

Mr Adrian Maddocks
 Senior Development Manager
 Wind Prospect CWP Pty Ltd
 PO Box 1708, 45 Hunter Street
 NEWCASTLE NSW2300

7th November 2011

Dear Adrian

Re Sapphire Wind Farm Landscape and Visual Impact Assessment – turbine modification for a 1m increase to tip of blade height

Thank you for your email (20th October 2011). Further to the preparation of our Landscape and Visual Impact Assessment (LVIA) for the Sapphire Wind Farm Project, we understand that Wind Prospect CWP Pty Ltd (the Proponent) propose to consider an additional wind turbine model extending to a tip height of 157m (comprising a 94m tower and 126m rotor diameter) for the Project.

The LVIA originally determined levels of impact for the '80m' and '110m' wind turbine design layouts. The parameters for the '80m' and '110m' design layouts, together with the proposed '157m tip of blade' wind turbine are outlined in the following table.

Element	80m Design Layout	110m Design Layout	157m tip of blade
Tower Height	100m	100m	94m
Rotor Diameter	92m	112m	126m
Overall height to tip of blade	146m	156m	157m
Total number of turbines	159	125	125

We understand that each of the proposed '157m tip height' wind turbines would be located in the same position as the previously assessed '110m' design layout wind turbine and include a total of 125 wind turbines. In addition to a proposed 1m increase in tip of blade height we have also considered the resultant decrease in tower height from 100m to 94m (a difference of 6m) as well as an increase in the total rotor swept area from approximately 9,847m² to 12,462m².

As requested we have reviewed the Sapphire Wind Farm LVIA (V9 – Final Issue September 2011) to identify any additional level of landscape or visual impact that might result from a 1m increase to the wind turbine tip of blade height. Our review included an assessment of potential changes:

- in wind turbine visibility within the Sapphire Wind Farm 10km viewshed;
- to levels of visual impact determined for residential and public view locations;
- to the shadow flicker assessment; and
- to the extent of cumulative impact.

Our review of the Sapphire Wind Farm LVIA has determined that:

- A 1m increase in wind turbine tip height would not result in any significant increase in the level of visibility of wind turbines over and above that originally determined in the Sapphire Wind Farm LVIA for the 156m tip of blade (110m design layout). There would be no significant or discernable difference to the ZVI Diagrams prepared for the '110m design layout' (Figures 8 and 9 ZVI Diagrams 5 and 6 within the LVIA). Lowering the height of the nacelle by around 6m may, in some circumstances, remove the nacelle from view depending on the influence of surrounding topography and vegetation when compared to the results of the '110m design layout' ZVI.
- A 1m increase in wind turbine tip height would not result in any changes to the level of visual impact over and above that determined for the 139 residential dwellings or 13 public view locations identified and assessed in the Sapphire Wind Farm LVIA Tables 17 and 18.
- In accordance with the shadow flicker diagram provided by the Proponent, a 1m increase in tip height would not result in any associated or non associated residential dwelling experiencing shadow flicker in excess of 30 hours per year.
- A 1m increase in tip height would not result in any additional level of cumulative impact over and above that determined in the Sapphire Wind Farm LVIA.

Further to the production and receipt of an additional photomontage and a shadow flicker diagram we have prepared 3 additional figures to illustrate the proposed '157m tip of blade', these include:

- Figure 62 Photomontage Location PM11A Comparative Photomontage;
- Figure 63 Photomontage Location PM11A Detail Sheet Comparative Photomontage; and
- Figure 64 Shadow Flicker 157 tip of blade layout.

The additional photomontage (PM11A) illustrates the '157m' tip of blade wind turbine on the '80m design layout'. The '80m design layout' was adopted in order to provide a direct comparison with the original LVIA photomontages which are also based on the '80m design layout'. The LVIA photomontage are based on a 146m tip of blade, with a 100m tower and 92m diameter rotor and are indicative of a scale of turbine which would be suitable for the '80m' layout, but larger turbines, such as the 157m tip height, would use the 125 turbine '110m' layout.

Photomontage Location PM11 (Krystal Blue residential property) was selected to provide a proximate and non associated residential view comparison between the '80m design layout' photomontage and the proposed turbine to '157m tip height'.

Yours sincerely,

GREEN BEAN DESIGN

landscape architects

Andy Homewood, AILA
Registered Landscape Architect

Indicative extent of visible Sapphire wind farm turbines



Photo A: Viewpoint PM11A Extended panorama (tower height 100m, rotor diameter 92m and turbine tip height 146m)

Proposed view north east to south from Krystal Blue
Distance to nearest Sapphire turbine: 1.8km
Number of Sapphire turbines visible: 44

Indicative extent of visible Sapphire wind farm turbines



Photo B: Viewpoint PM11A Extended panorama (tower height 94m, rotor diameter 126m and turbine tip height 157m)

Proposed view north east to south from Krystal Blue
Distance to nearest Sapphire turbine: 1.8km
Number of Sapphire turbines visible: 44

General Notes: Viewpoint PM11A, Krystal Blue

Coordinates: Easting 341144, Northing 6713550

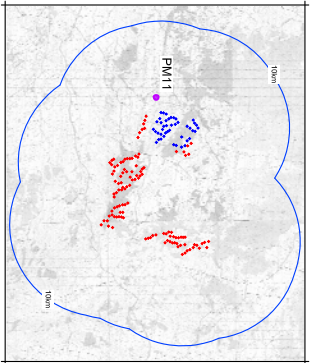
Photo date: 2nd August 2011, 4.20pm

Elevation: 769m AHD (+/- 4m)

Camera: Canon EOS 4000, 30mm 1:1.4DC Lens (equivalent to 35mm SLR Camera with 50mm lens) F/16 at 1/250 sec

Original Page Format: A1 Landscape

This photomontage represents the likely view of the proposed Sapphire wind farm.



General location plan - PM11A
(Turbine locations are indicative only)

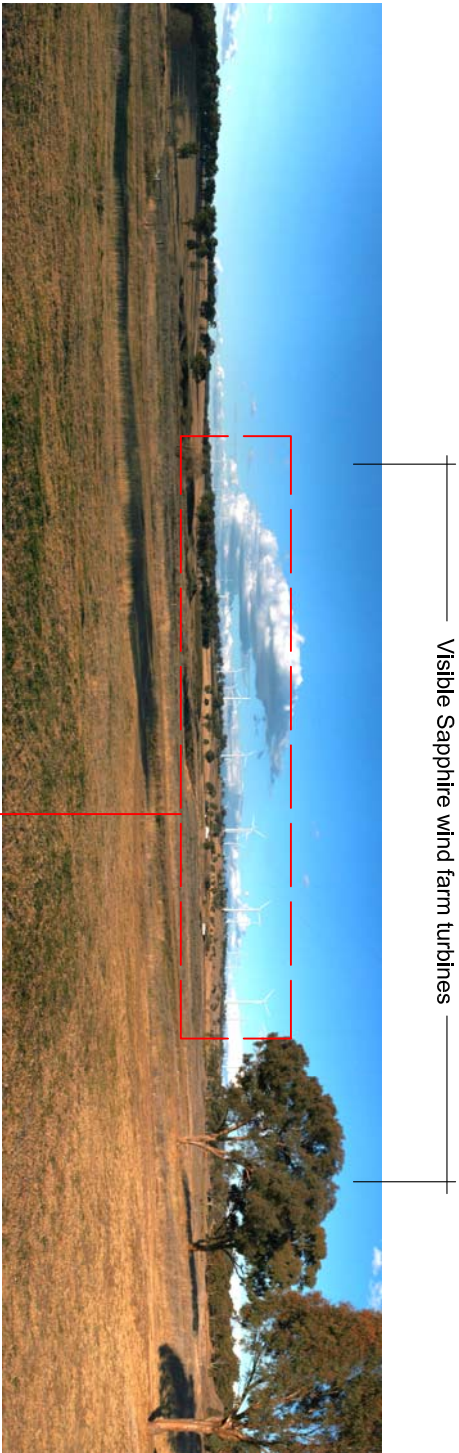
Legend

- Sapphire turbines likely to be visible from Photo location PM11A
- Sapphire turbines unlikely to be visible from Photo location PM11A



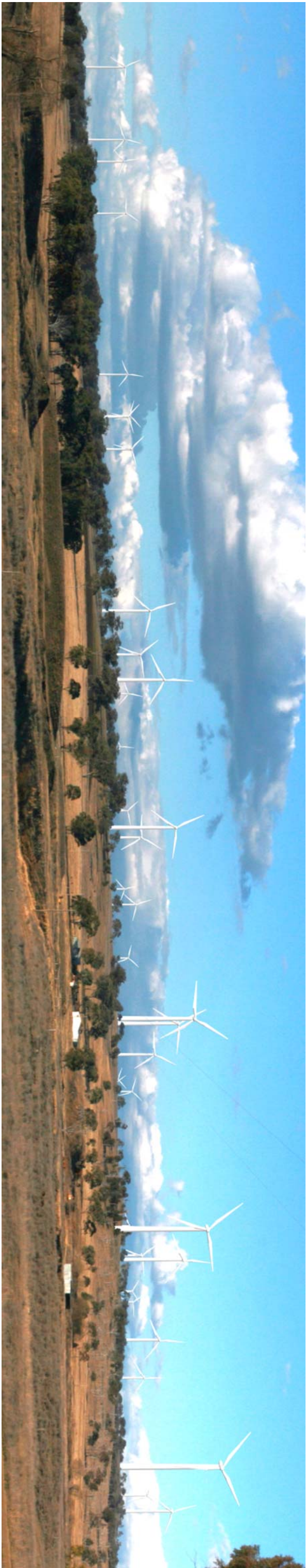
Figure 62
Photomontage PM11A
Comparative Photomontage

Figure 63 Photomontage PM11A
Detail Sheet
Comparative Photomontage



Photomontage Location PM11A
Krystal Blue

Refer Detail A and B below



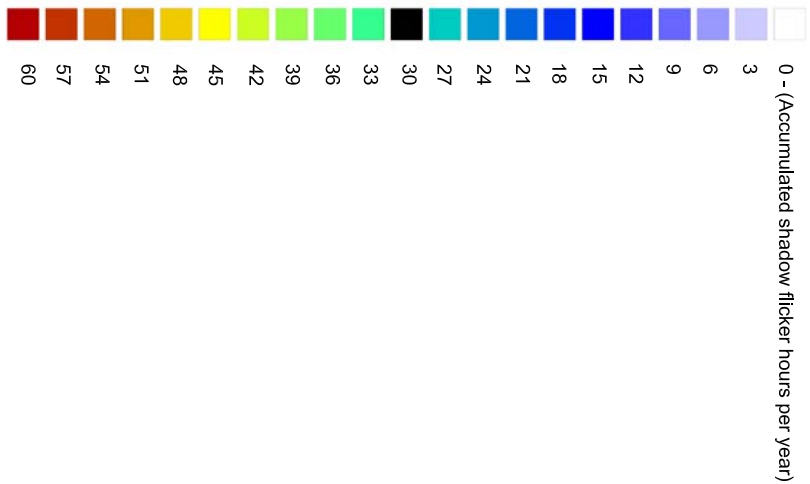
Photomontage Location PM11A - Detail A (turbine 146m to tip of blade, tower height 100m and rotor diameter 92m)



Photomontage Location PM11A - Detail B (turbine 157m to tip of blade, tower height 94m and rotor diameter 126m)

SAPPHIRE WIND FARM - PM11A KRYSTAL BLUE

Legend



‘110m’ turbine layout

Local road or Highway

2km distance from proposed wind turbine

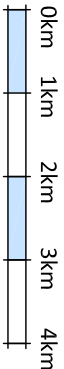
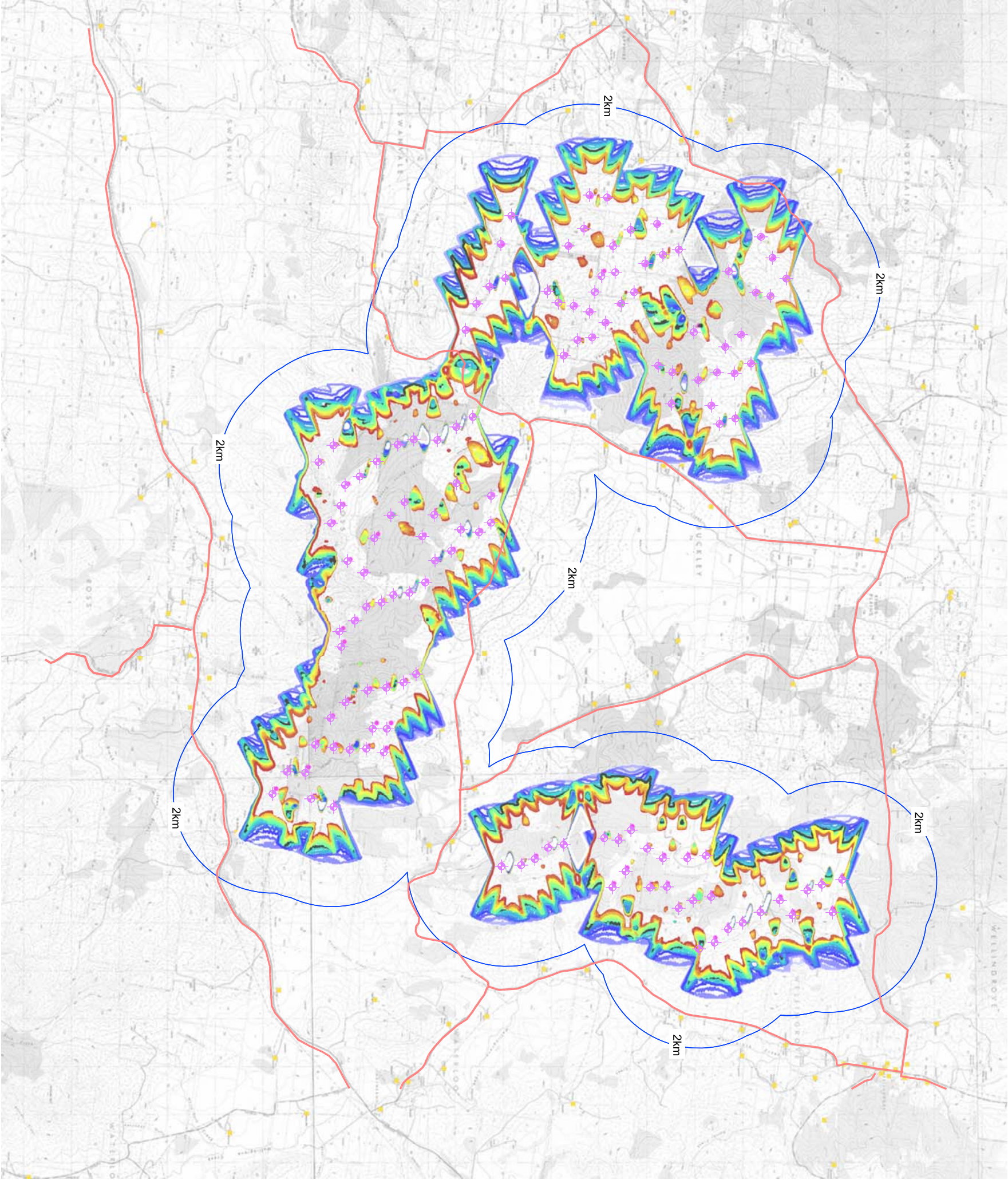


Figure 64
Shadow Flicker ‘157 tip
of blade’ layout



Source: Copyright Department of Lands Panorama Avenue Bathurst 2795 (www.lands.nsw.gov.au)

SAPPHIRE WIND FARM