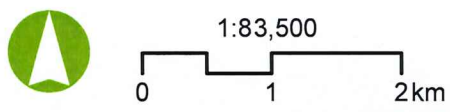
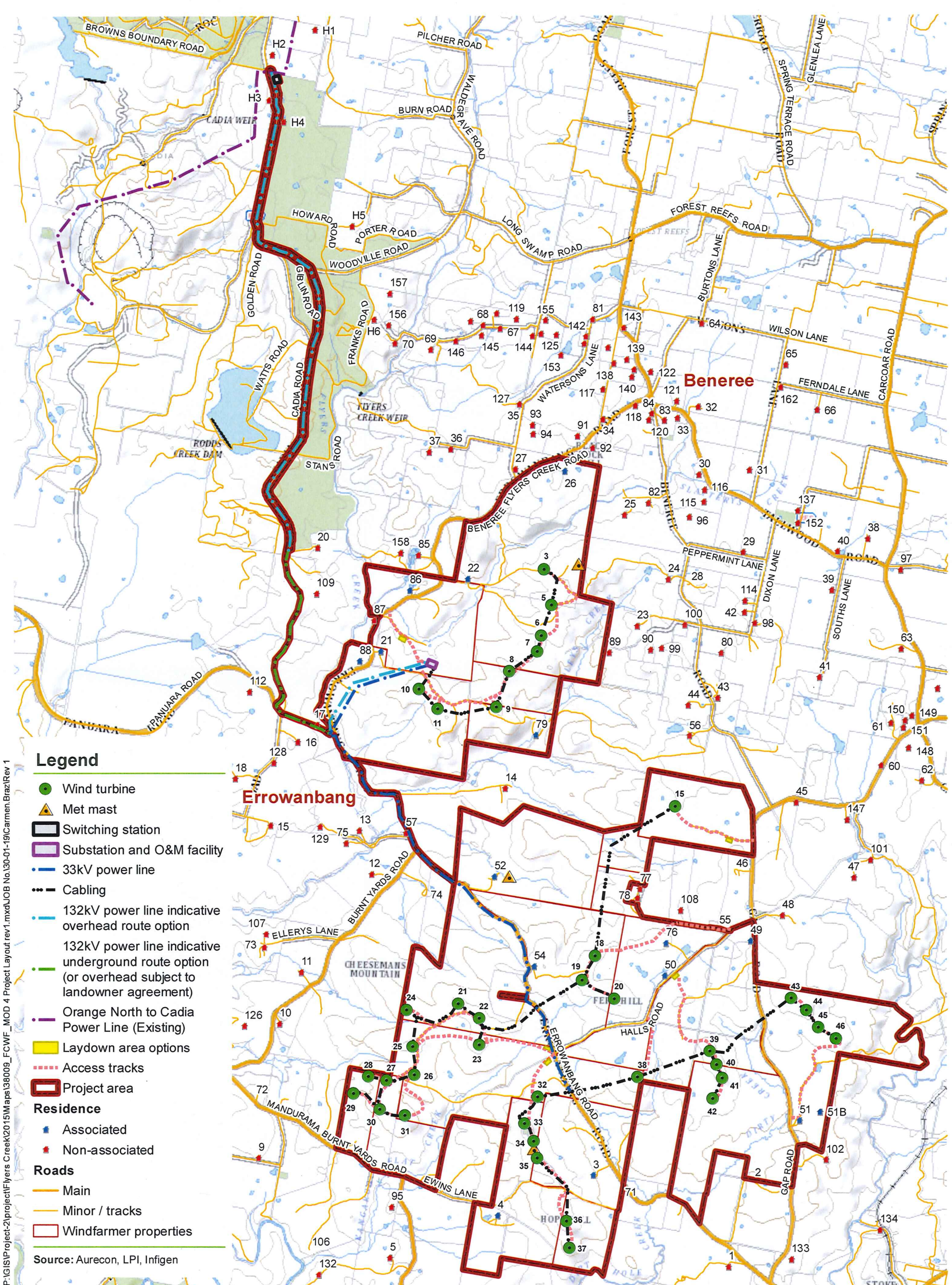


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Projection: GDA 1994 MGA Zone 55

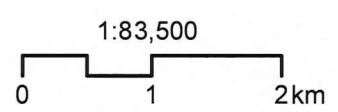
Flyers Creek Wind Farm
 MOD 4 Figure 2: Project Layout (aerial images)



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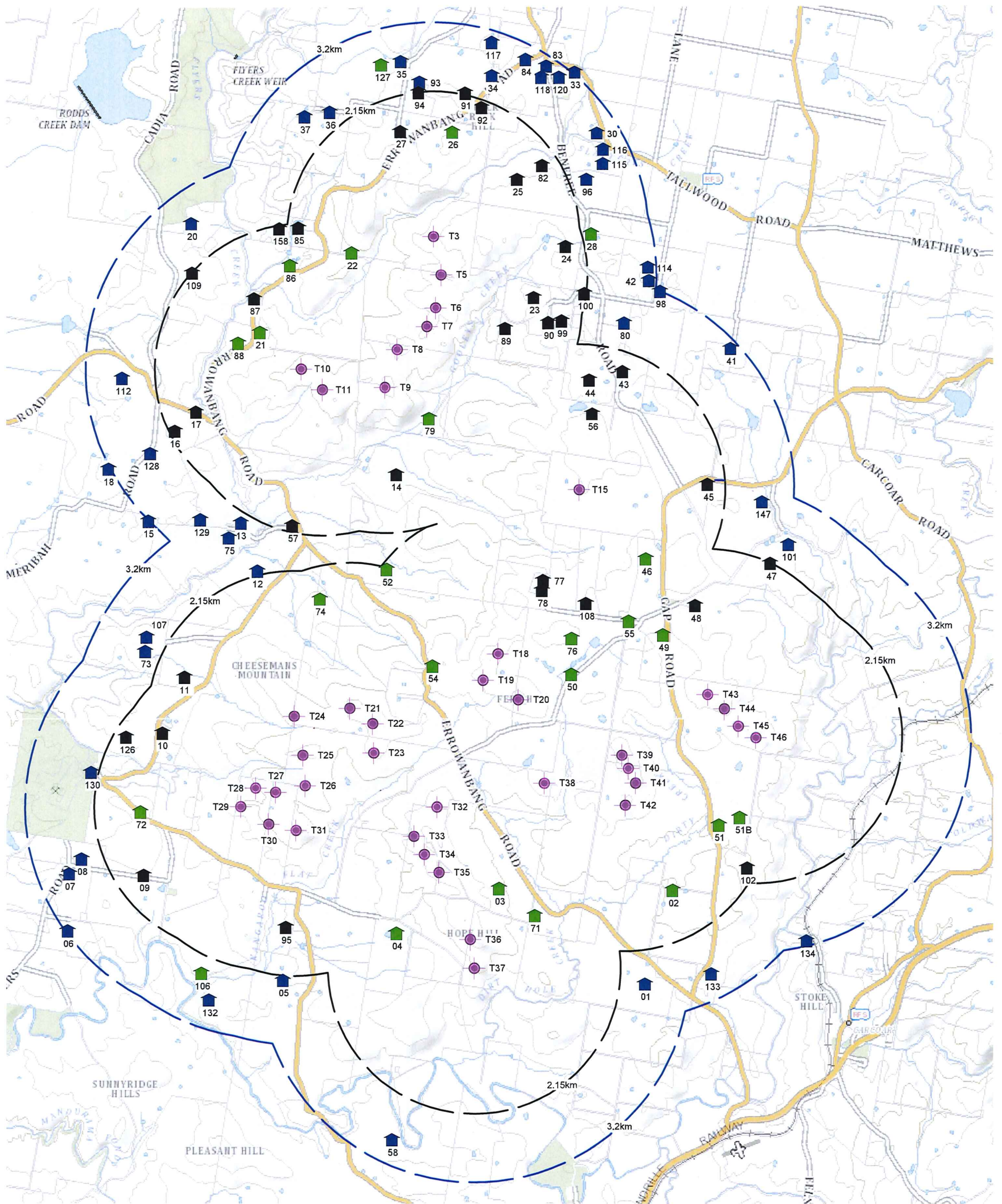
Legend

- Wind turbine
 - ▲ Met mast
 - Switching station
 - ▭ Substation and O&M facility
 - 33kV power line
 - Cabling
 - 132kV power line indicative overhead route option
 - 132kV power line indicative underground route option (or overhead subject to landowner agreement)
 - Orange North to Cadia Power Line (Existing)
 - Laydown area options
 - Access tracks
 - ▭ Project area
 - Residence**
 - Associated
 - Non-associated
 - Roads**
 - Main
 - Minor / tracks
 - ▭ Windfarmer properties
- Source: Aurecon, LPI, Infigen



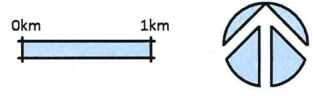
Projection: GDA 1994 MGA Zone 55

Flyers Creek Wind Farm
MOD 4 Figure 1: Project Layout



Legend

- Approved FCWF wind turbine location (indicative location)
- Associated dwelling within 3.2 km of an approved FCWF wind turbine
- Non associated dwelling within 2.15 km of an approved FCWF wind turbine
- Non associated dwelling between 2.15 km and 3.2 km of an approved FCWF wind turbine
- 2.15 km wind turbine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height
- 3.2 km wind turbine distance offset in accordance with DPE Visual Bulletin Dec 2016, Figure 5 - 160 m tip height

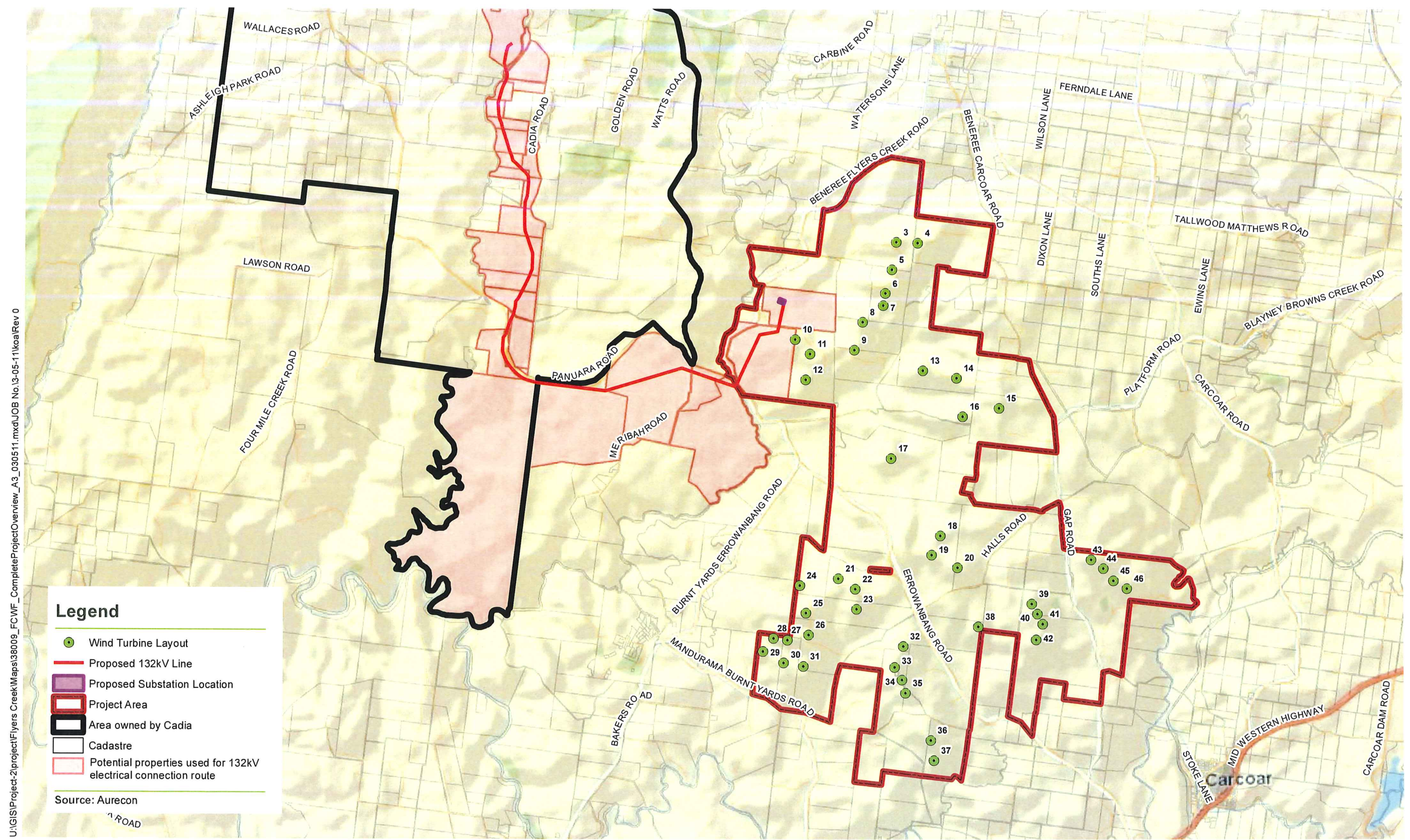


Flyers Creek Wind Farm Modification 4

Note:
FCWF Mod-4 wind turbine locations are as per approved wind turbine locations.

Figure 1
FCWF approved wind turbine layout



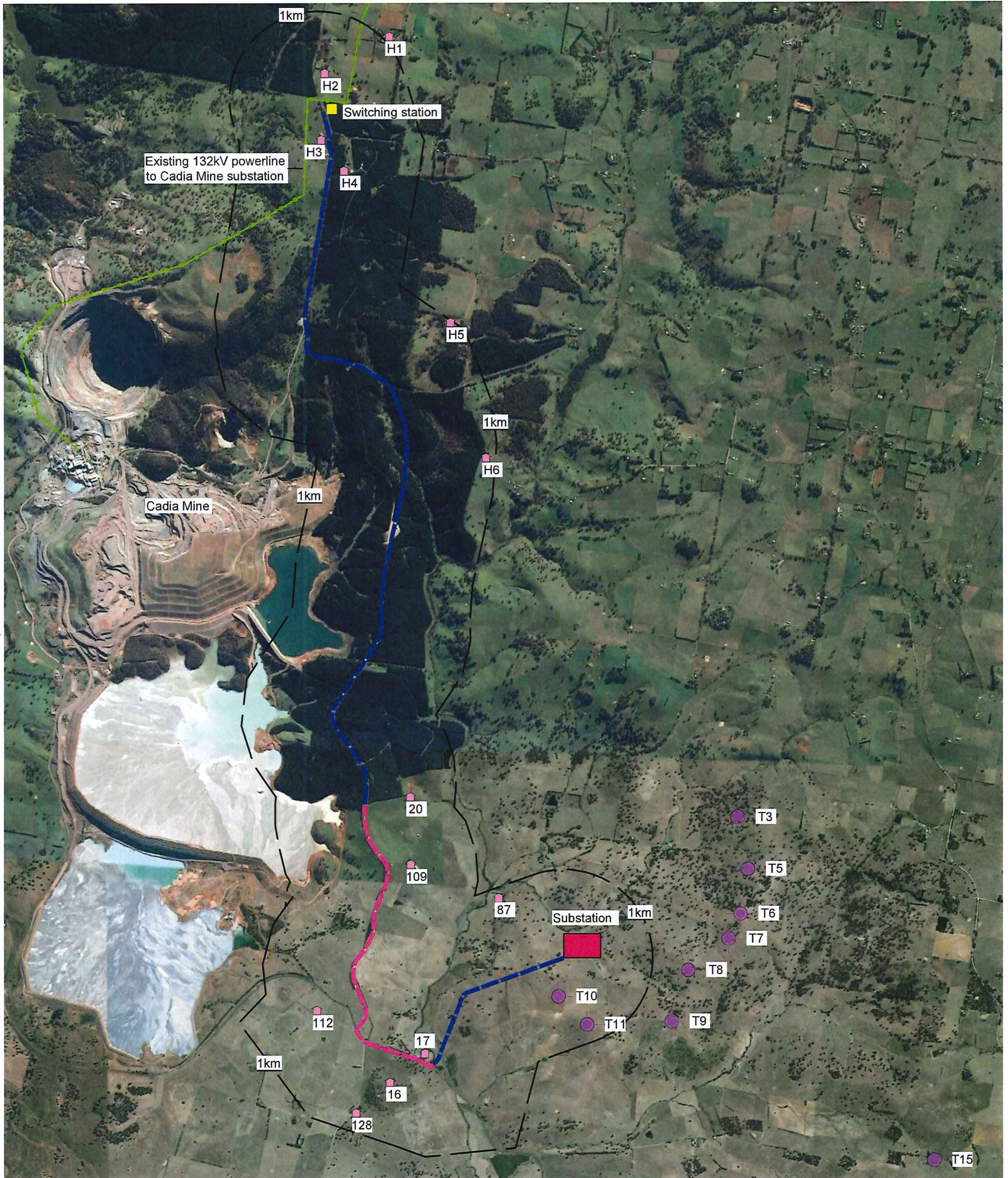


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1:110,000
 0 1 2 3 kilometres

Projection: GDA 1994 MGA Zone 56



Legend

- FCWF approved wind turbine location (indicative location)
- Approved FCWF substation (indicative location)
- Mod 4 switching station (indicative location)
- Dwelling within 1 km of Mod 4 132kV powerline
- Mod 4 132 kV powerline indicative overhead route option
- Mod 4 132 kV powerline indicative underground route option (or overhead subject to landowner agreement)
- Mod 4 132 kV powerline 1 km distance offset

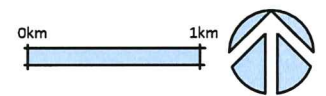


Figure 26
FCWF 132kV powerline
indicative alignment

Flyers Creek Wind Farm Modification 4

How Reference heights change the reference wind speed, but not the noise level.

Wind speed increases the higher it is measured above ground level as shown in the typical example below. This is known as the wind gradient.



The criteria for the house when measured at 1.2 m is the background + 5 dB(A) at whatever the reference speed is. In this case the criterion is 37 dB(A) being 32 dB(A) + 5 dB(A).

The reference height may be at 10 m, hub height of 80 m or hub height of 100m. The reference height and consequently the reference wind speed can change but the noise criterion stays the same.

In this example the criterion is 37 dB(A) and can be referenced at either 6 m/s @ 10 m, 8 m/s @ 80 m or 8.5 m/s @ 100 m. These are all the same.



Wind turbine noise

Recommendation

For average noise exposure, the GDG conditionally recommends reducing noise levels produced by wind turbines below **45 dB L_{den}** , as wind turbine noise above this level is associated with adverse health effects.

No recommendation is made for average night noise exposure L_{night} of wind turbines. The quality of evidence of night-time exposure to wind turbine noise is too low to allow a recommendation.

To reduce health effects, the GDG conditionally recommends that policy-makers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.

Strength

Conditional

Conditional



World Health
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NOISE
GUIDELINES
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