BEFORE THE QUEENSTOWN LAKES DISTRICT COUNCIL

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	Proposed Queenstown Lakes District Plan 2015 – **Energy and Utilities**
SUBMITTER	**AURORA ENERGY LIMITED** Submitter 635 Further Submission F-1121

STATEMENT OF EVIDENCE IN CHIEF BY JOANNE DOWD

Hearing Date: 14 September 2016

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1. INTRODUCTION

Qualifications and Experience

1 My name is Joanne Dowd. 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 and I currently sit on the Otago Branch committee. I am employed as Network Policy Manager with Delta Utility Services Limited (**"Delta"**). I have been employed in my present position since June 2015 and I have 23 years international planning experience in both the private and public sector.

2 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.

3 Recent projects I have been involved with are set out within **Appendix A** to this evidence.

4 As I am an employee of Delta, I am unable to comply with the Code of Conduct for expert witnesses contained in the Environment Court Practice Note. However, I have prepared this evidence with reference to it. I confirm that I have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note. I confirm that I have considered all the material facts that I am aware of that might alter or detract from the opinions I express. In particular, unless I state otherwise, this evidence is within the scope of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

OVERVIEW OF SUBMISSION

5 Aurora Energy Limited ("Aurora") owns, operates and maintains an electricity distribution network in Dunedin, Central Otago and the Queenstown Lakes District within the Otago region. This network carries electricity from the National Grid to more than 85,000 homes and businesses across Dunedin City, Central

Otago and the Queenstown Lakes District. Aurora owns substations, lines and cables located in public road reserve, as well as on private property.

6 The electricity network owned by Aurora comprises high voltage power lines (above and below ground) which distribute electricity to local substations where the voltage is reduced before distribution through standard power lines (overhead and underground) as seen throughout the Otago Region. Aurora's overhead line network extends to 3,889 km of which 513 km are high voltage subtranmission lines up to 66kV. In addition to the distribution network, Aurora has the capacity to own and operate high voltage (up to 110kV) transmission lines, and associated structures, and may be required own such assets as regional electricity demand grows.

7 Electricity is a vital resource for New Zealand, its economy and social and cultural wellbeing. The networks owned by Aurora are considered as regionally significant and critical infrastructure. The demand for electricity in Queenstown Lakes is increasing and Aurora seeks to secure the ability to meet this demand in the most efficient and cost effective manner. Due to the nature and scale of Auroras' assets, continual upgrade, maintenance and renewal of these assets is also required to ensure security of electricity supply.

SUBMISSION POINTS

General

8 Aurora's submission and further submissions are primarily concerned with ensuring that the Proposed Queenstown Lakes District Plan (**"Proposed Plan"**) appropriately recognises the significance of the electricity distribution network as a physical resource under section 5 of the Resource Management Act 1991 ("**RMA**").

9 In addition, Aurora has sought protection of its assets from adverse effects, including reverse sensitivity effects associated with land use activities and appropriate management of potential adverse effects of Aurora's network, taking into consideration the specific locational, technical and operational requirements of its network.

10 In my opinion, the distribution assets owned by Aurora are critical to sustaining and growing Queenstown Lakes and have positive effects in enabling people and communities to provide for their social, economic and cultural wellbeing and for their health and safety.

11 Submissions and further submissions lodged by Aurora sought amendments to a number of controls proposed to be introduced and sought amendments to various objectives, policies and rules. Aurora's further submission supports relief sought by other submitters where this would appropriately recognise and provide for network utility activities.

12 In its submissions, Aurora also sought corridor protection for its strategic or critical electricity distribution assets which have been highlighted within the evidence of Mr Sullivan. Such corridor protection measures for distribution assets are operative in a number of District Plans around New Zealand and have been operating well without adverse effects on landowners while ensuring that safety clearances required under The New Zealand Electrical Code of Practice for Electrical Safe Distances ("**NZECP 34:2001**") and the Electricity (Hazards from Trees) Regulations 2003 from electricity distribution assets are maintained. In my opinion, it is appropriate that the Proposed Plan contains a policy and rule framework to protect the integrity of these high voltage and critical distribution lines, and their ability to provide the safe, secure and efficient supply of electricity. In my view such measures will protect subtransmission distribution infrastructure and other identified high voltage lines against land uses and development effects (i.e., reverse sensitivity) that have the potential to compromise its operation.

13 The Operative Queenstown Lakes District Plan (**"Operative District Plan"**) currently fails to adequately protect such critical infrastructure (i.e., lines less than 110kV) with the result being that developments have the potential to be consented without input from the affected asset owner. The high voltage assets and Critical Electricity Lines ("**CELs**") owned by Aurora are not covered by the National Environmental Standards for Electricity Transmission activities ("**NESETA**"), nor any other National Environmental Standard, hence protection of such infrastructure is best provided through the Proposed Plan review process currently being undertaken.

14 Aurora has also sought to ensure that the Proposed Plan recognises the strategic and lifeline importance of all parts of the electricity network. In my view this is essential to ensure that the Proposed Plan achieves the purpose of the RMA, in that the use, development, and protection of the electricity network (a physical resource) is managed in the most appropriate way to enable people and communities to provide for their social, economic and cultural wellbeing and for their health and safety.

NETWORK UTILITIES OBJECTIVES AND POLICIES

15 Aurora lodged a number of submissions generally in support of the Objective and Policy framework of the proposed Energy and Utilities Chapter. I note that some minor amendments have been proposed to Objectives and policies by the S42A Report Author which in my view add clarity, greater balance to the provisions and as such are supported. This relates in particular to the proposed changes to Objective 30.2.5 and the addition of proposed new policy 30.2.5.4 which recognise the positive social, economic, cultural and environmental benefits of utilities.

16 Aurora also lodged submissions which sought to ensure that the Proposed Plan appropriately recognised and provided for the operational and technical constraints faced by network utility operators, this included submissions on Policy 30.2.7.1. While the relief sought by Aurora in relation to Policy 30.2.7.1 has been rejected by the s42A Report Officer, the proposed amendments to Policy 30.2.6.2 will go some way to address Aurora's concerns. Policy 30.2.6.2 is recommended to be revised as follows in the S42A report:

> *When considering the effects of proposed utility developments with adverse environmental effects, consideration shall be given to the consideration of alternatives, but also to how adverse effects have been managed through the route, site and method selection process while taking into account the locational, technical and operational requirements of the utility and the benefits associated with the utility.*

17 In my view the amendments to Policy 30.2.6.2 are appropriate and are supported and will address the imbalance in the notified provisions.

OTHER PROVISIONS AND RULES

18 Aurora lodged a number of submissions on the Other Provisions and Rules section of Chapter 30. As part of the suite of provisions proposed by Aurora relating to Critical Electricity Lines (discussed further below) Aurora sought compliance with the Electricity (Hazards from Trees) Regulations 2003. I note that the s42A Report Author has recommended an advice note that requires vegetation to be planted around electricity networks should be selected and/or managed to ensure compliance with these regulations. In my view it is appropriate that the Proposed Plan references these regulations and the inclusion of the advice note is supported.

RULE 30.4.6 AND CHAPTER 36 NOISE PROVISIONS

19 Rule 30.4.6 relates to *Non-renewable Electricity* Generation. Aurora supported the intent of this rule, whereby non-renewable electricity generation is permitted in specific instances, particularly in relation to utility activities. However, Aurora questioned why the provisions relating to noise should apply. Emergency and backup generators provide a vital role in maintaining supply of electricity during times of supply interruption. Aurora considered that the imposition of a requirement to comply with the noise provisions in Chapter 36 would be overly onerous, given the positive effects provided by the supply of electricity. Aurora considered that noise from emergency and back-up electricity generators should be explicitly provided for as a *Permitted Activity* and should not be subject to the noise provisions in Chapter 36.

20 In the s42A report the Report Author refers to and relies on the evidence of Dr Stephen Chiles[1]. I note that Dr Chiles, at paragraph 6.2 of his evidence, states that temporary noise from an emergency generator is an appropriate exemption from normal noise limitations, as temporary sound from an emergency generator is likely to be tolerated by most people at higher levels than other permanent sound sources. However, Dr Chiles recommends that time limits are necessary in relation to noise from generator testing. I note that the s42A Report Author for the Noise Chapter has recommended an exemption for such activities as follows:

[1] Evidence of Dr Stephen Chiles - dated 19 August 2016.

(Redraft) 36.4.7

Sound from emergency and backup electrical generators:

(a) operating for emergency purposes; or

(b) operating for testing and maintenance for less than 60 minutes each month during a weekday between 0900 and 1700.

21 In my view the exemption provided is appropriate and is supported.

22 However, I note that as currently drafted the t*emporary generators* utilised by Aurora as part of routine maintenance is not provided for in the rule framework. Aurora sought a specific exclusion for *temporary emergency generators* from the proposed definition of *Utility* as follows:

Utility does not include structures or facilities used for electricity generation (excluding temporary emergency generators), the manufacture and storage of gas, or the treatment of sewage.

23 The s42A Report Author recommends rejecting this submission on the basis that temporary emergency generators are provided for under the energy activities definition as a *Non- Renewable Electricity Generation Activity*, and are better suited there than under the *Utility* definition.

24 The current provision for *Non-Renewable Electricity Generation* within Rule 30.4.6 provides for the following:

Non-renewable Electricity Generation *where the generation only supplies activities on the site on which it is located* {my emphasis} *and involves either:*

- *Standby generators associated with community, health care, and utility activities; or*

- *Generators that are part of a Stand-Alone Power system on remote sites that do not have connection to the local distributed electricity network.*

Note – Diesel Generators must comply with the provisions of Chapter 36 (Noise) and Hazardous Substances (Chapter 16 ODP).

25 In my opinion Rule 35.4.15 which states:

Temporary Utilities

Any temporary utilities that:

- *Are required to provide an emergency service, or*
- *Are related to, and required in respect of, a permitted temporary activity specified in this chapter of the District Plan.*

was intended to enable the use of generators in emergencies. However the efficacy of this rule is eliminated due to the exclusion of electricity generation from the definition of Utility. It was for this reason that Aurora sought that temporary emergency generators be excluded from the exclusion within the definition.

26 If it is considered preferable to provide for temporary generation in Rule 30.4.6 that would be satisfactory, however the current rule does not enable the type of generation that is required for Auroras purposes.

27 Given the linear nature of Aurora's network, and the fact that multiple land landholdings are often involved in a planned programme of works, it will not always be possible to locate the generator on the site of the proposed activity. This being the case, Aurora's temporary generators (for non-emergency use[2] - such as planned maintenance and outages) would default to a *Non-complying Activity* status. Therefore the relief sought by Aurora has not been provided for.

28 In my view Rule 30.6.4 requires amendment to ensure that it specifically provides for temporary generators not provided for under the Temporary Activity provisions of the Proposed Plan. This could be achieved in the following way:

Rule 30.4.6
Non-renewable Electricity Generation *where:*

(a) the generation only supplies activities on the site on which it is located and involves either:

[2] Temporary Utilities - Emergency service is provided for under Proposed Rule 35.4.15

- *Standby generators associated with community, health care, and utility activities; or*
- *Generators that are part of a Stand-Alone Power system on remote sites that do not have connection to the local distributed electricity network.*

(b) Temporary generators required for Utility Activities.

Note – Diesel Generators must comply with the provisions of Chapter 36 (Noise) and Hazardous Substances (Chapter 16 ODP)

29 **Attachment B** to my evidence includes the amendments to provisions supported or promoted by Aurora.

RULE 30.4.11 – NEW LINES AND SUPPORT STRUCTURES AND DEFINITION OF MINOR UPGRADING

30 Aurora supported the intent of this rule, in that the installation of new lines and associated support structures are *Controlled Activities*. The s42A Report Officer has recommended some amendments to the wording of the rule which address a number of Aurora's concerns including the refocus of the rule on "*New*" lines and associated structures. However, given the reduction in the activities provided for under the proposed definition of *Minor Upgrading*, the majority of works undertaken by Aurora on private land will now be considered under this Rule and require a resource consent.

31 The proposed definition of *Minor Upgrading* requires:

- "*support structure replacement within the same location as the support structure that is to be replaced"* and
- provides for the addition of a single support structure for the purpose of providing a service connection to a site (excluding rural zones where no provision is provided).

32 Replacement of support structures within the same location is not technically feasible while maintaining the security of electricity supply. Typically on the Aurora network, replacement support structures are required to be located within 2-5m of their current location. This ensures that line crews can work

safely on the overhead lines without taking the line out of service for lengthy periods of times and the resulting inconvenience to customers. As such a resource consent requirement will be generated every time Aurora seeks to replace an existing power pole.

33 In my view this will significantly impact on Aurora's distribution network activities within the District particularly the planned pole replacement programme which is currently being rolled out across the District. In addition, almost 50% of Aurora's network, within the QLDC District, is located on private land, predominantly in Rural Zoned areas. This means that the majority of activities undertaken by Aurora in these areas will also require resource consent. In my view, this is operationally prohibitive and will unduly constrain electricity distribution activities within the District.

34 The proposed provisions are more stringent than the Operative District Plan which currently provides the following activities as permitted minor upgrading activities:

a) *Replacement of existing support structure poles provided they are less or similar in height, diameter and are located within 1 metre of the base of the support pole being replaced;*
b) *Addition of a single service support structure for the purpose of providing a service connection to a site, except in the Rural General zone;*
c) *The addition of up to three new support structures extending the length of an existing line provided the line has not been lengthened in the preceding five year period, except in the Rural General Zone;*

35 In my opinion, the restrictions imposed on electricity distribution operators due to the narrow definition of Minor Upgrading are unreasonable and have the potential to compromise Aurora's ability to provide a secure and efficient supply of electricity. The removal of the aforementioned permitted activities is a significant change from the current Permitted Activity status under the Operative Plan without any substantive justification for this increased regulation in the section 32 report.

36 In my view, the *Minor Upgrading* definition is significant for electricity distribution companies as it dictates the range of activities that are considered

an appropriate part of routine operation and maintenance. In my view, greater flexibility is required and this would be achieved by amending the definition of Minor Upgarding as follows:

Minor Upgrading

means an increase in the carrying capacity, efficiency or security of transmission and distribution lines utilising the existing support structures or structures of a similar scale, intensity and character and includes:

- *Addition of a single service support structure for the purpose of providing a service connection to a site, ~~except in the Rural zone~~;*
- *The addition of up to ~~three~~ four new support structures extending the length of an existing line provided the line has not been lengthened in the preceding five year period, ~~except in the Rural Zone~~;*
- *~~Replacement of conductors or lines provided they do not exceed 30mm in diameter or the~~ bundling together of any wire, cable or similar conductor ~~provided that the bundle does not exceed 30mm in diameter;~~*
- *~~Re-sagging of existing lines;~~*
- *~~Replacement of insulators provided they are less or similar in length; and~~*
- *~~Addition of lightning rods, earth-peaks and earth-wires.~~*
- *The addition of lines, circuits and conductors.*
- *The re-conducting of the line with higher capacity conductors.*
- *The re-sagging of conductors.*
- *The bonding of conductors.*
- *The addition or replacement of longer or more efficient insulators.*
- *Addition of electrical fittings or ancillary telecommunications equipment.*
- *The addition of earth wires that may contain telecommunication lines, earth peaks and lightning rods.*
- *Support structure replacement within the same or immediately adjacent location within the existing alignment of the distribution corridor.*
- *The replacement of existing cross-arms with cross-arms of an alternative design.*

An increase in support structure height required to comply with the New Zealand Electrical Code of Practice 34:2001 by not more than 15% of the base height of the support structure and where the height is defined as the height of the structure at date of public notification of the District Plan.

RULE 30.4.11 – NEW LINES AND SUPPORT STRUCTURES – MATTERS OF CONTROL

37 Aurora lodged submissions in opposition to the proposed matters over which Council has reserved control for new lines and support structures. This includes the requirement for a natural hazards assessment for any new structure on a site subject to any natural hazard.

38 I note under the revised provisions relating to Telecommunications, greater flexibility has been provided for this industry, including the erection of structures within all zones up to 8m as a *Permitted Activity*. Where consent is required for Telecommunications structures as *Controlled Activities*[3], I note that the matters of control mirror those for electricity structures, with the exception of the requirement for a natural hazards assessment. It is unclear to me why electricity structures would require a natural hazards assessment, while telecommunications structures do not. This is not addressed in the section 32AA report. In my opinion, the requirement for a natural hazards assessment is overly onerous and has the potential to cause significant delays in Aurora's network utility activities. In my view, infrastructure providers, such as Aurora, are in the best position to assess the risks of locating network utility structures (involving non-habitable buildings) in potential hazard areas in terms of continuity of electricity services and the reliability of its network.

39 Aurora also has concerns over the proposed control in relation to *appearance, scale and visual effects*, of any new lines and associated support structures. The support structures utilised on the Aurora network are designed in accordance with technical, operational and safety requirements which limit opportunities for mitigating potential effects associated with height, bulk, scale and design (including materials used). Given the challenging topographical conditions; safety clearance requirements and issues associated with access, Aurora is increasingly utilising taller structures with longer spans on network upgrade projects. While this provides for an overall reduction in the number of support structures, it can result in a greater visual effect, particularly given the linear nature of the network. As such, there will be instances where the

[3] Proposed Rule 30.4.14

installation of new assets will have a visual effect with little opportunity to mitigate such effects. Requirements to paint support structures results in costly construction and maintenance requirements that can affect the integrity of the support structure and result in more frequent maintenance/replacement requirements.

RULE 30.4.18

40 Rule 30.4.18 relates to *Buildings* (associated with a Utility) and seeks to control utility buildings and structures within Significant Natural Areas; the Arrowtown Residential Historic Management Zone and the Remarkables Park Zone.

41 Aurora submitted that given the small scale nature of electricity cabinets and kiosks, and the necessity to provide secure electricity supplies, exemptions for these assets should be provided for within the Rule as follows.

Buildings (associated with a Utility)
Any addition, alteration or construction of buildings and structures, (other than masts for any telecommunication and radio communication facility, navigation or meteorological communication facility or <u>electricity cabinets or kiosks or</u> supporting structures for lines) in:

- *Any Significant Natural Areas;*
- *The Arrowtown Historic Management Zone.*
- *The Remarkables Park Zone*

42 The s42A Report Officer has recommended that the submission be rejected and as such any addition, alteration or construction of any building or structure (excluding support structures) in these zones will require resource consent as a *Discretionary Activity.* I attach as **Attachment C** to my evidence typical examples of the types of equipment typically used by Aurora on its network. In my view, many of these structures are small scale in nature successfully integrate into the areas they are installed within without adverse visual effects and as such should be exempt from this rule. In instances where consent is required, the default consent status should be amended to a *Controlled Activity* rather than *Discretionary* to ensure that certainty can be provided to utility operators.

RULE 30.5.8 HEIGHT

43 Aurora is concerned that provision has not been made within Rule 30.5.8 to exclude "*support structures for overhead lines*" from complying with the maximum height provisions for buildings of the zone they are located in. The height of electricity support structures are dictated by Electricity Industry Standards and Regulations to ensure appropriate safety clearances are achieved. Having to comply with the relevant maximum height provisions for buildings of the various zones could potentially result in Aurora requiring resource consent to erect any new support structure as a *Discretionary or Non-Complying Activity* as height is typically controlled through the relevant Zone Standards. Aurora submitted that this was overly restrictive and would have major implications for the operation of its network. Aurora sought the following exemption within Rule 30.5.8:

Height

All buildings or structures, (excluding masts and antennae for any telecommunication and radio-communication facility, navigation or meteorological communication facility or support structures for overhead lines) shall comply with the relevant maximum height provisions for buildings of the zone they are located in.

44 The s42A Report Author has recommended rejecting Aurora's submissions. Although I was unable to find any reasoning for this.

45 In my view, it is appropriate that support structures for overhead lines be exempt from complying with height requirements of the various zones. The technical and operational requirements of the infrastructure dictate the height to ensure appropriate safety clearances are achieved. I note that specific height requirements have been identified for structures associated with telecommunications or radio communication facilities. A similar approach could be taken in the Proposed Plan for support structures associated with electricity overhead lines.

DEFINITIONS

46 Aurora submitted on a number of definitions seeking additions and deletions of terms and activities. The s42A Report Author has recommended accepting in part or has recommended new definitions for the following:

- Utility – the addition of substations to the definition;
- Electricity Sub Transmission Lines;
- Electricity Sub Transmission Corridor;
- Electricity Distribution;
- Regionally Significant Infrastructure;
- Support Structure;
- Sensitive Activities.

47 In my opinion the amendments to and inclusion of the above definitions (as set out in **Attachment B** to this evidence) are appropriate and are supported, subject to the various issues identified below.

CORRIDOR PROTECTION FOR INFRASTRUCTURE AND REGIONAL SIGNIFICANCE OF SUB-TRANSMISSION ASSETS

48 Aurora is concerned that issues associated with reverse sensitivity for its infrastructure have not been adequately addressed within the Proposed Plan. Council has associated issues of reverse sensitivity primarily with the National Grid, with little regard or recognition that such effects can impact on the sub-transmission and distribution assets of other network utility operators.

49 The District's sub-transmission network and critical infrastructure (as outlined within Aurora's submission) is an element of electricity distribution that can be adversely effected by reverse sensitivity to the same degree as other high voltage transmission lines.

50 Corridor protection is a term that relates to providing a buffer or separation between development and overhead electricity distribution and transmission lines. Aurora seeks to have identified electricity lines (33kV subtransmission lines and the identified strategic 11kV electricity lines) recognized within the Proposed Plan. Critical electricity lines are lines located throughout the Queenstown Lakes District, they are not covered by NPSET but have the

potential to be crucial to the District and Region's quality, reliability and security of electrical supply. These electricity lines are crucial because they contribute to the social and economic wellbeing and health and safety of the region and are lines that:

i) Supply essential public services; or
ii) Supply large industrial or commercial electricity consumers; or
iii) Supply high numbers of consumers; or
iv) Are isolated and difficult to replace with an alternative electricity supply if they are compromised.

51 The reasons for corridor protection and the requirement to protect these strategic assets is outlined in the evidence of Mr Sullivan.

NATIONAL POLICY STATEMENT FOR ELECTRICITY TRANSMISSION (NPSET)

52 The NPSET is a national level policy document which provides guidance on how to manage effects generated by the national transmission network (owned and operated by Transpower) and to provide a policy framework for reverse sensitivity effects generated by development near the National Grid. The NPSET requires local authorities to give effect to this document.

53 The NPSET is not applicable to any of Aurora's electricity lines. The assessment undertaken below on the applicability of corridor protection for Aurora's identified electricity network is not reliant on NPSET as a statutory framework. I acknowledge that the NPSET provides a statutory framework to provide provisions in the Plan for the protection of the National Grid. However, I do not believe that this direction in the NPSET precludes the Plan for providing corridor protection provisions for Aurora's critical electricity distribution lines.

54 Therefore while I accept the importance of the NPSET in relation to Transpower's assets, I do not consider that it means corridor protection for identified critical electricity distribution assets is inappropriate within the Plan. In my view it reflects the fact that the National Grid is of National Significance, while Aurora's assets are regionally and locally significant.

IMPORTANCE OF CORRIDOR PROTECTION WITHIN THE PROPOSED PLAN

55 Mr Sullivan outlined in his evidence the importance of Aurora's identified distribution network to Queenstown Lakes. The policy direction provided by the Proposed Otago Regional Policy Statement 2015 (**"Proposed ORPS"**) demonstrates the need for a regulatory tool to manage reverse sensitivity effects associated with development near strategic infrastructure. The Proposed ORPS includes provisions that seek to *recognise the functional needs of infrastructure of regional and national importance* (Proposed Policy 3.4.1) and to *protect infrastructure corridors for infrastructure needs, now and for the future* (Proposed Policy 3.4.2).

56 Aurora made submissions to the Otago Regional Council that it's identified Critical Electricity Lines should be recognised as regionally significant and critical infrastructure and as such benefit from measures to protect such infrastructure corridors for infrastructure needs and into the future.

57 Aligned with this, Aurora has sought to include a range of provisions within the Proposed Plan which seek to protect the integrity of these high voltage and critical distribution lines, and their ability to provide safe, secure and efficient supply of electricity. The provisions requested included a policy and rule framework which included new definitions; amendments to Chapter 30 (Energy and Utilities) policies, notification, setback from network utilities rules; proposed new performance standards for setbacks from critical electricity lines; and consequential changes throughout the various zones (contravention of performance standards activity status and assessment matters).

58 Federated Farmers of New Zealand (FS1132) submitted in opposition to Aurora's submission. They are concerned with precedent effects and believe that NZECP34 provides a corridor protection measure through the required setback distances from overhead lines. However, as outlined by Mr Sullivan in his evidence the NZECP34 is difficult to enforce and a number of instances have previously occurred where the safe distances set out in the code were not adhered to. The public and landowners are more aware of and familiar with their obligations under the RMA, inclusion of corridor identification within the Plan will ensure that people are aware of their obligations around this infrastructure. In

my opinion the corridor protection provisions Aurora is seeking will complement the existing regulatory framework. Further to that, the provisions should provide regulatory protection that will ensure the relevant objectives and policies of the Proposed ORPS are being achieved. Reliance on the NZECP34 to meet these objectives and policies does not achieve that purpose for the identified critical lines.

59 The s42A Report Author has given due consideration to the issues raised in both the original submission by Aurora; the further submissions by other submitters and the evidence provided to both the Strategic Directions and Subdivision chapters of the Proposed Plan on behalf of Aurora. In my view the s42A report provides a balanced discussion of the key issues associated with *Critical Electricity Line* identification and the necessity for such provisions within the Proposed Plan. I note in particular that the s42A Report Author considers that sub-transmission networks are significant to the District, but local distribution networks, (which are important to the continuance of electricity supply) are not. On this basis the s42A Report Author recommends accepting in part the submission by Aurora, allowing for sub-transmission networks as regionally significant without extending such recognition to distribution networks.

60 In my view this is appropriate and is supported. In addition, I agree with the s42A Report Author, that it is efficient to clarify what is considered regionally significant infrastructure and what is not, thus determining what types of activities are covered by the objectives and policies that utilise this term.

61 I note however that while the majority of Critical Electricity Lines identified in the Aurora original submission are either currently operating at 33kV or 66kV capacity (or have been designed to operate at this capacity and are currently operating at a lower voltage {Glenorchy Line; Cardrona Line and Treble Cone}) the overhead line from Wanaka to Makaroa is only designed and operated at 11kV. (This is unlikely to change over the life of the ProposedDistrict Plan). The proposed definition of Electricity Sub-Transmission Line as proposed by the s42A Report Author will effectively exclude this line, although it is clear from the discussion in the section 42A Report that this line should also be protected. If the definition recommended in the section 42A report is accepted the supply from Wanaka to Makarora would not be protected by the Electricity Sub-

transmission corridor provisions and as such be at risk of adverse effects associated with reverse sensitivity.

62 In my view the definition of *Electricity Sub-Transmission Line* needs to be extended as follows to include the Makarora line:

Means the conveyance of electricity via sub-transmission (operating at 22kV, 33kV and 66kV) lines and cables (aerial and underground), support structures and substations operated by a Network Utility Operator.

It also includes the 11kV overhead line from Wanaka to Makarora as shown on the Planning Maps.

Advice note: Only transmission and electricity sub-transmission lines are identified on the planning maps, however, works in close proximity to all electric lines can be dangerous. Compliance with NZECP 34:2001 is mandatory for buildings, earthworks, and when using machinery or equipment within close proximity to any electric lines.

RULE 30.5.10

63 As part of the original Aurora submission, new rules and assessment matters were proposed relating to Critical Electricity Lines. The section 42A Report has assessed the proposed provisions and confirms that the standards of restricting buildings within 10m of the sub-transmission lines, is consistent with the NZECP 34:2001 which stipulates a setback of 9m from lines conveying electricity from 33kV to 66kV. As such these provisions are recommended to be accepted in part and are reflected in the new rule framework proposed at Rule 30.5.10.

64 While I support the introduction of these provisions, I note that the s42A Report Author has recommended a number of departures from the provisions requested by Aurora.

65 The first departure relates to restrictions on the planting of trees, shelterbelts, commercial forestry and horticultural operations within 20m of the defined Electricity Sub-Transmission Corridor. The s42A Report Author remains silent on restrictions on trees in proposed Rule 30.5.10. In my view, the rules surrounding the Electricity Sub-Transmission Corridor need to include provisions

which restrict shelterbelt planting and trees associated with production forestry and horticultural operations within 20m of the centreline of the defined corridor and which comply with the requirements of the Electricity (Hazard from Trees) Regulations 2003. This is aligned with the original submission by Aurora which I consider is appropriate and support.

66 The second departure relates to the proposed activity status recommended by the S42A Report which is more restrictive than that proposed by Aurora. Aurora proposed that the default activity status should be *Restricted Discretionary* rather than *Non-Complying*.

67 In my opinion the activity status should be amended to *Restricted Discretionary* as it is less onerous for plan users and will still achieve the outcomes required to protect the Critical Electricity Lines. In my view, the matters of discretion, outlined within the Aurora submission are appropriate and I support the introduction of such provisions within the Proposed Plan. **Attachment B** to my evidence outlines the relevant provisions which I support and promote.

SETBACKS FROM ELECTRICITY SUB-TRANSMISSION CORRIDOR - SUBDIVISION

68 The s42A Report comments on the proposed setback for subdivision activities from the Electricity Sub-Transmission Corridor. As outlined within the evidence of Mr Sullivan, the 32m setback distances for subdivision are taken from Table 2 of NZECP34:2001 which sets out the safe distances from conductors under normal conditions without engineering advice for conductor spans up to 375 m. The minimum setback from the side of the conductors for circuits exceeding 33kV but not exceeding 110kV is 21m either side of a line. The suggested 20m setback in the s42A Report would therefore be non-complying in terms of NZECP34:2001 for Aurora's assets. The 21m outlined within NZECP34:2001, does not take into consideration access requirements which need to be taken into account when setting appropriate setback distances to trigger a consent. Therefore in my view the proposed threshold of 32m is appropriate as a trigger for new subdivisions in proximity to the sub-transmission lines to ensure that buildings are established at safe distances from conductors without site specific engineering analysis. This will also provide Aurora the necessary access to the overhead lines for

maintenance, while avoiding unduly restricting the underlying land. This is coupled with the relief above relating to the activity status for a breach of the setback. In my view the rule framework is to enable a site specific assessment of proposed activities within the setback area. Engineering or management approaches may be employed that enable activities to take place within the setback area. The approach in the section 42A report narrows the setback area, but suggests a near prohibition on activities within the area. This will tend to exacerbate the concerns of the likes of Federated Farmers while creating potential for activities to take place outside the corridor area, but within the NZECP-34 area without appropriate consideration.

CONCLUSION

69 Aurora welcome the opportunity to be involved in the development of the Proposed Plan. Through this process Aurora seeks to ensure that its sub-transmission assets and critical assets are appropriately recognised as regionally significant and protected from the potential adverse effects of other activities, and that provision is made for the operation, repair, upgrading and maintenance activities while appropriately managing potential adverse effects of its network activities. In my view the amendments sought by Aurora on provisions contained in the Proposed Plan and the corridor protection measures sought will promote the sustainable management of natural and physical resources and will assist Aurora in delivering a robust and reliable power distribution network to the District.

J Dowd

14 September 2016

APPENDIX A

Summary of Recent Project Experience

- Preparation of submissions on behalf of Aurora Energy Limited, on the Proposed Queenstown Lakes District Plan 2015.
- Preparation of submissions on behalf of Aurora Energy Limited, on the Proposed Second Generation Dunedin City District Plan 2015.
- Resource consent for temporary emergency generator – Closeburn, QLDC.
- Resource consent for telecommunications equipment within the Frankton Substation – Frankton Road, Queenstown.
- Resource consent for an Electric Vehicle Charging Station – Dunedin.
- Preparation of Notice of Requirements for new electricity zone substations throughout Southland and Invercargill on behalf of The Power Company Limited.
- Preparation of outline plans for development of the Kennington Sub Station, Invercargill, on behalf of The Power Company Limited

- Infinity Investment Group – Riverside Stage 6 Variation to the Queenstown Lakes District Plan
- Infinity Investment Group – Peninsula Bay Plan Change, Wanaka
- Infinity Investment Group – Hillend Station, Wanaka
- Gibbston Valley Station – Obtaining resource consent for a luxury golf and viticultural resort within the Gibbston Valley including visitor accommodation, commercial activities, residential use and community facilities.
- Anthem Ventures Ltd – Resource Consent for Winery complex and associated development within the Gibbston Valley.
- University of Otago – Resource Consent Application to utilise research vessels in the inland waters of Fiordland.
- RPR Properties – Proposed Private Plan Change at Westacott Park, Dunedin.

- RJH Enterprises Ltd – Resource Consent for a Good Food Market and Rural Selling Place, Invercargill.
- HW Richardson Group – Provision of Resource Management Advice Relating to the Location of Proposed Concrete Batching Plants throughout New Zealand.

APPENDIX B

Proposed Amendments Supported by Aurora

ATTACHMENT B

DEFINITIONS

Electricity Distribution

Means the conveyance of electricity via electricity distribution lines, cables, support structures, substations, transformers, switching stations, kiosks, cabinets and ancillary buildings and structures, including communication equipment, by a network utility operator.

Electricity Sub Transmission Lines

Means the conveyance of electricity via sub-transmission (operating at 22kV, 33kV and 66kV) lines and cables (aerial and underground), support structures and substations operated by a Network Utility Operator.

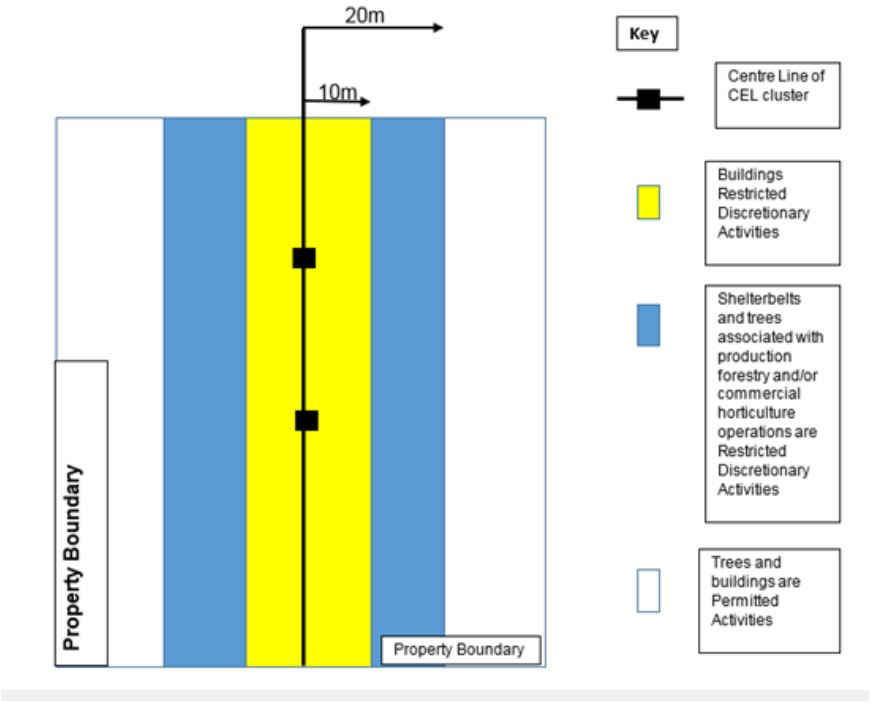
Advice note: Only transmission and electricity sub-transmission lines are identified on the planning maps, however, works in close proximity to all electric lines can be dangerous. Compliance with NZECP 34:2001 is mandatory for buildings, earthworks, and when using machinery or equipment within close proximity to any electric lines.

Electricity Sub Transmission Corridor

Means the area located 10 metres either side of the centreline of any overhead Sub-Transmission line (as shown in blue in the diagram below).

It also includes the 11kV overhead line from Wanaka to Makarora as shown on the Planning Maps,

Distances from Electricity Sub-Transmission Lines are to be measured from a point directly below the centreline of the line or cluster of lines, as shown in below.



Minor Upgrading

means an increase in the carrying capacity, efficiency or security of transmission and distribution lines utilising the existing support structures or structures of a similar scale, intensity and character and includes:

- *Addition of a single service support structure for the purpose of providing a service connection to a site, ~~except in the Rural zone~~;*
- *The addition of up to ~~three~~ four new support structures extending the length of an existing line provided the line has not been lengthened in the preceding five year period, ~~except in the Rural Zone~~;*
- *~~Replacement of conductors or lines provided they do not exceed 30mm in diameter or the~~ bundling together of any wire, cable or similar conductor provided that the bundle ~~does not~~ ~~exceed 30mm in diameter;~~*
- *~~Re-sagging of existing lines;~~*
- *~~Replacement of insulators provided they are less or similar in length; and~~*
- *~~Addition of lightning rods, earth-peaks and earth-wires.~~*
- *The addition of lines, circuits and conductors.*
- *The re-conducting of the line with higher capacity conductors.*
- *The re-sagging of conductors.*
- *The bonding of conductors.*
- *The addition or replacement of longer or more efficient insulators.*
- *Addition of electrical fittings or ancillary telecommunications equipment.*
- *The addition of earth wires that may contain telecommunication lines, earth peaks*

and lightning rods.

- *Support structure replacement within the same or immediately adjacent location within the existing alignment of the distribution corridor.*
- *The replacement of existing cross-arms with cross-arms of an alternative design.*

An increase in support structure height required to comply with the New Zealand Electrical Code of Practice 34:2001 by not more than 15% of the base height of the support structure and where the height is defined as the height of the structure at date of public notification of the District Plan.

Regionally Significant Infrastructure

Regionally significant infrastructure means:

a) Renewable electricity generation facilities, where they supply the National Grid and local distribution network and are operated by an electricity operator; and

b) Electricity transmission infrastructure forming the National Grid and Electricity Sub-Transmission Lines; and

c) Telecommunication and radio communication facilities; and

d) Key centralised Council infrastructure, including water reservoirs, and wastewater treatment plants; and

e) Roads classified as being of national or regional importance; and

f) Queenstown and Wanaka airports

Support Structure

Means a utility pole or tower that forms part of the electricity distribution or transmission network that supports conductors as part of a line. This includes any ancillary equipment, such as communication equipment or transformers.

Utility

Means the systems, services, structures and networks necessary for operating and supplying essential utilities and services to the community including but not limited to:

- substations, transformers, lines and necessary and incidental structures and equipment for the transmissions and distribution of electricity;
- pipes and necessary incidental structures and equipment for transmitting and distributing gas;
- storage facilities, pipes and necessary incidental structures and equipment for the

supply and drainage of water or sewage;

- water and irrigation races, drains, channels, pipes and necessary incidental structures and equipment (excluding water tanks);
- structures, facilities, plant and equipment for the treatment of water;
- structures, facilities, plant, equipment and associated works for receiving and transmitting telecommunications and radio communications (see definition of telecommunication facilities);
- structures, facilities, plant, equipment and associated works for monitoring and observation of meteorological activities and natural hazards;
- structures, facilities, plant, equipment and associated works for the protection of the community from natural hazards;
- structures, facilities, plant and equipment necessary for navigation by water or air;
- waste management facilities;
- flood protection works; and
- Anything described as a network utility operation in s166 of the Resource Management act 1991

Utility does not include structures or facilities used for electricity generation, the manufacture and storage of gas, or the treatment of sewage.

OBJECTIVES AND POLICIES

Policy 30.2.6.1

Recognise the need for maintenance or upgrading of ~~a~~ utilities ~~y~~ including regionally significant infrastructure to ensure its on-going viability and efficiency.

Policy 30.2.6.2

When considering the effects of proposed utility developments with adverse environmental effects, consideration shall be given to the consideration of alternatives, but also to how adverse effects have been managed through the route, site and method selection process while taking into account the locational, technical and operational requirements of the utility and the benefits associated with the utility.

Policy 30.2.6.6

Manage adverse effects, including reverse sensitivity effects that could compromise the development, operation, upgrading and maintenance on the identified electricity sub-transmission lines, through the management of activities within an identified buffer corridor.

RULES AND OTHER PROVISIONS

Advice Note: Electricity (Hazards from Trees) Regulations 2003

Vegetation to be planted around electricity networks should be selected and/or managed to ensure that it will not result in that vegetation breaching the Electricity (Hazards from Trees) Regulations 2003.

RULES - ACTIVITIES

Rule 30.4.6

Non-renewable Electricity Generation where:

(a) the generation only supplies activities on the site on which it is located and involves either:

- Standby generators associated with community, health care, and utility activities; or
- Generators that are part of a Stand-Alone Power system on remote sites that do not have connection to the local distributed electricity network.

(b) Temporary generators required for Utility Activities.

Note – Diesel Generators must comply with the provisions of Chapter 36 (Noise) and Hazardous Substances (Chapter 16 ODP)

Rule 30.4.11

Lines and Supporting Structures

~~A conductor line , or support structures for overhead lines,~~

New lines and associated above ground support structures, including masts, poles or ancillary equipment, but excluding lattice towers, to convey electricity (at a voltage of equal to or less than 110kV at a capacity of equal to or less than 100MVA); or overhead lines for any other purpose including telecommunications.

Control is reserved to all of the following:

- Location
- Route
- Height
- ~~Appearance, scale and~~ visual effects
- ~~Where a site is subject to any natural hazard and the proposal results in~~

~~an increase in gross floor area: an assessment by a suitably qualified person is provided that addresses the nature and degree of risk the hazard(s) pose to the resilience and operation of the facility and associated buildingspeople and property, whether the proposal will alter the risk to any site, and the extent to which such risk can be avoided or sufficiently mitigated.~~

Rule 30.4.16

New buildings and structures ancillary to or associated with utilities provided:

The building or cabinet or structure is less than 10m^2 in total footprint or less than 3m in height.

Rule 30.4.18

Any addition, alteration or construction of buildings and structures, (other than masts for any telecommunication and radio communication facility, navigation or meteorological communication facility or electricity distribution cabinets or kiosks or supporting structures for lines) in:

- Any Significant Natural Areas
- The Arrowtown Residential Historic Management Zone.
- The Remarkables Park Zone

Rule 30.4.22

The construction, alteration, or addition to underground lines for electricity or telecommunication purposes when:

the ground surface is reinstated to the state it was prior to works commencing.

Note – Refer to the Operative Earthworks chapter.

Rule 30.5.10 -

Buildings and Structures and Earthworks permitted within the Electricity Sub- Transmission Corridor include:

Within 10m of a centre line in the corridor:

30.5.10.1 Any building or structure that does not require building consent; or,

Alteration of any building that does not exceed outside the envelope or footprint of the existing building.

Within 20m of a centre line in the corridor:

30.5.10.xx Planting of trees other than shelterbelts, production forestry or commercial horticultural operations.

30.5.10.2 Earthworks that:

a. Are not directly above an underground cable(s); and

b. Do not result in a reduction of existing ground clearance distances from overhead lines below the minimums prescribed in the New Zealand Code of Practice 34:2001 (NZECP 34:2001); and

c. Are in accordance with NZECP 34:2001.

Rule xxx

Activities that do not meet the requirements for permitted activities, require resource consent as a restricted discretionary activity. Discretion will be restricted to:

i. the safe and efficient operation and maintenance of the electricity supply network, including:

f. The use, design and location of buildings; and

g. The mature size, growth rate, location, and fall zone of any associated tree planting, including landscape planting and shelterbelts; and

h. Compliance with NZECP 34:2001; and

i. Effects on public health and safety; and

j. Effects on access to CEL's, designated substations and associated infrastructure for maintenance purposes.

NOISE PROVISIONS

Rule 36.4.7

Sound from emergency and backup electrical generators:

(a) *operating for emergency purposes; or*

(b) *operating for testing and maintenance for less than 60 minutes each month during a weekday between 0900 and 1700.*

APPENDIX C – Equipment Examples

AURORA ELECTRICITY CABINET TYPES

Ground mounted cabinets are required in areas with underground electricity distribution.

Cabinets act as locations where the underground cables are brought to an accessible point above ground, to provide connection points to fuses, switches and transformers.

The types of cabinets that are used on the Aurora network include the following:

SERVICE FUSE BOX

A service fuse box is a small black or green pillar outside a residential property that holds the main low voltage fuses protecting that property.

One service fuse box usually holds fuses for the two nearest properties, but could in some circumstances hold more fuses, for example where infill subdivision has taken place.

A typical footprint for a service fuse box is 0.1m², with a height of up to 0.5m above ground level.

Figure 1: Typical Service Fuse Box

LOW VOLTAGE DISTRIBUTION PILLAR

A distribution pillar is a larger box that hold switches and fuses for controlling the low voltage cables running in the street.

Pillars allow the network operator to isolate short sections of cable in the event of a fault instead of isolating the entire circuit, minimising the number of customers affected by the outage.

The footprint of the pillar depends on the number of circuits it controls, but will typically range from 0.2m² to 0.4m², with a height of up to 1.1m above ground level.

Figure 2: Typical Distribution Pillar

11kV RING MAIN UNIT

An 11kV ring main unit fulfils the same operational function in the 11kV network as a distribution pillar does at low voltage.

The ring main unit will include fuses for protecting any transformers connected to it, and switches to control the 11kV cables in the street.

A typical footprint for an 11kV ring main unit is 0.85m², with a height of up to 1.4m above ground level.

Figure 3: Typical 11kV Ring Main Unit

DISTRIBUTION TRANSFORMER

Distribution transformers convert the 11kV supply to low voltage suitable for distributing to customers.

The low voltage network is usually capable of allowing a transformer to supply customers within a radius of approximately 300m.

Distribution transformers are available in a range of power capacities, measured in kiloVolt-Amps (kVA), with the appropriate capacity depending on the number and type of customers being supplied.

A common transformer size is 300kVA, which is suitable for supplying approximately 100 residential customers.

Larger transformers can supply greater numbers of customers, but the 300m radius limit remains relatively constant.

Figure 4: Typical 300kVA Distribution Transformer

The degree to which the physical size of a transformer can be reduced is limited by the requirement for it to contain oil.

The oil acts as both electrical insulation and as coolant, and there will be a minimum volume of oil that this necessary to do this.

Depending on its capacity, distribution transformer footprints range from 1.0m² from the smallest 15kVA units to 3.4m² for large 1000kVA units, with 2.2m² being a typical footprint for a 300kVA transformer. The transformer cabinet height is up to 1.5m above ground level.

In order to fulfil its function, each distribution transformer requires an 11kV ring main unit that incorporates the fuses that protect the transformer, and a low voltage distribution pillar to control the cable circuits leaving the transformer.

The low voltage distribution pillar is incorporated into one end of the transformer cabinet, but there is insufficient space in the cabinet to house an 11kV ring main unit, requiring it to be housed in a separate cabinet.

Figure 5: 300kVA Distribution Transformer with Adjacent Ring Main Unit

COMPACT SUBSTATION

A compact substation, also known as a berm substation, incorporates an 11kV switch, a distribution transformer and a low voltage distribution pillar into a single cabinet, in order to reduce the number of cabinets required.

Compact substations are larger than standalone transformers, due to the additional space required to house a ring main unit inside the same cabinet as the transformer.

A typical compact substation has a footprint of between 3.0m² and 4.6m², with a height of up to 1.5m above ground level.

Figure 6: Typical Compact Substation incorporating Transformer and Ring Main Unit