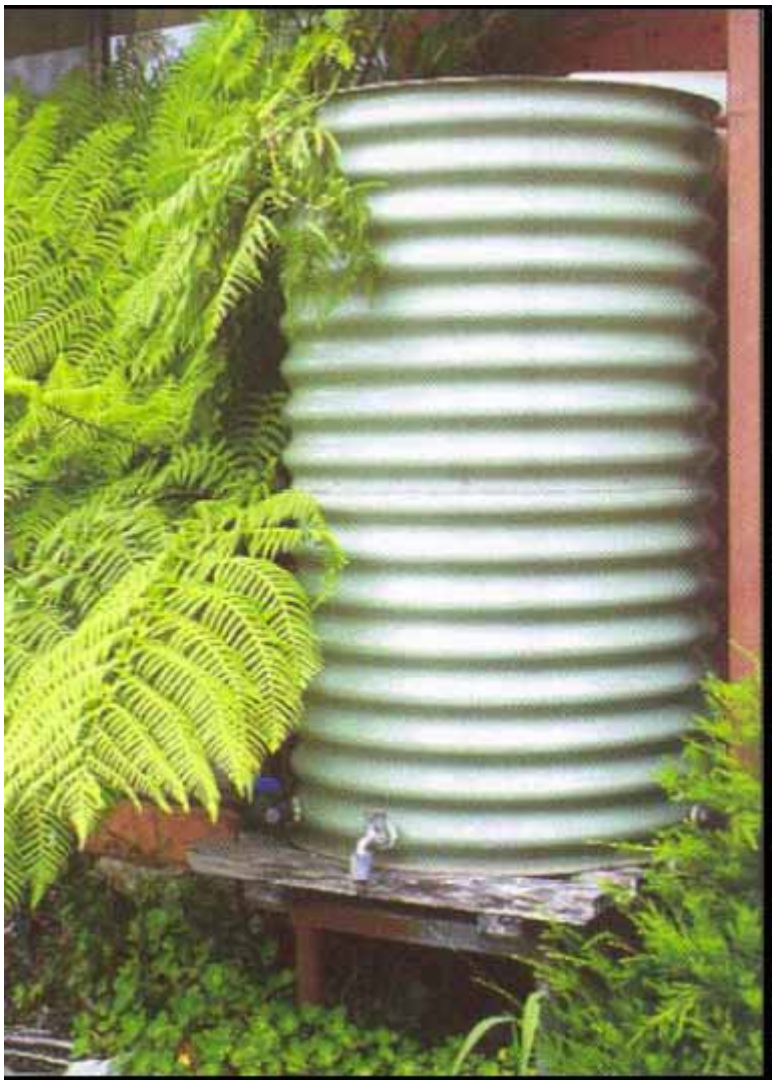
LITHGOW CITY COUNCIL

A GUIDE TO RAINWATER TANKS



A Guide to Rainwater Tanks

This kit aims to assist you to maximise the benefits from the use of rainwater tanks. Water use depends on its availability and its quality, both of which relate to costs. Consideration of your water requirements is essential to determine the right option of your situation. The following information details the factors you should take into account to ensure the appropriate choice to meet your needs.

TABLE OF CONTENTS

Rainwater Tank Information Pack

What you need to know about rainwater tanks

Rain falls from the sky, so if you catch and store enough of it you would not only have a supply of cheap water but you would also have a supply of fairly pure water was well. This seems a simple conclusion; however, there are many factors to consider prior to making a decision to install a rainwater tank.

The cost of water from tanks can be more than town water and the quality can vary considerably. Thus, those contemplating installing rainwater tanks need to understand not just why they are doing it but also the actual outcomes they might receive.

Rainwater tanks have been seen as desirable as they contribute to our overall water resource usage and conserve water for the environment. For use on the garden or other non-drinking uses such as washing and toilet flushing. This generally requires a much larger tank (5,000 litres and above) as the primary purpose would be to reduce town water usage and save water for the environment.

Before you buy a rainwater tank, it's important to make a plan first so that you end up with a tank that best suits your needs and situation. If you intend to use rainwater in your home and garden, you need to install a tank with a least a 5,000 litre capacity. However, your tank size will also depend on your site's constraints. Use the checklist below to guide you when you talk to your tank supplier or plumber.

Things to consider:

- Size and type of tank to suite your needs
- Available area to locate a tank
- Area of roof draining to the rainwater tank
- Extras like a pressure pump, ability to top up with drinking water, a Backflow prevention device and a first flush device
- The suitability of your roofing materials
- Your budget
- What's involved in installation
- What kind of maintenance is necessary
- Council requirements

Apart from purchasing a tank, there are a number of other possible expenses you need to be aware of including:

- Delivery
- Installation
- Gutter, roof and downpipe alterations
- A foundation or tank stand for above ground tanks
- Excavation work for below ground tanks
- Backflow prevention devices
- A flow regulator
- First flush device, screens and gutter guards

- Extra plumbing
- Maintenance
- A pump of needed
- A pipe to top up if needed

After weighing up the cost of a rainwater tank and its associated expenses, you should also consider the long term benefits of purchasing a rainwater tank. This includes the savings in your water consumption costs.

Option 1: No direct or indirect connection with mains supply

Many customers use a rainwater tank just to water their garden and do not have any plumbing work over the top of the tank as a back up water supply. For all cases, you must still comply with Councils installation requirements check this by completing the "Rainwater Tank Compliance Checklist". **See below – Figure 1.**

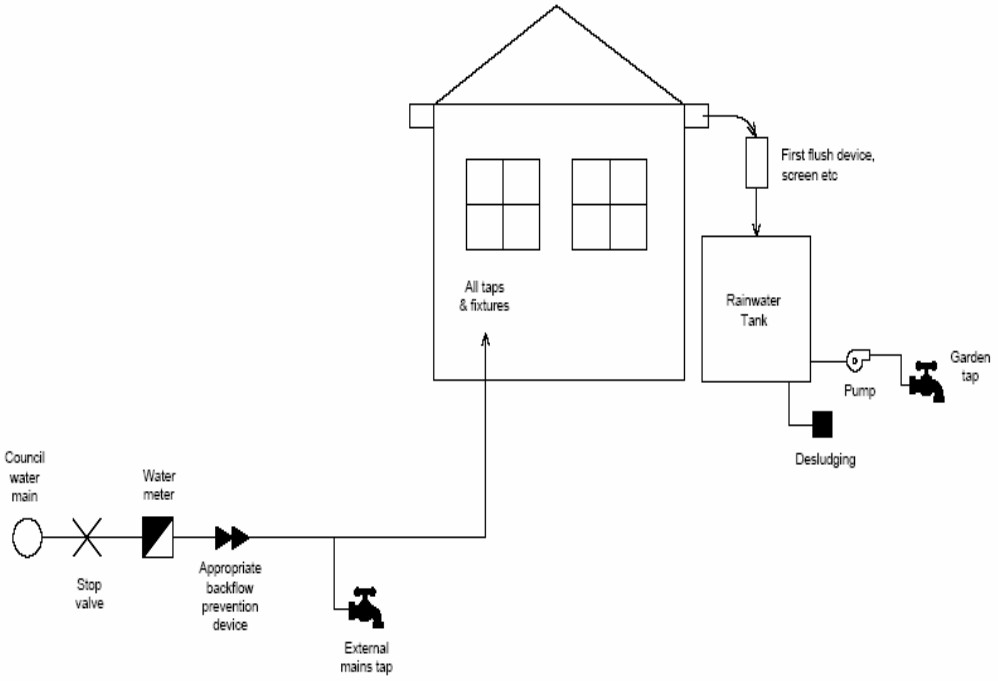


Figure 1: No direct or Indirect Connection with the Mains Supply (Option 1)

Option 2: Connection to toilet and or washing machine and Mains supply with "Top Up"

In cases where customers choose to connect their tank to internal plumbing, for example to supply a toilet or washing machine, because this will usually require a back up water supply to the tank (in the event of low rainfall). These customers will normally have a 'top up' connection from Lithgow City Council Water Supply (Option 2.) A plumber is essential as he will be aware of requirements which will need to be met including having a visible air gap between the water supply and your tank, to gain S68 approval. **See Figure 2**.

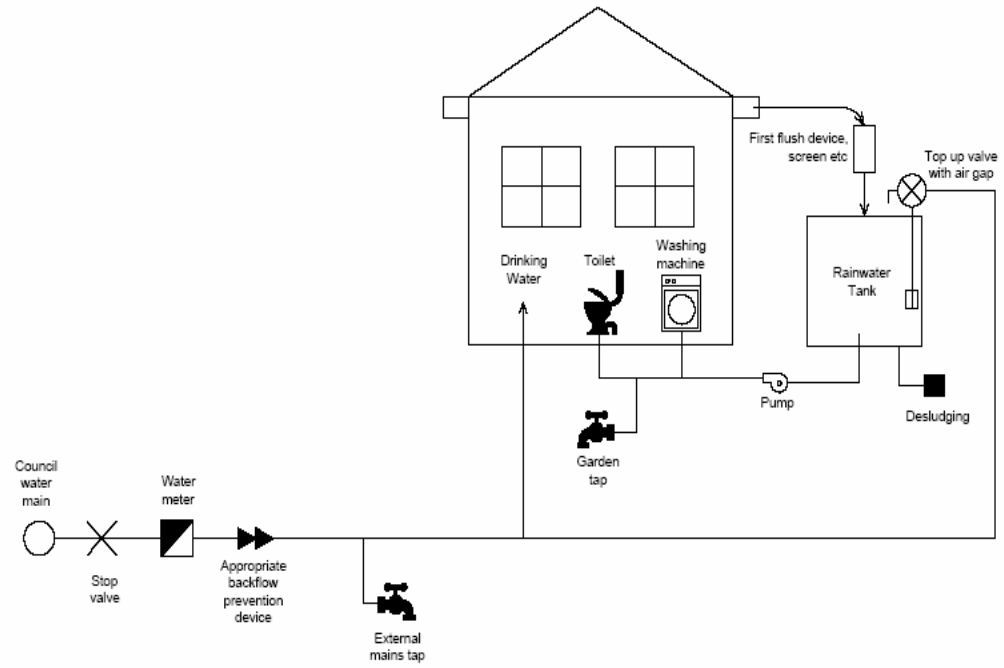


Figure 2: With Topping Up from the Potable Supply (Plumber required – Option 2)

How they work

Rainwater tanks store rainwater run-off from catchment areas like your roof. In most cases, the water from your roof is funnelled along your gutters and into downpipes connected to your tank. If you are going to install a rainwater tank, alterations to your guttering may be required. To get the best out of your rainwater tank, it's important to install appropriate screens to stop debris and insects entering the tank.

The volume of water collected depends on the roof area available as catchment, the size of the tank and the rate of water usage. The following table gives an indication of the dimensions of various tanks:

Typical Tank Size

Volume (Kl)	0.5	1.0	2.0	5.0	10.	20.
Diameter (m)	0.8	0.9	1.3	1.9	2.5	3.6
Height (m)	1.0	1.5	1.5	1.8	2.0	2.0

The table below gives an indication of the amount of water you could collect for use.

Rainwater Tank Yield (litres per day) *						
Contributing Roof Area (m^2)	Tank Size (kilolitres)					
	0.5	1.0	2.0	5.0	10.0	20.0
50	20	25	40	55	65	
100	25	35	55	85	110	130
150		40	65	105	145	180
200		45	70	120	170	225
* Indicative only						

1 KL – 1000 litres
(kilolitre)

Water pressure issue and top up system connection

If you are connecting your tank to the toilet or washing machine you will need to maintain a minimum level of water in your tank and will therefore need a top-up system. This will require you to engage a licensed plumber.

A top-up system will deliver water to your tank through a pipe from the Lithgow Water supply. An air-gap is required between this pipe and the rainwater tank. This is to ensure no backflow can go into the drinking water supply from your tank. (see Figure 2)

Council requires that the flow from your top up system be limited. If the flow rate is too high, it can affect the water pressure supplied to you and your neighbours. When you are topping up your tank, you will need a flow restrictor installed on the piping. This will ensure the water pressure supplied to you and your neighbours. When you are topping up your tank, you will need a flow restrictor installed on the piping. This will ensure the water pressure supplied to your neighbours is not affected when you are filling your tank.

Your plumber can advise of the requirements of the top up system for your property, including determining the air-gap required and flow rate restriction required.

Council Requirements

Please consult the Council before installing a rainwater tank by filling in your "Rainwater tank compliance checklist".

Sizes and Types

It's important to make sure you get the right size rainwater tank to suit your needs. Generally, the larger the tank, the more reliable and effective it is in conserving water or managing storm water. As a guide we recommend:

- A minimum size of 5,000 litres for non potable (non drinking) domestic water uses (eg flushing the toilet, in washing machines, watering the garden) and holding storm water
- A minimum size of 2,000 litres when you have a small garden area to water

These size tanks would generally be sited on the ground and would require:

- A reasonable area within the lot
- May require modifications to guttering to direct water to the tank
- May need a pump to distribute water

If a property is connected to town water and also has a rainwater tank system, the following conditions will apply:

- A suitable backflow prevention device shall be fitted immediately downstream after the water meter
- Tanks may be "topped up" from the town water only through an air gap, external to the tank meeting the requirements of AS3500.
- Rainwater tank systems may be interconnected with the town water supply system, but require an appropriate backflow prevention device. A licensed plumber is required to carry out all work relating to the installation of rainwater tank systems.

Things to consider

- The number of people living in your home (if you want to use rainwater for toilet flushing)
- The amount of water you currently us
- The size of your garden
- Intended use of rainwater (eg garden, toilet flushing)
- Available fittings and components to suit your needs
- The size of the roof catchment area

Types of rainwater tanks available

In general the householder has available choice of rainwater tanks manufactured in either galvanized iron, concrete polyethylene or fiberglass.

For most house applications the tanks are manufactured under factory conditions and transported as a complete unit. Tank sizes are generally standardized and vary little from manufacturer to manufacturer.

Polyethylene tanks

Commonly know as 'poly' tanks, these tanks come in many sizes and colours and are suitable for both above and below ground use. They will last a long time, are UV resistant, often cost less and because of their lightweight and construction are easy to transport.

Metal Tanks

Metal tanks are light and easy to transport, are suitable for above and below ground use, can be custom made and are usually corrugated or straight rolled. They can be made from a variety of metals including:

- Galvanised steel – silver-coloured zinc/aluminum coated steel (prone to rusting)
- Copper and stainless steel used for specialized applications.

Concrete

Concrete tanks can be built above or below ground. They're usually made on site and are durable and long lasting. Sizes up to 10,000 litres may be transported to site. They're good for preventing algal growth (light can't penetrate) and they keep water cool.

Fibreglass Tanks

Fibreglass rainwater tanks are resistant to rust and chemical corrosion and are suitable for both ground and stand installations. They are tolerant of extreme temperatures, come in a large range of colours and sizes and because of their lightweight construction, are easy to transport. Fibreglass tanks can be more expensive than other varieties.

Above or Below Ground Tanks?

Above ground tanks

Advantages:

- Easy to detect cracks and leaks
- Can extract water via gravity and or pumps
- Can be raised off ground to increase water pressure
- Usually cost less than below ground tanks

Disadvantages:

- Testable backflow prevention device required
- More difficult to extract water from – usually need a pump

- Hard to detect leaks or problems
- Hard to empty when top is left on – difficult to drain for cleaning
- Risk of contamination from groundwater or floodwaters
- If access point is left uncovered, there's a risk to public
- Can be damaged by heavy vehicles driving over them.
- Excavation costs

Underground tanks require additional protection against entry of surface runoff or groundwater, animal or human faecal material and soils containing pesticides and fertilizers. These tanks need to be properly sealed and access points need to be protected against ingress of surface run-off. Maintenance and cleaning of underground tanks may be more difficult.

Planning and Building Requirements

Once you have decided on the size and type of tank, you will need to find out about planning and building requirements in your area.

You should consult Council before installing a rainwater tank by forwarding the "Rainwater tank compliance checklist". Tanks with a capacity of 10,000 litres or less generally do not require Council approval. However, tanks are subject to certain government requirements such as location, height, labeling of tank outlets and associated pipe work.

Do not install your tank in a easement or over a sewer maintenance structure. If the tank has a capacity of 10,000 litres or more, check with Council to ensure it is not located near a sewer main. Any overflow from the tank must run to the stormwater system, not the sewerage system.

Installation Requirements

The following requirements and recommendations will ensure your tank operates efficiently and our water systems and the environment are protected.

If you are using the tank water indoors (e.g. Washing machine or toilet) you will need to maintain the minimum water levels in your tank. A licensed plumber will need to connect a 'top-up' system from Lithgow City Council guidelines:

- Install a flow restrictor to ensure the flow rate of water used to top-up the tank does not affect you or your neighbours' water pressure.
- Leave a visible 'air-gap' between the pipe from the mains supply and the tank to ensure rainwater does not flow back and mix with your drinking water.
- Fit a proper backflow prevention device to your meter.
- Label tank outlets and pipes as 'rainwater'
- Make sure there is no connection between the pipes carrying the rainwater and the pipes carrying the mains water unless appropriate backflow prevention devices are installed.
- The tank must be fitted with a first-flush device, being a device that causes the initial run-off of any rain to bypass the tank to reduce pollutants entering the tank.

In all cases, stormwater overflow from rainwater tanks must be directed to the stormwater drainage system and not the sewerage system.

Pumps

Elevated water tanks may provide sufficient water pressure, however, pumps may be necessary to effectively operate irrigation spray system, solenoid valves in dishwashers and washing machines and cistern floats.

If your tank is not sufficiently elevated to allow gravity to provide the required water pressure, you will need to install a pump. Your installer can advise you about the range of pumps on the market.

Two or more tanks can be linked using a pump and there are many types and sizes of pumps available from both tank manufacturers and irrigation suppliers.

Low pressure cistern floats are also available.

All pumps require basic regular maintenance and need to be secured firmly on a concrete plinth and kept under cover.

Pumps have the potential to cause a noise nuisance to your neighbours if installed inappropriately. For example, a pump installed next to a side boundary fence near your neighbour's bedroom window is likely to cause a noise nuisance to your neighbour. Consider the placement of your pump and sound proofing that may be required to reduce a potential noise nuisance.

Maintenance Requirements

It is important to maintain your rainwater tank and components to ensure they work effectively and supply high quality rainwater.

Regularly clean your roof, gutters, first flush devices and insect screens of leaves, debris and overhanging tree branches. If mosquitos are present, find out how they entered the tank and block their access.

Check the bottom and sides of your tank for sludge every two years. If sludge is present, you will need to either siphon the sludge out or empty the tank.

Sediment in the tank may block your irrigation system or discolour your toilet cisterns and washing machine. Check in the Yellow Pages for professional tank clears, if required.

Leaf traps will reduce contamination and sealing the tank from light will discourage the growth of algae and bacteria.

Health

As rainwater falls from the sky, it's mostly free of micro organisms and other pollutants. However, during collection and storage, its possible rainwater can become contaminated.

Find out more about rainwater tank health guidelines from NSW Health www.health.nsw.gov.au and the NSW Health Rainwater Tanks Brochure.

For this reason, NSW Health doesn't advise using rainwater for drinking when there's an alternative mains water supply available. Find our more about rainwater tank health guidelines from NSW Health.

It's important to find out if your roofing materials or the paint used in your catchment areas could contaminate your water tank. Speak to your rainwater tank supplier about testing roofing materials.

Good maintenance is the key to good water quality. Installing screens helps to keep physical contaminations out of your tank, as do first flush devices. Remember to regularly clean first flush devices, gutters and guards. The installation and maintenance of rainwater tanks shall comply with the *Guidance on Use of Rainwater Tanks Health Council 2004*.

Backflow Prevention

It is important for us to protect our mains water supply from any risk of contamination through backflow from tanks into our supply. Backflow occurs when a contaminated source enters the water supply. The contaminated source can enter through a cross connection with the drinking water supply.

The water supply system is designed to ensure that water flows to your property under pressure. If this pressure is not maintained, there is a chance that water could be drawn back into the mains of Lithgow water.

Water pressure can be affected when:

- There is a break in the watermain
- Water is being pumped from the main water supply during a fire
- A customer is using water at a higher pressure than the pressure supplied by Lithgow water (back pressure)
- Heavy water usage downstream, reduces water pressure upstream
- The water outlet on the property is higher than the watermain causing a constant back pressure.