



water forever



TOWARDS CLIMATE RESILIENCE SUMMARY

OCTOBER 2009

FOREWORD

Water, the lifeblood of Perth and Western Australia, is no longer taken for granted.

To ensure that there is enough water for all, we need to address the challenges of our drying climate, increasing population and minimising our environmental impact by using less water. We cannot meet water demand for the next 50 years from the development of new sources alone.

Water Forever provides a portfolio of options to manage our demand and supply balance to 2060 by:

- reducing water use by 25%;
- increasing wastewater recycling to 60%; and
- developing new sources.

Water Forever has become a catalyst for change in how the Water Corporation provides sustainable water services across the State. We are already identifying ways to reduce water use in industry and making recycled water free on an “as-is-where-is” basis for community benefit. We believe that by focusing on helping communities become more climate resilient, we can fulfill the promise of ensuring the security of our water supplies for present and future generations.

Our final plan, *Water Forever: Towards Climate Resilience*, is only the beginning of this shared journey. The true test of this plan will be how well we as a community embrace this framework to reduce water use, increase water recycling and be open to new ways of sourcing water. In times of climatic uncertainty, adapting our lifestyle to reflect the needs of the environment we live in will ensure a more sustainable future.

The enthusiasm and interest of the Western Australian community throughout the *Water Forever* project has shown that there is a strong willingness to accept this challenge. It is now up to each and every one of us to make it happen.

I take this opportunity to thank everyone who contributed to the development of our 50 year plan. While individual contributions are too numerous to mention, the support from the community, stakeholders, staff and particularly the *Water Forever* Science Panel was invaluable and greatly appreciated.



The richness and diversity of views has resulted in a well balanced strategic plan which provides a strong platform to ensure the security of our State’s water supply well into the future.

I hope this dialogue continues as we work together to deliver on the promise of climate resilience.

Sue Murphy
Chief Executive Officer

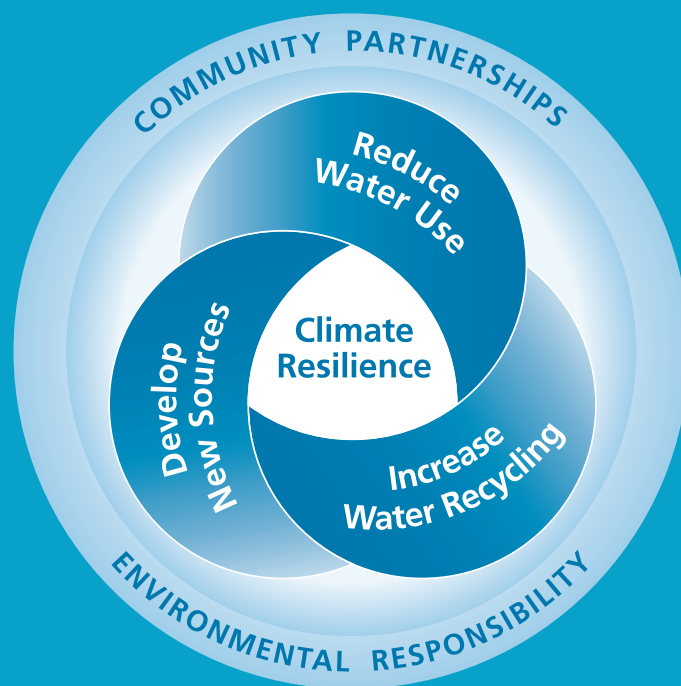


TOWARDS CLIMATE RESILIENCE

Water Forever: Towards Climate Resilience is the Water Corporation's 50 year plan to deliver sustainable water and wastewater services to Perth and surrounding areas including the Goldfields and Agricultural water supply.

Water Forever has been developed with the community and industry to ensure it reflects your views and preferences for securing our water future.

This transition to climate resilience is a shared journey, with the Water Corporation working in partnership with the community.



THE CHALLENGE AHEAD



It is estimated that an additional 120 gigalitres of water will be required by 2030.

The challenge for *Water Forever* is to provide water for all:

- in an even drier climate;
- with twice as many people; and
- with less environmental impact.

Based on work completed by the CSIRO and the Bureau of Meteorology, over the next 50 years, the south west of Western Australia is expected to experience further declines in rainfall due to climate change. This will have a significant impact on water availability for households, business and industry, local government, mining and agriculture.

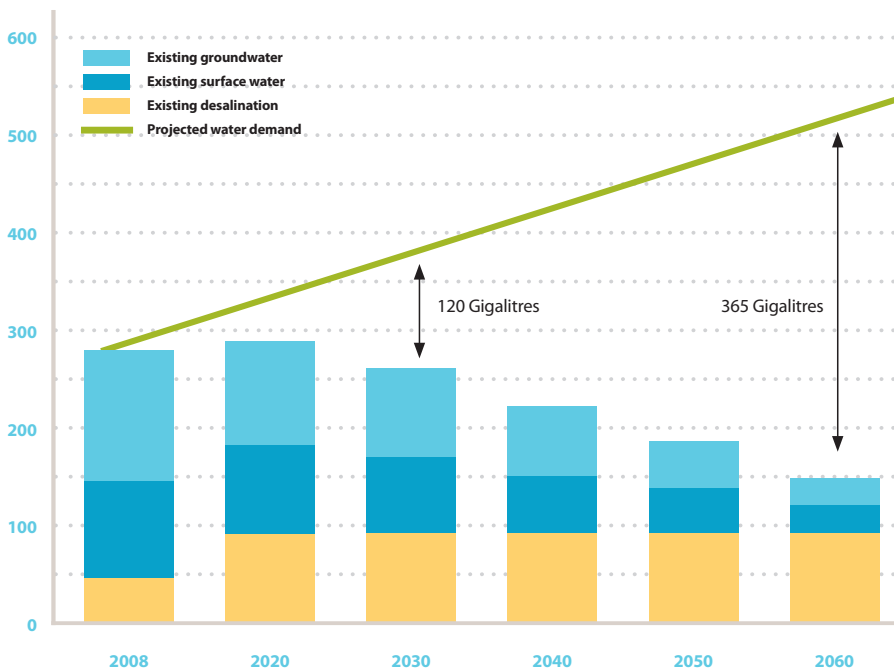
Water Forever has adopted a climate scenario that projects a 20% decline in rainfall by 2030 and a 40% decline in rainfall by 2060.

Based on the planning assumption of reduced rainfall combined with a growing population, it is estimated that an additional 120 gigalitres of water will be required by 2030 – more than 40% of current annual water use.

By 2060 it is forecast that Perth and connected towns will need an additional 365 gigalitres of reticulated drinking water supply. Some of this will replace existing sources affected by forecast declines in rainfall and the balance will meet the projected growth in demand.

Since 2001, the average water use per person has decreased by 20%. Even with these savings however, Perth remains one of the highest water using cities in Australia. More can be done to reduce water use and adapt to the changing climate. Over time, it is expected that we will need to progressively change the way residential gardens, public parks and ovals are landscaped to adapt to changing conditions.

The Water Corporation is committed to improving environmental outcomes include decreasing the average amount of groundwater taken from the Gnangara Mound after the second desalination plant is operational, becoming more energy efficient, investing in renewable energy and increasing the recharge and use of stormwater and drainage water locally.



Gap between water supply and demand to 2060
(Gigalitres per year)



REDUCE WATER USE



The Water Corporation will help business and households reduce their current water use by a further 25% over the next 50 years.

▶ 2060 Goal

25% reduction in per person scheme water use, from 2008 levels

▶ 2030 Target

15% reduction in per person scheme water use, from 2008 levels

Most people in the community agree that a long term, sustained focus on using less water is central to living with less rainfall.

The Water Corporation will help Perth households and businesses reduce water consumption to use a quarter less water. This begins with reducing per person water use from 2007/08 levels of 147 kilolitres a year to 125 kilolitres a year by 2030.

For households this means a per person target of 85 kilolitres a year by 2030.

Using less water has many benefits.

In the short term it will defer the immediate need for a new water source once the Southern Seawater Desalination Plant is commissioned (scheduled for 2011). Reducing water use also has substantial environmental benefits including reduced energy use, greenhouse gas emissions, land clearing and an increase in water left in the environment.

Using less water also helps to maintain the affordability of this essential service.

Actions to 2015

Continue to	<ul style="list-style-type: none"> • Work with the nursery and garden, turf and irrigation industries to reduce water use • Reduce water use in high water using businesses, industries and services through Waterwise programs and Water Efficiency Management Plans • Work with the WA Planning Commission and the Department of Planning to promote water sensitive urban design and fit for purpose water use at regional, district, local and subdivision scales of development
Commit to	<ul style="list-style-type: none"> • Implementation of a large-scale Waterwise Homes program to work one-on-one with households to reduce water use inside and outside the home • Education programs to increase the uptake of climate resilient gardens • Working with the WA Planning Commission and the Department of Planning to better integrate strategic land and water planning • Working with the Department of Sport and Recreation and sport/leisure associations to reduce water use • Expanding the Waterwise Schools program to all metropolitan primary schools • Facilitating water sensitive urban design recharge and reuse in local areas to improve water quality of receiving water bodies • Reviewing metering, pricing and billing practices to support reduced water use • Supporting the Waterwise Council program in partnership with the Department of Water and local governments • Implementing leak detection and pressure management programs, where cost effective
Explore	<ul style="list-style-type: none"> • Liaising with the Department of Water to increase metering, monitoring and reporting of private water use, with a view to improving its productivity by 20% • Working with land planning agencies to increase urban density • Working with the Building Commission and the housing industry to mandate minimum water efficient approaches and appliances for new residential and commercial developments • Working with national bodies to regulate for minimum WELS ratings for water efficient products • Collaborating with local governments and lead agencies on specific projects to improve drainage water quality

INCREASE WATER RECYCLING



In the longer term, most of Perth's wastewater can be recycled.

► 2060 Goal

60% recycling of all metropolitan wastewater

► 2030 Target

30% recycling of all metropolitan wastewater

Currently, only 6% of treated wastewater is recycled in the metropolitan area. By 2030 it is estimated that water recycling in Perth will exceed 30%. In the longer term, most of Perth's wastewater can be recycled. This will require collaboration between the Water Corporation, State and local governments, business and industry.

Major advances in water recycling can be made through large scale recycling schemes such as:

- groundwater replenishment, where high quality recycled water is stored in groundwater for use in drinking water supplies;

- recycling to industry; and
- providing recycled water to irrigate public parks, gardens and for horticulture.

Recycling water at a household level still has a role to play, although the water savings made through individual recycling systems are relatively small. Water recycling at household and community levels is supported where risks to human or environmental health are carefully managed in accordance with national guidelines and local regulation.

Actions to 2015

Continue to	<ul style="list-style-type: none"> • Work with the private sector and industry to use biosolids for beneficial uses, including agriculture • Optimise operations of Kwinana Water Recycling Plant to supply recycled water to industry • Monitor ocean discharges to ensure appropriate water quality to protect the environment
Commit to	<ul style="list-style-type: none"> • Expanding the existing Kwinana Water Recycling Plant output by a further 3.6 gegalitres a year • Working with land planning and development agencies to ensure that the Neerabup and East Rockingham Industrial Estates are reticulated to support the use of recycled water • Reducing the use of potable scheme water in wastewater treatment plants to less than 10% • Investing in co-generation to harvest more energy from wastewater treatment plant processes • Identifying existing or proposed Water Corporation land that could be irrigated with recycled water and used for community, sporting and recreational activities • Working with local government to irrigate more public parks and ovals with recycled water
Explore	<ul style="list-style-type: none"> • Water quality and quantity parameters for returning recycled water to the environment • Working with the WA Planning Commission and the Department of Planning to incorporate future wastewater infrastructure, recycling plants and pipeline corridors into strategic planning • Working with the WA Planning Commission, the Department of Planning and the Department of Water to develop streamlined approval processes for alternative water supplies and recycled water • Working with the Armadale Redevelopment Authority to identify the most appropriate non drinking water to supply the Wungong Urban Waters community (including design standards)



DEVELOP NEW SOURCES



As a community we cannot rely on a single source of water.

► 2060 Goal

New source options are identified, investigated and secured to support development by the Water Corporation and the private sector

► 2030 Target

Develop an estimated 70 to 100 GL of new sources from the portfolio of source options

While reducing water use and recycling more water will take us a long way to becoming climate resilient, they are not enough to overcome the significant reductions in rainfall that are projected.

New sources of water will eventually be required to supply a growing population in a drying climate. As a community we cannot rely on a single source of water.

By 2030, 70 to 100 gigalitres of additional water will be required, subject to the targets for reducing water use and water recycling being achieved. If these targets are not achieved, the need for new sources will increase even further.

The Water Corporation has considered a range of new water sources that could be developed. Further work needs to be undertaken to determine which sources will be developed and in what order.

It is inevitable that water will need to be moved to areas of demand, with almost all new source options located outside of the study area of this plan.

Over the next 50 years, it is expected that existing surface water and groundwater sources will comprise an increasingly smaller portion of public water supply. As the climate dries the focus of new source development will continue to favour rainfall independent sources such as recycling and desalination.

Actions to 2015

Continue to	<ul style="list-style-type: none"> • Complete the 50 gigalitre Southern Seawater Desalination Plant at Binningup • Complete the Groundwater Replenishment Trial • Mitigate the impacts of energy intensive sources such as desalination by contracting for energy from sources including biomass, wind, sun and waves or purchasing offsets
Commit to	<ul style="list-style-type: none"> • Ensuring a range of water source options can be developed when required • Securing sites for possible desalination plants in the northern corridor • Developing a full scale groundwater replenishment scheme, if the trial is successful and supported by the community • Securing approvals for the next major water source, or partner with the private sector for delivery • Reducing the amount of water taken from the Gnangara Mound to an average 120 gigalitres per year (once the Southern Seawater Desalination Plant is operational) • Reviewing the Wungong Catchment Management Trial to determine the viability of thinning catchments to increase run-off into dams • Working with the State and Federal Governments and the Water Services Association of Australia to monitor and plan for the introduction of the Carbon Pollution Reduction Scheme
Explore	<ul style="list-style-type: none"> • Research into the viability of new technologies to reduce evaporation from drinking water dams • Resource investigation on groundwater in the North West metropolitan coastal groundwater area • Conducting a detailed economic, social and environmental impact assessment on the most prospective future water sources • Working with the WA Planning Commission and the Department of Planning to ensure that future buffers and infrastructure corridors are secured and reflected in structure plans and local planning strategies

PORTFOLIO OF OPTIONS

Reduce water use	Rainfall independence	Yields 2010 - 2030	Yields 2030 - 2060	Portfolio total
Water efficiency programs				
• Homes and gardens	high	30	40	70
• Urban density	high	15	30	45
• Business, industry and services	high	5	10	15
Leakage and pressure management	high	5	10	15
Alternative water supplies				
• Rainwater tanks	low	13	7	20
• Garden bores	medium	4	0	4
• Community bores	medium	2	5	7
Subtotal		74	102	176
Increase water recycling	Rainfall independence	Yields 2010 - 2030	Yields 2030 - 2060	Portfolio total
Industry	high	20	20	40
Public open space	high	3	2	5
Agriculture (horticulture)	high	5	10	15
Residential greywater recycling	high	1	6	7
Residential dual reticulation systems	high	10	10	20
Subtotal		39	48	87
Develop new sources	Rainfall independence	Yields 2010 - 2030	Yields 2030 - 2060	Portfolio total
Groundwater replenishment	high	35	80	115
Southern seawater desalination plant expansion	high	50	0	50
Wellington dam desalination	low	0	45	45
Esperance- Kalgoorlie desalination	high	0	12	12
New desalination sites	high	50	150	200
North West metropolitan coastal groundwater	medium	25	0	25
Gingin-Jurien groundwater	medium	0	48	48
Jandakot groundwater expansion	medium	3	0	3
Wellington dewatering	medium	10	0	10
Catchment management	low	25	0	25
Gnangara water trading	medium	20	0	20
Subtotal		218	335	553
Total options to meet future supply - demand gap		331	485	816

The figures in the above table are shown in gigalitres per year.

Disclaimer

The Water Corporation is committed to quality service to customers, including the provision of reliable data in this document. Changes in circumstances after publication may impact the quality of information.

This document summarises *Water Forever: Towards Climate Resilience*. A copy of the full report is available by phoning 13 10 39 or by visiting www.watercorporation.com.au/waterforever

Alternative formats are available on request.

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