

Wastewater treatment



Wastewater from toilets, showers, laundries, kitchens, industries and commercial properties are collected through a series of **underground private sewer pipes** then carried by gravity to Council's sewer network system.

The wastewater travels through the sewer reticulation mains by gravity or pumped to various wastewater treatment plants where it is treated to the required standards prior to being returned to the environment or reused as recycled water.

Wastewater treatment plants

Bundaberg Regional Council currently operates **wastewater treatment plants** at:

- Rubyanna
- Millbank
- Thabeban
- Gin Gin
- Lake Monduran
- Bargara
- Childers
- Woodgate

The plant process

The operation and activities at wastewater treatment plants consist of physical, biological and chemical treatment of wastewater. The plants are designed to remove inorganic and organic matter from the influent wastewater to produce effluent that meets the requirements of the Environment Protection Agency (EPA).

The wastewater treatment process consists of four distinct stages:

- **Preliminary treatment:**
Screening and sedimentation
- **Aeration/digestion:**
Biological degradation of volatile organics
- **Disinfection:**
Chlorination of final effluent
- **Dewatering:**
Biosolids concentration to remove water.

The preliminary treatment stage of screening and sedimentation removes coarse inorganic solids from the wastewater. This material is removed upfront from the wastewater as the debris may damage pumps or deposit in process units (taking up volume as well as mostly being non-biodegradable).

The sedimentation process occurs after screening and serves to remove the settled solids prior to treating the wastewater biologically to remove dissolved organics.

Aeration and anaerobic digestion are two distinctly different biological process streams of which the former utilises aerobic micro-organisms while the latter is a process without oxygen present. The micro-organisms from both treatment streams metabolise the organic material into simple, stable compound forms such as Carbon Dioxide, Nitrogenous Oxides, Phosphates and Methane.

Disinfection is the final stage of treatment where chlorine is dosed to the effluent to destroy disease causing micro-organisms.

These biological treatment processes produce a great quantity of biosolids that now undergo dewatering which is accomplished in two ways:

- **Drying beds** – this is a simple process of evaporation
- **Belt press** – biosolids are passed through a belt press which produces a dry cake with approximately 15% water content

The dewatering reduces the quantity of biosolids hauled for final disposal.

Council has adopted initiatives to investigate options for the beneficial reuse of both effluent and biosolids.

Reuse schemes have been established for effluent reuse while biosolids is applied in agriculture for soil conditioning.

The treatment process can be affected by illegal discharges into the system such as toxic trade waste and non-biodegradable household items. Stormwater infiltration can also cause problems (such as flooding) which can impact on the wastewater treatment process.

What can cause the volume of wastewater to change?

The amount of wastewater that arrives at the wastewater treatment plant varies according to the time of day, with the flow generally peaking in the morning and again in the evening. Industry activities can also cause variations to both the volume and quality of the wastewater.

The volume also increases during large wet weather events. This can occur when stormwater downpipes are accidentally connected to private sewer pipes or when old or damaged sewer pipes allow for the intake of groundwater.

Environmental Protection Act

Council has an obligation to minimise environmental harm to the receiving waters when treated wastewater is discharged into the Burnett River.

Environmental Protection (Water) Policy 2009 provides the framework under which Council must manage its environmental obligations.

Bundaberg Regional Council has developed and implemented an Integrated Environmental Management System (IEMS) which provides a systematic approach to managing our environmental responsibilities.