

# Secure Groundwater

## bores and wells

### for safe household water

If your water comes from a bore or a well, there are things you need to know.

Water used for drinking, teeth-cleaning, hand-washing, bathing, showering, food preparation and cooking needs to be free from harmful germs and chemicals. So does drinking water for stock and pets.

Clear water does not always mean the water is safe. The only way to know if your groundwater is safe is through regular laboratory testing. Your local council or public health service will advise about testing.

Major sources of water supply contamination are:

- sewage pollution, including septic tanks
- animal faeces, especially if animals are within 10 metres of a bore-head
- fertilisers

## GERMS - BACTERIA & VIRUSES

Disease-causing bacteria and viruses may enter a water supply at the source, eg, through animal or human faeces. Some of the most commonly found bacteria in bores and wells are *Salmonella*, *E Coli*, and *Campylobacter*. *Cryptosporidium* and *Giardia* can also enter wells that are:

- near rivers
- near septic tanks, or
- poorly protected.

Water-borne germs can cause serious illness (diarrhoea and vomiting) which can be particularly dangerous for infants, very old people or people with damaged immune systems.

If you are unsure about germs in your drinking water supply, you can disinfect some water by:

- a) using an approved filter or purifier (complying with the Australia/New Zealand Standard, AS/NZS 4348)
- b) boiling the water for one minute (or until automatic jug switches off)
- c) adding chlorine. Half a teaspoon of household bleach added to 10 litres of water kills most germs, but only boiling kills *Cryptosporidium*.

## CHEMICALS

Some areas have chemical contaminants in the land the groundwater comes from. Sometimes these can be harmful, like nitrate, arsenic and boron and sometimes they can be a nuisance, like iron.

A high nitrate concentration can affect breathing, because it affects how oxygen is carried round your blood system. This can cause illness in babies and pregnant women. Nitrate can enter groundwater from fertilisers, and is often found where human and animal wastes are discharged.

The chemicals arsenic and boron often occur in geothermal areas.

Iron is not a health risk, but it makes water taste metallic, and can stain washing and whiteware.

Your council will know the groundwater chemicals likely to be in your area.

### Where does my bore water come from?

Bore and well water - groundwater - comes from rain and rivers, seeping down through layers of soil and rock which hold the water and allow its slow movement underground. The areas of "held" water are called aquifers. An aquifer may be confined or unconfined.

**Confined aquifer (secure):** a layer of solid material, like rock, overlays and confines the aquifer, forming a closed, protected collection of water. Contamination is unlikely to enter unless a spring emerges at the surface.

**Unconfined aquifer (not secure):** an unconfined aquifer does not have the top protective layer, so it is possible for surface water to seep in. It is no safer to use than surface water, especially in shingle aquifers overlain by shallow soils.

## How do I know what kind of aquifer I've got?

When the ground is drilled to make a well, the rock layers are noted (this is the "bore log"), and it may be pump tested. This helps show how much water is there, and if the aquifer is confined or unconfined.

If the water levels in the well are seasonally variable, the aquifer is probably unconfined. Artesian water, which flows without pumping, is generally from a confined aquifer.

## How do I know if my water supply is safe?

The safest groundwater comes from secure aquifers under areas with little access by people or animals, where there is no intensive agriculture or industry.

Wells/bores need to be properly constructed and located away from contamination sources, and away from where groundwater could supply contaminants.

ALL bore-heads and well-heads must be secure (sealed and protected), to stop contamination of ANY groundwater, whatever its uses.

## Contamination checklist

Check near the water source - the feed supply to the aquifer - for the following risks to your water supply:

- ✘ pesticides, fertilisers
- ✘ underground stores of petrol or diesel
- ✘ sewage disposal systems, including septic tanks
- ✘ offal pits
- ✘ old or poorly maintained wells
- ✘ animals closer than 10 metres from the bore-head

All these are a risk to your water supply, and therefore a risk to your household's health.

### **What can I do to protect my bore/well?**

- ✓ Seal the area between the casing and the surrounding ground with concrete to stop rain or surface water carrying contaminants into the well.
- ✓ Seal between the casing and any hoses or cables going down the shaft.
- ✓ Lock a protector cap on an unused well.
- ✓ Keep rubbish, pesticides, fertiliser, animals and compost away from the well-head.
- ✓ Seal any free-flowing wells.
- ✓ Install a back-flow preventer if you want to keep a hose feeding a stock trough, to stop any contaminated water flowing back into the home supply.
- ✓ Check the security of your well-head regularly.
- ✓ Earthquakes or other ground movement can damage a well-head, so a maintenance check should be carried out after each event.

Contact your regional council if you want information on your area's land type, natural water flow direction, etc.

### **What should I do to protect my household's health?**

Protecting your groundwater supply, and preventing its contamination, will help safeguard your household's health.

Spending time and money on checking for contamination and protecting your water supply will save on laboratory and water treatment costs and reduce health risks.

If you are concerned that your water supply could be contaminated, or you would like more information about your water quality, you can pay a laboratory to test for chemical and/or microbiological contaminants.

**For more groundwater information:**

- ask your regional council for the leaflet *Your WELL WATER might be making you SICK*
- get a copy of Household Water Supplies (code 4602) from your local public health service or council office
- check out *Guidelines for Drinking-Water Quality Management for New Zealand* (published by the Ministry of Health, held by public libraries, councils and public health services).

If you are concerned about your water supply contact a Health Protection Officer at your local public health service, or an Environmental Health Officer at your local council - they'll recommend a local water testing laboratory. Remember, a master plumber can advise on fitting a water supply system.

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