

Mokihinui Hydro Proposal



October 2007

This information outlines a proposal by Meridian to develop a hydro dam on the Mokihinui River on the South Island's West Coast. Further information will be made available as consultation on the proposal proceeds.

Meeting power needs

A reliable electricity supply is critical to New Zealand's lifestyle and economy, as well as the health and safety of people and communities. Each year our demand for electricity is growing by around two percent, the equivalent of adding a city the size of Dunedin to the country annually.

In recent years, the growth in demand has been higher in the South Island than the North, mostly as a result of rural and forestry development. During the winter of 2006 the South Island was a net importer of electricity from the North Island.

At present the West Coast endures up to 50 percent transmission losses at peak times from power delivered from the Waitaki hydro system. Electricity from Benmore is transmitted via Christchurch, Kikiwa and Inangahua before reaching the West Coast. This has an impact on the cost of power on the West Coast and presents a risk to the security of its power supply if transmission problems occur along the route.

Meridian is New Zealand's largest renewable energy generator. With a total capacity of 2496MW, we generate more than

30 percent of New Zealand's electricity using only renewable energy resources. Meridian is also New Zealand's only certified carboNZero electricity supplier.

Meridian's Sustainability Policy is a cornerstone of our operating philosophy. It means we balance every decision we make by considering the social and environmental, as well as financial impacts, it will have on communities, our country and the planet. Our commitment to renewable generation and sustainability for the long term is consistent with our philosophy of leaving this country a better place for future generations.

Diversifying the way that energy is supplied through renewable energy projects will help ensure the security and reliability of New Zealand's energy supply, especially as Maui gas reserves are running out.

Energy efficiency is important to Meridian. We are working with our customers to develop, sell and promote innovative, energy efficient practices and products.

Meridian manages 74 percent of New Zealand's hydro storage capacity. Currently we own and operate eight hydro stations on the Waitaki river system; New Zealand's largest hydro station at

Manapouri; the Te Āpiti wind farm in the North Island; the Wellington wind turbine; and White Hill, the South Island's first wind farm.

Meridian has begun construction of Project West Wind, a 62-turbine wind farm west of Wellington. Applications for resource consents have been lodged for the North Bank Tunnel Concept on the Waitaki River and for Project Hayes, a wind farm proposal for the Lammermoor Range, west of Dunedin.

New Zealand's renewable resources, including wind and hydro, can and should provide the bulk of New Zealand's future electricity needs for the foreseeable future. Meridian is committed to only generating electricity from renewable sources.

The Mokihinui Hydro Proposal

Meridian is investigating a potential hydro development on the Mokihinui River, to produce between 310 and 360 gigawatt hours (GWh) per year of renewable electricity generation. This output would provide the capacity to meet the current and immediate future needs of the South Island's West Coast electricity demand and provide security of supply to the region.



Simulated aerial image shows Mokihinui Hydro Proposal

The Mokihinui River is in the Buller District, 40km north of Westport. Its catchment area is approximately 68,000 hectares of the Glasgow, Matiri, Lyell, Allen and Radiant Ranges. From the Mokihinui Forks, the river runs 27 kilometres (km) westward, through the naturally formed Lake Perrine, the steep-sided Mokihinui Gorge and a short lowland valley, before discharging into the Tasman Sea.

Investigations into a 65-85MW power station began in 2006 and follow studies originally undertaken by the Ministry of Works during the 1960s and 1970s. Initial analysis of recent studies has led to the proposal for a dam approximately 80-85 metres (m) in height and 300m wide. The proposed dam and power station site would be immediately below Welcome Creek, 3km upstream of Seddonville and 11 km upstream of the coast.

The hydro dam would be constructed using the roller compacted concrete (RCC) method, which has been used to build approximately 250 dams around the world in the past two decades. The RCC method uses concrete compacted in layers, using a similar technique to building a road.

The dam would create a long and narrow 340 hectare lake extending eastwards 14km, approximately 500m past where Specimen Creek joins the river. The lake would have a relatively small operating range of three metres, so its banks would have a natural appearance.

Connection to the electricity network

The proposal is to construct approximately 29km of 110kV transmission line from the power station switchyard through the upland region southwards to meet the

Inangahua-Waimangaroa line near Cedar Creek. Meridian and Buller Electricity are working together to investigate local supply options.

River flow

The Mokihinui River currently has an average flow of 90m³/second (cumecs). Historical flow records show it is susceptible to frequent flash floods, with the potential for an 1840 cumec flood to occur once every two years. But, for 80 percent of the time, flows are below 105 cumecs.

How the flow would be managed (the flow regime) below the dam is still to be determined. However, it's expected the river flow would fluctuate within an environmentally sound range, in response to energy demand.

The Mokihinui River hydrological and fishery studies have shown that a minimum flow of 16 cumecs would maintain river health. To assist with whitebait migration and to ensure whitebaiting is not affected, the flow regime will need to maintain the river's natural flow from 1 September to 14 November each year.

Effects of development

Several specialist studies are being prepared on technical issues, some of which are covered



The Mokihinui Gorge from Seddonville flats; the dam would just be visible at the entrance to the gorge.

briefly here. Once studies are complete, information sheets on each topic and reports will be available on Meridian Energy's website www.meridianenergy.co.nz.

The topics covered by this series of information sheets will be water (hydrology and sedimentation, coastal erosion, lake water quality and tidal hydraulics), aquatic ecology (fisheries), social, landscape, terrestrial ecology, archaeology, recreation, construction (and construction effects).

Key benefits of the development

Security of supply for the West Coast

A key benefit of this hydro proposal is the opportunity to provide renewable generation on the West Coast which would enhance security of supply in the region.

The West Coast's electricity demand presently peaks at about 65MW and is expected to increase by 15-23MW in the next five years.* With a capacity of 65-85MW producing 310-360GWh per year, the Mokihinui Hydro Proposal has the capacity to meet the current and immediate future energy needs of the West Coast.

* As estimated by Buller Electricity and Westpower and contained in Transpower's Annual Planning Report 2007.

Recreational facilities

The lake created beyond the dam could provide some excellent recreational opportunities, including fishing, mountain biking, tramping and canoeing. Access to the Mokihinui Forks Ecological Area and surrounding areas could be enhanced with lake access and the upgrade of the existing degraded track.



Recreation

The main recreational uses of the river below the Mokihinui Forks are whitebaiting and angling below the proposed dam site.

There is also some white water kayaking, rafting, mountain biking, hunting and tramping in the proposal area. Currently, activities above the proposed dam site are made difficult by the poor quality of the access track (Mokihinui River Track) from the Welcome Creek road end. Helicopter access is required for kayaking, rafting and is also often used for angling.

The replacement of white water with a lake environment beyond the proposed dam as far as The Forks would be the most obvious recreational effect of the hydro proposal. White water kayakers and rafters have access to numerous other rivers on the West Coast which are considered to be better for kayaking and rafting than the Mokihinui. Flat water kayaking would be possible in the proposed lake.

The proposed dam and lake would have no direct effect on access to the walking tracks at Denniston and Charming Creek. The landscape might be affected if the transmission lines were visible from the tracks. However, the transmission route is being assessed so that this potential is minimised.

An upgrade of the Mokihinui Track would provide easier access above the dam to The Forks area. The effect on hunting activities is expected to be no more than minor.

Fish and fisheries

Mokihinui River is a renowned whitebait and trout fishery. Whitebait are caught below the SH 67 bridge. Trout fishing occurs both in the headwaters above the Mokihinui Forks

Ecological area and below Welcome Creek. Very little angling currently occurs within the gorge area.

NIWA recently studied fish populations and their preferred habitats in the Mokihinui River and its tributaries. The fish found in the Mokihinui River also live in other West Coast rivers. Twelve native fish species were identified including five whitebait species. The whitebait catch of the Mokihinui River is mainly made up of juvenile koaro and inanga. Banded, giant and shortjawed kokopu also live in the river. Other native fish found included longfin eels; common, redfin and bluegill bullies and torrentfish. One lamprey was found. Introduced brown trout live throughout the river and its tributaries.

As some species migrate up the river, a 'catch and carry' system is proposed to assist eels and koaro to move upstream. The fish studies also found that the spawning habitat for inanga whitebait is relatively rare in the lower reaches of the Mokihinui River and tributaries below the proposed dam site.



Inanga, Galaxias maculatus. Photograph: R.M. McDowall.

Ecology

Studies of vegetation, animals and birds in the proposed development area have found that each of the identified species is typical in other areas of the West Coast. The species are also found in the headwater area of Mokihinui

The Mokihinui Gorge history

According to one reference, the name Mokihinui means 'big reed raft'. This refers to an occasion when a Maori raiding party making its way down the coast constructed a large raft to take all its warriors across the Mokihinui River in one trip, to avoid leaving anyone behind and vulnerable to attack from Ngai Tahu Maori. The raft was apparently used for many years.

The Mokihinui area was the site of two main gold rushes. Gold was first prospected along the beach around the mouth of the Mokihinui River in 1866 – a small township of several thousand miners grew about a mile up river from the mouth. In 1873, the river became a focus for gold miners when quartz reef containing good quality gold was found about 20 miles up the river. This area was the main focus of gold mining for the next 60 years, mostly around Maori Creek and Jones Creek.

Forks and the Ngakawau Ecological Area.

No threatened species of plants were found in the Mokihinui Gorge area and the area is not considered to be primary habitat of any threatened species of bird.

Tomtits, bellbirds, robins, grey warblers, fantails and silvereyes all live in the area and the morepork are frequently heard at night. Kereru, kea, kaka and kakariki were found in low numbers in the Mokihinui Gorge and they usually live in podocarp-rich forests like the Mokihinui Forks Ecological area. Seven whio (blue duck) were sighted during the studies and are believed to live in the area.

Deer and goats were found, as well as the predator pests, possums and rats, which

destroy wildlife and trees. Meridian would investigate options for predator control in the nearby Mokihinui Forks Ecological Area to make the habitat safer for wildlife.

Landscape

The waters of the Mokihinui come from a system of seaward mountains and steep bush clad slopes. A characteristic of the river is its narrow proportions, a result of its steep and narrow valley.

The Mokihinui Gorge is a remote landscape. The proposed site of the Mokihinui Hydro Proposal is not on a regular tourist route or one of the West Coast's renowned landscape features.

A hydro development proposal on this site would be in keeping with the majority of land use activities on the West Coast. While the landscape would temporarily be affected by construction activity, including vegetation removal and earthworks. The proposal includes full restoration of affected areas.

Neither the dam, nor the lake, would be easy to see, particularly from key vantage points. Research suggests that if it goes ahead, the dam and reservoir would become attractions, as have other South Island hydro dams and lakes. The lake and proposed new lakeside walking track would allow easier access to the gorge and its environs.

Construction effects

A hydro dam development involves site clearance; formation of a site works area; establishment of buildings and workshops; aggregate crushing; concrete batching plant; storage areas; excavation and river diversion works. The construction works would include building a diversion channel; hydro dam; powerhouse; switchyard and a transmission line. On completion of the proposed dam and transmission line construction, Meridian will rehabilitate the sites altered by the construction work.

The main construction effects would be increased traffic movements and noise.

Meridian would avoid and minimise these effects with an environmental management plan. This plan will include management of stormwater and wastewater, noise, traffic, pests, weeds, health and safety and restoration works. All construction works and associated effects would meet New Zealand safety standards.



View from above the dam site towards Seddonville; the site facilities area would be to the left of the river.

Archaeology

An archaeological assessment identified nine previously unknown sites of historical and local significance in the proposal area. Four of these sites would be inundated by the lake which would be formed as a result of the proposal. There is limited visual evidence of the sites and in many places access is becoming overgrown with regenerating vegetation. Slips and floods have also affected some sites.

The West Coast of the South Island was the scene of many gold rushes in the 1800s and the remains of many sites can be found throughout the coast. There are other, more accessible, heritage examples on the West Coast, including the gold mining settlement and operations at Lyell and coal mining infrastructure and settlements at Denniston and Charming Creek. These sites contain the



Remains of the Iron Bridge, Mokihinui Gorge

same working and settlement elements as those in Mokihinui, but are all in better condition and more accessible.

Meridian would work with the Historic Places Trust to ensure the best outcome for the Mokihinui sites. The project would include full archaeological recording and, where possible, re-location. The remains of the Iron Bridge, for example, would be moved to a more accessible location and much of the pack track would be restored as a walking track.

Consultation and local impacts

Community and stakeholder consultation gives people a chance to have their say on energy development projects. It also lets Meridian learn more about the communities, their interests and concerns. Meridian will consider social, environmental and resource use issues raised and take them into account in its development proposal as well as identifying ways to address any potential adverse effects. An independent specialist will assess any likely social impacts of the hydro dam construction and associated transmission route.

The company's commitment to consultation has contributed to widespread support and the success of other recent renewable energy projects.

Information days will be held over the coming months. The location and timing of these information days will be publicised in local newspapers. Anyone is welcome to attend.

Where to get more information

Information days: watch your local newspapers for Mokihinui Hydro Proposal information days, which will be held from time to time as part of the consultation process.

Send us a letter: Project Manager, Mokihinui Hydro Proposal, Meridian Energy, PO Box 2454, Christchurch.

Email us: hydro.info@meridianenergy.co.nz

Phone us: 0800 496 501

Visit our website: www.meridianenergy.co.nz

To join our database and receive more information on this proposal please phone or email us.

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