

**BEFORE THE HEARING PANEL
CONSTITUTED BY THE MACKENZIE DISTRICT COUNCIL**

IN THE MATTER of the Resource Management Act
1991

AND

IN THE MATTER of submissions on Proposed Plan
Change 20 to the Mackenzie
District Plan

AND

IN THE MATTER of submissions and further
submissions by Meridian Energy
Limited

**STATEMENT OF EVIDENCE BY ERIN BRIDGET WHOOLEY
FOR MERIDIAN ENERGY LIMITED
DATED 15 NOVEMBER 2022**

INTRODUCTION AND SCOPE OF EVIDENCE

Name, Qualifications and Experience

- 1 My full name is Erin Bridget Whooley. I am an Environmental Manager at Meridian Energy Limited (**Meridian**).
- 2 I have been employed by Meridian for five months and am responsible for providing resource management advice and expertise to Meridian's Assets and Project teams.
- 3 Prior to joining Meridian, I was employed by Beca Ltd, a consultancy firm. I have undertaken a range of planning projects, particularly relating to resource consenting of major infrastructure and public notification processes in Wellington and Auckland, and policy work associated with gas infrastructure across the North Island.
- 4 I hold the qualification of a Bachelor of Resource and Environmental Planning from Massey University, obtained in 2008. I am a full member of the New Zealand Planning Institute. I have approximately 13 years of experience in planning and resource management matters.
- 5 My statement of evidence is not as a planning expert, rather this statement is made in the context of my position with Meridian from an operational perspective and is factual in nature rather than opinion. The primary purpose of my statement is to assist the Hearing Panel in understanding the operational consequences of Plan Change 20 (**PC20**) in the context of the operation of the Waitaki Power Scheme (**WPS** or **Scheme**).
- 6 Independent expert planning evidence for Meridian has been provided by Ms Susan Ruston who is attending the hearing. I have read Ms Ruston's brief of evidence.
- 7 I am authorised to present this evidence as a representative of Meridian and on behalf of the Company.

Purpose and Scope of Evidence

- 8 The purpose of my statement is to:
- (a) Provide an overview of Meridian Energy Limited (Meridian) as a business;
 - (b) Introduce the Combined Waitaki Power Scheme and the Waitaki Power Scheme;
 - (c) Explain the national and local significance and contribution of the Waitaki Power Scheme to the Mackenzie District and New Zealand and describe its importance in the context of meeting New Zealand's climate change objectives; and
 - (d) Explain Meridian's approach to MDC Plan Changes, specifically including Plan Change 20 (PC20) and implications on renewable energy generation including from the nationally significant WPS.

INTRODUCING MERIDIAN ENERGY LIMITED

- 9 Meridian is a limited liability company listed on the New Zealand Stock Exchange, with 51% of the company owned by the New Zealand Government. Genesis Energy, Mighty River Power and Meridian formed from the split of the Electricity Corporation of New Zealand on the 1st of April 1999.
- 10 Meridian's core business is the generation, marketing, trading and retailing of electricity and the management of associated assets and ancillary structures in New Zealand. In addition to being New Zealand's largest generator of electricity, Meridian is the country's largest generator of renewable electricity and is committed to generating electricity from 100% renewable sources.
- 11 Meridian owns and manages two hydro power schemes in New Zealand: the Waitaki Power Scheme (from Lake Pūkaki down and comprising 6 power stations), and the Manapouri Power Station. Meridian owns five wind farms in New Zealand: Te Uku (Raglan), Te Apiti (Manawatu), Mill Creek (Wellington), West Wind (Wellington), White Hill (Southland) and one currently under construction at Harapaki (Napier). Meridian's hydro stations generate enough electricity to power the equivalent of around 1.7 million homes each year and the wind farms generate enough electricity to power the equivalent of around 190,000 homes each year.

- 12 Meridian has a significant interest in the Mackenzie District Plan, primarily because large parts of the WPS are located in the district,¹ and because Meridian may develop new renewable energy generation projects in the future.

THE COMBINED WAITAKI POWER SCHEME AND THE WAITAKI POWER SCHEME

- 13 In this section I describe the Combined WPS and WPS, focusing on the area of the scheme which lies in the Mackenzie District.
- 14 The Combined Waitaki Power Scheme is the largest hydro-electric power scheme in New Zealand, with controllable and flexible generating capacity of approximately 1,740MW and hydro storage capacity of approximately 3,310GWh.
- 15 The Combined WPS is divided into two parts: the first part includes the Tekapo A and Tekapo B hydro-generation assets and associated canal network which are owned and operated by Genesis Energy Limited, referred to as the Tekapo Power Scheme. The balance of the WPS, including six of the eight power stations which are owned and operated by Meridian, which I refer to as the WPS. When I refer to both, I refer to Combined Waitaki Power Scheme, shown as a schematic in Appendix 1.
- 16 The Combined Waitaki Power Scheme consists of eight power stations, four canal systems, large modified storage lakes, weirs, gates, a series of canal diversions, a cascade of in-river dams and other control structures that operate together. Progressively constructed between 1928 and 1985, the Scheme is designed as a linked hydro-electricity generation chain, with water 'descending' from the top of the catchment to pass through eight Power Stations. All inflows to the catchment above the Waitaki Dam, unless otherwise abstracted, pass through one or more power stations and hence are available to generate electricity.
- 17 Water is received into Lake Pūkaki from Lake Tekapo via the Tekapo Canal and Tekapo B Power Station operated by Genesis Energy. The majority of the water utilised within the WPS is derived from the alpine headwaters which either feed managed natural lakes (Lakes Pūkaki and Ōhau) or flow into the Ahuriri Arm of Lake Benmore. Below Lakes Pūkaki and Ōhau there are four artificial lakes (Ruataniwha, Benmore, Aviemore

¹ The WPS straddles the Waitaki River and is partially within the Waitaki District.

and Waitaki – created as a result of the corresponding dam at each location) that store water and therefore manage generation before water reaches the Lower Waitaki River and ultimately flows to the sea. There are numerous tributaries that enter the rivers and lakes, the largest of which is the Ahuriri River.

- 18 The hydro-storage capabilities of the Scheme are unique – the Combined WPS ‘normally’ holds approximately 60% of the national hydro-storage capacity, and this is exclusively located within Mackenzie District in Lakes Tekapo and Pūkaki. This hydro-storage is critical to enabling the traditionally higher summer inflows into these lakes to be retained so hydro-electricity can be reliably generated during winter when consumer demand is typically higher. The storage capacity means that the generation output can be altered as national demand changes daily, weekly and within the seasons. In addition to the normal storage amount, contingency storage is available during low flow events and energy critical periods.
- 19 The elements of the WPS owned and operated by Meridian which are located within the Mackenzie District consist of:
 - Pūkaki high dam (various components)
 - The Pūkaki and Ōhau and Ōhau A Canals
 - Lake Ōhau Gate Control Structure (Gate 20)
 - Lake Ōhau Weir, Northern Side
 - The Ōhau A Power Station
 - Lake Ruataniwha, Northern Side (excluding the Ruataniwha Control Gate Structure (Gate 22)).
- 20 The WPS influences the following waterbodies either wholly or in part within Mackenzie District under the operating easements from Toitū Te Whenua Land Information New Zealand (LINZ) and includes the entire margins, as shown in Appendix 2:
 - Lake Pūkaki
 - The Pūkaki River
 - Lake Ōhau (Waitaki District Council).

- The Northern Side of the Upper Ōhau River
 - Lake Ruataniwha (northern side)
 - The Northern Side (Haldon Arm) of the Lower Ōhau River
 - The Northern Half of Lake Benmore
- 21 The WPS, as a whole², operates constantly. Meridian staff work 24/7 to monitor and manage power generation. Due to the full-time nature of hydro power production through turbines, constant refurbishment, maintenance and upgrades are necessary.
- 22 Meridian's asset value within the Mackenzie District is worth over \$4bn. Meridian pays a considerable contribution to district rates which contributes to MDC services.
- 23 Meridian has a range of Core Land and Operating Easements which apply to land within the Mackenzie District. Core land is owned by Meridian, generally sited around assets and is managed for hydro-generation purposes. Core land areas have previously been extensively modified to provide for the construction, operation, maintenance, and the refurbishment needs of the Scheme.
- 24 Operating easements apply to Crown owned land where Meridian has been provided with an easement to enable use of the land for renewable energy generation (specifically the operation and management of hydro facilities). Operating easements are held over WPS lakes all or partly located within Mackenzie District (Lake Pūkaki, Lake Ruataniwha, Lake Benmore³ and Lake Ōhau) and over certain rivers within the Mackenzie District (Pūkaki River, Upper Ōhau River and the Lower Ōhau River).

LOCAL AND NATIONAL IMPORTANCE OF THE WPS

- 25 The WPS is an essential and irreplaceable component of New Zealand's electricity system; it provides a national contribution to electricity generation due to the hydro-storage capabilities.

² Note that not all stations operate all the time. Occasionally, stations or specific infrastructure has an outage.

³ Note that the Operating Easement over Lake Benmore is fully in place within Mackenzie District, but has yet to be fully completed within Waitaki District.

- 26 On average, the WPS contributes approximately 18% of NZ's annual electricity generation requirements and contributing proportionally more during periods of peak demand – to 30% of the national requirement. The output from WPS in 2022 was 7750 GWh – enough energy to meet Canterbury's annual requirements and help meet demand in other regions. There is no readily available alternative generation in New Zealand that could substitute the volume of electricity produced by the Scheme.
- 27 The Combined WPS is an adaptive and stable system that plays a foundational, and increasingly more important role in national electricity supply, particularly in terms of forecast increases in New Zealand electricity demand.
- 28 Maintaining a secure electricity supply system, both nationally and regionally is critically dependent on flexible and controllable generation technologies that are able to respond to continuously changing electricity demand. Currently (using today's technology), this flexibility can only be provided by hydro generation with storage, thermal power stations with flexible fuel arrangements, or by reducing demand to match supply. The WPS comprises 56% of the historical-average hydro storage for New Zealand.
- 29 The unique ability of the Scheme to quickly respond to short-term changes in supply or demand compliments existing inflexible and/or intermittent renewable generation (e.g. solar and wind generation which is uncontrollable, intermittent and cannot be matched to demand). With nation-wide growth in intermittent renewable generation, this function of hydro generation will become increasingly important.
- 30 Differences in demand and supply can cause the national power system frequency (50hz) to change, and unless corrected, can quickly lead to system failures and electricity blackouts. The WPS can adjust generating units instantaneously and start and shut down individual generating units within minutes compared to some thermal power stations which can take hours to start up (or to reinstate following an unplanned shut down). This responsiveness means that the WPS is uniquely very good at meeting sudden changes in market demand or responding to the failure of power stations elsewhere. If this level of responsiveness was not available, it would be necessary to maintain more generating units in service at partial

output to cover the risk of other generating units failing. Many power stations can provide a level of automatic short-term response to system frequency variations but generation around the country must be adjusted in a coordinated manner to match the trend in demand.

- 31 In terms of all of the power sources in New Zealand, the WPS operates 'ahead' of fossil fuel generation, reducing output from what would otherwise be carbon emitting.
- 32 Due to the hydro storage of the WPS using both long-term (Lakes Tekapo and Pukaki) and short-term (Lakes Ōhau, Benmore, Aviemore and Waitaki) storage lakes, the generation capacity is flexible and controllable, able to meet fluctuations in demand instantaneously, hourly and daily and seasonally – by storing water in high-inflows and releasing it during periods of low inflows.
- 33 The WPS supports the HVDC link at the site of the Benmore Power Station, which connects the South Island transmission network to the North Island and allows electricity to flow between the two islands. Between Haywards (Hutt Valley) and Benmore Power Station, there is no other connection to the HVDC link. This is important because the New Zealand electricity system is diverse by demand, generation type and is generated on both islands.
- 34 As explained previously, the WPS runs through the Mackenzie district. Twizel, Aviemore, Lake Waitaki, Otematata and Lake Tekapo were historically 'hydro towns' which provided accommodation and community centres to the workers who constructed the WPS. These towns now provide a key contribution to tourism and growing holiday home/subdivision needs. The Meridian hydro-generation infrastructure are landmarks within the Mackenzie district.
- 35 The four canals associated with the WPS are key to both land use productivity and tourism. The canals irrigate approximately 54,600ha of land through the Mackenzie district and provide a reliable source of water which is key to development. The lakes, specifically Lake Benmore, and the Lower Waitaki River provide key, are internationally renowned fishing spots. The canals support commercial salmon farms which employ locals and attract visitors.

- 36 Meridian has an office in Twizel which provides the base from which the South Island generation assets, including WPS, are run. There are approximately 100 staff based here who live in and contribute to the Twizel, Lake Tekapo and Ōhau communities.
- 37 Meridian provides a community fund “Power Up” to support local projects. In the Mackenzie District in October 2022, this included contributions to the following projects:
- Twizel Volunteer Fire Brigade – community awareness of fire protection
 - Omarama Land Search & Rescue - emergency generator
 - Twizel Mini Kickers and Junior 5-a-side - Tournament Kit
 - Kurow Bowling Club – maintenance equipment contribution
 - Hakataramea Cemetery Trust – grave restoration and preservation
 - Whalan Lodge Trust - Kitchen Equipment
 - Aoraki Mount Cook Museum Trust – archiving support
 - Waitaki Valley Community Native Nursery - signage
 - Twizel Little Movers - play resources
 - Otematata Residents Association Inc - track, carpark, and accessible entrance development at Otematata Wetlands
 - Vanished World Centre Refresh - Concept Plan Project at Duntroon
 - Predator Free Mackenzie – trap construction
- 38 Nationwide, in the past 15 years, Meridian has invested more than \$9 million into 1,241 projects.

POLICY FRAMEWORK FOR THE SCHEME

- 39 The Combined WPS is fundamental to achieving the Government’s aspirations for renewable electricity generation and climate change.
- 40 The “national significance” of the Waitaki Power Scheme is established in statutory documents, specifically including the National Policy Statement for Renewable Electricity Generation 2011 (**NPSREG**), the National Policy Statement for Freshwater Management 2020 (**NPSFM**), and the

Canterbury Regional Policy Statement (**CRPS**). Ms Ruston's evidence provides an assessment of PC20 with respect to the relevant statutory and planning requirements, including the NPSREG, NPSFM and CRPS.

- 41 New Zealand has committed to achieving net zero emissions by 2050⁴. The Government aspires to achieve 100 percent renewable electricity by 2030. Meridian acknowledges that New Zealand's energy demand has been growing steadily and is forecast to increase in terms of electrified heating and transportation. This increase in demand needs to be met by renewable electricity generation – both existing and new generation. Newly developing technologies which will offer opportunities to decarbonise parts of the wider energy system (e.g. hydrogen for transportation energy) will require electricity for production/operation.
- 42 The WPS is recognised as vital infrastructure in New Zealand's toolkit for decarbonising the New Zealand economy; a reliable renewable electricity system is key to decarbonisation. The Climate Change Commission 2021 '*Ināia tonu nei: a low emissions future for Aotearoa*' dated 31 May 2021 suggests that responding to climate change by decarbonising our economy is a key national policy objective and a priority area for action includes increasing the amount of clean energy Aotearoa can produce.
- 43 The Ministry of Business, Innovation & Employment is developing the *New Zealand Energy Strategy*⁵ and has indicated that the '*Renewable energy strategy*' work programme will include renewable electricity generation.
- 44 There is national, regional and district benefits to reducing emissions. Accordingly, maintaining and increasing generation of electricity from renewable sources is an important aspect of meeting national objectives relating to climate change.

MDC PLAN CHANGES

- 45 Fundamentally, Meridian is seeking to ensure that the provisions and changes promoted through PC20 recognise and ensure the retention of the WPS's existing renewable energy generation, and secondarily, provide for future renewable energy development options. The WPS can

⁴ Climate Change Response (Zero Carbon) Amendment Act 2019, Part 5B, s5Q

⁵ <https://www.mbie.govt.nz/building-and-energy/energy-and-natural-resources/energy-strategies-for-new-zealand/>

only provide renewable power generation services to New Zealand if the Scheme can be appropriately operated, maintained, improved and refurbished.

46 Meridian has been involved in several Mackenzie District Plan Changes, specifically including;

- Plan Change 13 – Mackenzie Basin (PC13); and
- Plan Change 18 – Indigenous Biodiversity (PC18)

47 I understand Meridian was substantially involved in these processes and sought to ensure an appropriate planning framework for the WPS was provided. The plan changes introduced topic specific matters.

48 Mackenzie District Council has chosen to review the District Plan in parts as stated by the s42A officer (s42A report, paragraph 18).

“The Strategic Direction chapters provide overarching direction to be achieved through the remainder of the District Plan and as such, they are intended to guide the review of provisions within other chapters, as the MDPR progresses”.

49 For Meridian, like PC13 and PC18, this creates some difficulties in anticipating how the individual parts of the District Plan will be integrated and fit together, and what the overall effect of the District Plan on both development of renewable electricity generation and the operational, maintenance and refurbishment needs of the WPS will be.

50 Given the national importance of the WPS, Meridian seeks specific acknowledgement of this infrastructure through PC20 in the context of its strategic importance and suggest this is achieved by providing an objective relating to renewable energy generation which specifically refers to the WPS.

51 Meridian is concerned that, without appropriate District Plan strategic objectives for the WPS, PC20 may prevent or frustrate the necessary ongoing operation, maintenance and refurbishment of the WPS as other parts of the Plan are developed. This could lead to the imposing undue regulatory hurdles to future works associated with the Scheme.

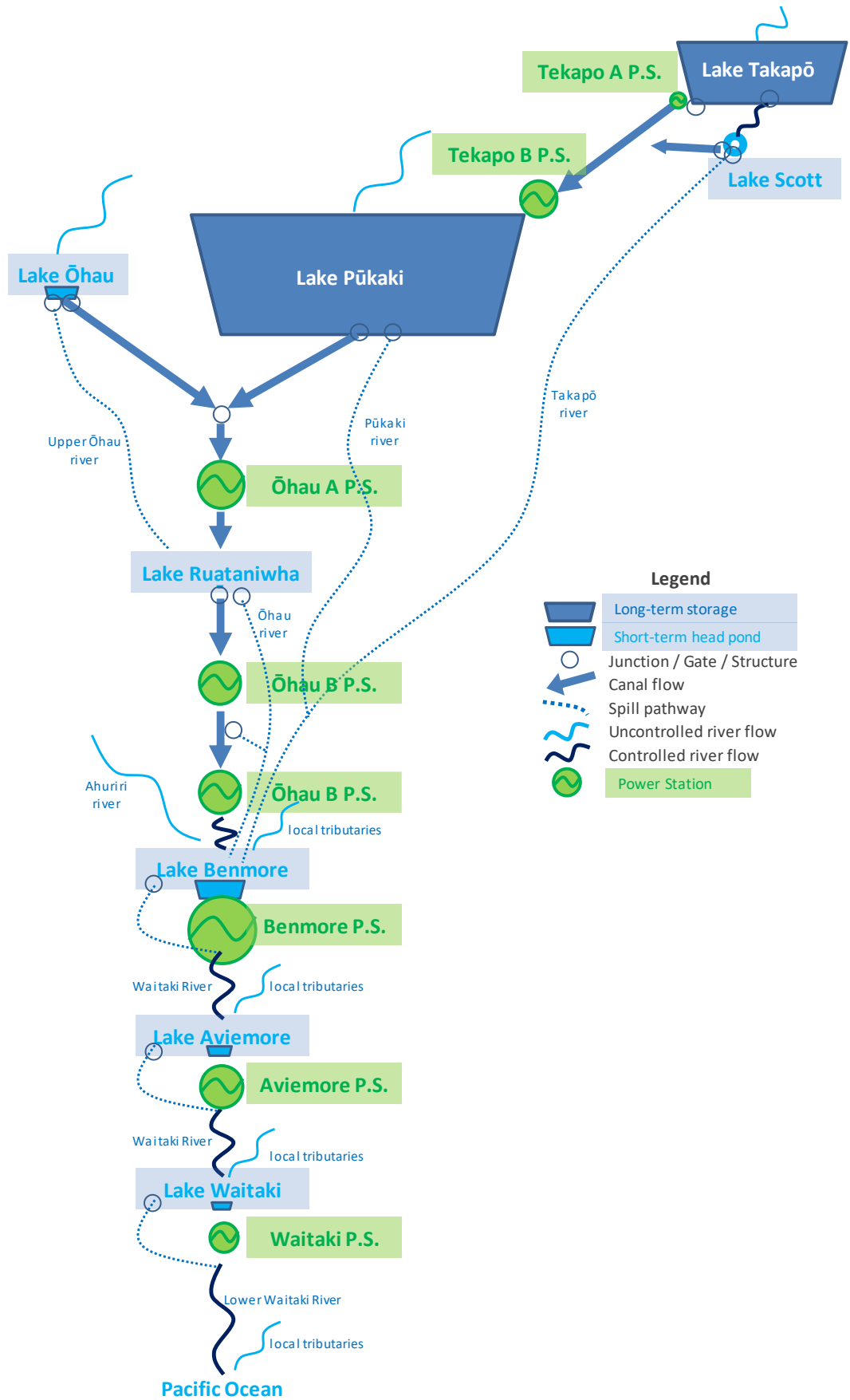
CONCLUSIONS

- 52 The WPS is nationally important infrastructure and makes a significant contribution to New Zealand in meeting climate change obligations and providing reliable electricity generation.
- 53 Meridian's submission focuses on recognition of the WPS's existing renewable energy generation and future provision for further development of renewable generation in the Mackenzie District. Meridian and the WPS can only provide renewable power generation services to New Zealand if the Mackenzie District Plan provisions adequately recognise and provide for this large piece of nationally significant infrastructure and enables it to be appropriately operated, maintained and refurbished.
- 54 Hydro storage is the most important renewable element in a reliable, flexible, and controllable electricity supply. Without this, emissions and renewable energy targets cannot be met.
- 55 Meridian seeks the relief provided to amend the Strategic Objectives chapter of PC20 as outlined in Ms Ruston's evidence.

Erin Whooley

15 November 2022

APPENDIX 1 – COMBINED WPS SCHEMATIC



APPENDIX 2 – MAP OF WPS INFRASTRUCTURE WITHIN THE MACKENZIE DISTRICT

