

**BEFORE THE QUEENSTOWN LAKES DISTRICT COUNCIL**

**IN THE MATTER** of the Resource Management Act  
1991

**AND**

**IN THE MATTER** of the Queenstown Lakes Proposed  
District Plan

**BY** **AURORA ENERGY LIMITED**

**Submitter No. OS 635**

**HEARING STREAM 4 - SUBDIVISION**

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**SUPPLEMENTARY EVIDENCE OF JOANNE DOWD  
ON BEHALF OF AURORA ENERGY LIMITED  
IN RESPONSE TO QUESTIONS FROM THE HEARINGS PANEL  
DATED 5TH AUGUST 2016**

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1. Thank you for the opportunity to reply in writing in relation to questions raised on my evidence in chief relating to the subdivision chapter. Outlined below are my responses to the various questions raised by the panel.

**As the Earthworks Chapter (Chapter 22) is operative and not part of Stage 1 of the PDP, how is it envisaged that amendments to the PDP can achieve the benefits set out in paragraph 40?**

2. I note that the provisions relating to the enhanced setbacks for earthworks proposed under Aurora's suite of provisions relating to "Critical Electricity Lines" ("CELs") cannot be considered under Stage 1 proposals. It is assumed that the earthworks provisions will be reviewed as part of Stage 2 proposals and Aurora Energy Limited ("Aurora") will lodge submissions at the relevant time.
3. However, Stage 1 of the Proposed Plan provides an opportunity to identify and control subdivision activities. Therefore Aurora sought changes to the subdivision provisions that would require subdivision activities to have appropriate regard to the critical electricity lines within areas of land to be subdivided. The matters of discretion associated with the relevant rules would allow the potential effects of subdivision works or subsequent land development to be assessed at the time of subdivision and avoid subdivisions being designed in a manner that will have adverse effects on Aurora's critical infrastructure.
4. I also note, that Proposed Policy 30.3.2.3 contained in the Energy and Utilities Chapter of the Proposed Plan requires:

*Policy 30.3.2.3*

*New Zealand Electrical Code of Practice for Electrical Safe Distances*

*Compliance with the New Zealand Electrical Code of Practice for Electrical Safe Distances ("NZECP 34:2001") is mandatory under the Electricity Act 1992. All activities regulated by the NZECP 34, including any activities that are otherwise permitted by the District Plan must comply with this legislation.*

5. This Policy will be relevant to the assessment of any earthworks consent until such time as the earthworks provisions specifically address earthworks in the vicinity of Aurora's Critical Infrastructure.

**To what extent are the electricity lines noted in para 47 (i.e. the Critical Electricity Lines) located within road reserve?**

6. I have undertaken a review of the Aurora Geographic Information System ("GIS") and note that the CELs identified in the Aurora submission are located in a range of both road reserve and private property. Generally the high voltage lines that feed Queenstown, Arrowtown, Glenorchy and Cardrona (including those parts of the Crown Range Road) are located on private property and typically constructed in the 1960's, 1970's and 1990's and as such are subject to existing use rights under the Electricity Act 1992. There are lengths of circuits, such as along State Highway 6 – Frankton Road, where the CEL's are located in the road reserve. A higher percentage of CELs serving Wanaka and Luggate are located in road reserve. **Table 1** below provides an analysis of the various CELs proposed. An electronic copy of the Aurora CEL locations can be provided to Council to map against Council's GIS system.

**Table 1**

Critical Electricity Lines	Constructed	Private Property	Road Reserve
33kV and 66kV sub-transmission and distribution overhead lines - Queenstown	Majority of the overhead lines feeding Queenstown were constructed in 1972	CEL's located within Gibbston Valley, approach to Arrowtown and from Glenda Drive through to Hallenstien Street  Approximately 80% in private property – No easements.	Portions of high voltage overhead lines running along Frankton Road to Glenda Drive.  Approximately 20% in road reserve
33kV and 66kV sub-transmission and distribution overhead lines - Wanaka	Dual Circuit runs from Cromwell to Wanaka  UC66-1 – Constructed in 1978  WK2752 – Constructed 1992	UC66-1 is located predominantly in private property with local pockets located in road reserve.  Approximately 50% in private property – No easements.	Approximately 50% of the CEL's feeding Wanaka and Luggate are located along the Road Reserve.  WK2752 is located mainly within road reserve
11kV overhead line to Glenorchy.	Overhead line L40A1 – constructed in 1983. - Constructed at 33kV capacity but currently operated	Approximately 90% located on private property. Existing use rights – no easements.	Approximately 10% on road reserve.

	at 11kV. Major upgrade of this line proposed over the next five years to operate the line at 33kV capacity.		
11kV overhead line between the Cardrona Substation up to the ski fields;	Cardrona feeder L60A1 originally constructed in the 1960's and subject to a major upgrade in 2011 which relocated some of the line off private property into road reserve. – Existing use rights – no easements.	Approximately 70% within private property	Approximately 30% in road reserve
11kV overhead line to Treble Cone	Line L20A constructed circa 1983	70% on private property – existing use rights – no easements.	30% located on road reserve.
11kV overhead line to Makarora	Line constructed circa 1971 – Existing use rights – no easements	Approximately 80% of line located on private property.	Approximately 20% in road reserve

**To the extent the CELs are on private land, to what extent are they authorised by easements?**

7. As many of the CEL overhead lines were built prior 1992, there are no easements in place on the various parcels of private land. Such assets rely on existing use rights as defined within the Electricity Act 1992.

**How many designated substations are there in QL District?**

8. Within the QLDC District, Aurora has 12 Zone Substations. Five of these substations are already subject to a designation. These include:
- Arrowtown Substation;
  - Commonage Substation;
  - Jacks Point Substation;
  - Queenstown Substation and

- Riverbank Road.

9. Aurora has also sought to obtain new designations over the remainder of its Zone Substations which include:

- Camp Hill Substation;
- Closeburn Substation;
- Coronet Peak Substation;
- Dalefield Substation;
- Fernhill Sunshine Bay Substation;
- Glenorchy Substation; and
- Remarkables Substation.

**Is there a need to distinguish between zone substations and distribution substations in your proposed rule?**

10. Yes, the substations referred to in the proposed rule relate only to “Zone” Substations not electricity distribution substations. I have therefore suggested some amendments to the proposed rule as set out in **Attachment A** to this evidence.

**Given your evidence about required separation distances, what is the rationale for a blanket 32 metre separation, as per Aurora’s suggested rule?**

11. The values quoted in my evidence relate to setback distances once engineering advice has been applied. Table 2 of NZECP34:2001 sets out the safe distances from conductors under normal conditions without engineering advice for conductor spans up to 375 m. This is the table which has been utilised to determine the setback requirements. You will note from Table 2 (below) that the minimum setback from the side of the conductors for circuits exceeding 33kV but not exceeding 110kV is 21m either side of a line. In assessing the appropriate setback proposed under this rule, Aurora has taken into consideration the characteristics of the lines (length of cross arms, pole heights, span lengths) to determine maximum conductor swing distances in everyday wind conditions. In my view the proposed threshold of 32m is appropriate as a trigger for new subdivisions in proximity to the 33/66kV 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.

**TABLE 2 SAFE DISTANCES FROM CONDUCTORS WITHOUT ENGINEERING ADVICE**

Circuit voltage	Maximum span length (m)	Minimum distance beneath conductors under normal conditions (m)	Minimum distance to the side of conductors under normal conditions (m)
Not exceeding 1 kV	50	4	3.5
Exceeding 1 kV but not exceeding 11kV	80	5.5	5
Exceeding 11 kV but not exceeding 33 kV	125	7	8.5
Exceeding 33 kV but not exceeding 110 kV	125	7.5	9.5
Exceeding 110 kV but not exceeding 220 kV	125	8.5	11
275 kV d.c. & 350 kV d.c.	125	8.5	7.5
Not exceeding 33 kV	250	8	12
Exceeding 33 kV but not exceeding 110 kV	350	8.5	12.5
Exceeding 110 kV but not exceeding 220 kV	250	10	14
275 kV d.c. & 350 kV d.c.	250	10	11
Not exceeding 33 kV	375	9.5	20.5
Exceeding 33 kV but not exceeding 110 kV	375	10	21
Exceeding 110 kV but not exceeding 220 kV	375	11	22.5
275 kV d.c. & 350 kV d.c.	375	10.5	18
For all other spans		Engineering advice required	

*Voltages are a.c. except where specified as d.c.*

**NOTES**

- (a) Other source of potential conductor motion is required to ensure safe distances during construction.
- (b) Where supporting structures are not located on equal elevations, a specific engineering study may be required to ensure distances are in accordance with Table 2.

12. I note that the 32m setback requested is aligned with similar provisions provided for in other District Plans<sup>1</sup> in New Zealand and in my view is appropriate for Aurora's 33/66kV sub-transmission assets within the District. The blanket application of the 32m separation across all the identified CEL's was purely to ensure that the administration of the District Plan was not overly complicated.

13. However, in recognition of the fact that Aurora is seeking to protect a number of critical 11kV lines and the reduced setback requirements for circuits of this voltage, outlined in NZECP34:2001, I have re-evaluated my position. In my view the blanket 32m separation distance proposed is somewhat excessive in relation to the 11kV circuits and could be reduced accordingly. NZECP34:2001 requires a minimum

<sup>1</sup> Whangarei District Plan

setback from 11kV lines of 8.5m to the side of conductors under normal conditions. Therefore a setback of 15m from the centreline of the 11kV circuits would be appropriate and I have suggested amendments to the CEL suite of provisions to reflect this.

Joanne Dowd

17 August 2016

## ATTACHMENT A – AMENDED CEL PROVISIONS

NOTE: The following provisions apply district wide in addition to any other provisions in this Plan applicable to the same areas or site. Critical Electricity Lines (CEL's) and zone substations are the key components of the electricity network in the Queenstown Lakes District. To provide a resilient electricity network the use and development of CEL's and zone substations must be sustainable, secure and efficient. CEL's and zone substations can be vulnerable to inappropriate subdivision or building location to the extent that they can restrict access and affect the ability to maintain the CEL's (lines, cables and support structures). Trees planted too close to CEL lines or cables can disrupt supply. CEL's are, or have the potential to be, critical to the quality, reliability and security of electricity supply throughout the district or region. These lines contribute to the social and economic wellbeing and health and safety of the district or region and are lines that:

- Supply essential public services such as the hospital, civil defence facilities or Lifeline sites; or
- Supply large (1MW or more) industrial or commercial electricity consumers; or
- Supply 1000 or more consumers; or
- Are difficult to replace with an alternative electricity supply if they are compromised.

The locations of CEL's and designated substations are identified in the planning maps of the District Plan.

The following activities are permitted activities:

1. Within 10m of a CEL or the designation boundary of a Zone substation:
  - i. Any building or structure that does not require building consent; or
  - ii. Alteration of any building that does not exceed outside the envelope or footprint of  
the existing building; or
  - iii. 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.
2. Within 20m of a CEL or the designated boundary of a Zone substation:
- i. Planting of trees other than shelterbelts, production forestry or commercial horticultural operations.
3. Activities that fail to meet the standards in (1) and (2) above, provided that prior to the commencement of any works:
- i. Written notification has been provided to the Council; and
  - ii. The proposed activity is being carried out in accordance with the Electricity Act 1992 and associated regulations (NZECP 34:2001, the Electricity (Hazards from Trees) Regulations 2003 (SR 2003/375), and the Electricity (Safety) Regulations 2010);

**OR**

- 3.1 The proposed activity is being carried out by a network utility operator or territorial authority in accordance with NZECP 34:2001.

**Note:**

Specified distances from CEL's are to be measured from a point directly below the centreline of the line or cluster of lines, as shown in the Critical Electricity Line Definition.

**Insert New Restricted Discretionary Rule - Land Use**

**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:

- a) the safe and efficient operation and maintenance of the electricity supply network, including:
- b) The use, design and location of buildings; and
- c) The mature size, growth rate, location, and fall zone of any associated tree planting, including landscape planting and shelterbelts; and
- d) Compliance with NZECP 34:2001; and
- e) Effects on public health and safety; and
- f) Effects on access to CEL's, designated substations and associated infrastructure for maintenance purposes.

#### **Insert New Rule**

#### **Rule xxx**

#### **Restricted Discretionary Activity - Subdivision**

- 1. Subdivision:
- 2. Within 32m of the centre line of a 33/66Kv Critical Electricity Line, or
- 3. Within 15m of the centre line of an 11kV Critical Electricity Line, or
- 4. Within 32m from the designation boundary of a zone substation;

shall be a restricted discretionary activity.

#### **Classification of Subdivision in Vicinity of Critical Electricity Lines**

When considering any restricted discretionary activity under Rule xxx, discretion will be restricted to:

- i. the safe and efficient operation and maintenance of the electricity supply network, including:
  - a. The use, design and location of buildings; and

- b. The mature size, growth rate, location, and fall zone of any associated tree planting, including landscape planting and shelterbelts; and
- c. Compliance with NZECP 34:2001; and
- d. Effects on public health and safety; and
- e. Effects on access to CEL's, designated substations and associated infrastructure for maintenance purposes.

For restricted discretionary activities under Rule xxx the relevant network utility operator will be considered an affected party under s 95E of the Resource Management Act 1991.