Desalination in South East Queensland

FACT SHEET

DECEMBER 2023

South East Queensland's population is set to grow, putting greater demand on existing water supply assets.

Climate change research suggests we may be required to rely less on our dams into the future, with impacts to average temperatures, evaporation rates, and inflows into dams being planned for. The next major enhancement of the SEQ Water Grid could be needed by 2035, based on growth projections and the known impacts of climate change.

To support a safe, reliable and resilient water supply for South East Queensland into the future, Seqwater is currently investigating a second desalination plant for South East Queensland.

Seqwater is also investigating the potential expansion of the existing Gold Coast Desalination Plant, located at Tugun. The plant was commissioned in 2009 in response to the Millennium Drought, and can currently provide up to 43 GL per year.

Desalination is the process of transforming sea water into safe drinking water. Exploring the expansion of desalinated water sources, which don't rely on rainfall, is an essential feature of Seqwater's planning.

Gold Coast Desalination Plant Process

1. Seawater intake and tunnel

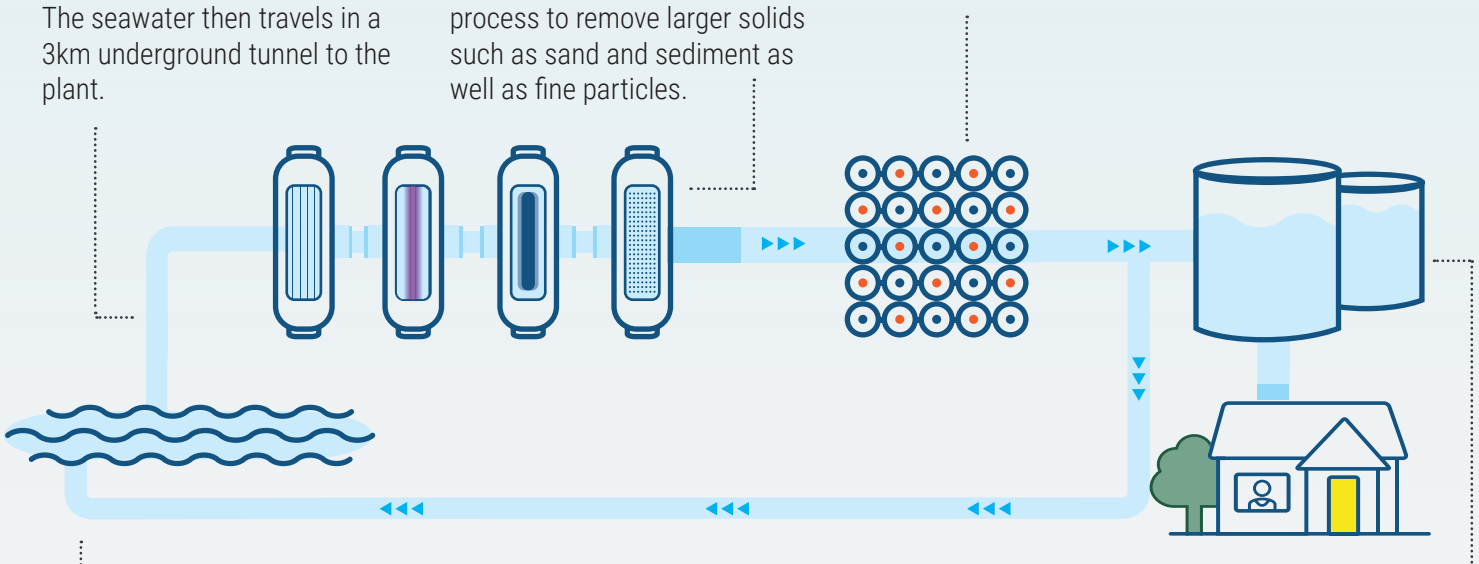
An intake structure on the seabed draws in water at a low speed. Fish and marine animals cannot be drawn in. The seawater then travels in a 3km underground tunnel to the plant.

2. Filtration

The seawater must be very clean before entering the Reverse Osmosis membranes. It is put through a multi-stage filtration process to remove larger solids such as sand and sediment as well as fine particles.

3. Reverse osmosis

Filtered seawater is forced at high pressure through thousands of semi permeable membranes. Salt and other particles are trapped on one side of the membrane, allowing pure water to pass through.



4. Remineralisation, storage and distribution

The water produced is very pure so we add minerals like carbon dioxide and calcium. The treated water is then stored in tanks at the plant before it enters the SEQ Water Grid via a water transfer pipeline.

5. Outfall diffusers and tunnel

The seawater not converted into drinking water, called brine, is returned to the ocean through an underground tunnel and outfall diffusers. The water is released in an area about the size of eight football fields.

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Why desalination

Less than 2% of the world's water is fresh water and our local water supply is largely dependent on rain. Desalinated water offers an alternative source of drinking water and can supplement the SEQ Water Grid when needed, including in drought or when water quality is impacted by flooding.

Desalinated water undergoes a thorough, multi-staged treatment process to meet strict public health regulation standards and the Australian Drinking Water Guidelines 2011.

Environment

Desalination plants are subject to stringent environmental regulations and undergo rigorous approval processes involving regulatory bodies and government agencies.

These ensure comprehensive monitoring and compliance. For the Gold Coast Desalination Plant, we have a long-term independent marine monitoring program in place, which shows that the plant operates in compliance with licence conditions developed to prevent environmental impacts.

Design considerations

Desalination plants implement measures like advanced screens, water velocity control, and strategic intake locations to minimise their impact on marine life. The velocity of the seawater going into the intake structure is low speed so fish are able to swim through the current without being swept in, and a protective grill ensures larger fish and marine life cannot swim into the intake structure. Interestingly, these measures often create thriving habitats for diverse marine organisms around intake structures.

Seawater concentrate, called brine, is safely returned to the ocean through an underground tunnel and diffuser structures. The outfall diffusers are located a distance away from the beach and ocean currents dilute the concentrate within seconds.

The intake and outfall tunnels are underground minimising impacts on beach goers and water recreation.

Did you know…

Desalination plants do not operate at full capacity constantly, the same as conventional water treatment plants. Production is ramped up or down depending on water demands, and can be activated during periods of water stress, extreme weather, and when conventional water treatment plants are offline. Their reduced operation does not diminish their essential contribution to water security.

In 2022-23, the Gold Coast Desalination Plant produced more than 7,310 million litres of treated bulk water to support the operation of the SEQ Water Grid, including in response to the 2022 flood events when raw water quality issues reduced production at conventional water treatment plants. In the preceding two financial years, the plant was also used extensively in drought response.

Seqwater's commitment to sustainability

In line with the Queensland Government's Energy & Jobs Plan, Seqwater is committed to a more sustainable future. Seqwater's approach to Environment, Social and Governance (ESG) is targeted towards potential opportunities to transition asset management and operations to a more sustainable future. Over the next five years, Seqwater's investments in projects and initiatives will incorporate consideration of how Seqwater sources and consumes energy within its operations, as well as across its energy-related value chain.

For more information on desalination in South East Queensland, visit **seqwater.com.au/water-treatment**

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