

Crookwell 2 Wind Farm – Modification 2

Response to Submissions and further information subsequent to a site inspection with the NSW Department of Planning and Environment and the Departments Independent Expert Mr Terry O’Hanlon.

EA Website Submissions – Govt, Agency & Org

Submission ID174435

Comment:

I submit that the increase in visual impact will be unacceptable. Although the number of turbines is to decrease from 46 to 33, there will still be a very considerable increase in visual impact merely from the increase in tip height, since the disproportion between the height of wind turbines and the heights of other features in the landscape (trees, sheds, etc.) is itself responsible for a negative aesthetic effect.

Green Bean Design response:

A detailed assessment of potential visual impacts was undertaken and presented in the Crookwell 2 Wind Farm Modification 2 Visual Impact Assessment Report, May 2016 (C2WF Mod 2 VIA).

The detailed assessment included a determination of potential visual effects on people at residential dwellings within 5 kilometres of the approved C2WF Mod 1 development and the proposed C2WF Mod 2 wind turbines.

The C2WF Mod 2 VIA identified potential visual effects that would result from an increase in wind turbine dimension as well as the reduction in the number of proposed wind turbines.

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimension would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

The C2WF Mod 2 VIA does not concur with the submission and does not consider the visual impact associated with the modification to be unacceptable when compared to the visual impacts associated with the approved C2WF wind turbines.

EA Website Submissions – Public Feedback

Submission ID 171223

Key points extracted from submission:

Comment:

The C2WF Mod 2 VIA determined that no non-associated residential dwellings surrounding the C2WF Mod wind turbines would experience shadow flicker. This is at variance with the findings of DNV-GL.

Green Bean Design response:

To clarify, no non-associated residential dwellings will experience shadow flicker which exceeds an accumulated 30 hours per year in accordance with relevant guidelines as per the Shadow Flicker Assessment undertaken by DNV-GL.

Comment:

The final conclusion implies that the reduction in turbine numbers overrides any visual impact of the turbine size increase.

Green Bean Design response:

The C2WF Mod 2 VIA does not imply that reducing the overall number of wind turbines overrides any visual impact of the turbine size increase. No statement to this effect has been provided in the C2WF Mod 2 VIA report.

The C2WF Mod 2 VIA has concluded that the removal of up to 13 approved C2WF Mod 1 wind turbines would result in an overall reduction in wind turbine visibility, but makes no suggestion that this compensates for an increase in wind turbine dimensions.

Comment:

Mr Homewood tries to minimise the modification with diagrams showing how negligible the additional angle and height is at 2km.

Green Bean Design response:

The diagrams (C2WF Mod 2 VIA Figures 5 and 6) do not attempt to minimise the modification. The diagrams simply illustrate differences in the C2WF Mod 2 and approved C2WF Mod 1 wind turbine dimensions and view angle at distances of 2km and 5km.

The C2WF Mod 2 VIA notes that 'within the parameters of human vision, the proposed Mod 2 wind turbines are not considered to give rise to an increased level of visual magnitude over and above that determined for the approved C2WF Mod 1 development'.

Appendix A - Figures includes additional Figures PS01 and PS02 which illustrate the additional view angle above the approved C2WF wind turbine at distances of 1km, 2km, 3km; 4km and 5km.

Comment:

With groupings Mr Homewood "expects" the visual impact to be the same. No Mr Homewood, you have to justify that sameness, otherwise don't group residences.

Green Bean Design response:

Grouping of residential dwellings has occurred where the distance and landscape characteristics between dwellings and the wind turbines is similar and the determination of visual impact is consistent.

Comments:

Confirm if column 6 is assessing the overall VI subsequent to the modification or just the delta impact of Modification 2.

Green Bean Design response:

The C2WF Mod 2 VIA Table 6 column 6 describes the delta of Mod 2 (i.e. the likely change to the C2WF Mod 1 visual effect).

Comment:

GBD advises: "A detailed assessment of cumulative visual effects has been undertaken for the proposed Crookwell 3 Wind Farm project and considers the potential for cumulative visual effects in association with the C2WF proposed Mod-2"

A "must have" from the Department for this modification is missing.

Green Bean Design response:

GBD prepared a detailed cumulative visual impact between the Crookwell 1 wind farm, C2WF, C3WF and Gullen Range Wind Farm. GBD understand that this report is available on the NSW Department of Planning and Environment website.

Submission ID 171805*Comment:*

The proximity of planned turbines so close to a major road and to the town of Crookwell is greatly opposed. Crookwell is well known for its picturesque rural landscape and attracts many tourists because of this. To create yet another wind farm so close to Crookwell will be detrimental to the growth of the township and the income of all those that rely on the tourist dollar to supplement their income. Crookwell has enough turbines! Let them be built elsewhere.

Green Bean Design response:

The C2WF Mod 2 VIA considers a modification to an approved wind farm development.

Submission ID 171777*Comment:*

"The developer of Crookwell 2 seeks to increase the tip-height of the turbines from 127m to 159m, or by 25%. This is not a minor change, but will result in a major increase in visual impact of the towers. The developer implies that the reduction in number of turbines will minimize the visual impact of the higher turbines, but this is not so.

Green Bean Design response:

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimension would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

The C2WF Mod 2 VIA does not imply that reducing the overall number of wind turbines overrides any visual impact of the turbine size increase. No statement to this effect has been provided in the C2WF Mod 2 VIA report.

The C2WF Mod 2 VIA has concluded that the removal of up to 13 approved C2WF Mod 1 wind turbines would result in an overall reduction in wind turbine visibility, but makes no suggestion that this compensates for an increase in wind turbine dimensions.

Submission ID 172132*Comment:*

The increasing of the turbine size will have an exaggerated detrimental effect on the pristine rural landscape which surrounds our property. Our property is our piece of paradise and our sanctuary and the increase in the size of turbine will ruin the rural landscape for us and others forever.

The pictures that have been produced by the proponent in the Photomontage show the towers blend in to the landscape. A drive around our district to view other windfarm sites tell a completely different story, these turbines will be even more prominent if the proposed increase in turbine height is approved.

Green Bean Design response:

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimensions would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

The photomontages have been prepared with regard to general guidelines set out in the Scottish Natural Heritage (2006) Visual representation of wind farms and the British Landscape Institute Advice Note 01/11 (March 2011) Photography and photomontage in landscape and visual impact assessment.

Submission ID 171541*Comment:*

The ZVI (called a ZTV) of 5 kms used in the assessment is ridiculously small.

Green Bean Design response:

The potential for any significant visual effect due to changes in the perceived visual appearance of approved and proposed wind turbines beyond a 5km distance is considered to be low. A ZTV to a distance of 5km is considered appropriate for the potential visual effects associated with the C2WF Mod 2 wind turbines.

Comment:

Failure to Acknowledge and Allow for Extent to which Photomontages Underestimate VI

Green Bean Design response:

The photomontages have been prepared with regard to general guidelines set out in the Scottish Natural Heritage (2006) Visual representation of wind farms and the British Landscape Institute Advice Note 01/11 (March 2011) Photography and photomontage in landscape and visual impact assessment.

Comment:

On page 15 of the VI Assessment it is stated “However, when compared to the approved C2WF Mod-1 wind turbines, the increase in wind turbine visibility would be restricted to the upper sections (hubs and rotors) of wind turbine structures, rather than whole wind turbines”.

This suggests to the reader that the impact can be discounted because only part of the turbine is visible.

Green Bean Design response:

The C2WF Mod 2 VIA makes no suggestion that partial views toward wind turbine structures has discounted the potential visual effect.

Comment:

The VI Assessment uses an arbitrary 4 point scale, structured so 3 points on the scale allow the VI in particular instances to be readily dismissed. Scale construction is biased and inadequate.

Green Bean Design response:

The C2WF Mod 2 VIA methodology is set out in industry and best practice guidelines including the Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment, 2013 – Chapter 6 Assessment of visual effects.

Comment:

The Evaluation of Methodologies for Visual Impact Assessments review draws on peer reviewed research which demonstrates that professional ratings of VI have low validity in predicting the VI actually experienced by people who live near a development.

Green Bean Design response:

The C2WF Mod 2 VIA methodology is set out in industry and best practice guidelines including the Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment, 2013 – Chapter 6 Assessment of visual effects.

Submission ID 171747

I object to this proposal. The increase in blade size will inevitably lead to an increase in visual and noise pollution in this rural area and is inappropriate.

Green Bean Design response:

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimensions would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

Submission ID 173074

The now proposed turbines that are 157m in height, with a rotor of diameter of 130m, will dominate and impact vast areas of landscape.

Regardless of the amendment to an increase in the size of the Crookwell 2 & 3 turbines, the impact and connectivity to whatever is built, when collectively viewed with the Gullen Range wind turbines will have a “plantation” effect.

Green Bean Design response:

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimensions would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

The C2WF Mod 2 VIA considers a modification to an approved wind farm development.

Submission ID 173088

The developer of Crookwell II seeks to increase the tip-height of the turbines from 127m to 159m, or by 25%. This is not a minor change, but will result in a major increase in the visual impact of the towers. The developer implies that the reduction in the number of turbines will minimise the visual impact of the higher turbines, but this is not so.

Green Bean Design response:

The C2WF Mod 2 VIA concluded that the proposed increase in wind turbine dimensions would be discernible from some surrounding and proximate view locations where views toward the approved C2WF Mod 1 wind turbines exist; however, the C2WF Mod 2 wind turbines are not considered to be of a magnitude that would significantly increase visual effects associated with the approved C2WF Mod 1 development.

The C3WF Amended VIA has made no claim, implied or otherwise, that reducing the number of wind turbines offsets any visual effect associated with the overall increase in wind turbine dimension. The C2WF Mod 2 VIA has determined that a number of residential dwellings gain no reduction in visual impact despite wind turbines being removed from their view.

Further information subsequent to a site inspection with the NSW Department of Planning and Environment and the Departments Independent Expert Mr Terry O’Hanlon.

Update to C2WF Mod 2 Figure 1 Approved Mod-1 and proposed Mod-2 layout

The C2WF Mod 2 Figure 1 has been updated and amended to:

- Remove wind turbine F9. The approved C2WF Mod 1 F9 wind turbine has been removed by the Proponent
- Remove dwelling R124. Dwelling R124 has been verified by GBD and the NSW Department of Planning and Environment as an agricultural shed
- Add dwelling R1a which has been confirmed as a DA approved shed conversion and residential dwelling
- Add dwelling R134 recent construction
- Add dwelling R134A recent Development Approval (not constructed)

The amended Figure 1 is included in Appendix A – Figures as PS03.

Assessment of dwellings 1A, 134 and 134A – C2WF Mod 2

Residential dwellings 1A, 134 and 134A include a shed conversion and other dwellings with recent DA approvals and have been assessed in accordance with the C2WF Mod 2 Visual Impact Assessment.

Receiver location	Category of receiver location	Approximate distance to approved and/or amended wind turbine	Approved C2WF Mod-1 Visual Effect	Description and Magnitude of C2WF Mod-2 amended visual effect	Proposed C2WF Mod-2 Visual Effect
R1A	Non associated residential dwelling	1.4 km	Moderate	Views toward the approved C2WF Mod-1 would be altered by the removal of three wind turbines (F6, F8 and F9) within the cluster closest to the dwelling, and in addition by the removal of wind turbines within distant views east of the Crookwell-Goulburn Road. There would be very limited change in the composition or contrast between the approved Mod-1 and proposed Mod-2 development and the surrounding landscape. Planting beyond the dwelling would also screen views toward both approved Mod-1 and proposed Mod-2 wind turbines. Low – resulting in no change to the approved C2WF Mod-1 visual impact rating.	Moderate

Receiver location	Category of receiver location	Approximate distance to approved and/or amended wind turbine	Approved C2WF Mod-1 Visual Effect	Description and Magnitude of C2WF Mod-2 amended visual effect	Proposed C2WF Mod-2 Visual Effect
R134	Non-associated residential dwelling	3.6 km	Low to Moderate	The observable scale of change would be limited by distance between the dwelling and closest approved C2WF Mod-1 wind turbine. There would be a very small change in the composition or contrast between the approved Mod-1 and proposed Mod-2 development and the surrounding landscape due a small degree of additional visibility toward approved Mod-1 wind turbines F48 and F50 above Pigmans Hill.	Low to Moderate
R134A	Non - associated residential dwelling	2.9 km	Low to Moderate	The observable scale of change would be limited by distance between the dwellings and closest approved C2WF Mod-1 wind turbine. Views toward the approved C2WF Mod-1 would be altered by the overall removal of wind turbines within the cluster east of the Crookwell-Goulburn Road. There would be very limited change in the composition or contrast between the approved Mod-1 and proposed Mod-2 development and the surrounding landscape.	Low to Moderate

Review of dwelling R60 (Pejar Park) C2WF Mod 2 VIA

The C2WF Mod 2 VIA noted that there would be a minor change in the composition or contrast between the approved Mod-1 and proposed Mod-2 development and the surrounding landscape. This occurs where the approved Mod-1 visible wind turbines F48 and F50 would extend above the hill with turbine hubs partially visible. Landform rising to the west, and tree planting surrounding the main dwelling would also screen views toward the majority of approved Mod-1 and proposed Mod-2 wind turbines.

Our review confirms that the overall visibility of the C2WF Mod 2 wind turbines F48 and F50 would be restricted to a partial view of each wind turbine nacelle and blades as they extend horizontal to and above the nacelle.

Plates 1 and 2 illustrate indicative views toward the C2WF Mod 1 and Mod 2 wind turbines F48 and F50 to the west of Pejar Park. The Plates illustrate the general extent of wind turbine visible between each Mod, but do not illustrate the view from the west of the Pejar Park residential dwelling.

Review of dwelling R120 (Elmgrove) C2WF Mod 2 VIA

The C2WF Mod 2 VIA noted that observable scale of change would be noticeable between the Elmgrove dwelling and closest approved C2WF Mod-1 wind turbine. Views toward the approved C2WF Mod-1 would be altered by the removal of three approved Mod-1 wind turbines F6, F8 and F9 within the cluster south west of the dwelling. There would be limited change in the composition or contrast between the approved Mod-1 and proposed Mod-2 development and the surrounding landscape. Planting surrounding the dwelling would also screen and filter views toward both approved Mod-1 and proposed Mod-2 wind turbines.

Plates 3 and 4 illustrate indicative views toward the C2WF Mod 1 and Mod 2 wind turbines to the south west of Elmgrove.

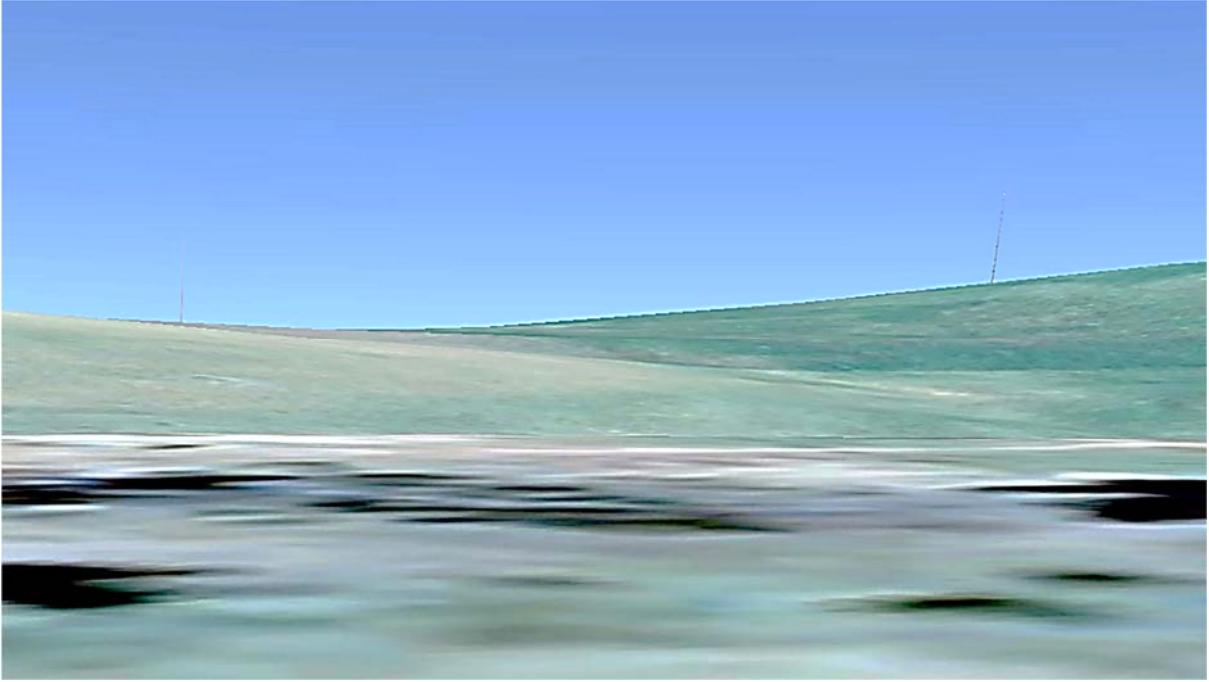


Plate 1 – Google Earth extract, R60 Pejar Park illustrating approved C2WF Mod 1 wind turbines F48 and F50 with partial blade visible above ridgeline



Plate 2 – Google Earth extract, R60 Pejar Park illustrating C2WF Mod 2 wind turbines F48 and F50 with nacelle and blade visible above ridgeline

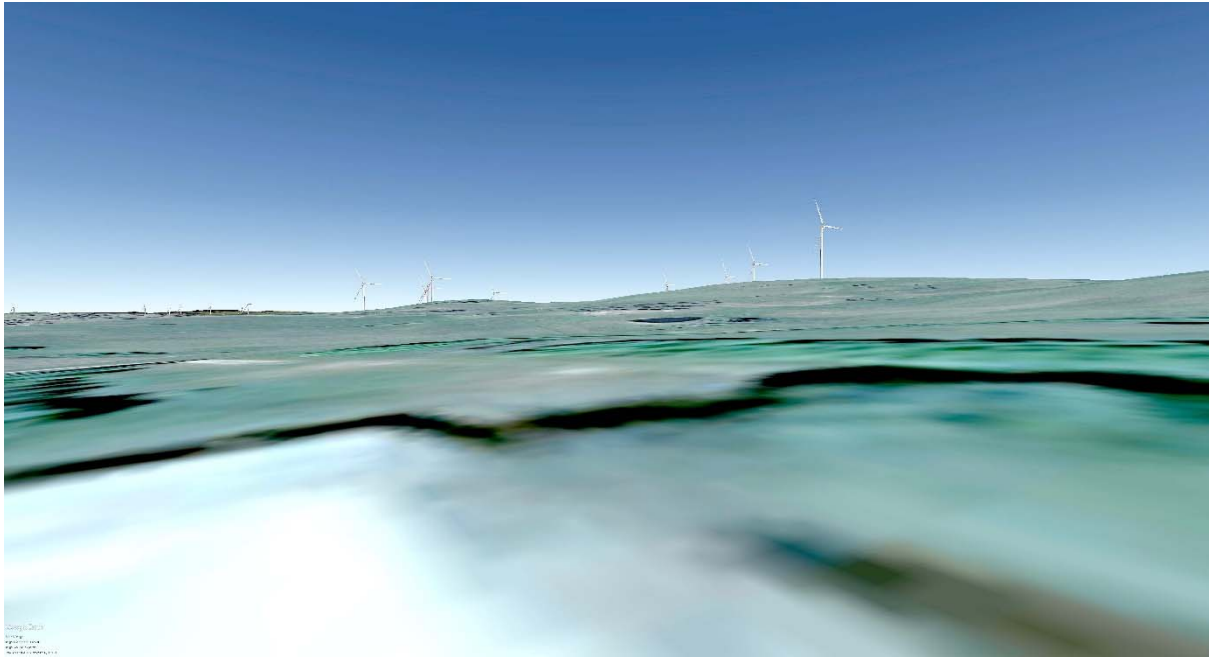


Plate 3 – Google Earth extract, R120 Elmgrove illustrating approved C2WF Mod 1 wind turbines

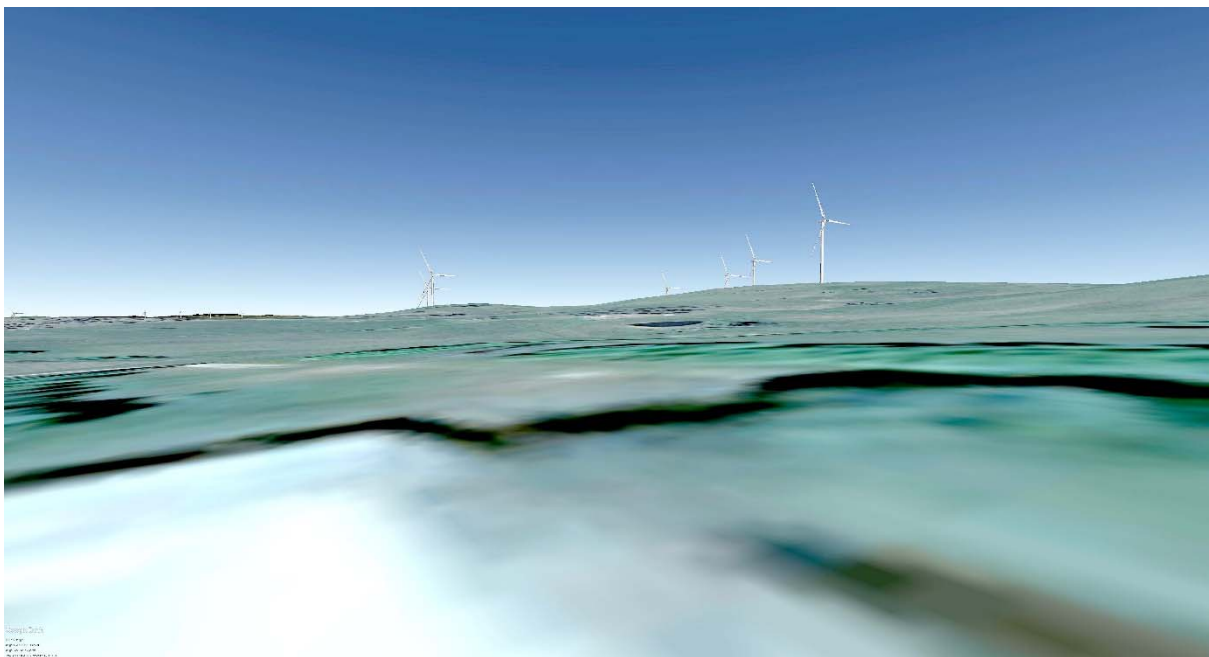
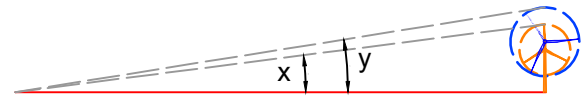


Plate 4 – Google Earth extract, R120 Elmgrove illustrating C2WF Mod 2 wind turbines

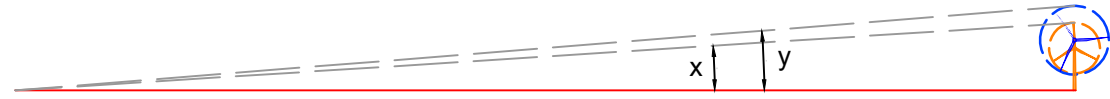
Appendix A - Figures

Table 01 - Change in approved and modified view angles at varying distances

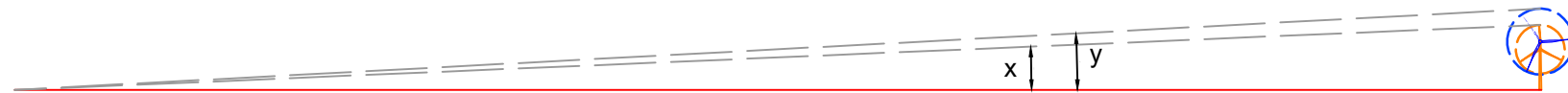
View distance from wind turbine (km)	Approved Mod 1 wind turbine 128m tip height view angle to tip of blade (x)	Proposed Mod 2 wind turbine 160m tip height view angle to tip of blade (y)	Change in view angle
1	7 degrees 18 mins	9 degrees 5 mins	1 degree 48 mins
2	3 degrees 40 mins	4 degrees 34 mins	55 mins
3	2 degrees 27 mins	3 degrees 3 mins	37 mins
4	1 degree 50 mins	2 degrees 17 mins	27 mins
5	1 degree 28 mins	1 degree 50 mins	22 mins



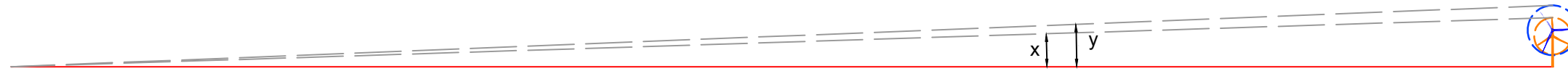
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 1 km view distance



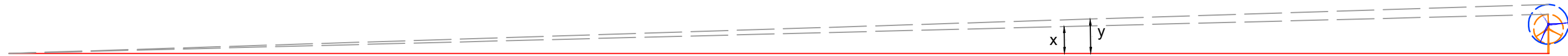
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 2 km view distance



View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 3 km view distance



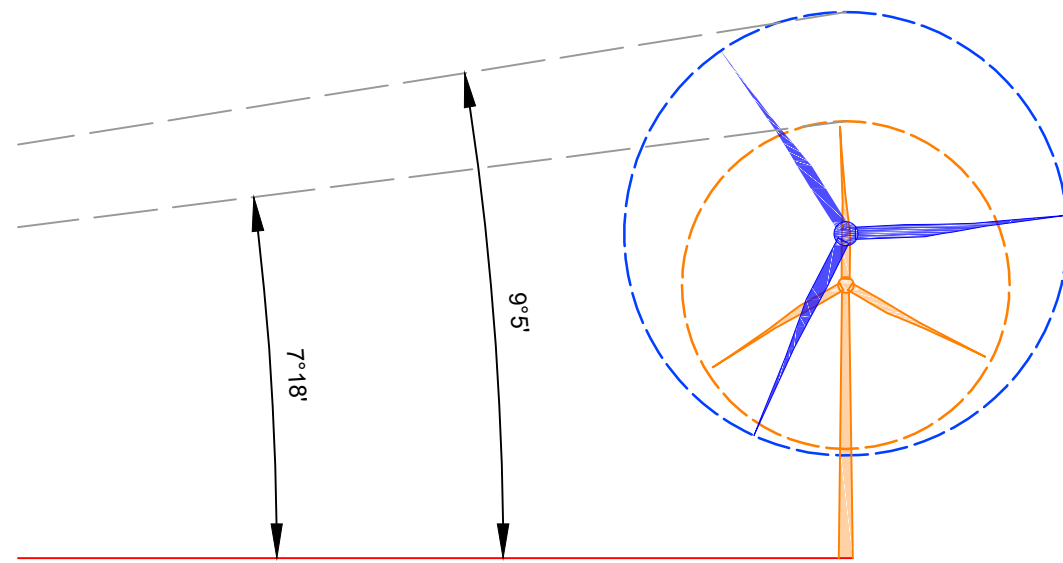
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 4 km view distance



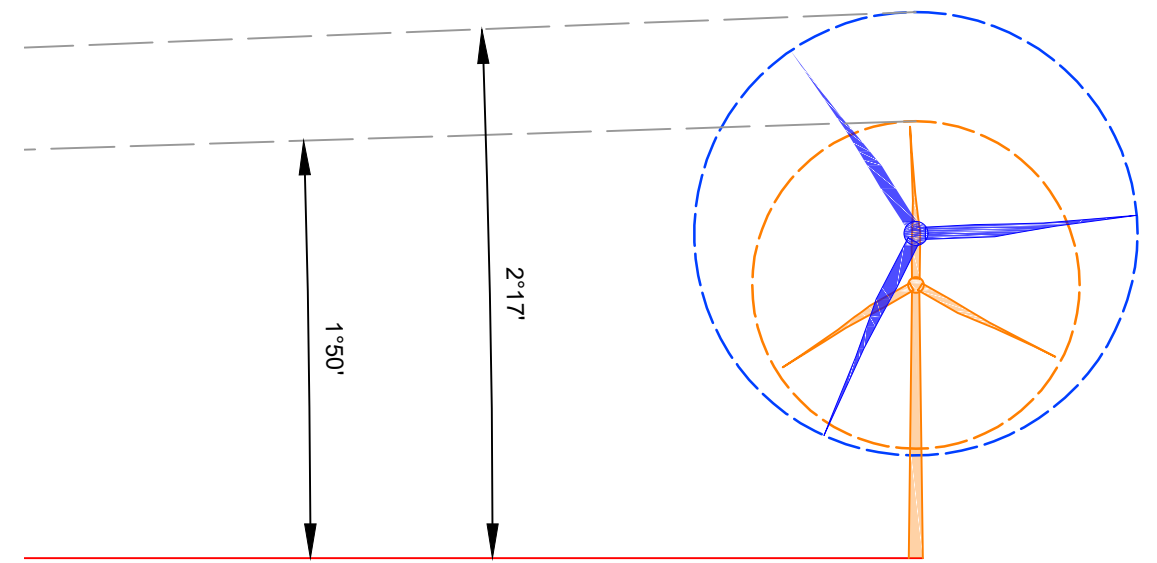
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 5 km view distance

Crookwell 2 Wind Farm Mod-2 Visual Impact Assessment

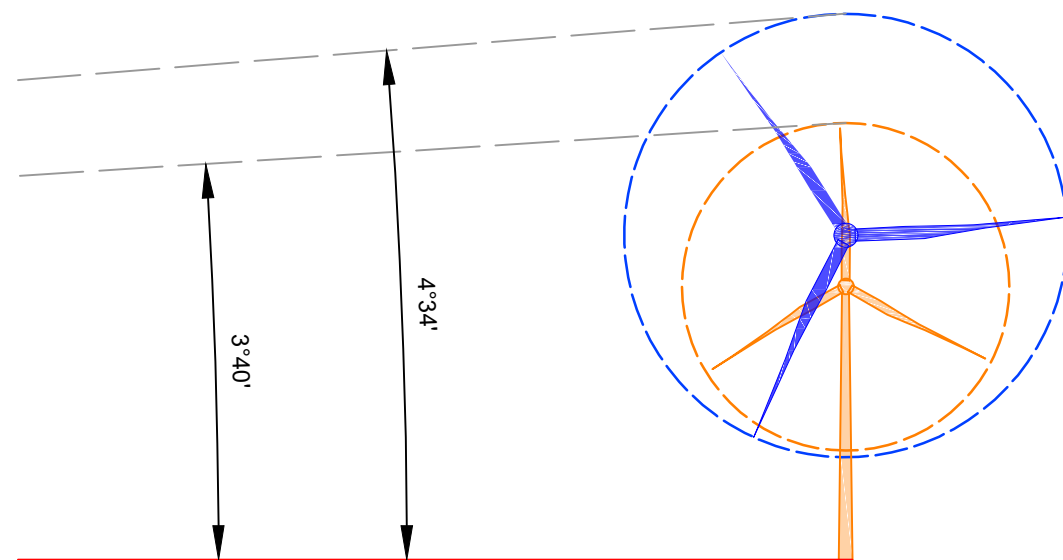
Crookwell 2 Wind Farm Mod-2 Visual Impact Assessment



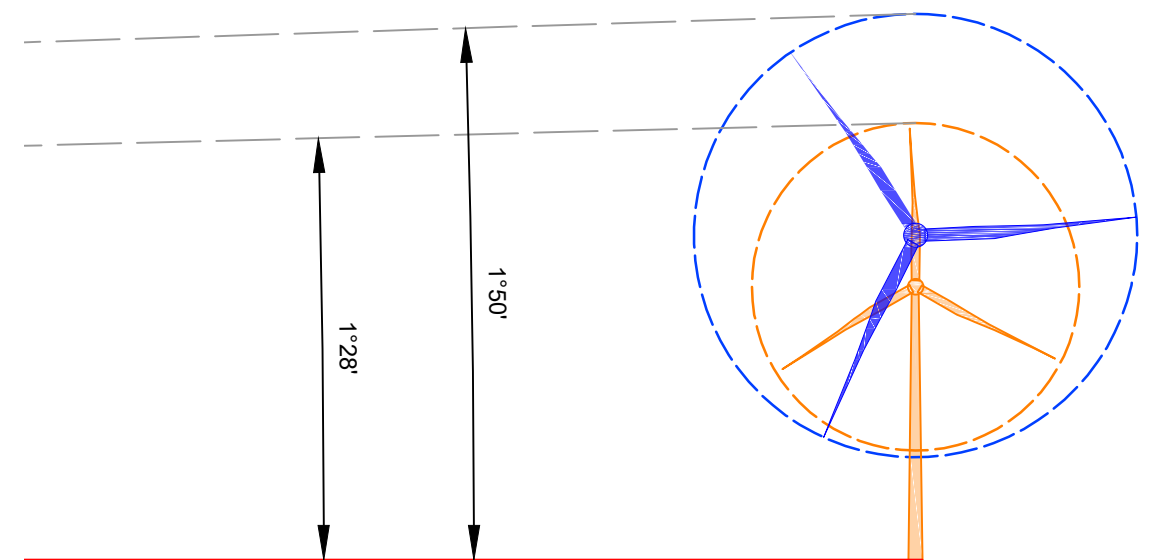
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 1 km view distance



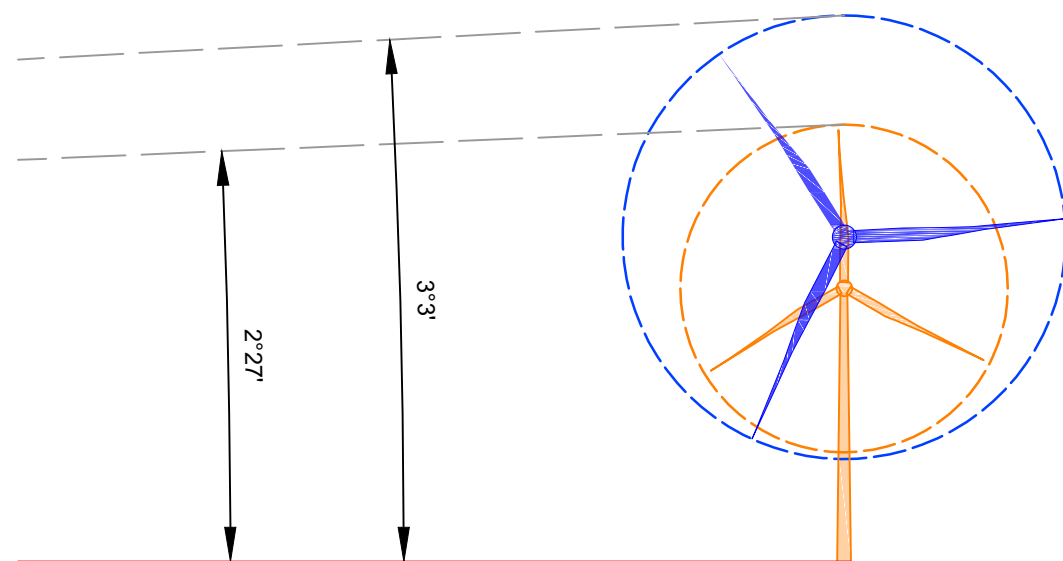
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 4 km view distance



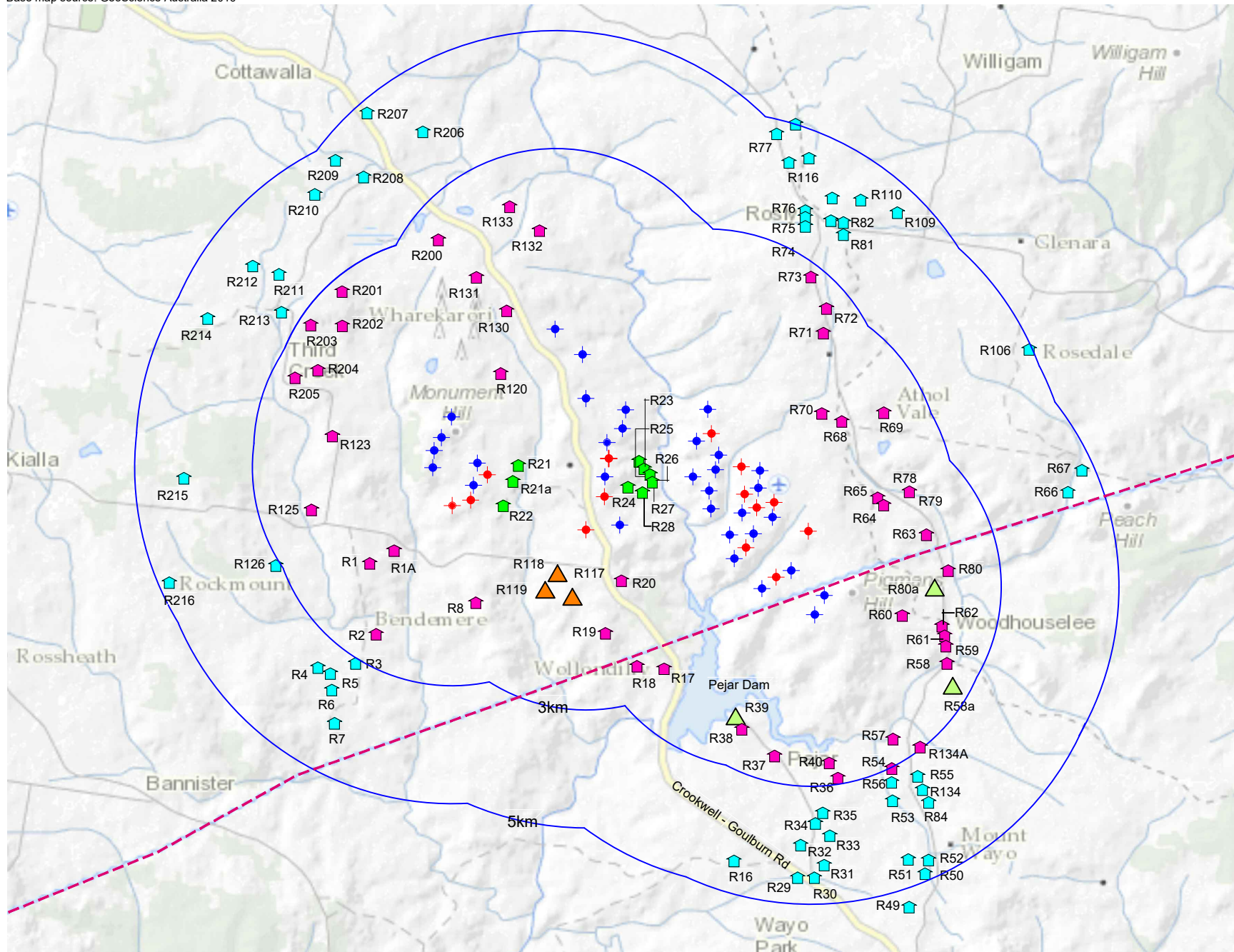
View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 2 km view distance



View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 5 km view distance



View angle toward approved C2WF Mod-1 and CW2WF Mod-2 wind turbine tip of blade from a 3 km view distance



Legend

- Approved C2WF Mod-1 wind turbine layout subject to Mod-2 (indicative location)
 - Approved C2WF Mod-1 wind turbine to be removed (indicative location)
 - Approximate distance from approved Crookwell 2 wind turbine
 - Associated C2WF residential dwelling
 - Non associated residential dwelling within 3km of approved C2WF Mod 1 wind turbine
 - Non associated residential dwelling between 3km and 5km of approved C2WF Mod-1 wind turbine
 - Potential future dwelling location without DA lodged
 - Non residential structure
 - Existing 330kV transmission line
- Note: All house locations are indicative only

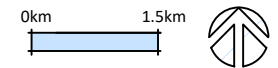


Figure POS 3 C2WF Approved Mod-1 and proposed Mod-2 layout

Crookwell 2 Wind Farm Mod-2 Visual Impact Assessment

CROOKWELL
DEVELOPMENT PTY LTD
UNION FENOSA
WIND AUSTRALIA

GREEN BEAN DESIGN
landscape architects