

Noise Peer Review

## Memorandum



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Subject:	Thunderbolt Energy Hub Noise & Vibration Assessment Peer Review		

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As requested SLR has reviewed the *Thunderbolt Energy Hub Stage 1 Noise and Vibration Assessment* report dated October 2021 authored by Sonus, ref: S6576.1C2, (the Sonus Report) and I can make the following recommendations for amendment.

- **2 Project Layout** this section really requires a visual map, that shows and labels, WTG layout, ancillary equipment, meteorological mast, sensitive receptors (involved & uninvolved) and monitoring locations.
- **2 Project Layout** *Table 3 Dwellings in the Vicinity of the Wind Farm* this table would be more useful to list the distance to the closest WTG
- **3.1.1 Special Noise Characteristics Tonality** The method for determining tonality described in the Sonus Report is limited to the ISO 1996.2: 2007 Simplified Method (e.g. 1/3 octave band).

NSW adopts SA 2009, which The Bulletin states:

SA 2009 requires that development applications for wind energy projects report the following: "To help determine whether there is tonality, the method and results of testing (such as in accordance with IEC 61400–11) carried out on the proposed WTG model to determine the presence of tonality should also be specified in the development application"

As well as the following notes:

Note 1: Narrow band analysis using the reference method in ISO1996-2:2007, Annex C may be required by the consent / regulatory authority where it appears that a tone is not being adequately identified, for example where it appears that the tonal energy is at or close to the third octave band limits of contiguous bands.

Note 2: Noise assessments for wind energy projects shall, however, also report the results of tonality assessments under IEC61400-11 for the particular turbine being considered.

For planning approval noise impact assessments, it is customary to evaluate the potential for tonality by examining WTG noise test reports which have been completed in accordance with under IEC61400-11, as per Note 2. If tonality is at all present, then appropriate SAC penalty should be included in the predictions.

- **4.1 Background Noise Monitoring** For full transparency and traceability a technical report should list all equipment details, SLM model, serial numbers and a confirmation of NATA calibration status.
- **4.1 Background Noise Monitoring** The Sonus Report states logger placement was 'at an equivalent distance from the facade of the dwelling as any significant trees'. This is perhaps just requiring re-phrasing.

SA EPA 2009 requires that 'The microphone should be positioned 1.2–1.5 metres above the ground and at least 5 metres from any reflecting surface (other than the ground). In general, any area within 30 metres of a house and in the direction of the wind farm would be a valid measuring position. Care should be taken to ensure that the area is not screened from the wind farm by house, shelter or other elements. Background noise levels can be significantly affected by local conditions, such as the presence of trees nearby.

Photographs from multiple directions are to be taken showing the noise measurement position and associated surroundings, such as buildings, trees and topography'.

• **4.1 Background Noise Monitoring** – The Sonus Report provides photographs of the noise monitoring equipment in Appendix B.

Appendix B only shows typically 1 photograph of noise equipment in-situ at each location. SA EPA requires Photographs from multiple directions are to be taken showing the noise measurement position and associated surroundings, such as buildings, trees and topography. It is customary to include photographs of the equipment in-situ from all 4 compass directions

- **4.1 Background Noise Monitoring** Meteorological mast it would be useful to include the location of the Met mast on the overall layout map. Furthermore, it would be useful to understand the met mast wind heights, also a brief explanation of the 'shearing up' process. Is it based on a constant average shear, or determined by 10-minute bin determined shear?
- **4.3 Assessment Noise Sources** Tonality The Sonus Report provides '*The assumption has been confirmed for the representative wind turbine model by reviewing the 1/3 octave band data*'. The more appropriate method to evaluate tonality is nearfield tests in accordance with IEC61400-11 narrow band tonal audibility test.
- **4.3 Assessment Propagation Model –** The Sonus Report provides 'predictions of environmental noise from the Project have been based on the CONCAWE noise propagation model and SoundPLAN noise modelling software'.

Current best practice is described in Institute of Acoustics (IOA) - A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise. It advocates for use of the ISO 9613-2 standard, with special input parameters detailed in Section 4.3 of the Guideline.

The Sonus Report lists 'widely accepted input conditions', many of which are not aligned with the IOA special input parameters detailed in Section 4.3 of the Guideline. e.g. relative humidity, soft ground, receptor height.



My recommendation is for the modelling to be in accordance with the best practice IOA Guideline, alternatively a significantly more robust justification of the selection of CONCAWE is warranted and the author should provide evidence of how and why the input conditions are *'widely accepted'*.

- **5.1 Criteria** The Sonus Report states '*The amenity level for a noise source which operates over a 24-hour period in a rural area is 40 dB(A)*'. This would be better re-phrased as '.....noise source which operates during the night period'.
- **6.2** Assessment Table 16 header '*Predicted construction noise levels for the non-associated locations > 40 dB(A)'*. The Night-time Noise Management Level is RBL+5dBA = 35 dBA
- **7 Traffic Criteria -** If deliveries are anticipated to occur out of standard hours, e.g. delivery of blades/tower/nacelle etc. due to traffic safety considerations then I would suggest an Lmax sleep disturbance assessment is appropriate.
- Appendix B Photographs of Logging Equipment at Dwellings as there generally are only a single photograph of the noise monitoring equipment in-situ it is difficult to ascertain if the selection of monitoring sites are in accordance with the requirements of SA EPA 2009.

Noise Logger at Dwelling 6 - Noise logger appears that it may possibly less than 5m from reflective surface.

Noise Logger at Dwelling 29 - Noise logger appears that it may be greater than 30m from the dwelling. It also appears to be closely surrounded by orchard trees. From the photograph it is not possible to judge if the equipment location is indicative of dwelling.

• Appendix D - Noise Prediction Contours - Whilst 35 dBA represents the minimum criteria, it would be useful to see more than one contour, especially given that not all presented receptors are detailed in the results table.

I trust that the above is suitable for your current requirements, if you have any questions relating to the above feel free to contact me.

Regards

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Authorised	by:	DL	

