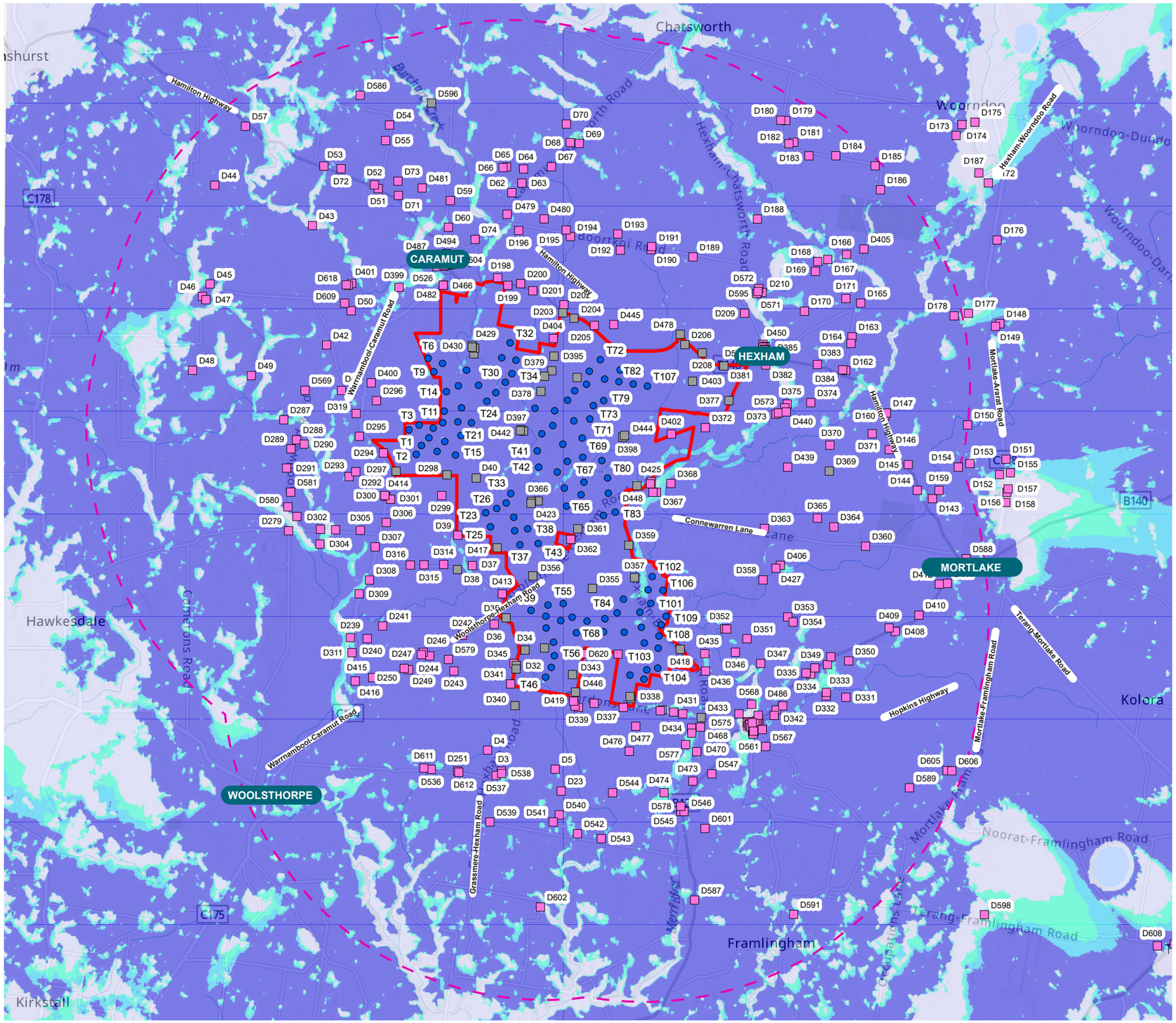


Figure 15 Zone of Visual Influence (Blade Tip Height 260 m) (Base Map Source: VicPlan 2023)

Zone of Visual Influence Blade Tip Height: 260 m

Hexham Wind Farm

LEGEND

- Project Boundary
- Proposed 260 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- 15,000 m from nearest turbine
- Main Road

ZVI Number of Visible Turbines (at blade tip):

- **0**
- **1 - 26**
- **27 - 53**
- **54 - 79**
- **80 - 106**

Note:

The ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. a landscape without screening, structures or vegetation. As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.

N

0 3 6 11 km

08

Public Viewpoint Analysis

8.0 Public Viewpoint Analysis

8.1 Overview of Public Viewpoint Analysis

A total of 37 viewpoints were taken from public locations during the field work process. Viewpoints have been carefully selected to be representative of the range of views within the Study Area. The selection of viewpoints is generally informed by the topographical maps, field work observations and other relevant influences such as access, residences, landscape character and the popularity of vantage points. Viewpoints are selected to illustrate a combination of the following;

- Viewpoints identified by the community through consultation process,
- Present landscape character types,
- Areas of potentially high landscape or scenic quality,
- Range of distances,
- Varying aspects and elevations,
- Varying extent of wind farm visibility (full and partial visibility), and
- Sequential views along specific routes.

It is important to note that viewpoints for this LVIA study have been taken predominantly on accessible public land (typically roads) which were identified as having a high or moderate potential for visibility of the Project.

The viewpoint locations assessed for the Project have included key viewpoints identified through assessment of the existing landscape character. Additional public viewpoint locations were also assessed as representative viewpoints for non-associated dwellings within 3,000 m - 6,000 m of the Project.

Selected viewpoint assessment locations are shown on **Figure 16**.

8.2 Public Viewpoint Analysis Methodology

Once the viewpoints had been selected, panoramic photographs are taken in accordance with the standards outlined in the Scottish Natural Heritage Visual Representation of Wind Farms Guidance Version 2.2.

Photographs used for viewpoints are taken on a level tripod at a height of 150 cm (to represent eye level). Photographs were taken with a Canon EOS 5D Mark IV Full Frame digital SLR through a 50mm fixed focal lens which closely represents the central field of vision of the human eye. Parameters for the photography is provided in **Table 8**.

The visual impact of the Project from each viewpoint was assessed through a combination of on-site investigation and a preliminary desktop assessment, which utilised topographic and aerial imagery to ensure accuracy.

The locations of the viewpoints have been identified in **Figure 17** and the general viewing direction of each viewpoint is identified on the map on each viewpoint.

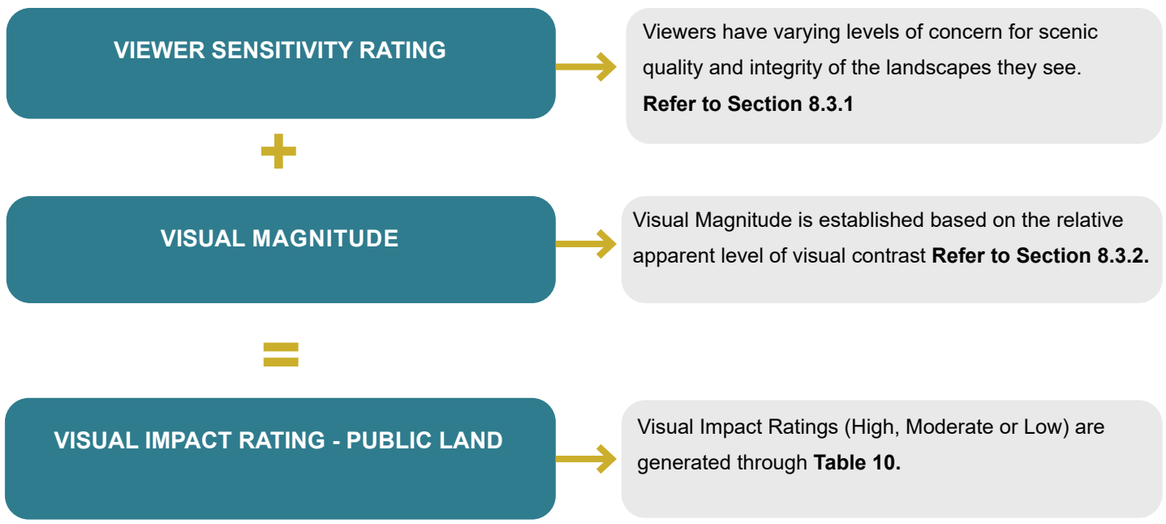
Viewpoint analysis prepared for the Project from public locations has been included as Appendix B.

Photography Specifications:	
Camera Make and Model:	**Canon EOS 5D Mark IV Full Frame Digital SLR**
Lens:	**EF50mm f/1.2L USM**
Focal Length:	**50mm f/0**
Aperture Setting:	**f/6.3 - 10**
Tripod Height:	**150cm**

Table 8 Photography Specifications

8.3 Public Viewpoint Study Method

The visual impact assessment for each public viewpoint location is assessed based on the relationship between the visual sensitivity (refer to **Section 8.3.1**) and visual magnitude (refer to **Section 8.3.2**). The following section provides an overview of the methodology implemented to determine the level of visual impact at each public viewpoint location.



8.3.1 Visual Sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape is viewed by people from different areas. The assessment is based on the number of people affected, land use, and the distance of the viewer from the proposal (Transport for NSW, 2020).

For example, a significant change that is not frequently seen may result in a low visual sensitivity although its impact on a landscape may be high. Generally the following principles apply:

• Visual sensitivity decreases as the viewing time decreases.
• Visual sensitivity decreases as the number of potential viewers decreases.
• Visual sensitivity can also be related to viewer activity (e.g. A person viewing an affected site whilst engaged in recreational activities will be more strongly affected by change than someone passing a scene in a car travelling to a desired destination).

8.3.2 Visual Magnitude

Visual magnitude refers to the extent of change that will be experienced by receptors. Factors that are considered when assessing the magnitude of change include:

- the proportion of the view / landscape affected;
- extent of the area over which the change occurs;
- the size and scale of the change;
- the rate and duration of the change;
- the level of contrast and compatibility.

(Source: AILA, 2018)

8.3.3 Visual Impact

Visual impact refers to the change in appearance of the landscape as a result of development. (EPHC, 2010). Visual impact is the combined effect of visual sensitivity and visual magnitude. Various combinations of visual sensitivity and visual magnitude will result in high, moderate and low overall visual impacts as suggested in **Table 9** below (Transport for NSW, 2023).

VISUAL IMPACT RATING					
		VISUAL MAGNITUDE			
		HIGH	MODERATE	LOW	NEGLIGIBLE
VISUAL SENSITIVITY	HIGH	HIGH	HIGH-MODERATE	MODERATE	NEGLIGIBLE
	MODERATE	HIGH-MODERATE	MODERATE	MODERATE-LOW	NEGLIGIBLE
	LOW	MODERATE	MODERATE-LOW	LOW	NEGLIGIBLE
	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE	NEGLIGIBLE

Table 9 Visual Impact Rating Table (Adapted from Transport for NSW, 2023)

Public Viewpoint Analysis Locations

Hexham Wind Farm

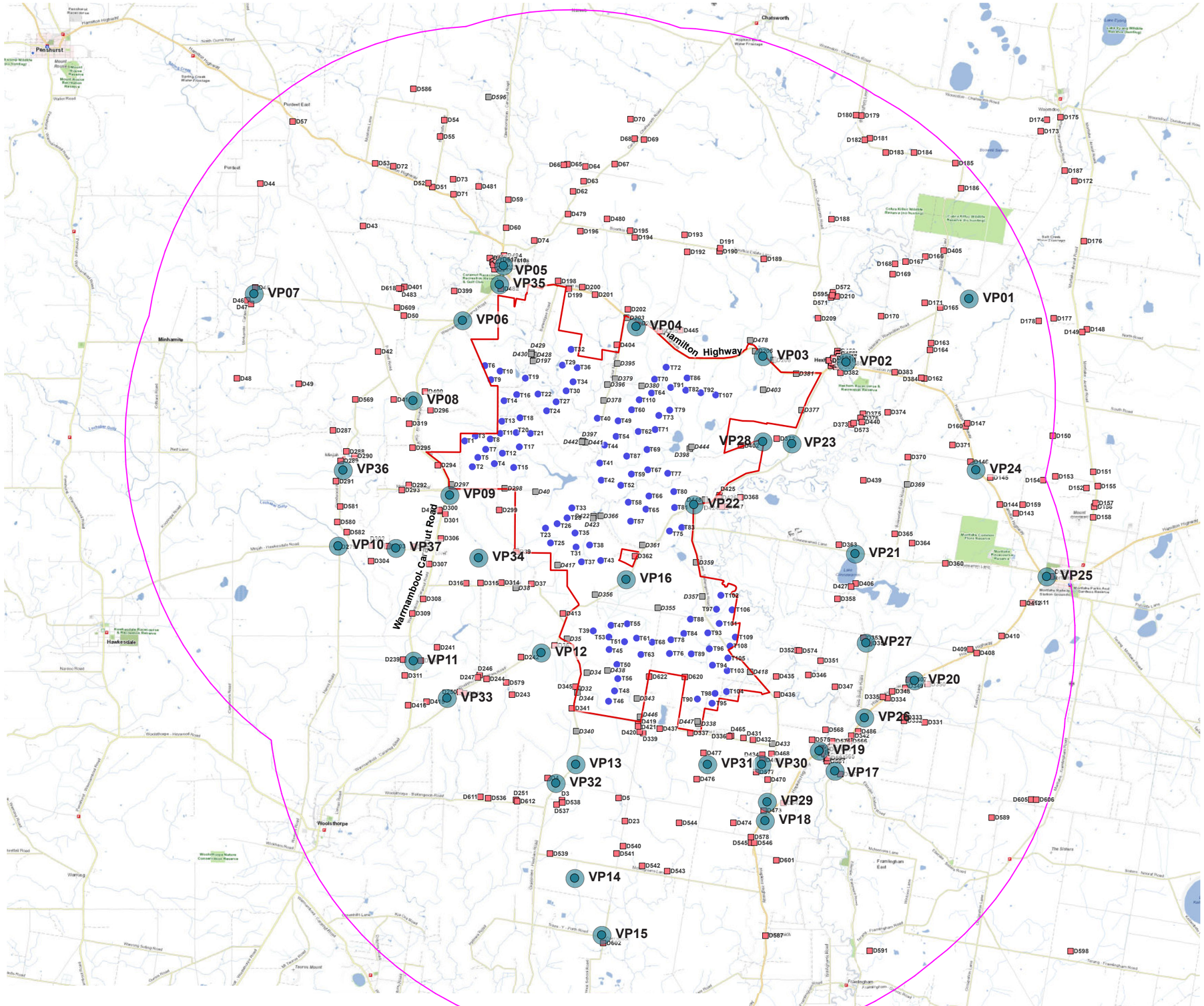


Figure 16 Public Viewpoint Analysis Locations (Source: VicPlan 2023)

8.4 Summary of Public Viewpoint Analysis

The 25 public viewpoints assessed for the purpose of this PLVIA were taken from varying distances and locations surrounding the Project. A summary of the visual impact ratings for each of the public viewpoint location assessed has been provided as **Table 10** and the assessment details can be found in **Appendix B**.

Of the 37 viewpoints:

- 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.

Generally, those with a visual impact rating of Moderate are due to the higher visual magnitude which is determined by the magnitude of change to the existing landscape character. Only two (2) viewpoints have high visual sensitivity, however, due to distance and the intervening vegetation screening views, a Nil visual impact rating was recorded for both.

Summary of Public Viewpoint Analysis

Viewpoint	Location	Distance to Nearest Turbine	Visual Sensitivity	Visual Magnitude	Visual Impact Rating
VP01	Hexham-Woorndoo Road, Hexham VIC	11.92 km	LOW	LOW	LOW
VP02	Hamilton Highway, Hexham VIC	5.53 km	LOW	NIL	NIL
VP03	Hamilton Highway, Hexham VIC	2.79 km	LOW	HIGH	MODERATE
VP04	Intersection of Boorktoi Road and Hamilton Highway, Hexham VIC	2.05 km	LOW	HIGH	MODERATE
VP05	Hamilton Highway, Caramut VIC	4.24 km	MODERATE	LOW	MODERATE-LOW
VP06	Intersection of Minhamite-Caramut Road and Warrnambool-Caramut Road, Caramut VIC	2.38 km	LOW	LOW	LOW
VP07	Minhamite-Caramut Road, Caramut VIC	10.84 km	LOW	LOW	LOW
VP08	Intersection of Purdeet Road and Warrnambool-Caramut Road, Caramut VIC	2.53 km	LOW	LOW	LOW
VP09	Warrnambool-Caramut Road, Minjah VIC	2.05 km	LOW	LOW	LOW
VP10	Minjah-Hawkesdale Road, Minjah VIC	6.89 km	LOW	LOW	LOW
VP11	Warrnambool-Caramut Road, Woolsthorpe VIC	7.96 km	LOW	LOW	LOW
VP12	Woolsthorpe-Hexham Road, Woolsthorpe VIC	2.65 km	LOW	HIGH	MODERATE
VP13	Grassmere-Hexham Road, Ballangeich VIC	2.91 km	LOW	LOW	LOW
VP14	Intersection of Cooramook Lane and Wilsons Lane, Ballangeich VIC	4.21 km	LOW	LOW	LOW
VP15	Maes-Y-Porth Road, Grassmere VIC	10.36 km	LOW	LOW	LOW
VP16	Woolsthorpe-Hexham Road, Ellerslie VIC	1.33 km	LOW	HIGH	MODERATE
VP17	Ellerslie Cemetery, Ellerslie-Panmure Road, Ellerslie VIC	5.77 km	HIGH	NIL	NIL
VP18	Hexham-Ballangeich Road, Ballangeich VIC	5.47 km	LOW	LOW	LOW
VP19	Ellerslie Memorial Park, Ellerslie VIC	4.88 km	HIGH	NIL	NIL
VP20	Hopkins Highway, Ellerslie VIC	7.83 km	LOW	LOW	LOW
VP21	Connewarren Lane, Mortlake VIC	5.98 km	LOW	LOW	LOW
VP22	Intersection of Hexham-Ballangeich Road and Woolsthorpe-Hexham Road, Hexham VIC	0.86 km	LOW	HIGH	MODERATE
VP23	Woolsthorpe-Hexham Road, Hexham VIC	3.98 km	LOW	HIGH	MODERATE
VP24	Hamilton Highway, Mortlake VIC	12.20 km	LOW	LOW	LOW
VP25	Hamilton Highway, Mortlake VIC	13.90 km	LOW	LOW	LOW
VP26	Hopkins Highway, Ellersie VIC	5.73 km	LOW	LOW	LOW
VP27	Delaneys Lane, Ellersie VIC	5.85 km	LOW	LOW	LOW
VP28	Narong Lane, Hexham VIC	2.80 km	LOW	HIGH	MODERATE
VP29	Hexham-Ballangeich Road, Ballangeich VIC	4.78 km	LOW	LOW	LOW
VP30	Hexham-Ballangeich Road, Ballangeich VIC	3.73 km	LOW	LOW	LOW
VP31	Purnim Lane, Ballangeich VIC	3.24 km	LOW	MODERATE	MODERATE-LOW
VP32	Grassmere-Hexham Road, Ballangeich VIC	4.22 km	LOW	LOW	LOW
VP33	Woolsthorpe-Hexham Road, Woolsthorpe VIC	4.93 km	LOW	LOW	LOW
VP34	Bostocks Road, Woolsthorpe VIC	5.98 km	LOW	LOW	LOW
VP35	Warrnambool-Caramut Road, Caramut VIC	3.19 km	LOW	LOW	LOW
VP36	Goodwood Road, Minjah VIC	5.54 km	LOW	LOW	LOW
VP37	Minjah-Hawkesdale Road, Minjah VIC	4.81 km	LOW	LOW	LOW

Table 10 Visual Impact Ratings for Public Viewpoints

09

Dwelling Assessments

9.0 Dwelling Assessments

9.1 Overview of Dwelling Assessment

Section 3.0 of this report defines the 'visual catchment' of this Project and identifies non-involved dwellings within the Study Area that require detailed assessment. Due to the large scale of the Project, relatively flat to gently undulating topography around the Project Site and number of dwellings within the visual catchment, representative dwellings within the Study Area have been assessed to provide an indication of the potential visual impacts from surrounding dwellings.

Dwellings located within 3 km are more likely to experience visual impacts due to their proximity, even where existing vegetation or structures provide some screening. The proponent offered on site visual dwelling assessments for all non-involved dwellings located within 3,000 m of the Project. A detailed dwelling assessment was undertaken for 27 non-involved dwellings. The dwelling assessment locations are presented in **Figure 18**.

These 27 non-involved dwellings are all located within 3,000 metres of the nearest turbine. A summary of the findings from the dwelling assessments can be found in **Table 13**, and the visualisations and details for each dwelling is provided in **Appendix A**.

Desktop assessment and on-site inspections during the field work process identified a number of dwellings within the visual catchment are likely to have limited or no views to the Project due to screening factors such as vegetation and/or existing structures. To assist in the assessment of dwellings between 3,000 - 6,000 m of a turbine, representative public viewpoints have been selected and assessed in **Appendix B**. **Figure 17** provides an overview of the vegetation character around all non-involved dwellings within approximately 6,000 m of the Project.

9.2 Study Method for Dwelling Assessments

Table 11 outlines the methodology used to assess each dwelling within the visual catchment. When assessing visual impacts at private dwellings, it is essential to consider the role of existing vegetation in shaping the landscape character. This vegetation not only contributes to the overall character of the area but also plays a key role in moderating views of the proposed development. While it is acknowledged that vegetation may not provide a long-term solution—due to factors such as seasonal change, growth cycles, or potential removal—it remains an integral part of the current visual environment and must be considered in the assessment..

For the purposes of this assessment, existing vegetation is treated as a defining element of landscape character. Its current screening capacity supports the assumption that it will remain a significant feature in the near future. As such, the assessment considers the proposed project's potential visual impact in relation to this existing vegetated context.

Viewer sensitivity for each dwelling has been determined based on the planning scheme zone applicable to the property. In the absence of specific sensitivity guidelines in Victoria, the NSW Wind Energy Guidelines – Technical Supplement (2024), specifically *Table 02- Viewpoint sensitivity levels and examples*, has been used to inform this component of the assessment (see viewer sensitivity of dwellings assessed in **Appendix A**).

Study Method	Process
Step 1. 3D Assessment (based on topography alone)	Using 3D modelling, Moir Studio identified turbines which will not be visible from the dwelling due to topography. As a result the extent of visibility is generally decreased when compared to the 2D assessment.
Step 2. Aerial Imagery	Information on the extent of visibility extracted from the 3D model is then overlaid onto a recent aerial image of the dwelling and its surrounds. This provides a detailed assessment of the direction and extent of potentially visible turbines and identifies any intervening elements (such as structures, wind break planting or vegetation) which may reduce the potential visibility.
Step 3. Site Inspection	Where access was granted, Moir Studio attended the property to undertake a site inspection to ground truth potential screening factors that were identified on aerial imagery. This included photographic assessment from the dwelling. During the site inspection Moir Studio identified potential intervening elements including vegetation and structures.
Step 4: Photomontage / Wire Frame Diagrams	Where potential impacts were identified, photomontages or wire frame diagrams were prepared from dwellings to represent those with potential impacts or to best represent the appearance of the Project from clusters of dwellings.
Step 5: Visual Impact Rating	A visual impact rating is applied to each dwelling with regards to the parameters outlined in **Section 9.3 (Table 12).**
Step 6: Consideration of mitigation methods	For non-involved dwellings where the Project has the potential to cause visual impact, mitigation methods have been suggested. **Refer to Section 15.**

Table 11 Dwelling Assessment Process

9.3 Visual Impact Rating Methodology

Moir Studio have developed a framework for defining and rating the level of visual impact from each dwelling.

The framework in **Table 12** has been prepared with regards to the third edition of the GLVIA3 (2013), Residential Visual Amenity Assessment (RVAA) and Moir Studio's extensive professional experience in undertaking LVIA's for wind energy projects.

Published in 2013, the GLVIA3 is well established as providing 'best practice guidance' when undertaking an LVIA. RVAA is a stage beyond LVIA and focusses exclusively on private views and private visual amenity. Considerations outlined in the RVVA which provide a framework for describing and evaluating the predicted magnitude of visual change and related visual amenity effects include:

- Distance of property from the proposed development having regard to its size / scale and location relative to the property (e.g. on higher or lower ground);
- Type and nature of the available views (e.g. panoramic, open, framed, enclosed, focused etc.) and how they may be affected, having regard to seasonal and diurnal variations;
- Direction of view / aspect of property affected, having regard to both the main / primary and peripheral / secondary views from the property;
- Extent to which development / landscape changes would be visible from the property (or parts of) having regard to views from principal rooms, the domestic curtilage (i.e. garden) and the private access route, taking into account seasonal and diurnal variations;
- Scale of change in views having regard to such factors as the loss or addition of features and compositional changes including the proportion of view occupied by the development, taking account of seasonal and diurnal variations;
- Degree of contrast or integration of new features or changes in the landscape compared to the existing situation in terms of form, scale and mass, line, height, colour and texture, having regard to seasonal and diurnal variations;
- Duration and nature of the changes, whether temporary or permanent, intermittent or continuous, reversible or irreversible etc.; and
- Mitigation opportunities – consider implications of both embedded and potential further mitigation.

(Source: RVVA, 2019).

VISUAL IMPACT RATING - RESIDENCES

	NEGLIGIBLE	LOW	MODERATE	HIGH
Distance	The project may be partially visible but very difficult to discern due to distance and / or intervening elements.	Turbines may be visible in distance or very partially visible in the foreground.	Turbines maybe visible in the middle ground or a small number may be visible in the near ground.	Turbines are highly visible in the foreground.
Type of views		Views from the dwelling are not focused on the Project.	Views from the dwelling are not focused entirely on the Project.	Views are focused directly towards the Project.
Direction of view		The Project may be visible in peripheral views or form a very minor element in primary views.	The Project may be visible from the dwelling, yet will not dominate primary views.	The Project will be highly visible and has the potential to be a dominant element in primary views from the property.
Extent of visibility		The Project may be partially visible or fragmented.	The Project may be visible from the dwelling yet will not significantly alter the existing visual character.	The Project has the potential to significantly alter the existing visual character when viewed from the dwelling.
Scale of change		The Project may be visible yet will not change to the existing visual character.	The Project has the potential to become a noticeable element in the view, yet will not overly diminish the existing visual character.	The Project has the potential to alter the existing visual character.
Degree of contrast		The Project will have a low level of contrast with the existing landscape.	The Project will result in a moderate level of contrast with the existing landscape.	The scale of the Project will result in a high level of contrast with the existing landscape.
Duration of change		Changes are temporary.	Changes to the landscape have the potential to be reduced over time (with the employment of. mitigation methods).	Changes to the landscape are continuous and / or irreversible.
Mitigation Options		Existing screening factors contribute to reducing the potential visibility.	Some existing screening factors may contribute to fragmenting the Project or there is opportunity to screen the Project.	Limited opportunities to screen the Project.

Table 12 Visual Impact Rating Methodology - Residences

Character of Nearby Dwellings

Hexham Wind Farm

LEGEND

- Project Boundary
- Proposed 260 m Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- 3,000 m from nearest turbine
- 6,000 m from nearest turbine
- Main Road
- Minor Road
- Non-involved Dwellings surrounded by moderate to dense screening vegetation
- Non-involved Dwellings with potential to view the Project

N

0 2 4 6 8 10km

Figure 17 Character of Nearby Dwellings (Source: VicPlan 2023)