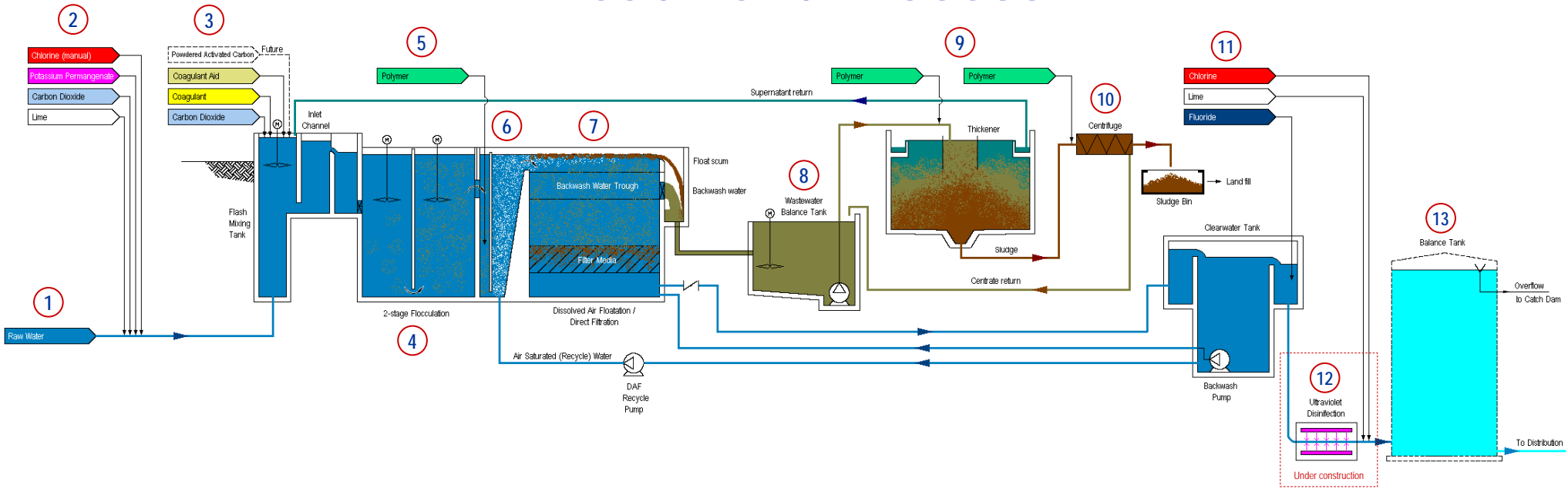


New Stromlo Water Treatment Plant Treatment Process



1. Raw Water

Normally sourced from Corin-Bendora Dams. Water can also be supplied from Colter Dam via manually operated pumps. The available raw water has very low alkalinity.



2. Pre-Dosing

En-route to the plant, the water is dosed within the mains to allow 60 second reaction time prior to reaching the plant. **Chlorine:** Can be dosed manually to provide initial disinfection. **Potassium Permanganate:** Required only seasonally to oxidise and precipitate Manganese and Iron. This enables these metals to be removed via direct filtration. **Carbon Dioxide:** Lowers pH to the levels required for flocculation to occur and helps to increase alkalinity and stabilise the raw water. Dosed constantly in Direct Filtration ("DF") and Dissolved Air Filtration ("DAF") modes. **Lime:** Increases alkalinity to assist flocculation. Used constantly in DF and DAFF modes.



3. Rapid Dosing

The Flash Mixing Tank receives pre-dosed water from the inlet main. Here, dosing and fast mixing occurs. **Coagulant:** Alum, the primary coagulant reacts with the alkalinity to begin producing floc particles. This process is used continuously to remove turbidity and colour along with some other constituents. **Coagulant Aid:** Polyaluminium Chloride (PACl), a more expensive form of Alum but more tolerant of pH and producing less solids is used as the secondary coagulant. This is typically used only when raw water quality is poor. **Carbon Dioxide:** Can be added to trim pH to the optimal level for flocculation. This is typically used during high rates of raw water flow. **Powdered Activated Carbon:** Could be added in future to treat taste, odour, herbicides and pesticides in case (a) such raw water characteristics emerge and (b) the existing process is found wanting.

4. Flocculation

This process occurs over a minimum 9 minutes in two stages that gently agitate and encourage the bonding (agglomeration) of small floc particles to form larger floc particles.



6. Dissolved Air Filtration

High-pressure air-saturated water is released into the flow stream where the air comes out of saturation to form tiny bubbles. These bubbles carry particles to the surface forming a floating scum which is periodically drawn off to the wastewater tank. The flotation process is effective in removing organic matter such as algae. It is used seasonally depending on raw water quality.

7. Direct Filtration

Traps floc particles via mechanical obstruction and electromagnetic attraction. The filters comprise 1.2 m deep of crushed coal (anthracite), 0.3 m sand and 0.1 m gravel.

8. Wastewater Collection

The wastewater tank collects backwash water, DAF float and other miscellaneous plant drainage. The wastewater is mixed in this tank to produce a more uniform output of product to the Sludge Thickener.



9. Sludge Thickening

Following the addition of Polymer (LT27AG) and to encourage floc reformation, incoming wastewater is detained to allow solids to settle to the bottom where a sludge forms and is pumped out to the dewatering facility. The supernatant is returned to the head of the plant (3).



10. Dewatering

Further polymer (LT27AG) is added before a Centrifuge separates water from the incoming sludge. This produces a sludge of minimum 15% solids which is acceptable for use as landfill. The sludge has no nutrient value and contains aluminium and polymer. Water extracted from the incoming sludge is returned to the wastewater tank (8).

11. Corrected Water Dosing

The Clearwater Tank stores filtered water used for backwashing and DAFF recycle purposes. Prior to exit, the filtered water is dosed to meet drinking water quality requirements. **Fluoride:** Is added constantly to comply with Health regulations. **Chlorine:** Is added constantly to disinfect the filtered water. **Lime:** Is added constantly to stabilise the water and raise pH to drinking water range. pH correction is necessary to avoid corrosion occurring within the distribution system.

12. Ultraviolet Disinfection

An ultraviolet (UV) disinfection facility is being added to enable water to be sourced from the Murrumbidgee River. The UV process effectively treats bugs such as Cryptosporidium and Giardia.



13. Balance Tank

Provides detention sufficient for disinfection to occur. Also provides storage of potable water to allow continuity of supply to distribution to be managed.