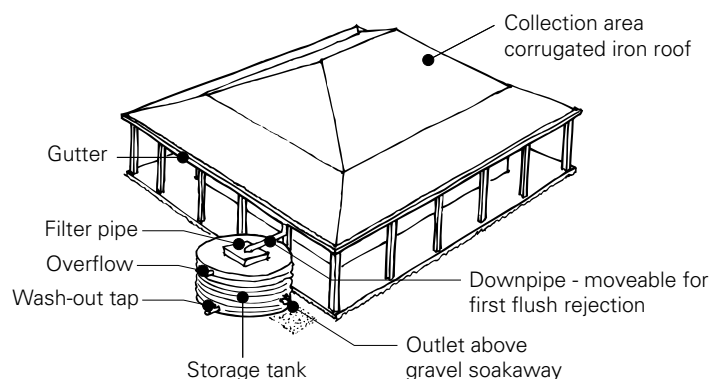


Rainwater



Rainwater is a valuable natural resource that can be collected for household use. Using rainwater can reduce your water bills, provide a chlorine-free supply of fresh drinking water, and reduce community infrastructure costs.

Opportunities for rainwater collection and use vary according to where you live: urban households already have a connection to a centralised, or reticulated, water supply system, whereas rural households typically have to source their water on their property.

Consequently, the regulations and guidelines concerning the collection and use of rainwater vary according to your location. Check with your local council or state health authority for advice on the current regulations and guidelines in your area.



In urban areas water bills will be lowered or eliminated.

USING RAINWATER

Advantages

Rainwater can aid self-sufficiency, providing a back-up supply in case of water restrictions caused by drought, peak supply shortages, or water quality problems.

Rainwater, being chlorine free, can provide a better quality potable supply than mains, bore or dam water.

Rainwater tanks can also provide cost-effective on-site detention of stormwater.

Reticulated water use can be reduced by 50 to 100 percent in urban areas. This can help to:

- > Reduce the need for new dam construction.
- > Protect remaining environmental flows in rivers.
- > Reduce infrastructure operating costs.
- > Reduce the energy used in pumping water, thereby lowering greenhouse gas emissions.

Disadvantages

In areas with reticulated water supply the main disadvantage of installing a rainwater tank is the financial cost. This is particularly the case if your water supplier charges a fixed charge for the centralised supply service, regardless of whether or not you use it.

A rainwater tank will cost a minimum of \$500 for a small 400 litre tank to around \$8000 for a 100,000 litre tank. Costs will vary considerably depending on the tank material, and installation and delivery requirements.

Regular maintenance, such as checking and cleaning gutters, is required, see 'System maintenance' for further details.

Health risks can arise if this is not carried out.

HEALTH AND SAFETY

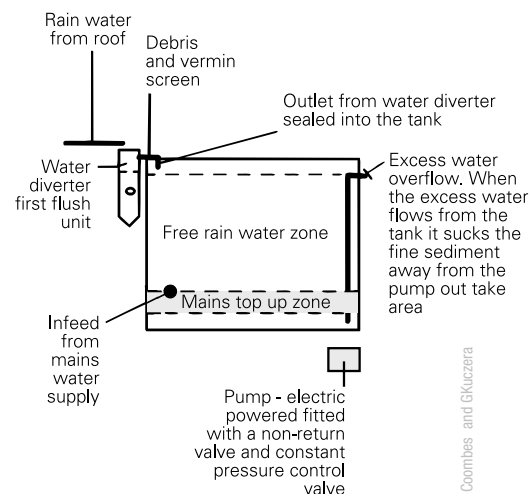
Cover and thoroughly screen tanks to exclude mosquitoes, birds and animals, especially in areas where mosquito-borne disease is an issue.

Design tanks to overflow to gardens, infiltration trenches or the stormwater system.

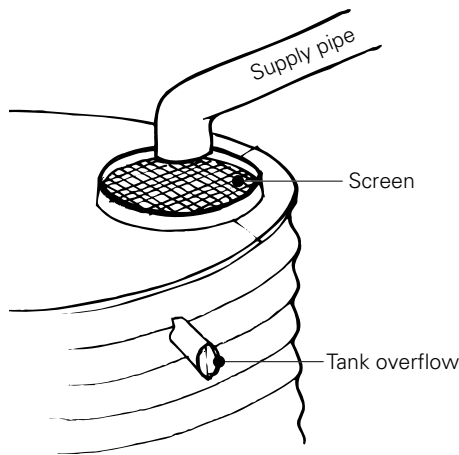
Desludge your tank periodically with a tap installed at its base.

If rainwater and mains supply are both used then mains water must be isolated from the rainwater system by a valve mechanism or tap. Exact specifications vary across Australia. Contact your local council or state health department for advice.

Protect water in tanks from sunlight, which can stimulate algal growth. Plastic tanks may allow light to penetrate so they should be kept out of the sun or painted.



Chemical disinfection or filtration of your rainwater is not necessary if you only use your rainwater for non-potable uses.



If you drink your rainwater it is recommended that you install a filter. Pathogens such as cryptosporidium and giardia may be present in rainwater, and in urban areas there is a risk of chemical contamination from lead and other compounds. Check with your local council, state health authority or rainwater tank supplier for guidance on the type of filter you should install.

SYSTEM MAINTENANCE

Regular maintenance is very important to ensure that your rainwater will be safe for all requirements around the home, including drinking.

The main contamination risks come from animals or birds leaving droppings on the roof and gutters or accidentally entering the tank and becoming trapped.

In urban areas there is also a risk of contamination from airborne pollutants.

To minimise these risks you should:

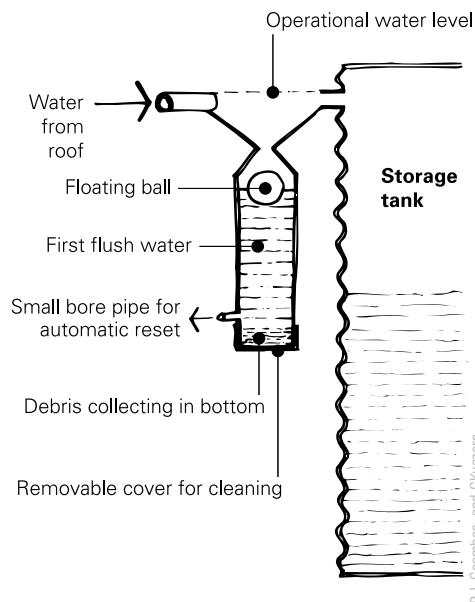
Check your roofs and gutters for vegetation and debris on at least a weekly basis.

Keep the roof clear of overhanging vegetation.

Check and maintain screens around the tank.

Drain and clean your tank every few years to remove sediment.

Install a first flush diverter. This device fits onto your tank inlet and prevents the initial flow of contaminant-laden water from the roof entering the tank when it rains.



Galvanised steel is the most common type of tank material in Australia. It is the least expensive, but its lifespan is limited by corrosion.



Concrete tanks are strong and long lasting. They are typically constructed on-site and can therefore be designed to meet specific site and householder requirements.

BUYING YOUR RAINWATER TANK

The major determinant of tank size is whether or not you have access to a centralised water supply system. If not you will need a tank that is sufficient for all your needs throughout the year. The size required will vary depending on the local climate.

If you have access to the internet you can establish the annual rainfall in your area by visiting the Bureau of Meteorology website, see 'Additional key references'. However, in many areas of Australia the rainfall is highly variable. This can lead to supply security problems.

Refer to Mobbs (1998) for a graph to help you size your tank, or White (ed) (1998) for an equation. Alternatively contact your local rainwater tank supplier or local council for advice.

Other factors that affect the size of your tank include:

- > The intended use of the rainwater.
- > The typical water consumption for these uses.
- > The area of your roof.
- > The security of supply you desire.

TANK MATERIALS

The most common tank materials include plastic (polyethylene), concrete, and galvanised steel.

The type of material you select for your tank depends on your budget, the size of tank required and water use.

Rainwater tanks typically have a twenty year warranty.

Plastic tanks are available in a range of sizes and colours. They are tough and durable and relatively lightweight.

CHOOSING THE RIGHT SYSTEM

Potable water

If you intend to use your rainwater for drinking only you will need a tank of 400 to 1000 litres capacity.

Tanks of this size will cost roughly \$500 to \$800, including installation. If you live in the city and are short of space you can purchase a 'slimline' tank that attaches to a wall on the side of your house.

Elevate the tank so that its base is higher than the kitchen bench to allow gravity feed to a separate tap at the sink.



Alternatively, a small pump can be used to provide pressure, but this should be avoided if possible due to the energy requirements of the pump.

Install a filter. For advice see 'Health and Safety Precautions'.

Garden watering

Fit a tap directly to the rainwater tank for watering the garden, washing cars and for other outdoor uses. A sprinkler will require a pressure pump.

While the amount of water required in your garden will vary with climate, the size of the garden and the type of plants it contains, an average household requires a tank with approximately 2000 to 4000 litres capacity to water their garden year round. This will cost from \$1000 to \$2000, including installation.

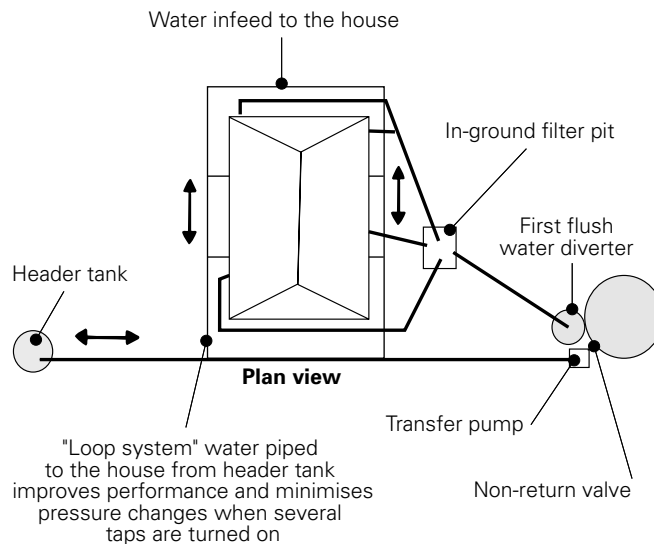
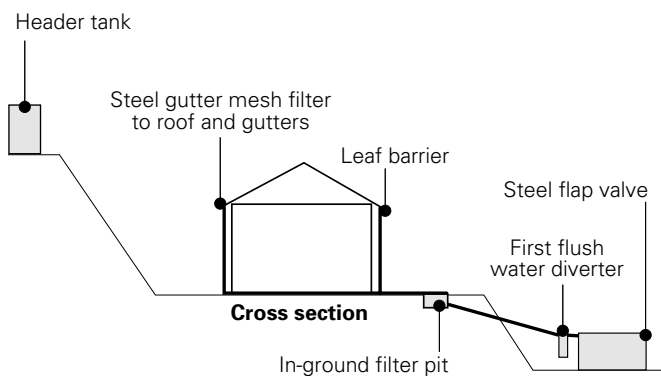
Total household water supply

If rainwater is to be your sole supply you will need a tank with a capacity of 50,000 to 100,000 litres. This capacity will cost from \$5000 to \$8000, including installation and delivery.

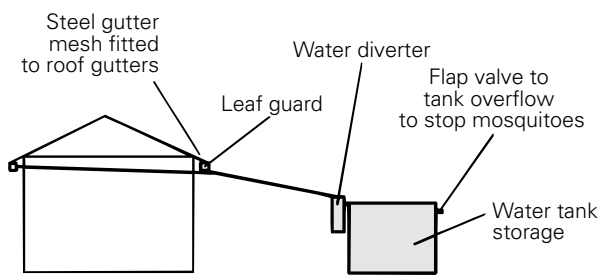
The most economic large tank is normally a concrete tank built in situ.

RAINWATER SYSTEM CONFIGURATIONS

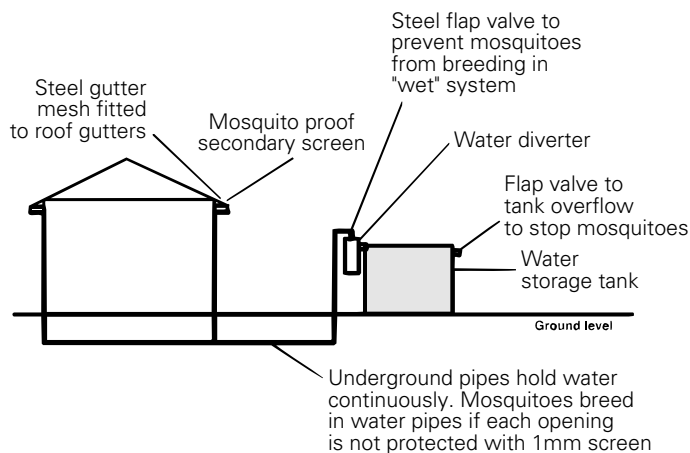
1. Gravity fed system with pump (can be solar)



2. Dry system

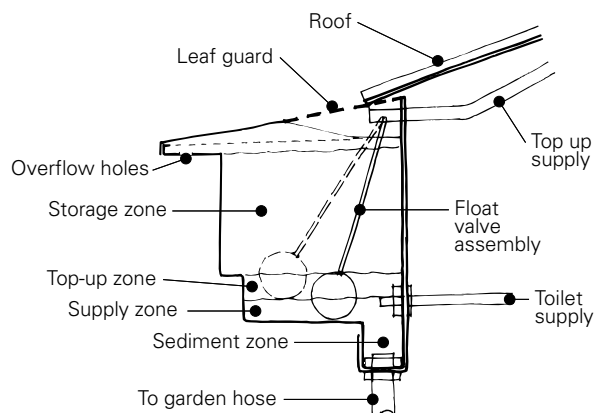


3. Wet system



4. Gutter storage systems

Gutter storage involves directing and storing rainwater in specially constructed large capacity gutters surrounding a house. Gutter storage systems are best suited to new houses, as the cost of the gutters can be offset by savings in building materials. The system is designed to gravity feed non-potable water for toilet flushing and garden watering.



ADDITIONAL KEY REFERENCES

Bureau of Meteorology
www.bom.gov.au/climate/averages

Cunliffe, D. A. (1998). *Guidance on the use of Rainwater Tanks* - National Environmental Health Forum Monographs - Water Series No. 3. Adelaide, South Australian Health Commission.

Mobbs, M. (1998). *Sustainable house: living for our future*. Sydney, Choice Magazine.

Wade, R. (1999). *Sustainable Water: How to do it and Where to Get it*. Brisbane.

White, S. (ed) (1998) *Wise Water Management: a Demand Management Manual for Water Utilities* Water Services Association of Australia, NSW Department of Land and Water Conservation.

Coombes P.J., Kuczera G (2001) *Rainwater Tank Design for Water Supply and Stormwater Management*, Proceedings of the Stormwater Association Industry Association Regional Conference.

Principal author:
Patrick Dupont

Contributors:
Steve Shackel