

# NIGHTCAP

## water treatment plant

---

### BUFFERING AND PH CORRECTION

Raw water is pumped from Rocky Creek Dam and/or the Wilsons River in to a raw water mixing chamber. This chamber ensures that water from the river cannot siphon back in to Rocky Creek Dam. The water is initially dosed with hydrated lime (“lime”) to raise the alkalinity and hardness and carbon dioxide (CO<sub>2</sub>) to lower the pH. The CO<sub>2</sub> reacts with the lime to form calcium bicarbonate which “buffers” the water, making it more resistant to changes in pH and, together with the CO<sub>2</sub>, prepares it for coagulation.

### COAGULATION AND FLOCCULATION

Coagulants (alum and polyelectrolyte) are added in the flash mixer which rapidly disperses the chemicals in the water. From here the water passes in to six two-stage flocculation tanks. The gentle mixing conditions in these tanks cause finely dispersed lightweight particles in the raw water, such as clay, to bind together and form heavier clumps, called “floc”.



### FLOTATION AND FILTRATION

Water then flows into six filtration tanks. Millions of micro-bubbles of air cause the floc to float to the surface forming a sludge which is then skimmed off and recycled through further treatment in the waste system. The water is filtered through deep sand filters to remove any floc that did not float to the surface as well as the coagulant chemicals which are bound up within the floc.



# NIGHTCAP

## water treatment plant

### PRIMARY DISINFECTION

The filtered water is then pumped through the ozone contact tank where primary disinfection occurs. Ozone, a strong oxidant, is manufactured on-site using generators which convert oxygen (O<sub>2</sub>) to ozone (O<sub>3</sub>). Ozone breaks down any organic material that may be present (such as taste and odour causing compounds, algal toxins, pesticides and herbicides) into biodegradable compounds. The top of the tank is enclosed and from the roof, air is extracted and diverted to an ozone destruction device, preventing ozone from escaping in to the atmosphere. The water is then filtered through biologically activated carbon, where the microbiological action in the filters consumes and removes the compounds.



### SECONDARY (RESIDUAL) DISINFECTION AND PH CORRECTION

The treated water is then given a final dose of hydrated lime to raise the pH to drinking water standards and is dosed with sodium hypochlorite (chlorine) to provide protection against disease causing organisms from the treatment plant to the consumer tap.

### WASTEWATER TREATMENT AND DISPOSAL

The sand filters and activated carbon filters are regularly “backwashed” to keep them clean. This involved pushing high volumes of water through the filter in the reverse direction to filtration, which expands the filter media and flushes out trapped particles. The waste water from backwashing, as well as the sludge skimmed off the surface of the filtration tank, is sent to a central collection tank for further treatment and reuse. From the collection tank the sludge in the waste water is thickened in a clarifier before passing in to a centrifuge. The separated clear water from the clarifier is sent back to the beginning of the plant. The dewatered sludge is then taken away by truck for use in a quarry rehabilitation project.

---

### CONTACT INFORMATION

02 6686 4444

[ballina.nsw.gov.au](http://ballina.nsw.gov.au)

40 Cherry Street, Ballina 2478

