Crookwell 3 Wind Farm
Aeronautical

Purpose

Aviation Projects Pty Ltd was engaged to assess the aeronautical and obstacle lighting impacts arising from the Crookwell 3 Wind Farm.

Potential cumulative impacts from the proposed Crookwell 3 Wind Farm, the existing Crookwell 1 Wind Farm, the approved Crookwell 2 Wind Farm, and other approved wind farms in the vicinity of the site were assessed.

International example of a Wind Farm

Key Findings and Impacts

The proposed wind farm may result in an increased area that would potentially be restricted from aerial application of agricultural fertilisers and/or pesticides and fire fighting. However, it was determined that the owners of the site have no intention of using aerial application of agricultural fertilisers and/or pesticides in the future. Furthermore, there are adequate ground-based fire-fighting methods available.

Based on the CASA guidelines, Aviation Projects recommends medium intensity obstacle lighting should be installed at the proposed wind farm:

- to identify the perimeter of the wind farm;
- at longitudinal intervals not exceeding 900 m;
- so that they are synchronised to flash simultaneously; and
- so that any wind turbines of significantly higher elevation are also identified.

It is recommended to light 12 of the proposed turbines. The proposed turbines recommended for night lighting are: A1, A3, A5, A10, A12, A15, A19, A23, A26, A25, A31 and A33. Refer to Figures 1 and 2 for indicative obstacle lighting plans.

The lighting design is subject to final confirmation of applicable regulatory requirements prior to installation of the lights during construction.

Table 1 sets out the distances to two significant aerodromes that are located within the vicinity of the project:

Table 1: *Distances to local airports*

Airfield	Approximate Distance to Wind Farm	Direction from Wind Farm	OLS/PANS OPS
Goulburn Airport	27km	143 degrees magnetic	OLS: Code 3 instrument non-precision - 4000 m inner horizontal surface, 15,000 m approach and take-off surfaces PANS-OPS – 25 nm sector MSA with 5 nm buffer
Crookwell Aerodrome	8km	293 degrees magnetic	Not applicable

The assessment revealed that:

- The proposed development does not impose any significant risk to normal flying operations for nearby aerodromes or aircraft landing areas.
- There will be no adverse impact by the proposed wind farm on obstacle limitation surfaces.
- The proposed wind farm will not penetrate any Procedures for Air Navigation Services - Aircraft Operations surface.
- The proposed wind farm will not adversely impact aviation-related communication systems or navigation aids.

In regards to impacts on the current air traffic routes in the vicinity of the wind farm, aircraft would potentially have to fly at a higher altitude or divert around the wind farm.

No aviation-related electric or magnetic fields were identified or notified during the prescribed consultation activities and therefore no adverse effect is anticipated.

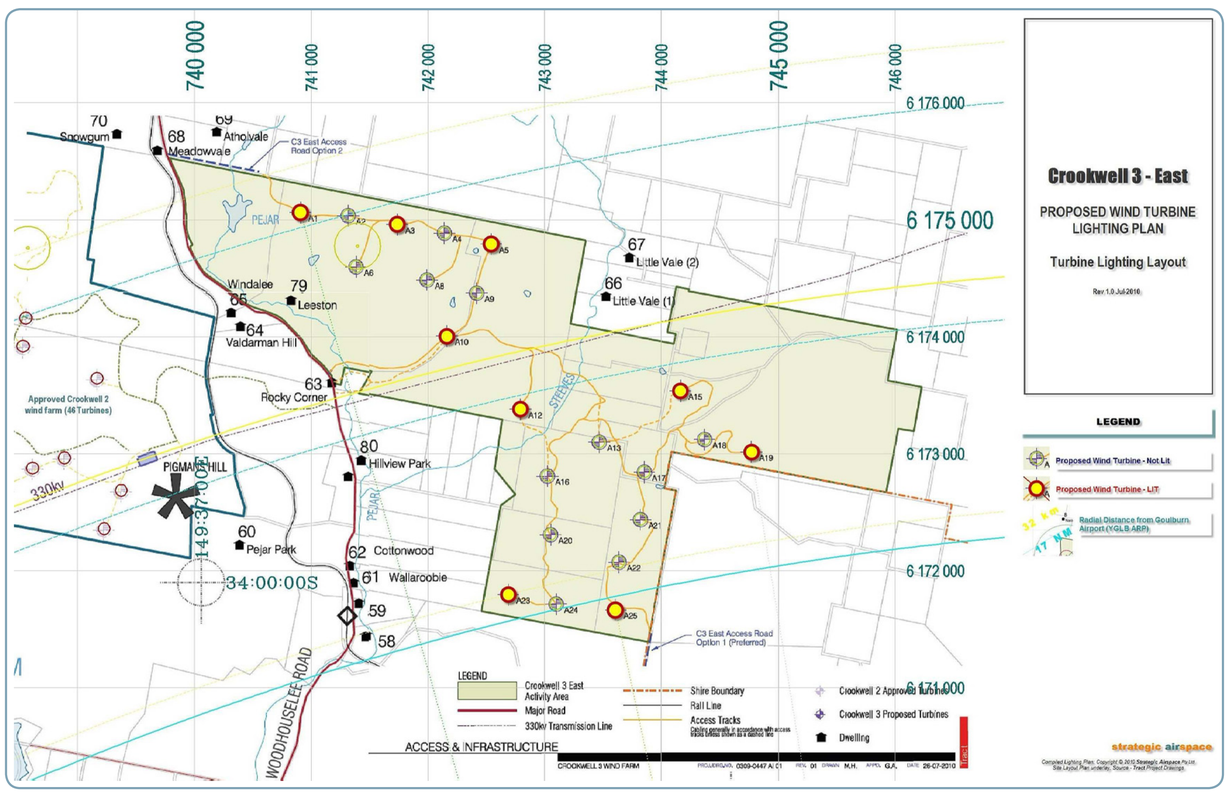

Figure 1: *Indicative obstacle lighting plan - Crookwell 3 East*

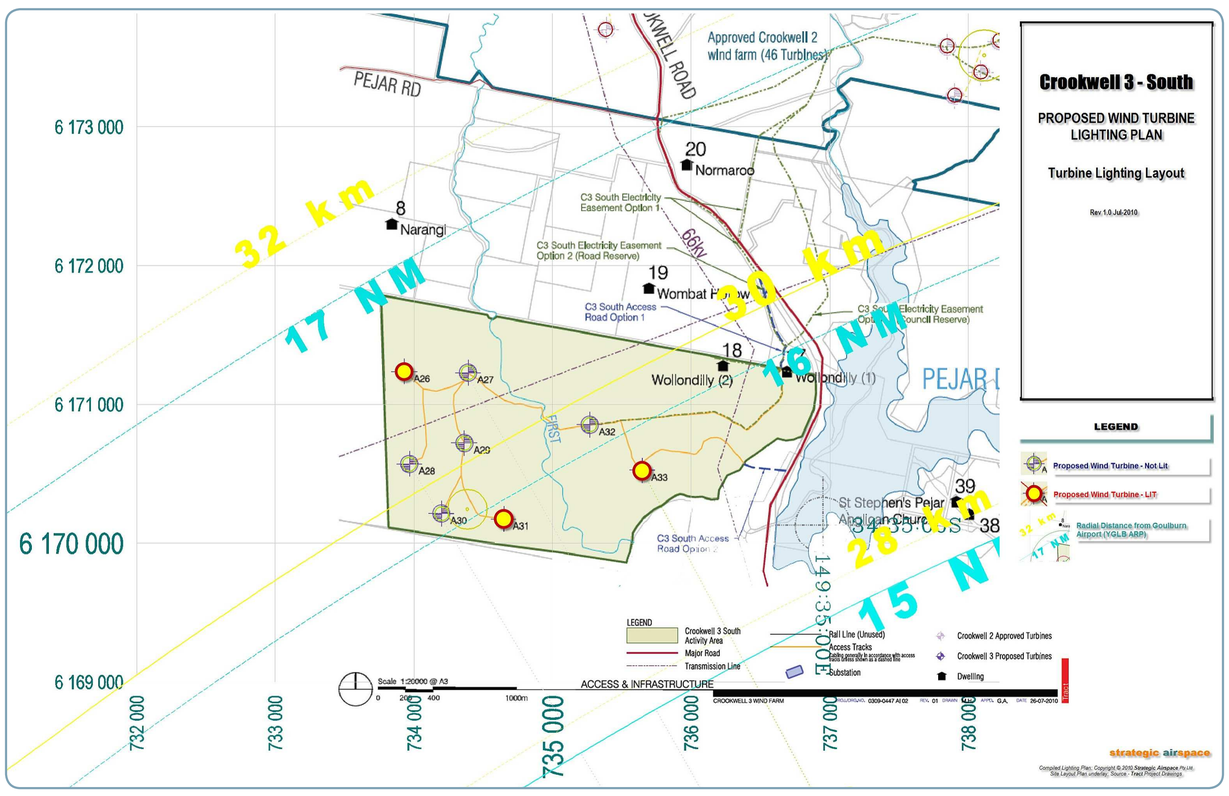

Figure 2: *Indicative obstacle lighting plan - Crookwell 3 South*

Response to Findings

The report recommended that the following actions be implemented to mitigate the aeronautical impacts of the project:

- The final (approved) turbine coordinates and elevations should be provided to RAAF AIS.
- The rotor blades, nacelle and the supporting mast of the wind turbines should be painted white or off-white.
- An assessment be prepared as to whether marking or lighting would be required to provide an acceptable level of safety, in consultation with applicable stakeholders, prior to construction.
- The installation of medium intensity obstacle lighting, with characteristics specified in MOS 139, Chapter 9.
- The guidance provided in withdrawn AC 139-18(0) on the minimisation of visual impact should be adopted in the lighting design.
- The lighting design is subject to final confirmation of applicable regulatory requirements by CASA prior to installation of the lights during construction.
- Ensure the ongoing availability of obstacle lights, a monitoring, reporting and maintenance program is established in accordance with MOS 139, Chapter 9.

Visual impacts can be minimised by restricting the downward component of light to either, or both, of the following:

- Such that no more than 5% of the nominal intensity is emitted at or below 5° below the horizontal.
- Such that no light is emitted at or below 10° below the horizontal.

In the event that adjoining neighbouring landowner(s) would require aerial agriculture spraying of their land adjacent to the wind farm and there is an increase in cost associated with the proximity to turbines, the proponent will cover the reasonable cost increase for the aerial agriculture activity.

Wind mill and shed

Typical landscape from hilltop

Site from western access point

View south from northern boundary

UNION FENOSA WIND AUSTRALIA | gasNatural fenosa