



Use of
TANKS
for storing
DRINKING
WATER

Building Standards

If you are installing a cold water storage tank to hold drinking water, you may have your own private water supply, particularly if you live in a rural area. The water storage tank could be a rainwater tank connected to your roof, or a tank connected to a nearby stream, bore or reticulated water supply.

This guide provides simple information to help you keep your drinking water supply safe and healthy.

Likely health risks

Pathogens

Your drinking water supply can become contaminated with harmful microorganisms (or *pathogens*) including viruses, bacteria and parasites.

Generally, these come from human or animal faeces, such as contamination from a leaking septic tank and on-site waste water management system if you have an underground tank. On-site waste water management systems can also contaminate other water sources (such as a nearby stream or bore) if they're not properly maintained. Water in irrigation channels and streams can be contaminated with pathogens from run-off from farming activities, making it generally unsuitable for drinking if not properly treated.

These pathogens are not visible to the naked eye and may be present in water that appears to be clear. Drinking water that contains pathogens causes gastroenteritis. Children, older people and people with suppressed or weakened immune systems are the most vulnerable to these pathogens.

You can reduce the risks by ensuring your drinking water comes from a reliable source and by regularly maintaining your water supply system.

Chemicals

Chemical and heavy metals contaminants can also pose a health risk, although they are usually less common than other contaminants:

- soil from previous industrial, mining or agricultural activities, which may contain contaminants. Dust

can be blown on your roof and washed into your rainwater tank, leading to chemical residues and other contaminants that can build up in the water over time

- crop dusting, which can result in agricultural chemicals entering rainwater tanks from roof catchments, irrigation channels, streams and dams
- residues from solid wood fired heaters, which can condense near flues on your roof
- residue from lead-based paints or lead flashing on older roofs and gutters, which can be washed into your rainwater tank
- run-off from roofs in urban or industrial areas, which can contain chemical pollutants from the air.

In some parts of Tasmania, groundwater may contain elevated levels of substances such as arsenic and nitrates.

Materials used to manufacture tanks (such as lead solders or non-food grade sealants) can also be harmful to your health.

Making sure your water is safe to drink

To significantly reduce the risk of pathogens, chemicals or heavy metals in your drinking water supply, collect and store your water so that contamination from human, chemical or animal sources is minimised:

- ensure surface run-off, irrigation water, leakage from on-site waste water management systems, other drainage systems and/or underground seepage cannot enter your drinking water supply. If possible, store drinking water in an above ground tank rather than an underground tank; and ensure your drinking water plumbing is completely separate from all other plumbing or pipe systems on your property, and all pipe joints are properly made
- do not collect your drinking water from recently painted roofs (wait until after the first few rainfalls), timber roofs preserved with chemicals, roofs coated with lead-based paints or tar-based coatings, or parts of roofs near flues from solid wood heaters. Most

other roof types will normally be safe for drinking water collection, provided they are kept clean

- regularly clean your roof and gutter to remove leaves, animal remains, dust and other debris. Install simple screens between your roof and the tank, or use a gutter guard or leaf diverter. The first rainfall after a dry period usually collects most of the contaminants on your roof. Installing a 'first flush' or other diversion system will prevent this water from entering your tank. This first flush water can be stored separately and used for non-drinking purposes (such as garden watering)
- if your house is over-sprayed by aerial chemical spraying, divert the collection pipe from your rainwater tank to prevent any chemicals from entering it. Clean the roof or wait until after the next few rainfalls before reconnecting your drinking water tank to your roof
- seal your tank so insects, small animals, birds and sunlight cannot enter. This will help to minimise the growth of algae
- regularly maintain your water tank and clean out accumulated sludge from the base of the tank. You should check your tank for sludge accumulation every two to three years. For advice on desludging your tank, read enHealth's Guidance on use of rainwater tanks (see the end of this guide for details).
- make sure any bore you use as a source of drinking water is properly cased, with an above ground well-head
- always disinfect your water supply if you suspect it has become contaminated with pathogens (see the FAQs in this guide for details)
- consult the installer or manufacturer of your bores, roofing material, tank systems or ancillary equipment for specific advice you may need. Pipes and water tanks should meet the relevant Australian Standards for materials that come into contact with drinking water (you can check this with your plumber, supplier or manufacturer).

Frequently Asked Questions

Do I need to filter my water?

- ▀ Generally, water that is cloudy or dirty will not be suitable for drinking unless it is properly treated. It is usually more cost-effective to obtain your water from a good quality source than to treat poor quality water so it is safe to drink.
- ▀ However, if your drinking water supply does require filtration, make sure the filter complies with the relevant Australian Standards (you can check with your plumber, supplier or manufacturer) and be sure to follow the maintenance instructions.

Do I need to disinfect my water?

- ▀ In most rural areas of Tasmania, rainwater that is collected from a clean roof and securely piped into a well-maintained above ground tank shouldn't need to be disinfected.
- ▀ Groundwater from cased deep bores also shouldn't require disinfection.
- ▀ Groundwater obtained from a shallow bore should be disinfected in case the bore has been contaminated with farm waste or effluent from septic tanks.
- ▀ If you suspect your water supply has become contaminated with pathogens, you should disinfect it before using it for drinking, preparing food, making ice or personal hygiene.

How do I disinfect my water?

- ▀ Inexpensive and effective options include boiling the water that you drink and adding chlorine to the water supply. These are detailed below.
- ▀ Another option is using ultraviolet light. However, ultraviolet light systems require very clear water to work effectively, and must be carefully designed, maintained and operated.

Boiling water

- Bring the water to a rolling boil; use an electric kettle with an automatic shut-off.
- Allow the water to cool before storing it in a clean container until it is needed.
- For further guidance read the Tasmanian Plumbing Code 2013 and enHealth's Guidance on use of rainwater tanks (see the end of this guide for details).

Chlorinating

- Use enough chlorine to provide a free chlorine residual of around 0.5 milligrams per Litre (mg/l) after 30 minutes. As a general guide, an initial dose of 5 mg/l of chlorine will provide this residual. You can test the residual in your water tank with a swimming pool test kit or dip strips (available from pool shops and suppliers).
- To work out how much chlorine to add to your tank to provide the initial dose of 5 mg/l:

1. Calculate the volume of water in your tank (in kilolitres):

For a cylindrical tank:

the volume of water (in kilolitres) =
$$D \times D \times H \times 0.785$$

D = diameter of the tank (in metres)

H = depth of water in the tank (in metres)

To check your calculation, compare this volume with the maximum capacity of your tank.

2. For every kilolitre of water in your tank:

Add either:

- 40 ml of liquid pool chlorine (sodium hypochlorite: 12.5% available chlorine), or
- 8 gms of granular pool chlorine (calcium hypochlorite: 65% available chlorine).

- Follow the safety and handling instructions on chlorine containers. Wear proper hand and eye protection when handling or preparing chlorine solutions.
- After chlorinating, you should ideally wait at least 24 hours before using the water (to allow the pathogens to be destroyed). The chlorine may leave the water with a harmless taste and odour, but this is harmless and should disappear in around 10 to 14 days. Boiling the water will also remove most of this taste and odour.
- For further guidance read the Tasmanian Plumbing Code 2013 and enHealth's Guidance on use of rainwater tanks (see the end of this guide for details).

What can I do if I find a dead possum or bird in my tank?

- A dead animal in your tank will not necessarily cause illness if you drink the water, but it is best to drain all water from the tank as a precaution.
- Wash out any sludge from your tank, repair any holes in the roof, and scrub the interior with a household bleach solution.
- Maintain good ventilation whenever you are cleaning out any tank and always work with an assistant outside the tank.
- Refill your tank with good quality water and disinfect it with chlorine (as detailed above).
- If good quality water is in short supply and it's not feasible to drain and refill the tank, remove as much of the animal carcass as possible and disinfect the water with chlorine (as detailed above).

Where can I get my water tested?

- ▀ Generally, your drinking water supply shouldn't need to be tested if it is well managed and maintained.
- ▀ However, if you do need your water tested, most analytical laboratories can provide this service. Look in a business telephone directory under 'analysts' or check with your local council's environmental health officer.

Is there sufficient fluoride in my private drinking water supply?

- ▀ Fluoride is added to many town water supplies to help protect teeth against decay. Rainwater will not contain fluoride; some groundwater supplies may.
- ▀ If your drinking water supply doesn't contain fluoride, it is especially important to look after your teeth through healthy eating, regular brushing with fluoridated toothpaste (although children under the age of two should not use fluoridated toothpaste without dental advice), and regular dental check-ups.
- ▀ For more information on fluoride, call the Department of Health and Human Services on 1300 135 513.

What other problems might affect my water supply?

- ▀ **Mosquitoes** often breed in water tanks. Screening inlets and overflow outlets with fine mesh is the best option to prevent mosquitoes from entering your tank. If mosquitoes are already breeding in your tank, add a small amount of domestic kerosene or liquid paraffin. Use one teaspoon of kerosene in a 1 kilolitre water tank or 3 teaspoons in a 10 kilolitre tank; double these amounts if you are using liquid paraffin. Do not use industrial or commercial kerosene; do not use kerosene in tanks with a liner or lined with a polymer coating. If in doubt, check with your tank supplier.
- ▀ **Zinc** from a newly galvanised tank might give an unpleasant metallic taste to the water for a while, but is not harmful.

- **Water pH** tends to rise when stored in new concrete tanks, due to the leaching of lime from the concrete surface. These tanks may need to be flushed before their first use.
- **Bushfires** generate large amounts of smoke, ash and debris, which can settle on your roof. Generally this doesn't represent a health risk, although it may affect water colour, taste and odour. If your area has been affected by a bushfire, remove ash and debris from the roof and ensure the first flush of rainwater is not collected in your tank.

I operate a business with a private drinking water supply. Are there any additional obligations I should be aware of?

- If you are using a private water source that supplies drinking water to be used for commercial purposes (such as food processing or commercial accommodation), you are considered to be a 'private water supplier' under the Tasmanian Drinking Water Quality Guidelines (see the end of this guide for details).
- These types of supply require a higher level of management than that required for individual dwellings, as you have a responsibility to reassure the public that the water is safe for drinking.
- Private drinking water supplies in these situations should meet the Australian Drinking Water Guidelines (see the end of this guide for details).

How do I know if my tank is suitable for storing drinking water?

- New provisions in the Tasmanian Plumbing Code 2013 clarify what materials Australian Standards must be met in the manufacture of cold water storage tanks for storing drinking water.
- The manufacturer is to state in its warranty 'This tank has been manufactured for the storage of drinking water and all materials used are suitable for contact with drinking water'.
- Tanks to be used for storing drinking water must have a warning label 'Warning: Drinking Water' (see below for an example). This warning label allows your plumber (when connecting the tank to a drinking water system) to identify the tank's purpose; and alerts water carters to only use drinking water when topping up your tank.



What is required if my tank is also connected to a reticulated supply from one of the water authorities?

- You must obtain a certificate of certifiable work from the relevant water authority for the connection to your property.
- You will most likely be required to provide a physical air gap between the top up to the tank from the water authority's water supply, or install a backflow prevention device at the boundary.

For further information

- Contact your local council.
- Go to your local library for help accessing relevant Australian Standards. These include:
 - ▮ AS/NZS 3500.1 Plumbing and drainage, Part 1 Water services
 - ▮ AS/NZS 3500.1 Plumbing and drainage, Part 3 Stormwater drainage
 - ▮ AS/NZS 3500.5 Plumbing and drainage, Part 5 Housing installations
- See enHealth's Guidance on use of rainwater tanks: go to www.health.gov.au and search for 'rainwater tanks'.
- See the National Health and Medical Research Council's Australian Drinking Water Guidelines: go to www.nhmrc.gov.au and search for 'water guidelines'.
- See the Tasmanian Drinking Water Quality Guidelines: go to www.dhhs.tas.gov.au and search for 'water quality guidelines'.
- See the Tasmanian Plumbing Code 2013: go to workplacestandards.tas.gov.au and search for 'plumbing code'.

For more information contact
Building Standards

Phone: 1300 366 322 (within Tasmania)
(03) 6233 7657 (outside Tasmania)

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