

**BEFORE THE COMMISSIONER ON BEHALF OF THE DUNEDIN CITY
COUNCIL**

UNDER	the Resource Management Act 1991
IN THE MATTER	an application for resource consent of LUC-2015-469
BY	Blueskin Energy Limited Applicant

**BRIEF OF EVIDENCE OF STEPHEN GORDON CHILES
RESPONDING TO SUBMITTERS AND
GUIDANCE FROM HEARING PANEL**

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Introduction

1. My full name is Dr Stephen Gordon Chiles. My expertise and experience has been set out in my Evidence in Chief dated May 2016. I also confirm that I agree to comply with Code of Conduct for Expert Witnesses.
2. I was provided with the hearing notes of Ms Price, legal counsel for submitters Ryan/Ashby and Clayton, and the Guidance from the Hearing Panel. This is a response to the matters raised in those documents that relate to acoustics issues.

Ms Price – Issue 1

Budget constraints and modelling

3. While I have provided some of my own time without charge, I was not placed under any budget constraints by Blueskin Energy. Mr Willis repeatedly made clear to me that any work that I recommended would be done. The extent of work that has been conducted has been at my recommendation and not resulting from budget constraints.
4. In terms of modelling done by others, it was not conducted by Blueskin Energy themselves but by another windfarm acoustics specialist. I personally directed and checked this modelling and confirm it is appropriate.

Terrain screening

5. My assessment report submitted with the application (page 4, paragraph 1, last sentence) is explicit that no terrain screening was included in the model. This should also be obvious to an acoustics specialist from the relatively smooth sound level contour lines in Figure 2 of my report.
6. This assumption is more stringent/conservative than the UK Guidelines referenced by Ms Price.
7. Ms Price is incorrect that this issue was not discussed by me and is incorrect that there is a deficiency in the information provided.

Ms Price – Issue 2

8. Wind turbine sound data can be defined in terms of 'rated' or 'guaranteed' levels. Rated levels are the actual measured sound levels from a wind turbine recorded during certification testing. When manufacturers sell wind turbines they generally add a safety factor to these rated levels resulting in a guaranteed level.
9. The sound power level used in the modelling for this project is largely an administrative matter for Blueskin Energy. Ultimately compliance is demonstrated by comprehensive measurements once the wind farm is constructed. If Blueskin Energy has not included appropriate tolerance in the sound level predictions, then it might be unable to comply with the proposed standards and would need to take extra steps in order to achieve compliance. However, I have included appropriate tolerances in the predictions so this should not be the case. Regardless, with respect to Ms Price's comments:
 - (a) NZS 6808:2010 Clause 6.2.1 states "*For the purposes of this Standard it is recommended that wind farm sound level predictions be based on the apparent sound power and tonality values for the nominated wind turbine model, determined in accordance with IEC 61400-11.*" This extract is referring to the rated sound power level, and while Ms Price implies that guaranteed sound power levels should be used, under NZS 6808 that is not required.
 - (b) Regardless of the above, in Appendix A to my evidence the two results sheets from Enercon clearly state in the WTG section under "Noise data" that the predictions include a 1 dB safety margin on the rated wind turbine sound power levels. This is in addition to other conservative elements of the calculations, such as the omission of terrain screening.

Ms Price – Issue 3

10. As stated above, I was not placed under any budget constraints and Mr Willis was willing to commission background sound measurements if I considered them necessary. As set out in paragraph 72 of my Evidence in Chief, I did not and do not consider background

measurements to be appropriate or necessary at this time. In summary, this is because noise limits should be determined based on background sound measurements made nearer to the time of wind farm construction, and at this stage, in this instance noise effects can be assessed without detailed background monitoring data.

11. I have explained in paragraph 26 of my Evidence in Chief that compliance can be achieved regardless of background noise. Even if the background sound is surprisingly low, the wind farm could comply with the base 40 dB noise limit.
12. In terms of assessing effects, I have based my assessment on typical background sound levels in rural areas, and this has been confirmed by spot measurements conducted by Mr Bell.

Ms Price – Issue 4

13. Ms Price criticises the noise assessment for not including background sound level measurements across the wind speed range. However, it is normal to define wind farm noise limits at each wind speed from up-to-date background sound measurements following grant of consent. This was the case for the Mt Stuart wind farm and, although a different technique was used, background sound was also measured after consent was granted at Flat Hill wind farm. In fact, for Mt Stuart the consent conditions explicitly required background sound monitoring after consent was granted, presumably to ensure up-to-date information was used to define noise limits.
14. Monitoring after consent is granted also occurs for larger scale wind farms. For example, noise limits at two of the assessment points by Meridian's Mill Creek wind farm were only defined following background sound measurements in 2014, immediately prior to installation of the turbines and after consent was granted.
15. The background sound measurements will have minimal influence on the assessment of noise effects as even if the background sound levels increase at higher wind speeds the wind turbine levels will plateau at the values used in modelling.
16. I disagree with Ms Price's assertion that the application is missing a lot of information. Understanding of sound emissions from the proposed

activity and the surrounding environment is more than adequate to allow accurate assessment of potential effects. This will be verified by extensive monitoring prior to and following construction. In my opinion this approach is entirely appropriate given the potential effects.

Ms Price – Issue 5

17. Ms Price stated *“We can find no information in the acoustic information provided in the application that shows how many decibels noise reduction would be achieved.”* Appendix A to my Evidence in Chief shows that a 2 dB (1.9 dB) reduction in sound level can be achieved by reducing the power of a turbine from 800 kW to 600 kW. A range of other reductions are also possible, such as reducing power output of more turbines.
18. Ms Price quotes Mr Day as advising a reduction of 3 dB is required. This arbitrary number has no justification and is not required in this instance. Regardless, it would probably be achievable with greater loss of power.
19. Ms Price said that I state *“they can get the power of one turbine below 40 dB”*. This is a misquotation. I explicitly state that sound levels quoted relate to all three turbines operating together. It is just that only one of the three turbines needs adjusting to bring the total sound level down to 40 dB, in that example. This is explicit in Appendix A to my Evidence in Chief.

Hearing panel guidance – noise effects – paragraph 2

20. Under all district plans there are a wide range of permitted activities that may alter the amenity of different areas. The noise limits are generally set at a level that maintains reasonable amenity rather than providing an absolute protection or inaudibility.
21. The proposed wind turbines will be audible at times. However, as set out in my Evidence in Chief, this will be at a reasonable level that should not result in a significant deterioration of rural amenity values. Audibility is not an appropriate criterion for environmental noise as it would essentially prevent any development and would be inconsistent with permitted activity standards which anticipate and accommodate changes over time.

22. In this instance the predicted levels are well below thresholds for sleep disturbance. During the day, the predicted levels are significantly below permitted activity limits. Subjectively wind farm sound at 40 dB is roughly half as loud as a permitted activity at 50 dB. Therefore, while the wind farm will influence the rural amenity it should not represent a significant deterioration.

S G Chiles

2 June 2016