

# **Mangawhai Wastewater Treatment Plant Balance Tank scope enhancement, business case and procurement plan**

**Meeting:** Council Briefing  
**Date of meeting:** 03 March 2021  
**Reporting officer:** Donnick Mugutso, Waters and Waste Manager

## **Purpose/Ngā whāinga**

The purpose of the report is to seek direction from Council on the proposed scope enhancement for Mangawhai Wastewater Treatment Plant (Mangawhai WWTP) Balance Tank project and seek support for progressing the Procurement Plan.

## **Context/Horopaki**

The investment strategy for providing capacity for growth in the Mangawhai WWTP is two-fold

- Reduce the impact of peak flows (storm and seasonal) – Balancing Tank
- Develop the plant to a system so that water can be increasingly reused – progressing to a membrane filter plant with the Balancing Tank repurposed as a Treatment Tank

In the September 2020 Council meeting, council was presented with a report for the construction of the Mangawhai Wastewater treatment plant Balance Tank for an estimated cost of \$2.1m. This was based on constructing a Balance Tank which could be repurposed as a Treatment Tank when required.

Council supported the proposal and the allocation of funding allowed for the procurement of the design consultant.

As part of the gateway review undertaken before progressing to construction, the opportunity to enhance the scope has been identified.

- The project team have progressed the detailed design including Safety in Design, Hazard and Operability Analysis (HAZOP) and identified health safety risks that can be addressed at this stage.
- Opportunities for scope enhancement that would make it easier to upgrade to a reactor tank in the future have also been identified. These components are included in the plant upgrade currently identified later in the LTP.

The revised budget estimate is \$2.869m. (inclusive of 7.5% contingency and Management, Surveillance and Quality Assurance (MSQA)).

**The direction sought from Council is whether to proceed with an enhanced scope (\$2.869m) or continue with the current Balance Tank scope (\$2.1m).**

The scale of investment exceeds \$500k and therefore Council support for the Procurement Plan is sought in accordance with the Procurement Guidelines and Manual.

**Direction is also sought from Council as to their support for the procurement proceeding to the Request for Tender stage based on a process which will allow for the contract to be awarded for either investment option.**

The Business Case (**Attachment A**), Procurement Plan (**Attachment B**) and Risk Register (**Attachment C**) are attached.

## Discussion/Ngā kōrerorero

### Safety in Design, Hazard and Operability Analysis (HAZOP)

The Mangawhai WWTP is operated as a sequencing batch reactor, which means that it requires monitoring and operating expertise to achieve the desired treatment results.

It is a duty of KDC to minimise risk to all users of the plant throughout its lifetime.

During the concept design, the designer identified some risks which they quantified and estimated those that could be estimated, at a high level. **(Attachment C)**.

Some of the risks have now been confirmed at detailed design and mitigation measures are proposed such as:

- *requirement for higher volume earthworks to ensure bank stability (item 4 Attachment C)*
- *requirement for a new screen (Item 5 Attachment C)*
- *requirement for an upgraded odour control (Item 6 Attachment C)*
- *requirement for a walkway to mitigate tank cleaning risks (Item 7 Attachment C)*
- *requirement of a high-pressure wash water system (Item 7 Attachment C)*

In discussions with treatment plant operations during detailed design, the designer identified scope enhancements:

- *construction of a walkway for operability and safe cleaning of the tank*
- *relocation of the balance tank pump station from the southern to the northern in proximity with the drainage sump*

The table below illustrates the key Outcomes

	Current Scope - \$2.1m	Proposed Scope - \$2.869m
<b>Balancing Peak Flows</b>	Yes	Yes
<b>Transition to reactor tank</b>	Yes	walkway and higher-pressure wash water make operability easier safer
<b>Bank stability adequacy</b>	Unknown and raised as a risk	higher earthwork volumes propose in design
<b>Inlet screen sufficiency</b>	Assumed to work with the reuse of existing inlet screen	new screen proposed in design
<b>Odour control sufficiency</b>	Assumed to be adequate with no expected offensive concentrated substances	high sulphates expected in influent
<b>Tank cleaning safety</b>	Assumed access from platform to clean tank	a walkway is proposed
<b>Tank cleaning operability</b>	Assumed that the wash water pressure was sufficient for the cleaning	higher pressure wash water booster system proposed
<b>Pump station location</b>	Assumed the flow could be drawn for the southern end	Located pump station close to sump to avoid pipe clashes

## Financial impact

Some elements of the enhanced scope were envisaged as part of future works when the tank is changed into a treatment tank – Screen, New Walkway and Booster System (\$424k). Bringing forward components of the reactor tank and installing at this stage will reduce risk going forward and aid operations of the plant. Whilst this has a net zero impact on the LTP budget, the negative side is that we will be spending Development Contributions earlier.

The additional (\$345k) will be funded through rates and Development Contributions as per the original scope.

## Costs

	Change	Comment
<b>Physical Works</b>		
Preliminaries and generals	+ \$115k	increase by based on a percentage of the total
Earthworks	+ \$70k	to reduce the risk bank instability, identified after completion of slope stability analysis
Structure	-\$160k	use of tapered walls and an increase in the odour control system as higher concentrations of sulphates are expected
Piping, Pumps and Filtration	+\$230k	due to the location of the pump station on the northern side next to the drainage sump rather than the southern side and the now completed design shows bend and supports of the steel inlet structure requiring clashes avoidance
<b>Scope Enhancements – Screen, Walkway, Water Boost</b>	+\$424k	the original assumption of using the current screen which allows a flow rate of 100l/s is marginal and risks causing overflows at the inlet. New screen requires additional wiring and cabling, switchboard extension as the existing switchboard is too small
<b>Contingency</b>	- \$90k	We have now progressed past the Developed Design and therefore contingency reduced
<b>Management Surveillance Quality Assurance (MSQA)</b>	+\$150k	the original estimate did not include MSQA as these had been assumed to be by internal staff.
<b>Procurement</b>	+\$30k	the original estimate did not include procurement support (i.e. preparation of contract documentation) as these had been assumed to be by internal staff.
<b>Total</b>	<b>\$769k</b>	

## Procurement

At the September 2020 Council Meeting, the report sought the Council to delegate to the CE to approve the contract for award up to \$2.1m once the tender process had been concluded. Whilst Council approved delegation of authority to the CEO to award a contract if it is below \$2.1m, a formal request to approve the Procurement Strategy was not sought at the time.

An Expression of Interest was sought from the local market. Ten proponents submitted expressions and they will be shortlisted using a pass/fail assessment based on safety and experience.

The next stage is a Request for Tender (RfT) for those shortlisted parties. The proposed evaluation criteria are a pass/fail based on methodology followed by an assessment of costs. Lowest Price Conforming is considered acceptable given that all the shortlisted Contractors have the ability and experience to undertake the works.

**Direction is sought as to whether Elected Members are comfortable with officers progressing to the RFT stage on the proviso that the process allows for a contract to be formed to deliver the Balancing Tank (as per currently agreed scope) as well as the proposed scope enhancements.**

Our procurement approach aligns with the 2019 Procurement Strategy.

<i>Objective</i>	<i>How</i>
Deliver safely – a commitment to reducing harm to us and the people involved in our supply chain;	Enhancing scope to include safety measures identified through risk assessment
Create and demonstrate public value through our activities with particular focus on: <ul style="list-style-type: none"> <li>• Good price - whole of life costs</li> <li>• Good quality - customer centric delivery</li> <li>• Good outcomes - social, cultural, environmental and economic</li> </ul>	Improved odour control and reducing environmental risk
Improve the efficiency of how we progress projects though their lifecycle to deliver the capital programme	Including appropriate scope in the contract to deliver future plant requirements
Increase the ability of our iwi, communities and businesses in Kaipara to participate in Council activities	Te Uri o Hau
Increase the size and skill level of the supply chain delivering work in Kaipara	
Support the transition to a zero net emissions and promote efficient use of resources	Improved plant efficiency

The benefit of this approach is that we will be able to commence construction in this financial year. The alternative approach is to bring the Procurement Plan to the March Council Meeting for formal approval.

## Next steps/E whaiake nei

The project team can still deliver the original scope for the \$2.1m budget, however it is recommended that the scope enhancements are included

- To make it safer for our operators
- To reduce the possible increase in operational costs

It is noted that the part of the \$2m 2026-2027 financial year related to the Mangawhai wastewater treatment plant upgrades (see MCWWTP Roadmap – Attachment D) can be brought forward in the LTP if accepted.

### Actions

Complete the Expression of Interest stage and prepare Contract and Tender Documentation.

Commence the RFT stage.

Prepare a Council report for the March Council meeting seeking approval of fund allocation for the enhanced scope – subject to feedback from the briefing.

Negotiate and award contract and continue to construction and update Council on progress.

## Attachments/Ngā tapiritanga

	Title
A	Mangawhai WWTP Business Case
B	Mangawhai WWTP Procurement Plan
C	Mangawhai WWTP Balance Tank Risk Register
D	Mangawhai WWTP Roadmap

