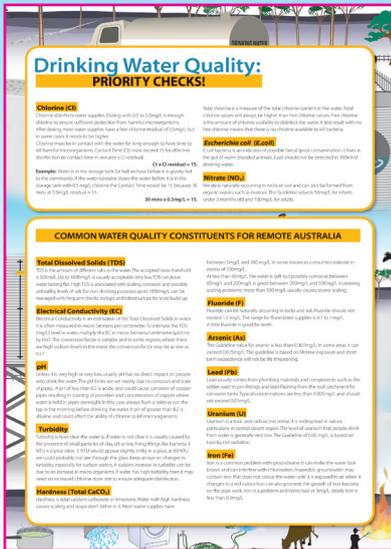


Appendix 5: Water quality



The 'Water Quality' poster provides basic information about drinking water quality that is relevant to remote Australian communities. The poster covers uranium, total dissolved solids, electrical conductivity, turbidity, hardness, lead, fluoride, arsenic, iron, and pH. It is important that people know about these issues because they help us assess the health risk to people who drink the water.

Detailed information about these, and other potential contaminants can be found in the *Australian Drinking Water Guidelines*. Contact your service provider or a water quality expert with any concerns. Appendix 9 'Troubleshooting tips' provides some guidance on common water quality problems.

Water treatment

In communities that have water treatment, hazards to the water supply can include the following:

- Water is not being treated at all (e.g. chlorine has run out).
- Water treatment is not effective (e.g. not enough chlorine contact time).
- Contaminants have been inadvertently added to water (e.g. chlorine overdose).

The risk of these hazards can be reduced by making sure the equipment is maintained and protected from damage, supplies are in stock and the operator is adequately trained.

A small community might not go to the expense of treating and testing a water supply regularly if the water is good quality and the supply system is well managed. However, even these supplies may need event-based treatment; for example, after finding a dead animal in a rainwater tank. In every case, the first priority is to comply with the risk management principles of having multiple barriers to contamination, monitoring and checking the supply regularly and taking prompt action in response to any hazard or water contamination event.

Chlorination and UV are the most common water treatment methods in remote communities.

Chlorination

Chlorine-based disinfectants, such as bleach, are commonly used because they effectively kill micro-organisms, they are safe and cheap, and they are easy to monitor.

Contact time is the amount of time that chlorine needs to be in contact with the water to kill micro-organisms. The contact time will vary with pH and temperature

but 30 minutes should be enough. If it doesn't seem to be effective within 30 minutes, seek guidance from a service provider or water quality specialist. An adequate chlorine residual level will ensure disinfection is effective. The amount of chlorine needed to effectively disinfect the water can change from day to day depending on changes in water quality. The general level for chlorine residual is 0.5 mg/L or 1 mg/L.

There are several ways of adding chlorine:

- Bleach is easy to get and easy to handle. The volume needed depends on the concentration of sodium hypochlorite it contains—household bleach is around 4% but the concentration varies between brands. Pool-grade bleach is around 12%. Once open, bleach starts to oxidize.
- Tablets or granules of calcium hypochlorite are also easy to use and moderately hazardous to handle. They have a long shelf life.
- Chlorine can be added as a liquefied gas. Extreme care needs to be taken with storage and handling because of the gas's high toxicity.
- Hypochlorite can also be created on-site but the capital cost is high, and it requires power and high-level technical skills.

Chlorine is easy to remove. Exposure to air, heat or filtration through activated carbon will remove chlorine from water. Chlorine creates some potentially harmful disinfection by-products and some people don't like the chlorine taste. The benefits of killing pathogens outweigh these disadvantages.

UV

To disinfect using ultraviolet (UV) light, water is passed through a pipe containing a UV-emitting light bulb in a sleeve. UV light is ionising radiation, which kills bacteria and viruses. UV works well when water is already clear and storage and distribution systems are well maintained.

The advantages of UV are:

- no effect on taste
- no by-products
- no chemicals needed
- low maintenance.

However, UV does not provide residual protection like chlorine and it will not work effectively if the water has high turbidity.