

1 Introduction

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1.1 Meridian Energy Limited

Meridian Energy Limited (“Meridian”) is the largest of the three state-owned enterprises (SOEs) formed from the split of the Electricity Corporation of New Zealand (ECNZ) on 31 March 1999.

When Meridian was formed on 1 April 1999 the assets associated with the Waitaki Power Scheme, including the suite of resource consents for its operation previously held by ECNZ, were transferred to Meridian as the new owner and operator.

Meridian has 2538 MW of generation capacity in New Zealand, which is delivered primarily from its South Island hydro plants based around the Waitaki and Manapouri/Te Anau catchments. These catchments produce on average 13,000 GWh annually, which is approximately one-quarter to one-third of New Zealand’s electricity generation. The 90 MW Te Apiti wind farm north of the Manawatu Gorge has been operating since October 2004 and Meridian commenced construction on its 58 MW White Hill wind farm in Southland during the 2006 autumn. Consents for wind farms in Wellington and Central Otago are also being sought and if approved will contribute to the energy generation portfolio of Meridian.

1.2 Meridian’s Commitment to Sustainability

Sustainability is a key driver for Meridian and its Sustainability Policy is a cornerstone of the company’s operating philosophy. This means that Meridian balances decisions it makes according to social and financial as well as environmental effects its activities will have on communities, the country and the planet. Sustainability means being in business for the long haul and it is a commitment that the company has made since its inception in 1999.

As well as being New Zealand’s largest single generator of electricity, Meridian is also the country’s largest generator of renewable electricity. The company is actively investigating and pursuing new renewable electricity generation options. On 22 November 2004 Meridian announced that it is committed to developing electricity from renewable sources only. The company is doing this because it believes this is the right decision for New Zealand, not because it is an easy business decision or one with high financial rewards. Since that time Meridian has continued to demonstrate leadership in the energy market, actively promoting energy efficiency and the development of sensible options for New Zealand which are developed in a responsible way.

1.3 Brief Description of this Proposal

The North Bank Tunnel Concept (NBTC) is a proposed hydroelectricity generation scheme to take water from Lake Waitaki through a tunnel and power station and discharge the water back into the Waitaki River upstream from Stonewall.

The nature of the concept means that unless the consents for taking and discharging water are granted, a commercially viable project would not be achievable. Meridian therefore considers it appropriate to stage the resource consent applications. This would give increased commercial certainty in regard to the availability of water and will allow the final design of the scheme to be developed against the first stage consents. To summarise:

1. The first stage of consenting is for water consents only. These consents involve the take and divert of water from Lake Waitaki, the use of that diverted water for hydroelectricity generation, and the discharge of the water back to the Lower Waitaki River.
2. Subsequent consenting would involve works required for the establishment of the finalised intake and outfall structures, the building and operation of the tunnel, the power station and other associated infrastructure, and detailed consents for the construction process itself.

The current Assessment of Environmental Effects relates to only the first stage of consents. All of the effects related to the water take, divert and discharge, such as in-river, riverbed, ecology, recreation and landscape are fully assessed. Further, the assessment makes reference to the likely intake and outfall structures to ensure the consents for these structures can be decided separately with the second land-based applications.

A North Bank Tunnel Concept would take water directly from Lake Waitaki by way of an intake portal immediately upstream of the Waitaki Dam. The design flow of an NBTC system is proposed to be 260 m³/s with an annual average intake diversion flow of about 200 m³/s. This water would be diverted into a 34 km long tunnel and pass through a power station before being discharged back to the Waitaki River upstream from Stonewall (Black Point).

The power station would either be an upstream underground power station close to Waitaki Dam, or a downstream ground-level power station at the outfall location. Approximately 125 m of head would be available for hydroelectricity generation. See Appendix 1 for the indicative route of a North Bank Tunnel Concept.

The concept would have a capacity of between 200 and 285 MW (depending mainly on the final optimum tunnel diameter chosen) and would generate an average, additional, annual energy of between 1100 and 1400 GWh. This output is more than enough energy to power every house in Christchurch.

It is proposed that there would be a flow regime in the river downstream of the Waitaki Dam, as follows:

- The design flow of the NBTC system would be 260 m³/s, with an annual average flow of about 200 m³/s.
- A minimum flow varying on a monthly basis (ranging between 110 m³/s and 150 m³/s) for the Lower Waitaki River between the Waitaki Dam and the tunnel outfall near Stonewall. Meridian intends to maintain a relatively stable river flow for most of the time, specifically in order to achieve ecological objectives for this section of the river. The minimum flow in most of the river between Waitaki Dam and the outfall will be supplemented by tributary flows and the Waitaki Dam discharge will include an allowance of up to a maximum of 172 million m³/yr for abstractions for other uses in addition to the 110–150 m³/s minimum flow.
- The flow in the river immediately downstream from the tunnel outfall would have a mean flow (before abstraction) of 376 m³/s, a median flow of 373 m³/s, and flows between 150 and 110 m³/s would occur at this reach for only about 2.5% of the time.

- Ramping rate limits¹ on the water discharged from the Waitaki Dam and from the tunnel outfall.
- At least four flushing flow discharges of 450 m³/s for 24 hours from the Waitaki Dam, with three occurring in the summer period between 24 January and 30 April, and one in the winter between 1 July and 10 August.
- The occurrence of flood flows would be largely natural (ie, floods would occur when high inflows to the catchment storage lakes coincide with high lake levels). When river flows into Lake Waitaki exceed 900 m³/s, the tunnel would be shut down for a period of 48 hours so that the full flood flow passes down the river, specifically in order to assist with ecological and other objectives for the river.

Meridian has not yet carried out any detailed design of the intake and outfall structures. However, a description of example intake and outfall structures is provided as a part of this application to provide assurance that appropriate, workable options could be consentable at a later date. The concepts provided are examples only and do not form a part of the applications sought at this time.

1.4 Purpose of this Document

The purpose of this document is to provide an assessment of the potential environmental effects that the proposal may have on the environment, in support of the application for resource consent.

An assessment of effects on the environment is required to accompany any application for resource consent under the provisions of Section 88 of the Resource Management Act 1991 (RMA). This document has been prepared to accompany the resource consent applications sought in accordance with the Fourth Schedule of the RMA.

1.5 Summary of Consents Sought

These applications seek only the necessary water consents to enable the take, use, divert and discharge of water for hydroelectricity generation. No consents are sought at this time for structures or physical works. All other consents necessary from both the Regional and District Councils will be sought after the determination of these initial applications.

The proposed take, use and diversion of water is covered by the Waitaki Catchment Water Allocation Regional Plan (WRP), while the discharge of water is covered by the Proposed Canterbury Natural Resources Regional Plan (PNRRP) as detailed in Chapter 10 of this document. The consents sought include the following.

¹ Downstream of Waitaki Dam: When increasing the flow the maximum change in any one hour (ramping rate) would be limited to 30 m³/s at flows up to 200 m³/s with no restriction when flows exceed 200 m³/s. When decreasing the flow, the ramping rate would be limited to 50 m³/s at all flows.

Downstream of the tunnel outfall at Stonewall: When increasing the flow the ramping rate would be limited to 30 m³/s at flows up to 200 m³/s with no restriction when flows exceed 200 m³/s. When decreasing, the flow the ramping rate would be limited to 100 m³/s at all flows.

Table 1-1 Summary of Consents Sought

Activity Proposed	Rule(s)	Summary
Take, Use and Divert	Rule 2, Table 3 (Rule 16) WRP	A minimum flow varying between 150–110 m ³ /s is proposed. This proposal would not meet the requirements of Rule 2(1)(a) as the flow is less than the minimum flow of 150 m ³ /s specified in Table 3 for the Lower Waitaki River. Rule 2(1)(d) requires 7 flushing flows each year. As the NBTC proposes four flushing flows each year this rule is not met. The activity is assessed to be non-complying under Rule 16.
Take, Use and Divert	Rule 6, Table 5 (Rule 15) WRP	The take, use and divert for hydroelectricity generation will comply with the annual volume allocated to that activity in Table 5, Rule 6. Any activity, which complies with Rule 6, is a discretionary activity under Rule 15.
Discharge	Rule WQL 1 and WQL 56 PNRRP	The discharge is unable to meet all of the conditions under Rule WQL 1, specifically condition 2 relating to rates of flow and condition 10 relating to duration. Accordingly the activity falls to be assessed under Rule WQL 56. The activity is able to meet these conditions and therefore is assessed to be a discretionary activity.

The existing consent held by Meridian for the use of water in relation to the operation of the Waitaki Dam requires a minimum flow in the river below the Dam of 120 m³/s (condition 22 of resource consent CRC905361.2). In the event that water consents for a North Bank Tunnel Concept are granted, such a scheme would not be able to operate with flows in the river below Waitaki Dam of less than 120 m³/s unless the provisions of the Waitaki Dam consent are changed, reviewed or renewed to enable the operation of an NBTC scheme at minimum flows of 110 m³/s in the months of June, July and August. A change of condition for the Waitaki Dam consent is not sought at this stage.

1.6 Legal Description

The location of the proposed take and divert of water from Lake Waitaki is on land owned and managed by Meridian.

The discharge of water from the proposed NBTC outfall is into surface water or on to land in circumstances in which it may enter surface water. The relevant land is Crown Riverbed with Land Information New Zealand (LINZ) as the administrator of this land. LINZ have confirmed their awareness of the proposal and their willingness to discuss appropriate property agreements should NBTC proceed beyond these current water-only consent applications (see letter attached as Appendix 29).