

SUBMISSION ON HYDRO-POWER GENERATION

By

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Lake Tekapo is the first of a series of hydro-storage lakes that store and release water for power generation along the Waitaki River system. This Waitaki River power development generates about 30 percent of the total electric power used in New Zealand, and Lake Tekapo contains the second largest amount of water storage legally available for power generation within the country. (The volume of physically available hydro storage equals the volume of water contained between the maximum lake level and the bottom of the intake structure. The legally available storage is usually less than the physically available storage, and neither is necessarily related to the total volume of water in the lake.)

Fig.1 shows a sketch of the lakes, canals and rivers in the headwater region of the Waitaki River system. Water from Lake Tekapo passes through a tunnel before entering the power station at Tekapo A. Water leaving Tekapo A then enters the Tekapo-Pukaki Canal and is ultimately used to generate power at the Tekapo B Power Station just before entering Lake Pukaki. Water leaving Lake Pukaki flows through the Pukaki-Ohau Canal to Lake Ohau and leaves Lake Ohau through the Ohau-Benmore Canal before entering Lake Benmore. The water passes through three more power stations (Ohau A, Ohau B and Ohau C) between Lake Pukaki and Lake Benmore.

Water spilled at Lake Tekapo flows a short way down the dry bed of the Tekapo River before entering a small reservoir, Lake Scott, beside the Tekapo A Power Station. At this point, water may be diverted into the Tekapo-Pukaki Canal or else spilled into the dry bed of the Tekapo River. Water spilled into the Tekapo River passes directly downstream into Lake Benmore, bypassing power stations at Tekapo A, Tekapo B, Ohau A, Ohau B and Ohau C.

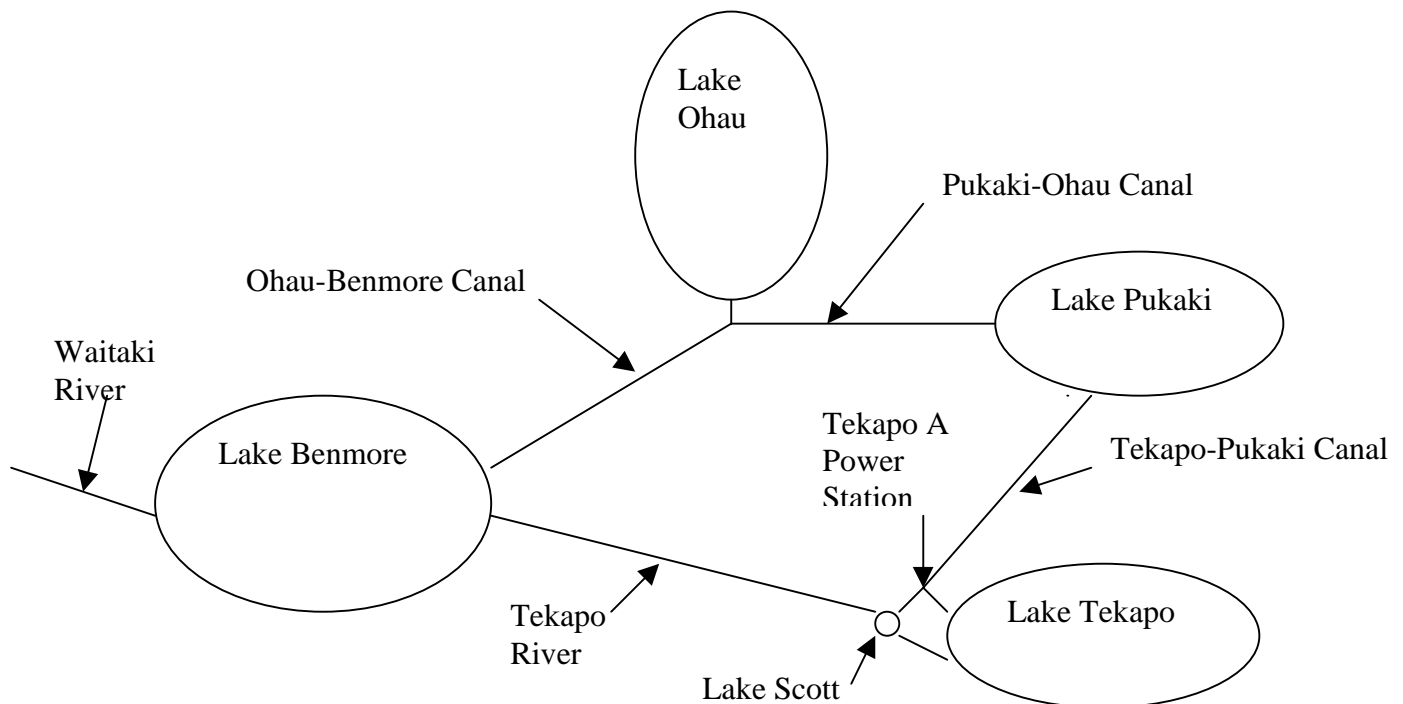


Fig.1- Sketch of the upper Waitaki rivers and canals.

Meridian Energy started spilling water from Lake Tekapo on 4 January 2001, when the lake was close to its maximum allowable level. The spilled water was sent directly to Lake Benmore via the Tekapo River, bypassing power stations at Tekapo A, Tekapo B, Ohau A, Ohau B and Ohau C. This spill was stopped on 2 February, at which time Lake Tekapo was 1.10 metres below its maximum allowable level. Lake Tekapo has a length of about 40 kilometres, a width of about two kilometers and a total surface area of 87 square kilometres, which means that a total of about 95.7 million cubic metres of water was wasted through this spillage. This wastage could have been prevented by stopping spillage as soon as the lake dropped below its maximum allowable level, and there was no apparent reason for continuing the January spill past this point.

On 6 February Meridian Energy started a second spill from Lake Tekapo that finished on 22 February. The lake level was well below its maximum value at the start of this spill, so it is not possible to tell from lake level records how much further drop in lake level resulted from this spill. However, Meridian apparently admitted to the Christchurch Press that this second spill lowered the level of Lake Tekapo by three-quarters of a metre (*The Press*, 18 August 2001, page1). Thus, in January and February a total of 161 million cubic metres of water was sent merrily on its way down the Tekapo River without the possibility of generating power at any of at least five bypassed power stations. Whether or not this wastage continued at power stations further down the Waitaki system is not known for sure, although a letter to the Christchurch Press by G. Kennerley on 19 August stated that Meridian was spilling large volumes of water in January at downstream dams as well.

When questioned about the reasons for these spills, Meridian stated that they were necessary to make room in Lake Tekapo for possible inflow floodwaters, to satisfy requirements in their resource consents to spill water for kayakers and to protect habitat for the black stilt and other threatened species. In reply, we point out that the Waitaki River system was developed, at enormous expense to the taxpayer, primarily to generate power and not to act as a flood control system. The Tekapo River often flooded before outflows from Lake Tekapo were controlled, and at present the entire riverbed is uninhabited and fenced off from grazing. Furthermore, one normally expects dry weather rather than flooding in this area after Christmas, and heavy rains and subsequent flooding never eventuated either during or after the spills. Kayakers require 40-65 cumecs from Lake Tekapo for 18 six-hour days between Labour Day and the end of January. However, kayakers only use the water between Lake Tekapo and Lake Scott, after which the flow could have been diverted into the Tekapo-Pukaki Canal for power generation at four other power stations before reaching Lake Benmore. This was not done. Finally, birds in the riverbed feed on insects that hatch from underwater larvae in the river, and the flooding caused by Meridian's spills scoured the riverbed, flushing most of the larva downstream. These insect larvae didn't repopulate again until about a month after flooding ceased, and the birds simply moved elsewhere to find another source of food. We suspect that the birds could do without this kind of protection!

During the hearings of the Commerce Select Committee on the Electricity Industry Bill, Meridian Energy admitted a loss of 1300GWh of potential electricity generation due to hydro spill from all lakes under their control. This is just under 11% of the total energy produced by Meridian from July 1999 to June 2000. It also equals the total output of the Manapouri Power Station run at maximum capacity for three months. We have no information to say how much of this spill was controlled, which is water wasted by Meridian's choice, and how much was uncontrolled, which is flood water passing over the spillway of an already full reservoir. However, water that was spilled at Lake Tekapo in January and February lowered the lake level by 1.85 metres and was definitely controlled. We believe that a similar wastage of water should never be permitted to happen again in any of the New Zealand hydro lakes. Since the water and lakes are still owned by the Crown, we suggest that the Government act to require power generators to cease spilling water once lake levels start to drop below their maximum allowable values.

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