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OVERVIEW

A water authority is looking to install a new concrete reservoir. The authority is wishing to explore the *sustainability* and *whole of life cycle cost benefit* for the use of Xypex high performing Crystalline Technology admixtures with the proposed 30.5m diameter 10m high structure which will employ post tensioning cables and conventional reinforcement.

The following report will outline the Whole of Life Cycle costs benefit assumptions and table the estimated net present cost benefit Xypex additives can provide to the project.

ENVIRONMENTAL CONDITIONS

The proposed structure will be located within 1.5km of the coastline. Therefore, chloride ingress and sulphate reactions from the seawater/coastal environment is of concern. To confirm the presence of chloride, we would recommend testing of structures in the areas for surface chloride levels. For the purpose of estimates, we have reviewed much literature regarding the potential surface chloride levels which are affected by many parameters. For simplicity, we are assuming a chloride surface level of 0.6% by weight of concrete.

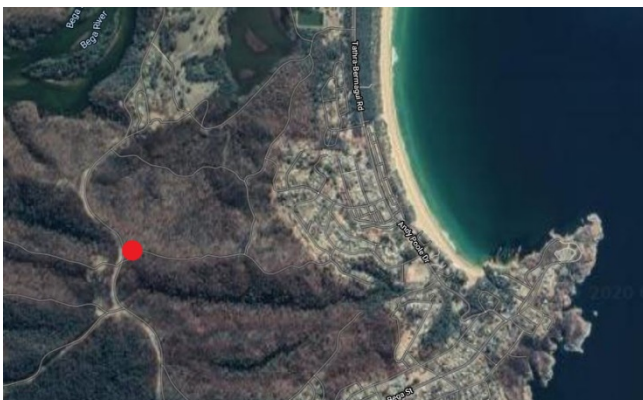


Figure 1 – Proposed Asset Location Map (Source Six Maps)

Further parameters have been estimated in the service life calculations and maintenance intervals as indicated in the detailed report. Detailed Calculations.

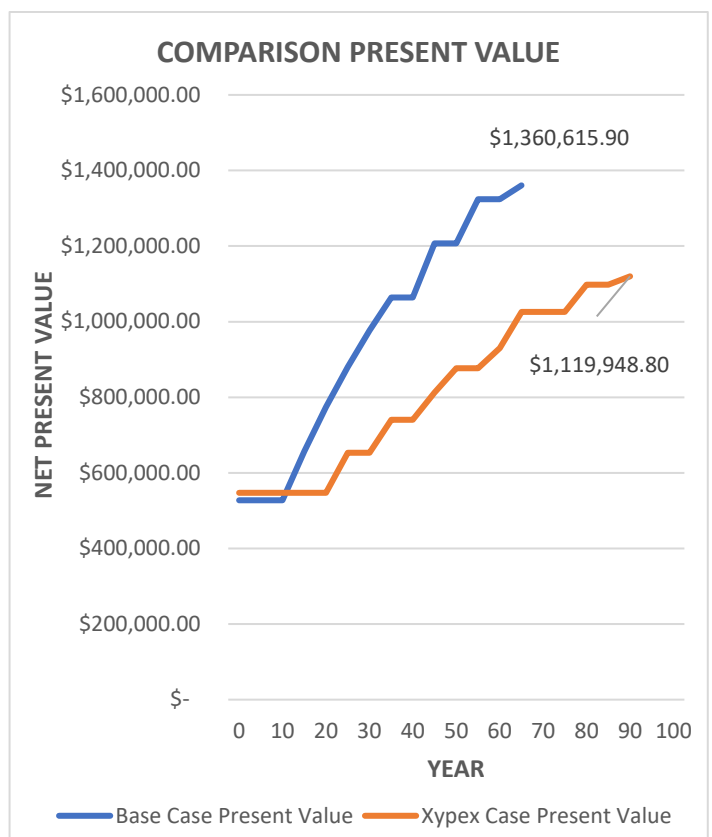
Whole of Life Costing

WHOLE OF LIFE COSTS

Estimates for the whole of life cycle costs for the assets indicates that the Xypex additive incorporation into the concrete structure can extend the estimated service life of the structure by 17 years and due to our project experience/testing, this is extended to a total service life extension of 25 years due to the further densifying, reactivation and cracking sealing ability of the Xypex technology.

This improvement leads to an overall present value cost improvement of \$240,000. Which is a 12-fold improvement on the initial Xypex investment costs, and a 21% improvement on the base case net present value.

A visual representation of this improvement is as follows. As indicated, the detailed parameters adopted are indicated in the detailed report.



Whole of Life Costing

SUMMARY

The Whole of Life Cycle Analysis is based on Xypex performance testing, which indicates estimated values based on a single life cycle. The following is a summary of the calculations:

- Xypex is estimated to extend the service life by 25 years with no cost benefits attributed to this benefit of life extension within the analysis. We have not analysed this life cycle extension in terms of costs due to the high variability of future construction costs. But a 25-year extension is envisaged as a very high cost saving. Early replacement and other impacts of renewal such as ladders, roof replacements and future project management etc are also not incorporated into the calculations.
- Xypex is estimated to provide a net present cost benefit of \$240,000 which is a 12-fold enhancement on investment costs. Which essentially is calculated due to delayed maintenance and remedial costs only. This present value is estimated to be worth \$1.5 million at the end of the Xypex structures cycle.

This analysis indicates the high performance and improvements Xypex provides to the structures concrete.

It also provides an indication of what the product is worth in terms of asset management, service life extension and net present value.

The benefits of utilising Xypex has a very high return and beneficial outcome for the structure, authority and community.