

## Resource 8

### ❖ The Western Corridor Recycled Water Project—Fact sheet

Queensland is being affected by climate change, with warmer winters and hotter summers. During 2006–07 South East Queensland (SEQ) experienced its worst drought in 100 years. The water supply in Queensland is under threat.

In addition, the population of SEQ will almost double over the next 50 years. The region needs additional capacity to meet growing demand. The combined levels of the three main dams that supply water to South East Queensland—Wivenhoe, Somerset and North Pine—reached record lows in 2007.

To ensure that people in South East Queensland have enough water, the Queensland Government decided to use purified recycled water as part of a plan to secure water supplies in this region.

In South East Queensland, purified recycled water will be delivered by the Western Corridor Recycled Water Project pipeline to industry and power stations. It will also be introduced into Wivenhoe Dam to supplement water supplies when SEQ's combined dam levels drop to 40%. Here it will pass through the Mt Crosby Water Treatment Plant before it is distributed to households. It is the largest recycled water scheme of its kind to be undertaken in the southern hemisphere.

The pipeline links six existing sewage treatment plants in Brisbane and Ipswich to three new advanced water treatment plants.

#### **What is purified recycled water?**

Purified recycled water is wastewater that has been treated to the highest standard using a sequence of water treatment processes. This water is then blended into another water supply source such as a dam, flowing river or aquifer. In Queensland, purified recycled water will be subject to strict rules to make sure it meets health and safety requirements at all stages of the treatment process. These safety requirements will be overseen by a team of experts.

There are a number of existing large purified recycled water schemes around the world including the USA, UK, Singapore and Belgium.

#### **How do we ensure that purified recycled water is safe?**

The safety of purified recycled water is assured through a multi-barrier approach. At all stages of the process, the water is subject to quality monitoring and testing. If there is a problem at one barrier, it is identified and resolved at the next barrier. There are seven barriers in the water treatment process that ensure that the final product is safe to drink.

# Resource 8 (continued)

## How is Purified Recycled Water made?

The purification system proposed for South East Queensland involves a 7-barrier treatment process. It will take advantage of proven technology and equipment and will incorporate world's best practice technology and testing protocols.



This diagram has been reproduced with permission from the Queensland Water Commission. Further information is available at <[www.qwc.qld.gov.au](http://www.qwc.qld.gov.au)>.

### » Barrier 1—Source control

The first barrier in managing water quality is to control what is put into the sewerage system. Strict regulatory controls prevent the disposal of harmful and problematic wastes into the sewerage system.

Councils provide a sewerage system mainly for transporting and treating sewage from residential houses.

Some industries and small businesses are allowed to dispose of their trade wastes through the council sewerage treatment system. These businesses require a written trade waste approval from the council that states the requirements and conditions under which discharge to the sewer is allowed. For example, hospitals must obtain a trade waste approval and have waste management plans in place to ensure

## Resource 8 (continued)

that hospital wastes, such as unused pharmaceuticals, are disposed of in an appropriate way and do not enter the sewerage system.

In the home, the sewerage system (that is, sinks and drains) should not be used to dispose of unwanted household products such as pesticides, herbicides, shampoos, detergents, cosmetics, perfumes and cleaning chemicals. Large quantities of chemicals in these products can be problematic in wastewater and, although they will be removed from purified recycled water, they should be minimised at their source as much as possible. Local councils run hazardous household waste drop-off days when you can dispose of some of these waste products.

**Barrier 1—Source control** aims to minimise the risk of harmful chemicals being released into the sewerage system.

### » Barrier 2—Wastewater treatment plant

Our current world-class wastewater treatment plants already play an important role in treating water to a safe standard to discharge to our waterways and they act as a second barrier in the process.

A wastewater treatment plant is a biological reactor that destroys or separates organic matter, solids and most nutrients to produce clear water suitable for discharge into a waterway.

Water passing Barrier 2 is suitable for use in outdoor irrigation, such as on golf courses.

**Barriers 3, 4 and 5 are contained in the advanced water treatment plants.**

### » Barrier 3—Microfiltration

Microfiltration is a process that removes micro-organisms including most bacteria and some viruses. Water is forced through bundles of tiny plastic straws with microscopic holes thinner than one 300th the diameter of a human hair. This technology is commonly used to make everyday products like food, beer, fruit juice, bottled water and soft drinks, as well as to sterilise medicines.

The membranes are checked regularly to make sure that they are working properly. Water passing Barrier 3 is disinfected and can be used for flushing toilets and garden irrigation in areas that have dual reticulation.

### » Barrier 4—Reverse osmosis

Water treated by reverse osmosis is forced at high pressure through dozens of membranes with very fine pores (holes) that are 100 times smaller than a virus. The process removes remaining micro-organisms, chemicals such as pharmaceuticals, and other chemicals such as salts. Reverse osmosis is also used in desalination and in many home water-filtration units.

## Resource 8 (continued)

Water passing Barrier 4 can be used in industrial processes such as computer chip manufacturing, which requires water of much greater purity than tap-water.

### » Barrier 5—Disinfection and advanced oxidation

Advanced oxidation is a disinfection process in which water passes through a chamber where ultraviolet (UV) light, hundreds of times stronger than the sun's rays, reacts with the additive—hydrogen peroxide. By the time water has passed through this barrier, any remaining chemicals or impurities are reduced to harmless levels, well below safe drinking water standards. Doctors and dentists also use UV light to sterilise surgical instruments.

Water passing Barrier 5 is 100% purified recycled water. It is required to meet standards set by the Australian Drinking Water Guidelines and is also strictly regulated by the Office of the Water Supply Regulator. Constant testing ensures that water quality is maintained.

By now, purified recycled water is required to be safe to drink and is supplied direct to industry and power stations. However, it still has to pass through two more barriers before being distributed to households.

### » Barrier 6—Natural environment

When the combined dam levels of SEQ drop to 40%, purified recycled water will be added to our drinking water supplies.

### » Barrier 7—Water treatment plant

Water will leave the dam and pass through the Mt Crosby Water Treatment Plant, which has been producing safe, reliable drinking water for generations. The drinking water treatment process at Mt Crosby involves filtration, chlorination and other treatments before water is distributed to households.

The primary objective of treating drinking water is to remove micro-organisms that may cause infections. These micro-organisms may have entered the dam water when it flowed in its catchment and along the river.

The second objective of drinking water treatment is to improve the colour, taste and odour that may be caused by impurities from the catchment. Chlorine is added to the water before distribution to prevent the regrowth of micro-organisms while the water is distributed to users through the network of pipes. Water passing Barrier 7 is treated drinking water.