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Date: 26/5/20

Ms Tatsiana Bandaruk
Senior Environmental Planning Officer
Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Dear Ms Bandaruk

Rye Park Wind Farm – Modification 1 – Tip Height Increase

I refer to your request for advice regarding the Rye Park Wind Farm Modification 1 (SSD-6693 Mod 1). The modification proposes to amend the project approval by removing 12 wind turbines, increasing the wind turbine envelope to a maximum tip height of 200m, revising the development corridor, and the selecting of the preferred transport route.

The EPA has reviewed the Modification Application Report and the Noise Assessment for the proposed modification. The EPA has also reviewed documentation relating to the original proposal, including the Environmental Assessment, Response to Submissions, Noise Impact Assessment, and Planning Approval SSD-6693. The EPA's comments are contained in **Attachment A**.

In summary, the EPA recommends that the correlation between the modified hub height wind speed and background noise level at the receiver be re-examined. The EPA also recommends that the Department of Planning, Industry and Environment consider whether the *Wind Energy: Noise Assessment Bulletin* (NSW Planning and Environment, 2016) should be applied in full to the modification, or whether Condition 11 of SSD-6693 would require consideration of special noise characteristics as defined in the Bulletin.

I trust these comments are of assistance. If you have any questions or wish to discuss, please contact Amanda Fletcher on (02) 6229 7002.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'J Goodwin', with a long horizontal flourish extending to the right.

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Attachment A

Background

EPA understands that the modification application seeks an increase in blade tip height from 157m to 200m. Further, the applicant seeks a revised wind farm layout, reducing the approved number of turbines from 92 to 80. The Modification Environmental Noise Assessment ('modification NIA') has assessed the proposal against the noise criteria in the issued planning approval SSD-6693, specifically Condition 11.

The Modification Application Report ('modification application') and modification NIA does not contain any information regarding a request to change to the noise criteria. A screen capture of the criteria used in the modification NIA as taken from Planning Approval SSD-6693 is included for your reference below.

Operational Noise Criteria – Wind Turbines

11. The Applicant must ensure that the noise generated by the operation of wind turbines does not exceed the relevant criteria in Table 4 at any non-associated residence.

Table 4: Noise criteria dB(A)

Residence	Criteria (dB(A)) with Reference to Hub Height Wind Speed (m/s)							
	5	6	7	8	9	10	11	12
R1	35	35	36	37	39	41	43	46
R6, R7, R8, R9, R10,	35	35	35	35	35	37	38	40
R11	35	35	35	35	37	39	41	44
R17, R19, R20, R22	36	36	36	37	38	39	40	42
R26, R29, R38	35	35	35	35	35	35	35	35
R40, R65	35	35	35	35	35	35	37	40
R45, R170	35	35	35	35	35	37	40	42
R47, R48	35	35	35	35	35	36	38	40
R50, R53, R324	35	35	35	35	35	37	39	41
R56	35	35	35	35	36	38	40	41
R63	36	37	38	39	41	42	44	45
All other non-associated residences	The higher of 35 dB(A) or the existing background noise level (L _{A90 (10-minute)}) plus 5 dB(A)							

Note: To identify the residences referred to in Table 4, see the applicable figure in Appendix 2.

Noise generated by the operation of the wind turbines is to be measured in accordance with the relevant requirements of the South Australian Environment Protection Authority's *Wind Farms – Environmental Noise Guidelines 2009* (or its latest version), as modified by the provisions in Appendix 4. If this guideline is replaced by an equivalent NSW guideline, then the noise generated is to be measured in accordance with the requirements in the NSW guideline.

However, these criteria do not apply if the Applicant has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Wind farm noise assessment methodology

Under both the SA Wind Farm Guidelines, 2009 [applicable for the development at the time of original assessment] and the more recent NSW Wind Energy Guidelines 2016, noise criteria is derived using regression analysis. This establishes a relationship between hub height wind speed and background noise level at a receiver location. A typical example of a regression analysis for wind farms is depicted below.

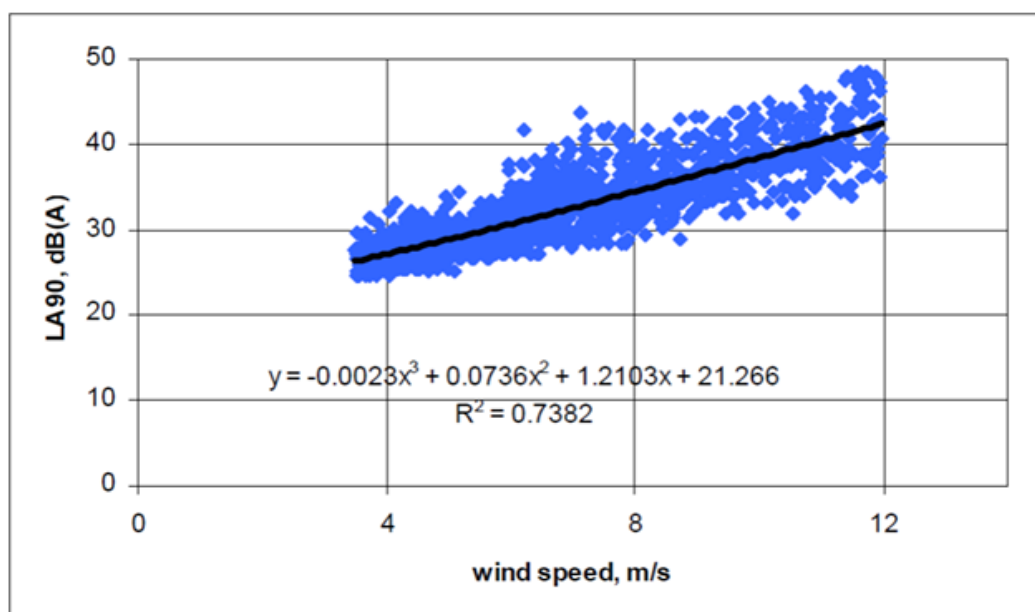


Figure 1 Background noise at the receiver vs wind speed at wind farm

It is clear from this typical regression that a higher wind speed at hub height (x-axis) is correlated with a higher background noise level at a receiver location (y-axis). Typically, wind speed increases with height. For this reason, the relationship presented in the graph above only holds true for the hub height being considered in the analysis and cannot be used without justification for revised hub heights. This is important because noise criteria is derived based on this relationship, and it is important to ensure that the background noise level at the receiver is correlated to the correct hub height.

EPA's review notes the following:

- The noise criteria in SSD-6693, condition 11 (reproduced above) are based on an 80m hub height as considered in the Noise Impact Assessment prepared by SLR and dated 2 August 2013 ('EIS NIA');
- The proposed hub height was revised in the Response to Submissions prepared by Trust Power/Epuron and dated 12 May 2016 ('RtS Main Report') to 157m blade tip height and 101m hub height and the planning approval allows for turbines with a maximum blade tip height of 157 metres which corresponds to a hub height of 101m. It does not appear that any revised correlation between the revised hub height and background noise levels was considered in the Environmental Assessment prepared by SONUS and dated February 2016 ('RtS NIA').
- The proposal in the Modification Application is for wind turbines with a hub height of 117m. As noted above, the noise criteria in SSD-6693, Condition 11 is based on a correlation between wind speed at hub height (80m) and background noise at a receiver location. For the reasons outlined above it is not appropriate to consider the impact of the revised wind turbine hub height without exploring/updating the correlation between proposed hub height wind speed and background noise at the receivers as this may impact the applicable assessment criteria.
- SSD-6693, Condition 11 states: *"Noise generated by the operation of the wind turbines must be measured in accordance with the relevant requirements of the SA EPA Wind Farm Environmental Noise Guideline 2009 (or it's latest version) as modified by the provisions in Appendix 4. If this guideline is replaced by an equivalent NSW guideline, then the noise generated is to be measured in accordance with the requirements in the NSW Guideline"*.

The *Wind Energy: Noise Assessment Bulletin* (NSW Planning and Environment, 2016) provides proponents of wind energy projects and the community with advice about how noise impacts are assessed for large-scale wind energy development projects that are State significant development. Department of Planning, Industry and Environment should consider whether the *Wind Energy: Noise Assessment Bulletin* should be applied in full to the modification, or whether condition 11 would at

least require consideration of special noise characteristics as defined in the *Wind Energy: Noise Assessment Bulletin*.

Recommendation

It is recommended that:

1. The correlation between the modified hub height wind speed and background noise level at the receiver be re-examined and fully justified to confirm the appropriateness [or otherwise] of the approved noise limits for the modified project. This should include a correlation between 80m and 117m hub height wind speeds for the project area; and
2. Department of Planning, Industry and Environment consider whether the *Wind Energy: Noise Assessment Bulletin* should be applied in full to the modification, or whether condition 11 would at least require consideration of special noise characteristics as defined in the bulletin.