

Euston Wind Farm

Preliminary Noise Assessment

S7394C1

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1 INTRODUCTION

The Euston Wind Farm (the **Project**) is proposed to be constructed approximately 7.6km north of Euston, New South Wales. The Project consists of 96 wind turbines and associated infrastructure.

This preliminary noise impact assessment has been prepared for the Scoping Report which has been prepared to assist in the application for the Secretary's Environmental Assessment Requirements (**SEARs**). The SEARS will guide the preparation of the Environmental Impact Statement (**EIS**) for the Project.

The assessment includes predictions of the noise from the Wind Turbine Generators (**WTGs**) in accordance with the New South Wales Department of Planning and Environment's (DPE, 2016) *Wind Energy: Noise Assessment Bulletin (the Bulletin)*, which makes reference to the 2009 South Australian document *Wind farms – environmental noise guidelines (SA 2009)*.

The preliminary wind turbine noise impact assessment is based on the following information:

- 96 WTG locations at the locations summarised in Appendix A;
- Dwelling locations (up to 10km from the nearest turbine) summarised in Appendix B, including the distance to the nearest WTG and the predicted noise level;
- Local topographical contours¹;
- Noise level data for an indicative WTG with a sound power level of 107 dB(A) (including an addition for uncertainty), which is a conservative assumed sound power level for the likely model of wind turbine proposed;
- A hub height of 175m above ground level, with a tip height up to 275 m; and,
- The WTG being free of any excessive levels of tonality or any other special audible characteristics, when assessed at the dwelling.

¹ Gallant, J., Tickle, P.K., Wilson, N., Dowling, T., Read, A. 2010. 1 second SRTM Level 2 Derived Smoothed Digital Elevation Model (DEM-S) version 1.0. Record 1.0.3. Geoscience Australia, Canberra. <https://pid.geoscience.gov.au/dataset/ga/70715>

2 METHODOLOGY

The predictions of environmental noise from the Project have been based on the noise propagation model described by ISO 9613-2:1996 "*Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation*" (**ISO 1996-2**) and SoundPLAN noise modelling software. ISO 9613-2 is one of the recommended models under SA 2009 for the prediction of wind turbine noise. The noise propagation model considers the following:

- sound power levels and noise source locations;
- separation distances between noise sources and dwellings;
- topography of the area;
- influence of the ground;
- air absorption; and,
- meteorological conditions

ISO 9613-2 provides a methodology for predicting noise levels at sensitive land uses under meteorological conditions favourable to noise propagation. Specifically, the ISO 9613-2 model predicts noise based on the assumption of downwind noise propagation (resulting in higher noise levels) from all WTGs to all noise sensitive receptors simultaneously, therefore representing a conservative approach.

Inputs to the noise prediction model are in accordance with the Institute of Acoustics "*A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise*" (May 2013) (**IOA Guide**), which includes the following requirements:

- 10°C temperature;
- 70% relative humidity;
- Intermediate ground absorption (required by the IOA Guide, despite the pastoral nature of the land);
- barrier attenuation of no greater than 2 dB(A) (required by the IOA Guide);
- Receiver point located 4m above ground level at the dwelling (required by the IOA Guide, despite receiver points being at a lower level than this); and,
- application of a 3 dB(A) correction where a "concave" ground profile exists as defined by the IOA Guide.

These inputs are in accordance with updated version of SA 2009 (November 2021), which specifically references the IOA Guide for suitable noise model inputs.

3 CRITERIA

The Bulletin provides criteria based on the higher of 35 dB(A) or 5 dB(A) above the background noise level at each integer wind speed for non-associated dwellings.

This preliminary assessment is based on the baseline criterion of 35 dB(A). Background noise monitoring conducted as part of the acoustic assessment for the EIS may result in an increase in the criteria above the baseline criteria.

4 RESULTS

The highest predicted noise from WTGs (corresponding to hub height wind speeds of 10m/s and above) is detailed for each dwelling within 10km in Appendix B and is shown graphically in Figure 1 below. Figure 1 shows the predicted 35 dB(A), 40 dB(A) and 45 dB(A) noise contours. The preliminary prediction indicates that the noise at dwellings shown outside of the 35 dB(A) contour achieves the baseline criterion.

Based on the preliminary modelling, there are no dwellings that have a predicted noise level greater than or equal to 35 dB(A), and as such, the baseline criterion is achieved at all sensitive receptor (refer to Figure 1).

The Project will be refined as part of the ongoing design process to seek to minimise noise impacts at all dwellings.

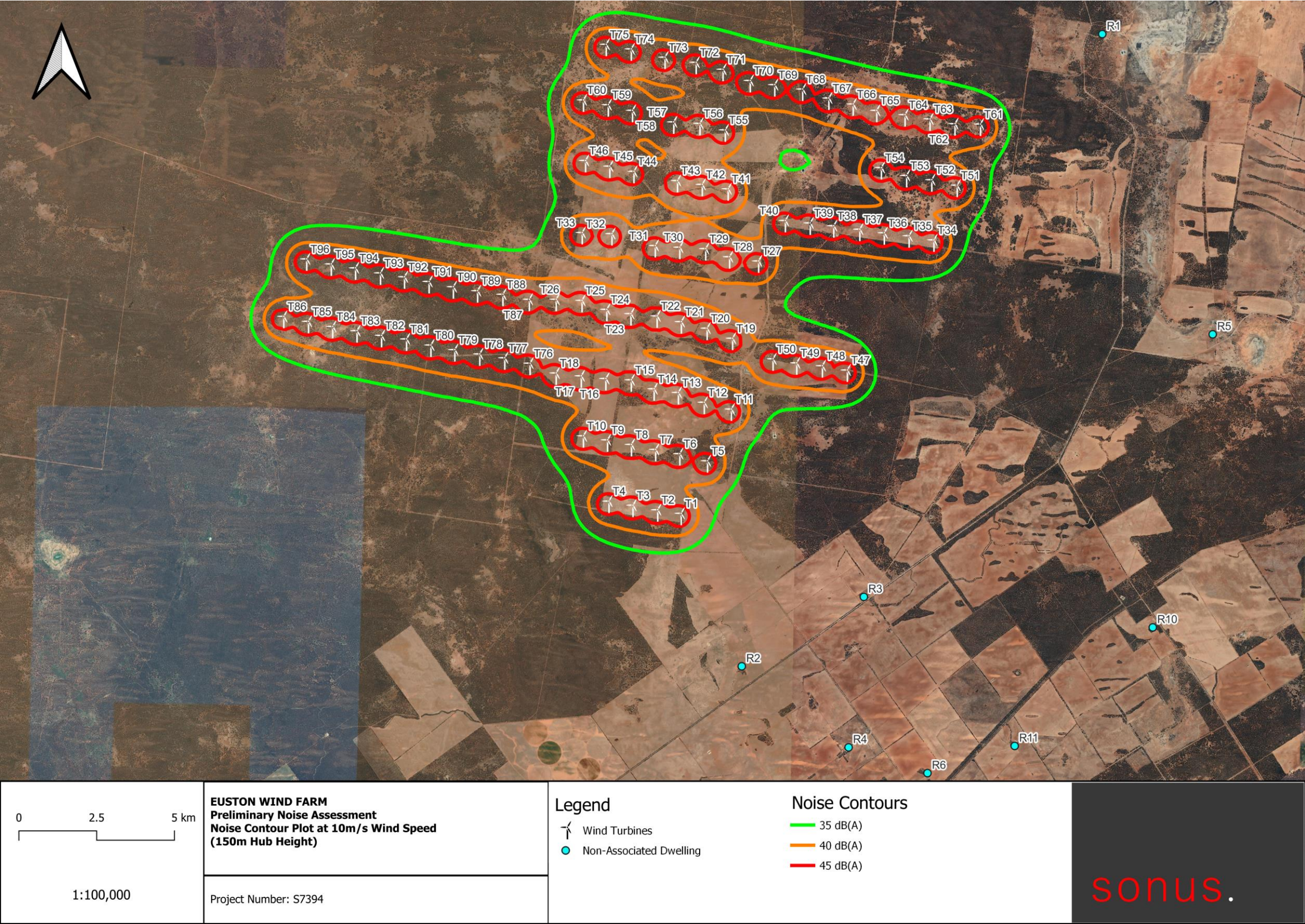


Figure 1: Preliminary Assessment Noise Contours

5 ACOUSTIC IMPACT ASSESSMENT

A detailed acoustic assessment will be prepared for inclusion in the EIS, addressing the following components:

- WTG noise in accordance with the Bulletin;
- Ancillary infrastructure noise in accordance with the *Noise Policy for Industry, 2017*;
- Construction noise in accordance with the *Interim Construction Noise Guideline, 2009*;
- Traffic noise in accordance with the *NSW Road Noise Policy, 2011*;
- Vibration in accordance with *Assessing vibration: A Technical Guideline, 2006*; and,
- Cumulative noise impacts, considering other developments in the area.

The EIS will incorporate the following information to assist in considering the detailed assessment:

1. Background noise monitoring results;
2. Establishment of criteria in accordance with the background noise monitoring results;
3. Predictions which account for the sound power levels and locations of WTGs and ancillary infrastructure;
4. A construction noise assessment and framework for a management plan, if required;
5. A traffic noise assessment;
6. Commentary on vibration impacts; and,
7. Noise reduction measures where the relevant operational or construction assessment criteria are not achieved.

APPENDIX A: NOISE SOURCE LOCATIONS

WTG Number	WTG Coordinates (GDA94 / MGA zone 54)	
	Easting	Northing
T1	670109	6193530
T2	669353	6193645
T3	668558	6193791
T4	667786	6193922
T5	670954	6195219
T6	670063	6195450
T7	669287	6195584
T8	668508	6195745
T9	667740	6195891
T10	666965	6196022
T11	671721	6196882
T12	670850	6197100
T13	670017	6197415
T14	669238	6197534
T15	668504	6197822
T16	667686	6197864
T17	666896	6197949
T18	666089	6198041
T19	671760	6199158
T20	670942	6199481
T21	670113	6199692
T22	669334	6199876
T23	668493	6199949
T24	667717	6200087
T25	666919	6200375
T26	666089	6200410
T27	672597	6201642
T28	671664	6201777
T29	670896	6202038
T30	670063	6202084
T31	669276	6202137
T32	667882	6202521
T33	666926	6202556
T34	678233	6202318
T35	677434	6202452
T36	676636	6202548
T37	675849	6202663
T38	675012	6202775

WTG Number	WTG Coordinates (GDA94 / MGA zone 54)	
	Easting	Northing
T39	674255	6202863
T40	673457	6202944
T41	671618	6203961
T42	670785	6204103
T43	669990	6204226
T44	668589	6204522
T45	667813	6204690
T46	667034	6204871
T47	675449	6198137
T48	674647	6198275
T49	673822	6198367
T50	673061	6198494
T51	678981	6204076
T52	678164	6204253
T53	677354	6204391
T54	676544	6204644
T55	671526	6205854
T56	670712	6206065
T57	669867	6206111
T58	668543	6206483
T59	667763	6206664
T60	666965	6206817
T61	679730	6206042
T62	678908	6206053
T63	678106	6206207
T64	677304	6206345
T65	676394	6206483
T66	675637	6206687
T67	674854	6206879
T68	674013	6207167
T69	673115	6207309
T70	672328	6207443
T71	671453	6207804
T72	670589	6208027
T73	669587	6208192
T74	668504	6208457
T75	667698	6208606
T76	665249	6198356
T77	664435	6198529
T78	663632	6198655

WTG Number	WTG Coordinates (GDA94 / MGA zone 54)	
	Easting	Northing
T79	662830	6198793
T80	662062	6198939
T81	661279	6199135
T82	660476	6199250
T83	659686	6199400
T84	658906	6199538
T85	658127	6199700
T86	657332	6199861
T87	665226	6200410
T88	664377	6200571
T89	663563	6200686
T90	662784	6200813
T91	662004	6200982
T92	661214	6201132
T93	660442	6201258
T94	659640	6201419
T95	658860	6201546
T96	658069	6201707

APPENDIX B: DWELLING LOCATIONS AND PREDICTIONS

Dwelling	Dwelling Coordinates (GDA94 / MGA zone 55)		Distance to Closest Source (m)	Closest Turbine	Predicted Level (dB(A))
	Easting	Northing			
R1	683699	6209028	4970	T61	22
R2	672110	6188708	5223	T1	22
R3	676035	6190940	6469	T1	22
R4	675544	6186103	9205	T1	<20
R5	687248	6199379	9484	T34	<20