

Purified recycled water

June 2018

Advanced water treatment plants produce purified recycled water from treated wastewater.

Purified recycled water is wastewater that's been purified to drinking water standards through multiple levels of treatment and disinfection. Wastewater is created when we use water in the home and from industrial and commercial activities.

This wastewater is then treated at advanced water treatment plants to world-class standards. Using well-known and proven technology and a stringent water testing regime, this process means we can safely recycle water for drinking and other domestic uses.

So far across the world, purified recycled water is blended with another water source, such as groundwater or a dam before being reused.

How is purified recycled water produced?

In South East Queensland, treated wastewater intended for recycling is sent to advanced water treatment plants at Bundamba (west of Brisbane), Gibson Island and Luggage Point (in Brisbane's east).

At the plants, treated wastewater is filtered and then passed through a number of processes including membrane filtration, reverse osmosis and ultraviolet advanced oxidation to produce purified recycled water.

The purified recycled water is then pumped to Wivenhoe Dam, where it blends with rainwater runoff stored in the dam. Water is then treated again at water treatment plants downstream at Mt Crosby, before being delivered to homes and businesses. The advanced water treatment plants can produce about 180 million litres a day or about 20% of current demand.

We call the system of wastewater treatment plants, advanced water treatment plants, and the pipeline network, the Western Corridor Recycled Water Scheme (WCRWS).

Why do we need recycled water?

Nature already recycles water but not always at the right place at the right time. The advanced water treatment plants were built in 2008 during the Millennium Drought - the worst drought in 100 years - to provide a climate-resilient drinking water source.

Under South East Queensland's Drought Response Plan, we will begin bringing the advanced water treatment plants back online when the combined levels of our drinking water dams reach 60% of their capacity. This is so purified recycled water will be available to supplement drinking water supplies in a prolonged drought.



The scheme is currently in 'care and maintenance' mode, as our drinking water dam levels are high. Purified recycled water is currently not being pumped into Wivenhoe Dam.

At all of our water treatment plants, the safety and quality of the drinking water produced is paramount. Purified recycled water will be so clean it exceeds Australian Drinking Water Guidelines even before it is added to Wivenhoe Dam and blended with dam water.

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How we produce purified recycled water in South East Queensland

As with our existing water treatment plants, there are many systems and processes in place to make sure our drinking water is safe.

Waterways and dam

Rain falls in and around the catchments and flows into Wivenhoe Dam, to be stored for use as drinking water.

Surface water treatment and water reservoir

Water released from Wivenhoe Dam travels down the Brisbane River to be treated at the Mt Crosby water treatment plants so it meets drinking water standards. Water is treated through the processes of coagulation, flocculation, sedimentation, filtration, pH correction, primary and secondary disinfection. We also add fluoride. Drinking water is stored in reservoirs before being distributed to communities.

Home and Industrial

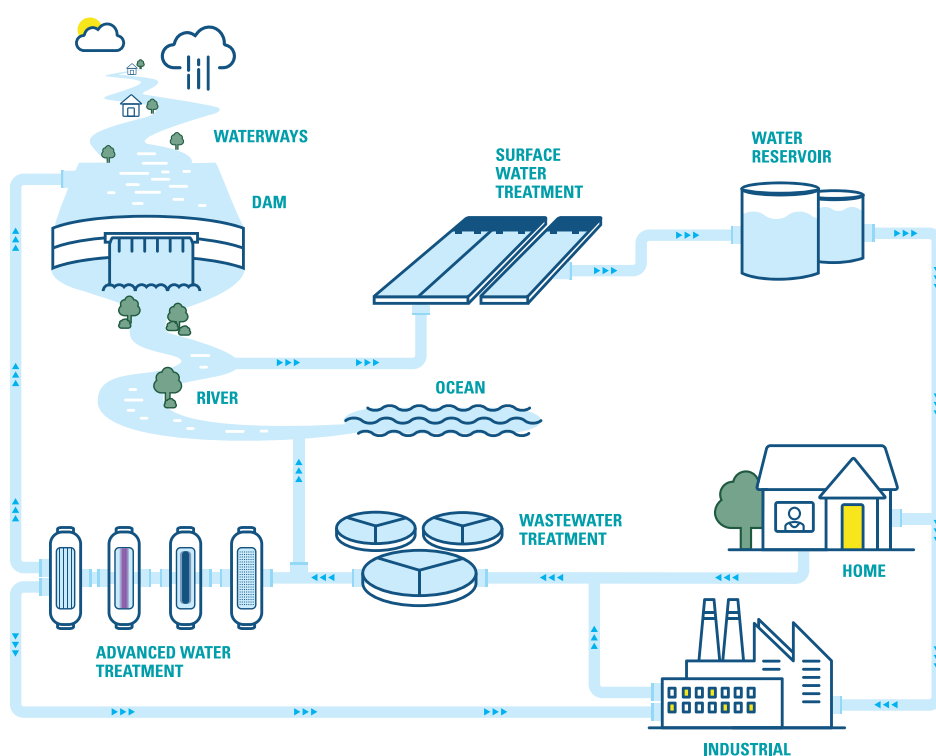
Water is distributed to homes and for other uses in the community. The wastewater created is collected and pumped to wastewater treatment plants.

Wastewater treatment

Wastewater is treated at one of six treatment plants to remove a significant amount of pollutants before being returned to the environment, reused or recycled.

Advanced water treatment

The wastewater, which has now been treated and filtered, is distributed to advanced water treatment plants, where chloramine is added to limit bacterial growth and ferric chloride to remove phosphorous.



The next stage is **membrane filtration**.

The treated water is passed through very fine hollow fibre membranes to remove particulate matter, protozoa and viruses. After this process, the filtered water mostly contains dissolved salt and organic molecules.

The water is then forced through special membranes at high pressure to remove remaining impurities. This is called **reverse osmosis**. The water is now more pure than drinking water.

The filtered water is then exposed to **UV advanced oxidation** - ultraviolet light combined with hydrogen peroxide. The UV intensity is around 300 times that of the sun's rays.

Chlorine disinfection provides a further treatment for bacteria and viruses and ensures the water is protected from any further microbiological growth or contamination.

To prevent corrosion of piping and pumping equipment, the water is stabilised by adding lime and carbon dioxide.

The purified recycled water can then be pumped to Wivenhoe Dam, where it mixes with dam water and the process begins again.

We can also supply purified recycled water for industrial uses, including power generation.