

By email
21 October 2022

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Our ref 270849-00/DWS

Dear [REDACTED]

Lal Lal Wind Farm **Verification Report for Post-Construction Noise Assessment - Elaine**

In refer to your emails dated 15 September 2022 (**15 September Email**) and 4 October 2022 (**4 October Email**) regarding my Verification Report for the Post-Construction Noise Assessment - Elaine section of the Lal Lal Wind Farm.

In response to the 15 September Email, I note that there were two revisions of my Verification Report which correspond to two revisions of the Post-Construction Noise Assessment Reports prepared by SLR Consulting Pty Ltd (**SLR**) the subject of my verification, namely:

- a) I issued a Verification Report to RES Australia Pty Ltd (RES) on 22 June 2022 (**Original Verification Report**), addressing the Post-Construction Noise Assessment Report prepared for the Elaine section of the Lal Lal Wind Farm by SLR (Lal Lal Wind Farm – Elaine, Post-Construction Noise Assessment, SLR Report No. 640.11872-R04-v1.5, dated March 2022) (**Original PC Noise Assessment Report**).
- b) RES subsequently provided me with an updated Post-Construction Noise Assessment Report by SLR (SLR Report No. 640.11872-R04-v1.7, dated June 2022) (**Updated PC Noise Assessment Report**) which contained some changes from the Original PC Noise Assessment Report. I therefore reviewed the Updated PC Noise Assessment Report and issued an updated Verification Report on 28 June 2022 (**Updated Verification Report**).

The changes between the Original and Updated PC Noise Assessment Reports involved references to a change in the turbine type and a later version of the Planning Permit. No other changes were made, and I therefore refer only to the Updated PC Noise Assessment Report below (although they equally apply to the Original PC Noise Assessment Report). The changes made no difference to the findings of my verification.

In preparing the Updated Verification Report, I removed some elements from the 'Conclusion' provided in Section 8 as these were repetitive of a passage already contained in Section 7.4 *Technical Verification of the Post-construction Noise Assessment*. It is therefore incorrect for you to assert that the conclusions are "significantly different". The wording deleted from Section 8 in the Updated Verification Report remain addressed in the body of the report in Section 7.4.

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With respect to the 4 October Email and the report prepared by L Huson & Associates (LHA403, September 2022) (**Huson Report**) attached thereto, in my view, Mr Huson's criticisms are not supported, and I consider that the Updated PC Noise Assessment Report adequately demonstrates that the compliance measurements have been undertaken in accordance with the NCTP and NZS6808:2010. I therefore remain satisfied that my verification was completed in compliance with my duties and the Updated Verification Report should stand as it is.

In response to the Huson Report, I note the following;

- Mr Huson reviewed my Original Verification Report, not the Updated Verification Report.
- It is apparent that there was a *transcription error* between Table 6 of the Background Noise Monitoring report prepared by Marshall Day Acoustics and Table 2 of the Noise Compliance Test Plan (NCTP). This was identified and confirmed by SLR during preparation of the Updated PC Noise Assessment Report.
- NZS6808:2010 is explicit in providing flexibility in the selection of the objective method for assessing Amplitude Modulation (AM). The method it provides for the objective assessment of AM is expressly described as an *interim* method in B3.2, and CB3.2 states that;

'This method is considered to be an adequate interim test that has been used in New Zealand. It is envisaged that appropriate objective tests for modulation special audible characteristics will be developed in future to replace B3.2 or provide a more robust objective method than B3.2.'

The proposed method of determining AM (UK IoA AMWG rating method) is the current 'state-of-the-art' and is the most well developed and tested objective method for assessment of wind farm AM. It is therefore reasonable to accept it as an 'an appropriate objective test for modulation special audible characteristics' in accordance with NZS 6808:2010.

- The data filtering process described in S5.4 of the NCTP (in relation to relevant operational turbines) was adopted by SLR in undertaking the Post-construction analysis (Updated PC Noise Assessment Report, S10.1.1, and Appendix B) – but is noted to result in the rejection of a significant amount of measurement data. A slightly less conservative data filtering approach (termed the '0.5dB method', and described in S7.1 of the Updated PC Noise Assessment Report) was also tested as a variation to enable a larger data-set. *Both* methods were shown to demonstrate compliance.
- In regard to wind speeds adopted for supplementary background noise level measurements at location K15aa, I note that S7.3.3. of NZS 6808:2010 is *not prescriptive* about the location of the wind speed measurements, only noting that the same location and height *should* be used for the before-and-after measurements.

I note that S2.1 of NZS6808:2010 states; *'For the purposes of this Standard, the word*

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'shall' refers to requirements that are mandatory for compliance with this Standard, while the word 'should' refers to practices that are advised or recommended.'

- In regard to the noise measurement location at K15aa, it is accepted that measurements within the 20 m *notional boundary* of the property (described by NZS6808:2010) were impacted by local noise sources (air-conditioning units), and were therefore not appropriate for the measurement of background or operational noise levels. Furthermore, S7.1.5 of NZS6808:2010 notes that *'When considering a group of noise sensitive locations, it is acceptable to conduct background sound level measurements at a representative location' provided that 'The sound generating features at the representative location shall be similar in proximity and character to those at other noise sensitive locations represented by that location'*. I consider the location used for the background (and post-construction) noise level measurements to be reasonably representative of location K15aa for the purposes of the analysis.
- It is apparent that the post-construction noise level measurements at L18aa shown in the Updated PC Noise Assessment Report is somewhat lower than the baseline background noise levels used to set the target noise limits. Given that the original measurements were undertaken in August and September 2017, and the post-construction measurements were undertaken between March to May 2021, these types of differences can legitimately occur for a range of reasons including different atmospheric stability conditions during measurement periods and changes in local vegetation and buildings. The site photographs indicate that a new shed has been built on the North side of the property, and some changes in vegetation and grass cover.
- In relation to wind speed and direction observations made during the attended subjective listening, it is considered reasonable that the subjective observations noted at ground level may be somewhat different to the hub-height average speed and direction data measured at the met-mast or turbines themselves.

Since the NCTP and NZS6808:2010 do not set any definitive requirements for the 'operating conditions required for attended observations', it is not reasonable to suggest that the approach adopted by SLR is deficient or non-compliant.

- The audit team is familiar with the occasional 'clunking' noise caused by yaw brake release. However, it usually occurs infrequently, and is not expected to have any significant influence on the overall measured $L_{A90, 10min}$ noise level, and so does not impact the compliance level assessed under NZS 6808:2010.

Furthermore, the suggestion that it 'rings down' with a frequency of approximately 340 Hz is mistaken, and not supported by any objective evidence. It is understood that the tonal noise between 340–360 Hz is due to emissions from the turbine gearbox.

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- I note that on the basis of the subjective tonality assessment, SLR did apply the objective tonality test to all measurement periods and apply the appropriate penalty to the measurement period in accordance with NZS6808:2010.

In regard to Mr Huson's comments on the SLR Complaint Survey (November 2020) documenting noise level measurements at J14aa, I understand that location J14aa is outside the predicted 35 dB(A) noise contour documented in the Pre-Construction Noise Assessment prepared by Sonus, and therefore, that Location J14aa is not identified in the NCTP as a relevant noise sensitive receiver that is required to be assessed in the Post-construction Noise Assessment prepared by SLR.

Therefore, the Complaint Survey report was not subject to verification, and I have not been provided with a copy of it. I am therefore not in a position to respond to Mr Huson's comments, and they should be directed to RES.

Yours sincerely



David Spink

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