

## Finding alternative water supplies

Declining dam levels, greater demand for water and fears over climate change have forced the government to focus on alternative water supplies.

Amid years of drought and decreasing levels in some of the country's major rivers and reservoirs the federal government in 2004 set up the National Water Initiative (NWI) with the aim of securing future water supplies. The NWI is an agreement between the Commonwealth and the states and territories, with the exception of Western Australia and Tasmania. The National Water Commission was set up to manage and implement the NWI, which sought to find ways to better manage current water resources, particularly in the Murray Darling Basin.

In 2004 the Prime Minister and the Premiers of New South Wales, Victoria, South Australia and the Chief Minister of the ACT signed the Murray Darling Basin Water Agreement, with the aim of more efficient water management.

Major studies have been undertaken into alternative supplies like recycling drinking water, desalination and storm-water harvesting.

Experts also considered a range of measures like stepping up water conservation, imposing tighter usage restrictions and increasing water efficiency.

It was inevitable that two major alternative water strategies were brought to the forefront -- purifying recycled water and desalination, or taking the salt out of seawater.

Both these strategies have been adopted, or are in the pipeline, in the water-hungry states of Western Australia, Queensland, NSW, Victoria and South Australia.

### Recycling drinking water

Queensland is the pioneer state in terms of purifying recycled water and Brisbane will this year become the first city to supplement its drinking water supplies with recycled water.

The introduction of treated recycled water into the drinking water supply is known as "indirect potable re-use" (IPR). In other words, highly treated recycled water is fed into an existing reservoir where it mixes with the source supply. It's then treated the same way the reservoir supply would be, before being fed to households.

The National Water Commission has recommended IPR as one option for securing a sustainable drinking water supply for Australia.

A number of countries worldwide use IPR for drinking water supplies such as Singapore, parts of the UK, the US state of California and the African nation of Namibia.

Water recycling is practiced to lesser quality levels in several states where it's used for irrigation, recreation (such as golf course irrigation), industrial and commercial purposes, but not strictly for drinking.

Melbourne for example has two major sewage treatment plants which treat about 855 million litre of sewage per day, of which about 11per cent (or 36,000 litres per year) is treated, recycled and sold.

This kind of low-grade recycled water can be used for secondary domestic use such as toilet flushing and garden watering, but it is often not viable for domestic use as it requires dual-purpose piping.

### Desalination

The process of desalination, or removing the salt from sea water, is quite a complex one. Salt and other impurities are removed from seawater by a process of reverse osmosis to produce drinking water.

Drought-ravaged Perth opened the country's first desalination plant at Kwinana in 2006, and is already planning a second one.

Major desalination plants are planned for Kurnell in Sydney, Wonthaggi in Victoria and Tugan on the Gold Coast.

Desalination is widely practiced in the Middle East, particularly Saudi Arabia, UAE, Kuwait and Israel as well as India and parts of the US such as San Francisco. Spain -- which has been severely hit by drought in recent years -- Singapore and other US states such as Texas and Florida are planning going down the desalination route.

### Which option is best?

Both alternative water supplies -- purified recycling and desalination -- have produced strong reactions from the public and interest groups.

Critics say desalination is a financially and environmentally costly option. They say it creates extra greenhouse gas emissions, despite various promises that have been made for powering the plants with green energy.

Concerns have also been raised about the effect of the waste product -- salty brine which would be pumped out into the ocean, which could affect marine life. Experts say the brine would be easily diluted if discharged correctly.

Environmentalists say purifying recycled water is a more cost-efficient and energy-efficient option than desalination, which they say also discourages water conservation.

But advocates of desalination insist it's the only 'climate-proof' option to secure future water supplies, particularly in the face of climate change.

Many experts advocate a range of options that include both IPR and desalination, along with water conservation.

"We need a combination of dams, desalination, recycled water, rain-water tanks and storm water reused," says Ted Gardner, principal scientist at Queensland's Department of Natural Resources & Water.

"If we don't have that mixture we don't have a robust water supply system for our cities," he says.

While it's true that recycling is a more cost-effective and energy-efficient option, it will only work if there is an adequate supply of sewage.

"The thing about desalination is it doesn't matter if it rains or not the water is on location," Mr Gardner says.

"As ironic as it may sound, if it doesn't rain while we're in water restrictions we generate less sewerage. We're now in level 5 restrictions (in Brisbane) and we don't have enough sewerage to actually produce 230 ML a day from the existing sewage treatment plants," he says.

But not everyone agrees. Environmentalist and former Australian of the Year Tim Flannery says desalination should just be a back-up, a small plant that doesn't have to run all the time. It should not be the primary source of a city's water supply, he told the ABC earlier this year.

One drawback of IPR is gaining social acceptance and public trust in the purification process. This has not been an issue in Southeast Queensland, where studies have shown high acceptance by the community.

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