# Hexham Wind Farm

## Landscape and Visual Impact Assessment

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# Contents

# Executive Summary

Moir Landscape Architecture Pty Ltd (t/a and hereafter referred to as Moir Studio) have been commissioned by Hexham Wind Farm Pty Ltd to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Hexham Wind Farm (the Project). This LVIA forms part of an Environment Effects Statement (EES) process. The EES is to be prepared in accordance with the Scoping Requirements issued by the Department of Transport and Planning (DTP) [formerly known as DELWP]. The evaluation objective for landscape and visual is *to "avoid and, where avoidance is not possible, minimise and manage potential adverse effects on landscape and visual amenity."*

The Site is located in southwest Victoria, approximately 3 km south west of Hexham and 15 km west of Mortlake. The Project includes the construction, operation and decommissioning of a wind farm with an estimated capacity 741 Megawatts (MW) and a maximum blade tip height of up to 260 metres.

In addition to the wind turbines, ancillary infrastructure including access tracks, road upgrades, underground electricity cabling, overhead power lines, terminal substation and switchyard, battery energy storage system (BESS), quarrying location, concrete batching plants, operations and maintenance facility and grid connection to the adjacent 500 kV transmission line have been assessed in this LVIA.

Relevant literature and best practice guidelines relating to visual impact assessment have been considered to formulate a quantitative study method. Moir Studio's previous experience undertaking Landscape and Visual Impact Assessments on large scale infrastructure projects has also been applied in the Study Method.

Field work was undertaken by Moir Studio to develop a baseline against which the Project has been assessed. The assessment determined the regional landscape character is typical of the Western Volcanic Plain characterised by agricultural land predominantly utilised for grazing, with some areas of remnant vegetation. The landscape was categorised into six (6) Landscape Character Units (LCUs).

Although the landscape is predominantly flat and cleared, landscape features which form a part of the existing landscape character would assist in reducing the potential for viewing the Project. These include large areas of roadside vegetation, windbreak planting and riparian vegetation associated with creeklines. The assessment found the Project could be undertaken whilst maintaining the key visual features of the landscape.

A total of 37 public viewpoint locations were selected to assess the potential visual impacts from varying distances, landscape character units and viewing directions. A quantitative methodology was applied to assess the visual impact from each of these locations which found:

- Three (3) public viewpoints were assessed as having Nil visual impact ratings.
- 25 public viewpoint locations were assessed as having a Low visual impact rating.
- Two (2) public viewpoint locations were assessed as having a Moderate-Low visual impact rating.
- Seven (7) public viewpoint locations were assessed as having a Moderate visual impact rating.

A total of 27 non-involved dwellings were selected within 3,000 m to assess the potential visual impacts. Site inspections and desktop assessment identified:

- Two (2) non-involved dwellings have the potential for a high visual impact
- Seven (7) non-involved dwellings have the potential for a moderate visual impact
- 18 non-involved dwellings were assessed as having a low visual impact rating

Practical and feasible mitigation measures have been proposed for each of the nine (9) non-involved dwellings with a moderate or high visual impact rating. The proposed mitigation methods recommended in the report will assist in significantly reducing the visual impacts resulting from the majority of these dwellings. Mitigation measures in keeping with the existing character include screen planting and supplementary planting with species that are representative of the existing landscape character.

# 01
# Introduction

# 1.0 Introduction

## 1.1 Introduction

Moir Landscape Architecture Pty Ltd (Moir Studio) have been commissioned by Hexham Wind Farm Pty Ltd (the Proponent) to prepare a Landscape and Visual Impact Assessment (LVIA) for the proposed Hexham Wind Farm (referred to hereafter as 'the Project').

The Project will include:

- The construction, operation and decommissioning of a wind farm with an estimated capacity 741 megawatts (MW), a maximum of 106 turbines and a maximum height of up to 260 m (to blade tip); and
- Ancillary infrastructure, including site offices, internal roads, underground cabling, overhead power lines, BESS, a terminal substation and temporary on-site quarry.

This LVIA assessment addresses the scoping requirements received for the project in September 2024 that are relevant to landscape and visual impacts as part of an EES, as required under the *Environment Effects Act*, 1978. The report also supports the planning permit application for the project, as required under the *Planning and Environment Act* 1987.

The report details the results of the field work, documents the assessment of the landscape character and visual setting, and makes recommendations to minimise and manage potential adverse effects on landscape and visual amenity resulting from the proposed development. This information will assist the community and the Department of Transport and Planning (DTP) to understand and assess the likely visual impacts.

This LVIA takes into account the guidelines set by the *Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria*, February 2022.

The landscape and visual impact assessment is broken into two main stages:

***Stage 1:*** A preliminary assessment to understand existing landscape and visual character that would inform the wind farm design process and assist the Minister of Planning in assessing the need for EES.

***Stage 2:*** A detailed assessment as part of the planning and approvals process following the determination of the need for an EES.

This report relates to Stage 2: detailed visual impact assessment phase.

## 1.2 Relevant Experience

Moir Studio is a professional design practice and consultancy specialising in the areas of Landscape Architecture, Landscape Planning and LVIAs. Our team has extensive experience in undertaking LVIAs for large scale infrastructure projects, including the mining industry, sustainable energy sector and commercial developments in visually sensitive areas. Our capabilities include digital terrain modelling, viewshed assessment, photomontage development, landscape character assessment and community consultation. In the context of our experience, we have developed methodologies to ensure a comprehensive and qualitative assessment of the Project. Relevant experience includes the preparation of LVIAs for the following Wind Energy Projects:

- *Darlington Wind Farm* (Darlington, Victoria)
- *Cherry Tree Wind Farm* (Seymour, Victoria)
- *Liverpool Range Wind Farm Modification* (Coolah, New South Wales)
- *Crudine Ridge Wind Farm* (New South Wales)
- *Bodangora Wind Farm* (Bodangora, New South Wales)
- *Capital II Wind Farm* (Bungendore, New South Wales)
- *Uungula Wind Farm* (Wellington, New South Wales)
- *Hills of Gold Wind Farm* (Nundle, New South Wales)
- *Jeremiah Wind Farm* (Adjungbilly, New South Wales)
- *Valley of the Winds Wind Farm* (Coolah, New South Wales)
- *Warracknabeal Wind Farm* (Warracknabeal, Victoria)

## 1.3 Peer Review

This report has undergone an independent peer review by Stephen Schutt, Registered Landscape Architect and a Director of Hansen Partnership in September 2025. The purpose of the peer review was to ensure technical accuracy, completeness, and alignment with relevant standards. All comments and recommendations identified through the peer review process have been considered, with appropriate revisions incorporated to address the identified requirements.

# 02

# Study Method

# 2.0 Study Method

## 2.1 Environment Effects Statement (EES) Requirements

A Preliminary landscape and visual impact assessment (PLVIA) was prepared in January 2022 by Landform Architects. The PLVIA accompanied a referral under the *Environment Effects Act 1978* and assisted the Minister for Planning's assessment as to whether an Environment Effects Statement (EES) is required.

The Minister's Reasons for Decision, issued on the 19th April 2022, determined that an EES is required for the Project.

The EES is to be prepared in accordance with the EES Scoping Requirements issued by the DTP. The EES Draft Scoping Requirements evaluation objective for Landscape and Visual is:

*"Avoid and, where avoidance is not possible, minimise and manage potential adverse effects on landscape and visual amenity."*

**Table 1** provides an outline of the EES Scoping Requirements and a summary of where these have been addressed in the LVIA.

## 2.2 Overview of the Study Method

Moir Studio have formulated a study methodology based on best practice guidance and with consideration of previous experience on large scale infrastructure projects and relevant literature and guidelines relating to large scale energy projects.

Extensive field work and photographic survey work for the study was undertaken in April and May 2023 from public and private properties.

| Landscape and Visual Impact Assessment Report Structure: | | |
|---|---|---|
| | **Requirement relevant to landscape and visual** | **Sections where requirements are addressed:** |
| KEY ISSUES | • Potential for nearby residents / communities to be exposed to significant effects to the visual amenity, including blade glint and shadow flicker, from project infrastructure. | • Section 8.0 and 9.0 and Appendix A and B. Shadow flicker and blade glint assessment has been undertaken by others (refer to separate report). |
| | • Potential effects on landscape, including significant volcanic and other landforms, through removal or covering of features or reshaping of surfaces. | • Section 14.0 |
| | • Potential cumulative impacts of other operating and approved wind farms on landscape values of the region. | • Section 12.0 |
| EXISTING ENVIRONMENT | • Characterise the landscape character, features and values of the project area. | • Section 6.0, 7.0 and 11.0 |
| | • Identify public and private view sheds to and from the project and characterise visual values of the area, including dark skies. | • Section 6.0, 7.0 and 11.0 |
| | • Identify existing built features within the landscape (e.g. Salt Creek Wind Farm, Dundonnell Wind Farm, Mortlake South Wind Farm, 500 kV powerlines and other transmission lines) and their impact on the existing landscape and visual setting. | • Section 12.0 and 13.0 |
| | • Identify the components of the project that may result in a significant visual amenity effect. | • Section 8.0 and 9.0 and Appendix A and B. Shadow flicker and blade glint assessment has been undertaken by others (refer to separate report). |
| LIKELY EFFECTS | • Assess the landscape and visual effects of the project, including on public and private views, and effects of blade glint and shadow flicker on neighbouring dwellings and communities. Use photomontages, maps and other visual techniques to support the assessment. | • Section 8.0, 9.0 and 10.0 and Appendix A, B and C. |
| | • Assess the potential for cumulative impacts associated with the development of the project in the context of existing built infrastructures and nearby proposed/approved wind farm developments. | • Section 12.0 |
| DESIGN AND MITIGATION | • Outline and evaluate any potential design and siting options that could avoid and minimise potential effects on landscape and visual amenity of neighbouring residences and communities and additional management strategies that may further minimise potential effects. | • Section 13.0 and 15.0 |
| PERFORMANCE | • Describe proposed measures to monitor residual effects on landscape and visual amenity values, including in the context of potential rehabilitation and restoration work post-construction and following decommissioning. | • Section 15.0 and Appendix A |
| | • Describe contingency measures to be implemented in the event unforeseen adverse residual effects on landscape and visual amenity are identified requiring further management. | |

**Table 1** EES Scoping Requirements

## 2.3 Report Structure

The flow chart on the following page provides a high level overview of the LVIA process utilised to undertake the assessment.

The project methodology is derived from Moir Studio's experience and current best practice in landscape and visual impact assessment. Detailed methodologies for each part of the assessment have been included in the relevant chapters of the report.

## 2.4 Additional Literature

The following literature has assisted in the formulation of the study methodology and where relevant has been referenced in the report:

- Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria, (2022).
- Scottish Natural Heritage, Visual Representation of Wind Farms - Good Practice Guidance (2017)
- Environment Protection and Heritage Council, Draft National Wind Farm Development Guidelines (2010)
- Landscape Institute and Institute of Environmental Management & Assessment, Guidelines for Landscape and Visual Impact Assessment Third edition (2013)
- Clean Energy Council, Best Practice Guidelines for Wind Energy Development (2018)
- South West Victoria Landscape Assessment Study: Regional Overview Report (2013)
- Transport for NSW Guideline for landscape character and visual impact assessment (2023)
- Ministerial Guidelines for Assessment of Environment Effects under the Environment Effects Act 1978 (2006)

## 2.5 Policy Considerations

### 2.5.1 Local Government Policies

The Project is located within the extents of the Moyne Shire Local Government Area (LGA). Relevant local government policies outlined in the Moyne Shire Council Planning Scheme, last updated in 2023, have also been considered.

With specific reference to the proposal of a wind energy facility in the Moyne LGA, Clause 52.32 of the Moyne Planning Scheme specifies that all land within 5 km of the high water mark of the coast east of the urban area of Warrnambool is prohibited from wind energy facility development (Moyne Shire Council, 2023).

**Section 5.0** of this report provides an overview of the zoning designations and sensitive landscape overlays specific to Moyne Shire Council (Refer to **Sections 5.2 - 5.6**).

### 2.5.2 Civil Aviation Safety Authority

The LVIA includes an assessment of potential visual impact associated with night lighting in accordance with the Civil Aviation Safety Authority (CASA). Refer to **Section 11.0** of this LVIA.

## 2.6 Landscape and Visual Impact Assessment (LVIA) Process

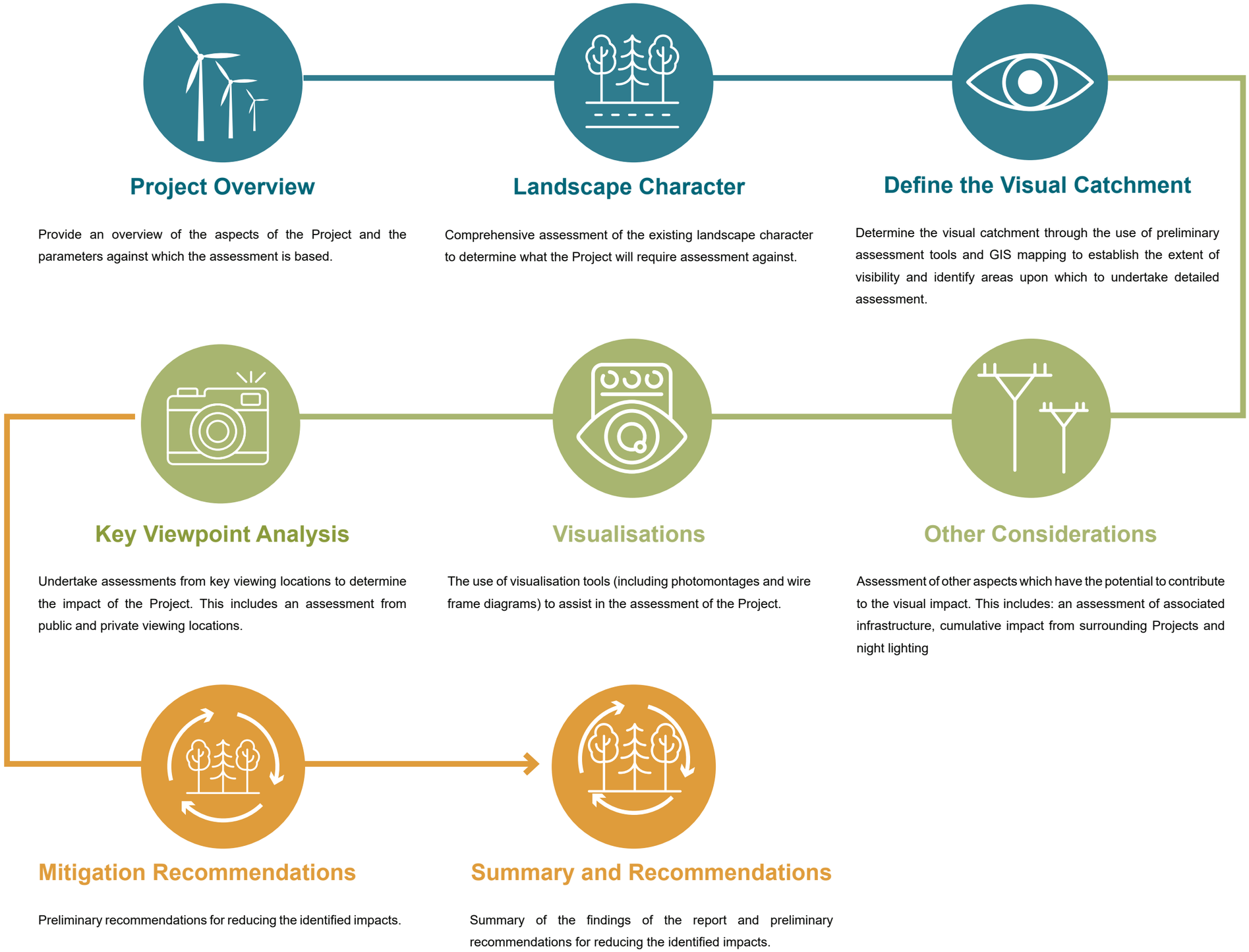


**Figure 1** Landscape and Visual Impact Process

# 03

# Project Overview

# 3.0 Project Overview

## 3.1 Regional Context

The Project Site is located in south-west Victoria, approximately 15 kilometres west of Mortlake, 4 kilometres to the south of Caramut and 15 kilometres north-east of Woolsthorpe. Hexham is the nearest settlement, approximately 3 kilometres to the north-east of the site. The site is bound by the Hamilton Highway to the north, Woolsthorpe-Hexham and Hexham-Ballengeich Roads to the east, Gordons Lane to the south and Warrnambool- Caramut Road to the west. The site covers approximately 16,000 hectares of relatively flat private and public land located within the Moyne Shire local government area (see Figure 2).

The Project Site is located within Victoria's South-West Renewable Energy Zone (REZ) which is generally located in the southwestern Victorian Plains region. The flat, planar topography and minimal obtrusive elements across this landscape allow efficient and optimal harvest of wind energy. The Project is therefore strategically located in a broad area identified as suitable for a renewable energy projects.

The landscape is characterised by gently undulating agricultural land which has been subject to extensive vegetation clearing and is predominantly utilised for grazing activities. The Project is located to the south of Hamilton Highway and the east of Warrnambool-Caramut Road. The closest towns are Hexham, Caramut, Mortlake and Ellerslie.

The site is within close proximity to the proposed Mt Fyans Wind Farm, Darlington Wind Farm, the operating Mortlake South, Salt Creek, Mortons Lane and Dundonnell Wind Farms, the approved Woolsthorpe Wind Farm, and the completed Hawkesdale Wind Farm (see Figure 2).

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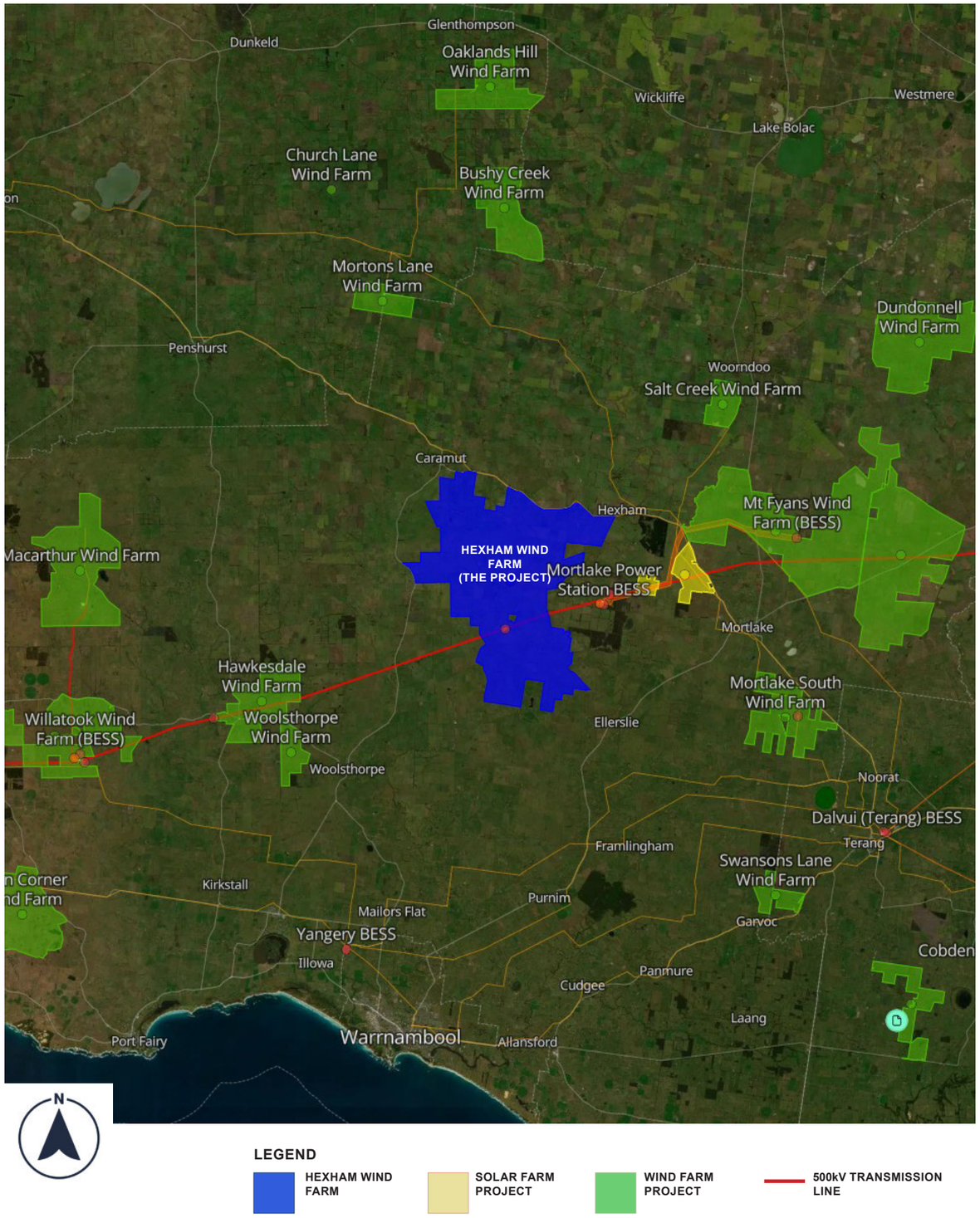


**Figure 2** Regional Context (Map Source: RenewMap 2024e)

## 3.2 The Study Area

The Study Area refers to the land associated with and surrounding the Project. For the purpose of this report, the Study Area for dwellings have been defined as 6 km from the Project, and 15 km radius around the Project for landscape character assessments (refer to rationale in **Section 6.1.3**), however assessment of land outside of this radius will be undertaken as necessary. **Figure 3** provides an aerial view of the Project Site.

## 3.3 The Project Site

For the purposes of this report, the Project Site refers to the land associated with the Project within the Project boundary. Most of the site has been cleared of native vegetation to support farming although scattered trees and tracts of dense windbreak vegetation are common within and around the Project (see **Figure 3**). The Project Site ranges from between 100 m and 150 m above sea level with a gently undulating topographic character that is consistent with the character of this region. There are several creeks and drainage lines that cross the site including Mustons Creek, Drysdale Creek, Tea Tree Creek and Limestone Creek. Further detail on these features are provided in Section 5.0. The site is currently used for agricultural purposes (predominantly for sheep and cattle grazing).


**Figure 3** Aerial Image of the Site (Map Source: Google Maps 2022)

## 3.4 The Project

The Project will deliver much needed renewable energy to the region. It will support the reduction of carbon emissions and assist Australia in achieving the net-zero emissions target. The proposal will comprise up to 106 wind turbines, providing a total generation capacity of up to 741 MW.

The Project comprises of the following:

- Up to 106 individual wind turbines with an approximate maximum blade tip height up to 260 m;
- Internal unsealed tracks for turbine access;
- Upgrades to local road infrastructure including up to 12 access points;
- A terminal substation, including metering, electrical switching, control and transformation equipment to connect to the adjacent 500kV transmission line;
- Approximately 40km of 33kV overhead powerlines (with 25m high poles to connect to the project terminal substation;
- Approximately 124km of underground cabling connecting turbines;
- BESS (delivery capacity TBC)
- Temporary facilities including a concrete batching plant during the construction phase, on-site quarry facility, construction compounds, site offices, storage and component laydown areas;
- Up to 5 permanent wind monitoring anemometry masts;
- Potential for obstacle lighting to selected turbines;
- Potential for native vegetation removal in some areas and additional vegetation planting to provide screening.

# The Project

## Proposed Hexham Wind Farm

**LEGEND**

- Project Boundary
- Proposed 260 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- Main Road
- Minor Road
- National Park / Nature Reserve

N

0 2 4 6 8 10km

**Figure 4** The Project (Source: VicPlan 2023)

## 3.5 Wind Turbine Design

The final turbine model will be selected in the detailed design phase post approval. This report considers the proposed turbines with a maximum blade tip height of 260m as a worst case scenario, including:

- A generating capacity of 7 MW;
- A tubular steel tower holding the nacelle;
- Three blades mounted to a rotor hub on a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of up to 260 m AGL;
- A gearbox and generator assembly housed in a nacelle; and
- Adjacent hardstands for use as crane pads and assembly and laydown areas.

**Table 2** provides an overview of dimensions of the turbine components that have been used for this assessment. To best represent a worst case scenario, the maximum hub height of 170 metres has been used for modelling and visualisation purposes in this report. **Figure 5** illustrates the turbine parameters utilised for this report. **Image 1** shows the appearance of a typical wind turbine.

| Wind Turbine Components | | |
|---|---|---|
| **Project Component** | **Dimensions used in LVIA:** | **Quantity** |
| Uppermost Blade Tip | 260 metres AGL | 106 |
| Tower (hub) height | Up to 170 metres | |
| Blade length | Up to 95 metres (including nacelle) | |
| Swept Area | 25,446 m | |

**Table 2** Wind Turbine Parameters for Visual Assessment

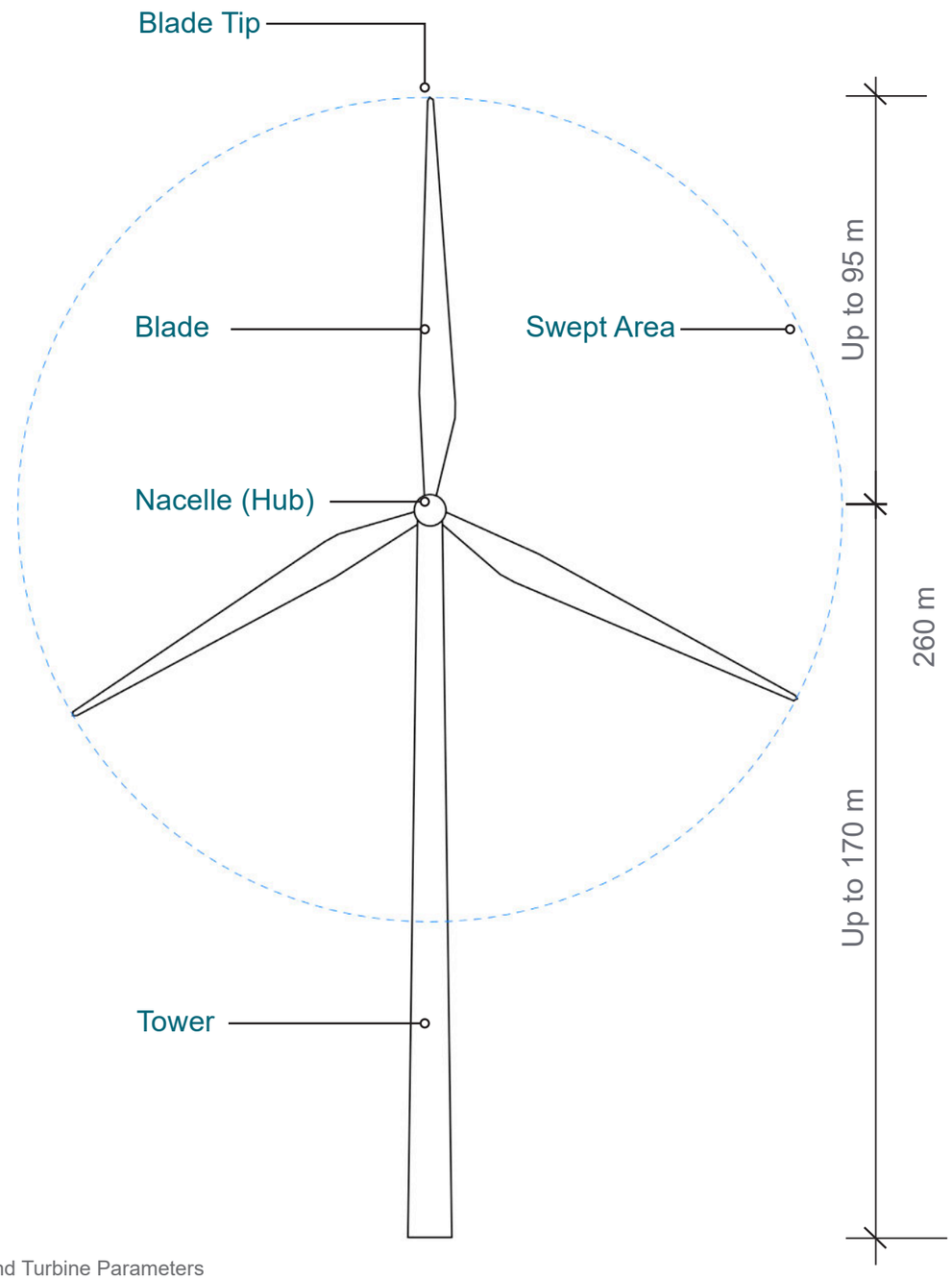


**Figure 5** Wind Turbine Parameters

## 3.6 Associated Infrastructure

In addition to the turbines, the following provides an overview of the permanent associated infrastructure components proposed for the Project which may contribute to the visual impact. An overview of the assessment of the potential visual impacts resulting from the associated infrastructure has been provided in **Section 13** of this report.

| Associated Infrastructure | |
|---|---|
| **Project Component** | **Description** |
| **On-site substation** | Construction of on-site electrical terminal substation |
| **Overhead transmission lines** | 33 kV lines approximately 40 km in length |
| **Internal & external roads** | Upgrade to existing local road infrastructure and internal unsealed tracks |
| **Meteorological monitoring masts** | Five (5) permanent Wind monitoring masts up to 150m high |
| **Battery storage facility** | Battery storage (Capacity TBC) |

**Table 3** Associated Infrastructure

The following temporary elements will be required during construction of the Project:

- Construction compounds;
- Laydown areas;
- On-site quarry facility;
- Site offices; and
- Concrete batching plants.

UPDATE

**Image 1** Typical Wind Turbine Design (Gullen Range Wind Farm)

**Image 2** Typical Substation (Source: NGH)

**Image 3** Crane Hardstand Area (Source: NGH)

**Image 4** Transmission Line (Source: NGH)

**Image 5** Operations and Maintenance Facility (Source: NGH)