Desalination
- Gold Coast -

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What is Desalination?
Desalination is a technology that separates dissolved salts and other minerals from seawater to provide clean drinking water. This water would be combined with current drinking water supplies and distributed directly to users (GC Water 2007).

The most common desalination process is reverse osmosis, which involves the removal of salts and other minerals out of the water as it moves through a membrane process under high pressure. Other processes include thermal distillation and electrodialysis (GC Water 2007).

The major benefit of desalination is that it can continue to deliver high quality drinking water even when there is no rain. It also provides an alternative source of water supply that will make our overall supply more diverse and less vulnerable to disruption. In addition to the benefits, there are a number of significant difficulties associated with desalination. These include minimising energy consumption, minimising the cost of plant construction, operation and treatment, and minimising environmental impacts.

Desalination plants can be found in Israel, Saudi Arabia, United Arab Emirates, Singapore, WA's Rottnest Island and Perth. Sydney, Melbourne and Gold Coast plants are currently in development.

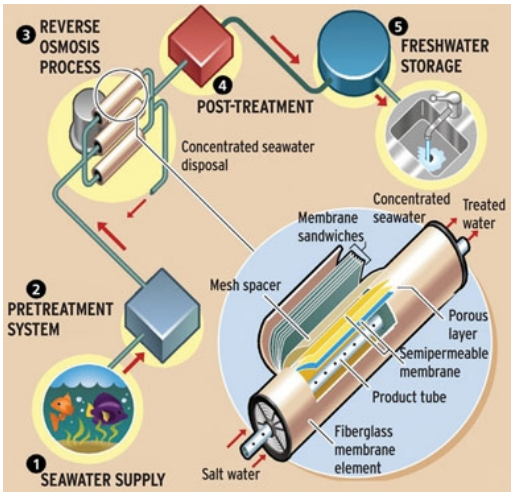

Image: Desalination process (AWA, 2007)

Gold Coast Desalination Plant
The Gold Coast desalination project is a joint initiative between Gold Coast City Council and the State Government costing approximately $1.1 billion. It is part of Council's Gold Coast Waterfuture Strategy and the State's South East Queensland Regional Drought Strategy Contingency Supply Plan.

The Queensland Government is building a sustainable water supply in SEQ through a range of options including the Gold Coast desalination project, SEQ water grid, western corridor recycled scheme and new dams.

The initial 10-year contract to build the Gold Coast desalination facility will include two tunnels, 2.2 km and 2 km long, offshore from Tugun for seawater intake and discharge. A 25 km pipeline will also be built to connect the desalinated water to the southeast Queensland water supply network. The facility is expected to supply 125 million litres of water per day to southeast Queensland.

The project is on schedule to be producing water in November 2008 and fully completed by January 2009.

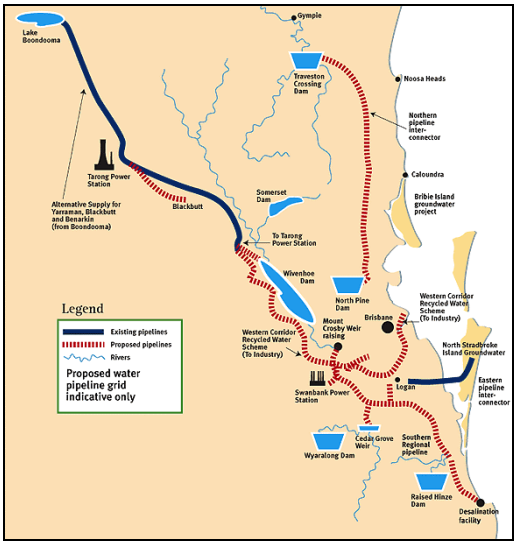

Image: Gold Coast Desalination Plant location (QWC, 2007)

Impacts

The GCD Alliance is in charge of ensuring that the plant meets the highest environmental standards. Stringent environmental investigations were necessary to meet relevant Queensland legislative requirements including marine ecology assessments, bird management assessments, terrestrial ecology studies and marine water quality.

High energy use and greenhouse gas emissions

The energy used in the desalination process is predominantly electricity and heat. Energy requirements for desalination plants depend on the:

- Volume of water
- Salinity and water temperature
- Quality of water produced
- Technology used

Desalination plants due to the high energy requirements produce large amounts of greenhouse gases. A plant using reverse osmosis technology requires less energy (SCC, 2005).

Marine ecology

One of the main impacts of desalination plants is the risk to marine life associated with the ocean water uptakes. Organisms living within the vicinity of the desalination plant have a high mortality rate. As the water gets sucked in from the ocean, marine life such as plankton and fish larvae are unable to escape.

Waste

The discharge of concentrated waste is a major environmental concern with desalination plants. A highly concentrated byproduct consisting of everything that was removed to make fresh water and is often disposed of in the water is referred to as brine. This may contain:

- High salt concentration and chemicals
- Toxic metals

The liquids wastes from the desalination plants may be:

- Discharged into ocean
- Combined with other discharges before ocean discharge
- Discharged into sewer for treatment
- Dried out

Any solid waste produced is disposed of in land fill (SCC, 2005).

Further information

For further information on desalination in southeast Queensland visit the Gold Coast City Council website: www.goldcoast.qld.gov.au

Or contact the Griffith Centre for Coastal Management on (07) 5552 8506 or email gccm@griffith.edu.au.

References

- Sydney Coastal Councils Group (SCC) 2005, www.sydneycoastalcouncils.com.au
- Australian Water Association (AWA) 2007, www.awa.asn.au
- Queensland Water Commission (QWC) 2006, www.qwc.qld.gov.au