
ALTERNATIVE WATER SOURCES

STRATEGIC GOALS

- > Secure water supplies for current and future generations by developing new, alternative and diverse water resources
- > Supply fit-for-purpose and reliable recycled water
- > Improve environmental outcomes from all aspects of the business
- > Listen to and engage the community to seek support for our projects and priorities
- > Conserve and improve biodiversity and ecosystems
- > Invest prudently and efficiently, taking account of environmental, social and financial considerations, whole-of-life costs, risks and service needs
- > Operate and maintain our assets efficiently, in accordance with sustainability principles

KEY ACHIEVEMENTS

- > Partnered with City West Water to conduct a trial on managed aquifer recharge
- > The WTP Recycled Water Quality Management System was recertified against internationally recognised standards
- > Developed and implemented internet-based urban stormwater harvesting guidelines

DISAPPOINTMENTS

- > The volume of water recycled was low (8.3%) in 2010/11 due to high rainfall leading to reduced recycled water demand
- > Compliance with retail requirements for reliability and quality of recycled water from ETP and WTP were not met mainly due to wet weather affecting reliability of supply and turbidity

CHALLENGES

- > Integrating all sources of water to diversify supply, improve climate resilience and promote fit-for-purpose use to keep potable quality water for drinking
- > Supporting the Ministerial Advisory Council and Government objectives to enhance Melbourne as a liveable, healthy and prosperous city
- > Managing recycled water salinity in the west of Melbourne
- > Managing adverse impacts on the recycled water supply system from large storm events

Melbourne Water is working with local councils and the retail water businesses to deliver stormwater harvesting projects for residential and open space end uses

BENEFITS FOR COMMUNITIES, INDUSTRY, AGRICULTURE AND THE ENVIRONMENT

Alternative water sources include stormwater, recycled water and sewage. Managed aquifer recharge can be utilised to store water from alternative sources.

Drinking quality water makes up less than one-third of Melbourne's total water demand. The Department of Health requires that drinking water quality must be used for indoor taps, showers and selected industrial uses.

A lower quality of water can be used for toilet flushing, laundry use, domestic gardens, parks and gardens, some environmental purposes, industry and peri-urban agriculture. A fit-for-purpose approach to meeting demand enables Melbourne to preserve finite high quality water for specific uses.

There are multiple direct and indirect benefits associated with developing alternative water sources and increasing fit-for-purpose water use including:

- Community – healthy open spaces and sports fields, a reduced urban heat island effect and improving the resilience of the water supply system to climate change and variability
- Economic – opportunities for growth especially in industry and agriculture
- Environment – increasing the amount of water available for environmental flows, and reducing harmful discharges such as stormwater and treated wastewater.

Melbourne Water is working with local councils and the retail water businesses to deliver stormwater harvesting projects for residential and open space end uses.

We are also working with City West Water, Southern Rural Water, South East Water, and the Water Infrastructure Group to provide customers with recycled water produced at our sewage treatment plants. The fit-for-purpose recycled water is used for open space irrigation, agriculture, industry and for residential dual pipe schemes.

STORMWATER HARVESTING

Under the *Water Act 1989*, Melbourne Water is delegated responsibility for the licensing of surface water from waterways and from its own works, which includes the requirement to licence stormwater.

There are currently 12 active stormwater licences issued by Melbourne Water, predominantly to councils and sports clubs, totalling 608 million litres.

Melbourne Water continues to work with local councils on stormwater projects such as the Clayton South Retarding Basin project (see page 19).

We have been working with Manningham City Council and Yarra Valley Water to service the Doncaster Hill Principal Activity Centre. This development will integrate reticulated stormwater and recycled water into the existing urban setting. Melbourne Water is also partnering with South East Water and VicUrban on the Troupes Creek development to deliver third pipe systems for stormwater.

Melbourne Water, Yarra Valley Water and Moreland City Council are working together to treat stormwater from two existing drains to service the Central Coburg precinct and surrounds.

Melbourne Water, Western Water, Southern Rural Water, Melton Council and land developers have worked together to develop the Toolern Precinct Structure Plan at Melton South, which is part of an Integrated Water Management



Above: Police Road Retarding Basin, Dandenong Creek, Rowville

Plan prepared by the Growth Areas Authority. Stormwater will be captured, then filtered through Melbourne Water's wetlands and transferred to storages (including Melton Reservoir) for environmental, agricultural and community uses.

Melbourne Water, South East Water and Southern Rural Water are developing an *Integrated Water Management Strategy* to guide investment in projects in the south east. Opportunities that contribute to the vision of a 'Productive, Liveable and Sustainable' region in 2050 are being identified in collaboration with local councils. The strategy will be completed in late 2011.

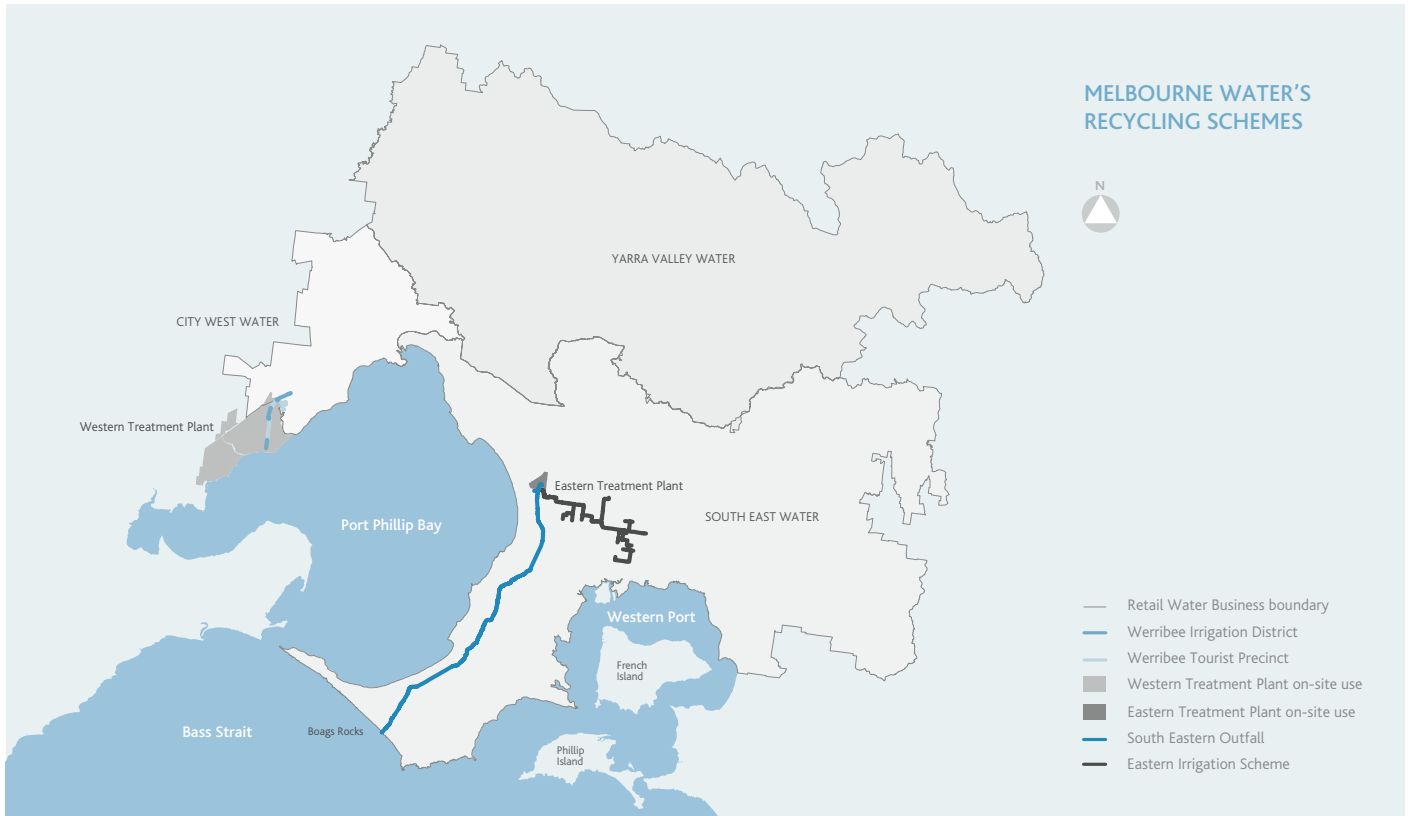
MANAGED AQUIFER RECHARGE

Managed aquifer recharge is the actively managed recharge of water to aquifers for subsequent recovery and use, or environmental benefit. It creates storage by utilising aquifers to store excess water during times of surplus to meet future demand. Deposits are made in times of surplus (commonly during winter) and extraction of the stored water occurs during peak demand times when traditional supplies struggle to meet demand (summer).

Multi-year balancing is also possible for long term-storage. Typically, managed aquifer recharge involves the capture and use of treated stormwater or recycled water to recharge an aquifer for future recovery and use.

Managed aquifer recharge is proposed as a key component of City West Water's West Werribee Dual Pipe Scheme. To enhance the efficiency of the project by operating the WTP salt reduction plant at full capacity throughout the year, the potential of managed aquifer recharge is being investigated as an option to store excess salt-reduced recycled water. This will balance short-term seasonal demands as well as ensuring security of supply for the coming decades. Melbourne Water is continuing to partner with City West Water on the West Werribee Aquifer Storage and Recovery trial. The most recent phase includes documentation and planning, extended trial and analysis and functional design.

ALTERNATIVE WATER SOURCES



In 2010/11, City West Water and Melbourne Water:

- Collaboratively developed the scope for Phase two of the trial, which included investigating storage for recycled water and stormwater
- Consulted with stakeholders and regulators on a draft risk management plan
- Submitted the risk management plan to Southern Rural Water for approval to conduct a long-term trial and a functional scheme
- Melbourne Water also began investigations into managed aquifer recharge opportunities at our sewage treatment plants.

RECYCLED WATER

Managing water quality and reliability of supply

Recycled water quality was maintained at the Eastern and Western Treatment Plants this year through quality management systems and supply frameworks, consistent with EPA Victoria guidelines.

Melbourne Water has continued to work with the retail water businesses to reduce salt discharges to sewer and is reviewing the salinity reduction strategy with the aim of providing fit-for-purpose recycled water for customers. A review was considered timely due to changing circumstances such as easing of drought conditions, possible impacts from the City West Water salt reduction plant and construction of the Victorian Government's desalination plant at Wonthaggi.

The objective of the salt reduction strategy review is to fill gaps in knowledge and determine the lowest community cost options for salt management. This will be informed by salt sensitivity analysis to establish impacts of salinity and sodicity from recycled water and the cost for its management, and an infiltration study to investigate and identify sources of salt infiltration into the Hobson's Bay Main sewer catchment. An engagement plan has been developed and will be used to identify and incorporate stakeholder views in the revised strategy.

A duplicate Class C pipeline at the Western Treatment Plant is being constructed to increase the flexibility of the plant's recycled water system, and ensure a more reliable supply can be maintained to customers. The pipeline is due to be operational by 2012.

Algal blooms can occur in the treatment lagoons at WTP in summer when increased sunlight and warmer weather coincide with high nutrient concentrations and lower flows.

Research initiatives associated with blue-green algal blooms were undertaken in 2010/11 to reduce the risk of algal blooms impacting on the availability of recycled water. These include:

- Further refining the use of field test-kits that provide rapid indication of blue-green algal toxin levels in Class A recycled water
- Establishing the effectiveness of chlorination for destruction of the blue-green algal toxin, Microcystin
- Assessing the sensitivity of an on-line meter for detection of the proliferation of blue-green algae
- Evaluating the effectiveness of ultrasonic destroyers for blue-green algal control

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Above: Recycled water being used on a golf course

- Developing rapid molecular tools to determine the percentage of the blue-green algae with toxin genes.

Water recycling west of Melbourne

The Western Treatment Plant supplied 11,249 million litres of recycled water to customers in 2010/11 (37,122 million litres last year). This comprises 9,328 million litres of recycled water used onsite (24,337 million litres last year), mostly Class C water for pasture irrigation and land and salinity management, and 1,921 million litres of Class A recycled water supplied to Southern Rural Water and City West Water for offsite customers (12,785 million litres last year).

In addition, 18,723 million litres was provided for conservation purposes in the Ramsar-listed wetlands (17,199 million litres last year). Including the conservation flow, 13.9% of Melbourne Water's treated wastewater was recycled.

Supply to Southern Rural Water

Southern Rural Water was Melbourne Water's largest Class A recycled water customer, with 1,789 million litres supplied (12,483 million litres last year).

Of this total, 1,746 million litres was supplied for growers in the Werribee Irrigation District (12,381 million litres last year) and 43 million litres for customers in the Werribee Tourist Precinct (102 million litres last year).

Supply to City West Water

Melbourne Water supplied 132 million litres of Class A recycled water to City West Water (303 million litres last year) for the Werribee Employment Precinct, MacKillop College and standpipes for water carters.

In the Werribee Employment Precinct, recycled water is used by City West Water commercial customers for wash-down, industrial processes at Melbourne Water's Hoppers Crossing Pump Station and open space irrigation. During the year, 94 million litres was supplied to City West Water for this precinct (138 million litres last year).

City West Water was supplied with 16 million litres of recycled water for MacKillop College (38 million litres last year).

Water carters were supplied with 22 million litres of recycled water from City West Water standpipes at WTP (127 million litres last year) for a range of applications.

Water recycling east of Melbourne

The Eastern Treatment Plant at Bangholme currently produces Class C recycled water. This year 16,741 million litres of recycled water (20,496 million litres in 2009/10) was supplied from ETP, including 14,597 million litres onsite (14,179 million litres last year).

Work has continued on the upgrade of the plant (see Sewerage, page 11). The upgrade will improve the quality of recycled water and enable a broad range of non-drinking applications including toilet flushing, watering sports grounds and irrigating vegetables. Melbourne Water is working with South East Water and Southern Rural Water to investigate opportunities for new recycled water projects, including the Bunyip Food Belt, once the upgrade is complete in late 2012.

Supply to Water Infrastructure Group

Melbourne Water supplied 1,666 million litres of Class C recycled water (5,182 million litres last year) to the Water Infrastructure Group. This was supplied for treatment to Class A recycled water for use in the Eastern Irrigation Scheme.

The Eastern Irrigation Scheme operates under the brand TopAq, a wholly owned subsidiary of Water Infrastructure Group. TopAq distributes the recycled water to more than 80 customers for horticulture, open space irrigation and industrial processes.

TopAq also supplies South East Water with the recycled water for dual pipe schemes in residential developments where the water is used for toilet flushing, garden watering, streetscape and open space irrigation.

Supply to South East Water

Melbourne Water supplied 478 million litres of Class C recycled water to South East Water via the South Eastern Outfall pipeline (1,135 million litres last year).

The pipeline transports recycled water from ETP and smaller South East Water treatment plants to Boags Rocks on the Mornington Peninsula.

South East Water customers along the pipeline use this recycled water for agricultural and horticultural activities, root crop irrigation, flower growing and drip irrigation of vineyards, and for watering golf courses and sports grounds. There are now 53 customers using recycled water from the South Eastern Outfall (50 last year).

Melbourne Water is working with South East Water and Southern Rural Water to investigate opportunities for new recycled water projects, including the Bunyip Food Belt

RECYCLED WATER VOLUMES

	Actual 2009/10		Actual 2010/11		Forecast 2010/11	
	ML	%*	ML	%*	ML	%*
WESTERN TREATMENT PLANT						
Onsite recycling	24,337	9.0	9,328	2.8	30,000	10.9
Supply to Southern Rural Water						
Werribee Irrigation District	12,381	4.6	1,746	0.5	10,650	3.9
Werribee Tourist Precinct	102	0.0	43	0.0	200	0.1
Supply to City West Water						
West Werribee Dual Pipe Project	0	0.0	0	0.0	0	0.0
Werribee Employment Precinct	138	0.1	94	0.0	360	0.1
MacKillop College	38	0.0	16	0.0	50	0.0
Water tankers / standpipes	127	0.0	22	0.0	200	0.1
WTP Total	37,122	13.7	11,249	3.4	41,460	15.1
EASTERN TREATMENT PLANT						
Onsite recycling	14,179	5.2	14,597	4.3	13,800	5.0
Supply to Water Infrastructure Group						
Eastern Irrigation Scheme	5,182	1.9	1,666	0.5	5,000	1.8
Supply to South East Water						
South Eastern Outfall	1,135	0.4	478	0.1	1,600	0.6
ETP Total	20,496	7.6	16,741	5.0	20,400	7.4
TOTAL RECYCLED	57,618	21.3	27,990	8.3	61,860	22.5
Treated wastewater available for recycling	271,108		335,764			
Conservation flows at WTP	17,199	6.3	18,723	5.6		
TOTAL INCL. CONSERVATION FLOW	74,817	27.6	46,713	13.9		

* Refers to percentage of treated wastewater produced at Melbourne Water's treatment plants
ML = million litres