

Before a Board of Inquiry

Under the Resource Management Act 1991

In the matter of Notices of requirement for designations and resource consent applications for the Transmission Gully Proposal

Between **NZ Transport Agency**
Requiring Authority and Applicant

And **Porirua City Council**
Local Authority and Applicant

And **Transpower New Zealand Limited**
Applicant

**Statement of rebuttal evidence of Helen Louise Yorke
for Transpower New Zealand Limited**

20 January 2012

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INTRODUCTION

1. My full name is Helen Louise Yorke
2. I have the qualifications and experience set out at paragraph 2 of my statement of evidence in chief, dated 18 November 2011 ("EIC").
3. I repeat the confirmation given in my EIC that I have read and agree to comply with the Code of Conduct for Expert Witnesses as contained in the Environment Court Practice Note 2011.
4. In this statement of rebuttal evidence, I respond to the evidence of Sally Peake, on behalf of Kapiti Coast District Council ("KCDC").

EXECUTIVE SUMMARY

5. I have considered Ms Peake's evidence in relation to transmission towers in the vicinity of Tower 2A. None of that evidence has caused me to alter the opinions expressed in my EIC.
6. In my opinion there are sound reasons why Tower 2A should remain where it is proposed and why undergrounding a short section of transmission line has not been pursued.

EVIDENCE OF MS PEAKE

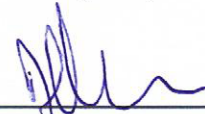
7. Ms Peake's evidence acknowledges that the proposed transmission line by-pass route of the Wainui Saddle is appropriate in landscape terms. However, she raises concerns about the adequacy of the assessment of the towers located north of the Wainui Saddle and in particular the visual prominence of Tower 2A.
8. The alternative options for transmission alignments were initially assessed as discussed in Ms Lesley Hopkins evidence. That included consideration of options involving towers in the vicinity of Tower 2A. The preferred alignment selected minimised the extent of the transmission relocation works. The design of the tower locations and tower heights was then undertaken based upon this alignment.
9. Relocating towers is proposed where necessary to provide safe construction and operational clearance to the new highway. The proposed alignment and tower locations have been assessed using the transmission line design tool, PLS CADD to determine the locations of the towers and heights. This design is undertaken by an experienced line design engineer. The PLS CADD design tool enables the designer to

check clearances under the conductors, heights of towers and resulting loads on the towers. I subsequently undertook a site visit to confirm the suitability of the proposed tower locations.

10. As part of the design process statutory electrical clearances from the conductors to ground as well as clearance to the road are checked. The existing ground contours as well as the proposed finished road level and embankments need to be taken into account, as the transmission relocations will occur prior to the road construction works. The ground rises steeply to the eastern side of the highway prior to the proposed crossing Tower 2A to Tower 3A.
11. My understanding of Ms Peake's concern is the visual prominence of Tower 2A whilst travelling north on the new highway. The consequence of siting a tower on the eastern side of the highway would be to have an abnormally tall tower at Tower 1 to provide clearance to the ground and road and another tall tower on the eastern side of the highway at a sufficient distance away from the cut face. An additional tower would then be required on the spur above the building to connect to Tower 3A. Tower 1 is currently 17.3m tall and would need to be at least three times this height. It would also be more solid in appearance. Though Tower 3A is already proposed to be a strain tower, (with no angle), this option would increase the angle of the line, which would likely result in a heavier (more solid tower).
12. Alternatively, an additional tower between Towers 1 and 2 would be required with a larger angle and significantly taller than the proposed Tower 2A. This is due to the large change in elevation from Tower 1 to a suitable site on the eastern side of the highway. The tower location on the eastern side of the highway would need to be on top of the spur above the building to avoid adding another tower to connect into Tower 3A.
13. This option is also not preferred due to the additional tower and increasing the angle on Tower 3A resulting in a heavier tower. The additional tower between Towers 1 and 2 would need to be taller and heavier than the current Tower 2A.
14. For those reasons, in my opinion the current location of Tower 2A is preferable.
15. Ms Peake also comments that undergrounding a short section of transmission line in this location to reduce the visual impact should be

considered. This was considered not a practical solution, and not pursued, for the following reasons:

- (a) 110 kV double circuit cable section would require either two pole mounted or two ground mounted cable terminations stations either end of the cable section. These would be large diameter, tall pole structures with insulators and equipment mounted on them. Ground area of approximately 11 m x 26 m would be required for pole mounted station and a greater area for the ground mounted. This type of major structure located in the vicinity of Tower 1, in my opinion would create more visual impact than the current Tower 2A
- (b) In order to underground a section of overhead transmission, the road would need to be constructed with cable ducts, prior to the transfer of the overhead circuits to cable. This would require Towers 2A and 3A to be constructed as part of the enabling works to allow the highway to be constructed.
- (c) It is unlikely that there is available space to locate these structures adjacent to the proposed highway, without significant earthworks to prepare platforms to construct them on.
- (d) The cost of the cable stations and cable would be significantly higher than the overhead option, approximately 10 times for the cable with a significant cost again for the cable termination stations. Additional cost for the temporary move of the overhead circuits would also be required. This is a very uneconomic solution compared to the proposed relocation of Tower 2A, and would be difficult to justify.
- (e) Adding short lengths of cable sections embedded in overhead transmission for 110 kV and above transmission circuits is not recommended, due to increased number of components in the system for on-going maintenance and reliability. Also for maintenance of the highway and the transmission circuits it is not desirable to have them located in the state highway.



Helen Louise Yorke
20 January 2012