

OptiFacts



Optimatics

Water Systems Optimization

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“The Optimatics study resulted in a significant reduction in capital costs for a new Water Supply Zone and a major reduction in operating and capital costs for Trunk Infrastructure augmentations across the region in real terms. We have no hesitation in recommending them to other authorities and are currently discussing other opportunities for further work.”

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Gold Coast South Network Optimization Trunk and Reticulation Water Network Optimization

AN OPTIMIZATION study was carried out on the existing capital works plan of the southern region Gold Coast System. The results of the study were unexpectedly significant with an improvement in hydraulic performance and large savings.

KEY POINTS

- Significant savings
- Trunk system optimization
- Reticulation system optimization

Background

With a fast growing population and the demand to increase water supply, Gold Coast Water engaged Optimatics to optimize the distribution system for the southern Gold Coast by augmentation of the bulk transport and reticulation mains.

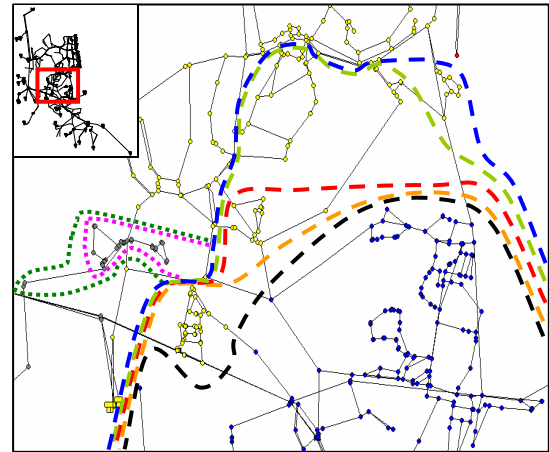
The Project

The project was split into two parts. The first phase involved the optimization of the reticulation system, including new boundary location requirements. The second phase was to optimize the bulk water system, including zone storage sizes.

Multiple zone boundaries

During Part 1 of the study, which focussed on the reticulation mains, cutting costs was not the only objective. Optimatics was also required to consider five northern and four southern possible zone boundary locations.

The choice of these boundary locations impacted on the pressures achieved within the network and the amount of storage at the tanks feeding the



Multiple zone boundary locations optimized within the study

zones.

Trunk system

Part 2 of the study was the optimization of the additional pipes, storage, pumps, and system operations required to deliver the water to all 10 sub-zones for best utilisation of the existing Gold Coast trunk main system. This phase also considered an extended period simulation (EPS) of the mean day, maximum month demand case.

Key Outcomes

Optimatics identified a superior design that improved levels of service and reduced capital. The

optimized solution performed slightly better hydraulically and utilised the existing storage more effectively.

For part 2 of the study, two different preferred solutions were identified (Options 2 and 3.) Savings achieved for each of the studies are shown in the table above.

Benefits

Planning of new water sources for a city can involve a significant change in the flow paths of the bulk water. This can mean significant capital works and the need for optimal scenario modelling.

This optimization study resulted in a robust master plan, and enabled Gold Coast Water to save millions of dollars through improvements to their original design.

	Original cost	Saving in \$	Saving as %
Study 1	\$29.5 million	\$8.6 million	29%
Study 2 - Option 2	\$40.9 million	\$7.8 million	19%
Study 2 - Option 3	\$40.9 million	\$14.2 million	35%

Multiple zone boundary locations optimized within the study