impacts (refer Chapter 5 – "Impact on water prices")
Effectiveness of the consultation process	The Panel finds that the consultation process was comprehensive, but had the following shortcomings: • The general population of Melbourne was not highly engaged • Apart from poorly attended public forums, there was little opportunity for community education through discussion of issues.	Noted. The engagement process and strategies used in the Central Region will be reviewed in terms of lessons that can be applied for future water strategies.

Appendix 2

Appendix Two: Stormwater and Urban Water Conservation Fund

On 15th September 2004, the Premier and Minister for Water announced the establishment of a $10 Million Stormwater and Urban Water Conservation Fund (the Fund).

The Fund is providing support to 66 projects including innovative water sensitive urban development initiatives, stormwater conservation and water recycling initiatives that will lead to significant savings in existing potable water supplies across Victoria. Table A2.1 below outlines the list of successful projects in the Central Region.

Table A2.1 Stormwater and Urban Water Conservation Fund – successful projects in the Central Region

Round 1 (Business Projects)		
Project:	**Estimated volume of water savings (ML/year)**	**Comments:**
Combining Stormwater & Recycled Water Usage at Flinders Community College South East Water Ltd	30	In partnership with South East Water and Flinders Community College, demonstrates the use of stormwater and recycled water to irrigate sports ovals and gardens.
Mernda Villages ASR Scheme Stockland Development Pty Ltd	150	Will capture stormwater from a residential estate to undergo an Aquifer Storage and Recovery (ASR) system. The ASR system will pump treated water from a wetland system into an aquifer and use it to irrigate regional recreation parks in Mernda, 26 km north of Melbourne.
DMS Glass Conservation and Recycling of Potable Water, while reducing Landfill Don Mathieson & Staff Glass Pty Ltd	50	Aims to recycle potable water use for cooling and particle removal from glass surfaces using new 'Vitrosep' glass particle separator.
CERES Urban Stormwater Reuse Demonstration Project CERES	Community Educational Value for water conservation initiatives and awareness	Aims to install two examples of pervious pavements, collect stormwater run-off and divert it into existing stormwater collection treatment and storage systems and install a distribution system to supply treated stormwater for on-site irrigation use.
Stormwater Use at Lyco Industries Lyco Industries Pty Ltd	4.8	Aims to capture and reuse stormwater at new factory development site. The project involves installation of storage tanks which will be tied into the sustainable energy design by acting as heat sinks on the north side of the building.
Water Recycling at Bulace Dyeing Bulace Dyeing Pty Ltd	7.2	Aims to implement an economic treatment process to recycle waste-water from the dyeing process.

A2

Round 1: Local Government projects:			
Water Saving Watcher Wetlands City of Greater Dandenong		4.7	Aims to convert existing community reserve lakes currently filled via potable water supply with stormwater from local stormwater infrastructure.
Cattani Gardens Stormwater Capture and Re-use Project City of Port Phillip		12	Harvest stormwater to substitute potable water irrigation of the high profile Cattani Gardens in St. Kilda
Hampton Primary School Stormwater Conservation for Environment and Education Project Bayside City Council		0.7	Retrofitting of a stormwater collection system to the Hampton Park netball court to reduce the reliance of potable water for toilet flushing of the adjacent school by 30% per annum.
The Ballam Project Frankston City Council		200	The project will utilise Class C water for the irrigation of several sports fields, parks and recreation facilities on Karingal/Central Frankston through the use of treated effluent from the outfall pipeline from the Eastern Treatment Plant.
Greening Our Futures - Woodend Racecourse Reserve Macedon Ranges Shire Council		15	Aims to design and connect recycled water from Western Water's treated effluent pipeline to a large multipurpose sports facility in Woodend.
Recycled Water Supply Project - Gisborne Sportsground and Botanic Gardens Macedon Ranges Shire Council		7	Aims to install a recycled water irrigation system to Sankey Reserve in Gisborne and the Gisborne Botanic Gardens.
Footscray Park - Stormwater Recycling Project Maribyrnong City Council		25	Aims to install a major stormwater harvesting and reuse system. A stormwater pipe conveying runoff from a 400 ha catchment passes adjacent to the site and currently discharges untreated stormwater into the Maribyrnong River.
Sorrento Stormwater Reuse Project Mornington Peninsula Shire	Stormwater to substitute: 20ML of potable water and 50ML of groundwater		Aims to reuse the stormwater for irrigation purposes at Sorrento Golf Club
Sustainable Irrigation Initiative - Lake Guthridge Wellington Shire Council		45	Aims to apply existing technology in an innovative way to irrigate Stephenson Park & Rotary Reserve and Sale Botanic Gardens by using the collected stormwater from Lake Guthridge.
Demonstration of system for treatment & processing of stockyard solid waste, recycling of wash-down & stormwater for reuse City of Ballarat		44.5	Proposes to treat, store and reuse waste water and stormwater for truck washing purposes and hosing of yards. It is estimated that approx 60-95% of water used could be recycled thereby reducing potable water consumption and associated trade waste.
Total		**665.9**	

Round 2		
Project:	**Estimated volume of water savings (ML/year)**	**Comments:**
Stormwater Recycling Project – Mitchell's Lane – Recycled Water main Extension Hume City Council	23–45	Connects two major sporting complexes in Sunbury to recycled water from Western Water's Sunbury Melton Recycled Water Scheme, and ultimately, connection to the last remaining Secondary College in Sunbury which presently does not have recycled water supplies available.
Stormwater Recycling Project – Industry Stormwater Code of Practice Hume City Council		The Industrial Stormwater Code of Practice will initially serve as a guide for businesses as to their legal obligations in preventing stormwater pollution in Hume, but will be developed as a catchment-wide approach to addressing stormwater pollution and will therefore have capacity for application throughout the entire Merri Creek Catchment and beyond.
Stormwater Recycling Project – Glenroy Neighbourhood Facility WSUD Project Moreland City Council	0.013	Installation and integration of rainwater tanks totalling a collection volume of 13,540L into the building design of the new Glenroy Neighbourhood Facility to flush all AAA toilets and to promote water savings to the community. In addition, car park run-off from the site will be directed to and treated in a bio-retention system, integrated into the kerbside water efficient landscaping.
Stormwater Recycling Project – Stormwater reuse and protection at the Prahran Market	1.2	Project to Capture, treat, and reuse rainwater collected from the Prahran Market roof.
Monash University Sports Field Bio-Filtration System Monash University	2.8	Project maximises the stormwater collection from the multi storey south – east car park. Utilises emerging technology and provides an ongoing research and demonstration facility for the University.
Albert Park Stormwater Reuse Project Parks Victoria	200	Creates a new stormwater treatment system for the Albert Park Lake including the "retrofit" of an existing pollution control pond and the creation of a new pollution control pond.
Municipal Depot Stormwater Re-use Manningham City Council	5	Captures, harvests, treats, stores, and reuses stormwater throughout its municipal depot complex in, East Doncaster so permanently reducing its potable water consumption.
Billabong Restoration Trinity Grammar School	Up to 70	Intercept and divert up to 70ML of the urban stormwater flows from pipelines entering or passing Trinity Grammar School, and after wetland treatment, utilise this stormwater for irrigation within the two Colleges to minimise pumped makeup supply from the Yarra River.
Wades Creek Catchment Scale Stormwater Treatment and Re-use West Gippsland Catchment Management Authority and St Paul's Anglican Grammar School	400	Harness the urban stormwater resource, treat it to best practice environmental standards, and reuse the water for irrigation.
Drain Water Heat Exchange and Extraction Process Warragul Linen Service	26	Capture, treat and re-use water used in the final rinse module of the Continuous Batch Washing Machines (CBWM) at the Warragul Linen Service.
Garden Gully Hockey Facility City of Greater Bendigo	20	Construct a regional wet synthetic hockey ground to International standards, at Garden Gully Reserve, Ashley Street, Bendigo with a water recycling system in place.
Phillips Gardens Revitalisation Central Goldfields Shire Council	18	Revitalise Phillips Gardens and its lake by providing mechanisms for stormwater diversion from surrounding drainage catchments.
Stormwater: Alternative Natural Solutions – SWANS Northern Grampians Shire Council	36.9	Construction of stormwater treatment trains that will include water storage and reuse capabilities, litter traps, sediment traps, nutrient filters, and landscaped wetlands.
Approx Total:	**800 +**	

A2

Round 3		
Project & Applicant:	**Estimated volume of water savings (ML/year)**	**Comments:**
The key to recycling in nurseries- Harvest it, Treat it, Store it, Re-use it. Mansfield's Propagation Nursery Pty Ltd	47 ML per annum (15ML recycled water SEWL, 11.20 ML Stormwater and 21 ML onsite wastewater reuse	Aims to connect and use Class A recycled water from South East Water Ltd, harvest stormwater, treat and reuse it for a nursery watering system. Also includes solar pumps and water treatment via wetlands.
Carbon Wastewater Recovery at Sugar Australia's Yarraville Refinery Sugar Australia Pty Ltd	31.9	Potable water will be saved through the reuse of the carbon waste water from the refinery will be stored, treatment and reused. Less potable water will be consumed and less waste water will be exported from the site
Building Less to Gain More – The Altona Leisure Centre Hobsons Bay City Council	7.9	Potable water will be saved through substitution with stormwater from the Altona Leisure Centre roof and surrounding landscapes piped into the existing 25m lap pool then converted to a tank for storage before being pumped into the centres new pools. AAA rated shower heads and water conservation devices where installed.
Hilton Fabrics, Waste & Stormwater Optimisation Project Hilton Fabrics	91	The project includes a combination of process modifications, identification of areas where stormwater will substitute for potable water and the reuse of waste water after reverse osmosis filtration.
St Kilda Sports Club Stormwater Recycling Project St Kilda Sports Club	1.9	An aim is to capture stormwater from the clubhouse roof and bitumen pathway. Water storage will occur in underground tanks, filtered through an inbuilt filtration system and reused for irrigating the green, garden and clubhouse toilet flushing, and eliminate the reliance on potable water supplies.
Queen Victoria Market Rainwater Harvesting Project City of Melbourne and Queen Victoria Market	10.2	The Project aims to capture, treat and reuse rainwater collected as runoff from approximately 2.7 ha of the Queen Victoria Market (QVM) shed roofs. Rainfall from the upper market roof will be piped to an underground storage tank. The collected water will be used for toilet flushing and washing down of selected outdoor areas.
Yarra Water Conservation Showcase Yarra City Council	0.54	The project will showcase a range of innovative water conservation technologies across a number of City of Yarra's community facilities, inlcuding Edinburgh Gardens reserve. Technologies involved include the installation of rainwater tanks connected to a variety of applications such as toilets, hot water systems, bowling green irrigation and mains water. Waterless urinals and a Worm Farm Waste System will also be installed in community facilities.
Bundoora Park – On par for water saving Darebin City Council	42	Aims to save potable water by enlarging current storage dams to capture and reuse stormwater from the Mt Cooper Housing Estate for irrigation of the golf course. Water conservation will occur through returfing cool season grass species with a low water use grass, Santa Ana Couch on fairways. The Project will provide environmental benefits by treating stormwater runoff from the nearby housing estate before it is used on the grounds and interacts with Darebin Creek.
Total Water Cycle Management at CERES and its Associates CERES	20.4	The Project will complete 5 key infrastructure components from CERES Water Plan, including the demonstration of piped connections, solar pumps, storage augmentation and integrated metering to transfer stored water between existing dams and filter beds. The Project includes the development of educational programs for CERES and Sustainable Schools that focus upon the reasons for and advantages of total water cycle management.
Rylock Powder Coat Water Minimisation Project Rylock Pty Ltd	14.6	Aims to signifcantly reduce potable water consumption by implementing a new powder coat facility for its window and door products. A demineralisation unit will treat rinse water into high quality, salt free water then the water will be reused within processing.

Round 3		
Project & Applicant:	**Estimated volume of water savings (ML/year)**	**Comments:**
Hunt Club Estate. South East Water	7	The Project aims to reduce potable water consumption through the use of Class A recycled water to irrigate existing parkland on the residential Hunt Club Estate (HCE) at Cranbourne East and being developed by Dennis Family Corporation.
Closed Water System for Glass Processing Alternative Glass Supplies	7	The project aims to install two US sourced Simco Model #DL-275-XL liquid/solid separators that will lead to 80% reduction in potable water usage per year. Captured stormwater from the roof actually provides benefits to glass manufacturing compared to potable water, as it is not Chlorinated. Company productivity will increase by reducing the need for regular maintenance of glass processing machines, particularly the settling tanks.
Sandringham Yacht Club – FMP2 Sandringham Yacht Club	2	Sandringham Yacht Club (SYC) will capture stormwater from the roof of a new club house on the Port Phillip Bay foreshore. The stormwater will be used for landscape watering and regular wash down for the building and podium areas. The car park will use Water Sensitive Urban Design from land scape swales and bioretention drainage and pollutant traps, to collect stormwater, provide treatment and will result in cleaner runoff water entering Port Phillip Bay.
Cranbourne Turf Club – Irrigation Storage Dam Racing Victoria	30	The project will capture stormwater run-off, primarly from a carpark and associated catchment area of 8.3 ha and deliver it to a constructed 25ML irrigation storage dam via 300mm concrete drains at the Cranbourne Training Centre and Turf Club. The Cranbourne Racecourse roof will capture a further 5ML of stormwater.
City Oval Drainage Retention System (Box Hill) City of Whitehorse	12.5	The project plans to divert capture, store and reuse stormwater for reuse at Box Hill City Oval from an existing stormwater drain that runs under the oval.
Bentleigh Secondary College Wetland and Reuse System Bentleigh Secondary College	3	Aims to create a wetland to treat runoff in order for water storage and reuse directly outside science classrooms and integrate it into the schools curriculum. Educational demonstration to focus on water conservation principles, wetland ecology, stormwater treatment for receiving waters and water quality monitoring.
Barley Steeping Technology Upgrade Barrett Burston Malting Co Pty Ltd	62	The project is an innovative upgrade of the malting process through upgrading of the Geelong plant.
Hothouse Development Stage 2 Freshpak Victoria	86	The project will sufficiently substitute potable water with stormwater from roof capture and through water reuse leading to a total potable water substitution of 86ML/year.
DISC sporting complex Stormwater Reuse Project Manningham City Council	2.54	The project proposes to harvest stormwater runoff from the roof of a large basketball gymnasium building, store and reticulate the harvested water to the building and also irrgate an adjacent oval. Automatic pressure pumps will supply non-potable water to the building for toilet flushing.
Depot – Sustainable Water Project Frankston City Council	1.1	Aims to install and connect rainwater tanks at the Councils depot's large workshop building for the purposes of vehicle washing, street sweeping and toilet flushing
Epping Plaza Regional Shopping Centre Rain Water Catchment Project Bevendale Pty Ltd(Pacific Group of Companies)	20	Aims to install a 240,000L steel water tank at the Epping Plaza Shopping Centre which will store captured stormwater from the roof. Stormwater will substitute potable supply for the flushing of toilets, garden and lawn irrigation and high pressure cleaning of external walls, pathways and pavements.
Total	**1274.58 ML**	

IA Index of Actions

Action No.	Brief description
Protecting our rivers	
2.1	Engage Aboriginal communities in developing Regional River Health Strategies
2.2	Establish the environmental water reserve for each river in the Central Region
2.3	Annual compliance reporting of the environmental water reserves
2.4	Issue new entitlements or licences to extract additional water from rivers only if river health is protected
2.5	Further work on impacts and ways of mitigating impacts of small catchment dams
2.6	Review current operating rules and harvesting rules to improve river health benefits
2.7	Increase the environmental water reserve by 66,000 ML by 2015
2.8	Pilot the Water Swap program
2.9	Evaluate the effectiveness of stream frontage programs and assess options to accelerate their implementation
2.10	Develop environmental drought response plans
2.11	Approach to manage the potential impacts of climate change on river health
Protecting our groundwater	
2.12	Establish environmental water reserves for all areas where groundwater is found in reasonable quality and quantity
2.13	Establish permissible consumptive volumes for each groundwater management area
2.14	Annual compliance reporting of the use and recharge of aquifers
2.15	Approach to sustainably manage aquifers
2.16	Identify and develop underutilised groundwater resources and explore aquifer recharge opportunities
2.17	Issue new groundwater entitlements or licences if long term sustainability of aquifers and groundwater dependent ecosystems are protected
Conservation and efficiency	
3.1	Water authorities to implement water conservation programs to achieve conservation targets
3.2	Extend the regional *Our Water Our Future* behavioural change program until 2015
3.3	Extend the metropolitan *Our Water Our Future* behavioural change program until 2015
3.4	Introduce on-the-spot fines for breaching water restrictions or permanent water saving rules
3.5	Reform the water component of the 5 star standard for buildings
3.6	Water Efficiency Labelling and Standards (WELS) scheme
3.7	Trial of smart water meters
3.8	Continue to support the Smart Water Fund
3.9	Extend the Water Smart Homes and Gardens Rebates scheme for a further four years.
3.10	Distribute around 160,000 water efficient showerheads over the next three years
3.11	Develop a web-based ready-reckoner to assist home-owners in choosing water saving options
3.12	Continue the Sustainable Water Efficiency Program for schools

Action No.	Brief description
3.13	Extend the Pathways to Sustainability program throughout the region
3.14	Explore alternative pricing options for industry and investigate how to develop water markets that could be open to large industrial water users
3.15	Water authorities to report annually to the Minister for Water on large non-residential water users
Alternative sources	
3.16	Water authorities to set new recycling targets
3.17	Water authorities to mandate dual pipe systems for suitable areas
3.18	The Growth Areas Authority (GAA) to promote water conservation and recycling in new developments in the growth areas of Melbourne
3.19	Continue to research and explore aquifer storage and recovery (ASR) opportunities
3.20	Upgrade the Eastern Treatment Plant to Class A standard
3.21	Proceed to business case for the Eastern Water Recycling Proposal
3.22	Continue to monitor the quality and volume of the ocean outfall at Boags Rocks
3.23	Expressions of interest for a portion of the 35,000 ML of recycled water available from the Western Treatment Plant
3.24	Complete feasibility studies for large-scale stormwater reuse options, in particular at Dight's Falls (proceed to business case if appropriate)
3.25	Interconnect water supply systems and expand water markets in the Central Region
3.26	Develop a governance framework to guide urban authorities participating in the water market
3.27	Monitor the advances in desalination technology and complete a feasibility study for desalination options for Melbourne (proceed to business case if appropriate)
Ballarat	
4.1	Reduce total per capita water consumption by 25% by 2015 and 30% by 2020
4.2	Implement a range of conservation and efficiency programs
4.3	Substitute river water with recycled water in Lake Wendouree and for use by industry
4.4	Interconnect Cosgrave Reservoir to White Swan Reservoir
4.5	Interconnect Newlyn Reservoir to White Swan Reservoir
4.6	Interconnect to the Goulburn system (Waranga Channel)
4.7	Groundwater from Cardigan aquifer
4.8	Increase environmental flows in the Moorabool River by 6,000 ML by 2015
4.8a	Redirect the treated groundwater discharge from the Fyansford quarry to the lower Moorabool River
4.8b	Transfer part of the water authorities' water entitlements in the west and lower Moorabool catchments to the environment
4.8c	Voluntary buy-back scheme for unregulated surface water diversion licences in selected areas of the Moorabool catchment and transfer the water to the environment
Geelong	
4.9	Reduce total per capita water consumption by 25% by 2015 and 30% by 2020
4.10	Implement a range of conservation and efficiency measures

IA

Action No.	Brief description
4.11	Line the Wurdee Boluc Inlet Channel and Ballan Channel
4.12	Substitute river water with recycled water for on-site use at the Shell refinery
4.13	Conduct an initial trial of aquifer storage and recovery
4.14	Feasibility study of groundwater resource at Newlingrook aquifer and possible Melbourne-Geelong connection
4.15	Entitlement for the use of the Jan Juc deep aquifer
4.16	Reinstate the Dewing Creek diversion into the Wurdee Boluc Inlet Channel
4.17	Increase environmental flows in the Barwon River by 4,700 ML by 2015
4.17a	Continue release of part of the discharge from the South Ballarat Treatment Plant for environmental flows in the Leigh/Barwon rivers
4.17b	Transfer part of water authorities water entitlements in the West Barwon Reservoir to the environment
Inner West	
4.18	Reduce total per capita water consumption by 25% by 2015 and 30% by 2020
4.19	Implement a range of conservation and efficiency measures
4.20	Substitute recycled water for non-potable uses in new residential and commercial developments in Eynesbury and Melton South
4.21	Increase the use of recycled water from local treatment plants
4.22	Continue to investigate opportunities to substitute river water for recycled water in irrigation areas in the Werribee catchment
4.23	Upgrade the existing Melbourne-Inner West connection and purchase additional water rights from the Melbourne pool
4.24	Transfer 50% of the unallocated inflows in Lake Merrimu to Western Water
4.25	Develop a wellfield between Romsey and Lancefield
4.26	Purchase additional entitlements from Pykes Creek Reservoir
4.27	Increase storage capacity in the Romsey/Lancefield system
4.28	Increase environmental flows in the Werribee River by 6,000 ML by 2015
4.28a	Pipe the Werribee Irrigation District and transfer the water saved for environmental flows in the Werribee River
4.28b	Substitute river water with recycled water in the Werribee Tourist Precinct to free up water for environmental flows in the Werribee River
4.28c	Transfer 50% of the unallocated inflows in Lake Merrimu as an environmental entitlement for the Werribee River
4.29	Increase environmental flows in the Maribyrnong River by 3,000 ML by 2015
4.29a	Transfer part of Western Water's Rosslynne Reservoir entitlement to the environment
4.29b	Voluntary buy-back scheme for unregulated surface water diversion licences in selected areas of the Maribyrnong catchment and regulated diversion licences on Jacksons Creek to retire the licences and transfer the water to the environment
4.29c	Transfer part of Western Water's Barringo Creek entitlement to the environment
Melbourne	
4.30	Reduce total per capita water consumption by 25% by 2015 and 30% by 2020
4.31	Maintain existing water savings (350,000 water-efficient gardens and work with 140,000 householders)
4.32	Implement conservation and efficiency programs (water-efficient showerhead program; water-efficient washing machine program; water-efficient evaporative air conditioners)

Action No.	Brief description
4.33	Continue to manage the water distribution system efficiently and reduce leakage
4.34	Expand the Pathways to Sustainability program and implement other programs to achieve the non-residential conservation target
4.35	Implement efficiency measures in irrigation systems within the Yarra catchments
4.36	Invest in local water recycling and reuse schemes
4.37	Establish an industry working group to investigate opportunities to reuse and recycle 30,000 ML of local water sources
4.38	Business cases will be completed for: the Eastern Water Recycling Proposal; desalination options; and stormwater reuse options
4.39	Meet the scientific flow recommendations in the Yarra River by 2007
4.39a	Reduce the cap on entitlements in the Yarra River and establish an environmental entitlement of 17,000 ML
4.40	Investigate options to provide water to wetlands where it is not possible to provide overbank flows
4.41	Increase environmental flows in the Tarago/Bunyip Rivers by 3,000 ML by end 2006
4.41a	Create an environmental entitlement for the Bunyip/Tarago Rivers
4.41b	Conduct a scientific study of the flow requirements of the Bunyip/Tarago Rivers
West Gippsland	
4.42	Establish benchmarks and refine conservation targets for total water use (excluding major industry)
4.43	Develop a separate target for major industry, based on industry best practice
4.44	Implement conservation and efficiency programs, including replacing the water turbine pump from Blue Rock Reservoir to Moondarra with an electric pump
4.45	Complete Stage 1 of the Gippsland Water Factory to enable the substitution of river water with recycled water for industry
4.46	Future water available from the Eastern Water Recycling Proposal, Stage 2 of the Gippsland Water Factory or groundwater
4.47	Increase environmental flows in the Latrobe River by 10,000 ML by 2006 for seven years
4.47a	Temporarily transfer part of the unallocated share of Blue Rock Reservoir and unallocated entitlements in Lake Narracan to provide 10,000 ML of water a year for flows (for seven years) in the Latrobe River
4.47b	Conduct a seven-year research program on the Latrobe River to confirm the flow requirements and necessary complementary works
4.48	Increase environmental flows in the Thomson/Macalister River by 15,000 ML by 2012
4.48a	Continue to invest in channel automation technology in the MID and progressively transfer the water saved (15,000 ML) to the Thomson and Macalister Rivers
Westernport	
4.49	Reduce total per capita water consumption (excluding major industry) by 25% by 2015 and 30% by 2020
4.50	Implement conservation and efficiency programs
4.51	Increase use of recycled water from the Cowes Wastewater Treatment Plant and Westernport Water's purification plant
4.52	Comparative assessment of augmentation options (for implementation by 2008), including an interconnection with: the Bass River; groundwater bores near the Candowie Reservoir; Corinella aquifer; and the Melbourne supply system
4.53	Investigate a range of long-term augmentation options, including an interconnection with: the Bass River; groundwater bores near the Candowie Reservoir; Corinella aquifer; the Melbourne supply system; and aquifer storage and recovery using the Wonthaggi coal mine

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Action No.	Brief description
Delivering the Stratergy	
5.1	Specify in water authorities' and catchment management authorities' Statements of Obligations a requirement to deliver Strategy projects and services
5.2	Water authorities will ensure they can provide safe reliable water supplies and conserve water and secure water supplies for the future
5.3	Catchment management authorities will manage the environmental water reserve to optimise environmental outcomes and provide for healthy rivers
5.4	Provide funding to support sustainable water management and improve river health
5.5	Continue to monitor and improve understanding of river health
5.6	Continue to monitor groundwater and examine opportunities to expand coverage to include groundwater-dependent ecosystems and rivers/wetlands
5.7	Continue to implement and improve existing water accounting system
5.8	Continue to monitor water consumption and population trends to enable comparison with forecasts
5.9	Maintain water supply models across the region and upgrade where necessary
5.10	Monitor results of climate change studies occurring nationally and internationally
5.11	Establish a system to monitor and report on progress in achieving greenhouse neutrality
5.12	Improve demand modelling and forecasting ability
5.13	Investigate whether the adoption of water conservation measures reduces the effectiveness of water restrictions during drought periods
5.14	Review and enhance the methodology behind environmental flow studies
5.15	Improve understanding of the impacts on rainfall and streamflow of interactions between the El Nino-Southern Oscillation and fluctuations in the Indian Ocean.

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