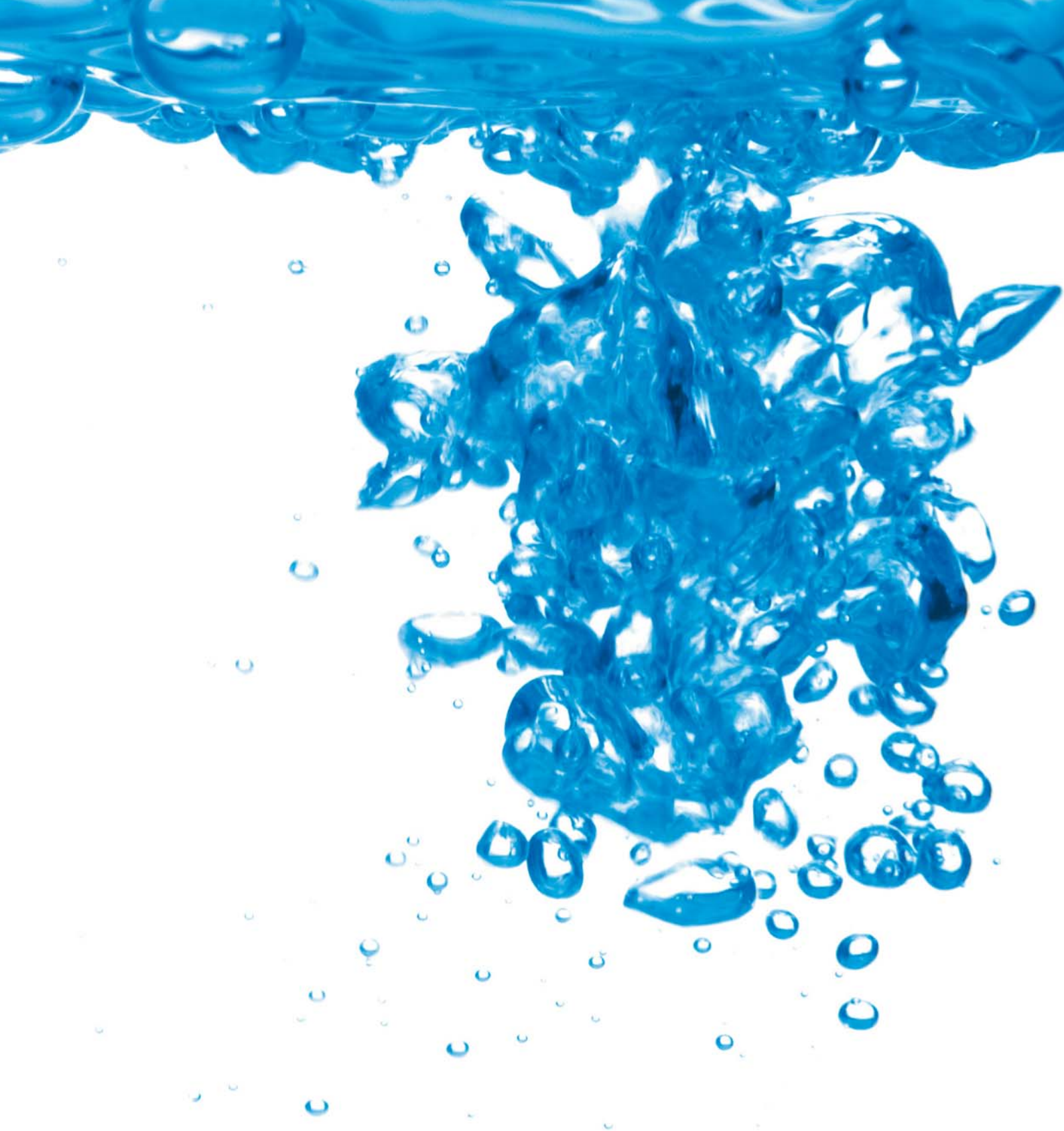
STATE WATER PLAN 2007

GOVERNMENT OF WESTERN AUSTRALIA



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CONTENTS

FOREWORD FROM THE PREMIER

Water. It is crucial to life and economic development. Managing water has been a challenge for many Western Australian Governments from the Goldfields pipeline that enabled gold mining activities to the new desalination plant. Our history has seen massive investments in collecting, transporting and treating water for use throughout the State.

As Western Australia has grown and developed, so too has our demand for water. What were already complex and expensive decisions have become even more critical because of climate change. We can no longer rely on traditional, seasonal climate patterns and rainfall in Western Australia. The southern half of the State, and Perth in particular, has experienced sharp changes in weather patterns and a rapid decline in rainfall and streamflows.

In 2001 former Premier Geoff Gallop took decisive action and responded quickly to the water supply pressures in Western Australia. The Government initiated a Water Symposium at Parliament House and through the collaboration of Government and the community released the State Water Strategy in 2003, a first of its kind in Australia.

The State adopted a water management strategy called 'Security through Diversity' as a way to address both the demand and the supply side issues facing Western Australia. This strategy is working. Today, Perth is the only major capital city in Australia where people can use sprinklers through summer and this follows the driest year on record in 2006.

Western Australia is receiving national and international acclaim for our approach to water management. We have implemented demand management initiatives like the Waterwise rebate system that are delivering savings of 60 gigalitres, and changed consumer behaviour. Industry and Government have worked together to tailor solutions for business like the Kwinana water recycling plant while water sensitive design principles are being incorporated into land planning.

Our overriding concern in all our thinking has been sustainability and protection of the environment. Western Australia now has Australia's largest wind powered desalination plant providing 45 gigalitres of water to Perth - a wonderful combination of clean wind energy providing water independent of rainfall. This desalination plant meets strict environmental standards and has reduced the pressure on our groundwater aquifers and dams.

The State has also pioneered innovative ideas like the Harvey Water Irrigation water trade. This project sees open air irrigation channels being converted into a piped system. The water saved through leakage and evaporation is available for other uses. We are also moving forward in conjunction with the Commonwealth in a groundwater replenishment project on the Gnangara Mound that will trial recharging highly treated wastewater into the mound.

We are also investing in science and research. The Premier's Water Foundation has seen a $6 million investment leverage over $21 million in Western Australian focused research.

We recognise that water is precious and scarce. We have been planning for the future since 2001 and have made decisions to safeguard our water security for all Western Australians. We will continue to be on the cutting edge of this important issue and we will not be complacent.

The *State Water Plan 2007* will guide our water future and improve water security and outcomes for the environment, industry and our community. I have initiated the development of a State Water Recycling and Conservation Strategy to support the achievement of targets in this Plan to further underscore our commitment to a sustainable and balanced water future.

HON ALAN CARPENTER MLA

PREMIER OF WESTERN AUSTRALIA

INTRODUCTION FROM THE MINISTER

State Water Plan 2007 provides a strategic framework to plan and manage water resources in Western Australia. It reflects our knowledge of resources, their intrinsic value to the environment, local and Indigenous communities and foundation for economic prosperity.

Western Australia has unique challenges in our management of water resources. We use significantly less water in agriculture and more in mining than most parts of Australia. We have greater access to and are more reliant on groundwater resources. Fortunately, we have not over allocated our water resources to the extent of other States.

State Water Plan 2007 adopts the best of modern approaches to water resource management, in a manner appropriate to Western Australia. It outlines seven policy objectives to support sustainable water resources in our vast and diverse State.

The ramifications of *State Water Plan 2007* are far reaching. The gains achieved over the last five years are being built on with continued focus on measurable targets for water recycling and conservation. The Government is continuing to invest in updated Waterwise programs, rebates and science.

In addition, Western Australia is implementing a range of new water resource management approaches. These include significant increases in metering and securing water for the environment and use through statutory water management plans and new forms of entitlement. These changes will allow us to more flexibly manage water use in times of seasonal and long-term climate shifts.

Through regional water planning, communities can contribute to the achievement of the objectives of this Plan, in their local area. Strategic planning will be supported by detailed plans to protect and share water resources and manage land use changes. Natural resource management and other community groups will be able to participate directly in the development of local strategies and delivery of these outcomes.

These changes represent the most significant reforms to water resource management in Western Australia in the last one hundred years.

Government has committed significant resources to deliver the detailed priority actions, outlined in this Plan, to support the vision for sustainable water resources in Western Australia.

State Water Plan 2007 is the result of ongoing community engagement and input. In particular, I wish to express my appreciation to members of the State Water Planning Review Panel and State Water Forum who have contributed significant resources and commitment to the development of this Plan.

I ask for your continued support to work with us to consolidate this decade of progress in water resource management in Western Australia.

John Kobelke

HON JOHN KOBELKE MLA

MINISTER FOR WATER RESOURCES

A STATE WATER PLAN FOR WESTERN AUSTRALIA

Water is highly valued by Western Australians. It is essential to the environment and supports the enormous biodiversity of our native flora and fauna. Water is fundamental to life and public health, drives and facilitates economic development and provides a variety of social, sporting and recreational opportunities. Water has cultural and spiritual value, particularly for Indigenous people.

Government initiated the development of a State Water Plan for Western Australia to address these drivers and integrate a range of water policy reforms at state and national levels.

The State Government has given water and the management of water resources strategic priority.

This will continue into the future given climate change and variability, resource scarcity and continued increases in demand.

This Plan outlines Government's commitment to strategically and effectively manage our limited and vital water resources. It provides the foundation for the community, water users and stakeholders to understand, engage and assess progress towards the vision for water resource management in Western Australia.

A whole of water cycle approach has been adopted with a planning horizon to 2030.

BUILDING ON STRONG FOUNDATIONS

State Water Plan 2007 has built on the foundations of extensive community involvement over the past five years.

Very poor winter rains in the southern part of Western Australia in 2001 highlighted the risk of changing and variable climatic conditions. In response to this drought, a series of Water Forums were held throughout the State, culminating in a Water Symposium and the release of the State Water Strategy in February 2003. This was a landmark in Government and community collaboration to invest in water use efficiency, research and new sources.

State Water Plan 2007 highlights some of the major achievements in water resource management in Western Australia since the release of the Strategy.

ADAPTING TO CLIMATE CHANGE

Western Australia is a large state with different climate zones ranging from tropical areas in the north, arid areas in the centre and a more temperate climate in the south.

Recently, there have been noticeable changes in climate, particularly in the southern half of the State. These changes are predicted to continue, resulting in lower rainfall and runoff and higher average temperatures. In addition to this placing pressure on water security for use, it is projected to impact ecosystems, water quality, recreational and other values.

State Water Plan 2007 has been informed by work completed in Western Australia to understand and adapt to these changes. It supports ongoing research into the nature of climate change and impacts on other regions of the State.

INTEGRATED MANAGEMENT FOR THE ENVIRONMENT

Western Australia has a diverse range of surface water and groundwater systems. We need to protect and manage water quality and availability in catchments and waterways. They are impacted by changing land use, the sharing of water for use and management practice. Natural events, including droughts and floods, require timely and flexible management responses.

In most areas of the State, water resources are not yet fully allocated. Where areas are over-used, *State Water Plan 2007* gives priority to the restoration of these systems. Statutory water planning, providing legal security to water entitlements for the environment, more metering and monitoring are practical measures to improve the integrated management of water for the environment and other public values.

MANAGING DEMAND AND SUPPLY

Over the past 25 years, water use has tripled in Western Australia. Groundwater accounts for almost three quarters of water used.

The outlook is for continued strong growth in the economy and the State's population, placing further pressure on existing resources. The agricultural, mining and household sectors have different water needs and account for more than 80% of all water use.

The most sustainable way to meet growing demand differs by user and location. The environmental, social and economic impacts of a range of demand and supply alternatives need to be evaluated.

Increasingly, demand will be met through water conservation, efficiency and recycling. The State is committed to further significant advances in these areas, enabled by research, rebates and industry partnerships.

Groundwater remains an important resource due to its relative availability and proximity to demand in most parts of the State. Desalination and other treatment technologies are emerging as economical options for high value water use.

COMMUNITY INVOLVEMENT

Regional and other water planning will facilitate community engagement on the water cycle and local actions to implement *State Water Plan 2007*. There is an ongoing need for continued investment in public education and collaboration with users, local communities and natural resource management groups.

VISION AND OBJECTIVES

State Water Plan 2007 has established a vision for water resource management in Western Australia, supported by seven objectives outlined in the table below.

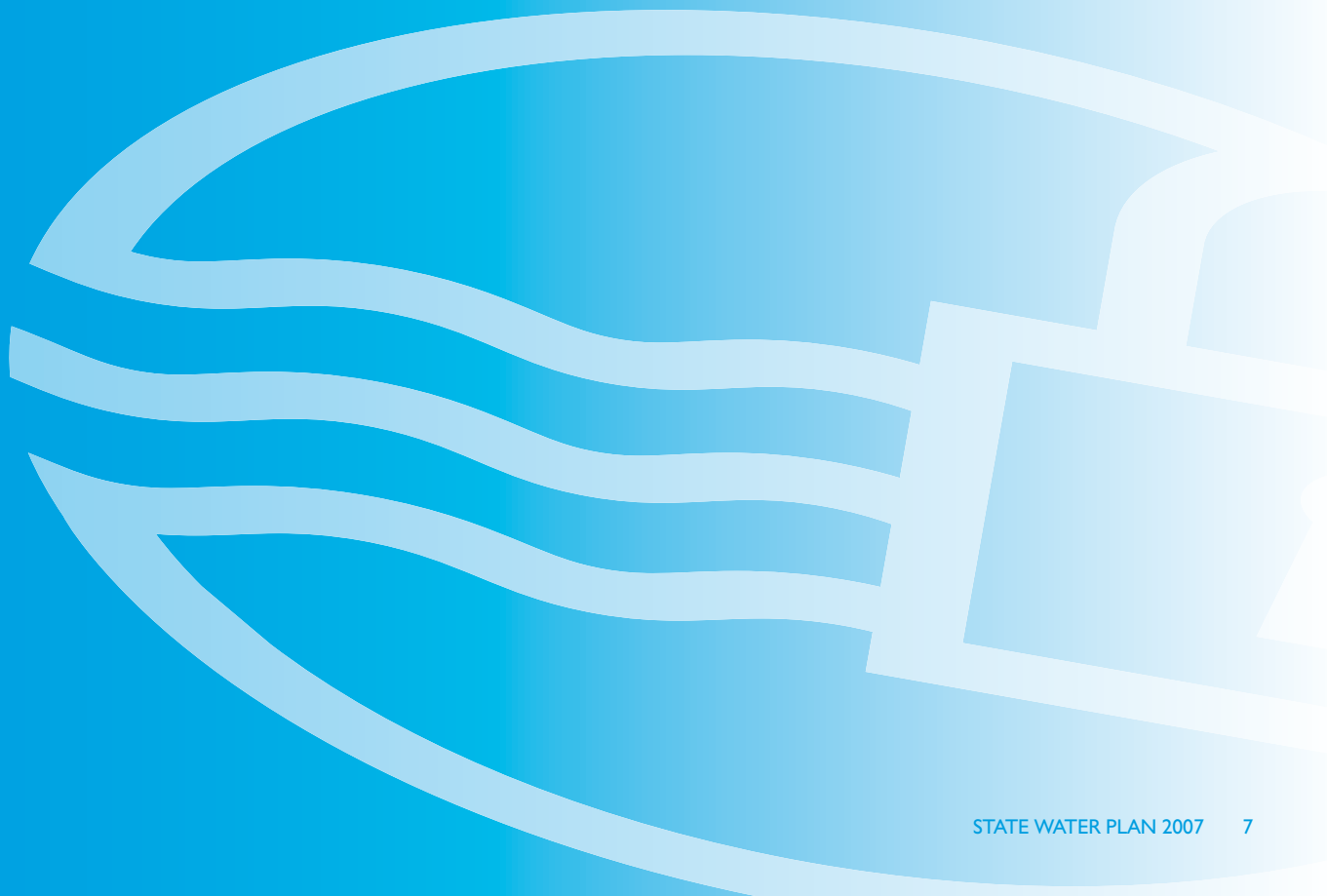
Our precious water resources are managed and developed in a sustainable manner to maintain and enhance our natural environment, cultural and spiritual values, our quality of life and the economic development of the State.

PRIORITY ACTIONS 2007 - 2011

State Water Plan 2007 outlines priority actions for implementation that align to the objectives and current focus of water resource management in Western Australia. These actions will be progressively delivered over five years by nine lead Government agencies. The Water Policy and Planning section of this report provides more information on these priorities.

1	Use and recycle water wisely	Conservation and efficiency Recycling
2	Plan and manage water resources sustainably	Regional water plans Statutory water management plans Integrated land and water planning Pricing and cost recovery
3	Invest in science, innovation and education	Groundwater investigation Adapting to climate change Information sharing and capacity building
4	Protect ecosystems, water quality and resources	Catchment protection and restoration Drainage plans Floodplain management plans Groundwater dependent ecosystems and wetlands
5	Enhance the security of water for the environment and use	Entitlements and registration Trading Metering
6	Develop water resources for a vibrant economy	Source development Sustainability assessment
7	Deliver services for strong and healthy communities	Safe drinking water Service delivery

SECURING OUR WATER FUTURE



GOVERNANCE

The Water Resources portfolio was created in 2005, in recognition of the strategic importance of water to Western Australia and the need to provide direction across a wide range of water matters.

Water is vested in the State Government that allows the community and individuals to access and use it for a variety of purposes.

The Minister for Water Resources is responsible for the Department of Water, the Water Corporation, Busselton Water Board and Aqwest (Bunbury Water Board).

The Minister is supported by the Department of Water, established in October 2005. The Department is responsible for water policy and planning and the overall management and regulation of water resources in Western Australia. Important accountabilities include water resources investigation and assessment, providing security for water for the environment and other community uses, licensing water for use and managing catchments, source protection, drainage planning and floodplains.

The water industry works across the public and private sectors to ensure a high standard of water resource management and service delivery. The Department of Water has the responsibility to coordinate water resource and water industry policy in Western Australia.

The Water Corporation, Aqwest and Busselton Water Board provide essential water services and are wholly owned by Government. These organisations have accountability for source development planning and service provision to agreed levels of service.

The Department of Health is responsible for implementing the Australian Drinking Water Guidelines for Western Australia and regulating the provision of safe drinking water.

The Environmental Protection Authority is a statutory authority that provides independent advice on environmental matters, undertakes impact assessments and assesses the performance of natural resource management in Western Australia. It is supported by the Department of Environment and Conservation. The Environmental Protection Authority can provide strategic non-statutory advice on a range of matters and is responsible for assessing the environmental impact of projects and proposals.

Levels of water service delivery are set by the Economic Regulation Authority and stipulate requirements in key areas such as drinking water quality, wastewater recycling and infrastructure performance. The Economic Regulation Authority also provides pricing oversight for water pricing, on referral from the Treasurer.

KEY GOVERNMENT AGENCIES

Aqwest (Bunbury Water Board) Water services to the city of Bunbury

Busselton Water Board Water services to the town of Busselton

Department of Environment and Conservation Manages conservation reserves, protects and manages biodiversity including wetlands and regulates wastewater discharges

Department of Fisheries Conserves, manages and shares fish, marine and living aquatic resources

Department of Health Manages compliance with drinking water quality guidelines

Department of Water Water resource and water industry policy, management and regulation

Economic Regulation Authority Licences water service providers and conducts inquiries into water pricing and other matters

Environmental Protection Authority Environmental protection

Local government Provides wastewater and drainage services in some parts of the State

Water Corporation Water, wastewater and drainage service delivery, statewide

Western Australian Planning Commission Plans for the protection and management of water resources as an integral component of land use planning

DEVELOPING STATE WATER PLAN 2007

Government committed to the strategic management of water resources in Western Australia in September 2005, by announcing the development of State and Regional Water Plans.

State Water Forum

In December 2005, Government convened the State Water Forum to engage with stakeholder organisations on the development of the Plan and associated reforms. The Forum has met five times in addition to other workshops and meetings. It represents environmental, industrial, agricultural, public water supply, consumer, recreational and other diverse interests in water management.

(L-R) Professor Robert Harvey - Edith Cowan University, Dr Geoff Syme - CSIRO, Ms Barbara Wiese - SW Sustainability Assessment Panel, Professor Greg Ivey - University of Western Australia

State Water Planning Review Panel

Government also convened the State Water Planning Review Panel (pictured above) to provide independent advice on the development of the Plan. Their significant contribution to the development of the Plan is acknowledged.

National Water Initiative

In April 2006, Western Australia became a signatory to the National Water Initiative, an agreement between the federal and state Governments. It recognises the continuing imperative to increase the productivity and efficiency of Australia's water use and protect the health of surface and groundwater systems.

The State's commitment to the National Water Initiative provides access to policy, funding and joint research projects to improve the security of water for the environment and for use.

Water Reform

Further to recommendations from the Irrigation Review in 2005, the Government established the Water Reform Implementation Committee to consider issues pertaining to the implementation of key water reforms.

These reforms include water access entitlements, markets and trading, integrated management of water for the environment and other uses, metering, integration with land planning, water use efficiency and community involvement.

In February 2007, Government released final decisions with respect to Water Reform. The 'Government Response to A Blueprint for Water Reform in Western Australia' provides detailed information on these issues and is available from the Department of Water.

Public consultation

Public consultation included direct engagement with key water users and other interest groups, visits to regional areas, community workshops and public submission periods on the following documents:

- Draft Water Policy Framework (April 2006)
- Draft Blueprint for Water Reform in Western Australia (July 2006)
- Draft State Water Plan (October 2006).

Over 25 community workshops were held and over 160 submissions were received during this period of extensive consultation.

State Water Plan 2007 reflects final decisions made by Government on the input provided through these processes.

LINKAGES TO OTHER GOVERNMENT POLICY

State Water Plan 2007 has significant linkages to Government policy including:

- Australian Drinking Water Guidelines
- National Action Plan for Salinity and Water Quality
- National and State Water Quality Management Strategies
- Natural Heritage Trust
- Natural Resource Management Strategies and Investment Plans
- National Water Initiative
- State Planning Strategy
- State Salinity Strategy
- State Sustainability Strategy
- State Wetlands Conservation Policy
- Western Australian Greenhouse Strategy
- Numerous interfaces with environmental policy and reporting including the Draft State of Environment Report 2006.

Water resource management also integrates with land use planning and natural resource management processes. The following sections overview these linkages.

INTEGRATING LAND USE

The State's land use planning system is hierarchical. The planning process commences at the state level with the State Planning Strategy and becomes more detailed and prescriptive as it progresses through regional, district and local planning to subdivision, proposed development and construction planning.

The integration of land use planning with *State Water Plan 2007* is currently at a strategic level and supported by

State Planning Policies released by the Western Australian Planning Commission:

- State Planning Strategy
- SPP 1 State Planning Framework
- SPP 2.5 Agricultural and Rural Land Use Planning
- SPP 2.7 Public Drinking Water Sources
- SPP 2.9 Water Resources
- Regional Strategies and Structure Plans (non-statutory policies).

Water planning should inform and integrate with land use planning. Increasingly, it is intended that water planning should precede land use planning. This provides an important natural resource management context for land planning and identifies resource opportunities, constraints and compatible land use activities.

The land use planning system has tools and policies that support integrated water cycle management including integrated land use and water management strategies, strategic land use plans and complementary water management plans. The legislative basis that supports the land planning and approval process can support sustainable water outcomes.

The streamlining of approval processes for land use and water planning will help avoid duplication and assist in timely decision making.

There is a need to engage with local government as many land use planning and approval processes occur at this level, within a context of statewide land planning policy. This is a challenge for water planning due to its largely centralised approach to development. Effective community engagement will assist in this regard.

The Department of Agriculture and Food has an important role to define agricultural precincts.

In addition, the Department of Environment and Conservation manages land vested in the Conservation Commission of Western Australia. The primary planning mechanisms are the Forest Management Plan reviewed every ten years and statutory plans for national parks and other conservation areas, prepared periodically.

NATURAL RESOURCE MANAGEMENT

A number of Government agencies undertake land based resource management activities including the Departments of Agriculture and Food, Water, Planning and Infrastructure and Environment and Conservation.

In Western Australia, peak natural resource management bodies are active in the following regions:

- Avon
- Northern Agricultural
- Rangelands
- South Coast
- South West
- Swan.

These groups provide community leadership on natural resource management matters within each region and coordinate partnerships between the community and all levels of government. These roles are carried out by supporting communication and information sharing within the region, advocating on natural resource management matters and coordinating the implementation of state and Commonwealth policies and programs relevant to the region.

All regional natural resource management bodies have executed a formal Partnership Agreement with the State Government to deliver maximum public benefits from this framework and approach. Funding is provided by the state and federal governments. Regional Catchment Councils prepare an Investment Plan bi-annually to identify programs, milestones and performance indicators.

Collaboration with regional natural resource management groups improves integration and outcomes.

Collaboration is improving outcomes in resource monitoring and measurement, identification of environmental, social and cultural values associated with water resources and their enjoyment, restoration of catchments, water quality, monitoring and reporting on outcomes.

INTERNATIONAL RECOGNITION

Western Australia is recognised internationally for achievements in water management with Torbay Catchment awarded the 2006 Thiess National Riverprize for Excellence in River and Waterway Management.

The Torbay Watershed Program is a joint initiative of the Torbay Catchment Group, Land and Water Australia, Water Corporation and Departments of Environment, Water and Agriculture and Food.

COMMUNITY ENGAGEMENT

Just as important as coordination across Government are linkages to industry, water users and the community.

Community engagement in water planning ensures that water managers understand the needs of the community, and increases community understanding of water resources and management issues.

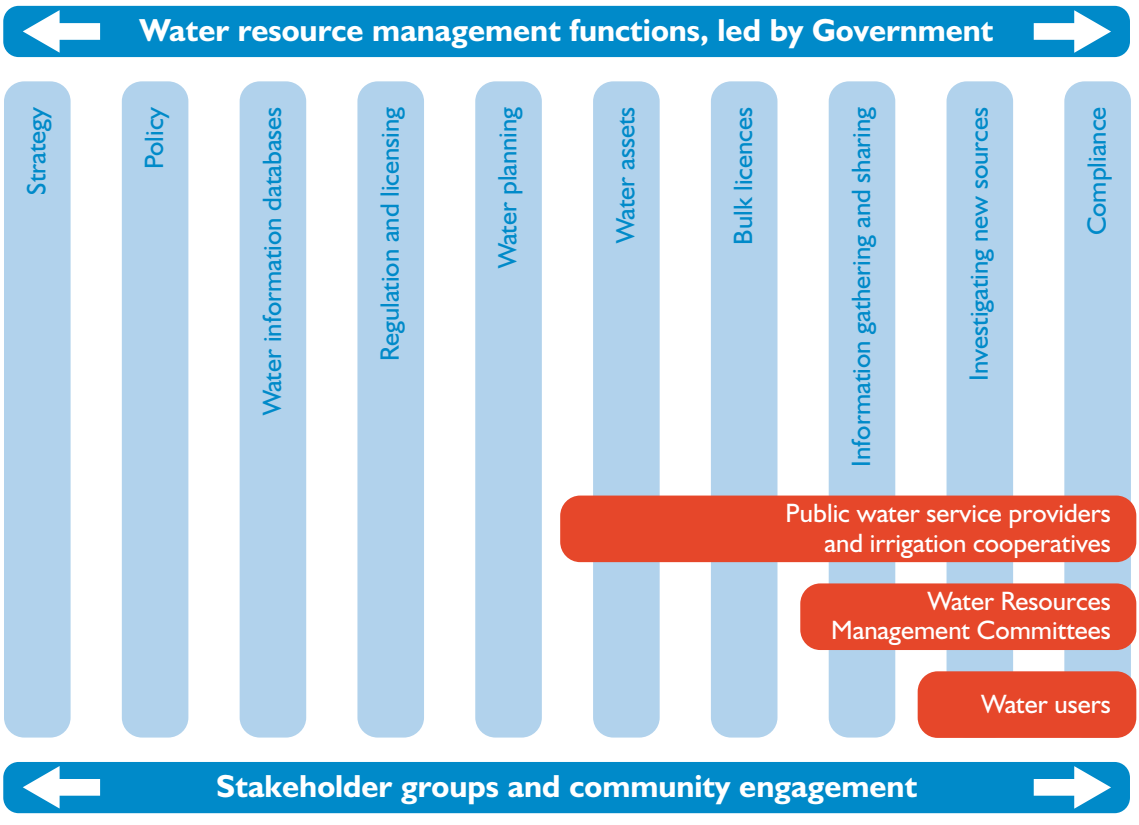
Increasingly, issues associated with water planning may extend across one or more planning regions. Community engagement should expand to include other stakeholders and community members who may have an environmental, commercial, personal or future interest in the plan outcomes. The need to engage with a broader community of interest is a challenge for water resource management.

The Minister for Water Resources can establish committees to assist the Government in the management of water resources. The current approach is to encourage membership from local residents with a range of experience and knowledge to represent the interests of water users and the community. Department of Water and other Government representatives are also included in the governance structure.

These committees provide a more formal and ongoing means of engagement in water planning. This may be particularly relevant in the development of statutory plans when consideration of detailed technical information is required through the process.

Further, specific stakeholder groups can be convened at a regional level to engage in strategic level planning.

Legislation currently before Parliament to amend the water resources legislation proposes the creation of the Water Resources Council, as an advisory body. One of the important benefits of the Council is expected to be representative community engagement on matters pertaining to use, allocation and management. It is also proposed that the Council advise on policy, planning and other strategic water management matters.



IMPLEMENTING STATE WATER PLAN 2007

The Water Policy and Planning section in this document includes detailed priority actions to significantly advance water resource management.

Each action identifies the lead Government agency responsible for implementation and timeframes for completion. All actions require collaboration across Government, industry and the community.

Government will coordinate the implementation of State Water Plan 2007 and publicly report on progress.

Significant resources have been committed to fund ongoing improvements in water resource management in Western Australia.

Government will continue to convene the State Water Forum to ensure that relevant stakeholder organisations are given the opportunity to be briefed on and contribute to the implementation of water reform and priority actions.

LEGISLATIVE PROGRAM

Parliament is currently considering the *Water Resources Legislation Amendment Bill 2006*. The Bill proposes to replace the Water and Rivers Commission and transfer the functions to the Minister for Water Resources and delegate some of these powers to the Director General of the Department of Water.

Further legislative reform is planned. The next phase will consist of wide ranging legislative reform to modernise and consolidate water resource management and water services statutes. The main objectives of this phase of the legislative reform program are to:

- Implement the Water Reform program and the National Water Initiative in Western Australia
- Modernise and consolidate water resource management and water service delivery legislation
- Optimise operational efficiency and streamline processes where possible.

Legislation is critical to fully realise the vision of this Plan. The review and reform of water statutes is a significant priority for Government.

REVIEWING STATE WATER PLAN 2007

State Water Plan 2007 commits Government to the sustainable management of water resources in Western Australia. The vision and objectives are aspirational and challenging.

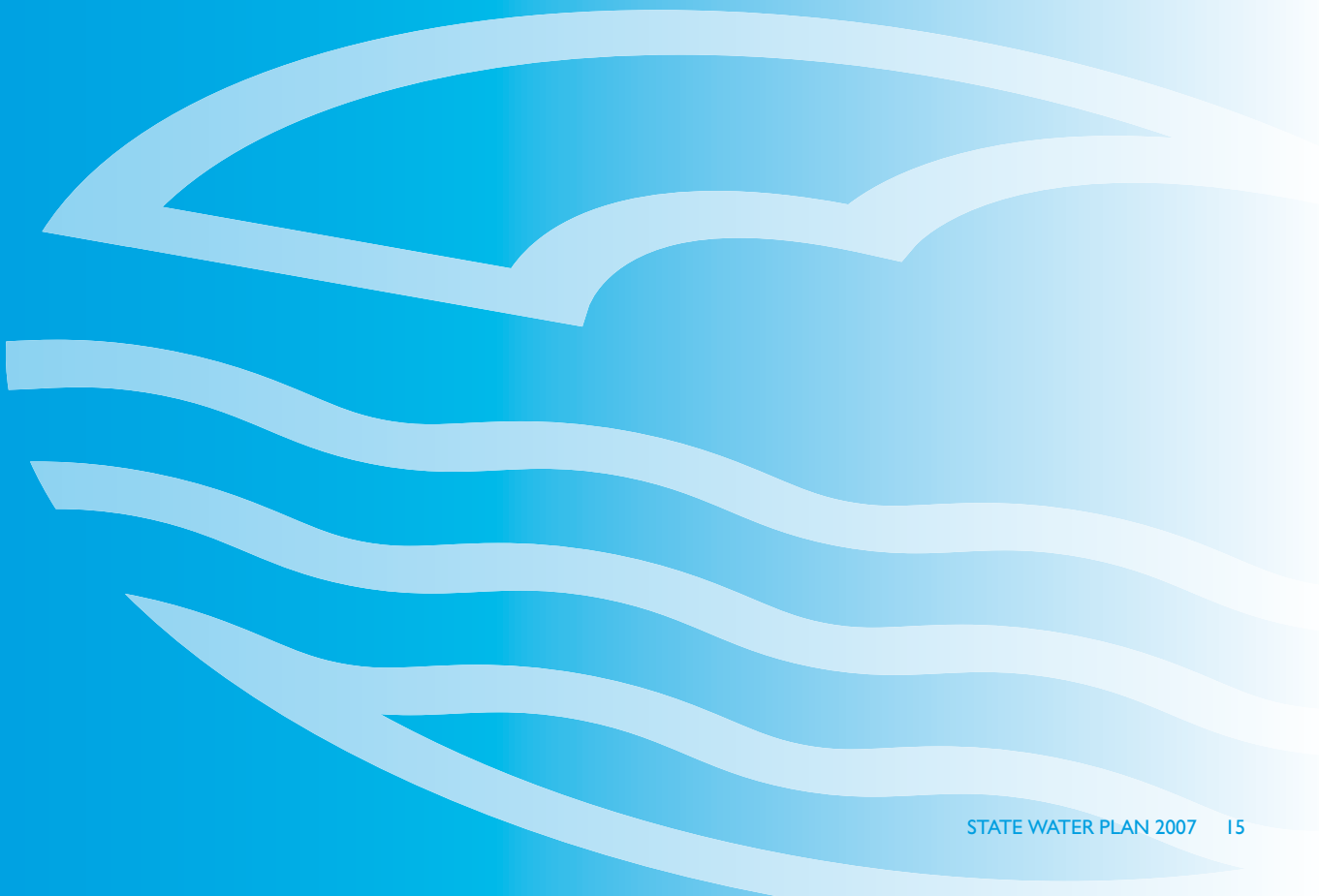
The priority actions will substantially progress water resource management in the next five years. Actions have been prioritised to focus on areas where the most significant gains can be made during this period.

Over the next five years, there will be changes to our knowledge, technology, climate, communities, water and land use. New legislation is also expected and detailed policy and water resource accounting is continually evolving at national and state levels.

Western Australia will need to understand and adapt to these changes.

State Water Plan 2007 will be reviewed by 2012 to continue to progress water resource management, by building on past achievements and striving to achieve our vision for the future.

WATER RESOURCES



WATER RESOURCES

THE VALUE OF WATER RESOURCES

Water has intrinsic value and supports life in all ecosystems. Plants, mammals, birds, reptiles, fish, amphibians and other wildlife depend on water. Coastal plains, rangelands, deserts, forests, wetlands, waterways, caves and other ecosystems rely on combinations of rainfall, overland and groundwater flows.

Soil, vegetation and native forests provide protection from erosion, stabilise land, can mitigate flood damage and act as natural drainage systems. Forests provide essential shade and shelter for native flora and fauna.

Healthy environments support good quality water for drinking and agricultural use. Catching fish, growing timber, grazing animals and riparian uses are some of the direct benefits. Sound catchment management practices minimise the need for water treatment, providing a range of ecological benefits and cost efficiencies.

The value of our water resources can only increase due to climate change and pressures for growth. It makes sense then, to protect water resources wherever possible to maximise opportunities and benefits for the future.

Groundwater and surface water resources support a variety of highly valued waterscapes that have a key role in the environmental well-being of the State.

Many wetlands, estuaries and waterways are recognised for their high conservation value under international and national protocols including the Ramsar Convention on Wetlands and the Directory of Important Wetlands in Australia. The State Government has also identified wetlands of regional significance and recognises the conservation value of wild rivers.

Water resources are vitally important to Indigenous people: water provides resources for life. Aboriginal culture is strongly connected with the environment and is linked to its custodianship. Waterways and water bodies are part of the dreaming paths of the Aboriginal people and have spiritual significance. Waterways are also important boundaries between tribal groups, and provide travel routes and food sources.

Water resource management in Western Australia has regard to high value water resources – they are a priority for protection.

Western Australia has thousands of kilometres of coastline that offers significant recreational opportunities. In addition, residents and tourists alike value its inland waters. Recreational activities in and around water include boating, fishing, camping, sport, bird watching and playing together with the restful and aesthetic benefits that water brings. Many of the inland waters in the State are relatively small and vulnerable to changes in water and land use practices.

The Western Australian Government is committed to managing water resources for current and future generations and finding the right balance to realize the environmental, social and economic values of water.

There is a need to continue to secure environmental water entitlements. Improving the security and certainty of water for the environment and use is a priority for water resource management.

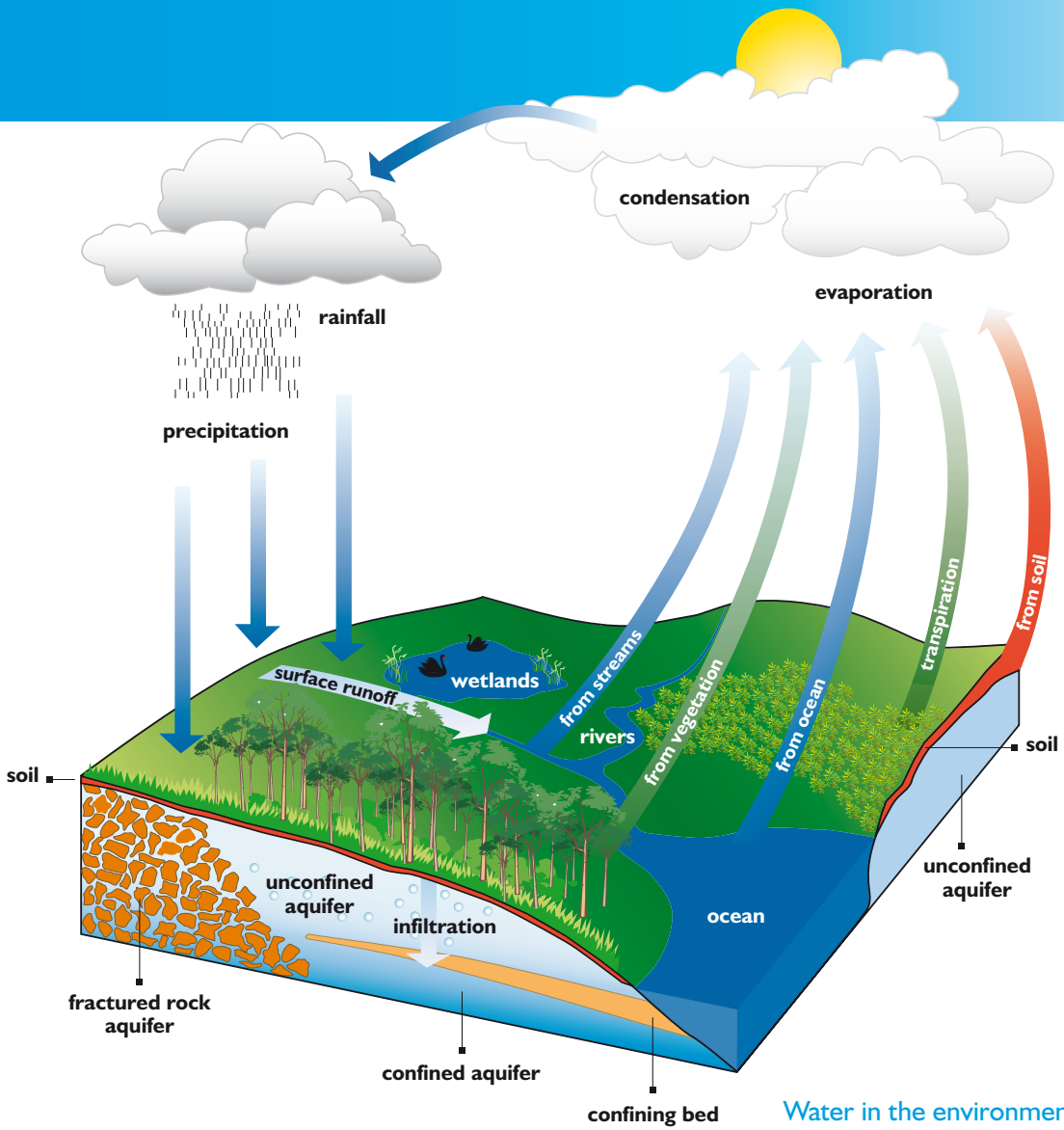
Securing water for ecosystems requires increased resource investigation and assessment, statutory water management planning, identifying environmental water entitlements and ongoing monitoring and reporting. Government, water users and the community need to work together to protect water resources and their quality.

Understanding our natural surface and groundwater resources, including their value to ecosystems, public health, business, culture and recreational pursuits, is vital to their sustainability.

VOLUMES OF WATER

Volumes of water are measured in litres. Different volumes of water are referred to in this document.

One litre - 1 litre - **1 litre**
One thousand litres - 1,000 litres - **1 kilolitre**
One million litres - 1,000,000 litres - **1 megalitre**
One thousand million litres - 1,000,000,000 litres - **1 gigalitre**



Water in the environment

ABOUT OUR CLIMATE

Western Australia is a vast state, covering over 2,500,000 square kilometres. It represents a third of Australia's overall land mass. Local rainfall and temperature patterns, together with global climate trends and forecasts, have a significant influence on water resource availability.

Due to its vast size, the State has different climate zones, through tropical areas in the north, arid regions in the centre and a more temperate climate to the south. In general, rainfalls decrease and temperatures increase moving away from the coast.

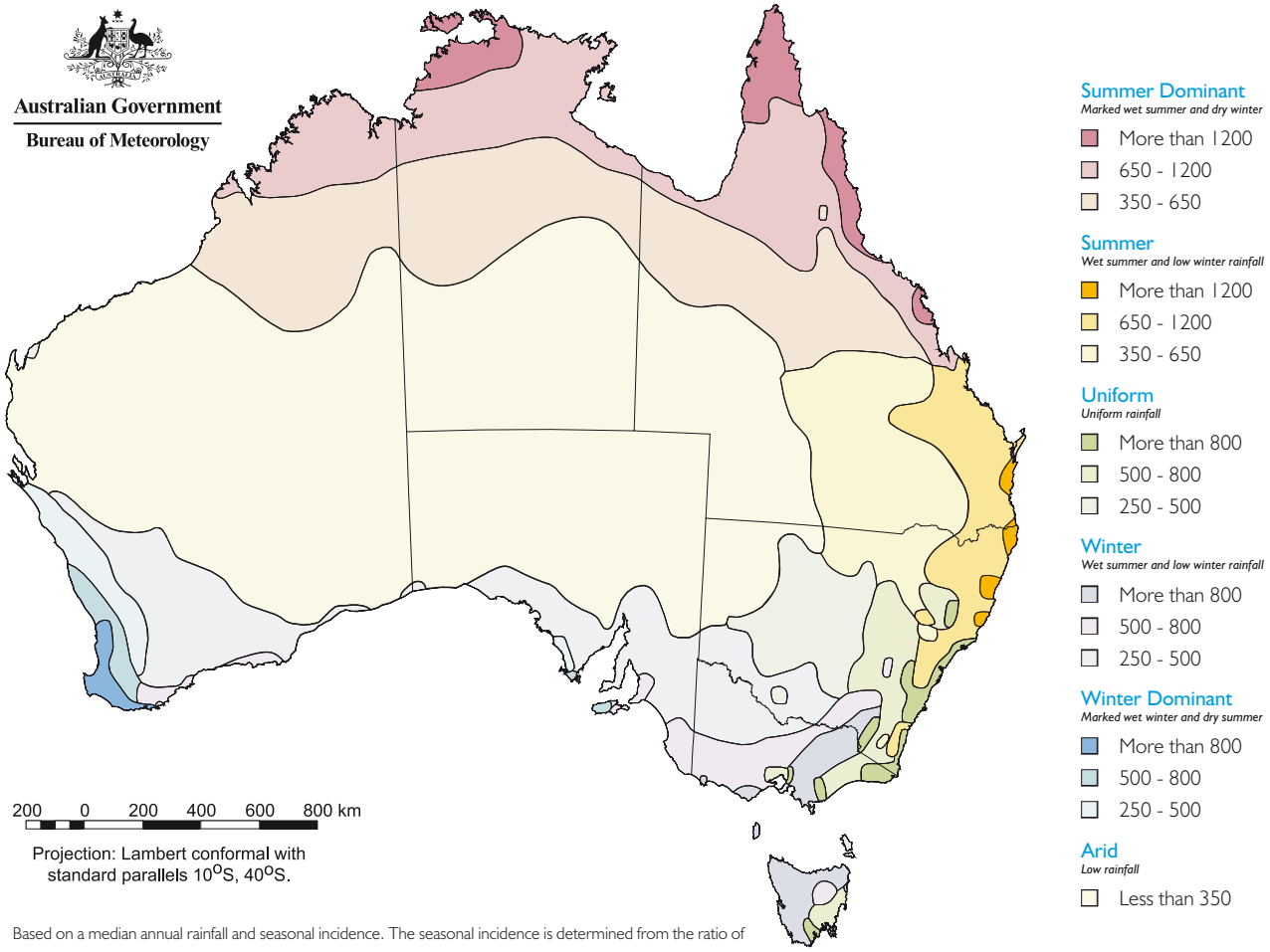
Information about climate generally refers to the average or most common weather patterns recorded over a long period of time, together with information on weather extremes and frequencies. However, there can be significant variability in rainfall and temperatures experienced from year to year.

Some of the most extreme weather events in the north of Western Australia are caused through tropical cyclone activity. These systems can bring extreme winds, very heavy rainfall as well as very large storm surges. Winter rainfall extremes in the south of the State are associated with cyclonic depressions and associated fronts. These low-pressure systems can bring very heavy rainfalls and flooding.

In the Kimberley there are predominantly wet summers and dry winters, with relatively high temperatures all year round. Through the Pilbara, Gascoyne and Goldfield regions there is generally less rainfall although it is more uniformly distributed through the year.

In contrast, the South West of the State experiences wet winters and relatively dry summers.

Average daily maximum temperatures in the north of the State are in excess of 35 degrees Celsius, annually. In the South West, average annual daily maximum temperatures are significantly lower at around 20 degrees Celsius. Higher temperatures generally increase evaporation rates and can be a significant factor in water use.



Based on a median annual rainfall and seasonal incidence. The seasonal incidence is determined from the ratio of the median rainfall: November to April and May to October. Based on a 100-year period from 1900-1999

Seasonal rainfall zones of Australia

CLIMATE CHANGE AND VARIABILITY

One of the most significant global challenges is climate change. It is most broadly considered to be due to a combination of impacts caused by human activity and cycles of natural variation.

Global climate patterns are impacted by a number of factors. One of these factors is the greenhouse effect - a natural process where gases in the atmosphere trap heat and create habitable conditions for most of the planet. However, human actions - particularly the use of fossil fuels, deforestation and land use changes - have dramatically increased the concentration of greenhouse gases. It is now scientifically accepted that this led to a period of rapid warming over the past one hundred years.

Climatic impacts are varied, however, with some areas experiencing a decrease in average temperatures. To date, research on the impact of climate changes in Western Australia has primarily focused on the South West. More work on the impact of climate change in the northern half of Western Australia is expected to be undertaken by the Indian Ocean Climate Initiative.

The South West has experienced significant climate change over the past 40 years. This has provided the earliest signal that human activity may be affecting rainfall. Climate modelling suggests that this trend will continue to change the nature and availability of water in surface and groundwater systems.

Climate modelling by CSIRO shows that average annual rainfalls are projected to decline in the South West of Western Australia by as much as 20% by 2030 and 60% by 2070, compared with average recorded rainfalls to 1990. The Indian Ocean Climate Initiative has already identified the following regional climate trends for the South West of the State:

- Increased average temperatures of 0.8 degrees Celsius since 1910 with most change occurring over the past 50 years
- Average Indian Ocean surface temperatures have increased by 0.6 degrees Celsius
- Over the past 35 years, the number of storms have decreased, bringing less rain
- Over this same period, annual rainfalls decreased by 10% and winter rainfalls have decreased by 15%.

Most strikingly, reduced rainfalls have resulted in decreases in flows to public water supply dams by more than 50% on average. In some areas, decreased recharge to aquifers has also occurred. In the metropolitan area, streamflows have decreased by two thirds. The 2006 winter was one of the driest on record.

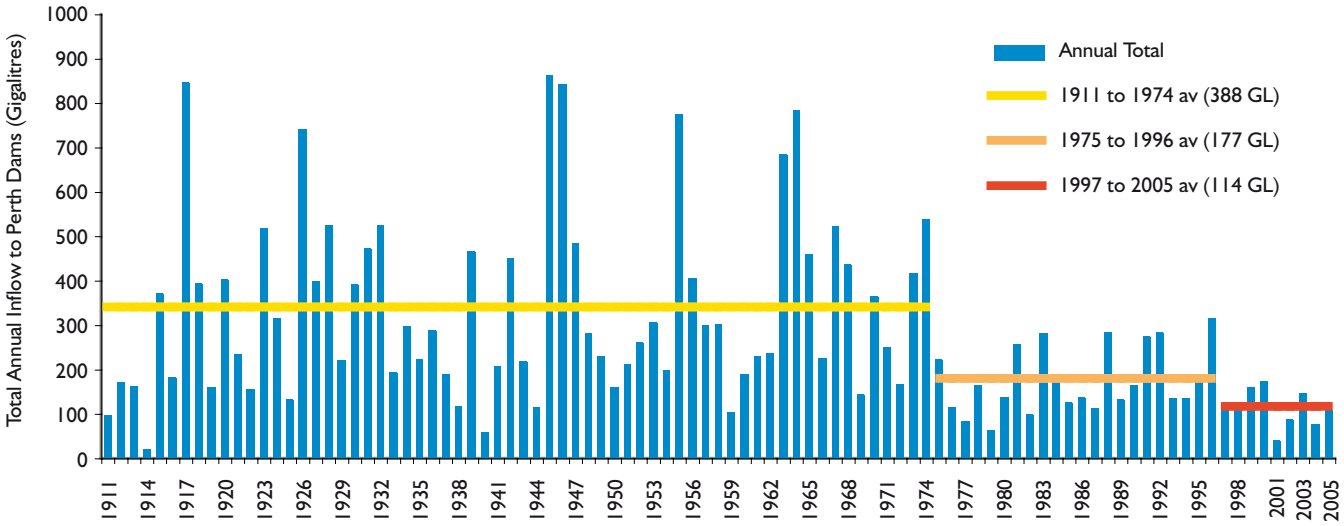
ADAPTING TO CLIMATE CHANGE

Western Australia cannot base water management decisions solely on recorded climate over the past 100 years. Looking ahead, in the southern part of the State there is an increased probability of combinations of reduced rainfall, streamflows and recharge together with higher average temperatures.

These patterns place significant pressure on water in the environment and water available for use.

Reduced stream and estuary flows are affecting water quality and adversely impacting environmental and recreational enjoyment of waterways. Water quality in catchments is also affected by intense wildfires that are more likely to occur with reduced rainfall and subsequent drier vegetation. This means there is less water available for fire fighting in surface water systems, including dams. Unfortunately, the trends also indicate the risk of greater seasonally variable flooding.

Climate change is beginning to impact the reliability of public and private water supplies, caused through reduced streamflows and some drying of groundwater reliant systems. This risks underperforming or stranded assets if existing infrastructure is unable to store or abstract historical water yields.



Streamflows to Perth's public water supply dams to 2005

Western Australia is responding to these challenges. The 2005, source development plan for the Integrated Water Supply Scheme incorporated reduced rainfall and streamflow averages from 1997. These are periodically reviewed to adapt to changing climate patterns.

The Western Australian Greenhouse Strategy was released in 2004, to ensure that industry and the community contributes to solutions to this global challenge. The strategy proposes platforms for reducing emissions, encouraging carbon sequestration and adapting to change. It also looks at the contributions needed from research, local government and the community with leadership from the State Government at local, national and international levels.

The work of the Indian Ocean Climate Initiative has significantly aided our understanding of climate change and galvanised action to respond. Continued investment in research into climate change in Western Australia will further support our ability to adapt.

Regional water plans provide the opportunity for local communities to better understand the impact of expected climate trends in their area. The most recent projections from the CSIRO have increasing rainfall over north and central Western Australia. More detailed regional studies are needed to support water planning in these areas of the State.

In addition, work to progress statutory water management plans and changes to water entitlements are vital. An adaptive management approach will need to be taken, so that management measures can evolve as knowledge of water resources improves, or as changes occur, including changes in climate.

CATCHMENTS, WATERWAYS AND WETLANDS

Surface water catchments collect water from the natural landscape. Catchments vary across the State from relatively flat systems to ones that connect with a number of surface water systems, including waterways and wetlands.

There are over 200 major waterways in Western Australia including rivers, streams and creeks. Maintaining ecosystem health of freshwater systems is particularly important.

Wetlands are seasonally, intermittently or permanently waterlogged and inundated land. Lakes, swamps, marshes, springs, tidal flats, lagoons and estuaries are all examples of wetlands. These surface water systems support water dependent ecosystems – they rely on water for the survival of flora and fauna species in the area.

Western Australia has extensive wetland systems. Wetlands on the Swan Coastal plain have been subject to considerable pressure due to development and other land use changes. In this area in particular, wetlands are connected to superficial groundwater aquifers which are the primary source of water in these systems.

Wetlands in the South West have been mapped, monitored and evaluated to improve the understanding of their impacts and conservation requirements. More work needs to be completed on systems in other parts of the State.

Catchment management considers a range of issues, including:

- Native flora and fauna
- Salinity
- Acidity
- Turbidity
- Nutrient levels
- Vegetation clearing
- Dams and other flow control structures
- Stock grazing
- Feral animals
- Altered fire regimes
- Floodplains and drainage.

One of the biggest environmental challenges facing Western Australia, with a direct impact on water resources, is salinity, where salt levels exceed those naturally occurring and adversely impact on land and water resource use.

The clearing of native vegetation and planting of shallow rooted crops can cause groundwater to rise, pass through unsaturated soil and dissolve naturally occurring salts. This highly saline water can eventually appear on or near the ground.

In areas affected by dryland salinity, damage to soil structures, native plants and crops can occur. Water in affected areas has limited application and is generally unsuitable for drinking or irrigation. Treatment processes can remove some or all of the salt, but are costly and energy intensive.

In addition to the immediate area, ecosystems across a much larger area may be adversely impacted if the water flows through to rivers and streams. State and federal governments work with the community and land owners to research and deliver effective responses to the salinisation of land and water. The Department of Water plays a lead role in catchment management and recovery in partnership with the community.

Salt levels are measured in **milligrams a litre**

Fresh	Less than 500mg of salt a litre
Marginal	Between 500–1,000mg of salt a litre
Brackish	Between 1,000–5,000mg of salt a litre
Saline	Between 5,000–35,000mg of salt a litre
Hyper-saline	More than 35,000mg of salt a litre

DRAINAGE

Constructed drainage systems in rural and urban areas collect and transport water in the landscape. In urban and residential areas these systems are used for stormwater, groundwater and flood management. In rural zones, constructed drainage systems may be used to drain waterlogged agricultural soils, for salinity management or flood control.

Drainage needs to be carefully managed to protect the health of waterways, wetlands and marine environments and facilitate land use changes for development. Drainage can also provide a water source.

FLOODPLAINS

Floodplains are a part of the landscape and influence water availability and its quality.

Flooding can occur when there has been very intense or prolonged rainfall, leading to rivers and other watercourses breaching their banks and inundating adjacent land. In coastal areas, flooding can occur in areas of low-lying land due to storm surges or extremely high tides.

The northern part of the State is more likely to experience flooding in the summer cyclone season. Floods in the South West are more likely to be during winter rainfall periods. Land clearing, urbanisation, high groundwater levels and saturated soils can lead to increased instances of flooding.

Floodplains provide many benefits to local ecosystems including replenishment of local waterways, carriage of seeds and organic matter and preservation of fish stocks. Maintaining the connection between floodplains and local waterways supports the viability of these ecosystems.

Historically, development has occurred on floodplains (including Perth, Bunbury, Busselton, Carnarvon and Moora) to gain access to water supplies and good soils.

Floodplain management seeks to minimize the risk where development has already occurred by providing mitigation measures and an early flood warning service on a number of river systems.

Severe floods do not occur frequently. However, when flooding does occur, the resulting damage to property can be considerable. Floodplains continue to be under pressure for more intensive use, despite this significant risk. This pressure is increasing as desirable undeveloped land becomes scarce in high growth areas.

Where development is planned, floodplain management generally provides a non-structural means of protecting future development from major flooding through land use planning and development controls.

WATER RESOURCES

WATER RESOURCES AVAILABILITY

Australian Water Resources Assessment 2000 estimated the annual sustainable yield of groundwater resources in Western Australia to be about 6,300 gigalitres. The current annual allocation limit is a more modest 3,800 gigalitres. This reflects relatively low levels of resource knowledge and use in most areas of the State and allows for water to be set aside to support the environment.

The Assessment estimated annual sustainable yields in surface water systems to be about 5,200 gigalitres. Current allocation limits for surface water systems total 4,400 gigalitres a year.

This table summarises annual water availability from groundwater and surface water resources. It does not include other sources such as desalination or recycling.

Most of these sustainable yield estimates have not yet been reviewed for the impact of climate change. This will progressively occur as part of statutory water planning and securing water for the environment and use.

Groundwater Division	Nature	Sustainable yield (gigalitres)	Current allocation limit (gigalitres)	Estimated use (gigalitres)
Canning	Sedimentary Basins	827	357	24
Carnarvon		244	78	50
Perth		1,937	1,472	908
Officer-Eucla		271	83	0
Sub total		**3,279**	**1,990**	**982**
Kimberley	Fractured Rock Provinces	813	29	8
Pilbara		472	316	191
Yilgarn		1,740	1,449	509
Sub total		**3,025**	**1,794**	**708**
STATE TOTALS		**6,304**	**3,784**	**1,690**

Surface water Division	Sustainable yield (gigalitres)	Current allocation limit (gigalitres)	Estimated use (gigalitres)
Timor Sea	3,160	2,952	321
Indian Ocean	440	402	16
South West	1,610	1,054	312
Western Plateau	1	1	1
STATE TOTALS	**5,211**	**4,409**	**650**
ALL WATER RESOURCES	**11,515**	**8,193**	**2,340**

MANAGING AVAILABILITY

In Western Australia, water resource availability is measured through progressive assessment of a number of key parameters for each surface and groundwater area.

Sustainable yield

The amount of water that can be sustainably extracted from a water resource measured over a specified timeframe.

Sustainable yield is a notional estimate of the amount of water that may be available for use in the future.

Sustainable yields for surface water and groundwater resources recognise acceptable levels of stress and protect key economic, social and environmental values.

Current allocation limit

The amount of a water resource that is currently available for use, annually.

Allocation limits are a management tool that are generally set conservatively and are usually less than sustainable yields. They recognise the level of knowledge of a resource, current and forecast demand for use, and the need to set aside water for the environment and other public purposes.

At this time, water allocation limits have only been revised for surface water in the South West drainage division as a result of current understanding of climate change. This means that further reductions in estimates of water availability may occur in some areas. Conversely, in other parts of the State, current allocation limits are set very conservatively. This reflects low demand for use and resource knowledge. As our level of knowledge increases, increases in allocation limits may also occur.

Licensed use

The amount of water that water allocation licence holders are legally able to take on an annual basis.

Water use

The amount of water currently estimated to be used.

Water use may be higher or lower than licensed use and includes allocations for dewatering.

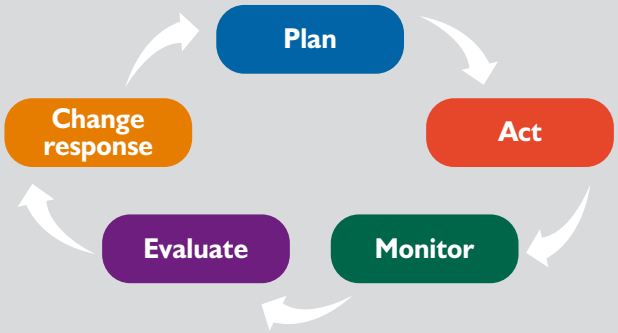
Given the relatively small amount of land in Western Australia with direct access to water resources, low historical levels of water use and limited resources, not all of the State's water resources are actively managed. In some areas, not all water uses are licensed. This has focused management effort in areas where water resources have significant values (environmental, economic or social) and where there is competition for their use.

Allocations for water use are defined in a water management plan that supports licensing water for use. However, a licence does not guarantee that water is always available to be taken. During drought periods, restrictions may be applied so that available water is shared and adverse impacts to the environment, the resource and users are minimised. Licence conditions may define how and when water may be taken and specify obligations the licence holder must meet when using the water.

Importantly, all water use, whether licensed or not, is estimated and accounted for in the management of a water resource. Estimates of water use are indicative of longer term usage patterns.

Adaptive management

As our knowledge of water resources improves, management approaches will be adapted. Sustainable yields and current allocation limits will move closer together, over time. This highlights the ongoing need for investment in resource investigation, assessment, measurement, monitoring and review.



Adaptive management approach

GROUNDWATER RESOURCES

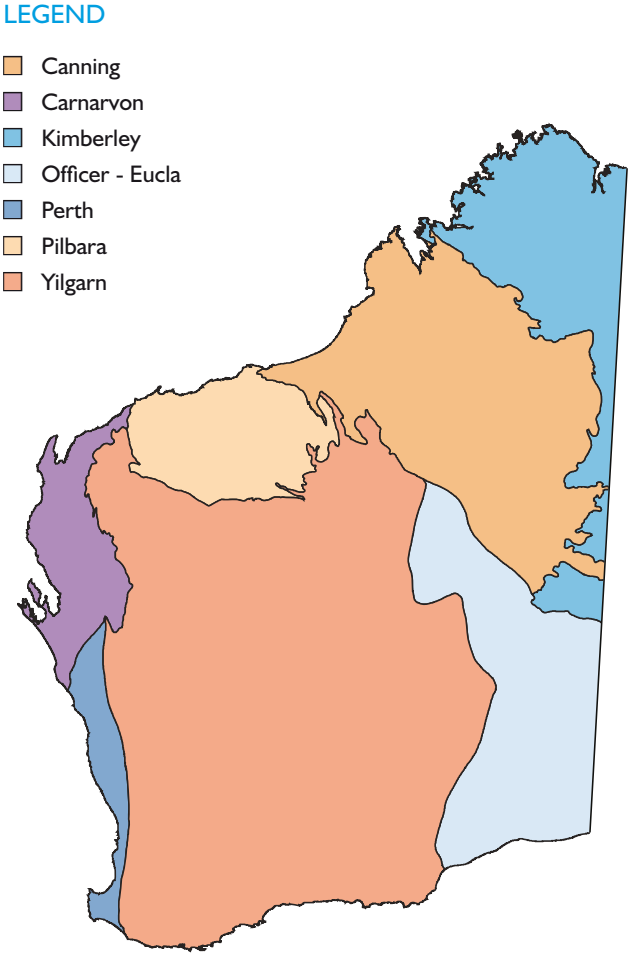
Rainfall infiltrates and percolates through the soil and through leakage from surface water bodies to create groundwater systems. Groundwater occurs in aquifers – rock or sand formations below the surface, that store water and generally allow water to flow through them.

An aquifer is characterised broadly by rock types: sedimentary and fractured. All of these rock types may form unconfined or confined aquifers. An unconfined aquifer has a direct connection with the surface. A confined aquifer is separated from the surface by an impermeable layer called a confining bed.

Superficial aquifers containing shallow unconfined groundwater occur in coastal plains and river valleys. Water tables in superficial aquifers usually fluctuate in response to recharge from annual rainfall or stream flow.

Sedimentary aquifers containing confined groundwater may extend to depths of several thousand metres. These aquifers can contain water recharged tens or hundreds of thousands of years ago, having less reliance on annual rainfall. In low lying areas, groundwater from artesian bores may flow freely at the surface.

Major groundwater resources are the sedimentary aquifers located in the Perth and Canning basins. The Carnarvon and Officer-Eucla basins are also sedimentary in nature.



Western Australia's groundwater divisions

The Kimberley, Pilbara and Yilgarn groundwater divisions all include fractured rock provinces, which account for over 50% of the State's land mass and an equivalent proportion of available groundwater resources. Many of these resources are relatively small and dispersed. While they can be very significant to local mining and pastoral operations, they do not generally lend themselves to the development of large single resources.

There are 174 groundwater management units aggregated into seven groundwater divisions for management purposes. Monitoring groundwater is much more complex than for surface water systems and the vast size and diversity of groundwater resources in Western Australia compounds this. Of 8,600 monitoring bores, 3,400 form the basis for the State's groundwater reference network.

The **Kimberley** province contains a moderate amount of groundwater resources with relatively low levels of use for town water supplies and the mining sector.

Underneath the extensive desert areas of the **Canning** basin lie significant sources of fresh and brackish groundwater. The largest users are irrigated agriculture, watering for livestock and the mining industry. The majority of water resources in this area are not developed.

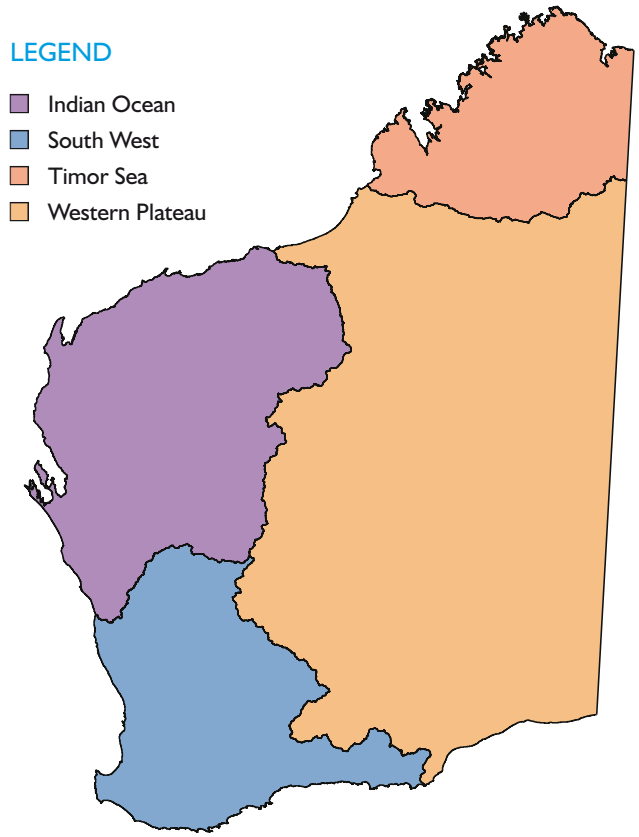
Freshwater resources can be found in the fractured rock aquifers of the **Pilbara** province. Extended drought periods are characteristic of this area and as a result groundwater plays an important role in ecosystem maintenance as well as having significant cultural and social values. Areas have been developed for scheme supply for mining and drinking water purposes. Other localised groundwater resources in fractured rock have been developed at mine sites for mine production and drinking water use.

The **Carnarvon** basin includes some small resources of brackish to saline groundwater in deep confined artesian aquifers. Irrigated agriculture in Carnarvon relies on the major freshwater resource in the alluvial aquifer of the Gascoyne River. Elsewhere, fresh groundwater resources, such as near Kalbarri and Exmouth, are limited.

The **Perth** basin has the largest fresh groundwater availability in the State. Groundwater in the superficial aquifers of this basin occurs along the coastal plain and supports many diverse ecosystems including lakes, wetlands and caves. There are three major aquifers in this basin – the Superficial, Leederville and Yarragadee. The Perth basin is the most heavily populated area in the State, with many of the resources accessed for agricultural use and public water supply purposes.

The next largest groundwater division by volume of water available is in the **Yilgarn**. Many of these resources are saline or hypersaline and located in fractured rock aquifers. This water is mainly used for mineral extraction and processing.

The **Officer-Eucla** basin contains some brackish groundwater with limited freshwater available. Use is currently for Aboriginal communities and for pastoral purposes.



Western Australia's surface water divisions

SURFACE WATER RESOURCES

Surface water systems include wetlands, waterways, streams, rivers and man-made dams. Rain falls directly into these systems and through natural and man-made catchments. Much of this rainfall is intercepted by vegetation.

Surface water systems have important environmental and social uses that are accounted for in water resources management.

For management purposes, there are 44 surface water management areas in Western Australia, primarily determined with reference to major river systems and natural catchments. These are aggregated into four drainage divisions: Timor Sea, Indian Ocean, South West and Western Plateau.

A network of over 300 river monitoring stations, with over 100 being able to be read remotely, is an essential part of our surface water knowledge base.

The **Timor Sea** drainage division has by far the most surface water resources in the State. This area, dominated by the Kimberley Plateau, includes the Ord and Fitzroy River systems. The climate is tropical monsoonal with distinct wet and dry seasons, high average maximum temperatures and evaporation. While average streamflows are high they are also highly variable, requiring significant investments in storage to maintain the reliability of supply. Over 90% of all rain falls in the wet season from November to April.

Construction of Lake Argyle on the Ord River extensively modified its natural flows. The river has changed from a seasonal to a permanently flowing waterway and has reduced flows. Lake Argyle has limited the frequency and severity of high flow and flood events. These waterways support significant economic development in the area including irrigated agriculture, diamond mining and hydroelectricity generation.

There are significant Aboriginal cultural values associated with water in this region. There is also increasing recreational and tourism activity in the area including boating, fishing, camping and hiking, that relies on water in the environment.

Moving south, the **Indian Ocean** drainage division includes the Murchison-Gascoyne and Pilbara surface water regions. Water is relatively scarce in this region. Most of the rivers in the Murchison-Gascoyne area, with the exception of the Gascoyne River, are salty. Most water use is therefore from the Gascoyne River and is used for agricultural purposes.

Rainfalls are highly variable in this area, with heavy reliance on cyclones and extreme rainfall events. The climate is semi-arid with hot summers and extended periods with little to no rainfall. This area includes the Hamersley Range and supports extensive mining and petroleum activities that are major contributors to State and national economies. The major public water supply dam in the division is the Harding Dam, located near Karratha.

The **South West** drainage division has 20 major river systems and includes catchments along the Darling Scarp. It has the second highest rainfall of the drainage divisions. Many of the river systems in this area have been regulated through the construction of dams, weirs and reservoirs. In addition to public water supplies, the Harvey, Waroona and Preston Valley irrigation areas are

located in this division. There are also extensive water supplies developed by private water users and industry in this area.

Traditionally, annual rainfall in the South West has been more reliable than other parts of the State, although climate change and seasonal variability have adversely impacted this norm. The climate is temperate.

The **Western Plateau** drainage division occupies the largest land area in the east of Western Australia although has almost no measurable surface water resources. This area is largely desert, incorporating the Great Victorian, Gibson and Great Sandy deserts.

OPTIONS TO BRING WATER TO PERTH FROM THE KIMBERLEY

Over the past 15 years there have been several proposals to bring water from the Kimberley to Perth. The significant annual flows in the Kimberley combined with declining rainfalls in the Perth metropolitan area generated strong community interest.

In 2004, the State Government convened an Independent Panel, chaired by Professor Reg Appleyard, to investigate the viability of transporting water to meet household demand or create irrigation projects in the South West of the State. Proposals that could yield a minimum of 50 gigalitres were sought. The Panel reported to Government in May 2006.

Importantly, the report examined the nature of the water resources in the region. The report noted that the flows in the Kimberley were highly seasonal, with the major flows occurring in February and March. To have a reliable source, the building of very large off stream storages would be required.

The Panel concluded that although Kimberley river systems have significant peak flows most years, the water in the environment has high ecological value and is not wasted.

The Panel also found that while several methods were technically capable of delivering water to Perth from the Kimberley, the cost of the water would need to be reduced by 80% to become competitive with sources closer to Perth. Additionally, the energy required to move water this distance, is significantly greater than other source options, including desalination.

Piping water from the Kimberley to the South West of the State is not considered to be environmentally, economically or socially sustainable. Detailed and summary reports are available from the Department of Water.

WATER USE

WATER USE

AN OVERVIEW OF WATER USE

Water supports economic growth and development. Our quality of life is supported by water use in industry, on farms, at mine sites, in petroleum operations, in households, by small businesses and for use in community, sporting and recreational facilities.

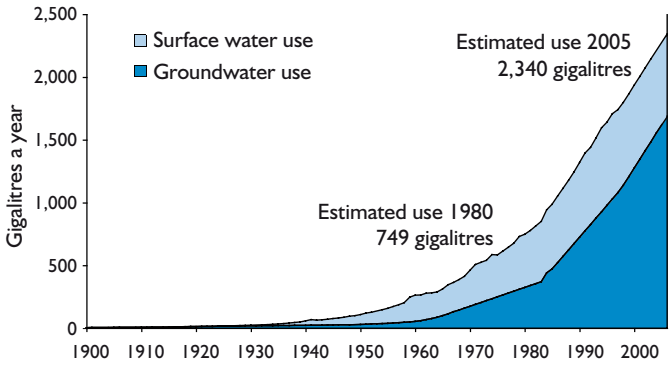
Water availability has influenced the economic development of Western Australia. Farming districts were traditionally located where there was an abundance of water, good soils and favourable climates. The growth of cities, towns and communities has been strongly influenced by the availability of water for drinking and other domestic uses.

Notably, however, Western Australia has large areas of the State where water is scarce. Innovative projects such as the Goldfields pipeline, constructed over 100 years ago, have engineered solutions to support economic development in areas otherwise lacking in water resources. These solutions will continue to be important to Western Australia's future, as demand will not always be located in areas rich in water resources.

Using less water, improving the productivity of water used and recycling water facilitates economic growth and reduces the need for new source development.

Water use has tripled over the past 25 years. In 1980, total estimated water use was less than 750 gigalitres, mainly from surface water resources. Since then, there has been a significant increase in groundwater use, with the volume of groundwater used today two and half times greater than surface water use. An estimated 2,340 gigalitres of water was used in Western Australia in 2005.

A total of 2,340 gigalitres, or about 30% of current allocation limits, was used in 2005. This represents an increase of 550 gigalitres, or over 30%, since the Australian Water Resources Assessment 2000.



Historical water use in Western Australia

MANAGING DEMAND AND SUPPLY

The State Government has adopted a holistic approach to meet growth in demand and address resource scarcity incorporating a range of demand and supply options.

Demand management targets the conservation and improved efficiency of water use, lessening the need for new water sources. In addition to direct ecosystem benefits, this strategy reduces the cost of water services and lowers energy use.

Recycling includes the beneficial re-use of wastewater and stormwater. Examples include on-site greywater reuse, recycling water in industrial processes, the irrigation of greenspaces and recharging aquifers.

There are incentives to recycle wastewater where disposal options are limited, and other alternative supplies are difficult to access. However, the relatively high cost to treat wastewater to meet health requirements is a significant consideration.

Water trading can facilitate the improved productivity of water use. Water can be traded to a commercial user with a temporary need or can be traded permanently to an area with greater capacity to pay.

Part of the challenge to meet the water needs of the State is also to develop water resources as required.

Groundwater will continue to be an important source of water for use, due to its proximity to demand in most parts of the State. Surface water resources will also play a role, particularly in the Kimberley and the South West.

In addition, there are now options for improvements in water treatment and the emergence of desalination as an economically viable source to supply high value water use sectors, such as mining, industrial and household use. The use of renewable energy to power desalination plants minimises greenhouse impacts.

Western Australia was the first state to respond to climate change and promote the development of large scale demand management and water supply initiatives.

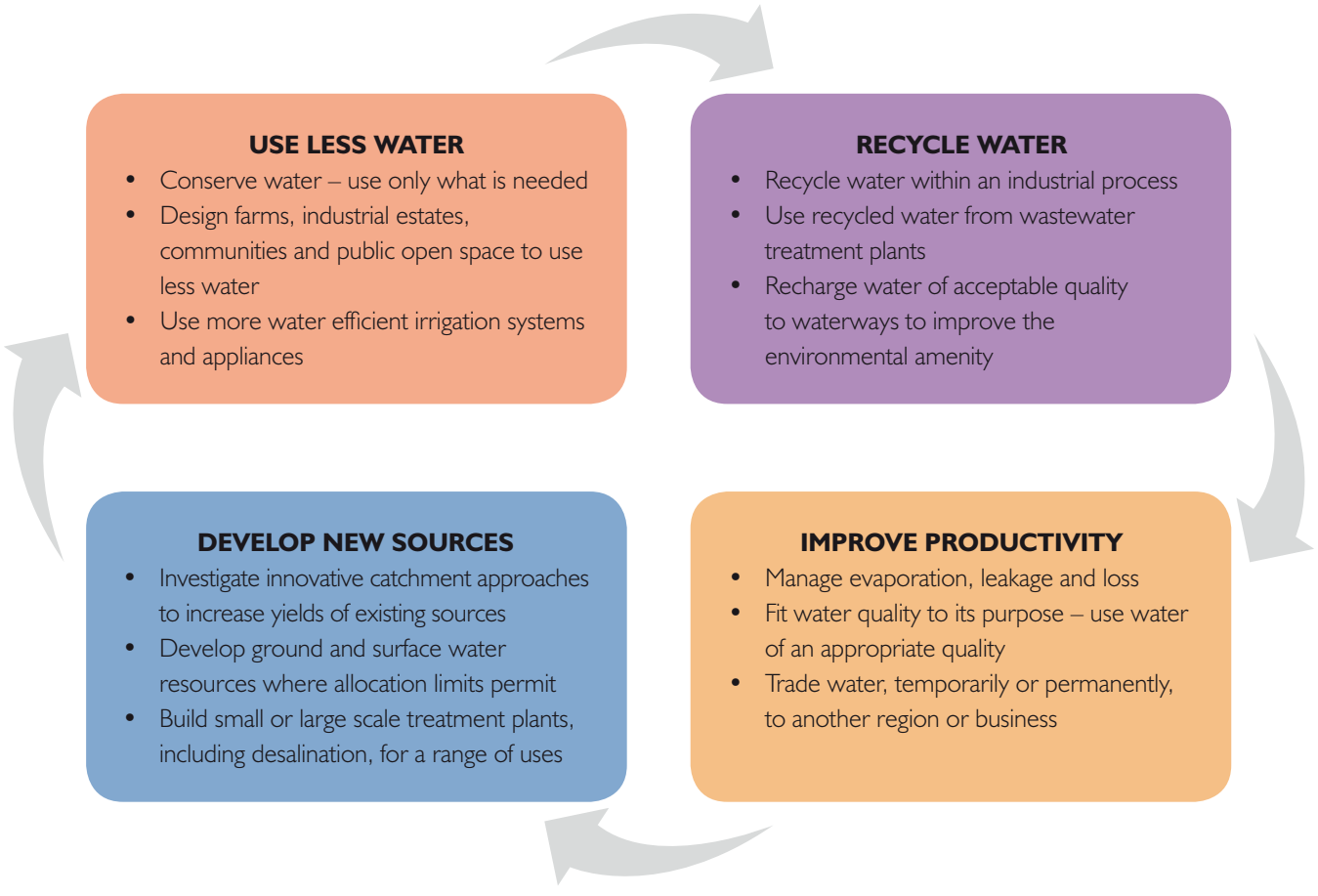
All water users should consider a range of alternatives to secure access to the water they require.

Increasingly, water should be fit for the purpose to which it is used. Care is taken to match water quality with an appropriate use – this enhances the value of scarce resources.

Sustainability assessments are a tool that can be used by all sectors to consider the range of demand and supply options that exist. Evaluation of options includes an assessment of the economic cost and benefits, social, community and local preferences and environmental impacts.

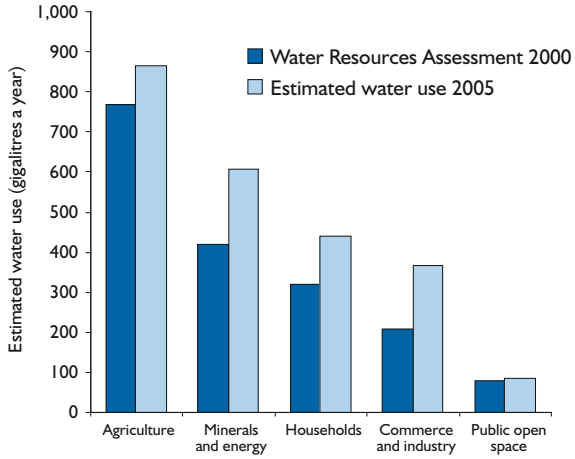
The most sustainable water solutions also consider the whole of the water cycle. Options should consider the impact on the natural environment, other water users, energy considerations and impacts of water discharges on receiving waterways.

A combination of demand and supply options can be developed together to find the best way to meet future water demands in a manner that considers the needs of the water user and the broader community. This also diversifies reliance on any single water resource.



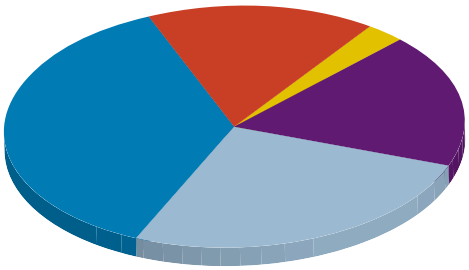
USE OF WATER RESOURCES BY MAJOR SECTORS

Increases in water use occurred across all sectors since the Australian Water Resources Assessment 2000.



Increases in water use by sector

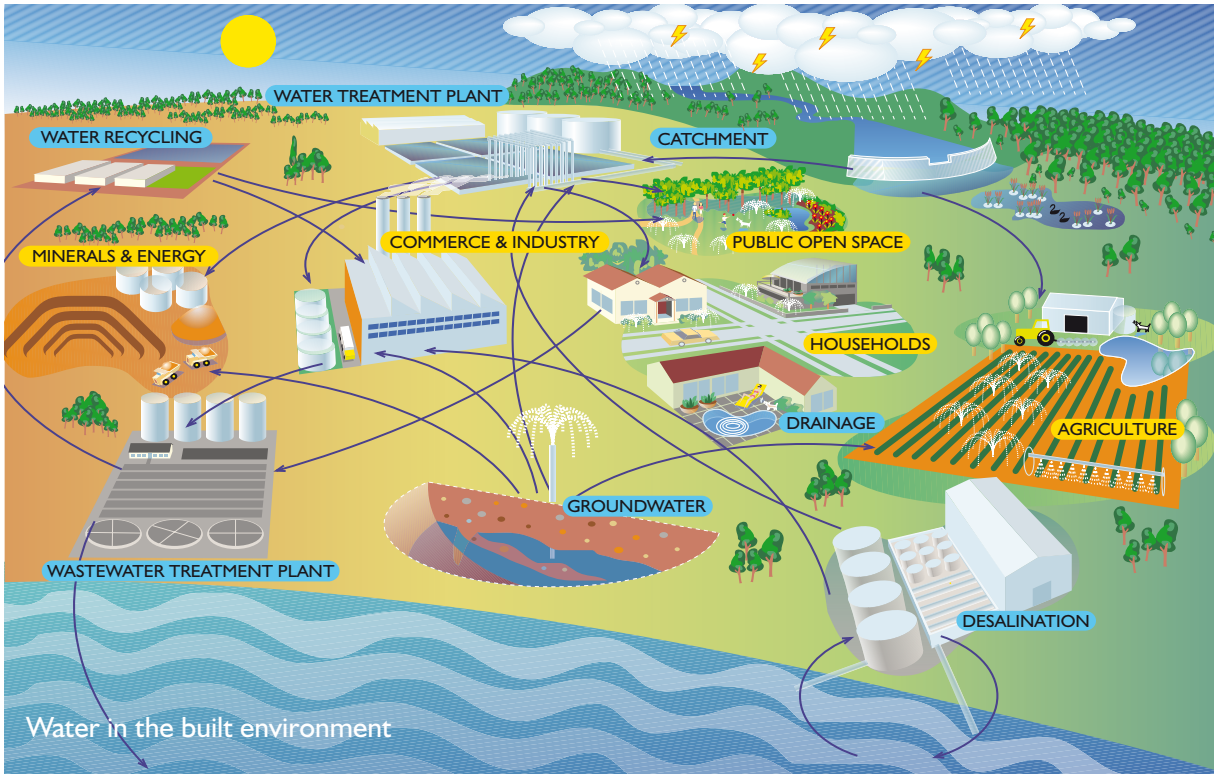
In 2005, 81% of all water used was applied to agricultural, minerals and energy, and household use. Water use for each of these three major sectors is examined in further detail. These sections consider current use, factors that will influence demand and the options to meet this demand, in a sustainable manner.



Estimated water use by sector

Commercial enterprises used 16% of all water. An improved understanding of the nature of water use in this sector will help to target efficiency and conservation measures that allow for increased productivity and reduced consumption. Improved water management can assist businesses by reducing costs and improving supply security, while helping the environment.

Water used for public open space irrigates parks, greenspaces, verges, ovals and sporting fields. Public open space provides important lifestyle and aesthetic benefits to the community. There is an opportunity to understand the value of water use in this sector more, to support its enjoyment and sustainable development.



PRICING WATER FOR USE

In common with other states of Australia and international practice, Western Australia generally charges for water on a cost-recovery basis. There are three major groups of costs to be recovered:

- Water licence administration costs
- Water resource management costs
- Infrastructure and service delivery costs.

Water licence administration costs

The Water Reform Implementation Committee looked at the introduction of water licence administration costs in Western Australia.

Government supports the recommendation of the Committee to recover the costs of administering the water licensing system that allows water to be accessed for a variety of purposes.

Water resource management costs

The Water Reform Implementation Committee also examined the introduction of a water resource management charge to recover the cost of managing Western Australia's water resources. Charges of this nature have been introduced in most states of Australia and are generally charged on a volumetric basis – that is, the greater the level of water use, the higher the charge.

The Western Australian Government is participating in a national committee to review and develop structures for the cost recovery for water resource management. The introduction of water resource management charges is a requirement of the National Water Initiative.

Infrastructure and service delivery costs

Where users access water through publicly owned infrastructure (scheme water supplies), Government owned utilities recover these costs through fixed and variable charges to developers, households, businesses and other users of scheme supplies. These charges recover the provision of infrastructure and the cost of operations, maintenance and administration.

Water prices increase for residential consumers with the amount of water used. At the upper end, this is a departure from the cost recovery basis for most water pricing.

In 2006/07, water use over 950 kilolitres in a metropolitan household is charged at $1.58 a kilolitre, which is currently more than the cost of supply. This charge, which applies to less than 1% of all households, has been successful in providing a strong pricing signal to dissuade unnecessary water use.

The State Government is committed to preserving the affordability of water prices to residential and commercial consumers. Community Service Obligations subsidise the high cost of most country water and wastewater services. In addition, they provide concessions for pensioners, seniors and new customers connecting to infill sewerage works.

It is expected that the cost of providing new water services will rise. Care will be taken to balance the need for cost recovery to preserve the viability and investment in new infrastructure, with the affordability of these essential services.

The Economic Regulation Authority will continue to play an important role to independently and transparently review water and wastewater charges and advise Government on how to balance these needs.

The Harvey, Ord, Carnarvon and Preston Valley Irrigation Cooperatives pay the cost of operating, maintaining and replacing their irrigation infrastructure, provided by Government at the time of privatisation of these schemes in the 1990s.

Where water users access water through their own infrastructure, they pay their own capital and operating costs.

AGRICULTURAL USE

The agricultural sector is very important to Western Australia. In 2005, the gross value of agricultural production was about $6.5 billion. More than 75% of this was exported, representing more than 12% of total State exports. There are about 14,000 farms in Western Australia that account for more than 42% of the total land area.

The agricultural food sector employs about 50,000 people directly and more than 92,000 when service and supply industries are included. Agriculture is a significant factor in regional economies and communities and forms part of our landscape.

Agricultural areas use water to produce crops such as grains, fruit, vegetables and wine grapes, and for domestic and livestock purposes. Due to low levels of metering in the agricultural sector, total water use can only be estimated. In 2005, it was estimated that 864 gigalitres (licensed and unlicensed use) or 37% of all water in Western Australia was used by agriculture, representing increased use of about 100 gigalitres since 2000.

While the grain industry accounts for more than half of Western Australia's gross value of agricultural products, the industry relies directly on rainfall and as such is not included in this review of water use.

Under the National Water Initiative, water use intercepted through farm dams and forestry operations should be accounted for as part of the water balance of a surface or groundwater system.

PROVIDING WATER TO AGRICULTURE

Western Australia has four irrigation schemes incorporating the Ord, Harvey, Carnarvon and Preston Valley irrigation areas.

These areas were historically developed by Government and include shared infrastructure including dams, borefields, pipes and measuring stations. Since the mid 1990s ownership and management has devolved to private irrigation cooperatives.

About 40% of all water used in agriculture in Western Australia is provided through these cooperatives - 30% from the Ord irrigation area and 10% from all others combined. There can be significant variation in water use from one year to the next. Water in the cooperatives is licensed and use is measured and monitored. This supports the management of water as a key business input and the long-term sustainability of water resources in the districts.

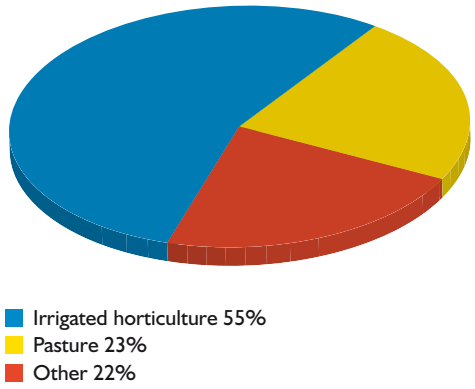
The remaining 60% is self-supplied through farm dams, bores or piping from surface water systems. Less is known about water use that is self-supplied. Some areas of the State, particularly surface water areas in the South West, are not licensed and there is very little metering and reporting of actual use.

A $6 million program is underway by the Department of Water to install meters on the Gnangara Mound north of Perth to monitor agricultural water use in this area. Metering and water reporting projects are vital to improve our level of knowledge of water use in agriculture.

Irrigated agricultural water users incur the cost of owning, maintaining and running their own bores or dams. These costs are a relatively small input to the total cost of production.

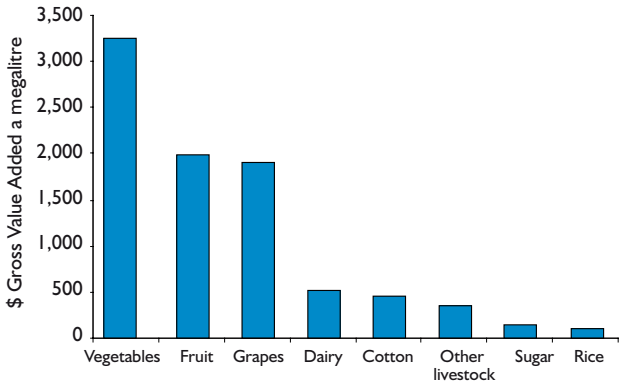
THE NATURE OF IRRIGATED AGRICULTURAL USE

In 2005, about 55% of water for irrigated agriculture was used in horticulture. This includes water for vegetables, fruit, nuts and grapes. Water for dairy and beef production is supported through the irrigation of pastures (23%) and other irrigated industries such as horticultural nurseries and turf farms account for the balance (22%).



Nature of irrigated agricultural water use in Western Australia

The economic value of water use differs between crops and livestock. This chart shows the averages for Australian agriculture, as reported by the Australian Bureau of Statistics in 2004. While there will be variances in water use and value in different parts of the nation and Western Australia due to crop types, local climates, watering practices and market conditions, it provides an indication of the relative value of water supplied to irrigated agriculture.



Gross value added per megalitre of water used in irrigated agricultural production in Australia

The majority of agricultural water use in Western Australia is applied to horticulture that has a relatively high economic value. This compares favourably to other areas in Australia that have much lower percentages of water allocated to horticulture compared with other agricultural markets.

FORECAST DEMAND

In 2005, about 46% of all vegetables and 37% of all fruit (excluding grapes and melons) grown in the State was exported. Given the significance of water used in the irrigated agricultural sector, access to export markets will influence future water demand in the sector as a whole.

There are a number of other complex factors that will influence demand for water for irrigated agriculture in Western Australia. Factors which could drive an increase in demand for water include access to good quality land and soils, consumer demand for agricultural produce and demand for managed investment schemes for primary production.

However, there are many factors which indicate that the growth in water demand for irrigated agriculture will not continue to experience the significant increases of the past 20 years. These include:

- Pressures of urbanisation, particularly at the outer boundaries of the Perth metropolitan area and in the South West
- The cost of fuel is increasing the direct cost of production and the cost of transport to markets
- Improved water efficiency and productivity
- Trading of water to other sectors, including mining and public water supply
- Increasing competition from imported produce
- Age profile of growers.

One of the most significant determining factors will be the viability of expansion of the Ord irrigation area.

The Ord irrigation district was established in the early 1960s in the east Kimberley, through the creation of Lake Argyle. The irrigation district currently covers an area of about 13,500 hectares and produces crops worth about $60 million annually. Privately owned and operated by the Ord Irrigation Cooperative, it provides employment and social benefits in the region, particularly to the Kununurra township. Lake Argyle also supports the production of hydro electricity.

WATER USE

The State Government is currently assessing Expressions of Interest received from the private sector to expand the Ord irrigation scheme by up to 16,000 hectares. The project requires the development of infrastructure for water, drainage, flood protection and public access roads. Conservation buffers and conditions need to be established and consideration will be given to maximising regional development opportunities including the use of existing port and townsite facilities, encouraging local processing and supporting local and Indigenous employment.

It is anticipated that this expansion, expected to predominantly support fruit and sugar production, could use up to an additional 400 gigalitres of water a year. Detailed feasibility of this expansion will be undertaken by Government in consultation with interested parties, stakeholders and the community.

In general, the irrigation areas in the South West and Carnarvon are not expected to significantly increase demand for water due to ongoing improvements in water use efficiency and limits to physical irrigation areas. In the Harvey area, water use in the agricultural sector may decrease due to opportunities to trade or use water in other sectors.

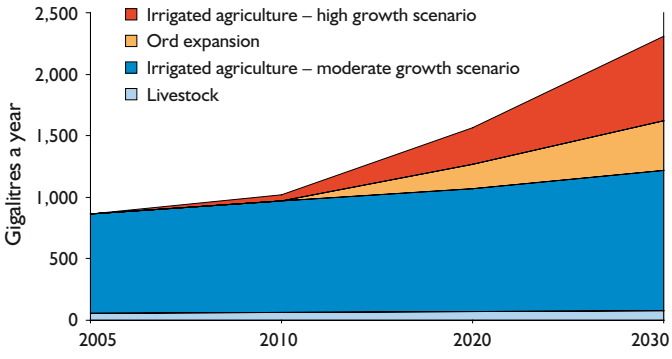
The other significant consideration is demand for water use outside of the irrigation cooperatives. Currently, it is estimated that over 500 gigalitres of water are used by self-supply farmers and businesses for irrigation.

In addition to agricultural market forces, water policy decisions may significantly influence water demand in this market segment. Water use in the sector will be facilitated by improved security of entitlements, longer tenure of entitlements and the ability to temporarily or permanently trade water. The amount of water used may be reduced through a decrease of licensed allocations in areas of overuse, or through licence conditions for water use efficiency and charges for use.

The Irrigation Review completed in 2005, projected that growth rates could range from 7% to 44% over the next ten years.

Water for livestock is expected to increase by about 20 gigalitres over the next 30 years. This includes potential increases for feedlots which will generally be located in close proximity to existing water resources, as transportation costs could otherwise be prohibitive.

A continuation of the growth rates experienced over the past 20 years would see water for agriculture increase to over 2,300 gigalitres by 2030. This would represent an increase of more than 1,400 gigalitres. Expansion at this rate is considered unlikely, for reasons of water scarcity, as well as other market conditions and changes to water policy.



Forecast demand - agricultural sector

WATER EFFICIENCY AND RECYCLING OPTIONS

Opportunities exist to improve the productivity of water used in irrigated agriculture. These are classified into three types:

- Technical efficiency
- Productive efficiency
- Allocative efficiency.

Technical efficiency in water use includes managing leakage, wastage, evaporation and improving watering practices. Further gains can be achieved through investments in technological innovation, such as the use of drip irrigation to replace flood irrigation, improved monitoring of watering application rates and the remote operation of systems.

Productive efficiency measures rely on physical activities outlined as supporting technological efficiency, and further realise net economic benefits in reducing the cost of production. These measures make good business sense and are facilitated by certainty over the future of the agricultural enterprise to allow for payback over time.

Significant improvements in water use efficiency can be achieved by allowing water to flow to higher economic value uses – from irrigating pasture to fruit or vegetable production for example. This is known as allocative efficiency. Further gains can be realised by the trading of water to other sectors such as mining or household use.

Trading between water users is encouraged. Irrigation cooperatives provide mechanisms for trading within the cooperative. In other areas, trading will be facilitated by shared infrastructure and systems (such as rivers and aquifers), as water is expensive to transport. Improving the certainty of licensed entitlements, reducing transaction costs, sharing information and ensuring regulatory approvals are timely, will further aid trade.

Where water is scarce or economic incentives make these practices viable, these efficiency measures are being applied in Western Australia. Incentive programs, such as Waterwise on the Farm, can also enhance the uptake of these practices.

In other states in Australia, some agricultural demand is met through treated wastewater.

The cost of these schemes is very high (over $1,000 a megalitre) particularly when they are not located in the irrigation area and water needs to be transported. The relatively low value of water per megalitre of water used in agricultural activities in Western Australia, means that these schemes are generally unviable.

The reuse of treated wastewater by agricultural industries can play a role where water is otherwise unavailable or where recycling provides an economic alternative to other wastewater disposal options.

SOURCE DEVELOPMENT OPTIONS

Surface water resources will be developed for agricultural purposes primarily in the Kimberley and the South West. As outlined, a major expansion of the Ord irrigation district will require significant investment in water infrastructure.

Other irrigation cooperatives are exploring continued investment in water efficiency infrastructure. Water outside of irrigation cooperatives is expected to be primarily self-supplied.

Over 75% of all local produce is marketed to large corporate grocery wholesalers and retailers. Increasingly, these groups are looking for quality assurance from primary producers. This underscores a trend for smaller farmers to consolidate onto larger farms and demonstrate water management competency as part of the assurance to gain access to some markets.

Consolidation may facilitate increasing source diversity, the ability to manage water across a range of primary produce, and increase the role that trading may play.

MINERALS AND ENERGY USE

The resources sector underpins the Western Australian economy. The value of the minerals and petroleum sector grew from $27.6 billion in 2000/01 to $43.2 billion in 2005/06.

There are a number of direct and indirect social and economic benefits attributed to the resources sector including the long-term sustainability of regional communities and employment. In 2006, an estimated 215,000 jobs in Western Australia were linked directly or indirectly to the resources sector.

The resources sector, which includes mineral and petroleum activities, is highly dispersed across Western Australia with approximately 500 projects covering about 50 different minerals. The majority of these projects are in regional and remote areas of the State.

Iron ore, oil and gas, diamonds and manganese are the major projects undertaken in the North West of the State, with gold, nickel and onshore oil and gas in the Goldfields and Mid West. There is also some iron ore production in the Mid West. The major projects in the South West are alumina, heavy mineral sands and coal.

Onshore petroleum water use is not licensed. These activities use small quantities of largely hypersaline water for a limited period. Generally, each oil or gas field uses less than 500 megalitres of water per year. Water is a by-product of the petroleum operation process.

In 2000, the resources sector used 419 gigalitres comprising 24% of total water use in Western Australia. This has increased to 608 gigalitres in 2005 or 26% of total water use, primarily as a result of increased sectoral activity.

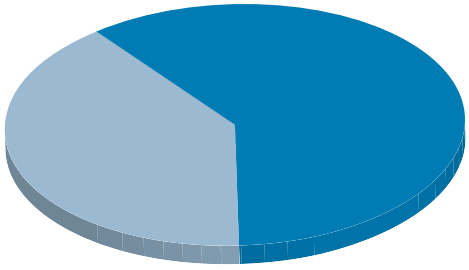
PROVIDING WATER TO MINESITES

The resources sector supplies over 95% of the water needs at mine sites, undertaking most of the water resource investigation and development. Some water for mining and oil and gas processing is supplied to resource companies by other licensed water service providers including the Water Corporation and Harvey Water. Water to regional and rural towns which support mining operations is generally provided through public water supplies.

Mine sites most commonly use groundwater extracted from fractured rock aquifers. Overall, less than 5% of water used for mining is from surface water sources.

Water quality varies widely from fresh to hypersaline. It is estimated that 40% of water used is of potable or fresh quality and 60% ranges from brackish to hypersaline. In most parts of the State there is little to no competition for water of this quality.

Resource development in areas with fresh to marginal quality water is generally for a limited duration. Consideration is given to the long-term sustainability of the water resource. Mining operations in remote areas with poor quality water, typically in the Goldfields and the Mid West, may deplete water resources in the short term. The resource generally recovers over time and the environmental impact is low and managed.



Water quality used by the minerals and energy sector

THE NATURE OF MINERALS AND ENERGY USE

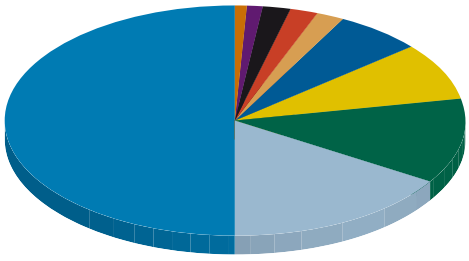
Mining companies require water for many uses including:

- Human consumption
- Transport of ore (slurries, suspension)
- Mineral separation (centrifuging)
- Breaking up materials (jetting)
- Cooling (power generation)
- Dust suppression (crushing and screening, conveyors and roads)
- Washing equipment
- Rehabilitation of mine sites.

Water used in mining also includes dewatering to enable mining to proceed safely. This use is carefully monitored and managed to minimize environmental impacts. Dewatering can use large volumes of water. This water may be recycled on site, returned to source or otherwise discharged to the environment.

Water use in mining operations is metered and monitored. Government works with the minerals and energy sector to manage the whole of the water cycle, from investigation, establishment and production through to mine closure and rehabilitation.

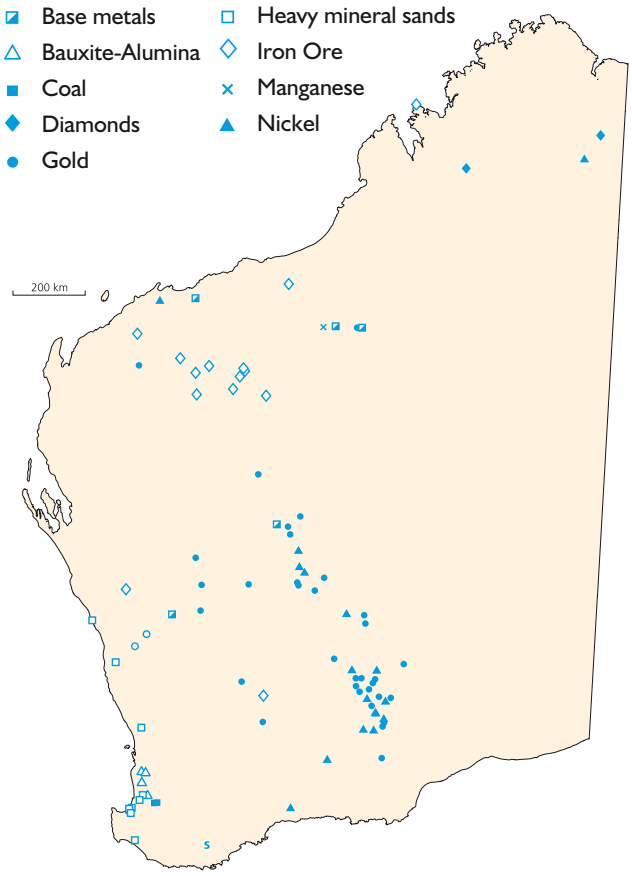
The gold sector uses half of all water used in the resources sector, followed by iron ore and nickel. Gold uses large volumes of water in the onsite processing of the mineral whereas iron ore operations require water for extraction and dust suppression.



Gold 50%
Other 1%
Diamond 1%
Coal 2%
Base metals 2%
Alumina 2%
Heavy mineral 6%
Manganese 8%
Nickel 12%
Iron ore 16%

Water allocation licences by volume and mineral

Generally, most mining operations operate for a finite period, reflected in the tenure of the water allocation licence. The National Water Initiative recognises that there may be special circumstances for resource development projects (including isolation and water quality issues) that may require specific water policy and management arrangements.



Water use and resource projects in Western Australia

FORECAST DEMAND

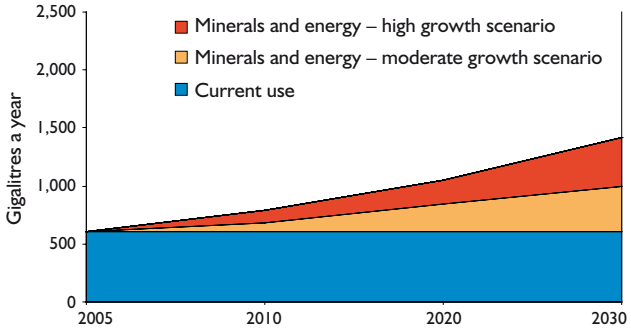
Projections of water demand for the resources sector need to consider a number of factors affecting production, including global markets. The major influences on demand for the sector for the next 25 years include:

- Commodity prices
- International demand
- Approvals
- Skilled labour
- Low cost competitors
- Transport
- Federal/state government arrangements
- Foreign exchange.

A continuation of recent growth in the sector would see total demand for water use of between 1,000 to 1,400 gigalitres by 2030, dependent on the nature of future resource projects. This represents additional demand of 400 to 800 gigalitres in total.

Water demand will be highly dependant on the nature of mineral expansion or contraction. For example, any change in gold production would have a significant impact of water use, given gold uses half of all water in the resources sector. In saying this, it is anticipated that gold will grow modestly over the next 25 years. The second largest mineral consumer of water, iron ore, is expected to increase at current rates.

In terms of increased use of groundwater resources for mining, the major pressure areas are expected to be in the northern Perth, Yilgarn and Pilbara basins.



Forecast demand - minerals and energy sector

WATER EFFICIENCY AND RECYCLING OPTIONS

The industry estimates that approximately 30% of water on minesites is recycled at least once before disposal. This varies greatly from mine site to mine site, dependent on the type of mineral production, site location, water quality and costs.

Water licence conditions require mining companies to prepare a water balance for each mine site showing the total amount of water available, flows and usage during the abstraction and process cycles and water returned to the environment. This approach highlights the opportunity for water savings.

Water pumped from a pit or underground mine as part of a dewatering operation can be reused at the mine site for different purposes or discharged into local watercourses, where impacts are acceptable.

Onshore petroleum continuously recycles water through the exploration and drilling process.

Options to increase recycling and the productive use of water for the resources sector need to continue to be developed. New technologies, fit for purpose development of sources for dust suppression and the setting of efficiency targets will improve water management practices in the sector.

SOURCE DEVELOPMENT OPTIONS

The major issue facing the mining sector is the security of supply to the Pilbara region. There is a need to develop supply options to meet growing regional demand. There is also increased pressure on the northern Perth basin due to opportunities to develop iron ore deposits.

Alternative sources such as desalination may augment water for mining operations and support future growth in some parts of the State. One proposal under consideration is the development of a desalinated supply from Esperance to the Goldfields.

The nature of mining operations, however, means that isolated resource development for relatively large amounts of water will be required at times. These demands can be unpredictable. They are best supported by continued investment in resource investigation and assessment by Government and the private sector.

Improved access to information on the nature, quantity and quality of water resources is required to support the minerals and energy sector.

HOUSEHOLD USE

Water is used by 2,000,000 people in Western Australia in households for drinking, food preparation, washing, sanitation and outdoor uses. An estimated 440 gigalitres was abstracted for use in 2005 by households.

Drinking water needs to have low levels of salt and meet all the health criteria of the Australian Drinking Water Guidelines 2004. Management of pathogens is particularly important. Safe drinking water is provided by a systems approach to managing water quality from the catchment to the tap. In addition to health criteria, the taste, colour and odour of water can impact on its acceptability to consumers.

External water use provides for important amenities in our gardens and greenspaces. It also supports irrigation, turf and garden industries that are significant employers and participants in the State's economy.

PROVIDING WATER TO HOUSEHOLDS

Household use is generally piped through a scheme water supply in urban areas and country towns by one of three major water service providers owned by the State Government. The Water Corporation is the largest supplier in the State, providing services to almost 97% of the State's population.

Water to households is mainly supplied through integrated water supply schemes that service more than one community. Larger schemes accessing a number of sources improve security of supply, water quality, system reliability, and provide operating and cost efficiencies.

The largest of these is the Integrated Water Supply Scheme that services the Perth metropolitan area, Mandurah and towns on the Goldfields and Agricultural pipeline, including Kalgoorlie. This integrated scheme supplies over 75% of the State's population. Other major schemes include the West Pilbara, Great Southern Towns and Lower Great Southern Towns schemes.

A number of farms are also supplied water by extensions to schemes in the Mid West, Goldfields and south east areas of the State.

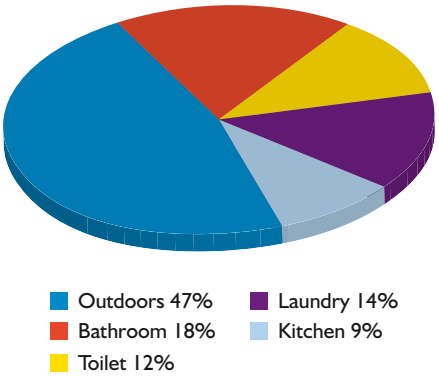
The Busselton and Bunbury Water Boards provide water services to their towns.

In addition to scheme services, some households use garden bores. Garden bores supply over 25% of all household water. It is estimated that there are about 164,000 garden bores in Western Australia – with about 90% in the Perth metropolitan area. If used responsibly and located in an area away from the ocean, river systems and wetlands, they can be a suitable supply for outdoor use.

Garden bores reduce the need for more or larger storages and treatment plants and take pressure off deeper aquifers for irrigation or other public water supply purposes. Garden bores in Western Australia provide a fit for purpose solution, as the water does not need to be treated as it would for drinking water use.

THE NATURE OF HOUSEHOLD USE

Water is an essential service. The Government is committed to providing safe and reliable water services and keeping these services affordable.



Typical scheme water use of a household in Western Australia

Outside water use is the largest single component to typical household use from scheme supplies in Australia. Use in Western Australia is consistent with this trend, influenced by traditionally large residential lots, hot summers and a lifestyle that embraces outdoor living.

FORECAST DEMAND

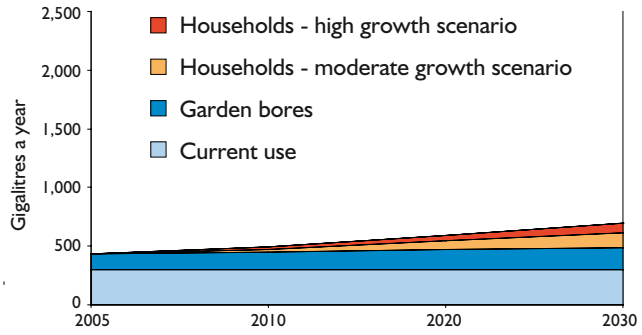
Water demand by households is influenced by a number of major factors:

- Population size and growth
- Household size (the number of people in a home)
- Rainfall patterns
- Incidence of very hot days
- External watering practices and restrictions
- Use of water efficient fixtures, appliances and the adoption of waterwise behaviours.

Western Australia is expected to increase its population from about 2,000,000 people in 2007 to 2,800,000 people by 2030. At the same time, the number of people living in each household is expected to decrease. The Indian Ocean Climate Initiative predicts more hot days and less winter rainfall in the southern part of Western Australia, where over 90% of the population resides.

These trends point to significant increases in water use for households in Western Australia.

The State Government and the community have worked together over the last five years to use more water efficient appliances, embrace two day a week sprinkler roster system and be more careful with water use



Forecast demand - household sector

at home, at school and at work. These actions help to reduce the overall impact of the trend for higher household water use.

An additional 140 gigalitres of water will be required to meet household demand by 2030 from scheme supplies and garden bores. This could be as high as 200 gigalitres if per person demand increases.

About 75% of this demand is expected to be for water in the metropolitan area.

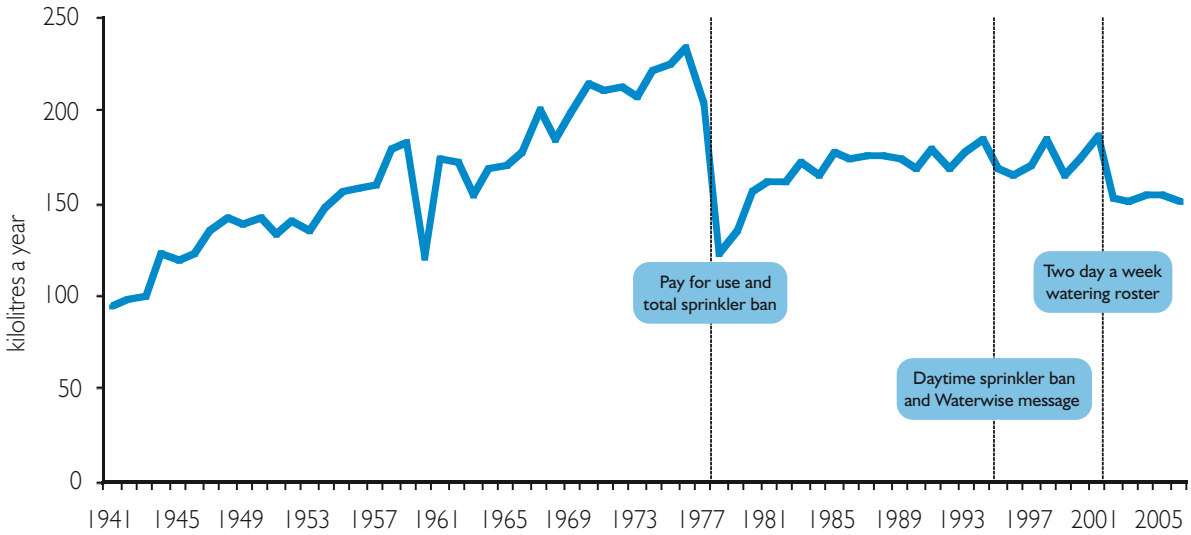
WATER CONSERVATION AND RECYCLING OPTIONS

A range of demand management alternatives have been developed in Western Australia and will continue to be vital to secure our water future.

Smaller lot sizes and the adoption of water sensitive design principles in land development and housing construction have the potential to further reduce water consumption.

In 2006, the State Government launched the national Water Efficiency Labelling and Standards Scheme to enable consumers to compare the water efficiency of appliances – the more stars, the more efficient.

A $30 million proposal has been developed for a 1.5 gigalitre a year Groundwater Replenishment Trial to investigate the feasibility of injecting high quality treated wastewater into aquifers for reuse in public water supply. Perth is in a unique position to take advantage of this technology and recycling solution, due to the nature of local groundwater aquifers.



Perth water use per person

Important components of the proposal are a comprehensive monitoring program to protect public health and the environment and an engagement process to determine community attitudes towards indirect recycling of treated wastewater.

In addition, there are opportunities to expand the capacity of wastewater recycling to the Kwinana industrial area.

Recycling wastewater in regional areas can reduce the pressure for new sources to meet demand in country towns and also provide the most sustainable option for disposal.

The amount of grey water recycled in Western Australia is relatively low. Grey water systems predominantly reuse household water in gardens and for sanitation. There are health guidelines available to oversee the use of these systems in domestic situations.

Grey water systems compete with the relative availability and low cost of alternative fit for purpose water in Western Australia, available through the use of garden bores and rainwater tanks.

SOURCE DEVELOPMENT OPTIONS

The winter of 2006 for most of the southern half of Western Australia resulted in extremely low streamflows to public water supply dams. New sources will be required to meet growing demand to secure water for household use, particularly in Perth and areas served by the Integrated Water Supply Scheme.

New source development will also be required throughout the State where there is increasing demand or reductions in water available in existing schemes. A range of demand and supply options will be required.

In this period of a drying climate, the trend will be away from the development of new surface water resources for household use in most parts of the State, although there may be opportunities to maximise yields from existing public water supply dams.

Confined groundwater resources and desalination offer greater protection and source security during drought periods.

Groundwater has the potential to meet much of the demand in the State. The major growth centres for domestic consumption are around Perth and the South West. These areas generally have access to significant groundwater resources. Aqwest and the Busselton Water Board have groundwater reserves to meet future needs.

Development of the 45 gigalitre Perth Seawater Desalination Plant, powered by renewable energy, has expanded the capability of the Western Australian water industry to plan, manage and operate this technology. Future water supply options for household use include consideration of additional desalination capacity.

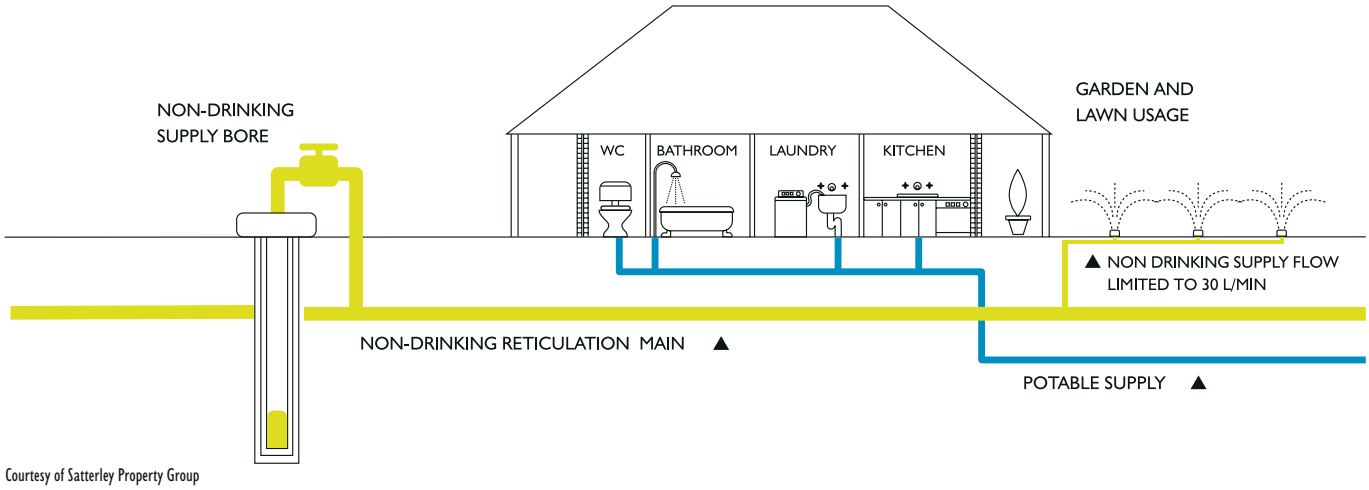
Desalination is also likely to play an emerging role for smaller towns to treat both seawater and brackish groundwater, as the technology becomes more efficient and cost effective.

Households can augment their water supplies, primarily for use outdoors and in toilets, through rainwater tanks or garden bores.

The use of rainwater tanks provides a fit for purpose water solution. Rainwater tanks and harvesting water from roofs can replace scheme water for some uses. They are predominantly found in rural and remote areas, often in addition to a scheme water supply. In Perth, a 100 square metre roof area can yield 25 to 55 kilolitres of water a year for gardens and inside water use in the toilet and laundry.

Although in some areas there may be limitations on the availability of garden bores due to environmental constraints, they are expected to continue to play a significant role in meeting demand for water outside the home. Garden bores are estimated to supply an additional 50 gigalitres of water to households by 2030.

A pilot of a third pipe scheme, using local groundwater in a communal garden bore for outside use, is also underway at Brighton in Perth's northern suburbs.



Courtesy of Satterley Property Group

WATER POLICY AND PLANNING

Our precious water resources are managed and developed in a sustainable manner to maintain and enhance our natural environment, cultural and spiritual values, our quality of life and the economic development of the State.

WATER POLICY FRAMEWORK

The Water Policy Framework guides water resource management in Western Australia. The framework:

- Provides strategic rationale for detailed policies, action plans and strategies
- Outlines key concepts to implement Government decisions on the Water Reform program
- Facilitates the implementation of the National Water Initiative in a manner appropriate for Western Australia
- Ensures water plans address issues in the context of shared whole of State objectives
- Ensures consistency of approach to water policy over time
- Builds a shared understanding of water resource management principles.

The Water Policy Framework has seven objectives to support the vision for water resource management (see diagram below). The objectives build on the foundations of the State Water Strategy and the National Water Initiative to improve water resource security and certainty for users, the community and the environment.

Water policy objectives reinforce each other. They work together to support water for ecosystems, recreational and cultural use, its vital role in developing our economy and the provision of safe, quality water services for healthy communities.

WATER PLANNING FRAMEWORK

Water planning is a mechanism to improve certainty for the environment, the community and all water users. The Water Planning Framework outlines water plans that are the primary responsibility of the Department of Water (see below). It describes each plan's objectives, geographical area, priorities and issues to be further considered.

Water plans acknowledge the multiple objectives in water cycle management and potential and agreed tradeoffs between these objectives. Plans outline the actions, operating strategies and compliance practices to achieve agreed outcomes.

Plans will be prioritised by risk and need and not necessarily developed in hierarchical order. This approach recognises the need for plans to be developed at all levels where there is greatest pressure.

State Water Plan 2007, Regional Water Plans and Strategic Water Issue Plans are strategic in nature. They are intended to be informative and will seek to optimise all aspects of the water cycle. Strategic water plans will be informed by plans prepared by water users (such as for mining or public water supply) and natural resource management groups.

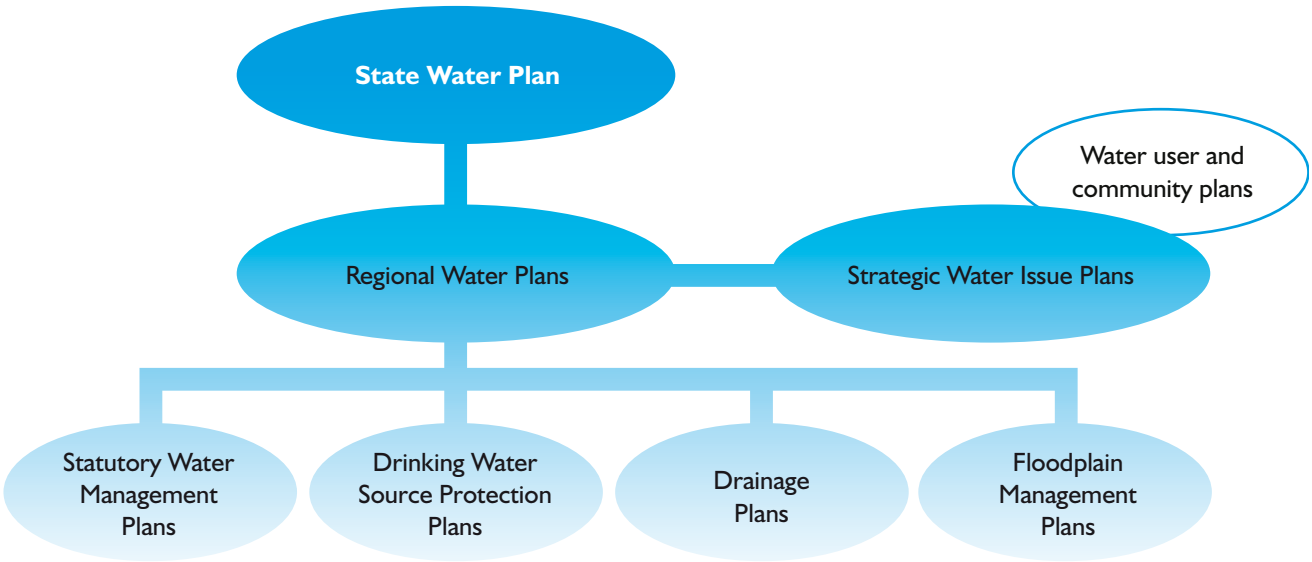
Statutory Water Management Plans will communicate decisions that have legal obligations and can be enforced. They will be prescriptive to facilitate certainty.

Detailed water plans to protect drinking water sources and manage drainage and floodplains will also be developed. Plans will be written in a manner that supports community involvement and understanding.

Integrated water management is a goal of strategic water management in Western Australia. Where possible, planning will be integrated to address the sustainability of the resource, use, protect catchments and drinking water sources and manage other impacts.

It is important that water plans integrate with land use planning in a manner that avoids duplication and unnecessary delays in decision making. The legislative reform of water resources statutes will specifically consider options to achieve these outcomes.

Legislative reform is required to further define and give full effect to the Water Planning Framework.



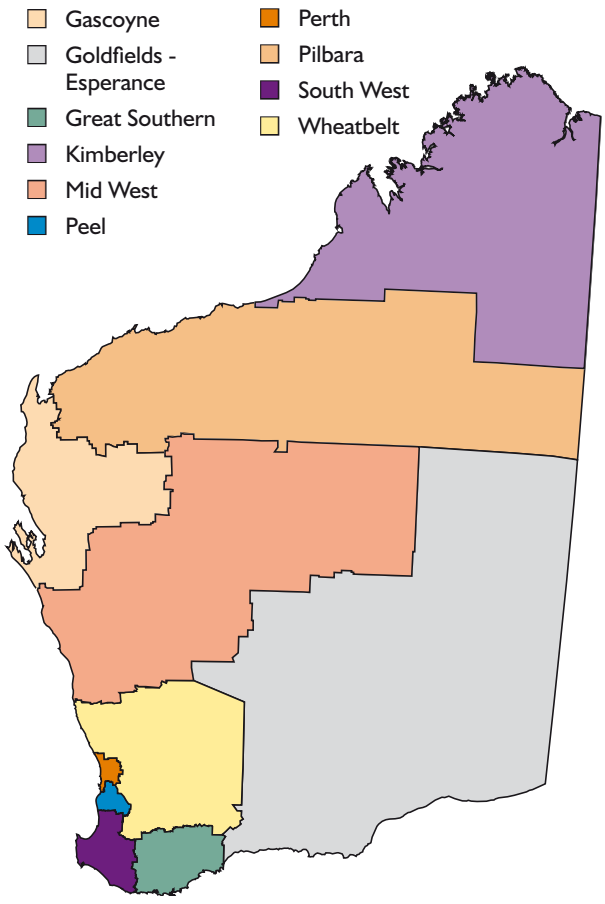
REGIONAL WATER PLANS

Regional water plans will be an important tool to implement the policy objectives of *State Water Plan 2007*. These strategic plans will be both informative and action oriented.

Regional plan areas will generally align with Regional Development Commission boundaries. These boundaries can be varied as required to manage specific water resources, stakeholder or servicing considerations. Plans will seek to integrate significant issues that cross regional boundaries.

Regional water plans are strategic in nature with a long term planning horizon that aligns with *State Water Plan 2007* (2030). They will not make final decisions with respect to applications for water entitlements or development of new water sources. Existing approval processes will continue to apply to these decisions, although they are expected to generally align with the direction of a regional water plan.

LEGEND



OBJECTIVES

- Using the Water Policy Framework, assess the current state of water resource management and service delivery in the region and consider future trends
- Identify current and forecast water availability and demand
- Understand the whole of the water cycle interfaces in the region
- Engage with the community to understand local priorities
- Communicate Government priorities for water resource management
- Align where possible with regional catchment council and other natural resource management activities
- Determine priority actions to support water policy implementation and improved management.

STRATEGIC WATER ISSUE PLANS

Government may determine that a specific water planning process is required to consider and address an immediate issue. These plans are called Strategic Water Issue Plans.

The intent is that these plans become a flexible water planning tool – the scope and timeframe should optimise resolution of the issue concerned. They could follow, or precede, a regional water plan. Over time, they should integrate with other strategic, statutory and detailed water plans.

Examples of water matters that Strategic Water Issue Plans may address include:

- Specific catchment management issues
- Salinity resource recovery
- Integrated land and water planning
- Drought response initiatives to address affected areas
- Development of drainage infrastructure required under a Drainage Plan
- Specific source development options for a town, sector or region.

OBJECTIVES

- Support the achievement of Water Policy Framework objectives
- Address a specific issue that cannot be dealt with through other plans in the Water Planning Framework
- Provide guidance on an urgent strategic issue
- Develop in collaboration with relevant Government agencies and the community.

Strategic Water Issue Plans recognise that not all water matters require the formalisation of a plan, nor do all issues require universal consideration on a statewide basis. They will be prioritised on need.

RURAL WATER PLAN

One example of a Strategic Water Issue Plan is the Rural Water Plan, originally released in 2000. This Plan was developed in response to the need to improve the reliability of access to water supplies in agricultural and pastoral areas of the State.

The Rural Water Plan aims to provide reliable and good quality farmland and pastoral station water supplies to the dryland areas of rural Western Australia.

The plan incorporates several water supply initiatives to improve on-farm, pastoral and community water supplies. The implementation of these initiatives is the responsibility of the Department of Water.

Extensive opportunity for community engagement and guidance is provided through the Rural Water Advisory Committee. The Committee was involved in the development of the Plan and convenes quarterly to oversee its implementation and advise on water supply issues in dryland areas of the State. In future, revisions of this plan will consider opportunities for water use efficiency.

WATERWAYS MANAGEMENT PLANS

Waterways Management Plans are another example of Strategic Water Issue Plans. They can identify the condition and values of a waterway, establish long-term goals and recommend management strategies to protect and restore waterways, particularly those of high conservation value.

Waterways Management Plans assist communities, landowners and relevant natural resource management and planning agencies to manage waterways to minimize adverse land use impacts.

STATUTORY WATER MANAGEMENT PLANS

Under the National Water Initiative, statutory water management plans are the principal device to improve the security of water allocations by moving from water licences to a water access entitlement. The State Government supports this graduated system of entitlements.

Environmental water entitlements determined through a statutory water planning process will have at least the same amount of security as water for consumptive use.

It is proposed that these plans cover all groundwater and surface water management areas, statewide, on an individual or grouped basis. Where groundwater and surface water resources significantly interact with each other the plan will cover both resources.

Water management plans will be guided by the characteristics and components of these plans outlined in the National Water Initiative. They will be based on the best available information, informed by community engagement to codify and possibly extend existing obligations and responsibilities of water users and the resources manager.

Statutory water planning will take into account Indigenous water requirements (established through Native Title determinations), economic, cultural and other public benefit outcomes documented in the planning process.

Plans will be reviewed within ten years of completion. This allows for an adaptive management approach informed by an improved information base.

Natural resource management and other community groups will be consulted in the preparation of statutory water management plans.

Nine statutory water management plans are prioritised for completion from 2007-2011.

Plans completed prior to the passage of water legislation will require review and may be subject to amendment to change the nature of water access entitlements.

OBJECTIVES

- Support the achievement of Water Policy Framework objectives
- Base plans on the best available knowledge and science
- Define the condition of the resource
- Define the consumptive pool and water availability
- Define environmental and other public benefit entitlements arising from the plans
- Define consumptive use entitlements (the register) arising from the plans
- Set rules for the diversion of water
- Take account of water resources and land use planning
- Prescribe the protocols that will apply to assessment of access entitlement applications
- Articulate compliance, monitoring and reporting requirements
- Detail trading process and rules.

DRINKING WATER SOURCE PROTECTION PLANS

Drinking water source protection plans recognise the primacy of water quality in the management of drinking water catchments to provide safe drinking water to communities.

Through source protection planning, inappropriate land uses and polluting activities (all of which can have significant health, environmental and economic impacts) can be avoided. They reduce the need for costly treatment of drinking water. From a risk perspective, treatment of water is much less desirable than protecting water quality in source catchments.

The Department of Water has the prime responsibility for the development of source protection plans. The Department works with other state agencies such as the Department of Health, the Western Australian Planning Commission, the Water Corporation and other service providers to manage water quality in drinking water catchments. This 'catchment-to-consumer' protection is consistent with the national approach outlined in the Australian Drinking Water Guidelines 2004.

Source protection plans identify risks to current and future public drinking water source areas and recommend protection strategies, such as the establishment of protection zones.

Currently, once a public drinking water source area is proclaimed, by-laws can be applied to manage land use.

State Planning Policy 2.7 Public Drinking Water Sources, guides State and local Government land use planning decisions in public drinking water source areas, through provisions in the Metropolitan Region Scheme and local Town Planning Schemes. These impact local government zoning and development.

Drinking water source protection plans can have beneficial impacts on catchments as they reduce the incidence of pollution and other activities that can degrade the catchment, impair water quality and adversely impact on biodiversity and ecosystem health.

A total of 136 drinking water source protection plans have been identified for completion with six plans prioritised for completion from 2007-2011. Additionally, source protection will be progressed in remote Indigenous communities.

OBJECTIVES

- Support the achievement of Water Policy Framework objectives
- Protect current and future public drinking water sources through land use management to prevent contamination and risks to public health
- Assess contamination risk
- Raise community understanding and awareness of contamination risks
- Determine measures to mitigate and minimize risk
- Guide land use planning decisions and approvals for compatible use
- Recognise other ecosystem, social and public benefit outcomes arising from source protection
- Contribute to broader catchment management through knowledge and science, management of land use, monitoring and reporting of catchment activities.

DRAINAGE PLANS

Drainage planning in metropolitan and country districts has historically focused on providing satisfactory levels of protection against the effects of flooding either from stormwater runoff or from high groundwater levels in low-lying, waterlogged areas. This focus led to the construction of drainage infrastructure to facilitate irrigation and urban development. These structures are embedded in our built environment.

It is now recognised that drainage planning needs to have multiple objectives. While flood protection remains a primary focus, consideration is also given to the impacts of drainage on wetlands, waterways, groundwater dependant ecosystems, receiving water bodies and the potential to remediate loss of productive capacity in salt affected districts.

In addition, drainage water is now seen as a valuable resource that should be managed as part of an integrated water cycle.

Drainage plans will cover urban, coastal and Wheatbelt areas of the State. The Department of Water has legislative responsibility for main drainage planning in the Perth metropolitan area.

Plans will be based on the best available knowledge and science. They will integrate with land use planning.

A total of 12 drainage plans have been identified for completion with five plans prioritised for completion from 2007-2011.

OBJECTIVES

- Support the achievement of Water Policy Framework objectives
- Provide protection from flooding caused by stormwater or inundation from seasonal or long term groundwater level fluctuations
- Protect valued natural resources (such as wetlands, waterways and recreation areas) and receiving water bodies
- Maintain or improve the quality of surface and groundwater systems
- Facilitate opportunities for water conservation, reuse and recycling
- Assess the potential for drainage water in a catchment to be used as a resource.

CURRENT DRAINAGE PLANNING

Drainage Plans are being prepared by the Department of Water to address water issues in proposed development areas in the Perth-Mandurah region. The plans will combine existing knowledge with groundwater and surface water modelling and address:

- land use planning
- water quality
- water quantity
- natural drainage features at a regional scale.

The plans will set objectives and criteria for detailed drainage planning at local and subdivision scales. Given the rapid urban growth experienced in Perth and the South West, priority actions have been established for the major urban development fronts including:

- Byford
- Southern River
- North East Corridor
- Jandakot
- Karnup-Baldivis.

Studies have been commenced to support future planning in North Mandurah, Mundijong-Whitby, Mandurah-Pinjarra and Albion-Henley Brook.

FLOODPLAIN MANAGEMENT PLANS

Floodplain management plans provide a means of assessing and managing risks associated with the use of floodplains for various purposes. They primarily plan for floods due to heavy rainfall, storm surges and cyclonic activity. These plans represent the considered opinion of the community, local and state agencies on how best to manage flood prone land. They provide a long-term path for future development.

A floodplain management study is essential for the development of a floodplain management plan. This is further addressed in the Draft Western Australia Floodplain Management Strategy, which describes the integration of floodplain management activities carried out by various organisations.

Floodplains are managed for the benefit of the whole community such that the risk to life and damage to property and the environment are minimised. They have important ecological values that need to be maintained.

Through a plan for a floodplain, the Department of Water recommends guidelines for development with the objective of minimizing flood risk and damage and provides advice to approving authorities. This influences statutory bodies, particularly local government, to exercise land use planning and development controls.

A total of 20 floodplain management plans have been identified for completion with six plans prioritised for completion from 2007-2011.

Approximately 50 floodplain management studies have been completed and are currently used for land use planning and development controls on floodplains across Western Australia.

OBJECTIVES

- Support the achievement of Water Policy Framework objectives
- Ensure land use minimises flood risk and damage costs
- Ensure all levels of Government and the local community understand their responsibilities in floodplain management
- Ensure appropriate floodplain mitigation measures minimise damage and are acceptable to the local community
- Promote the use of non-structural rather than structural mitigation measures where possible
- Ensure floodplain management measures have sound economic, social and environmental outcomes
- Support flood forecasting, warning systems and emergency management arrangements to cope with the impact of flooding.

Use and recycle water wisely

Use and recycle water wisely

POLICY

WATER CONSERVATION AND EFFICIENCY	All water users share a responsibility to conserve and use water resources efficiently at all times.
WATER RECYCLING	Significant increases in water recycling are facilitated by technological innovation, economic incentives, appropriate regulation and community acceptance.
TOTAL WATER CYCLE MANAGEMENT	Water resource management optimises the total water cycle for the natural and built environments.
LEADERSHIP BY BUSINESS	Business, including agriculture and mining, demonstrates leadership and innovation in water use efficiency.
WATER SENSITIVE DESIGN	Water sensitive design principles are incorporated in planning for new and retrofitted developments.
WATERWISE COMMUNITIES	Water efficient communities, housing, garden design, appliances and behaviours are promoted.
PUBLIC OPEN SPACE	The enjoyment and sustainable development of public open space is optimised through a collaborative approach to water management.

The State Water Strategy committed Government and the community to achieve significant improvements in water use efficiency for all sectors and significantly increase the level of recycling. The Water Policy Framework continues this commitment to water use efficiency and recycling as central to securing our water future.

Innovation is needed in technologies together with the alignment of regulatory systems, economic incentives and community acceptance to continue to achieve significant increases in the amount of water recycled.

Business has a pivotal role to play. Some businesses are leading the way demonstrating gains in water use efficiency. Not only does this realise cost savings but it improves the security of water available for use and can free up water to trade to other users.

Local government demonstrates leadership in this area through participation in initiatives such as the Water Campaign.

Water sensitive design principles assist in the efficient use of water resources in existing and new industrial, rural and urban developments, including recycling at residential estate scales. Some of the greatest gains can be made at this level as they embed waterwise practices in our built form.

Communities are building on these gains by adopting waterwise garden design, conserving water in the home and using water efficient appliances.

Public open space uses a combination of natural water resources and other water infrastructure and contributes significantly to our quality of life. Improved understanding of the value and needs of water use in public open spaces will help to preserve and develop these amenities.

Use and recycle water wisely

ACHIEVEMENTS 2002-2006

Reduced per capita consumption of water from Integrated Water Supply Scheme from 183 kilolitres to 155 kilolitres a person annually, through two day a week sprinkler roster system and Waterwise programs	Water Corporation
Introduced Water Efficient Labelling to support a compulsory six star water efficiency rating system for appliances	Department of Water and Water Corporation
Increased statewide wastewater reuse from 2.6% in 2000 to 13.6% in 2006	Water Corporation
Administered State Government Waterwise rebate initiative and granted 270,000 applications, estimated to save 5 gigalitres of water a year and 60 gigalitres over the lifetime of the products	Water Corporation
Over 50 industrial customers have attended water use efficiency information sessions and are implementing measures to improve water use efficiency including improved metering, monitoring and recycling	Water Corporation
Conducted Waterwise on the Farm programs in the Harvey, Scott River, Myalup, Busselton, Wanneroo, Gingin, Chittering, Baldivis, Donnybrook, Manjimup and Albany	Department of Agriculture and Food
Promoted agricultural best practice in irrigation and fertiliser management on the coastal plain from Lancelin to Busselton	Department of Agriculture and Food
Completed successful trial at McGillivray Oval in Subiaco to demonstrate safe irrigation of parks and gardens using treated wastewater	Water Corporation
Released the Code of Practice for the Reuse of Grey Water in Western Australia	Department of Health
Collaborated with industry to develop the Kwinana Industrial Area Water Planning Study to identify sustainable options for industrial water supply, wastewater reuse and disposal for a 15 year planning horizon	Department of Industry and Resources
Developed best management practices for vegetable production including a web based system for efficient vegetable irrigation on sandy soils	Department of Agriculture and Food

WATERWISE PROGRAMS

Since 1995, the Water Corporation has introduced Waterwise programs to increase awareness about water efficient practices. These programs apply across Western Australia.

- **Waterwise Schools** – A holistic water education program that helps students and their communities to learn about the need to conserve water. Over 270 schools are currently involved.
- **Waterwise Businesses** – Provides practical assistance to business including staff awareness, training and diagnostic tools to assess and modify water use. Includes access to information on specific topics including leak detection, water use in cooling towers and metering.
- **Waterwise Plumbers** – Plumbers trained in water efficiency visit householders to assess and provide advice on how water can be saved in the home.
- **Waterwise Garden Centres** – These centres are endorsed to sell plants with low water needs and other garden related water efficient products. Staff are trained to provide customers with information on waterwise gardens.
- **Waterwise Garden Irrigators** – Trained irrigators provide advice on and install low water-use irrigation systems.
- **Waterwise Display Villages** – Developers and builders use water-saving practices inside and outside display homes.

These programs support the Water Efficient Labelling and Standards Scheme and Smart Approved WaterMark that respectively rate water efficiency of indoor and outdoor products.

The suite of Waterwise programs are regularly reviewed and updated to meet changing community needs. New programs include:

- **Waterwise Land Developers** – An expansion of Waterwise Display Villages to cover shopping areas, housing estates and industrial areas. These programs promote water sensitive urban design for an entire development.
- **Waterwise Plants for Perth** – In conjunction with industry, low water use plants for Perth have been catalogued, detailing growth habits, water needs and where to buy them.

In addition to support for business and the broader community, the Government provides Waterwise Rebates for household products that promote water use efficiency and recycling. The Rebate program is reviewed periodically to best support the ongoing adoption of water use efficiency in households.

Waterwise Rebate

The more stars the more water efficient
WATER RATING
Water Consumption
13.1
Litres per wash
For more information and to compare appliances, refer to:
www.waterrating.gov.au

Smart Approved WaterMark

Use and recycle water wisely

TARGETS FOR WATER CONSERVATION, EFFICIENCY AND RECYCLING

The State Water Strategy set a target to reduce Perth's consumption to less than 155 kilolitres a year a person (from a high of 185 kilolitres a year) by 2012.

The community achieved this target by adopting a range of water conservation measures, including the two day a week sprinkler roster system.

Total Perth scheme water consumption now averages 153 kilolitres a person a year. This includes use for households, commerce, agriculture, parks, firefighting and water treatment. Of this total, residential water use averaged 106 kilolitres a person a year.

Perth use	Per person (kl)
Households	106
Commerce and industry	32
All other uses	15
Average 2002-2006	**153**

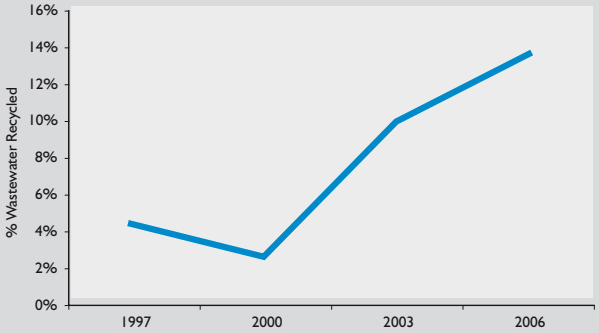
Now that this target has been achieved, Government has reviewed water efficiency opportunities and set new targets for each sector. Importantly, the State Government is seeking to conserve water in all areas of Western Australia, not just in Perth.

Households are being urged to conserve more water to further reduce Perth's demand to less than 100 kilolitres a person a year. This will reduce total water use for the residential sector by 20% from 2001 levels. This requires current outside watering practices and other improvements in household water use efficiency to be maintained and improved.

Government is working with the agricultural and mining sectors to improve water use efficiency by 20%. While overall water use in these industries may increase to support economic expansion, these aspirational targets reflect the need for continuous improvement in productive and efficient water use.

In working towards these targets it is important to note that gains by some users will be greater than others, depending on efficiencies already achieved and cost effective options remaining. Improvements in water recycling and matching water quality with use – fit for purpose – will also be recognised.

Water use in households in regional areas is being reviewed along with water use for commerce, industry and public open spaces. This will allow demand management programs to be targeted to these areas.



Percentage of wastewater recycled in Western Australia

The State Water Strategy also set a target to recycle 20% of all wastewater by 2012. Progress on this target is being made with total wastewater recycling now over 13%.

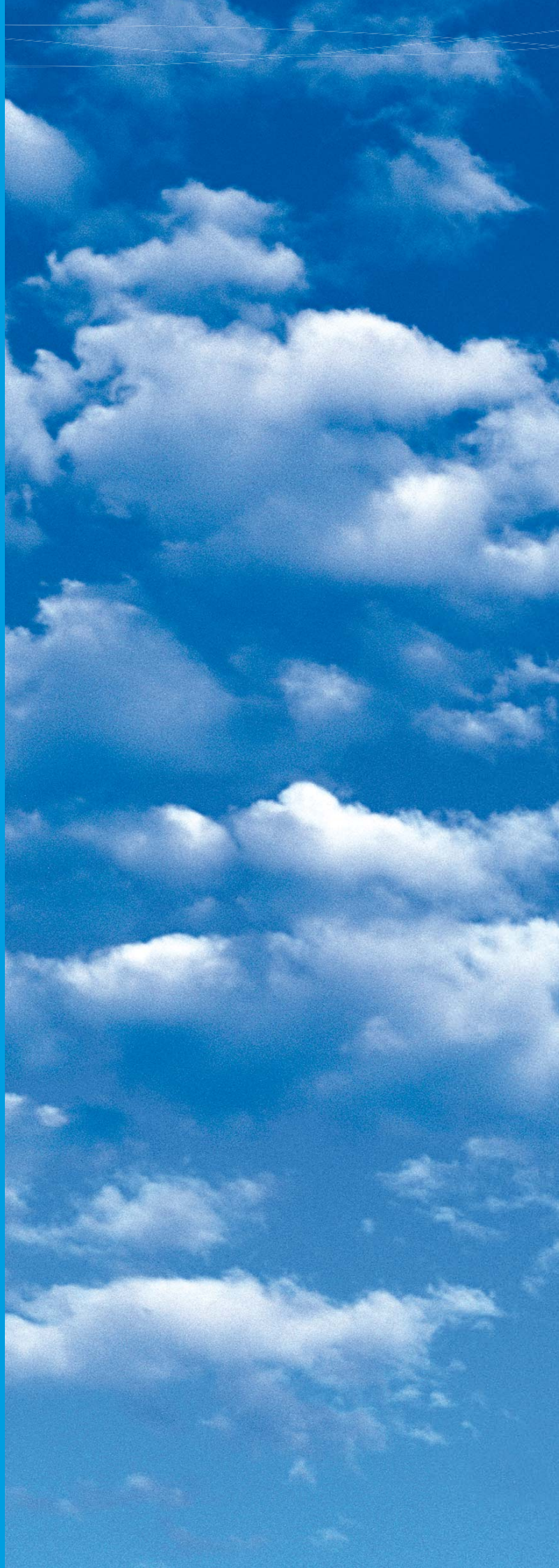
This target is being retained and strengthened. The long-term goal is for wastewater recycling in Western Australia to exceed 30%. A State Water Recycling and Conservation Strategy will be developed to engage with the community to explore options to achieve these targets.

Water Conservation	Priority Action 2007 - 2011
Agriculture	20% improvement in water use efficiency
Minerals and energy	20% improvement in water use efficiency
Commerce and industry	Review
Household use – Perth	Less than 100 kilolitres a person a year
Household use – regional areas	Review
Public open space	Review
Water Recycling	**Priority Action 2007 - 2011**
By 2012	20% wastewater recycling
Long-term	30% wastewater recycling

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Through best management practice, work collaboratively with the agricultural sector to significantly improve water use efficiency, in the order of 20%	Department of Water with Department of Agriculture and Food	●	●	●	●	●
Work with agricultural industries to develop water use efficiency benchmarks for irrigation across a range of industries and crops	Department of Agriculture and Food	●	●			
Complete a web based system for efficient vegetable irrigation (Stage 2) to include an irrigation scheduling decision support tool	Department of Agriculture and Food	●	●	●		
Through best management practice, work collaboratively with the minerals and energy sector to significantly improve water use efficiency, in the order of 20%	Department of Water	●	●	●	●	●
Reduce annual household use of scheme water in Perth to less than 100 kilolitres per person	Water Corporation	●	●	●	●	●
Review household usage in all areas of the State, to identify opportunities for further water use efficiency	Water Corporation		●	●		
Review Waterwise rebate program to support water policy directions	Department of Water	●	●			
Recycle 20% of all wastewater in Western Australia by 2012, and progress towards the long-term goal of more than 30%	Department of Water	●	●	●	●	●
Develop a State Water Recycling and Conservation Strategy to improve recycling of all water use including wastewater and urban stormwater	Department of the Premier and Cabinet	●	●			
Implement the Gnangara Mound Groundwater Replenishment Trial and engage with the community on the acceptability of recycling options	Water Corporation	●	●	●	●	●
Develop Recycled Water Groundwater Recharge Guidelines	Department of Health	●	●	●	●	

2 Plan and manage water resources sustainably



Plan and manage water resources sustainably

POLICY

SUSTAINABILITY	Our water resources and services are managed to protect our natural environment, our health and quality of life and support economic development.
CURRENT AND FUTURE GENERATIONS	Water is managed for current and future generations.
COMMUNITY INVOLVEMENT	Community involvement and understanding is essential to achieve the best outcomes in the management of water resources.
ADAPTIVE MANAGEMENT	Planning and management are modified as knowledge improves or circumstances change, including climate change and variability.
WATER RESOURCE MANAGEMENT, STATEWIDE	All water resources are managed through a risk based approach with management priority given to water for public supply or where there is competition for the resource.
WATER PLANNING	Water plans developed at State, regional and local levels inform and integrate with land planning and natural resource management activities.
INDIGENOUS COMMUNITIES	The knowledge and interests of Indigenous communities are specifically considered in water resource management.
COST RECOVERY	Water prices promote efficient use of water resources and infrastructure, provide revenue to support management and service delivery and promote paying for use.
FAIR AND TRANSPARENT PROCESSES	Water governance processes are appropriate, fair, transparent and timely.

The Government plans and manages water resources for current and future generations.

This accountability is met through transparent and open decision-making and processes that engage with the community. The water knowledge of Indigenous communities and their interests needs to be specifically considered in water resource management, including appropriate mechanisms for consultation.

Water planning is required to inform and focus management efforts. The vast size, climatic variation and diversity of water resources in Western Australia means that an adaptive management approach helps us to manage in an environment of changing knowledge and climate.

Management approaches need to adapt to changes in water use as it flows between sectors and for different purposes within sectors.

Over time, water prices for scheme and private supplies should reflect the full economic and environmental cost of using water. This provides economic incentives to develop resources, use water wisely and ensures the long-term sustainability of infrastructure, service delivery and water management.

Plan and manage water resources sustainably

ACHIEVEMENTS 2002-2006

Convened community water forums around the State and a Water Symposium in October 2002 culminating in the release of the State Water Strategy in February 2003	Department of the Premier and Cabinet
Released State Planning Policy 2.7 – Public Drinking Water Sources, which promotes compatible land uses within Drinking Water Source Protection areas	Western Australian Planning Commission
Released State Planning Policy 2.9 – Water Resources, which provides guidance for the consideration of water resources in land use planning	Western Australian Planning Commission
Completed Groundwater Management Plans for Esperance, Kemerton, Murray, Cockburn, Rockingham and Lower Gascoyne River	Department of Water
Completed the Ord River Surface Water Management Plan	Department of Water
Co-chaired the development of a national Framework for Strategic Water Management in the Minerals Industry to promote a strategic approach to water management at mining and processing sites	Department of Industry and Resources
Completed independent reports on water and wastewater pricing for metropolitan and regional areas	Economic Regulation Authority
Completed integrated land use and water management strategies: • Jandakot • Wungong • Gnangara • Warren-Blackwood	Department for Planning and Infrastructure

Minister for Water Resources congratulates Harvey Water

WATER AWARDS 2006

WaterAwards 2006 was held in October 2006 to recognise the contribution and collaboration of industry and the community in Western Australia to secure our water future.

The Department of Water and the Water Corporation jointly hosted the event. The Awards focused on products, processes and systems that support the sustainable management of water resources. Winning and finalist organisations worked in their industry, community or organisation to promote water use efficiency.

The 2006 Award for Excellence was presented to Harvey Water in recognition of:

- innovation to pipe irrigation channels
- significant improvement in water efficiency
- best practice operation of their irrigation system
- enabling the trade of water to the metropolitan area.

Future WaterAwards will continue to celebrate the ongoing partnership between government, industry and the community.

2006 Award for Excellence	Harvey Water
Waterwise Plumber	Kelly's Hot Water Gas & Air, Mandurah
Waterwise Garden Irrigator	The Watershed Water Systems, Midland
Waterwise Irrigation Design Shop	The Watershed Water Systems, Midland
Waterwise Landscaper	Fraser's Landscape & Design, Canning Vale
Waterwise Garden Centre	McBrides Garden Centre, Kalgoorlie
Waterwise Display Village	Ellenbrook Joint Venture, Malvern Springs Ellenbrook
Waterwise Business	Belmont Forum, Belmont
Waterwise School	Woodvale Primary School
Local Government Water Efficiency	City of Melville
Rural and Remote Water	Tropical Forestry Services Ltd
Water Recycling	Tiwest Joint Venture
Water Conservation and Efficiency	Harvey Water
Community Partnerships Award	CSBP Limited
AWA WA Water Environment Merit Award	Water Corporation

GNANGARA MOUND – A VITAL RESOURCE

The Gnangara Mound is one of the most important freshwater resources in the Perth basin. It supports local ecosystems, irrigated agriculture, commercial forestry and is the single largest source of water for the Integrated Scheme that supplies Perth and towns in the South West.

Balancing these competing needs for water with pressures for urban development and a drying climate is a complex and critical priority for water resource management in Western Australia. Progressive certainty will be provided through the processes below, leading to decisions to secure water for the environment and use while protecting water quality and other key values.

Plan	Scope	Timetable for completion
Gnangara Interim Water Management Plan	• Update the status of the groundwater resources in the Gnangara groundwater system • Set a framework for managing current allocations and licensing • Inform licensees with respect to their responsibilities in applying for and using groundwater.	2007
Gnangara Sustainability Strategy	• Plan for the entire Gnangara System • Gather information on groundwater system attributes and social, environmental and economic values • Engage with stakeholders on water, land, social, economic and environmental issues in a single Government process • Review existing water and land policy • Develop an integrated water and land management framework for future activities • Make clear and transparent decisions, recognising trade-offs between competing values.	2009
Gnangara Statutory Water Management Plan	• Informed by further hydro-geological investigation on water availability and management conditions • Basis for water allocation decisions, form of water entitlements and trading rules • Build on the Gnangara Sustainability Strategy to secure water for the environment and use.	2009

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Develop priority Regional Water Plans	Department of Water					
	South West Water Plan	●				
	Pilbara Water Plan	●	●			
	Perth-Peel Water Plan	●	●	●		
	Mid West Water Plan		●	●		
	Great Southern Water Plan		●	●		
	Kimberley Water Plan			●	●	
	Goldfields-Esperance Water Plan			●	●	
	Wheatbelt Water Plan				●	●
	Gascoyne Water Plan				●	●
Develop priority Statutory Water Management Plans	Department of Water					
	South West Groundwater Area Water Management Plan	●	●			
	Whicher Surface Water Areas Management Plan	●	●	●		
	Collie Surface and Groundwater Areas Water Management Plan	●	●	●		
	Canning River Surface Water Management Plan	●	●			
	Albany Groundwater Area Management Plan	●	●			
	Pilbara Surface and Groundwater Areas Water Management Plan		●	●	●	
	Serpentine Groundwater Area Management Plan	●	●	●		
	Perth South and Jandakot Groundwater Area Management Plan	●	●	●	●	
Plan a sustainable future for the Gnangara Mound	Department of Water					
	Gnangara Interim Water Management Plan	●				
	Gnangara Sustainability Strategy	●	●	●		
	Gnangara Statutory Water Management Plan	●	●	●		
Review and develop mechanisms to align land use and water planning at strategic and statutory levels	Department of Water with Department for Planning and Infrastructure	●	●			
Complete integrated land use and water management strategies	Department for Planning and Infrastructure					
	East Wanneroo	●				
	Middle Helena Catchment Area	●	●			
Implement water licence administration fees	Department of Water	●				
Participate in the national review of cost recovery for water resource management	Department of Water	●				

3 Invest in science, innovation and education

Invest in science, innovation and education

POLICY

SCIENTIFIC KNOWLEDGE BASE	Water resource management is founded on a sound knowledge base that includes the physical, biological, economic and social sciences.
CULTURAL AND LOCAL KNOWLEDGE	Cultural and local knowledge contributes to water resource information and management.
IMPACT OF CLIMATE CHANGE	Research on the impact of climate change and variation informs water resource management.
RESOURCE INVESTIGATION AND ASSESSMENT	Government coordinates water resource investigation and assessment, with significant contributions from water users.
WATER RESOURCE INFORMATION	Information on the hydrogeology, hydrology, ecology, quality, quantity, variability and use of water resources supports improved water management.
INFORMATION QUALITY AND ACCESSIBILITY	Information on water resources is accurate, maintained, publicly available and accessible.
COMPLIANCE AND PERFORMANCE	Compliance and performance indicators for water management are monitored, published and reviewed.
INNOVATION AND RESEARCH	Research and development is coordinated to develop our knowledge base and investigate innovative ways to use, reuse and manage our water resources.
CAPACITY BUILDING	Water expertise and understanding is developed across Government, scientific and academic organisations, industry and the community.
WATER EDUCATION	Investing in water education in schools, industries and communities builds understanding and fosters engagement.

An understanding of our water resources including catchments, river systems and groundwater is essential to their protection, informed planning, development, allocation and sustainable use. The State Government is committed to an ongoing resource investigation and assessment program. Some water users contribute significantly to this knowledge base through undertaking detailed investigation of water resources.

Accountability for our water resources and their sustainable use needs to be underpinned by sound science, resource investigation and assessment. An understanding of social, environmental and economic values is essential to this knowledge base.

The identification of knowledge gaps will be addressed through research and development and increased capacity by all sectors of the community to understand and engage in water resource management issues.

Public education and awareness programs focusing on climate change, water use efficiency and options for the future are vital.

The water resources knowledge base is being upgraded and information will be more transparent and accessible to the community. This includes information on water quality, water allocated to the environment, climatic changes, interactions between ground and surface water systems, registers of water entitlements and allocations, conditions, usage, compliance and trading.

Invest in science, innovation and education

ACHIEVEMENTS 2002-2006

Administered $5.7 million in funding from the Premier's Water Foundation to leverage over $21 million in research projects for innovative ways to manage our water resources	Department of Water
Supported the second phase of the Indian Ocean Climate Initiative to investigate climate change and variability in the South West of Western Australia	Department of the Premier and Cabinet
Supported the local government Water Campaign initiative with the active participation of 28 local governments	Department of Water
Expanded the range of Waterwise programs to provide community education, access to expertise and incentives to conserve and improve efficiency	Water Corporation
Released the second edition of the Perth Groundwater Atlas to promote the sustainable use of water in the metropolitan area	Department of Water
Launched the State Groundwater Investigation Program and completed investigations in Cowaramup, Scott Coastal Plain and Gingin	Department of Water
Developed the Perth Regional and South West Yarragadee Aquifer Modelling Systems to support groundwater modelling for these key resources	Water Corporation and Department of Water
More extensive monitoring and groundwater modelling completed on the Gnangara Mound	Department of Water
Sponsored the completion of Water and the Western Australian Minerals and Energy Industry: Certainty of Supply for Future Growth report to better understand the nature of water use in the minerals and energy sector	Department of Industry and Resources

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Invest in the State Groundwater Investigation Program	Department of Water					
	Gingin Brook	●				
	Gnangara North	●	●			
	Allanooka	●	●			
	Extension to arterial monitoring network (Perth Basin)	●	●	●	●	
	Yarragadee North	●	●	●	●	
Continue to invest in the science of climate change and variability	Department of Environment and Conservation	●	●	●	●	●
Progressively review sustainable yields state-wide to adapt to impacts of climate change	Department of Water	●	●	●	●	●
Continue to expand, enhance and maintain community partnerships to educate and provide tools to improve water knowledge through Waterwise programs	Water Corporation	●	●	●	●	●
In conjunction with industry, address the data backlog and develop databases and reports of water resources information, that are nationally consistent, accurate and publicly accessible	Department of Water	●	●	●	●	●
Work with the industrial and commercial sector to publish a study on the nature of its water use, to identify opportunities for sustainable cost effective improvements	Water Corporation		●	●		
Review the value and use of water for public open spaces, collaboratively with local government, parks, leisure and recreational sectors, to support their enjoyment and sustainable development	Department of Sport and Recreation with Department of Water	●	●	●		
Establish a Centre for Ecohydrology Research and develop courses on agriculture, the environment and water in partnership with the School of Environmental Systems Engineering	Department of Agriculture and Food	●	●			
Support the Northern Australian Irrigation Futures project to investigate and develop a sustainable approach to irrigation in the north of the State	Department of Agriculture and Food	●				

4 Protect ecosystems, water quality and resources

Protect ecosystems, water quality and resources

POLICY

WATER IN THE ENVIRONMENT	Water in the environment is fundamental to healthy ecosystems, biodiversity and society.
ECOLOGICAL CONSERVATION	Water plans identify key ecosystems and values that are a priority for conservation.
PROTECTION AND RESTORATION	All water users, relative to their impact, share a responsibility to protect and, where viable, restore water quality and biodiversity.
CATCHMENT MANAGEMENT	Catchments are managed through best practice and appropriate land use to protect surface and groundwater systems.
AQUATIC ECOSYSTEMS	Water management recognises that the sustainability of water for use is dependent on healthy aquatic ecosystems including rivers, waterways, wetlands, estuaries, groundwater and catchments.
ENERGY USE	Water resource management will work to minimise energy use and greenhouse impacts.
WATER AND THE ENVIRONMENT	Water needed to preserve agreed environmental values is determined through a transparent process of scientific investigation, social and economic analysis and community engagement.

All rivers, wetlands, estuaries and groundwater systems have intrinsic value. Protecting them supports ecosystems, water for use and biodiversity. In addition, water has many social values including recreation, relaxation, cultural and aesthetic appeal.

Water planning will identify water resources that are a priority for protection. The restoration of water resources to address issues of over use or poor water quality is the responsibility of water users and Government.

Those water users having the biggest impact bear a corresponding responsibility to contribute to restoration where possible, including the return of water use to sustainable levels of abstraction.

Catchment management plays an extremely important role in proactively preventing resource degradation. Best practice catchment management works with land owners, the community and water users to understand catchments and implement systems and actions to maintain and, in some cases, restore water quality and other values of healthy catchments.

There is a need to complete the mapping and evaluation of wetlands and waterways throughout the State, to protect high conservation areas.

Recycling and desalination technologies have the potential to alleviate pressures on existing surface and groundwater resources. However, they can use large amounts of energy. Local choices to minimise energy use and greenhouse impacts recognise the global responsibility to reduce the impact of human induced climate change.

Protect ecosystems, water quality and resources

ACHIEVEMENTS 2002-2006

Jointly awarded the Thiess National Riverprize for Excellence in River and Waterway Management for the Torbay Watershed Program	Department of Water
Implemented a trial program to divert highly saline early flows in the Collie River to reduce the salinity of Wellington Dam	Department of Water
Awarded the Premier's Environment Award for the Catchment Recovery Plan and Salinity Situation Statement for the Denmark River	Department of Water
Completed the Busselton Environmental Improvement Initiative, in partnership with the local community, to improve the environmental condition of Geographe Bay	Water Corporation
Supplemented environmental flows to seven caves at Yanchep to protect ecosystems	Department of Environment and Conservation
Completed Carnarvon Artesian Basin Rehabilitation Program (Phase 1) as part of Carnarvon 2020, estimated to save 55 gigalitres of water per year	Department of Agriculture and Food
Completed the Coastal Catchments Initiative to improve environmental water quality in the Peel-Harvey Inlet, leading to improved understanding of point and non-point source pollution and development of a process to review the effectiveness of industry practice to achieve regional water quality targets	Department of Agriculture and Food
Awarded WA Community Natural Resource Management Award for DairyCatch, a three year $1 million research and development project that implemented best practice with farmers to improve water quality in estuarine ecosystems	Department of Agriculture and Food
Awarded 2003 Australian Greenhouse Challenge Gold Award by the federal government for leadership in greenhouse abatement in industry	Water Corporation
Established the Wheatbelt Drainage Council to ensure a responsible approach to the planning, implementation and management of deep drainage in a catchment water management context	Department of Water

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Continue to protect and restore priority catchments to fresh water quality	Department of Water					
	Collie (by 2015)	●	●	●	●	●
	Denmark (by 2020)	●	●	●	●	●
	Kent (by 2030)	●	●	●	●	●
	Warren (by 2030)	●	●	●	●	●
	Helena (by 2030)	●	●	●	●	●
Contribute to Carnarvon 2020 through implementation of the Carnarvon Artesian Basin Rehabilitation Program (Phase 2) and other projects	Department of Agriculture and Food	●	●	●	●	
Develop priority Drainage Plans	Department of Water					
	Southern River Integrated Land & Water Management Plan	●				
	Review of 1995 North East Corridor Drainage Strategy	●				
	Jandakot Drainage and Water Management Plan	●				
	Byford Drainage and Water Management Plan	●				
	Karnup-Baldivis Drainage and Water Management Plan	●	●			
Develop priority Floodplain Management Plans	Department of Water					
	Margaret River Floodplain Management Plan	●				
	Avon River (Toodyay to Beverley) Floodplain Management Plan	●				
	Lake Grace Floodplain Management Plan	●				
	Carnarvon (Kingsford) Floodplain Management Plan Review	●	●	●		
	Serpentine River (Baldivis, Karnup, Amarillo) Floodplain Management Plan Review	●				
	Moore River (Moora) Floodplain Management Plan Review	●				
Review Wetland Conservation Policy for Western Australia through the Wetlands Coordinating Committee	Department of Environment and Conservation	●	●			
Continue to invest in acquiring knowledge on groundwater dependent ecosystems	Department of Water with Department of Environment and Conservation	●	●	●	●	●
Review programs for prescribed burning to optimise conservation and water management	Department of Environment and Conservation	●	●	●		

5 Enhance the security of water for the environment and use

Enhance the security of water for the environment and use

POLICY

ENVIRONMENTAL AND SOCIAL WATER REQUIREMENTS	Water provided to meet agreed environmental and social outcomes has at least the same security as water for consumptive use.
RESERVATION OF WATER	Water may be reserved for future public water supply and other high value uses.
WATER ENTITLEMENTS	A comprehensive system of water entitlements will include water licences, water access entitlements and basic rights to limited water for livestock and non-scheme domestic use.
WATER LICENCES	Water access and use can be licensed for a defined amount, duration and purpose.
WATER ACCESS ENTITLEMENTS	Perpetual water access entitlements can be granted as a share of a consumptive pool as defined in a statutory water management plan.
STATUTORY WATER MANAGEMENT PLANS	Statutory water management plans secure water for the environment and use, address issues of over use, set conditions to manage the resource and specify the form of water entitlements.
WATER MARKETS AND TRADING	Active water markets are encouraged to facilitate trade and improve the productivity of water use.
METERING	Water use is metered to facilitate water resource management, trading, dispute resolution and the development of statutory water management plans.

Enhancing the security of water underpinned Government decisions on A Blueprint for Water Reform in Western Australia. The full text of these decisions was released separately in February 2007 and is available from the Department of Water. This policy objective requires legislative change for complete implementation.

Providing water for the environment, other public benefits and use will be strengthened through statutory water management plans. These plans will promote ecosystem health, set management conditions and provide the basis for water access entitlements.

Where a statutory water management plan defines a consumptive pool, water access entitlements will be issued as unit shares in a consumptive pool. The amount of water available in the consumptive pool could fluctuate in response to changes in seasonal inflows and access rules, to preserve the long-term sustainability of the resource.

Statutory water management plans are prioritised where competition for the resource is high. Water licences, water access entitlements and basic rights to limited water for livestock and non-scheme domestic use, may coexist in areas covered by statutory water management plans. Where there is no statutory water management plan in place, existing water licensing and allocation arrangements will continue.

Government encourages the trading of water for economic use, to improve productivity and alleviate pressure on the environment. More metering will improve our knowledge of water resources and assist compliance oversight.

Enhance the security of water for the environment and use

ACHIEVEMENTS 2002-2006

Completed Irrigation Review to better understand water use and policy directions for the irrigated agricultural sector	Department of the Premier and Cabinet
Supported the completion of the Water Reform program to consult on policy direction for water entitlements, planning, metering, trading, charging and other key issues arising from the Irrigation Review and National Water Initiative	Department of Water
Installed over 300 meters to improve the knowledge of irrigated agricultural water use in the Gnangara groundwater area	Department of Water
Agreed to temporarily and permanently trade up to 17 gigalitres of water annually from Harvey Water, arising from an investment in piping open channels improving the efficiency and productivity of water use	Water Corporation
Determined environmental and social water requirements for the Ord and Preston Rivers together with the Harvey, Stirling, Harris, Samson and Wellington dams	Department of Water
Provided desalinated groundwater through the Merredin Water Initiative to manage the effects of rising groundwater and townsite salinity as part of the Rural Towns Liquid Assets program	Department of Agriculture and Food

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Develop operational policy to support water access entitlements	Department of Water	●	●			
Develop transitional arrangements from water allocations to water access entitlements	Department of Water	●	●			
Build new information and management systems to manage water access entitlements for surface water and groundwater systems	Department of Water	●	●			
Develop a Western Australian water register to support the introduction of water access entitlements	Department of Water	●	●			
Grant water access entitlements, as recorded in the water register, in accordance with completed statutory water management plans	Department of Water			●	●	●
Implement the actions to support the national Compatibility of Water Registers Report, to standardise water registers	Department of Water	●	●	●	●	●
Develop operational policy to support water trading	Department of Water	●	●			
Develop transitional arrangements for water trading	Department of Water	●	●			
Build or adapt new water information trading system for Western Australia	Department of Water	●				
Implement revised water trading arrangements	Department of Water			●	●	●
Complete and evaluate the Gnangara Mound metering pilot	Department of Water	●				
Develop operational policy to support substantial increases in metering surface water and groundwater resources, including roll out strategy	Department of Water	●				
Implement a metering pilot program in the Jandakot groundwater management area	Department of Water	●	●			
Progressively implement metering strategy, statewide	Department of Water		●	●	●	●
Develop and deliver training and awareness program to improve skills and understanding of water users, to support increased metering	Department of Water	●	●	●		

6 Develop water resources for a vibrant economy

Develop water resources for a vibrant economy

POLICY

ECONOMIC FORECASTING AND WATER	Forecast economic needs are accounted for in water planning.
RESOURCE DEVELOPMENT AND THE ECONOMY	New water supply technologies, resources and infrastructure are developed in a timely manner to support economic development.
SUSTAINABILITY ASSESSMENT	A range of demand and supply options is evaluated through a sustainability assessment, before water resources development.
FIT FOR PURPOSE	Water use is matched with an appropriate water quality.
WATER TRANSFERS	After scientific investigation and community engagement to understand local needs and impacts, water may be transferred between regions and systems.
RESOURCE DEVELOPMENT IN REMOTE AREAS	Water resource management recognises the importance of the resources industry and the reduced impact of source development in areas of isolation, limited resources, poor water quality or short periods of use.

Water plays a vital role in the Western Australian economy. It is important that we continue to develop water resources sustainably to drive local, regional and State development and promote a diverse and vibrant economy.

Significant investments in water resource management and service delivery will be increasingly subject to transparent sustainability assessment. This should consider environmental, social and economic benefits. The level of assessment should correspond to the level of resource development, potential impacts and investment.

A diverse range of demand and supply options for all water sectors should be explored. These include water conservation, recycling, trading, rainwater tanks, desalination, drainage, stormwater and other water treatments.

Care should be taken to match the quality of water resources with use and to minimise energy use.

The mining and petroleum sectors support the Western Australian economy. Often, water use in these sectors accesses poorer quality water in remote areas, where there is limited competition for other use. In some instances, these resources may be depleted for short periods of time without long-term harm to the resource, to the extent that the resource is able to recover, over time.

Develop water resources for a vibrant economy

ACHIEVEMENTS 2002-2006

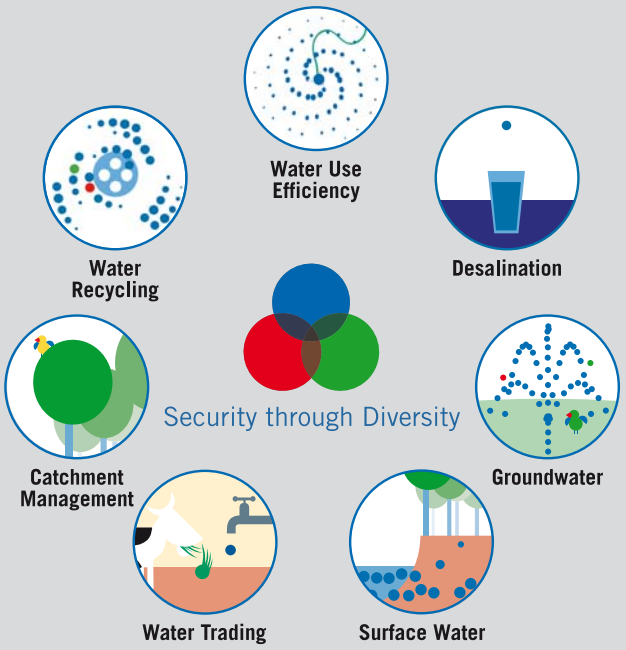
Built Kwinana Water Recycling Plant to produce six gigalitres a year of high quality process wastewater as a fit for purpose solution for industry	Water Corporation
Constructed Burrup Desalination Plant to provide a resource for industrial use in the Pilbara	Water Corporation
Improved resource security for Kalgoorlie-Boulder communities through the investment in 400 megalitres of additional storage	Water Corporation
Built a 45 gigalitre desalination plant in Kwinana, powered by renewable energy, to provide 17% of the demand and improve water resource supply security for customers of the Integrated Water Supply Scheme	Water Corporation
Completed substantial resource investigation, assessment and resource planning for the South West Yarragadee aquifer, including an assessment by the independent Sustainability Panel, convened by the State Government	Water Corporation
Initiated the Wungong Catchment Environment and Water Management trial to investigate the potential increase in surface water yields from improved catchment management approaches	Water Corporation
Reviewed a private sector proposal for a desalinated water supply for Kalgoorlie-Boulder	Economic Regulation Authority
Undertook planning for the Bridgetown Regional Scheme to improve long-term water supply security	Water Corporation
Supported the independent review of options to bring water from the Kimberley to the South West of the State	Department of the Premier and Cabinet
Developed the 'Security through Diversity' approach for demand management and source development options for the Integrated Water Supply scheme	Water Corporation
Developed new surface water sources at Wokalup and Samson and new groundwater sources in the Mirrabooka and Metropolitan Yarragadee aquifers to increase security for the Integrated Water Supply Scheme	Water Corporation
Supported the independent review of options for the rehabilitation and use of the Collie River and Wellington Dam	Department of Water
Completed the Goldfields-Esperance Water Supply Strategy 2003 to address demand and supply issues	Department of Industry and Resources

SECURITY THROUGH DIVERSITY

The Water Corporation has developed a new approach to meet the needs of growing communities. Their 'Security through Diversity' strategy embraces water conservation and a range of new sources as all being part of our water future.

Innovation, research and projects have focused on solutions, such as desalination and water recycling, that do not rely on increasing rainfall. An active water conservation and demand management campaign complements the Waterwise Rebate program and is a major part of this approach.

Significant achievements have been made in all areas targeted by the strategy. 'Security through Diversity' is now seen nationally as a model for other utilities, sectors and states to follow.



Develop water resources for a vibrant economy

PRIVATE SECTOR PARTICIPATION

Many water users in Western Australia access surface water, or more commonly, groundwater resources through their own infrastructure. These users include industry, agriculture, residential bore owners, local government and the minerals and energy sector. In fact, compared to the national average, Western Australia has a very high level of private investment in water infrastructure, due to the ability to access groundwater in most parts of the State.

Bulk water service provision is typically enabled by water service providers for drinking water and privately owned irrigation cooperatives.

The provision of drinking water services in Western Australia is almost exclusively undertaken through Government owned and corporatised water utilities (Water Corporation, Aqwest and Busselton Water Board) or by local government for some drainage and sewerage works. For many years, these utilities have contracted the private sector to deliver the majority of their capital works programs including design, construction and much project management and maintenance work.

In addition, a number of private sector alliance contracts operate and maintain water service provision in the metropolitan area. For example, the recently completed Perth Seawater Desalination Plant contracted a private company to operate the plant for a 25-year period, working with the Water Corporation to integrate this source into the metropolitan scheme. Private sector infrastructure and operational contracts for hundreds of millions of dollars are let annually. The private sector is an integral part of the water industry in Western Australia.

The provision of water services to homes, businesses and communities throughout Western Australia is an essential service. The State Government is committed to the delivery of quality, reliable water services and Government owned water utilities will continue to own, plan for and deliver the majority of these services, using private sector outsourced and alliance contracts as appropriate.

The State Government has also demonstrated a willingness to work with the private sector to consider innovative proposals for new infrastructure to meet the needs of this growing State.

For example, in 2004 the State Government convened an independent expert panel to source and evaluate a range of private sector proposals for the delivery of water from the Kimberley.

In October 2006, the Minister for Water Resources established an independent committee to investigate the future proposed uses of water from the Collie River Basin and Wellington Dam. The Committee considered the most appropriate method of assessment for both private and public sector options and the future role of stakeholder engagement.

Further, the Economic Regulation Authority has reviewed the feasibility of a private sector proposal to deliver a desalinated water supply to the Goldfields from Esperance.

A State Infrastructure Strategy is currently in development to ensure that future infrastructure needs for Western Australia – for transport, information and communication technology, water, energy, schools, hospitals and other needs – is coordinated to deliver maximum value and prosperity for future generations. Developing ways to more effectively integrate private sector innovation, including owning, maintaining and accessing new water infrastructure, is within the scope of this Strategy.

The State Government will work to ensure that water infrastructure decisions are sustainable by considering climate independence, economic, social, public health and environmental criteria, together with alternative ownership and delivery models.

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Complete the Pilbara Coast Water Study to investigate a range of demand management and supply options to meet the future needs of the region	Department of Water	●				
Develop a source development plan for the Pilbara	Water Corporation	●	●	●		
Implement and review the third pipe scheme in Brighton, to inform future policy and recycling options	Water Corporation	●	●	●		
Continue the Wungong Catchment Environment and Water Management trial	Water Corporation	●	●	●	●	●
Investigate the feasibility of expanding the capacity of the Kwinana Water Recycling Plant to 10 gigalitres a year to supply water to industry	Water Corporation	●	●			
Adopt sustainability assessments as a tool to evaluate a range of demand and supply alternatives	Department of Water	●	●			
Investigate the sustainability of expanding the Ord irrigation scheme	Department of Industry and Resources	●	●			

7 Deliver services for strong and healthy communities

Deliver services for strong and healthy communities

POLICY

WATER SERVICES AND PUBLIC HEALTH	Essential, scheme water services underpin our public health and economic systems, by providing safe drinking water and sanitation.
WATER SERVICES TO COMMUNITIES	All Western Australians have access to viable and appropriate water services.
CONSUMER INTERESTS	Consumers have a right to and are engaged in the provision of safe, reliable, quality water services.
DRINKING WATER SOURCE PROTECTION	Current and future public drinking water sources are managed with the primary aim of providing safe drinking water.
WATER SERVICE LICENSING	Water service providers are licensed to protect consumers and promote certainty for the community and the providers.
SERVICES TO NEW DEVELOPMENTS	Water service providers are determined in a timely manner to allow for the orderly provision of infrastructure and related services.
ASSET MANAGEMENT AND FINANCIAL CAPACITY	Service providers are competent, invest in sound asset management systems and possess the financial capacity to service communities now, and in the future.
AFFORDABILITY	Government may develop tariff structures or provide a transparent subsidy to ensure the affordability of essential water services.
DISPUTE RESOLUTION	Consumers of essential service providers have access to an independent dispute resolution process.

The provision of safe drinking water is a fundamental human right and critical to maintaining public health. Reticulated services provide the best option for the delivery of safe drinking water in accordance with the Australian Drinking Water Guidelines. However, in some areas, particularly in remote or isolated areas, rainwater tanks, community bores and standalone wastewater treatment units can be more appropriate.

Where public water supplies are developed, source protection has a primary responsibility to ensure the provision of safe drinking water. This supports a 'catchment to tap' approach that acknowledges that water treatment may enhance, but not replace, source protection.

The licensing of water service providers facilitates the delivery of quality water services to the community in an efficient and effective manner. Operating licences generally specify agreed levels of service to customers together with requirements to maintain an adequate asset management system and long term financial viability.

The cost of scheme water services reflects the economic, social and environmental cost of service provision, while ensuring affordability to all customers.

Consumers of water services should be involved in the setting of service levels. They have access to an independent dispute resolution process, if they are unable to settle matters with a service provider directly.

Deliver services for strong and healthy communities

ACHIEVEMENTS 2002-2006

Connected over 180,000 new water and wastewater services for quality and safe drinking water and sanitation services to communities around the State	Water Corporation
Completed 60 Drinking Water Source Protection Plans	Department of Water
Connected Coral Bay to scheme water supply	Water Corporation
Revised the Rural Water Plan and provided over $11 million in grants through the Farm Grants Scheme and Pastoral Water Grants Scheme to improve water supply security to agricultural areas	Department of Water
Awarded national Call Centre of the Year 2005	Water Corporation
Commissioned a micro-filtration plant at the Harding Dam Karratha to provide greater security of supply for towns in the West Pilbara	Water Corporation
Extended the Remote Area Essential Services Program for drinking water services to Indigenous communities from 48 to 91 communities	Department of Housing and Works

PRIORITY ACTIONS 2007-2011

Priority Action	Lead	2007	2008	2009	2010	2011
Implement the 2004 Australian Drinking Water Guidelines	Department of Health	●	●	●	●	●
Develop priority Drinking Water Source Protection Plans	Department of Water					
Walpole Drinking Water Source Protection Plan		●				
Marbelup Drinking Water Source Protection Plan		●				
Serpentine Drinking Water Source Protection Plan		●				
Canning Drinking Water Source Protection Plan		●				
Mundaring Drinking Water Source Protection Plan		●				
Denmark Drinking Water Source Protection Plan		●				
Engage with the community on water cycle options for the Integrated Water Supply Scheme, for the next 20 years	Water Corporation	●	●	●		
Develop initiatives to improve water services to Indigenous communities	Department of Water	●	●	●	●	●
Release the Country Sewerage Policy	Department of Health		●	●	●	●

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