

**BEFORE THE HEARING PANEL APPOINTED
BY THE OTAGO REGIONAL COUNCIL**

UNDER	The Resource Management Act 1991 (Act or RMA)
IN THE MATTER	of an original submission on the Proposed Regional Policy Statement for Otago 2021 (PRPS)
BETWEEN	AURORA ENERGY LIMITED Submitter 0315
AND	OTAGO REGIONAL COUNCIL Local Authority

EVIDENCE IN CHIEF OF JOANNE DOWD ON BEHALF OF AURORA ENERGY LIMITED



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1. Executive Summary

- 1.1 Aurora Energy Limited (**Aurora Energy**) is an electricity distribution business (**EDB**). Its role is to distribute electricity from grid-exit points (**GXPs**) that form part of the National Grid owned by Transpower New Zealand Limited, and deliver it to customers.
- 1.2 Aurora Energy was incorporated in 2003 as a wholly owned subsidiary of Dunedin City Holdings Limited, owned by Dunedin City Council. As the owner of an electricity distribution network and being a heavily regulated industry, Aurora Energy is responsible for constructing, maintaining, upgrading and developing an efficient and safe electricity distribution network. Aurora Energy is committed to ensuring the people within its networks safety, service and satisfaction.
- 1.3 Aurora Energy's network is New Zealand's seventh largest by customer connections network and is the largest of the three EDBs that operate in the region. Aurora Energy owns, operates and maintains two non-contiguous electricity distribution networks in Dunedin and Central Otago / Queenstown Lakes within the Otago region. This network carries electricity from the National Grid to more than 92,000 homes and businesses. The network is comprised of power lines, poles, underground cables, substations and transformers that delivers electricity to homes, farms and businesses.
- 1.4 Like many other distribution networks in New Zealand, Aurora Energy's infrastructure has developed along with the local population and industry, spanning over 100 years. As a result, large portions of the network are now due to be renewed. Over the next ten years, (and as evidenced in the recent successful Customised Price Path (**CPP**) application to the Commerce Commission) Aurora Energy need to make significant investments to maintain and renew the distribution network whilst catering for growth and security of supply.
- 1.5 While a resilient electricity distribution network (in conjunction with the National Grid and Energy generators) remains at the heart of New Zealand's energy future, climate change has become a central issue for governments globally and hence for Aurora Energy as one of the responsible owners and operators of the electricity distribution network in Otago. The electricity sector will play a critical role for New Zealand in meeting its zero carbon aspirations, by both investing in its existing assets and enabling connections to new sources of renewable energy and technologies.

- 1.6 Aurora Energy wishes to see appropriate planning provisions included in the PRPS to ensure that it is able to develop, upgrade, operate, and maintain its network to enable a sustainable, secure and reliable supply of electricity in Otago.
- 1.7 Aurora Energy generally supports or accepts the majority of the s 42A report recommendation in respect of Aurora Energy's submission. However, Aurora Energy considers that the amendments and additions set out in the evidence of Ms Justice are necessary to:
- (a) Ensure the ongoing operation, maintenance, upgrading and development of the electricity distribution network is appropriately enabled.
 - (b) Recognise and provide for the regional benefits of a secure energy supply.
 - (c) Encourage and enable the electricity sector's role in electrification of the economy to assist in meeting New Zealand's emission reduction goals; and
 - (d) Ensure electricity distribution assets are not compromised by avoiding adverse effects of activities.

2. Introduction

- 2.1 My full name is Joanne Dowd.
- 2.2 I am the Regulatory Assurance Manager at Aurora Energy and I have been in this role for 3 months. Before that I held the position of Planning, Property & Environmental Manager at Aurora Energy since 2015. I was involved in the preparation of the submission and further submissions by Aurora Energy on the PRPS. I was also involved in the original review of the Partially Operative Regional Policy Statement 2019 which commenced in 2015.
- 2.3 I hold a masters degree in Town and Country Planning from The Queens University of Belfast, obtained in 1993. I have been a full member of the UK Royal Town Planning Institute since 1997. I am also a member of the Resource Management Law Association since 2006. I currently sit on the Electricity Networks Associations (**ENA**) Infrastructure Working Group drafting proposed provisions for the National Planning Template proposed for Infrastructure. I have 29 years local and international planning experience in both the private and public sector.
- 2.4 My experience includes a mix of local authority and consultancy planning and resource management work. In recent years, I have focused on providing consultancy advice with respect to regional and district plans, utility developments, resource consents and environmental management and environmental effects assessments. This includes extensive experience with large-scale projects involving inputs from multidisciplinary teams.
- 2.5 I have been asked to provide this evidence in support of a submission on the PRPS lodged by Aurora Energy (OS0315).

3. Scope of Evidence

- 3.1 My evidence will:
- (a) Provide an introduction to Aurora Energy.
 - (b) Describe the current Aurora Energy network in Otago and the significant role they play locally and regionally.
 - (c) Set out the current challenges faced by Aurora Energy and the network development plans and obligations it currently has.

- (d) Identify the future challenges that Aurora Energy expects to face and what type of measures will be required to address these.
- (e) Discuss the importance of the Aurora Energy's Electricity Sub-Transmission Infrastructure (**ESTI**) and Significant Electricity Distribution Infrastructure (**SEDI**) to the region.
- (f) The relief sought by Aurora Energy in relation to the PRPS.

4. Aurora Energy's Network

- 4.1 Aurora Energy owns, operates and maintains two non-contiguous electricity distribution networks in Dunedin and Central Otago (which includes Queenstown Lakes) within the Otago region. This network carries electricity from the National Grid to more than 92,000 homes and businesses. These networks include the power lines, poles, underground cables, substations and transformers that deliver electricity to homes, farms and businesses. The network is located both within the road reserve and on private property. Approximately 50% of the Central Otago network is located within private property.
- 4.2 Aurora Energy's two regional networks, is made up of five distribution networks which are fed from Transpower GXPs as listed below:

Table 1

Distribution Network	Sub-network	GXP
Dunedin Network	Dunedin	Halfway Bush
		South Dunedin
Central Otago Network	Central Otago & Wanaka	Cromwell
		Clyde
	Queenstown	Frankton

- 4.3 The two Dunedin networks are the oldest networks – Halfway Bush and South Dunedin. The development of these networks started around 1910, although there were pockets of electricity supply before that. The three Central Otago networks – Frankton, Cromwell and Clyde – were mostly developed after 1960, although these also include pockets of older assets.

- 4.4 The Dunedin and Central Otago (which includes Queenstown Lakes) networks supply close to 56,050 and 36,500 customers, respectively. Both networks include a number of major and smaller industrial and commercial connections. In Dunedin these mostly relate to the city infrastructure, including the port, university, and local council operations. Large consumers on our Central Otago network include tourism, irrigation and council loads.
- 4.5 Electricity distribution networks are hierarchical in nature, with lines and cables operating at three distinct voltage ranges:
- (a) Sub-Transmission: operating at 66 kV (minority) and 33 kV (included in the definition of ESTI)
 - (b) High Voltage Distribution: generally operating at 11 kV in Central Otago and 6.6 kV in Dunedin
 - (c) Low voltage (LV): operating at 400 V three phase or 230 V single phase.

Sub-Transmission Network

- 4.6 The sub-transmission network conveys electricity to zone substations which supplies the distribution network that in turn supplies the low voltage network. The sub-transmission network has two operating voltages 66 kV and 33 kV. 66 kV is used where there are long distances between GXP's and zone substations, as this reduces line losses. Currently, Aurora Energy only use 66 kV in parts of the Cromwell network while the rest of the sub-transmission network is operating at 33 kV.
- 4.7 As of 31 March 2021, the Dunedin sub-transmission network runs for a total of 210 km with 144 km of that overhead. The Central Otago sub-transmission network is largely overhead with a total length of 399 km, with 20 km of underground cable and 379 km of overhead line.
- 4.8 Zone substations convert the sub-transmission voltage to 11 kV and 6.6 kV. The majority of Central Otago network distribution voltage is 11 kV with parts of Clyde township at 6.6 kV. Most of Dunedin network is 6.6 kV with suburbs such as Outram, East Taieri and Mosgiel are 11 kV. The distribution voltage is further transformed by distribution substations (either pole mounted or ground mounted) to 400V/230V to supply homes, farms and businesses.

High Voltage Distribution and Low Voltage Network

4.9 The Dunedin distribution and LV networks are largely overhead, with 323 of 1,036 km of distribution and 323 of 1,039 km of LV network being underground. In Central Otago, 808 km of 2,354 km of distribution and 762 of 891 km of LV are underground.

4.10 Aurora Energy's High Voltage District network is distinct from its ESTI and comprises a mixture of underground cables and overhead lines. As of 31 March 2022, Aurora Energy's electricity distribution network (both overhead and underground) comprised that infrastructure shown in Tables 2 and 3 below.

Table 2: Distribution Network Overhead

Sub-Network	GXP	Sub Transmission (33/66 kV) (km)	Distribution (11/6.6 kV) (km)	Low Voltage 400/230 V (km)
Dunedin	Halfway Bush South Dunedin	144	713	804
Cromwell Network and Central Otago	Cromwell Clyde	301	1261	107
Queenstown	Frankton	78	285	22
Total		523	2259	933

Table 3: Distribution Network Underground

Sub-Network	GXP	Sub Transmission (33/66 kV) (km)	Distribution (11/6.6 kV) (km)	Low Voltage (400/230 V) (km)
Dunedin	Halfway Bush South Dunedin	66	323	264
Cromwell Network and Central Otago	Cromwell Clyde	8	531	463

Queenstown	Frankton	12	277	299
Total		86	1131	1026

4.11 The total energy throughput for the year ending 31 March 2021 was 1,385 GWh (including distributed generation). This is 55 GWh (~4%) higher than the previous year. Overall energy growth on the Aurora Energy network has shown a consistent increase over the past few years, averaging 1-3% increase since Regulatory Year (RY) 17 despite the onset of the COVID-19 pandemic. The system peak demand saw a reduction in RY20 as influenced by the COVID-19 pandemic but bounced back in RY21 to previous peak demand.

4.12 Like many other networks in New Zealand, Aurora Energy’s infrastructure has developed along with the local population and industry, spanning over 100 years. As a result, large portions of the network are now due to be renewed. Aurora Energy’s past level of network investment has been too low to keep pace with replacing ageing equipment and the demands of a growing region. Aurora Energy is forecasting operational expenditure of \$194m over the next 10 years pursuant to our programme of monitoring, inspection, testing and maintenance. Over the same time, \$737M in capital expenditure is projected. This is expenditure is required to meet demand for new connections both residential, commercial and rural, and to ensure safety and reliability obligations are met.

4.13 To facilitate this investment Aurora Energy applied for and obtained approval for a customised price path (CPP) from the Commerce Commission to allow it to raise the funds necessary to complete this work. This was approved for the period from 2021-2024.

4.14 Sections 5 to 9 set out further detail around Aurora Energy’s sub-networks.

5. Queenstown Network

5.1 Aurora Energy’s Queenstown network is fed electricity by the Frankton GXP. From this location, Aurora Energy’s sub-transmission network extends north to the Wakatipu Basin, east towards Arrowtown, west towards Queenstown, and south past Jacks Point to Wye Creek. By way of example, a high-level overview of Aurora Energy’s Queenstown ESTI is shown in the maps enclosed with this evidence at **Appendix 1**. These are the same maps that have been used in the process of the Queenstown Lakes District

Council Proposed District Plan (Stage 1) and submitted to the Environment Court as part of consent memorandum.

- 5.2 Aurora Energy's ESTI supplies eight zone substations across Queenstown, Frankton and Arrowtown. These zone substations transform electricity voltages from 33kV down to 11kV (high voltage to medium voltage). The 11kV voltage is then used to reticulate the power to the smaller distribution transformers often seen next to footpaths in and around streets. There are approximately 2600 transformers located within this network area alone.
- 5.3 Aurora Energy has a number of network constraints within the Queenstown network and where possible these will be addressed through a programme of work over the next ten years. The Asset Management Plan (**AMP**) retains most of our planned growth projects and added replacement projects for our Coronet Peak, Fern Hill and Remarkables substations. Some work has been brought forward, such as the Frankton zone substation upgrade, which has recently experienced peak demand exceeding firm capacity.
- 5.4 The Arrowtown Ring Upgrade project should provide additional capacity and reliability to the circuit that supplies four zone substations (Arrowtown, Coronet Peak, Dalefield and Remarkables).
- 5.5 A key challenge on the Queenstown Network is the extent of outstanding natural landscapes and sensitive areas (including wetlands) which makes it virtually impossible to avoid developing infrastructure within those areas, due to the functional and/or operational needs of Aurora Energy's network and electricity distribution infrastructure generally. In such instances, it is also not always possible to find a cost-effective alternative solution to be able to avoid these protected areas. This reinforces the need for an enabling planning framework under the PORPS to ensure that Aurora Energy is able to continue to provide a safe and reliable electricity supply.

6. Glenorchy

- 6.1 Between Fernhill and Glenorchy, Aurora Energy has an overhead line that is designed and insulated for 33kV but currently operated at the lower voltage of 11kV. This is a particularly vulnerable part of our network because there is no other supply to Glenorchy and is an example of the natural environment creating difficulties for Aurora Energy in terms of providing a resilient and secure supply.

- 6.2 The network beyond Glenorchy is also vulnerable and is considered by Aurora Energy SEDI. This area is remote and reasonably difficult to replace for a range of factors including the current resource management planning framework as discussed further below and in the evidence of Ms Justice,
- 6.3 The line is also located in challenging vegetated terrain vulnerable to extreme weather events (particularly wind and snow). The location of the line means that access can be very difficult, particularly in adverse weather conditions. It is not uncommon for there to be damage to the road network in the area preventing repair vehicles from gaining access. This can increase the timeframe for identifying fault locations and deploying contractors to fix them, thereby increasing the duration of an outage.
- 6.4 On occasion, Aurora Energy has had to rely on helicopters for access to challenging locations during difficult conditions. To help address outage issues, in 2018 Aurora Energy installed a permanent back up diesel generator at Glenorchy. This can provide back-up supply while the distribution line is repaired, assuming no other damage on the lines between the generator and the Glenorchy township.

7. Central Otago District Network

- 7.1 Aurora Energy's Central Otago Network is supplied by the Clyde GXP located at the Clyde Dam. There is no connection between this GXP and the Cromwell GXP. The Alexandra, Clyde, Manuherikia, Ida Valley and Teviot Valley areas are supplied via two 33 kV sub-transmission circuits connected to the Clyde GXP. Most of the electricity demand in the Clyde GXP area is supplied from distributed hydro generation sites at Teviot, Ettrick and Earnsclough. The sub-transmission network plays an important role in injecting excess generation into the National Grid at the Clyde GXP.
- 7.2 Along this network are a number of Zone Substations all connected by 33kV lines and cables, including Dunstan, Clyde-Earnsclough, Earnsclough, Alexandra, Omakau, Lauder Flat, Roxburgh and Ettrick.
- 7.3 The Central Otago network together with the Upper Clutha Network has seen steady growth in residential subdivisions with significant one-off projects such as ski field developments. There has also been extremely high growth in irrigation load in some areas. Due to Central Otago's very dry climate, irrigation has always been important. A number of significant pumping stations have been in service for many years. Aurora Energy is expecting growth to increase due to large developments in the area.

- 7.4 The Cromwell Network provides electricity supply to Cromwell township and Upper Clutha area, which consists of Wānaka, Cardrona and Hāwea areas. Since the Upper Clutha area is located 55 km away from the Cromwell GXP, Aurora Energy needs to transform the 33 kV voltage from the GXP to 66 kV using two autotransformers (33/66 kV) and supply the large electricity demand with 66 kV voltage through a network of ESTI that connects a number of Zone Substations. The Cromwell GXP is located between Richards Beach Road and Bannockburn Road in Cromwell.¹
- 7.5 In Aurora Energy's 2020 AMP, it was expected that the economic impact of the COVID-19 pandemic would subdue any expected demand growth in Central Otago. Against expectations, the region has shown strong growth in recent years, and continued investment is required in the network to meet future demand.

8. Upper Clutha Network

- 8.1 Aurora Energy's Wanaka network supplies electricity to approximately 7500 customers across Wānaka, Cardrona and Hāwea areas. With no nearby GXP to rely on, Aurora Energy plays a greater role in delivering electricity to this community and does so in reliance on the following ESTI:
- (a) Two 66kV lines stemming from the Cromwell GXP.
 - (b) The following Zone Substations: Queensberry, Wanaka, Riverbank Road, Camp Hill, Cardrona.
- 8.2 The two 66kV lines that extend from the Cromwell GXP to Wanaka are critical to delivering electricity to the Cromwell Network. The lines straddle either side of Lake Dunstan. The line following the western side of Lake Dunstan first feeds the Queensberry Substation before traversing the mountainous terrain directly towards Wanaka Airport and on to the Wanaka Substation (following Ballantyne Road). The other line redirects towards the Queensberry Station at State Highway 6 (but does not feed into that Zone Substation) and then generally follows State Highway 6 past the Wanaka Airport and finally onto the Wanaka Substation. Each line is approximately 55km in length.
- 8.3 Aurora Energy has two Zone Substations located in Wanaka. The first is known as the Wānaka Zone Substation and is located at 39 Ballantyne. This was Aurora Energy's first

¹ Lot 1 DP 22181.

Zone Substation in the area and was, until relatively recently surrounded by pasture and within the rural zone.

- 8.4 The Wanaka Substation is unique in that it transforms electricity from 66kV down to 33kV and again to 11kV. From this location, 11 kV lines and cables supply the Wanaka township with a single line extending beyond the township to supply Glendhu Bay, Treble Cone and a number of remote rural communities. A 33 kV line extending from the Wanaka Zone Substation loops back down Riverbank Road, through Albert Town, across the Clutha River Mata-Au and on to the Camp Hill Zone Substation² which is responsible for the transformation of 11kV electricity to the Hāwea community.
- 8.5 Considerable growth over the last decade or so in the area has required Aurora Energy to invest significant capital into upgrades and development of its Cromwell Network. However, despite this investment there remain capacity constraints which has led Aurora Energy to seek and implement non-network solutions. During the planning period, Aurora Energy is taking steps to evolve our network to accommodate decarbonisation-driven electrification. In the Upper Clutha region, this includes trialling the use of third-party distributed energy resources (**DER**) as a non-network solution to meet our increasing electricity demand. As an alternative to significant network investment, the solution allows us to meet peak demand by utilising the electricity stored in consumer-owned batteries.
- 8.6 As more consumers become electricity generators, two-way power flows will place added pressure on the LV distribution network. As such, Aurora Energy is placing greater focus on our LV network so that we can identify potential capacity constraints. A 45% increase in solar connections to the Aurora Energy network between 1 April 2019 and 31 March 2021 has been noted. Most of these DER connections are photovoltaic (**PV**) but PV - battery systems are gaining ground. The former generates electricity during sunlight hours but will not materially impact peak demand during winter evenings. However, the latter provides the consumer the benefit of using battery to supply its own load during peak times where electricity prices are high and sunlight hours are short.
- 8.7 Ultimately, these innovative solutions will lead to material cost savings and flexibility to cater for fast-changing demand

² Located at 170 Camp Hill Road, Albert Town; Legal Description Lot 1 DP 484226 comprised in Record of Title 730620.

9. Dunedin City Network

- 9.1 Until the 1970s, Dunedin was supplied entirely from the Halfway Bush GXP. Construction of the South Dunedin GXP (plainly visible from Portsmouth Drive) resulted in the network supply points from some zone substations being altered. The additional South Dunedin GXP provides some added resilience for the city's supply; however, this does not provide the capability to transfer significant load between GXPs.
- 9.2 Most of Dunedin's sub-transmission is radial, where each zone substation is fed directly from the GXP. To attain N-1 security level (where the loss of one circuit can be taken up by the remaining assets), each zone substation has two zone transformers, each with a designated overhead line or underground cable directly from the GXP. In future, Aurora Energy is proposing to create a sub-transmission ring configuration to increase security of supply at the Dunedin central business district (**CBD**). This provides the capability to transfer significant load between GXPs.
- 9.3 The 33 kV underground cables installed in Dunedin vary in age and construction. The older cable construction in Dunedin uses high pressure gas insulation. Excavating around this type of cable requires significant care due to the pressure the cable maintains within its sheath.
- 9.4 Much of the Dunedin network was constructed 50-70 years ago and many of its assets are near end-of-life, requiring renewal over the next ten years. This coupled with historical low rates of replacement means we will replace assets including 33 kV cables, power transformers and switchgear over the next planning period. Example projects include:
- (a) Cable 'intertie' projects that will ensure appropriate levels of security and resilience, particularly around Dunedin CBD
 - (b) Rebuilding Andersons Bay and Green Island substations
 - (c) Transformer replacements at Port Chalmers, Corstorphine, Saint Kilda and North City
- 9.5 Key challenges for Aurora Energy within the Dunedin City network, relate predominantly to:
- (a) The age of the Dunedin Network and the requirement for significant upgrades; and

- (b) Intensification of development within the vicinity of its ESTI and SEDI. This is predominantly driven by the provisions within the National Policy Statement on Urban Development (**NPSUD**).

10. Current challenges and planned investment over the next 10 years

- 10.1 Aurora Energy's plan to sustain increased levels of network investment over the next decade, spending \$737 million in capital and operational expenditure on renewing and maintaining the existing network. Of this, \$348 million will be invested during the remainder of our CPP Period.
- 10.2 These levels of investments are necessary to effectively manage safety risk, stabilise network performance and deliver a valued service to customers. To achieve this, Aurora Energy is focusing our short-term investments on replacing assets that pose safety risks due to elevated likelihood of failure, and on addressing a backlog of poor condition assets.
- 10.3 The key investment plans and improvement initiatives that Aurora Energy will focus on are set out in the Aurora Energy AMP April 2022 – March 2022. This includes the following.
- 10.4 **Managing Network and Safety Risks:** As a lifeline utility, it is critical that Aurora Energy invest prudently to ensure its assets are safe, secure and resilient in the longer term. In the short-term, safety related investments will be prioritized. This involves carefully managing asset fleets, with the aim of stabilising their condition and performance to effectively manage network and safety risk. Over recent years, there has been a significant increase in levels of investment in renewal and maintenance. Alongside increased renewal rates, Aurora Energy are also seeking to establish proactive and effective vegetation management and asset maintenance regimes.
- 10.5 **Supporting network growth:** in response to the social and economic impacts of COVID-19, it was anticipated that there would be a reduction in demand on parts of the network. As discussed above, areas of recent high growth such as Queenstown and Central Otago were expected to slow. However, the network continued to grow at pre-pandemic rates. During the current AMP planning period, it is expected that this development activity will continue and supporting this growth will become a focus.
- 10.6 **Impacts of decarbonisation on the Energy Sector** – Technology will play a major role as New Zealand shifts towards a carbon neutral future. With climate change becoming

an ever-increasing concern globally, Aurora Energy anticipate increased efforts to adopt decarbonisation initiatives within the Otago Region. As such, it is expected that there will be more electric vehicles, photovoltaic installations and battery storage systems on the network. As discussed above, this includes the planned deferral of a large growth investment in the Upper Clutha region by using a DER solution to address a capacity constraint. This will also address customers preference to ensure that the future network should not limit options for residential customers to adopt technologies such as rooftop solar generation and electric vehicles. As such, Aurora Energy will make targeted, 'least regret' investments in enabling technology in the short term.

10.7 In January 2020, Aurora Energy developed its Network Evolution Plan which aims to prepare the business for a future where electricity plays a key role in decarbonising economies, both locally and globally. Shortly after, in 2021, He Pou a Rangi (the Climate Change Commission) released its report, A Low Emissions Future for Aotearoa, which outlined a pathway for meeting New Zealand's net zero emissions target by 2050. The Climate Change Commission identified electrification of transport and heating as important areas in reducing the nation's greenhouse emissions. Taking this information into account and considering other areas of change, including lighting technology change and underlying demand growth, Aurora Energy has developed its own approach to understanding the potential impacts of decarbonisation with regard to our network. The approach will be developed in three stages:

- (a) To develop scenarios that consider the range of futures with decarbonisation via increased electrification.
- (b) To establish a strategy.
- (c) To prepare plans and actions to allow Aurora Energy to prepare for these futures

10.8 The effects of climate change are becoming increasingly evident. We are anticipating more frequent and intense weather events that affect our infrastructure. The aftermath of these events is resource intensive and inevitably diverts staff away from projects that we are pursuing to respond to growth and adapt to long running issues or risks. They also increase costs to consumers. This was a key theme in Aotearoa New Zealand's First National Adaptation Plan³. Further guidance on climate change is expected from the development of the proposed New Zealand Energy Strategy. The terms of reference

³ Urutau, ka taurikura: Kia tū pakari a Aotearoa i ngā huringa āhuarangi Adapt and thrive: Building a climate-resilient New Zealand – August 2022.

for this strategy were released by the Ministry of Business, Innovation and Employment (**MBIE**) in October 2022⁴. Key high-level objectives for the strategy will include:

- (a) Energy affordability and energy equity for consumers.
- (b) Our energy system transitions at the pace and scale required to support a net-zero 2050.
- (c) Energy supply is secure and reliable, including as we adapt to the effects of climate change and in the face of global shocks.
- (d) Our energy system supports economic development and productivity growth aligned with the transition.⁵

11. Regionally Significant Infrastructure

11.1 The PRPS identifies ESTI as Regionally Significant Infrastructure (**RSI**). The submissions by Aurora Energy, PowerNet and Network Waitaki all sought to include SEDI in the definition of RSI.

11.2 The definition of SEDI as drafted is intentionally broad as it provides the ability for an EDB (like Aurora Energy) to select which of those lines are of critical importance to it and which require greater provision and protection in the PRPS.

11.3 The 11kV lines that Aurora Energy considers are particularly significant are those lines which service isolated communities or businesses. This is generally more prevalent in Queenstown given the terrain and sparse communities. Examples of SEDI which Aurora Energy has successfully identified in the Queenstown Lakes District Plan through the District Plan review process include:

- (a) Distribution Infrastructure connecting Wanaka to Treble Cone Ski-Field. This infrastructure currently operates at 11kV but in anticipation of future electricity growth in Glendhu Bay and Treble Cone sections of the 11kV line have been constructed and insulated to operate at 33kV. At this time there is no alternative means of supply to the Treble Cone Ski Field who rely on this line.

⁴ Ministry of Business Innovation & Employment (MBIE) - Terms of Reference - New Zealand Energy Strategy - October 2022.

⁵ Ibid.

- (b) An 11kV spur line from the Camp Hill Zone Substation to Makarora which supplies approximately 110 customers for which there is no alternative means of supply. Similar to Glenorchy, this line traverses challenging terrain that is subject to extreme weather making outages difficult to address quickly.
- (c) The 11kV lines and cable from the Cardrona substation to the Cardrona ski field tee off which is critical to the operation of the ski field, and which would also be used to supply the Mt Soho ski field should this development progress. The owners of the ski field have development plans that would treble existing demand.
- (d) The line from Fernhill to Glenorchy which is operated at 11kV but has been designed, constructed and insulated to operate at 33kV.
- (e) The above are shown in red on **Appendix 1**.

11.4 In my view, the length of the lines/cables and nature of the customers supplied is sufficient to warrant the special protection that is afforded to regionally significant infrastructure in the PRPS, and that the infrastructure is important to the overall functioning of the region.

11.5 I understand that as part of this submission and hearing process, relief has been recommended by ORC that would require District Plans to map ESTI and SEDI in District Plans. The maps enclosed as **Appendix 1** are an example of how this has been undertaken in the Queenstown Lakes District. It can be expected that over time, as other District Plans are reviewed, that other EDBs will seek to have their respective ESTI and SEDI included in maps. SEDI may also be added or deleted based on their significance being elevated or reduced.

11.6 In my view, it is necessary for the PRPS to recognise ESTI and SEDI as being regionally significant under in the PRPS so that they may be maintained, operated and upgraded with reasonable certainty so that Aurora Energy may plan and manage its network to meet its obligations to the community.

11.7 Part of the relief that Aurora Energy has sought through this process is identification, recognition and provision of ESTI and SEDI. There are two reasons that Aurora Energy sought this:

- (a) To protect this critical infrastructure from other activities that might develop under or in close proximity to these high voltage lines and compromise their operation or an EDBs ability to access and manage them; and

- (b) Recognize their importance and provide a clear pathway to allow their efficient management and/or development given that they can often be located in sensitive environments.

11.8 There are two regulatory instruments which go some way to providing the outcome sought by this relief, but their shortcomings or requirements require a complementary approach through an RMA Planning Instrument. Those instruments are the Electricity Act 1992 (**Electricity Act**) and the New Zealand Electrical Code of Practice for Electrical Safe Distances (**NZEC34**). The latter is discussed in the evidence of Mr Paterson.

11.9 The Electricity Act provides some protection for lines that were legally installed under previous Acts and Regulations i.e., any lines that were lawfully established prior to 1 January 1993. The legal protection conferred by the Electricity Act is a right of continued occupation and operation, including the ability to inspect, maintain, replace and upgrade the lines (subject to certain limits). This infrastructure is commonly known as existing works with existing statutory easement rights or existing use rights.

11.10 The Electricity Act does not provide a code for all aspects of the effects of electricity infrastructure or restrictions on land users developing in proximity to that infrastructure. With respect to the former issue, EDBs are not exempt from the provisions of the RMA and may still be required to obtain resource consent for an activity that might otherwise be provided for under the Electricity Act. In such an instance, Aurora Energy may then be required to obtain affected party approval from a landowner to permit the works be undertaken despite having the legal right to undertake them in accordance with the Electricity Act.

11.11 An example in the Queenstown Lakes of this occurrence is where works do not meet the definition of 'minor upgrading' simply because a pole has moved more than 5 metres from its original location and triggers a requirement for resource consent⁶. This type of resource consent can become problematic when works are urgent or there is a risk to health and safety of people or property. In Aurora Energy's view, the necessity of the works to the wider public should have elevated importance, particularly for SEDI and ESTI.

⁶ Aurora Energy has recently had to apply for multiple resource consents from the Otago Regional Council and the Queenstown Lakes District Council to replace an existing line in the vicinity of the Dart River near Glenorchy. The line is located in an area of outstanding natural landscape, Wāhi Tupuna area and involves structures within the Diamond Lake wetland area. As a result, the resource consent process has proved extremely challenging to replace an already existing asset which is now at the end of its useful life.

11.12 Additionally, the Electricity Act does not contain any obligations or requirements on landowners with existing works to prevent underbuilding. As discussed in the evidence of Mr Paterson, this literally means building underneath electricity lines or land use activities that are incompatible with the ongoing use and maintenance of existing works, particularly lines and zone substations. It is possible that buildings could be constructed, and other activities undertaken, beneath or adjacent to that infrastructure which risk comprising the ability to carry out essential maintenance functions or to undertake further developments or upgrades for the benefit of the community. Simply, the Electricity Act on its own does not afford sufficient protection from activities interfering with lines.

11.13 Aurora Energy recently successfully appealed a decision of the Queenstown Lakes District Council Proposed District Plan (Stage 3) which sought to introduce a residential zoning across an otherwise open rural area in Wānaka where Aurora Energy's Wānaka Zone Substation. The Wānaka Substation⁷ was built well before the Three Parks Special Zone was approved under the Operative District Plan. For all intents and purposes Aurora Energy had sought to locate the substation in an area that was well separated from any possible reverse sensitivity effects that might limit its operation. However, as Wānaka expanded over time the underlying zoning changed from Rural to Three Parks Special Zone and later to a residential zone.

11.14 The issue in this case was that the QLDC PDP Stage 3 did not contain any provisions which would limit land use activities in close proximity to the zone substation, including beyond the boundary of the site where issues such as noise and earth potential rise can be experienced. Allowing development right up to the boundary of the substation creates the potential to lead to restrictions being placed on the continuation or upgrading of the existing infrastructure due to concerns about health and safety, such as electromagnetic health effects, noise nuisance or amenity concerns. These may, in turn, create an undue restriction on the ability for the assets to be used to meet forecast demand and future growth. In my view this is unacceptable given the importance of this strategic asset to the network and the role it plays in terms of meeting electricity demand within the district.

⁷ Located at 39 Ballantyne Road, Wānaka.

12. Relief Sought by Aurora Energy

12.1 Aurora Energy wishes to see appropriate planning provisions included in the PRPS to ensure that it is able to develop, upgrade, operate, and maintain its network to enable a sustainable, secure and reliable supply of electricity in Otago.

12.2 Aurora Energy generally supports or accepts the majority of the s 42A report recommendation in respect of Aurora Energy's submission. However, Aurora Energy considers that the amendments and additions set out in the evidence of Ms Justice are necessary to:

- (a) Ensure the ongoing operation, maintenance, upgrading and development of the electricity distribution network is appropriately enabled.
- (b) Recognise and provide for the regional benefits of a secure energy supply.
- (c) Encourage and enable the electricity sector's role in electrification of the economy to assist in meeting New Zealand's emission reduction goals; and
- (d) Ensure electricity distribution assets are not compromised by avoiding adverse effects of activities.

13. Conclusion

13.1 The electricity distribution network is critical to the Otago Region and the country's social and economic wellbeing.

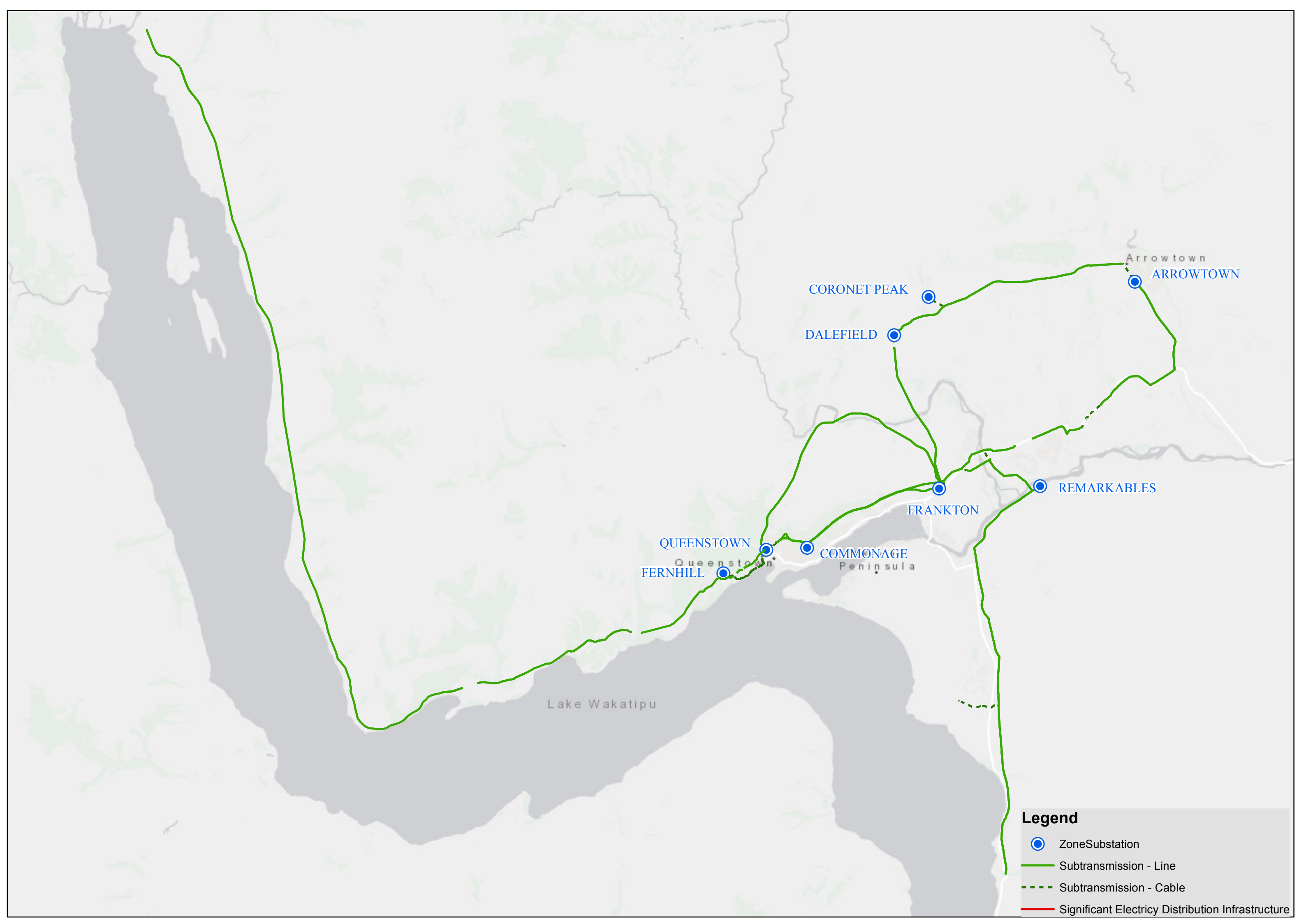
13.2 For the reasons set out above, Aurora Energy requests that the PORP include the provisions supported in Ms Justice's evidence.

13.3 This relief will ensure appropriate objectives, policies, and methods for the future development of the Otago Region. This is critical to the sustainable development of both electricity distribution infrastructure and other natural and physical resources.

Joanne Dowd

Aurora Energy Limited

Appendix 1 – Queenstown Lakes District Mapped ESTI and SEDI

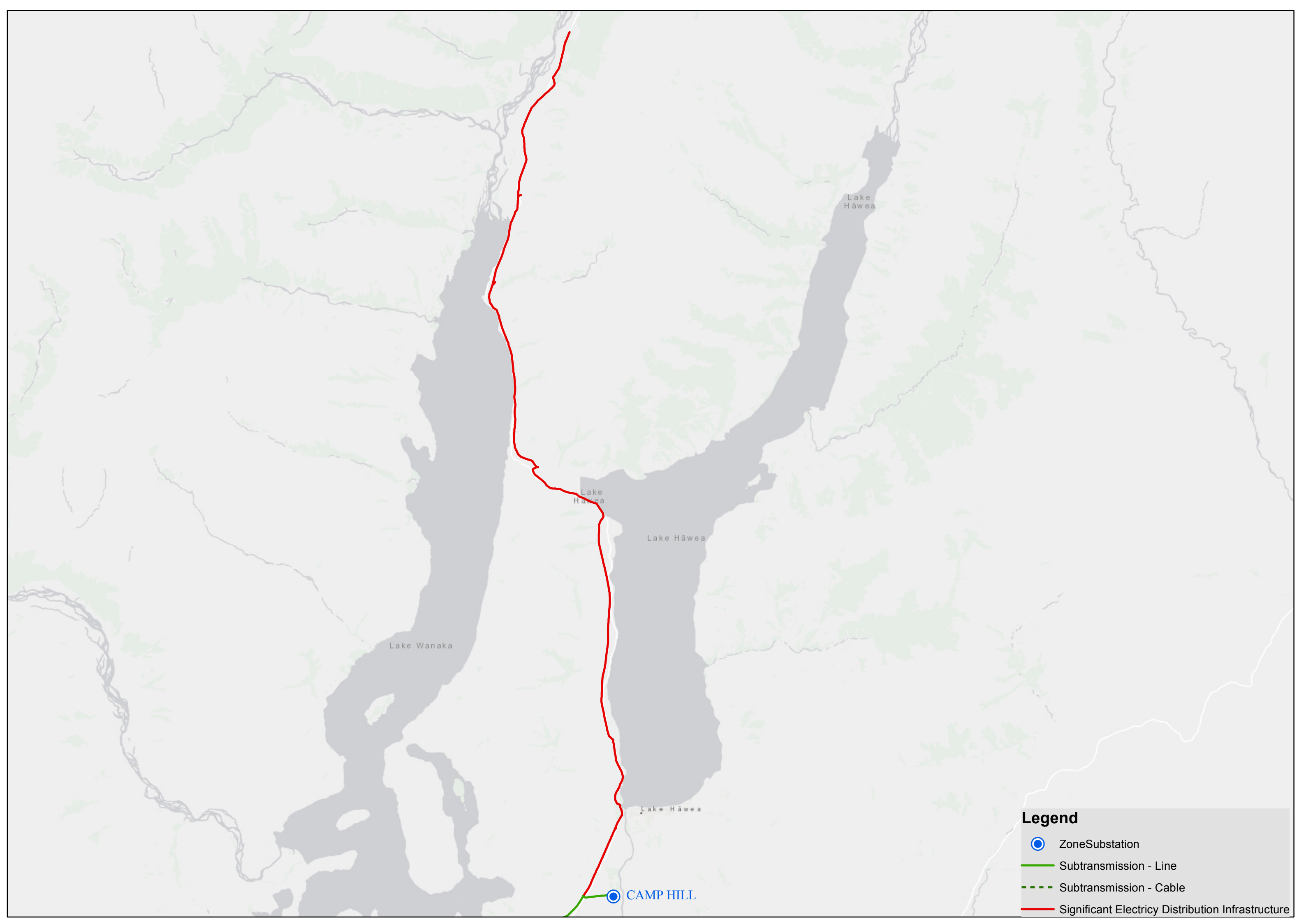


FERNHILL
QUEENSTOWN
COMMONAGE
FRANKTON
DALEFIELD
CORONET PEAK
REMARKABLES
ARROWTOWN

Lake Wakatipu

Legend

- ZoneSubstation
- Subtransmission - Line
- Subtransmission - Cable
- Significant Electricity Distribution Infrastructure



Lake Wanaka

Lake Hāwea

Lake Hāwea

Lake Hāwea

Lake Hāwea

CAMP HILL

Legend

- ZoneSubstation
- Subtransmission - Line
- - - Subtransmission - Cable
- Significant Electricity Distribution Infrastructure

