

To: ESCOSA escosa@escosa.sa.gov.au

Re: Waterloo Wind farm stage 2 Application to Vary Generation License and add 6 turbines (V117)

From: Dulcie Behn

Name: Dulcie Behn

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Relationship to the Waterloo Wind farm stage 2 Project: near neighbour

Distance from Residence to Nearest Turbine: 1599 metres

We submit that this application to vary the Generation License of Waterloo wind farm pty ltd should be refused because of Major Planning Faults and inconsistencies with standards applied to other wind farms in SA. The six larger turbines cannot legitimately be accommodated on the site due to noise, shadow flicker, inter-turbine spacing, "Do Not Stay" zones and over-sail constraints.

As close neighbours to the proposed Stage 2 we provide the following comments and information

1. Developer is now planning to construct the wind farm using a significantly larger turbine (Vestas V117) than they applied for in their 2012 Development Application. (Vestas V90)
2. No application to vary the turbine model and layout has been received by Clare and Gilbert Valleys Council to date.
3. Noise and shadow flicker modelling provided to the Clare and Gilbert Valleys Council Development Assessment Panel for Vestas V90 turbine is not relevant or valid for the V117 turbine. V117 impacts are likely to be greater than V90 due to increased tower height, blade length and rotor diameter.
4. No updated noise prediction reports or shadow flicker reports have been provided to neighbours or the Clare Council to indicate the impact on nearby property owners.
5. V117 turbines cannot be sited using the layout provided in this Application as the turbines are sited too close together according to the Manufacturer's specifications.

6. Vestas specifies that their turbines must not be sited less than 3 rotor diameter apart. For V117s the minimum spacing distance is 351 m apart. The layout provided in this Application shows V117 turbines as close as 250 m apart. It appears from the map provided in the Application that all turbines are less than 351 m apart.
See attachments “WWF2 turbine spacing less than 3 rotor diameters” and “Vestas spacing specifications “
7. Turbines sited less than 3 rotor diameters apart are subject to greater turbulence from neighbouring turbines. This increases the noise produced and also increases the wear and tear on the turbine leading to a shorter lifespan of components and increased risk of turbine failure.
8. Squeezing more turbines into the space will inevitably increase the noise level relative to fewer turbines just as 6 motorbikes make more noise than 4 motor bikes in the same space.
9. The Applicant has provided the map....

[Electricity Generation Licence Variation – Waterloo Wind Farm Pty Ltd - SitePlans](#)

This shows a very narrow view and misrepresents the environment surrounding the turbines. It is not evident from the map provided in the Application that there are 12 houses within 2 km of the proposed stage 2 turbines.

See map below from 2012 Development Application Figure 5-1 Planning. This gives a more representative view of the wind farm site and surrounds and shows how unacceptably close the turbines are sited to local houses.

10. The setbacks to houses for the Waterloo stage 2 development are insufficient, inconsistent with and significantly less than the 2 km setbacks for the neighbouring Stony Gap wind farm (proposed by the same developer and operator of the Waterloo wind farm stage 1 – Energy Australia.) Residents at Waterloo should be allowed the same 2 km setbacks as Stony Gap residents.
11. Turbines are sited too close to neighbours’ boundaries. Turbine blades will over-sail neighbours land. This is an unacceptable hazard according to SAFEWORK SA submission to the 2011 Ministerial Wind farms DPA because of the risk of turbine failure. Neighbours should not have to be subjected to whirring blades immediately overhead whilst utilising their property.

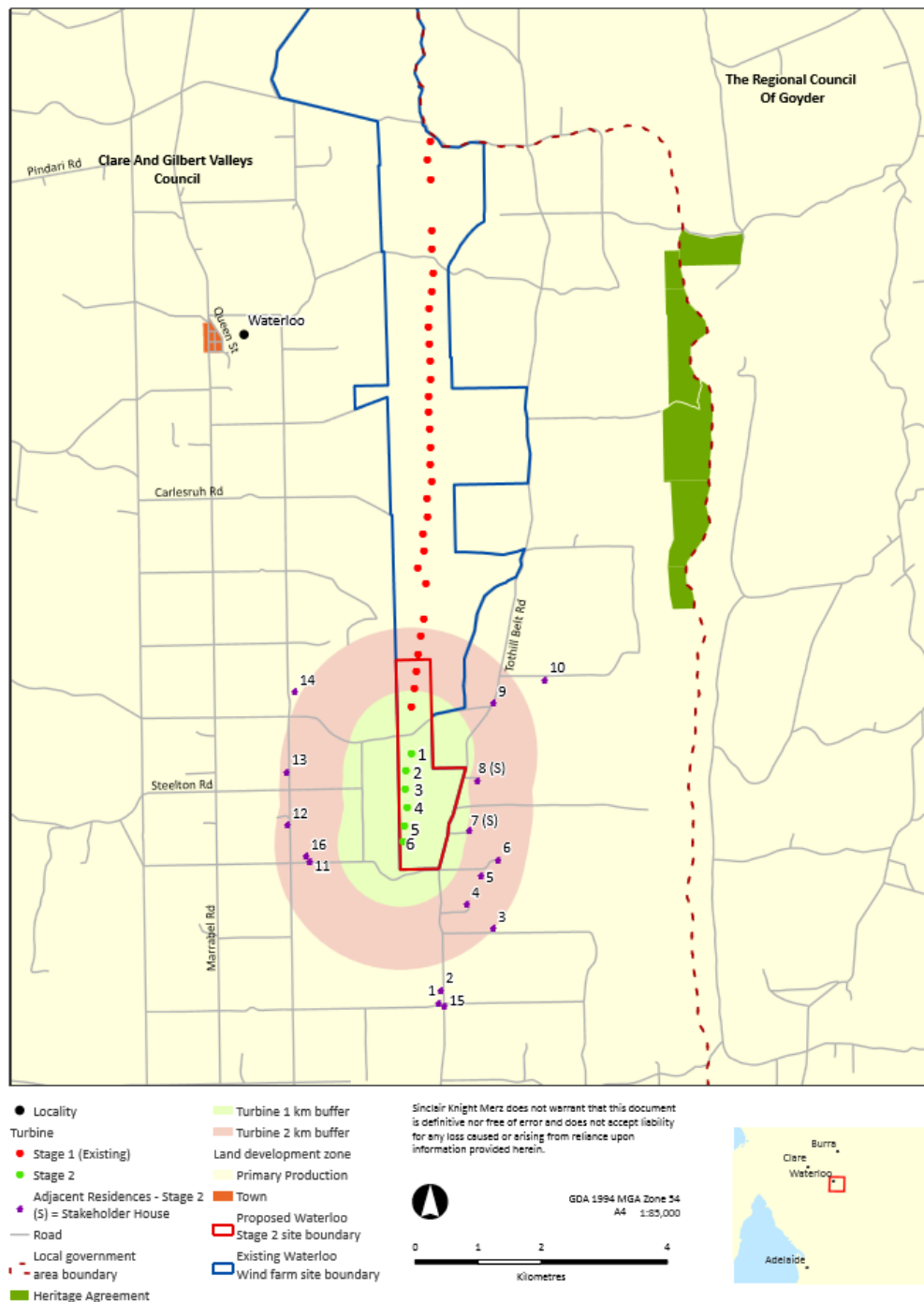


Figure 5-1 Planning



3/07/2012 4:02:03 PM mskewes I:\PINT\Projects\PI30386\Technical\Spatial_Data\ArcGIS\Waterloo Windfarm Figures\Figure 5-1 Planning.mxd
Prepared by: MJS
Checked by: CG

12. Turbines workers are advised of a “Do Not Stay “ area within 400 m of a turbine – see attachment - “DO NOT STAY ZONES “ Turbine should therefore be sited a minimum of 400 metres from property boundaries so that neighbours can use their whole property and not have to stay away from any area within the topple zone or drop hazard zone of a turbine .

13. Wedge Tailed Eagle nest set backs are also inconsistent with other wind farms developed in SA. Wedge Tailed Eagles nests at all other wind farm sites (except Energy Australia/Waterloo wind farm pty ltd 's Stony Gap, Waterloo stage 1 and Stage 2 wind farm) are given a 500 m year round buffer from turbines. Waterloo wind farm pty ltd allows an inadequate buffer of 180 m, but only at nesting time during construction.

14. Standard of Honesty and Integrity shown by Officers and Major Shareholders of the Applicant

Waterloo wind farm Stage 1 has been operating near our property since late 2010.

Noise and sleep disturbance from the stage 1 turbines has been a problem ever since the turbines began operating.

We and many neighbours have made multiple complaints to Clare Council and have had attended meetings with the Council and also made verbal complaints to company representatives Michael Head and Clint Purkiss at an information night on May 17 2012 at Marrabel Hall. We have also made complaints verbally to the SA EPA and submitted written noise diary complaints to the SA EPA.

Our concerns have been brushed aside by the company - saying the wind farm is compliant with the guidelines.

Our complaints have not been taken seriously.

Community Consultation with Company representatives regarding stage 2 has been inadequate with our concerns not resolved or adequately addressed by the Developers.

For these reasons we submit that the proposal should not proceed in it's current form and the application should be refused. Greater consideration must be given to ensuring that Planning deficiencies, Manufacturers specifications for spacing and safety requirements, noise and shadow flicker impacts are all adequately assessed and appropriate conditions applied to any license granted.

9.1 Climate and Site Conditions

Values refer to hub height:

Extreme Design Parameters	
Wind Climate	IEC IIA
Ambient Temperature Interval (Standard Temperature Turbine)	-40° to +50°C
Extreme Wind Speed (10 Minute Average)	42.5 m/s
Survival Wind Speed (3 Second Gust)	59.5 m/s

Table 9-1: Extreme design parameters

Average Design Parameters	
Wind Climate	IEC IIA
Nominal Power	3.3 MW
Wind Speed	8.5 m/s
A-Factor	9.59 m/s
Form Factor, c	2.0
Turbulence Intensity According to IEC 61400-1, Including Wind Farm Turbulence (@ 15 m/s – 90% quartile)	18%
Wind Shear	0.20
Inflow Angle (vertical)	8°

Table 9-2: Average design parameters

9.1.1 Complex Terrain

Classification of complex terrain according to IEC 61400-1:2005 Chapter 11.2.

For sites classified as complex, appropriate measures are to be included in site assessment.

Positioning of each turbine must be verified via the Vestas Site Check programme.

9.1.2 Altitude

The turbine is designed for use at altitudes up to 1000 m above sea level as standard and optional up to 2000 m above sea level.

9.1.3 Wind Power Plant Layout

Turbine spacing is to be evaluated site-specifically. Spacing, in any case, must not be below three rotor diameters (3D).

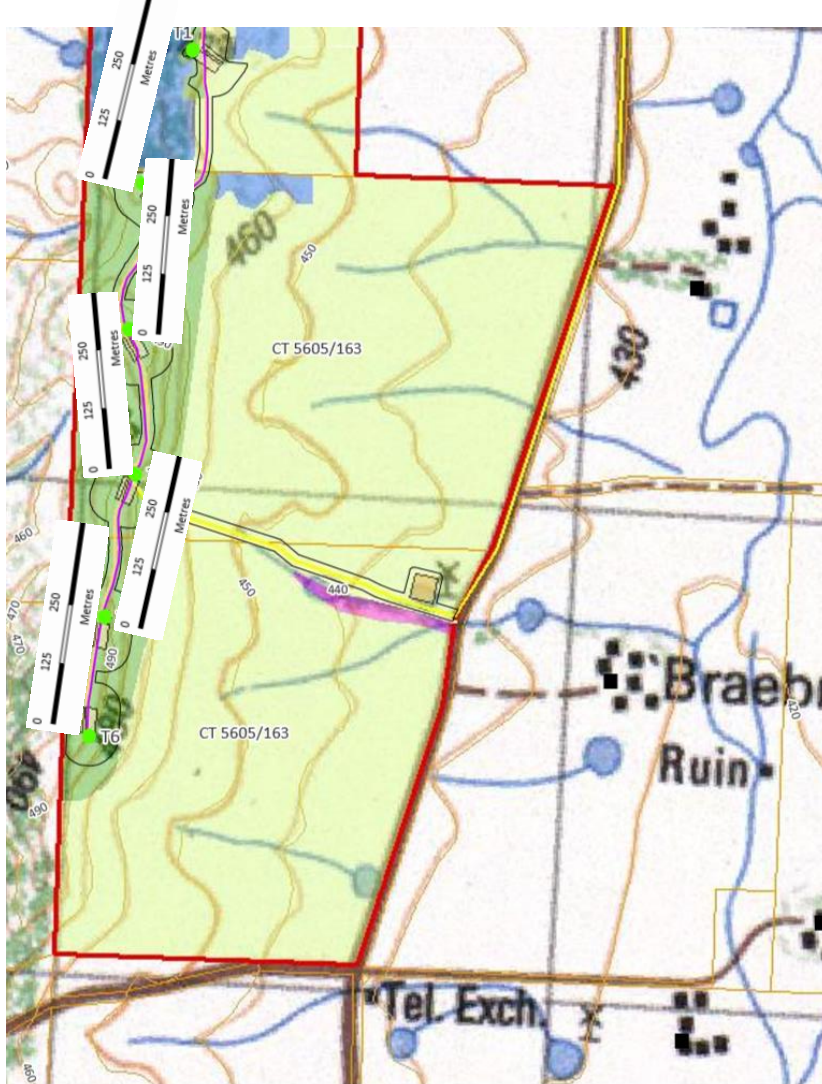
Waterloo Wind Farm Stage 2 Turbines - Spacing does not meet Vestas Specifications.

Vestas V117 are named on the Waterloo wind farm ESCOSA license variation [1] as the turbine to be used for Waterloo wind farm Stage 2. These have a rotor diameter of 117 metres. [2]

Vestas Spacing requirements for the V117 [2] state:

"9.1.3 Wind Power Plant Layout Turbine spacing is to be evaluated site-specifically. Spacing, in any case, must not be below three rotor diameters (3D)."

3 Rotor Diameters for the V117 = $117 \times 3 = 351$ metres. Examination of the map PI30386 Waterloo Wind Farm Stage 2 [3] shows that the spacing of all 6 turbines appears to be below 351 metres (3 rotor diameters and therefore all are in contravention of the manufacturer's specific spacing limits.

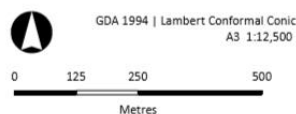


laydown area

Sindair Knight Merz does not warrant that this document is definitive nor free of error and does not accept liability for any loss caused or arising from reliance upon information provided herein.

je 2 site boundary

trostipa (Spear Grass) Grassland
permint Box) Woodland



[1] <http://www.escosa.sa.gov.au/library/20150917-Electricity-GenerationLicenceVariation-WaterlooWindfarm.pdf>

[2] Vestas 2013 Document no.: 0035-1209 V02 General Specification V117-3.3 MW Operational Envelope and Performance Guidelines Date: 2013-04-05 Page 25 of 38

[3] Waterloo Wind Farm Stage 2 site map <http://www.escosa.sa.gov.au/library/20150917-Electricity-GenerationLicenceVariation-WaterlooWindfarm-SitePlans.pdf>