Building water security for our region's future

Message from CEO

Kia ora koutou shareholders, stakeholders, supporters and those interested in the Waimea Community Dam.

After good progress in 2019, the start of 2020 has proved challenging. We first encountered issues with mined rockfill in January 2020, and then suspended work on site in late March following the COVID-19 level-4 restrictions. These restrictions also meant we had to cancel our 'town hall' with the public in March. This newsletter is an alternative update for you on the project.

COVID-19 SUSPENDS WORK

Central Government required us to suspend work on 25 March 2020. Like everyone, I am unsure how long the Tasman region will be in lock down and how effective international supply chains will be from then on, but I can assure you that our shareholders, contractors and WWL are committed to completing the dam as soon as practically possible. The dam will be built, just later than we thought.

More than ever, the Tasman region will need the Waimea Community Dam. Primary industry, so reliant on water security, is likely to be at the forefront of the region's and New Zealand's recovery from potentially the greatest recession many of us will ever experience. Finance Minister Grant Robertson said on 28 March that post lock down, the economy is going to be tough, unemployment will soar, and the entire domestic economic structure of New Zealand could need rethinking.

Tasman and New Zealand is going to need the primary and associated secondary and tertiary industries to step up to create jobs, investment and earn export dollars.

People don't necessarily have to travel, particularly in a recession, but they have to eat. Water supply and security, provided by the Waimea Community Dam, is instrumental in supporting our exporters and employers.

Minister Robertson has already eluded to a huge national-building programme of infrastructure and public works. Given that New Zealand has a large infrastructure deficit, including decrepit and deficient water infrastructure, the country has an opportunity to catch up on essential infrastructure, including for water. Since New Zealand's last large public dam, the Clyde Dam, was completed almost 30 years ago, our population has grown by 43%. That is an extra 1.5 million people who need feeding, watering and powering since NZ built its last dam.

One of New Zealand's greatest competitive advantages in the world is water, courtesy of our geography and orographic weather flow. Like the Waimea Community Dam, more water infrastructure that harvests water will undoubtedly lead to more investment, jobs and exports that will support our economy out of these difficult times.

PROGRESS

Until work was suspended due to COVID-19, the dam was continuing to make good headway with construction on the right-hand abutment, left-hand plinth, permanent stabilisation above the right-hand side plinth and the diversion culvert well progressed. On any given day of the working week, we usually have more than 150 people working onsite.

7/17 walls & roof sections

Drilling anchors for the left hand plinth

Preparing the culvert foundation - note void to be filled

Constructing permanent stabilisation to colluvium deposit on the right hand side

Dam site: Left hand plinth on left; culvert in middle; right hand side stabilisation

ROCK CHALLENGES

Early in 2020 we encountered issues with mechanically processing rock fill needed for the drainage layers of the embankment. That is the rock we need to excavate, move, process, lay and compact to form the embankment. So far, the undisturbed foundation rock on which the embankment sits has been as expected.

As we have cleared and excavated the dam site, we are encountering more argillite (silt / mudstone) and less greywacke (sandstone) than we expected. The argillite consistency has significant incipient foliations, which is a layering of the silt / mud due to insufficient metamorphic formation, not dissimilar to a pack of cards. The thin layers come apart easily and then break up on processing to create an excessive amount of 'fines' that would impede flow through the drainage layers.

To resolve this problem, we have:

1. Increased the size of the drainage zones to about 25% of the embankment to allow the challenging indigenous rock to be used in the balance of the embankment away from any water flow; and
2. Sourced alternative and much harder rock for the drainage material. Currently, we are planning to import the drainage material from a nearby quarry, but we continue to look at opportunities on site to reduce this additional cost.

People ask me why we didn't know about and budget for this problem before we started work. When it is still possible a project may not proceed, there is a balance between pre-investing in exploration and appraisal, and the residual risk.

Unlike above ground structures, such as buildings, sub-surface projects are based on samples and estimates of what is below the ground. This is why civil projects with a large sub-surface component carry significant uncertainty and risk. We have always been upfront about this.

Although we completed thirteen 60mm bores and two test pits before finalising the design to extrapolate an estimate of the sub-surface, we are now uncovering very non-homogenous and complex geology. Whereas we were expecting layers of greywacke, we are now seeing small fingering deposits in amongst predominantly silt and mudstone argillite. It was not practically possible to access and test much of the mining area prior to construction due to access, topography and vegetation.

Earlier design work concluded that rock fill is unlikely to break down considerably during construction, and in the possibility that rockfill does break down more than anticipated then the embankment zoning would need to be adjusted to provide additional drainage. The design is now being adjusted to ensure drainage and dam safety, because it did not accommodate rock breaking up with a continuous drainage layer.

As a ratepayer, I appreciate that the additional construction costs are disappointing, but we remain committed to providing Tasman with a safe and reliable asset to support our economy.

The site consists of predominantly argillite (silt / mudstone) with significant incipient foliations

COST INCREASE

In late February we announced an expected $25 million increase in the cost of the project.

Approximately ¾ of this cost increase is associated with unforeseen geological conditions, including the embankment rockfill, filling voids in the plinth and culvert foundation, and additional slope stabilisation.

The balance of the cost includes improving the resilience of the dam through increased drainage beneath the spillway and additional grout curtain; underbudgeted items such as engineering and mechanical work; and savings from removing a bridge and replacing the concrete face with a geosynthetic membrane.

DESIGN ENHANCEMENTS

WWL continues to pursue design enhancements, including:

- A PVC geosynthetic membrane to replace the concrete face. A geosynthetic membrane is more elastic than concrete and offers greater resilience to settlement and seismic movement. The proposed membrane also offers cost, schedule and carbon savings. The membrane has been used on almost 200 dams worldwide and is the 'go-to-repair' for failed concrete faces. The membrane has an estimated expected life greater than 70 years and is easy and cost effective to repair and replace.

Most recently used in New Zealand on the Tekapo Canal, the membrane is a geocomposite material comprising of a plasticised polyvinyl chloride (PVC-P) geomembrane bonded to a polypropylene geotextile. It is produced and certified in the EU in accordance with REACH (EC 1907/2006) and EN 13361:2018 to ensure a high level of chemical safety to protect human health and the environment. Consistent with European standards, the membrane cannot produce and use chemical components that are potentially harmful for human health or for the environment. The membrane is very similar to the PVC formulation used worldwide for blood bags and medical containers, and the UV absorbers present in the formulation are of the same kind used in sun screens with high UV protection for human skin.

- Drainage beneath the spillway will be increased to follow recent improvements in international standards, which are based on international learnings. The spillway has been modified to be self-supporting and less reliant on the geology and topography.
- Mechanical and electrical design will include one 1.4m diameter pipe running through the culvert with an offtake for potential future hydropower generation.

NGĀ MIHI

To our supporters and ratepayers, thank you. We share the same commitment to support our community, economy and provide a better future for our children, and, in light of current circumstances, probably more so than ever before.

And finally, to our wider WWL team; Fulton Hogan Taylors, Damwatch Engineering, Tasman District Council, Waimea Irrigators and Waimea Water, Kia ora. No-one can question the sweat, heart and soul you are putting into this legacy project.

I wish you all the best through this challenging period. Kia kaha.

Ngā manaakitanga,

Mike Scott, CEO

Chair David Wright

CEO Mike Scott

WWL Board – absent: Chair David Wright