



## DHI CASE STORY

## IT'S ALL ABOUT TIMING

### Increasing water quality by optimising treated water release in Australia's Gold Coast

Gold Coast is growing, and so is its need to release excess recycled water from its wastewater treatment plants. DHI optimized the timing of recycled water release into the waterway, increasing the amounts of water released while still improving water quality and minimising operational costs.

As one of the fastest growing regions in Australia, the Gold Coast City's population is expected to almost triple until 2056. This rapid growth, which is intensified by over 10 million tourists visiting each year, is placing much pressure on the city's infrastructure, including the wastewater treatment systems.

Currently, approximately 110 million L per day of excess recycled water is released to the Gold Coast Seaway, the main navigation channel connecting the Gold Coast Broadwater to the Pacific Ocean. This release is timed on an outgoing tide for the treated water to be most efficiently dispersed. However, the existing system at the Coombabah wastewater treatment plant (WWTP) was expected to reach capacity soon. Costs for standard infrastructure, such as an ocean outfall or duplicating the existing system, were estimated at more than AUD 60 million. Allconnex Water, Gold Coast's water and wastewater business, looked for a more innovative solution.



*Water is omnipresent in Australia's Gold Coast, and essential for the city's vibrancy.*

#### WHEN RATHER THAN HOW

DHI offered the local knowledge and technical expertise to find an alternative. The solution lay within the timing: Instead of refurbishing or replacing the infrastructure, DHI and Allconnex Water implemented the SmartRelease Decision Support System (DSS), which provides a fundamentally new way of managing the release of recycled water.

#### SUMMARY

##### CLIENT

Allconnex Water, Gold Coast, Australia

##### CHALLENGE

Rapid growth is affecting the Gold Coast's infrastructure, including the release of recycled water. Allconnex Water needed to accommodate increasing recycled water loads while preserving water quality and minimizing operational costs.

##### SOLUTION

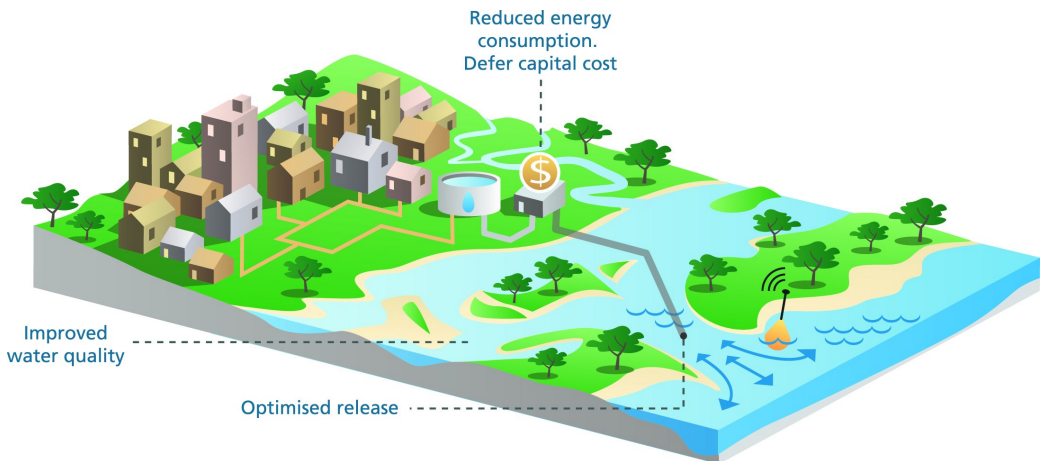
Instead of refurbishing or replacing the infrastructure, DHI optimized the timing of treated water release allowing more water to be released whilst improving water quality.

##### VALUE

- Improved water quality
- Increased volume of water now able to be released
- Deferring new infrastructure investments of AUD 60 million

##### LOCATION / COUNTRY

Gold Coast, Australia



DHI's SmartRelease DSS offers triple benefits: improved water quality, increased recycled water loads and reduced infrastructure costs.

Prior to this project, the treatment plant operators only had information regarding the condition of the plant, but not regarding the environmental conditions of the receiving waters. SmartRelease DSS combines online data from the WWTP with forecasts of wind and wave conditions in the Seaway. These data are fed into a series of MIKE 21 models to determine the optimal time to release the excess recycled water. As this optimal timing changes every day depending on the flushing of the waterway, it can only be predicted by an on-going forecast DSS.

**TROUBLE ON THE WAY**

Simple as it may sound, the project was not always so straightforward. "There were many technical and logistical hurdles to overcome throughout this project", recalls Greg Stuart from DHI Australia. "During the monitoring campaign we had 5 boats and 15 people collecting information on water levels currents, waves and water quality. Over a thousand individual water samples needed to be analysed. Delays in the monitoring program were caused by Tropical Cyclones and major dredging campaigns." Nevertheless – overcoming these problems and advancing the project also benefitted DHI. "We increased our programming skills as well as our monitoring activities", Greg explains. "Moreover, we have raised our profile among the local and regional water industry."

**EVEN BETTER THAN EXPECTED**

Owing to SmartRelease DSS, recycled water is now released without compromising the environmental and recreational value of the city's waterways. On the contrary – thanks to the perfect timing, the water quality has improved even though the amount of released treated water has increased. As a result, Allconnex Water was able to defer the need for the AUD 60

million infrastructure investment for up to 10 years.

"The SmartRelease Project has provided an increased understanding of the behaviour of the recycled water plume within the Gold Coast Seaway and adjacent Broadwater and the impacts of this release", Greg summarises. "The Project has provided a cost effective, short term solution to meet the demands of our growing city while ensuring environmental sustainability and protecting the environmental integrity of the natural receiving waters."

SmartRelease DSS is the first system of its kind in the Australian water industry – but surely not the last: The success of the project is reinforced by the fact that the client has engaged DHI to develop another DSS for releases from additional treatment plants, getting prepared for the region's future growth.



Award-winning work: Owing to its innovative and collaborative approach, including detailed field monitoring, three dimensional modeling and state-of-the-art decision support system, the project won the Water Research Award from the Queensland branch of the Australian Water Association. (from left to right: Guillermo Capati, Allconnex Water; Anna Hollingsworth, Allconnex Water; Greg Stuart, DHI; Sally Kirkpatrick, Griffith University)

**CLIENT TESTIMONIAL**

“ The Seaway SmartRelease Project is enabling us to meet future needs for recycled water release.”

Guillermo Capati—Group Manager Integrated Total Water Cycle Planning—Allconnex Water

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