138 Victoria Street, Level 3Level 3
Christchurch Central, CanterburyCanterbury 80138013
New ZealandNew Zealand
ghd.com

Our ref: 12656630
19 May 2025

Ministry for the Environment
PO Box 10362
Wellington 6143
New Zealand

Fast-track Referral Application: Lake Pūkaki Hydro Storage and Dam Resilience Works

Attention: Ministry for the Environment - Fast Track Administration Agency,

This letter is provided on behalf of Meridian Energy Limited (Meridian), as required under section 11(1)(e) of the Fast Track Approval Act 2024 (FTA), to advise you of a proposal by Meridian to pursue referral into the Fast-track Approvals Act for:

– permanent placement of rock armouring at Pūkaki Dam to enhance the resilience of the asset when operating at low lake levels, and
– the temporary approval (for the 3 consecutive years immediately following the granting of consent) to utilise the low range of Lake Pūkaki from 518 amsl to 513 amsl, without the System Operator having first determined that the electricity system risk meter status is at the Alert level.

Background information, a summary of the proposal and a site plan is provided below.

Project Background

Lake Pūkaki is a modified natural lake managed as part of the Waitaki Power Scheme (WPS). It is New Zealand's largest hydro storage lake, providing an average of 1,767 GWh of stored water under normal conditions, with an additional 546 GWh available during hydro shortages.

Under resource consent CRC905321.7, Meridian is authorised to dam the Pūkaki River and operate Lake Pūkaki between 518 mRL (normal minimum level) and 532.5 mRL (maximum storage level). During a Security of Supply Alert (SSA), the lake can be operated between 515 mRL and 518 mRL, as provided under consent CRC185833. In an electricity supply emergency with an Official Conservation Campaign (OCC), the lake can be operated between 513 mRL and 518 mRL, as permitted under Rule 17 of the Waitaki Catchment Allocation Plan.

The ability to utilise contingent hydro storage in Lake Pūkaki is related to electricity system supply triggers being initiated by the System Operator ((SO)Transpower).

Winter 2024

In winter 2024, New Zealand faced an energy shortage due to low hydro inflows, low wind generation, and low gas availability. During this period there was a real possibility that Meridian would need to manage Lake Pūkaki below 518 mRL in accordance with the Waitaki Catchment Water Allocation Regional Plan (WAP), existing resource consent and the mitigation and monitoring agreements in place with Waitaki Rūnaka and other major stakeholders.

Meridian, other hydro generators with contingent storage, and all electricity market participants had little certainty about when or if Transpower, as the System Operator (SO), would issue a SSA or start an OCC. This uncertainty hindered Meridian's ability to plan for using contingent storage and affected the use of stored water, especially above the consented minimum of 518 mRL.

As a result, Lake Pūkaki's operation did not achieve optimal energy outcomes. The uncertainty increased energy costs, lowered energy security, and resulted in higher emissions due to more thermal generation. Clarifying when Meridian and the electricity market can manage Lake Pūkaki below 518 mRL would enable more effective lake operation in the national interest.

Project location

Lake Pūkaki is located approximately 10 kilometers (km) north of Twizel in the Mackenzie Basin. It's water levels have been controlled since the early 1950's, when it was raised by 9 m via a low dam. In the late 1970s water from Lake Tekapo was directed into Lake Pūkaki via the Tekapo Canal and during this time Lake Pūkaki was raised by a further 37 m with the construction of the Pūkaki high dam (referred to as the Pūkaki Dam).

The outflow of water from Lake Pūkaki is generally into the Pūkaki Canal via the Pūkaki Canal inlet (Gate 18) which conveys water to the confluence of the Ōhau Canal, and then via the Ōhau A Canal to Ōhau A Power Station.

As necessary, flows can also be released into the Pūkaki River via the spillway situated within the Pūkaki Dam (Gate 19). Refer to Figure 1 for an image depicting Lake Pūkaki and key infrastructure associated with the WPS.

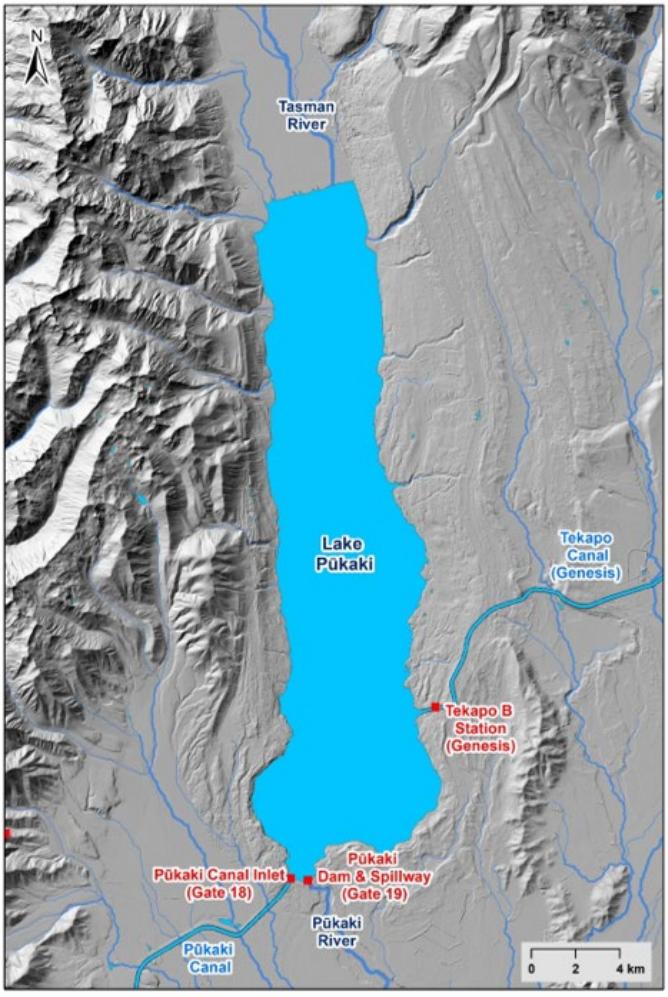

Figure 1 Lake Pūkaki and key infrastructure associated with the WPS

Proposal

Meridian is therefore seeking approval under the Fast-track Approval Act to temporarily remove restrictions on Lake Pūkaki contingent storage, allowing it to operate between 518 mRL and 513 mRL over a three-year period, without SSA or OCC triggers.

Meridian has undertaken modelling to inform operational decisions regarding the management of water stored in Lake Pūkaki comparing the current restricted operating regime to the proposed regime with the SSA and OCC triggers removed. In summary, enabling access to contingent storage is expected to result in a wider operating range, providing more flexibility and support to New Zealand's electricity system. Lake levels are expected to fall below the current minimum (518 mRL) only about 3% of the time, or approximately 33 days over three years.

Additionally, Meridian is seeking approval to permanently install rock armouring at Pūkaki Dam to ensure the structure's resilience to wave erosion when operating the lake at lower levels (below 518 mRL). Undertaking this work is dependent upon suitably low lake levels and the rock, once placed, will be permanent. The consent for this aspect is therefore intended to be enduring, allowing the work to be carried out at a future date when conditions allow.

The rip-rap placement construction is expected to be undertaken in a single stage with works being sequenced as follows:

1. Monitor lake level trends.
2. Finalise Environmental Management Plans I.e. Dust Management Plan, Erosion and Sediment Control Plan, Emergency Spills Response Plan and Accidental Discovery Protocol.
3. Update traffic management and safety plans.
4. Establish the site as the lake level lowers below 520 mRL and there is an expectation of the lake level continuing to drop to below 518 mRL.
5. Construct access tracks and ramps.
6. Begin rip-rap work on the dam and its abutments when lightly or unarmoured areas requiring protection become accessible (accurate rip-rap placement is possible to a depth of around 1 m).
7. Extend rip-rap protection by placing rock to levels as low as possible before lake level rises.
8. Remove construction benches and ramps by reinstating an evenly sloping dam face and abutments.

Figures 2 and 3 (see page 4) provide images detailing where rock armouring works will be completed and where Meridian has stockpiled rock for these works.

Approvals Required

Lake Pūkaki operation levels

Meridian seeks a temporary resource consent to operate without being restricted by SSA and OCC triggers. This activity is a prohibited activity under Rule 12 of the Waitaki Catchment Allocation Plan. Consequently, there is no consent approval pathway outside of the Fast-track process. The only alternative approval pathway would be via a further Private Plan Change which is not considered viable given the lengthy duration of a plan change process and the urgency of this work.

Pūkaki Dam rock armouring

The rock armouring erosion protection works will require resource consent under the Canterbury Regional Land and Water Plan and the Canterbury Air Regional Plan. Consent requirements are summarised below.

Canterbury Regional Land and Water Plan:

– The discharge of water or contaminants into surface water cannot meet the permitted activity standards of Rules 5.98 and 5.99. Therefore, consent is required under Rule 5.100 as a discretionary activity.
– The extraction of gravel from the bed of a lake including the deposition of substances, excavation or other disturbance of the bed of a lake cannot comply with the permitted activity standards of Rule 5.148. Therefore, consent is required under Rule 5.150 as a discretionary activity.

Canterbury Air Regional Plan

– The discharge of dust into air cannot meet the permitted activity standards of Rule 7.3. Therefore, consent is required under Rule 7.5 as a non-complying activity.

Wildlife Act 1953

The rock armouring works will also require a wildlife permit under section 53 of the Wildlife Act 1953 for the disturbance of lizard habitat, and the capture, holding and relocation of any lizards present to an alternative area of established habitat.

Figure 2 Lake Pūkaki Dam and location of existing stockpile areas

Figure 3: Approximate location of rock armouring works

Further Information and Opportunities for Feedback

We welcome any opportunities to discuss this proposal with you and/or your representatives.

Feedback over the coming months on a draft substantive application will also be welcome, and we will make people available at times and ways that work for you.

Regards

Amy Callaghan
Technical Director - Planning
s 9(2)(a)