

Frequently Asked Questions about North Bank Tunnel concept's water-only resource consent application



Q: Why does New Zealand need more electricity?

A: Electricity demand growth in New Zealand is increasing at an annual rate of approximately two percent, as a result of an expanding economy and growing population. Energy savings (demand side management) could reduce this growth rate and Meridian Energy is actively supporting a range of initiatives. However, demand growth will still occur.

Q: Do we really need a new power scheme on the Waitaki River?

A: South Island demand has actually been growing faster than in the North Island as a result of general economic growth and more intensive farming methods (such as dairying and irrigation). This means the South Island needs new power supply sources to ensure continued security of supply and to reduce what will be an increasing reliance on North Island supply (particularly during dry years).

Q: What other options are there?

A: Meridian Energy has built the South Island's first wind farm at White Hill in Southland and is investigating other wind farm sites throughout New Zealand. Meridian Energy is also investigating other potential hydroelectric sites. The North Bank Tunnel concept, however, is a very large renewable electricity generation option.

Q: Why can't the Waitaki power station be upgraded to provide additional power?

A: Hydroelectric generation is a function of head (height) and water flow. The existing Waitaki power station provides 21.5 metres of head: the North Bank Tunnel concept would provide around 128 metres of head. This means each unit of water that passed through the North Bank Tunnel concept scheme would generate many times more power than an equivalent unit of water passing through the existing Waitaki power station, even if the Waitaki power station machines were fully upgraded.

Q: How much additional power would the North Bank Tunnel concept generate?

A: The net gain would be between 1100 and 1400 gigawatt-hours per year (enough to power a city the size of Christchurch). The total output from a combined Waitaki Station and North Bank Tunnel concept scheme would be approximately 1900 gigawatt-hours per year, compared with an average 500 gigawatt-hours at the existing Waitaki power station.

Q: Where would the power be used?

A: The Waitaki power scheme is a vital part of New Zealand's power system and includes at Benmore the HVDC link between the South and North Islands. Any additional power generated would join the national grid for distribution to meet demand. In practical terms the power generated by the Waitaki scheme meets demand in Canterbury, Nelson-Marlborough and Westland, as well as the lower part of the North Island.

Q: Why does the tunnel have to be 34km long (rather than 24km or 44km)?

A: The energy a hydro power station can generate depends on two key factors: the amount of flow through the station and the height or "head" through which the water drops. In the case of North Bank Tunnel concept, the "head" is the difference in level between Lake Waitaki and the river level at Stonewall, a difference of 128m. This is a combination of the 21.5m high Waitaki Dam and the fall of the river from the toe of the dam to Stonewall. This river fall is not always apparent when driving along the highway between the dam and Stonewall. However, the river slopes at about 3m per kilometre. A shorter tunnel could be built, but each kilometre it was reduced in length would correspond in a 2 to 3% reduction in the amount of energy that could be generated.

It should be noted the potential length of the tunnel has already been reduced by approximately 2km to avoid some environmentally sensitive wetland areas.

Q: Where would the power station be located?

A: The North Bank Tunnel concept power station would either be located underground, immediately downstream from the existing Waitaki Dam, or above ground at Stonewall, 34km downstream from the Waitaki Dam.

Q: Could the proposed scheme run using less water than proposed?

A: If a scheme was designed to use less water it would have a reduced flow and therefore reduced energy output. However, there is not a proportional reduction in construction costs, because many of the major construction items have a relatively fixed cost. Therefore, any reduction in flow results in less electricity generation, as well as an incremental increase in the cost of electricity generated by the scheme.

Q: When would the proposed scheme be built and begin operating?

A: Meridian Energy is applying initially for water-only resource consents under a staged process. If these were granted it would then apply for the consents needed to construct and operate the proposed scheme (Land-Use consents). If these were granted then detailed design and then construction could begin, perhaps around 2010. Construction would take around six years, which means the scheme might be commissioned around 2016.

Q: Could the tunnel be extended past the proposed Stonewall outfall at a later date?

A: No. The geological conditions and land form below Stonewall are very different and do not lend themselves to tunnel construction. The area below Stonewall is generally underlain by gravels and soft rocks. Compared with greywacke rock that underlies the North Bank these materials represent difficult tunnelling conditions.

Q: How does the North Bank Tunnel concept interact with South Canterbury Irrigation Trust and Meridian Energy's Hunter Downs Irrigation proposal?

A: As recognised in the consent applications, the two schemes are separate projects. North Bank Tunnel concept returns water back to the river approximately 2km before the Hunter Downs intake and pumping station. Neither scheme is reliant on the other to proceed into the next phase of consenting and design.

Q: How much water would remain in the Waitaki River between the Waitaki Dam and the Stonewall outfall (Black Point)?

A: There would be an average flow in the river between the dam and Black Point of about 160 cumecs, made up from a minimum flow ranging between 110 and 150 cumecs (varying on a monthly basis) along with periodic flushing flows, flood flows, water for irrigation, tributary flows and flows which cannot be accommodated by the tunnel.

Q: What effect would there be on the river below the proposed Stonewall outfall?

A: The Waitaki River below Stonewall would, if the North Bank Tunnel concept went ahead, be similar to how this stretch of river is today. It would have a similar average flow (before irrigation and other takes).

Q: Would there be any significant cultural or heritage impacts as a result of the scheme?

A: Meridian Energy is currently consulting with local runanga, Ngāi Tahu and others to evaluate effects on cultural or heritage values.

Q: What impacts would didymo have on the scheme?

A: Didymo has colonised parts of the lower Waitaki River and early indications are the large nuisance growths would not be entirely flushed by medium sized 450 cumecs flushing flows proposed as part of the North Bank Tunnel concept flow regime. Current studies suggest larger flows will be needed to flush didymo and this underpins the proposal to shut down the tunnel at natural flows exceeding 900 cumecs for a 48 hour period, to allow the full flood flow to pass down the river. In the past, these types of floods have occurred once every two years. Meridian Energy does not intend to create this flow but would rely on floods of this frequency continuing to occur in the upper catchment and would ensure they are passed down the river when they occur. It should be noted that with or without North Bank Tunnel concept, didymo is an issue for the river for the foreseeable future.

Q: What impact would there be on salmon angling?

A: Scientific studies have concluded that salmon and trout stocks and fisheries would be largely unaffected by the North Bank Tunnel concept flow regime. However, there will be changes in fishing opportunities (e.g. fewer very big river fishing opportunities for boat anglers upstream of Stonewall, but more fishing opportunities for foot access anglers). The best salmon angling in the Waitaki River has been assessed to exist at flows of between 130 and 200 cumecs. Therefore, the North Bank Tunnel concept flow regime for the river between Waitaki Dam and Stonewall will continue to offer good salmon angling experiences during the key angling months. However, it should be noted that below Stonewall the flow regime will be largely unchanged and currently more than 60% of the salmon angling effort occurs from Stonewall to the sea.

Q: Why can't Meridian Energy just stay with the Plan's minimum flow?

A: While the WRP has set a minimum flow of 150 cumecs, it does contemplate applications for lower minimum flows. What the plan says is that if you want to take water with a minimum flow of 150 cumecs, then your application will be considered in a certain way. However, the Plan also contemplates that applicants may be able to make a case for a minimum flow lower than 150 cumecs, provided they can demonstrate the river values set out in the plan will continue to be met. Scientific assessments based on more than two decades of studies suggest Meridian Energy's proposed flow regime, along with appropriate mitigation measures will meet these important values.

Q: Would there be adverse effects from the proposed minimum flows?

A: The proposed minimum flow regime has been set based on extensive research and analysis. The basis of the regime is that the loss of quantity of habitat in the river is largely offset by an improvement in habitat quality, as frequent (daily and weekly) changes in flow levels which currently occur (and result in a large area of variable habitat) are largely removed. However, this more stable flow has a number of other issues which must be addressed by additional mitigation measures. A more stable flow will encourage the further spread of weeds across the river bed. The North Bank Tunnel concept consent would include conditions requiring riverbed vegetation management to ensure sufficient gravel areas are kept clear for bird breeding and to maintain the rivers dynamic braided nature. More stable flows will also encourage the deposition of silt and the growth of nuisance periphyton. The proposed flow regime includes regular flushing flows of around 450 cumecs to help remove these deposits. As discussed above, flood flow management is also proposed to help control Didymo and assist in river fairway management. A range of other mitigation measures is also proposed to avoid and remedy other environmental, social and cultural effects.

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