



# WATER QUALITY MANAGEMENT

## A MULTIPLE BARRIER APPROACH



IDEALLY DRINKING WATER SHOULD BE CLEAR, COLOURLESS, AND WELL AERATED, WITH NO UNPALATABLE TASTE OR ODOUR, AND IT SHOULD CONTAIN NO SUSPENDED MATTER, HARMFUL CHEMICAL SUBSTANCES, OR PATHOGENIC MICRO-ORGANISMS.

NHMRC AUSTRALIAN DRINKING WATER GUIDELINES

Clean, safe water is vital for everyday life. Water is essential for health, hygiene and the productivity of our community. On average, Hunter Water produces more than 200 million litres of high quality drinking water per day. Under its operating licence, the organisation is required to comply with the current National Health and Medical Research Council (NHMRC) Australian Drinking Water Guidelines.

### PROTECTING OUR WATER QUALITY

Protecting public health and providing our customers with very high quality drinking water is Hunter Water's prime concern. Hunter Water applies a 'multiple barrier' approach to protecting water quality, where water is;

- protected within the catchment
- treated using coagulation and filtration to remove impurities

- disinfected to protect against microbiological contaminants
- transported and stored within a closed distribution system
- routinely sampled and analysed for compliance.

The Framework for Management of Drinking Water Quality has been adopted as a feature of Hunter Water's evolving systems. The Framework emphasises a preventative risk management approach for all steps in water supply from catchment to tap. The principle of the Framework is to have in place robust, preventative measures to assure the quality of drinking water and protection of public health. A foundation of the framework is to instil knowledge of the system to those who use and manage it, and to document all information about this system so no information is lost over time.

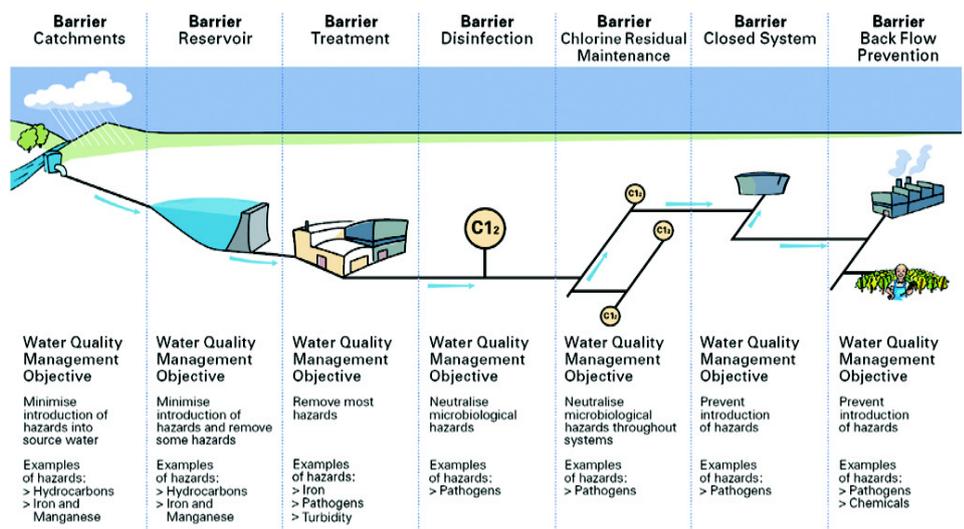


DIAGRAM COURTESY OF SA WATER CORPORATION



## HOW IS WATER MONITORED?

Hunter Water has an extensive water quality monitoring program that includes monitoring at all stages of the supply system. All source waters, treatment processes, and distribution systems are routinely monitored. The results of our water quality are summarised each year in our Annual Water Quality Report, which is available at Customer Centres, or by logging on the website.

## HOW IS THE WATER TREATED?

### Coagulation/Flocculation

During coagulation, liquid aluminium sulfate (alum) and/or polymer is added to untreated water (raw water). When mixed with the water, this causes the tiny particles of dirt in the water to stick together or coagulate. Next, groups of dirt particles stick together to form larger, heavier particles called flocs which are easier to remove by settling or filtration.

### Sedimentation

As the water and the floc particles progress through the treatment process, they move into sedimentation tanks where the water moves slowly, causing the heavy floc particles to settle to the bottom. Floc which collects on the bottom of the tank is called sludge, and is piped to drying lagoons. In Direct Filtration, the sedimentation step is not included, and the floc is removed by filtration only.

### Filtration

Water flows through a filter designed to remove particles in the water. The filters are made of layers of sand and gravel, and in some cases, crushed anthracite. Filtration collects the suspended impurities in water and enhances the effectiveness of disinfection. The filters are routinely cleaned by backwashing.

### Disinfection

Water is disinfected before it enters the distribution system to ensure that any disease-causing bacteria, viruses, and

parasites are destroyed. Chlorine is used because it is a very effective disinfectant, and a residual concentration can be maintained to guard against possible biological contamination in the water distribution system.

### Sludge Drying

Solids that are collected out of the water by sedimentation and filtration are removed to drying lagoons.

### Fluoridation

Water fluoridation is the treatment of community water supplies for the purpose of adjusting the concentration of the free fluoride ion to the optimum level sufficient to reduce dental caries. Hunter Water is required to fluoridate in accordance with the NSW Fluoridation of Public Water Supplies Act 1957.

### pH Correction

Lime is added to filtered water to adjust the pH and stabilise the naturally soft water in order to minimise corrosion in the distribution system, and within customers' plumbing.

## WHY DO YOU CHLORINATE THE WATER?

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## WHY ADD FLUORIDE TO DRINKING WATER?

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## WHAT IS BLUE-GREEN ALGAE?

It's a type of photosynthetic bacteria, called 'cyanobacteria' that relies on sunlight for energy. Blue-green algae is present in most aquatic ecosystems, including creeks, rivers, lakes, and wetlands.

However, as environmental conditions become just right, algae numbers can start to increase rapidly and blooms, or scums, become easily visible across the water surface.

Some blue-green algae species produce substances that can cause musty or earthy tastes and odours in drinking water.

Hunter Water carefully monitors blue-green algal concentrations in its surface waters and strategies are in place for effective treatment of water during periods of increased blue-green algal concentrations.

