

Benefits to the environment



How does water recycling benefit the environment?

Water recycling benefits the environment by significantly reducing the discharge of nitrogen, phosphorous and contaminants that flows into Brisbane River and Moreton Bay.

Before the Western Corridor Recycled Water Project was built in 2008, six wastewater treatment plants discharged water into the Brisbane and Bremer rivers, which flow into Moreton Bay.

Treated wastewater was released from:

- Oxley Wastewater Treatment Plant
- Bundamba Wastewater Treatment Plant
- Wacol Wastewater Treatment Plant
- Goodna Wastewater Treatment Plant
- Gibson Island Wastewater Treatment Plant
- Luggage Point Wastewater Treatment Plant

Even though wastewater is filtered and treated to an acceptable quality it still contains suspended solids, organic content and nutrients.

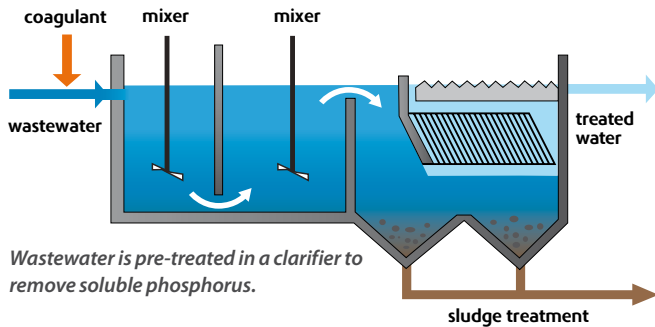
Scientists estimated these treatment plants collectively released more than one tonne of nitrogen and one tonne of phosphorous into our waterways and the bay each day.

Nitrogen and phosphorus damage our rivers, waterways and bay. The nutrients dissolve in water and attach to sediment that flows downstream. High levels of these two nutrients can contribute to algal blooms, fish kills and a decline in water quality.

Since the Western Corridor Recycled Water Project opened, there has been a significant reduction in nitrogen and phosphorous discharge by water treatment plants into Brisbane River, Bremer River and Moreton Bay.



Benefits to the environment



How are nutrients removed?

Existing wastewater treatment plants remove much of the nitrogen, phosphorous and chemicals before the water is piped to an advanced water purification plant. At Brisbane's three advanced water purification plants – located at Luggage Point, Gibson Island and Bundamba – nutrients and chemicals are extracted as the water passes through a network of advanced microfilters, reverse osmosis membranes and advanced oxidation reactors.

Removing these nutrients from the waste stream involves two steps. The first is called precipitation and clarification, which removes the phosphorus and the second step is called nitrification/denitrification, which removes the nitrogen (that is present as nitrate).

Stage 1

Phosphorus is removed through chemical precipitation by adding ferric chloride. The Luggage Point and Bundamba advanced water purification plants use special plate separators, while the Gibson Island water purification plant uses Actiflo units.

Stage 2

At the Bundamba plant, nitrogen is removed by biologically activated filters that convert nitrate to nitrogen gas, which is released into the atmosphere.

Together these steps lower the total phosphorous and the total nitrogen discharged into the environment.

What happens to left-over waste?

The rejected water from microfiltration is recycled back to the pre-treatment tank for reprocessing. The concentrated waste water from the reverse osmosis process is further treated to remove nitrogen. At the Bundamba plant, this treatment includes nitrification and denitrification units to significantly reduce ammonia and total nitrogen before this water is released into the Brisbane River.

The phosphorus and solid waste is added to sludge which is dewatered and transported to special landfill sites. For example, the water purification plant at Bundamba produces approximately 20 tonnes of dewatered sludge a day, which is transported by waste removal trucks to a licensed landfill site at Swanbank.

More water for the environment

Most people in the community believe that a long-term, sustained focus on using less water is central to living with less rainfall. While people have made a considerable effort to reduce water use in homes, business and industry, more can be done to adapt to a changing climate.

Recycling water and water purification schemes such as the Western Corridor Recycled Water Project help to sustain our water supplies, especially in our dams and reservoirs. This means more fresh water is available for our rivers, wetlands and creeks, which helps to keep them healthy.

How much energy is used?

Purified recycled water requires less energy to operate than desalination. The Western Corridor Recycled Water Project uses about one megawatt hour of electricity to produce one megalitre of purified recycled water. The Gold Coast Desalination Plant uses about three and a half megawatt hours of energy to produce the same amount of drinking water.

Further reading

WaterSecure
www.watersecure.com.au

Healthy Waterways
www.healthywaterways.org

Waterwise
www.nrw.qld.gov.au/waterwise

Printed on recycled paper using vegetable based inks.
WaterSecure acknowledges the Queensland Government for some images used in these materials.



Did you know?

Brisbane's advanced water treatment plants have resulted in less nitrogen and phosphorous being released into Brisbane River and Moreton Bay.