

# Water

Freshwater is essential to human existence, and to the functioning of the ecosystems that support us. Australia is the driest populated continent on earth and can yield only a limited amount of freshwater. The average annual rainfall in Australia of 469mm a year is well below the global average. Despite this, Australians are the greatest per capita consumers of water, using an average of 100,000L of freshwater per person each year. This figure increases tenfold if the water embodied in the food and products we consume is included.



Available freshwater resources are expected to decline with changes to rainfall patterns accompanying global climate change. As our population grows, so does the pressure on water use. To ensure future supplies of fresh, clean water we need to use it more carefully.

In addition to the problems of limited supply, the way we use water contributes to a range of ecological problems. Conserving water resources, even in areas

without shortages, helps reduce the need to build dams, protects river health by reducing the need to extract water, reduces wastewater produced and treated at sewage plants, lowers energy requirements for treating and transporting water and wastewater, and reduces greenhouse gas emissions. Managing surface runoff and stormwater pollution helps to prevent the degradation of rivers, wetlands and oceans.

The two big issues that households can help to address are:

- reducing the *quantity* of water we consume
- improving water *quality* by managing stormwater and wastewater.

Homes and gardens are directly responsible for about 12% of Australia's water use and much can be done in the home and garden to reduce water use and the impacts of stormwater and wastewater.

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## Reducing water demand

Reducing water consumption in the home is a simple and easy way to decrease water and energy bills and reduce your household's impact on the environment. Indoors, the shower is typically the biggest water user (34% of indoor water use in the average Australian home), followed by the toilet (26%) and laundry (23%). Therefore, effective strategies include choosing water efficient showerheads, toilets, appliances and taps. Outdoors, strategies include choosing local indigenous plants that are adapted for local growing conditions, mulching, and using water efficient irrigation systems.

New homes can be designed to be water efficient and in existing homes water demand can be reduced with renovations and minor upgrades. The national Water Efficiency Labelling and Standards (WELS) scheme requires certain products sold in Australia to be registered, rated and labelled for their water efficiency. Look for the WELS label as a guide for choosing showerheads, toilets, washing machines, dishwashers and taps. It contains a star rating (the more stars, the more water efficient the product) and data on actual water consumption.

## Rainwater

Using rainwater can reduce your water bills, provide an alternative supply during water restrictions and help maintain a green, healthy garden. It can also help to conserve water resources and reduce environmental impacts beyond the home.

Rainwater collected from a well designed and operated system can be suitable for all domestic uses. The more uses, the greater the savings in mains water. Different uses (e.g. toilet flushing, showering) require different levels of treatment. A typical strategy is to use rainwater for the garden and some indoor uses such as toilet flushing, clothes washing and even showering, while sourcing drinking water (which requires the highest level of treatment) from a mains water supply. Typical components of a rainwater system include the roof and gutters, collection system (rain-heads, downpipes and first flush diverters), tank and supply system (pumps, controllers and filters).

Optimum tank size depends on a number of factors including how many uses the rainwater supplies, local rainfall characteristics and roof catchment area. Rainwater systems must be designed to minimise health and safety risks, and need to be maintained.



## Wastewater reuse

At present, potable (drinkable) water is used for practically everything in the house and garden. We are literally flushing our drinking water down the toilet! On-site wastewater reuse can reduce potable water use in the home, though the opportunities for reuse vary depending on where you live. The two types of wastewater created in a home are greywater from non-toilet plumbing fixtures such as showers, basins and taps, and blackwater which has waste from the toilet.

Greywater is ideal for garden watering if detergents low in sodium and phosphorus are used and it is applied below the surface. Appropriately treated greywater can also be reused indoors for toilet flushing and clothes washing, both of which are significant consumers of water. Blackwater requires biological or chemical treatment and disinfection before reuse. For single dwellings, treated and disinfected blackwater can be used only outdoors, and often only for subsurface irrigation. Your local council or state health department can advise on local requirements.

The options for wastewater reuse vary and each has advantages and disadvantages, as do the types of wastewater treatment systems.





## Stormwater

Stormwater is all rain that falls on the roof or land plus anything it carries with it as it drains off site. Stormwater that carries soil, organic matter, litter, fertilisers from gardens and oil residues from driveways can pollute downstream waterways. Reusing stormwater can save potable water and reduce downstream environmental impacts.

Stormwater impacts can be managed during building construction and through water sensitive landscape design. Strategies to employ during construction include limiting cut and fill, and retaining existing vegetation on site (see the appendix *Sediment control*). Landscaping approaches follow the principles of water sensitive urban design, which seeks to imitate the natural (pre-development) water balance of the site. Strategies include permeable paving, garden beds designed for infiltration, and landscape features (e.g. swales and soakwells) that detain stormwater and increase percolation into the soil.

## Outdoor water use

Around 40% of household water is typically used outdoors, and in some locations in Australia the proportion is much higher. Using water conservation techniques in the garden saves money, time and effort and benefits the natural environment.

The many easy ways to reduce outdoor water use follow the principles of water efficient garden design and include choosing plants adapted to the local climate, improving the condition and moisture retention of soil, maintaining the garden, and using water-saving garden products and efficient irrigation systems. (see the appendix *Landscaping and garden design*)

## Waterless toilets

Toilets that use no water for flushing can have lower environmental impacts than water efficient toilets and even recycling wastewater. Waterless toilets or 'dry sanitation' systems do not use water to treat or transport human excreta. If appropriately designed, they conserve precious water resources and avoid disposal of effluent and pollutants into waterways and the general environment. They can also save money on water bills.

The different types of waterless toilets work differently and have different maintenance requirements. There is one just right for your home.



### Author

Caitlin McGee, 2013