

# Board Paper

## September 2015

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**Title:        Downstream Weir Upgrade – proposal to proceed**

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### **Purpose**

This paper presents, for consideration of the Board, a revised proposal to upgrade the Downstream Weir to increase the flood handling capability of the structure.

Board approval is sought to proceed with the completion of design and construction with a target commissioning date of August 2016.

The proposed upgrade is a lower cost alternative option compared to what was being proposed from January 2013.

The current estimate to complete the upgrade is \$1.6m - \$1.7m compared with the nearly \$3m cost that the previous proposal had crept to.

The project is currently on hold pending the Board's decision to proceed.

A comprehensive report from the project engineers, Tonkin & Taylor (T&T), accompanies this paper.

### **Background**

The earlier background to this project is covered in previous Board papers (January 2013 and June 2014). The June 2014 paper is attached for reference.

To recap briefly, the initial proposal to modify the downstream weir structure, in order to increase the flood handling capability, arose primarily as a result of the second operation of the fusible overflow embankment in May 2009. By February 2011, Tonkin & Taylor (T&T) had prepared a proposal to increase the flood capacity of the existing spillway to allow a flood passing capacity of approximately 250 cumecs compared with the previous 115 cumecs. This increased capacity meant that the frequency of the fusible embankment operating could be expected to reduce from around once in five years to something like once in 30 years. The proposal was based on modifying the existing spillway and installing flap gates on the spillway that would be lowered in the event of a major flood. This is now referred to as the LHS (left hand side) option.

A review of the options through 2011-12, resulted in a recommendation in January 2013 for an alternative option for a separate spillway structure that was considered to have a lower construction risk and offer some additional value adding features – notably better flushing flow capability and the option to install an additional hydro generator. The Board approved this recommendation and authorised the progress of a resource consent application and design sufficient to support the consent application. This option is now referred to as the RHS (right hand side) option.

The resource consent process proved to be unforeseeably tortuous and by May 2014 had still not been completed. With the Prospectus for the proposed company merger being finalised, the project engineers were requested to provide an update of expected project costs. The response to this request was quite unexpected and suggested a project delivery cost close to \$3m compared with the previous \$1.7m. At that stage, it was decided to suspend further development of that option and review our position.



## Discussion

The revised cost estimate provided by T&T would put the total project cost (ignoring cost to date) in the order of \$1.6m - \$1.7m. This cost is considerably less than the ~\$3m for the separate structure/RHS option.

The previous economic analysis was based on benefits arising principally from the avoided cost of overflow embankment rebuilds and also placed some value on the increased lake storage regime - those benefits were attributed solely to improved generation revenue. This analysis suggested an annual benefit of ~\$140k which would support a project cost of around \$1.6m based on an 8% IRR.

The analysis did not attribute any value to the additional storage volume that would be able to be maintained, at a lower risk than present, with a more robust DSW facility. It is well recognised that our previous lake storage operation has consistently had a degree of conservatism due to the perceived risk to the DSW of a large spill from the main dam which was more likely with a high/full lake. The experience of 2014/15 has, I suggest, highlighted the cost of non-supply and has created a different risk/value perception of utilising the top portion of the lake storage.

It is my view that the case for implementing the DSW upgrade is no less than previous and in fact could be said to be considerably greater due to the experience of the most recent irrigation season.

My view is that the lower cost, LHS option should be adopted and progressed.

I would propose that Tim Anderson be retained in a Project Manager role to oversee the process through to completion and encompassing the design development, procurement and delivery/construction phases.

Given the level of involvement and experience T&T have on the existing facility and on the proposed works, I believe it is most efficient to retain T&T for the next stages of the project. The Building Consent required for this work will see another design engineering consultant involved in a review role for ECan (on behalf of MDC). I believe one of the strong attributes Tim Anderson has that will provide real value to OWL, is his experience in managing design consultants and providing programme and budget discipline to the process.

There is some initial work to review the programme, confirm the budget for engineering costs (T&T and Tim Anderson). The need for some foreign exchange cover should also be an early consideration.

At this stage, the intended procurement model would be a design, tender, build process although some early consideration may be given to an earlier contractor involvement provision after a more specific review of the entities likely to be competent in this type of work and on the final risk allocation envisaged for project construction..

I suggest the internal resourcing for this (mainly interface with Tim A) would come primarily from me (some advantage with ChCh base) but it would be my intention to involve and delegate to Steve as much as possible. I would envisage that Steve would have a large involvement during construction which, at this stage, would be expected to be after the irrigation season. Julia would provide support initially for any resource consent matters but these should be substantially complete prior to her maternity leave.

I would suggest a Project Steering (or Control) Group be established to provide a governance level overview and interface with the Board.

Our current 2015/16 budget provided for a capital cost of \$2.7m financed from additional debt.

Our main financing facility with ANZ has a limit of \$34.5m and our current drawdown/debt level on this is \$32.9m (\$1.6m available). We also have a flexible credit facility of \$500k which was envisaged to be utilised for capital expenditure either unforeseen or where the debt facility was required for a shorter term. I would envisage we would attempt to cover the preliminary costs (engineering design and management fees) from cash flow and then draw

down on either debt facility once the high expenditure part of the project begins. The expenditure is expected to roll through to the next financial year.

## **Conclusion and Recommendation**

The proposal to upgrade the DSW is now based on the left hand option, a lower cost option that involves modifying the existing fixed spillway. The estimated cost of this option is \$1.6m - \$1.7m.

There are clear economic benefits from implementing this upgrade that arise primarily from the avoided cost of repairs to the overflow embankment which could be expected, on average, every five years (more accurately what is referred to as a 20% AEP – annual exceedance probability). There are additional benefits arising from the revision to the lake operating regime which would result in the lake operating at a higher average lake level which would yield better generation revenue. The upgrade reduces the risk (to the DSW) associated with operating the lake at a higher level and therefore will reduce the overall risk of providing water storage for dry irrigation seasons. No direct financial benefit has been attributed to this aspect.

The construction risks previously identified for this upgrade option have been reviewed. Some design solutions as well as some operating measures have been assessed that should adequately address those earlier risks.

A suitable Project Manager has been identified to manage OWL's interest in the delivery of this project.

OWL's existing finance facility has adequate provision for this project and the current year's budget includes adequate provision for the costs envisaged.

Following approval to proceed, some initial work is required to firm up costs (engineering fees) and establish a final budget. Foreign exchange cover will also need to be considered.

It is recommended the Board approve the implementation of an upgrade to the downstream weir facility based on the proposal included in this paper and attached documents.



Tony McCormick  
Chief Executive  
30<sup>th</sup> August 2015

### Attached

1. June 2014 Board Paper – as background for this current paper
2. Report from Tonkin & Taylor - Proposed Opuha Dam Downstream Weir Enhancement - LHS Option

# Attachment 1

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## **Board Paper June 2014**

To provide background to the current Board Paper (September 2015)

# Attachment 2

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## **Report from Tonkin & Taylor**

Proposed Opuha Dam Downstream Weir Enhancement - LHS Option