



Keri Keri Wind Farm

SSD-38358962

Landscape & Visual Impact Assessment

Addendum

Revision	Date	Author	Checked	Comment
A	08.12.25	AR / CA	AR	Draft for Discussion
B	17.12.25	AR	-	Revised Draft for Review
C	07.01.26	AR	-	Final for Submission

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1.0 Introduction

Moir Landscape Architecture Pty Ltd (t/a Moir Studio) prepared a Landscape and Visual Impact Assessment (LVIA) for the proposed Keri Keri Wind Farm (SSD-38358962) in March 2024. The LVIA formed part of the Environmental Impact Statement (EIS) which was publicly exhibited from Friday 24th May 2024 until Thursday 20th June 2024 by the Department of Planning, Housing and Infrastructure (DPHI).

Following the exhibition period, the Project has been amended in response to submissions received, further consultation and other considerations. The purpose of this LVIA Addendum is to provide an update of the assessment to reflect the amended project layout and respond to submissions specific to the LVIA.

Table 01 provides an overview of the submission and where this has been addressed.

BCS / NPWS Submission	Response:
3.2 NSW Dark Sky Planning Guidelines (DPE, 2023) are utilised as a guide in designing adequate lighting to avoid excessive light spill into the night sky to protect Yanga SCA night sky values where possible.	Refer to Section 3.0 - Night Lighting Considerations
3.3 National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) to ensure adequate design and consideration of the natural (biodiversity) values attributed to Yanga SCA and ensure: (a) aviation hazard lighting on WTGs and meteorological masts (referred to as wind monitoring towers (WMTs) as advised by Civil Aviation Safety Authority (CASA) is appropriately designed and operated. (b) internal project lighting installed at the substations and other buildings for occupation (Workers Accommodation Camp), night work, security and emergency operational purposes are designed to reduce light pollution and excessive light spill on to Yanga SCA.	Refer to Section 3.0 - Night Lighting Considerations
(b) NPWS staff accommodation (residential sites) Oakhampton cottage and Oakhampton Irrigation cottage.	Refer to Section 4.0
3.6 provide for an assessment of shadow flicker on Yanga SCA and effects on the values of Yanga SCA, especially natural (biodiversity) values and Keri Keri Road safety (as used by NPWS staff, Yanga SCA visitors and commercial operators.	Refer to Section 5.0

Table 01 Overview of submission provided by BSC / NPWS relevant to LVIA

2.0 Project Layout Amendment

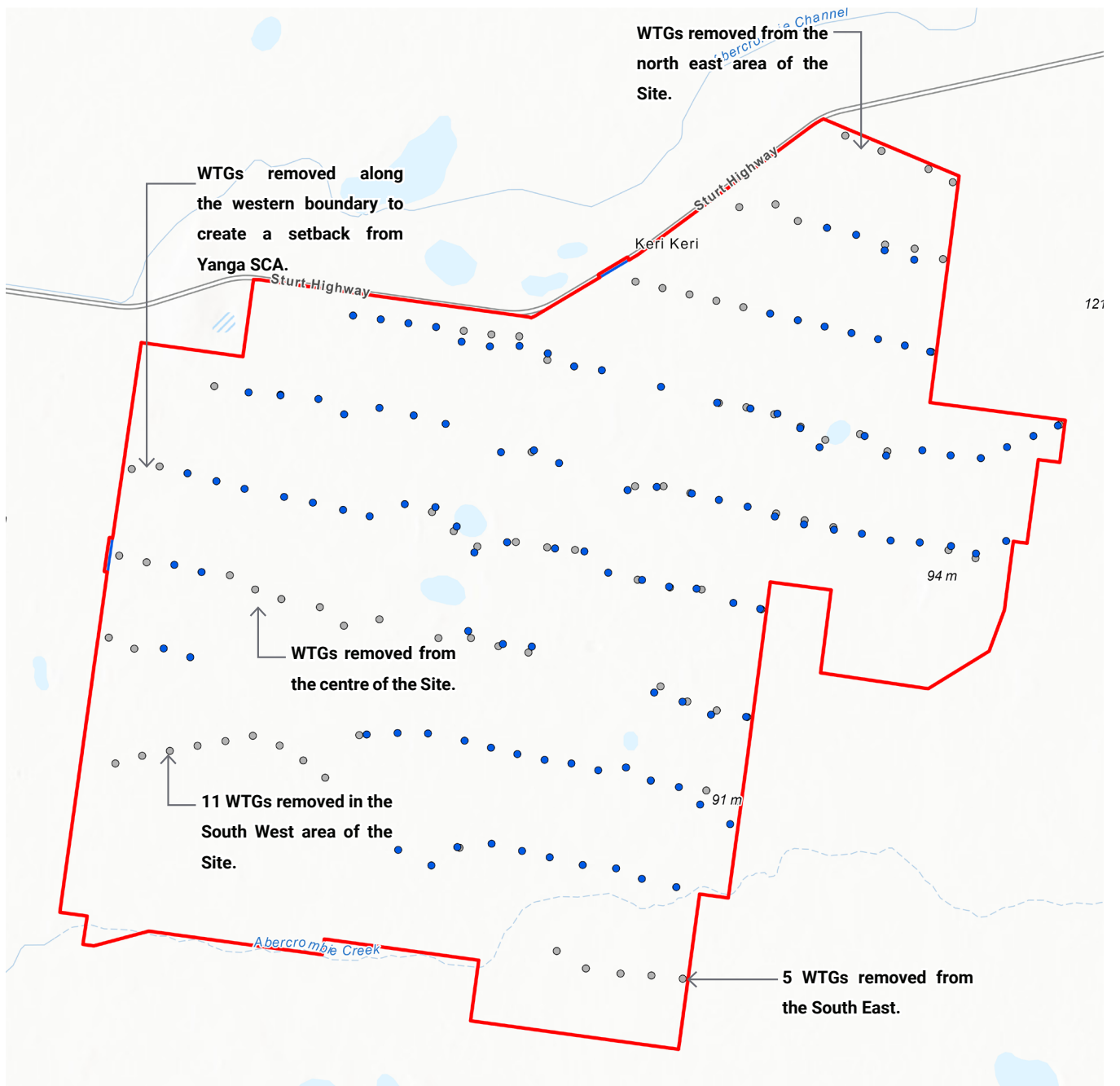
2.1 Overview of Project Layout Amendments

The Project has decreased the number of wind turbines (WTGs) by 41 WTGs (from 155 to 114). **Table 02** provides a comparison of the EIS Layout and amended Project Layout. **Figure 1** illustrates the amended Project Layout.

Apart from a change in the location of the wind farm infrastructure within the Project boundary, all other aspects of the project description provided within the EIS remain unchanged. Importantly, no additional environmental aspects or additional sensitive receivers have been identified for assessment specific to the new proposed location. A summary of the project changes are provided in **Table 02**.

Summary of Project Changes			
Project Element	EIS Layout	Revised Layout	Variation
Project Area	18,012 ha	18,006 ha	Reduced by 6 ha
WTGs	155	114	Reduced by 41 WTGs
Permanent Development Footprint	574 ha	491 ha	Reduced by 83 ha
Ancillary Infrastructure:			
330 kV Transmission Line	20 km	16.21 km	Reduced by 3.79 km
220 kV or 330 kV Transmission Line (Switching Station to proposed connection point)	Nil	0.7 km	Increased by 0.7 km
Overhead 33 kV Transmission Line	64.5 km	0 km	Reduced by 64.5 km
O&M Facility	3	1	Reduced by 2
Internal Access Tracks	148.3 km	116.5 km	Reduced by 31.8 km
Permanent Meteorological Masts	4	3	Reduced by 1
Temporary Facilities:			
Temporary Meteorological Masts	4	3	Reduced by 1
Laydown Areas	3	4	Increased by 1

Table 02 Summary of Project Changes



LEGEND

- EIS Project Layout
- EIS WTG Location (Removed)
- Amended Project Layout
- Amended Layout WTG Location

Figure 01 Revised WTG Layout
 Basemap Source - ESRI, 2025

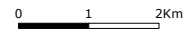
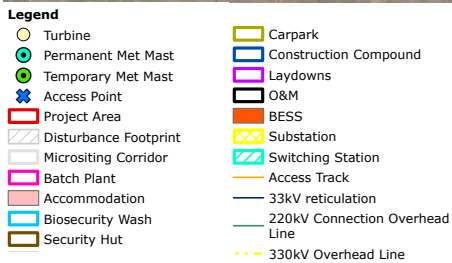
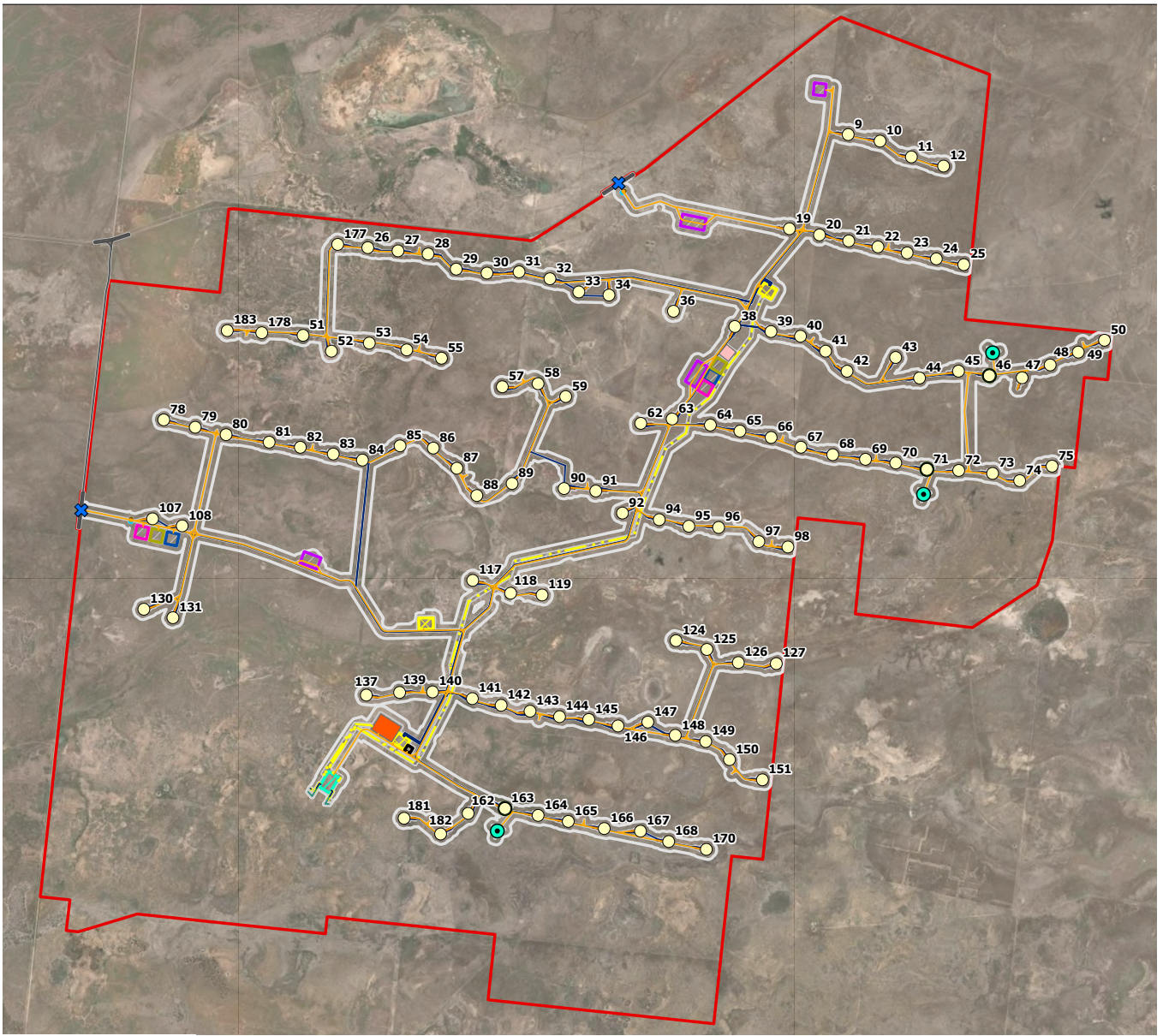


Figure 02 Amended Project Layout
 Basemap Source - ERM, 2025

2.2 Summary of Visual Impacts for the Amended Project

The reduction in visual impacts is attributed to the amended WTG layout, which significantly reduced the total number of WTGs in the north east, south west, south east and along the western boundary of the Project Area. This amended Project decreases the overall horizontal extent of visible infrastructure and results in fewer turbines being visible from key public viewpoints and residences.

The LVIA prepared in 2024 determined two non-associated dwellings are located within the black line of visual magnitude (3,900 m) and would have a moderate visual impact rating (Dwelling 19 and Dwelling 99). The amended layout results in a reduced number of turbines being visible from these two dwellings (see wire frame diagram in Appendix A). The amended layout results in a reduced extent of visibility as a result of the removal of turbines along the western boundary of the project.

The results of the LVIA prepared by Moir in 2024 should be considered as a conservative assessment given the significant reduction of WTGs.

3.0 Night Lighting Considerations

This Section addresses the following submissions:

NSW Dark Sky Planning Guidelines (DPE, 2023) are utilised as a guide in designing adequate lighting to avoid excessive light spill into the night sky to protect Yanga SCA night sky values where possible.

3.3 National Light Pollution Guidelines for Wildlife (DCCEEW, 2023) to ensure adequate design and consideration of the natural (biodiversity) values attributed to Yanga SCA and ensure:

(a) aviation hazard lighting on WTGs and meteorological masts (referred to as wind monitoring towers (WMTs) as advised by Civil Aviation Safety Authority (CASA) is appropriately designed and operated.

(b) internal project lighting installed at the substations and other buildings for occupation (Workers Accommodation Camp), night work, security and emergency operational purposes are designed to reduce light pollution and excessive light spill on to Yanga SCA.

3.1 Aviation Lighting

At the time of preparing the EIS, the Aviation Impact Assessment for the Project determined obstacle lighting of turbines was not a requirement for the Project. During the exhibition phase of the Project, Civil Aviation Safety Authority (CASA) reviewed the Project and provided a recommendation that the obstacle lighting be installed on the nacelle of turbines with a 200 candela intensity. Below is an excerpt from CASA's submission (dated 23/05/2024):

International standards require 2,000 candela lighting intensity on the nacelle (also recommended in the NASF guideline) and 200 candelas at the mid-point of the turbine mast. CASA recommends that 200 candela as a minimum intensity lighting on the nacelle (200 would suffice (due mainly to the lack of background lighting in the vicinity of the turbines).

As the Aviation Safety regulator, CASA does not consider the visual impact of obstacle lighting on neighbours / homesteads. However, there are mitigations for visual impact such as baffling and intensity control (as described in the Aviation Impact Assessment Table 10 / Page 57 'Effect of obstacle lighting on neighbours').

The visibility of an obstacle light depends on various factors, including distance, environmental conditions (e.g., darkness, fog, or atmospheric clarity), the observer's vision, and the angular position of the light. It is acknowledged that lighting impacts can extend beyond the light source itself (i.e. through glow and light spill). Aviation obstacle lighting is intentionally designed to ensure visibility for aircraft rather than ground-level observers. The focus on airspace visibility aligns with regulatory safety requirements and minimises unnecessary light spill or pollution toward the ground. While it is acknowledged that light spill and glow can extend beyond the immediate area of the light source, the intensity of these effects diminishes rapidly with distance.

The amended WTG layout has created a minimum 1.2 km setback from the eastern boundary of the Yanga SCA. No significant lighting impacts resulting from aviation lighting are anticipated at the Yanga SCA, as shielding is proposed to prevent light spill, in accordance with the principles set out in the LVIA. As shown on **Figure 03**, between 1,134 m and 2,286 m of the lit turbines, only 5% of the nominal light intensity would be visible. Prior to construction, a lighting plan will be prepared in accordance with National Airports Safeguarding Framework (NASF) Guideline D and in consultation with CASA. This lighting plan will identify which WTGs will require obstacle lighting, as it is expected that not all WTGs will require obstacle lighting.

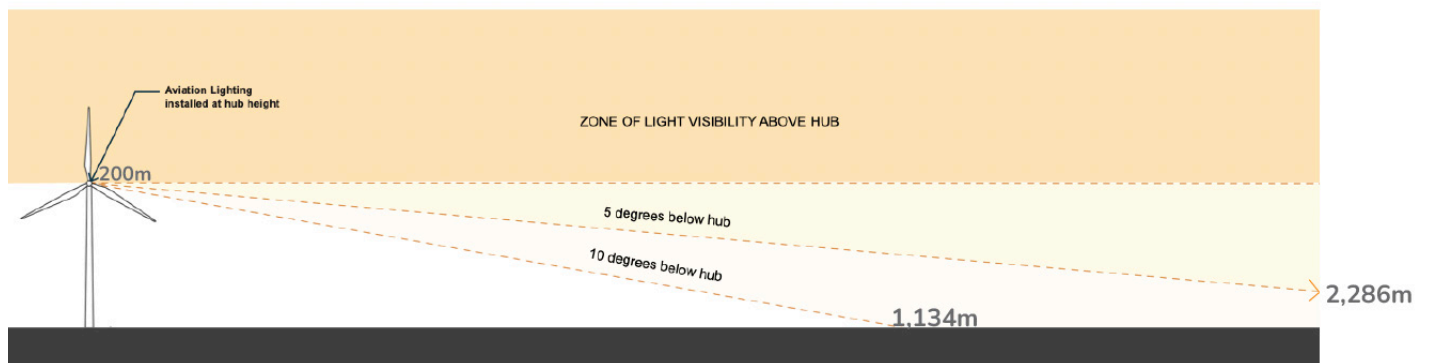


Figure 03 Light shielding recommendation

3.2 Ancillary Lighting

Security lighting will be required within the substation and switch yard compounds, as well as the Operations and Maintenance Facilities (O&M), Accommodation compound and construction compound. These facilities will be located at least 5 kilometres (km) east of the Yanga SCA boundary. The light sources at these facilities will be limited to low-level lighting for security, night time maintenance and emergency purposes. There will be no permanently illuminated lighting installed, any lighting will be temporary, intermittent (like motion-activated lights), or turned on and off as needed. Lighting will be designed in accordance with the requirements of AS4282:2023 and the National Light Pollution Guidelines for Wildlife.

Security lighting at the permanent facilities will be designed and installed to comply with AS 4282 Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 2019) and with regard to the National Light Pollution Guidelines for Wildlife (Commonwealth Department of the Environment and Energy (former), 2020).

4.0 Oakhampton Cottage

NPWS staff accommodation (residential sites) Oakhampton cottage and Oakhampton Irrigation cottage are located over 15 km west of the Project (refer to **Figure 04**). A wire frame diagram has been prepared from the Oakhampton Cottage site to demonstrate the potential worst case visibility of the Project (noting that it is prepared using topography alone). This is provided in **Appendix A**. At this distance and considering the existing intervening vegetation that surrounds the cottage (see **Figure 05**), the visual impact has been assessed as negligible.



Figure 04 Oakhampton Cottage Location
Basemap Source - Google Earth, 2025



Figure 05 Oakhampton Cottage Aerial Image
Basemap Source - Google Earth, 2025

5.0 Shadow Flicker Impacts on Yanga SCA

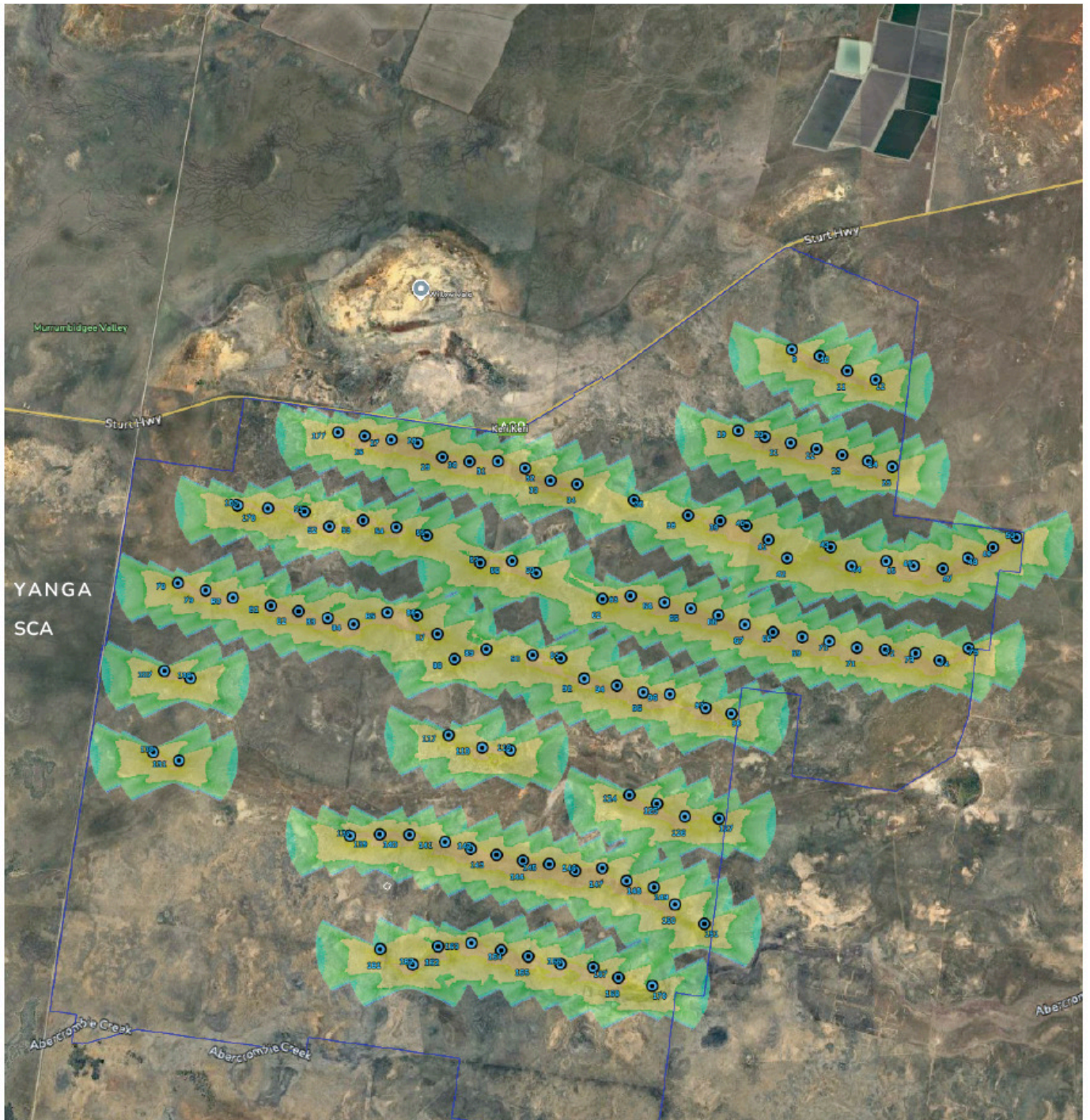
“Provide for an assessment of shadow flicker on Yanga SCA and effects on the values of Yanga SCA, especially natural (biodiversity) values and Keri Keri Road safety (as used by NPWS staff, Yanga SCA visitors and commercial operators.”

A shadow flicker assessment has been prepared for the amended project layout to determine the level of shadow flicker likely to be experienced in the Yanga SCA. Due to the removal of turbines along the western boundary of the Project Area, there is a setback of approximately 1.2 km from the western boundary of Yanga SCA to the nearest WTG.

In accordance with the Wind Energy Guidelines (2024), the first step when assessing potential for shadow flicker is to determine the extent of shadows from the turbines based on 265 m x maximum blade chord length (the distance from the front edge of the blade to the back edge of the blade). The maximum blade chord length for this Project is 4.3 m and therefore the setback for shadow flicker assessment is 1,139.5 m from the WTG.

Shadow flicker modelling was conducted using WindPRO software, applying conservative, worst-case assumptions. The modelling extent was defined by a 1,139.5 m radius (265 x blade chord length of 4.3 m), beyond which shadow flicker is not considered perceptible.

The revised shadow flicker assessment is provided in **Figure 06**. The figure demonstrates the WTGs are sufficiently setback from Yanga SCA to ensure no perceivable shadow flicker is experienced.



Legend



Figure 06 Shadow Flicker Assessment - Amended Project Layout
 Basemap Source - Google Earth, 2025

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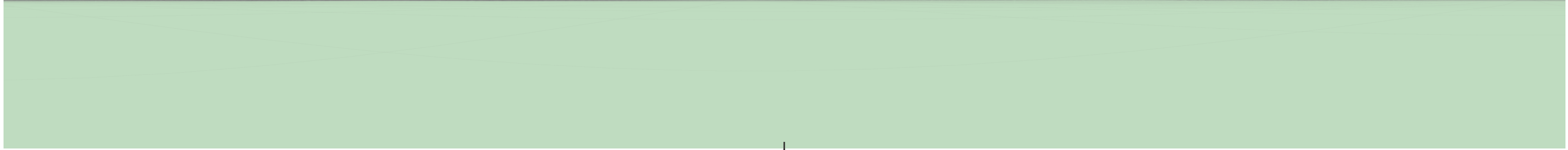
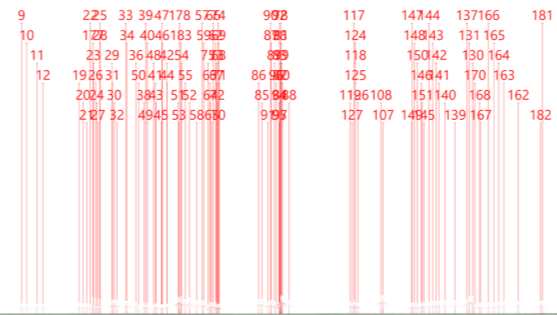
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Appendix A
Wire frame Diagrams -
Oakhampton Cottage & Dwelling19

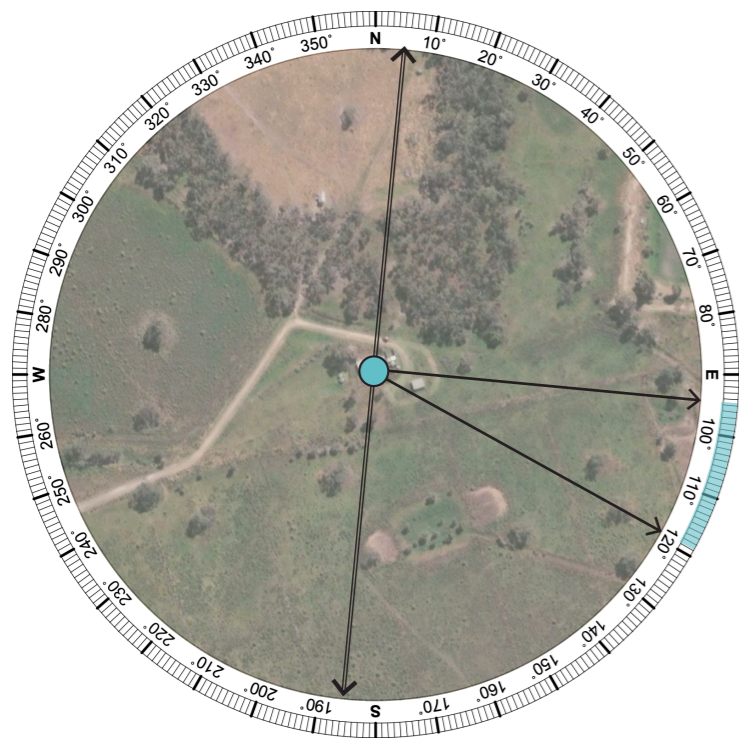
Viewpoint ID:

Oakhampton



180° Proposed View - Wireframe

Extent of Potential Visibility



Viewpoint Summary:

Location:

Sturt Highwat Yanga, NSW

Coordinates: Elevation:

143°43'45.59" 67 m

34°43'12.30"S

Viewing Direction: Distance to Turbine

East 15.67 km

Project layout:

IPAUSNSWXXKER20250819

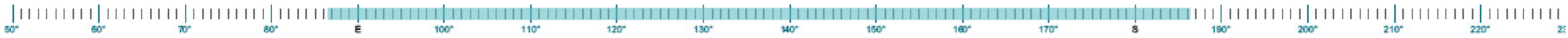
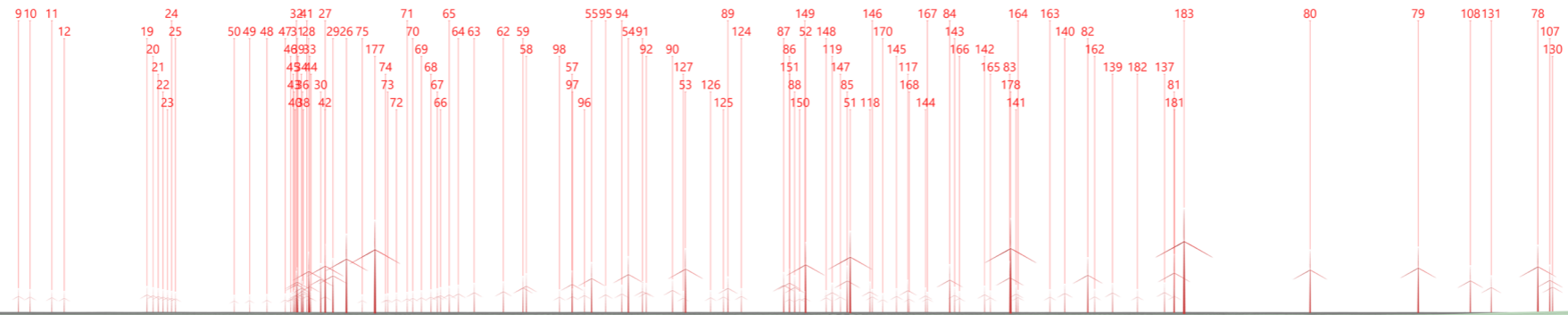
Base Map Sources: ESRI 2025



Viewpoint Location

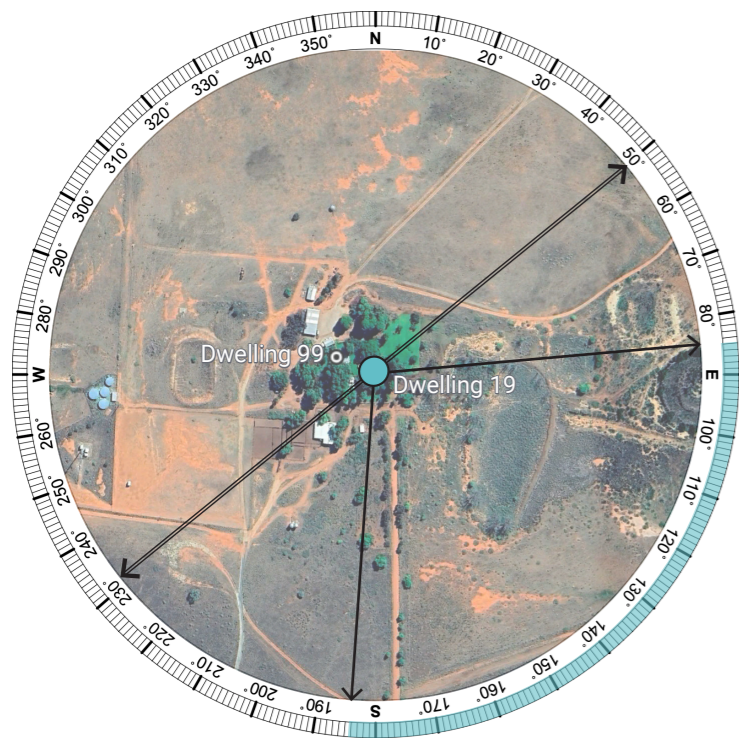
Dwelling ID:

Dwelling 19



180° Proposed View Amended Layout - Wireframe

Extent of Potential Visibility



Viewpoint Summary:	
Location: Dwelling 19 (Also representative of Dwelling 99)	
Coordinates: 34°43'8.29"S 143°53'59.41"E	Elevation: 75m
Viewing Direction: South East	Distance to Nearest WTG 2.43 km
Project layout: IPAUSNSWXXKER20250819	

Base Map Sources: ESRI 2025



Viewpoint Location