

## Rainwater Tanks

### Background

Rainwater tanks have long been a feature in rural areas in Western Australia. For well over 100 years they have provided storage to meet domestic water needs.

Increasingly, the use of rainwater tanks is now being considered as a source of non drinking water for urban areas providing water for uses such as gardens, toilet flushing and clothes washing. This is supported by State and some local government policies to encourage their use.

### *Rainwater tanks and groundwater*

Many areas in Western Australia have a 'natural' rainwater tank where there are groundwater sources. In these areas rain falls on the land, infiltrates the soil and is held in aquifers underground.

Many homes have downpipes that catch water off the roof and direct it to soakwells that recharge groundwater resources. In some cases, this water is tapped into by the home owner through a garden bore and used for garden watering.



### *Benefits*

There are a number of benefits associated with rainwater tanks including:

- reduced risk of water restrictions;
- can help to conserve drinking water supplies; and
- they may contribute to an increase in the resale value of the house.

### *How much water?*

Major determinants impacting how much water is collected by a rainwater tank include:

- size of roof area;
- indoor and outdoor use v outdoor use only;
- rainfall patterns;
- number of household occupants (and therefore usage); and
- tank size.

In the past 25 years Perth has experienced a drying trend. In the 1990s, the average annual rainfall was 766 mm of rain a year and now it is only 671mm a year.

On average, a roof area of 100m<sup>2</sup> (approximately 50% of an average house) in Perth can collect about 50 kilolitres of water a year when plumbed for internal and external use. This can supply up to 20% of a household's water needs. In fact a recent study conducted for the National Water Commission determined that roof size has the single greatest impact on the total yield available from a rainwater tank.

Rainwater tanks rely on rainfall, and storage capacity is limited in urban areas by the available space (generally two kilolitres but could be as big as ten kilolitres).

They are best used frequently, as this increases the number of times they can be refilled (such as connecting for toilet and clothes washing use). These uses require a back up scheme supply for times when there is not enough rainwater stored.

Perth gets 70% of its rainfall in four months of winter and spring. This means that the tanks may only be filled once or twice if they are only used for outdoor water use in a long, dry summer.

### *How safe is tank water?*

The Department of Health supports the use of rainwater tanks for non drinking water uses. There is some increased risk of pollution by airborne chemical and microbiological contamination when rainwater tanks are used for drinking water purposes.

### *Do I need council approval to install a rainwater tank?*

Most local councils require that a building application be approved before a rainwater tank can be installed. Check with your local council before going ahead.

## Current Situation

### *Rebates*

The State Water Strategy released in 2003 recognised that rainwater tanks can make a contribution to household water supplies provided the tank is correctly installed and maintained to minimise risks to public health.

The State Government provides a rebate of up to \$600 for tanks greater than 2 kilolitres that are plumbed into the house. Tanks greater than 0.6 kilolitre that are not plumbed in attract a \$50 rebate.

Rebate type	Number
Plumbed in	766
Not plumbed in	12,067
<b>Total</b>	<b>12, 833</b>

More than 12,800 rebates have been granted, with more than half of these in the Perth region. Most of these were for rainwater tanks that were not plumbed into the home. The estimated saving of scheme water from each of these tanks is about 21 kilolitres a year, and the total cost to Government so far has been \$1.4 million.

### *Designs*

Rainwater tank designs have come a long way from the large round tanks many of us have seen on rural properties. Slimline steel tanks that are designed to fit between the house and the boundary fence are becoming very common to make use of little available space. Some tanks are now being made in plastic which is expected to last as long as a steel tank (between 20 and 30 years). There are also new water sacks that can be installed under a deck or a space under the house. They can hold tens of thousands of litres of water.

## The Future

### *New developments*

Harvest Lakes is a new development south of the Swan River where design guidelines for new homes promote water conservation including low flow showerheads, rainwater tanks and water efficient appliances.

This has been made possible through a partnership between Landcorp, Water Corporation, Department of Water and the building industry. This development won the Water Sensitive Urban Design Award in the Urban Development Institute of Australia Awards for Excellence 2004. It is an example of how new developments can incorporate rainwater tanks into home designs.

### *Five Star plus building standards*

In May 2007 the Government announced new building standards for all new homes to have water and energy saving devices. Stage 1 took effect from 1 September 2007 with various measures including water efficient taps, showerheads and toilets now being mandated for new buildings (residential and commercial).

Stage 2, due to be introduced in late 2008, is expected to require plumbing to be installed to a water supply other than the scheme supply. This means that the cost for a homeowner to connect later to a rainwater tank for indoor use will reduce significantly. This should increase the number of rainwater tanks installed for this purpose in Western Australia.

### *Sustainability considerations*

<b>Economic</b>	<b>Social and cultural</b>	<b>Environmental</b>
Moderate cost of supply – largely borne by homeowner.	May help to maintain gardens as rainwater tanks are not subject to restrictions.	Takes the pressure off other water supplies which may have larger environmental impacts.
May enhance the value of a property.	Poor maintenance may impact their safety for drinking water purposes.	The energy efficiency of a rainwater tank is dependent on the efficiency of the tank pump.
Government rebate available.	Preferred to the taste of scheme water by some people.	May reduce the flow of nutrients into groundwater and stormwater drains.

The Water Corporation has sought to address the major sustainability considerations by:

- working with developers to assist with design to support the installation of rainwater tanks where desired;
- promoting the benefits of rainwater tanks, particularly for indoor non drinking water uses; and
- continuing to administer and review the effectiveness of the rainwater tank rebate.

### *Potential source yield*



Over the past five years the 6,937 rainwater tanks installed in Perth have saved about 0.15 gigalitres a year in scheme supply. It is expected that due to Stage 2 of the Five Star plus building standards to be introduced next year rainwater tanks will become more common. Programs that target large houses connecting to indoor uses will save the most water.

If 100,000 rainwater tanks were installed which used 50 kilolitres of water on average, 5 gigalitres of water – enough for over 20,000 homes – could be saved. Rainwater tanks are climate dependent and this may impact on their long term viability.



While most research has focused on the residential installation of rainwater tanks, there is also the potential for these to be mandated for commercial buildings, particularly where there is a large roof area.

### Costs



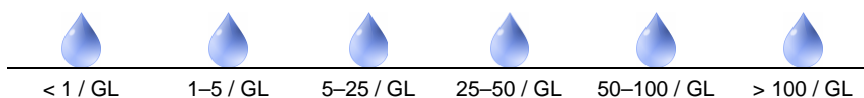
The National Water Commission published a report in March 2007 on the cost effectiveness of rainwater tanks in urban Australia. The following table summarises the cost per kilolitre for a tank plumbed for indoor and outdoor uses in Perth. The lowest cost estimates are in the range of \$2-\$3 a kilolitre.

Tank Size	2kL		5kL		10kL	
	50m <sup>2</sup>	200m <sup>2</sup>	50m <sup>2</sup>	200m <sup>2</sup>	50m <sup>2</sup>	200m <sup>2</sup>
Indoor and outdoor use(\$/kL)	6.98	3.51	7.32	3.04	8.34	3.07
Outdoor use only(\$/kL)	5.07	2.68	5.02	2.40	5.33	2.66

### More Information

- The State Department of Health and the Federal Department of Health and Aging both have excellent guides on using rainwater tanks safely.  
<http://www.health.wa.gov.au/envirohealth/water/rainwater.cfm>  
[http://enhealth.nphp.gov.au/council/pubs/documents/rainwater\\_tanks.pdf](http://enhealth.nphp.gov.au/council/pubs/documents/rainwater_tanks.pdf)
- Cost effectiveness of rainwater tanks in Australia available at  
<http://www.nwc.gov.au/publications/index.cfm>
- Five Star plus building standards  
<http://www.5starplus.wa.gov.au/premier/>
- Harvest Lakes development  
[http://www.landcorp.com.au/portal/page?\\_pageid=231,162276&\\_dad=portal&\\_schema=PORTAL](http://www.landcorp.com.au/portal/page?_pageid=231,162276&_dad=portal&_schema=PORTAL)
- Waterwise Rebate program at Department of Water's website  
<http://portal.water.wa.gov.au/portal/page/portal/WiseWaterUse/WaterwiseRebates>

### Key



Potential source yield (in 50 year planning horizon)



Potential cost (2007 \$)