

Rainwater Tanks for Drinking-water Supply

Maintaining Your Water System

Your will need to regularly check and maintain your water supply system to ensure that it operates properly and that the water is safe to drink.

- **Regular Checks.** Every few weeks you should check the easy-to-see parts of the system for any problems (e.g., scum from the overflow, damaged or blocked leaf diverter, leaking tank, overflowing gutter, etc.). Check that the tank access hatch is secure against entry by inquisitive children, and that there is no opportunity for insects, small animals or birds to enter the tank. Keep an eye on the water level indicator and refill the tank *before* it runs dry. Where you can see the roof from ground, keep an eye out for contaminants such as animal droppings and dead birds.

Warning: Climbing on ladders and roofs can be dangerous. Consider seeking professional help (see *Tank Services* in the Yellow Pages).

- **Cleaning tanks and gutters.** You should have your tank and gutters (if necessary) cleaned by professionals from time to time. The Ministry of Health recommend cleaning rainwater tanks every year.

Warning: Never enter an empty rainwater tank without having someone on the outside ready to call for help if needed. Never attempt to rescue someone injured or unconscious inside the tank. Instead, *immediately* call 111 and ask for the Fire Service.

- **Keep tree branches away from the roof.** If possible, keep tree branches at least 2 metres (6 feet) away from the roof to prevent animals from accessing the roof. Also, position T.V. aerials so that they overhang the ground rather than the roof.

- **Pumps, backflow devices and treatment systems.** These will require periodic maintenance. Follow the manufacturer's directions carefully. Keep the manufacturer's directions in a safe place for future reference, and ensure that new home owners are aware of them (this is *your* responsibility).

Water Conservation

Roof-water supplies can run out of water over dry summers. The following are some water conservation measures you should consider:

- Install dual-flush (6/3 litre) toilet cisterns.
- Install low-pressure shower roses (less than 9 L/min).
- Flow restrictors can be installed in some taps.
- Buy water-efficient appliances (e.g., clothes-washing and dish-washing machines).
- Avoid waste disposal units and other high water-use appliances.
- Use garden plants that require minimal watering over summer.
- Minimise your outdoor water use over summer – do outdoor washing jobs in the winter.

Storage Requirements

The amount of water storage you will need depends on the local rainfall, your usable roof area (i.e., the area that drains to the tank), the usual occupancy of the house (particularly over the summer), and how much water you typically use. The following tables provide guidance on the sizing of rainwater tanks for residential supply. The calculations are based on 25 years of rainfall data for each area (1980 to 2005), an average usage rate of 180 litres per person per day, and an average rainfall year. The data should be taken as a guide only because actual conditions can vary widely from those assumed in the calculations.



The usage rate of 180 litres per person per day assumes modern, water-efficient clothes and dish-washing machines, dual-flush (6/3 litre) toilet cisterns, and low-flow shower roses – but not garbage grinders. No allowance has been made for the natural tendency of people on rainwater tanks to conserve water during dry conditions. A minimum volume of water of three day's supply has also been assumed.

Example: Consider a house in Wellsford with a usable roof area of 160 square metres and typical occupancy over summer of 3 people. For one tank of 25,000 litres capacity, the number of refills in an average rainfall year from the table is 3 per year. Using two 25,000 litre tanks would reduce this to 1 refill per year.

Refill Tables

Hibiscus Coast
Raingauge: Orewa (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	2	5	8	1	3	4
120	1	5	8	1	2	4
140	1	5	7	0	1	3
160	1	3	7	0	1	3
180	1	3	5	0	1	3
200	0	3	6	0	1	3
220	0	3	5	0	1	2
240	0	2	5	0	1	1
260	0	2	5	0	0	1
280	0	1	4	0	0	1
300	0	1	4	0	0	1

Warkworth / Mahurangi East
Raingauge: Mahurangi (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	1	3	6	0	1	3
120	0	1	4	0	1	2
140	0	1	4	0	1	1
160	0	1	4	0	0	1
180	0	1	3	0	0	1
200	0	1	1	0	0	1
220	0	0	1	0	0	1
240	0	0	1	0	0	0
260	0	0	1	0	0	0
280	0	0	1	0	0	0
300	0	0	1	0	0	0

Matakana / Omaha / Leigh
Raingauge: Tamahunga (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	1	4	6	0	1	3
120	0	3	5	0	1	2
140	0	1	4	0	1	2
160	0	1	3	0	0	2
180	0	1	3	0	0	1
200	0	0	2	0	0	1
220	0	0	2	0	0	1
240	0	0	0	0	0	0
260	0	0	0	0	0	0
280	0	0	0	0	0	0
300	0	0	0	0	0	0

Wellsford
Raingauge: Hoteo-Oldfields (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	2	5	8	0	2	3
120	1	4	7	0	2	3
140	1	3	6	0	1	3
160	1	3	5	0	1	3
180	1	1	4	0	1	2
200	0	1	4	0	0	2
220	0	1	3	0	0	1
240	0	1	3	0	0	1
260	0	1	2	0	0	1
280	0	1	2	0	0	1
300	0	0	1	0	0	0

Kumeu
Raingauge: Kumeu (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	1	5	8	0	2	4
120	0	3	7	0	2	3
140	0	3	5	0	1	3
160	0	1	4	0	1	3
180	0	1	3	0	0	2
200	0	1	3	0	0	1
220	0	1	3	0	0	1
240	0	1	2	0	0	0
260	0	1	2	0	0	0
280	0	1	1	0	0	0
300	0	0	1	0	0	0

Helensville / Kaukapakapa / Waitoki
Raingauge: Makarau (1980 to 2005)

Usable Roof Area (m ²)	Tank Refills Per Year					
	25,000 Litre Tank			2 x 25,000 Litre Tanks		
	People Per Household					
	2	3	4	2	3	4
100	2	4	7	1	2	4
120	1	4	6	0	2	3
140	1	2	5	0	1	2
160	0	2	4	0	1	2
180	0	2	4	0	1	2
200	0	1	2	0	0	2
220	0	1	2	0	0	1
240	0	1	2	0	0	1
260	0	0	2	0	0	1
280	0	0	2	0	0	1
300	0	0	2	0	0	0

Key: 1 refill or less 2 to 4 refills 5 to 7 refills 8 or more refills

Note: you should aim for 1 refill or less per year if possible because this will reduce the cost of buying tankered water.

For more information about using rainwater contact our Call Centre on 0800 426 5169 or email info@rodney.govt.nz or visit our website at www.rodney.govt.nz

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Rainwater tanks

are a common method of water supply for homes in the Rodney District. About half of the properties in Rodney are on water tanks, and on the Whangaparaoa Peninsula about one third are on tanks with the rest on a public water supply.

The Ministry of Health recommends using the public supply for drinking water purposes (including cleaning teeth, washing

hands, bathing, showering, food preparation and cooking). However, there are many situations where a public supply is not available, and rainwater tanks are the most practical solution.

This pamphlet provides guidance on the selection, use, and maintenance of rainwater tanks for drinking-water purposes where the properties are not connected to a public water supply. It should be read in conjunction with our other pamphlet *Rainwater Tanks for Non-Drinking Water Purposes* which includes additional information about:

- The environmental benefits of rainwater tanks.
- Typical household usage.
- The various components of a rainwater system.
- Building consent requirements.
- Requirements for mains top-up systems (e.g., backflow prevention devices)

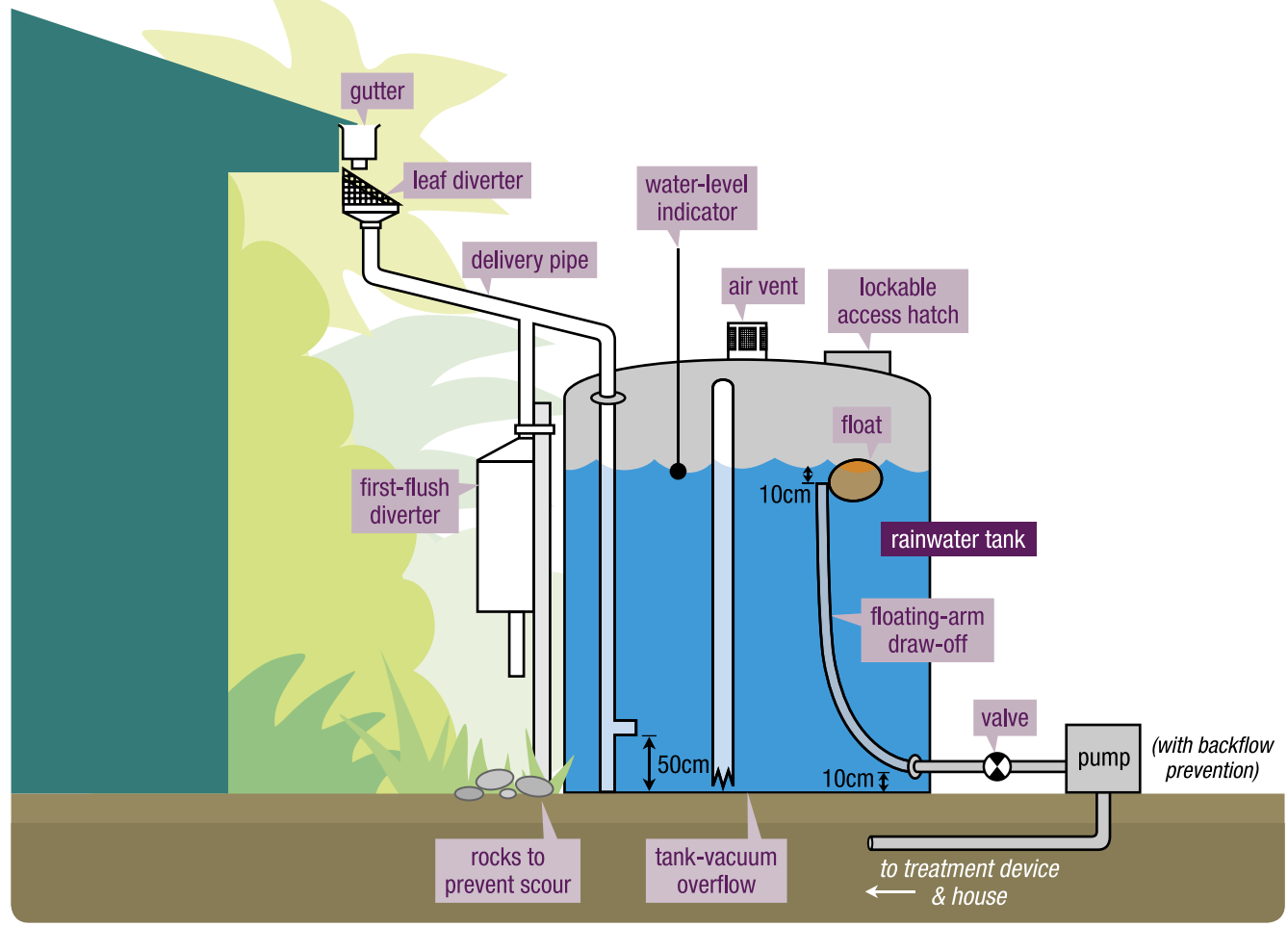
Health Warning
Private water supplies provide highly variable water quality and may not meet the NZ Drinking Water Standards. Advice on providing safe household water can be obtained from the Ministry of Health website: www.moh.govt.nz

Good Design

The following are some key points that you need to consider when designing a roof-water system for drinking water purposes. Note that a building consent will be required from the Rodney District Council.

- **Roofing materials.** Use non-corrosive materials such as clay and concrete tiles. Painted iron is acceptable provided that the paint is safe for drinking-water supplies (check with the paint supplier). Avoid lead in the roof, gutter and paint because rainwater can dissolve lead and contaminate the water.
- **Gutters and pipes.** Use non-corrosive materials such as PVC. Gutters and delivery pipes must be properly sized and sloped to maximise the quantity of water collected and keep the gutter clean of sediment.
- **House plumbing.** Use water-grade pipes from your tank to the house, and good quality, corrosion-resistant plumbing fixtures in the house. Alternatively, unlined concrete tanks help to reduce the acidity of the rainwater.
- **Locate tanks on the cool side of the house.** This not only makes the water nicer to drink, but more importantly, it discourages the growth of organisms in the water that could be harmful. Partially burying tanks is another good way to keep the water cool, and also reduces the visual impact.
- **Water tanks.** Tanks must not leak, and need to be opaque to prevent algae growth. The access hatch should allow safe and easy entry and exit, but also must be child-proof. The tank requires an air vent at the top, but this must be screened to keep insects out.
- **Leaf-diverters.** Leaf-diverters help keep leaves and other coarse debris out of the water tank. However, avoid using leaf-diverters that can trap sediment in the gutter, or deflect water over the edge of the gutter.
- **First-flush diverters.** Dust and other contaminants collect on the roof during dry periods and are washed off by the rain. The first-

* Recent research by the Ministry of Health has shown that first-flush diverters can significantly reduce the risk of harmful organisms reaching the water tank.



flush diverter captures the first part of the rainfall and helps to reduce the amount of sediment that reaches the main water tank.*

- **Delivery and draw-off pipes.** Ideally, the delivery pipe should drain directly into the tank to prevent water being trapped in the pipe and becoming stagnant. If it is necessary to have a buried pipe (e.g., to drain the opposite side of the roof), then use a water-grade pipe with a flushout. The delivery pipe should run down the inside of the tank to the bottom, with the discharge port about 500 mm above the bottom to avoid stirring-up sediment in the tank. The off-take to the house should preferably be a floating-arm type which takes water from just below the water surface.

- **Overflow pipe and tank-vacuum system.** The overflow pipe should have a flap valve on the outlet to prevent insects and animals accessing the tank through the pipe. You should also consider installing a tank-vacuum system which draws the overflow water from the bottom of the tank and helps to remove accumulated sediment.
- **Overflow discharge points.** Overflows from the main tank, and drainage from the first-flush diverter, need to be directed onto the lawn or garden in a manner that does not scour the ground or cause nuisance to your neighbours. For details of suitable discharge devices refer to our *Countryside and Foothills Stormwater Management Code of Practice, Part B – Stormwater Management Device Design Details.*

- **Sizing tanks.** When sizing tanks you need to consider not only your water requirements, but also those of the possible future owners of the property – see below for more details.
- **Treatment devices.** There are a number of commercial systems available to treat roof-collected rainwater. These include chlorine or ultraviolet light to disinfect the water, and fine filters at the household taps. However, treatment systems require care and attention, and will not work if they are not properly maintained.
- **Pumps, backflow prevention devices, and water level indicators.** Seek professional advice on these components as they are critical to the smooth operation of your system. Learn how to restart your pump in case it trips-out when the tank runs dry. Backflow prevention devices prevent contamination from the house back up the plumbing to the tank. Water level indicators don't need to be expensive, but are important as they let you know when the tank is running low.
- **Fire-fighting water supply.** In areas not reticulated for fire-fighting water supply, we recommend that you consider installing a sprinkler system in your home or business. You should also install a quick-connect valve to allow the Fire Service to take water from the tank if required, and, if possible, locate the tank at least 6 metres from the building.

Safe Water
Even if you have installed a treatment device, it is still a good idea to boil all water used for drinking and food preparation. If there is any sudden change in the quality of the water (taste, colour and smell), contact your local public health service and avoid using the water. If people in your household regularly suffer from upset stomachs and diarrhoea, your water may be to blame. Talk to your doctor first, and if necessary, have your water system cleaned by professionals (see Tank Services in the Yellow Pages).
If you have any questions about the safety of your water, contact our Call Centre on 0800 426 5169 and ask to speak with an Environmental Health Officer.