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HumeLink

Landscape Character and Visual Impact Assessment

EIS Technical Report 8

HumeLink

EIS Technical Report 8: Landscape Character and Visual Impact Assessment

20 July 2023

Executive summary

Impacts on landscape character

This assessment identified **moderate, moderate-low** to **low** landscape character impacts during construction. The moderate impacts would be on the Great Dividing Range and Upland Forest landscape character zones where there is greater vegetation removal and temporary construction activities. During operation, there would continue to be **moderate**, **moderate-low** and **low** impact on the landscape character of the landscape and visual study area.

Impacts on public domain views

Of the 28 representative public domain views assessed in this technical report, during construction there would be a **moderate** impact in seven locations where there are clear views towards the construction activities, including vegetation removal. There would also be **moderate-low** visual impacts in 15 representative views, with further public domain views assessed as **low** and **negligible**.

During operation, **moderate** visual impacts were identified at five locations, **moderate-low** visual impacts at 14 representative locations and otherwise **low** and **negligible visual** impacts. The **moderate** impacts would continue be in locations close to the project footprint, where there are clear views towards the project, including views with little intervening vegetation and/or where there are no existing transmission line structures visible. This includes the Snowy Mountains Highway, Gocup Road and Brungle Road to the north of Tumut, Cooks Hill Road to the north of Yass and Greendale Church, Broadway.

Scenic or significant vistas and road corridors in the public domain

There are no adverse impacts anticipated on significant vistas within the landscape study area.

In most locations the alignment would cross roads and the highways, rather than be aligned parallel to them, reducing the potential for a visual impact that would be experienced from the public realm for a long duration. Notably, there would be **moderate** visual impacts from the Snowy Mountains Highway, Gocup Road and Brungle Road where the landscape is more open, and the project would be visible across broad valleys and cross elevated hills. These impacts are included in the impacts on public domain views.

Air traffic

There would be a **moderate** and **moderate-low** visual impact in views from the air during construction, as the project would be visible from recreational flights operating from the Wagga Wagga Airport and the Tumut Airport, offering scenic views over the rural and alpine landscapes.

During operation there would be **moderate-low** visual impacts from the air as the transmission line route would create a strong line across the Bago State Forest, and hilly forested landscape between Snubba Road and the future Maragle 500 kV substation. In other areas surrounding Wagga Wagga and Tumut, there would be a **moderate-low** visual impact as the new transmission line easement and proposed Gugaa 500 kV substation would be seen within a varied and complex landscape.

Night lighting

During construction, there would be a **moderate** impact on seven landscape character areas, **moderate-low** impact on 11 landscape character areas and a **low** impact on one landscape character areas. The **moderate** impacts would be on the rural valleys (Gregadoo to Book Book), forested hills, upland forest and rural highland and deep valley landscape character zones where

there is greater vegetation removal and temporary construction activities, including a new 500/330 kV substation at Gregadoo (the proposed Gugaa 500 kV substation).

During operation, there would be a **moderate-low** impact on the Gregadoo to Book Book rural valleys landscape character area at night, due to the operation of the new 500/330 kV substation at Gregadoo, which would include operational lighting. The project would have a **negligible** visual impact at night on the other landscape character areas as there would be limited operational lighting required.

Views from surrounding residences

There are 180 dwellings which are either located in the project footprint, within 500 metres of the project footprint or have otherwise been identified as having the potential for a higher visual impact. Of these, 17 dwellings have the potential for a **high** visual impact, 27 dwellings have the potential for a **high-moderate** visual impact, and 36 dwellings have the potential for a **moderate** visual impact during project operation. All remaining dwellings would have a moderate-low, low, or negligible visual impact. These potential visual impact levels have the potential to be further reduced by mitigation measures.

During construction there would be temporary visual impacts from dwellings located with a view to some construction compounds in rural areas, including the Gregadoo Road compound (C06), Honeysuckle Road compound (C07), Red Hill Road compound (C08), Adjungbilly Road compound (C09), Woodhouselee, Road compound (C11) and Bowmans Lane compound (C15). There would also be some temporary visual impacts in views from dwellings surrounding the Tumbarumba Accommodation Facility (AC1).

Cumulative landscape and visual impact

If approved, there would be cumulative landscape character and visual impacts associated with this project and the EnergyConnect (NSW - Eastern Section); Gregadoo Solar Farm; Jeremiah, Rye Park and Crookwell 3 Wind Farms; Victoria to NSW Interconnector West (VNI West) and the Snowy 2.0 - Transmission Connection projects.

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Glossary and abbreviations

Term	Definition
Amenity	*'The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc*' (Australian Institute of Landscape Architects QLD 2018)
Bannaby 500 kV substation	The existing 500 kV substation at Bannaby.
Brake and winch sites	A brake and winch site is a temporarily cleared area where plant and equipment are located to spool and winch conductors into place on transmission line structures. The locations of the brake and winch sites may or may not be within the nominated transmission line easement. These sites are only required for construction of the project and do not need to be maintained during operation.
Construction compounds	Main construction compounds proposed for construction of the project. Each main construction compound would accommodate a range of facilities which may include (but not limited to): - laydown areas - site offices - amenities - construction support facilities such as vehicle and equipment storage, maintenance sheds, chemical/fuel stores and stockpile areas - parking.
Cultural Landscape	A cultural landscape is a physical area with natural features modified by human activity resulting in patterns of evidence layered in the landscape. These layers give a place its distinctive spatial, historical, aesthetic, symbolic and memorable character. Within cultural landscapes there are areas where human impact is more obvious.
DCP	Development Control Plan
DMP	Destination Management Plan
DSNSW	Destination Southern NSW
Easement	A legal right attached to a parcel of land that enables the non-exclusive use of the land by a third party other than the owner. For transmission lines, an easement defines the corridor area where the lines are located and that allows access, construction and maintenance work to take place. The easements for the 500 kV transmission lines would typically be 70 metres wide. However, a few locations would require wider easements up to 110 metres wide at transposition locations and up to 130 metres wide where the new transmission line would parallel the relocated section of Line 51. The easement grants a right of access and for construction, maintenance and operation of the transmission line and other operational assets.
EIS	Environmental Impact Statement
Field of view	The field of view (FOV) is the entire area a person can see at any one time through their eyes or an optical device such as a camera. It can be measured horizontally, diagonally, and vertically in degrees.
Future Maragle 500 kV substation	The future Maragle 500/330 kV substation that would be built under the Snowy 2.0 Transmission Connection Project, which is subject to separate planning approval.

Term	Definition
Glare	*'Condition of vision in which there is discomfort or a reduction in ability to see, or both, caused by an unsuitable distribution or range of luminance, or to extreme contrasts in the field of vision.*' (AS4282:2019)
HumeLink	The project
kV	Abbreviated form of kilovolt.
Landowners	People who own properties/land.
Landscape	*'All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure.*' (TfNSW 2020)
Landscape and visual study area	This assessment considers a study area which extends to approximately five kilometres from the project footprint for landscape character and to about two kilometres from the project footprint for visual impacts.
Landscape character	The … '*combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'*. (TfNSW 2020)
Landscape character zone	*'An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby*.' (TfNSW 2020)
LEP	Local Environmental Plan
LGA	Local Government Area
LSPS	Local Strategic Planning Statement
mAHD	Metres above Australian Height Datum
Magnitude	Magnitude is the … '*measurement of the scale, form and character of a development project when compared to the existing condition. In the case of visual assessment this also relates to how far the project is from the viewer*.' (TfNSW 2020)
NEM	National Electricity Market
NSW	New South Wales
(the) proponent	NSW Electricity Networks Operations Pty Ltd (referred to as Transgrid). Transgrid is the operator and manager of the main high voltage (HV) transmission network in NSW and the Australian Capital Territory (ACT) and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015*.
(the) project	Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of around 360 kilometres of new double circuit 500 kilovolt (kV) transmission lines and associated infrastructure between Maragle, Bannaby and Wagga Wagga.
(the) project footprint	The area that has been assumed for the purpose of this EIS to be directly affected by the construction and operation of the project. It includes the indicative location of project infrastructure, the area that would be directly disturbed during construction and any easement required during operation.
Proposed Gugaa 500 kV substation	The new 500/330 kV substation proposed near Wagga Wagga.
SEARs	Planning Secretary's Environmental Assessment Requirements
Sense of place	The intangible qualities and character of a place, interpreted and valued by people.
Sensitivity	*'Susceptibility of a landscape or receptor to accommodate change without losing valued attributes.*' (Australian Institute of Landscape Architects QLD 2018)

Term	Definition
	The sensitivity of a landscape character zone or view is '*its capacity to absorb change*' (TfNSW 2020).
Sky glow	*'The brightening of the night sky that results from radiation (visible and non-visible), scattered from the constituents of the atmosphere (gaseous, molecules, aerosols and particulate matter), in the direction of observation.*' It comprises Natural sky glow and artificial sky glow. (AS4282:2019)
Spill light	*'Light emitted by a lighting installation that falls outside of the design area. Spill light may or may not be obtrusive depending on what it affects'* (AS4282:2019)
Transmission line route	The location of the transmission line structures along the middle of the transmission line easement.
Transmission line structures	Proposed free standing structures to support the transmission lines.
TfNSW	Transport for New South Wales
Values	*'Any aspect of landscape or views people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed.'* (Australian Institute of Landscape Architects QLD 2018)
View	'*Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features.*' (Australian Institute of Landscape Architects QLD 2018)
Viewpoint	'*The specific location of a view, typically used for assessment purposes*.' (Australian Institute of Landscape Architects QLD 2018)
Visual absorption capacity	'*The potential for a landscape or scene to absorb a particular change without a noticeable loss of valued attributes.*' (Australian Institute of Landscape Architects QLD 2018)
Wagga 330 kV substation	The existing 330/132 kV substation located in Wagga Wagga.
Work site	A general word to describe a defined construction location.
Worker accommodation facilities	Temporary worker accommodation facilities that would be established for the construction workers, including the Tumbarumba Accommodation Facility (AC1).

Disclaimer:

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1.0 Introduction

1.1 Overview

The Australian energy landscape is transitioning to a greater mix of low-emission renewable energy sources, such as wind and solar. To support this transition, meet our future energy demands and connect Australian communities and businesses to these lower cost energy sources, the national electricity grid needs to evolve.

Transgrid proposes to increase the energy network capacity in southern New South Wales (NSW) through the development of around 360 kilometres of new 500 kilovolt (kV) high-voltage transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle. This project is collectively referred to as HumeLink. The project would be located across five Local Government Areas (LGAs) including Wagga Wagga City, Snowy Valleys, Cootamundra-Gundagai Regional, Upper Lachlan Shire and Yass Valley. The location of the project is shown on Figure 1-1.

HumeLink would involve construction of a new substation east of Wagga Wagga as well as connection to existing substations at Wagga Wagga and Bannaby and a future substation at Maragle in the Snowy Mountains (referred to as the future Maragle 500 kV substation). The future Maragle 500 kV substation is subject to a separate major project assessment and approval (reference SSI-9717, EPBC 2018/836).

The project would deliver a cheaper, more reliable and more sustainable grid by increasing the amount of renewable energy that can be delivered across the national electricity grid, helping to transition Australia to a low carbon future. It would achieve this by supporting the transfer of energy from existing renewable generation as well as facilitate development of new renewable generation in the Wagga Wagga and Tumut Renewable Energy Zones (REZs). The project would provide the required support for the network in southern NSW, allowing for the increase in transfer capacity between new renewable generation sources and the state's demand centres of Sydney, Newcastle and Wollongong. The project would also improve the efficiency and reliability of the current energy transfer in this part of the network.

Furthermore, HumeLink would form a key part of the transmission line infrastructure that supports the transfer of energy within the National Electricity Market (NEM) by connecting with other major interconnectors. The NEM incorporates around 40,000 kilometres of transmission lines across Queensland (QLD), NSW, Australian Capital Territory (ACT), Victoria (VIC), South Australia (SA) and Tasmania (TAS).

Construction of the project is targeted to commence in 2024, subject to the required planning and regulatory approvals. Once construction has commenced, the project is estimated to take approximately 2.5 years to build and would become operational by the end of 2026.

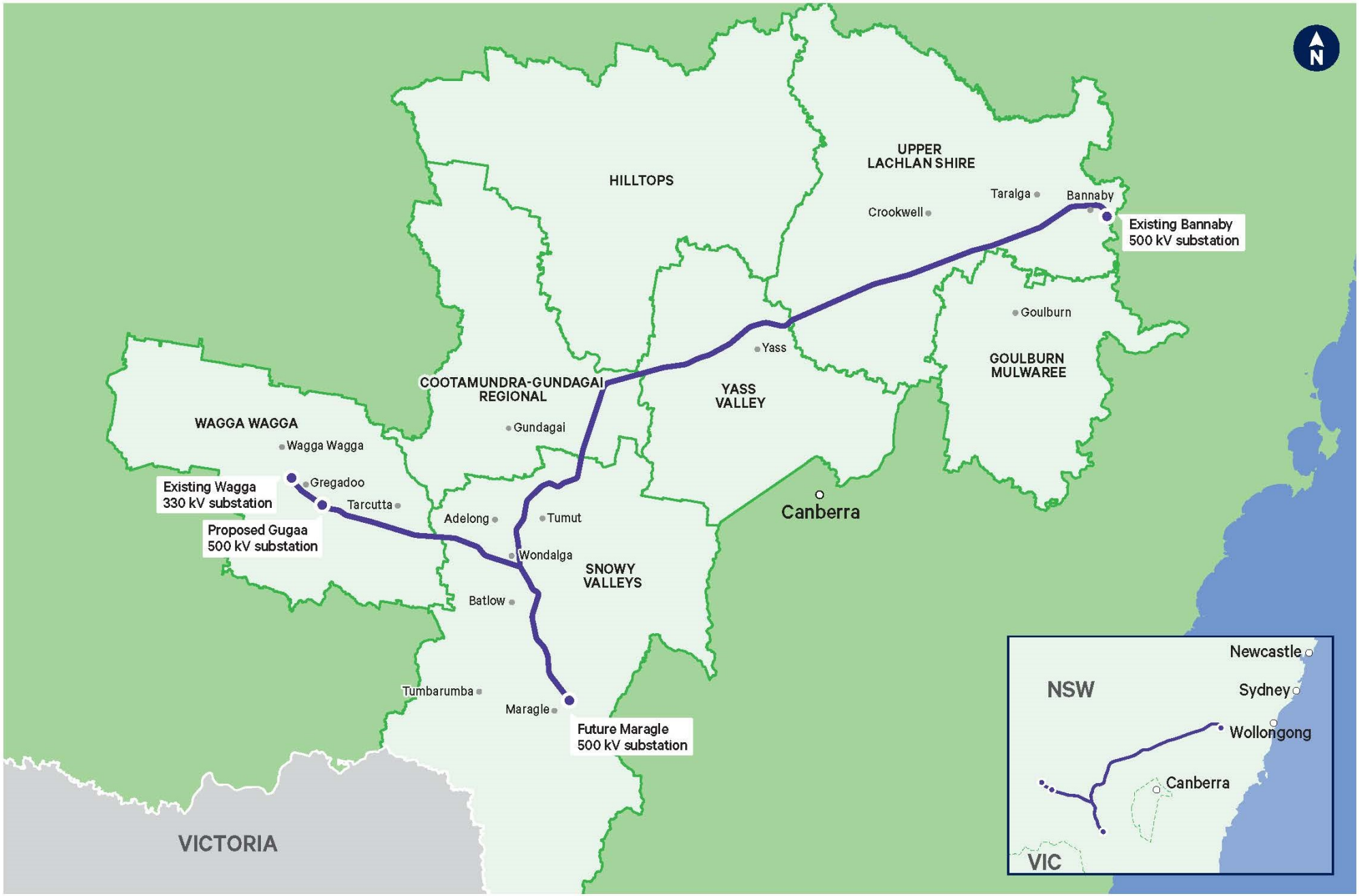
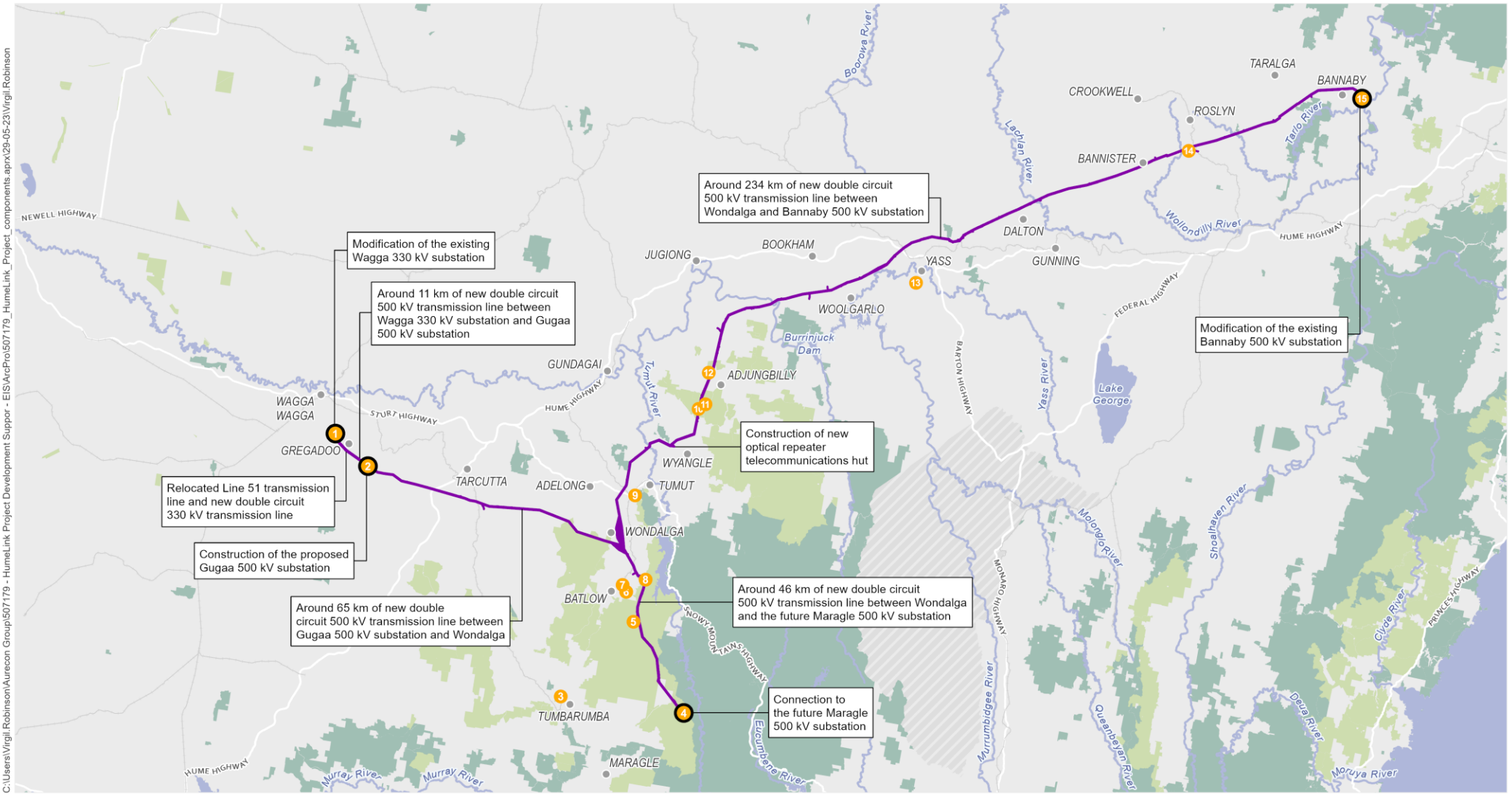


FIGURE 1-1 LOCATION OF THE PROJECT

1.2 Key components of the project

The project includes the following key components (refer to Figure 1-2):

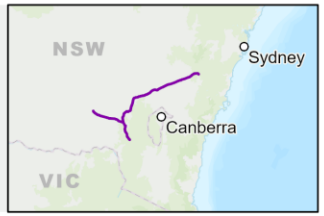
- construction and operation of around 360 kilometres of new double circuit 500 kV transmission lines and associated infrastructure between Wagga Wagga, Bannaby and Maragle
- construction of a new 500/330 kV substation at Gregadoo (the proposed Gugaa 500 kV substation) approximately 11 kilometres south-east of the existing Wagga 330/132 kV substation (Wagga 330 kV substation)
- demolition and rebuild of a section of Line 51 (around two kilometres in length) as a double circuit 330 kV transmission line connecting into the Wagga 330 kV substation
- modification of the existing Wagga 330 kV substation and Bannaby 500/330 kV substation (Bannaby 500 kV substation) to accommodate the new transmission line connections
- connection of transmission lines to the future Maragle 500/330 kV substation (Maragle 500 kV substation, approved under the Snowy 2.0 Transmission Connection Project (SSI-9717))
- provision of one optical repeater telecommunications hut and associated connections to existing local electrical infrastructure
- establishment of new and/or upgraded temporary and permanent access tracks
- ancillary works required for construction of the project such as construction compounds, worker accommodation facilities, utility connections and/or relocations, brake and winch sites, and helipad/helicopter support facilities.



Project footprint
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation location

Construction ancillary facilities

1. Wagga 330 kV substation compound (C01)
2. Gregadoo Road compound (C06)
3. Tumbarumba accommodation facility (AC1)
4. Maragle 500 kV substation compound (C05)
5. Snubba Road compound (C16)
6. Bowmans Lane compound (C15)
7. Memorial Avenue compound (C14)
8. Snubba Road compound (C03)
9. Snowy Mountains Highway compound (C02)
10. Honeysuckle Road compound (C07)
11. Red Hill Road compound (C08)
12. Adjungbilly Road compound (C09)
13. Yass substation compound (C10)
14. Woodhouselee Road compound (C11)
15. Bannaby 500 kV substation compound (C12)



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

HumeLink **Landscape Character and Visual Impact Assessment**

FIGURE 1-2: Key components of the project

1.3 Purpose of this technical report

This technical report is one of a number of technical reports that form part of the Environmental Impact Statement (EIS) for the project.

The purpose of this technical report is to identify and assess the potential impacts of the project in relation to landscape character and visual impacts. It responds directly to the Planning Secretary's Environmental Assessment Requirements (SEARs) (refer to Section 1.4) and has been prepared with consideration of relevant guidance for landscape and visual impact assessment. Further detail on the methodology applied in this assessment is detailed in Chapter 4.0 of this technical report.

1.4 Secretary's environmental assessment requirements

The NSW Department of Planning and Environment has provided the SEARs for the EIS. The requirements specific to this assessment and where these aspects are addressed in this technical report are outlined in Table 1-1.

TABLE 1-1: SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS – AMENITY

Reference	SEARs requirements	Where addressed in this report
Key Issue – Amenity	An assessment of the likely visual impacts of the project on:	
	○ surrounding residences	An assessment of the likely visual impacts of the project on surrounding residences is addressed in **Section 7.3**
	○ scenic or significant vistas	An assessment of the likely visual impacts of the project on scenic or significant vistas is addressed in **Section 7.1**
	○ night lighting	An assessment of the likely visual impacts of the project at night is addressed in **Section 7.2**
	○ air traffic	An assessment of the likely visual impacts of the project on air traffic is addressed in Section **7.1.3**
	○ road corridors in the public domain.	An assessment of the likely visual impacts of the project on road corridors in the public domain is addressed in **Section 7.1**

1.5 Structure of this report

The structure and content of this report is as follows:

- Chapter 1 – Introduction: Outlines the background and need for the project, and the purpose of this report.
- Chapter 2 – Project description summary: Summarises the components of the project including construction, pre-commissioning, commissioning and operational phases.
- Chapter 3 – Legislative and policy context: Provides an outline of the key legislative requirements and policy guidelines relating to the project.
- Chapter 4 – Methodology: Provides an outline of the methodology used for the preparation of this technical report.
- Chapter 5 – Existing environment: Describes the existing conditions of the site and surrounds, including the topography and landscape features, and a general description of the visibility of the project.
- Chapter 6 – Landscape impact assessment: Describes the potential landscape impacts associated with the project during construction and operation.
- Chapter 7 – Visual impact assessment: Describes the potential visual impacts associated with the project during construction and operation, day and night.
- Chapter 8 – Cumulative impacts: Outlines the potential cumulative impacts with respect to other known developments within the vicinity of the project.
- Chapter 9 – Mitigation measures: Outlines the proposed mitigation measures for the project.
- Chapter 10 – Conclusion: Provides a conclusion of the potential impacts of the project on the surrounding landscape character and visual amenity.

1.6 Key terminology

The study area for this technical report comprises an area which extends to approximately five kilometres from the project footprint for landscape character and to about two kilometres from the project footprint for visual impacts. Refer to Attachment A for the location and extent of the landscape and visual study area. The area considered for visual assessment is two kilometres from the project footprint for the assessment of views from the public domain and views from dwellings.

The landscape character of this area has been assessed in this technical paper. Within this study area the visibility of the project varies according to the topography and land cover (vegetation and built form) of the landscape. Generally, this assessment focuses upon views within two kilometres of the project. This distance is based on the scale and visual characteristics of the project elements.

2.0 Project description summary

The project description in this chapter is based on a concept design and indicative construction methodology for the project. The design and construction methodology would continue to be refined and confirmed during detailed design and construction planning by the construction contractors. Further details on the project are provided in Chapters 3 and 4 of the EIS.

2.1 Summary of key components of the project

Key components of the project are summarised in Table 2-1.

TABLE 2-1: SUMMARY OF KEY COMPONENTS OF THE PROJECT

Component	Description
Transmission lines and supporting infrastructure	
Transmission lines and structures	The project includes the construction of new 500 kV transmission line sections between: - Wagga 330 kV substation and Gugaa 500 kV substation (approximately 11 km) - Gugaa 500 kV substation and Wondalga (approximately 65 km) - Wondalga and Maragle 500 kV substation (approximately 46 km) - Wondalga and Bannaby 500 kV substation (approximately 234 km). The transmission line section between the Wagga 330 kV substation and proposed Gugaa 500 kV substation would operate at 330 kV under HumeLink. The project also includes the rebuild of approximately 2 km of Line 51 as a new 330 kV transmission line between the Wagga 330 kV substation and around Ivydale Road, Gregadoo. This would be adjacent to the new transmission line between the existing Wagga 330 kV and proposed Gugaa 500 kV substations. The 500 kV transmission lines would be supported on a series of free-standing steel lattice structures that would range between around 50 m up to a maximum of 76 m in height and generally spaced between 300 to 600 m apart. The typical transmission line structure height would be around 60 m. Earth wire and communications cables would be co-located on the transmission line structures. The 330 kV structures for the rebuild of Line 51 would range between 24 m and 50 m in height and have a typical height of 40 m. Indicative configurations of transmission line structures that may be used as part of the project are shown in Figure 2-1. The type and arrangement of the structures would be refined during detailed design. The footings of each structure would require an area of up to 300 m^2 to 450m^2, depending on ground conditions and the proposed structure type. Additional disturbance at each structure site may be required to facilitate structure assembly and stringing.
Transmission line easements	The easements for the 500 kV transmission lines are typically 70 m wide. However, a number of locations may require wider easements of up to 110 m wide at transposition locations[1] and up to 130 m wide where the new transmission line would parallel the relocated section of Line 51. The easement provides a right of access to construct, maintain and operate the transmission line and other operational assets. The easement also generally identifies the zone of initial vegetation clearance and ongoing vegetation management to ensure safe electrical clearances during the

[1] Transposition is the periodic swapping of positions of the conductors of a transmission line in order to improve transmission reliability.

Component	Description
	operation of the lines. Vegetation management beyond the easement may also occur where nearby trees have the potential to fall and breach safety clearances.
Telecommunications hut	Telecommunications huts, which contain optical repeaters, would be required to boost the signal in the optical fibre ground wire (OPGW). One telecommunications hut would be required for the project. The telecommunications hut would be located adjacent to existing transmission line structures. Cables would be installed between the transmission line structure and the local power supply. The telecommunications hut would be surrounded by a security fence. A new easement would be established for the telecommunications hut power connection. The project also involves a telecommunications connection of OPGW between two proposed transmission line structures and the future Rye Park Wind Farm substation (SSD-6693). This removes the need for an additional telecommunications hut in this area of the project.
Substation activities	
Construction of the proposed Gugaa 500 kV substation	A new 500/330 kV substation would be constructed at Gregadoo, about 11 km south-east of the Wagga 330 kV substation. The substation would include seven new 500/330 kV transformers and three 500 kV reactors. The proposed Gugaa 500 kV substation is expected to occupy an area of approximately 22 hectares.
Modification of the existing Bannaby 500 kV substation	The existing Bannaby 500 kV substation on Hanworth Road, Bannaby would be expanded to accommodate connections for new 500 kV transmission line circuits. The modification would include changes to the busbars, line bays, bench and associated earthworks, steelwork, drainage, external fence, internal/external substation roads, secondary containment dams, sediment containment dams, cabling, and secondary systems. All of the works would be restricted to the existing substation property.
Modification of the existing Wagga 330 kV substation	The existing Wagga 330 kV substation on Ashfords Road, Gregadoo would be reconfigured to accommodate new bays for two new 500 kV transmission line circuits within the existing substation property. This would include modifications to the busbars, line bays, existing line connections, bench and associated earthworks, relocation of existing high voltage equipment, drainage, external fence, internal substation roads, steelwork, cabling, and secondary systems.
Connection to the future Maragle 500 kV substation	The project would connect to the future Maragle 500 kV substation approved under the Snowy 2.0 Transmission Connection Project (SS1-9717). Construction of the Maragle substation is proposed to be undertaken between 2023 and 2026. Further detail on the Snowy 2.0 Transmission Connection project is available at the Department of Planning and Environment's Major Projects website: www.planningportal.nsw.gov.au/major-projects/project/10591.
Ancillary facilities	
Access tracks	Access to the transmission line structures and the substations would be required during construction and operation. Wherever possible, existing roads, tracks and other existing disturbed areas would be used to minimise vegetation clearing or disturbance. Upgrades to existing access tracks may be required. In areas where there are no existing roads or tracks, suitable access would be constructed. This may include waterway crossings.
Construction compounds	Construction compounds would be required during construction to support staging and equipment laydown, concrete batching, temporary storage of materials, plant and equipment and worker parking required to construct the various elements of the project.

Component	Description
	Fourteen potential construction compound locations have been identified. The proposed use of the construction compounds and their proposed boundaries/layout would be refined as the project design develops in consultation with relevant stakeholders and the construction contractors.
Worker accommodation facility	Existing accommodation facilities within towns adjacent to the project would provide temporary accommodation for the majority of the construction workers. However, a potential shortage in accommodation has been identified close to the project footprint. A potential option to provide additional temporary worker accommodation during the construction period is the establishment of a temporary worker accommodation facility at the corner of Courabyra Road and Alfred Street, Tumbarumba to accommodate about 200 construction workers. The worker accommodation facility would consist of demountable cabins and would be connected to existing utilities. All required amenities for the accommodation facility would be provided including services and worker parking for light and heavy vehicles. However, the ultimate delivery of the project may include multiple temporary worker accommodation facilities in various forms, which would be outlined in the Worker Accommodation Strategy for the project. The strategy will be developed in consultation with councils, and other relevant stakeholders. Any new or changed worker accommodation facility would be subject to additional environmental assessment, as required.
Helipad/helicopter facilities	To facilitate construction of the project, helicopters may be used to deliver materials/equipment and transfer personnel to construction areas particularly within high alpine regions. To enable helicopters to operate safely and allow easy access to the site, a helicopter landing pad would be required. The helipad is expected to occupy an area of around 30 m by 30 m, and would be remediated after construction. These areas would typically be located on existing disturbed land not subject to inundation and a reasonable distance from waterways, sensitive receivers and drainage lines. Eight locations have been identified and assessed as potential helipad locations. The exact locations to be used would be confirmed during detailed design by the construction contractors. In addition to this, the existing facilities at the Wagga Wagga Airport and Tumut Airport may be used.
Utility connections, adjustments and protection	The project would require utility connections, adjustments and protection. Such works include interfaces with other transmission lines and connections to existing services for temporary facilities. Potential impacts to existing services and utilities would be confirmed during detailed design and any proposed relocation and/or protection works would be determined in consultation with the relevant asset owners.

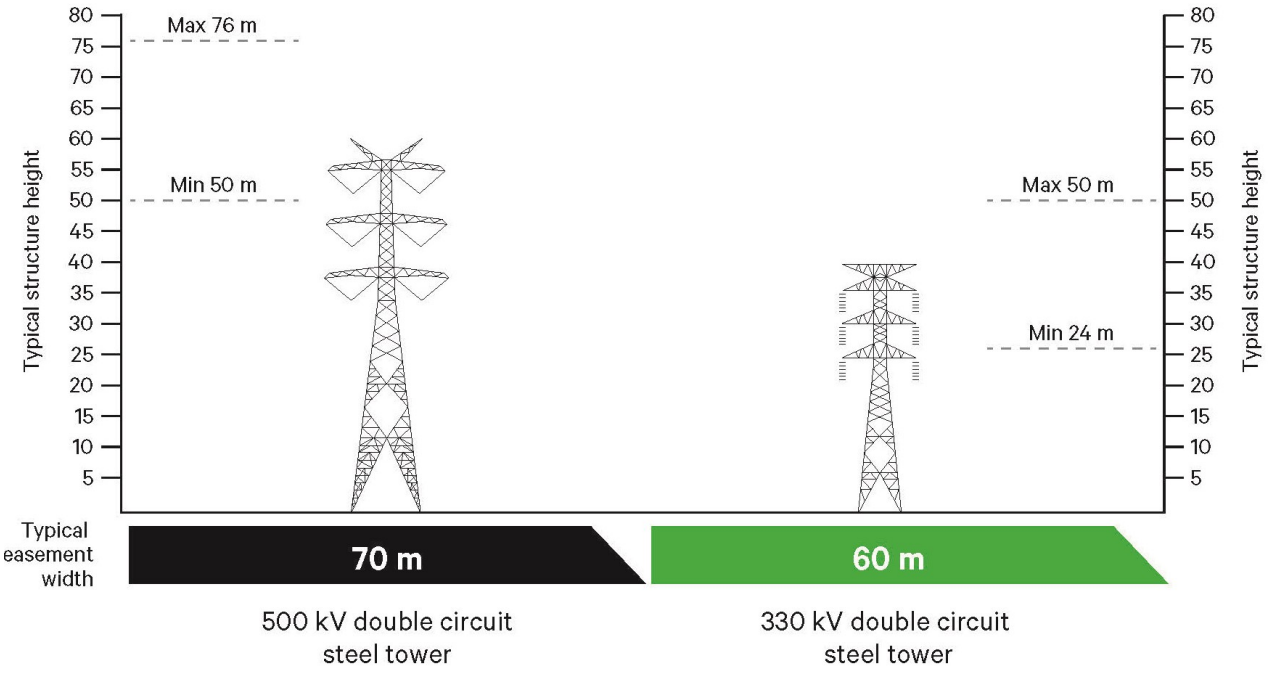


Figure not to scale.

FIGURE 2-1 INDICATIVE TRANSMISSION LINE STRUCTURES

2.2 Construction of the project

2.2.1 Construction activities

Key construction activities would generally include (but are not limited to):

- site establishment work, such as:
  - clearing of vegetation and topsoil
  - establishment of construction compounds and helipad/helicopter facilities
  - utility relocations and/or adjustments
  - construction of new access tracks and waterway crossings and/or upgrade of existing access tracks to transmission line structures
  - road improvement work
  - establishment of environmental management measures and security fencing
  - construction of temporary worker accommodation
- construction of the transmission lines, including:
  - earthworks and establishment of construction benches and brake and winch sites for each transmission line structure
  - construction of footings and foundation work for the new transmission line structures including boring and/or excavation, steel fabrication works and concrete pours
  - erection of the new transmission line structures
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level

- relocation of a section of Line 51, including:
  - demolition of the existing section of Line 51
  - erection of new transmission line structures for the rebuild of Line 51 in a new location
  - stringing of conductors, overhead earth wires and OPGW
  - installation of associated transmission line structure fittings inclusive of all earthing below ground level
- construction of the proposed Gugaa 500 kV substation, including:
  - bulk earthworks to form the substation bench, access roads, drainage and oil containment structures
  - installation of concrete foundations, bund walls, fire walls, noise walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment work and associated concrete pits, pipes and tanks including excavation
  - installation of new ancillary and equipment control buildings
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - erection of the substation site boundary security fencing, including site access gates
  - connection of the proposed transmission lines to the substation
- modification of the existing Wagga 330 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - demolition and removal of redundant electrical equipment, fencing and cabling
  - bulk earthworks to form the extended substation bench and modified drainage structures
  - installation of concrete foundations and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, and modified site stormwater drainage including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - testing and commissioning
  - connection of the proposed transmission lines to the substation
- modification of the existing Bannaby 500 kV substation to enable the proposed connection and operation of the new transmission lines, including:
  - bulk earthworks to form the extended substation bench, new access road, modified stormwater drainage, modified oil containment and modified sediment control structures

  - installation of concrete foundations, retaining walls, bund walls, fire walls and kerbs including excavation
  - installation of reinforced concrete and piled foundations for the electrical equipment and associated steel support structures
  - erection of galvanised steel structures to support electrical equipment
  - installation of electrical equipment on foundations and/or steel support structures
  - installation of electrical conduits, electrical trenches, site stormwater drainage, oil containment works and associated concrete pits, pipes and tanks including excavation
  - installation of conductors, cabling, wiring, electrical panels and electrical equipment
  - installation of fencing, lighting and other security features
  - demolish redundant fencing including footings and kerbs
  - testing and commissioning
  - connection of the proposed transmission lines to the substation
- connection of the proposed transmission lines to the future Maragle 500 kV substation, including:
  - stringing conductors between transmission line structures and the future Maragle 500 kV substation gantry (including overhead earth wire (OHEW) and OPGW)
  - installing droppers from the future substation gantry to the switchgear
- construction of the telecommunications hut, including:
  - bulk earthworks to form the pad for the hut
  - excavation and preparation for concrete foundations
  - installation of reinforced concrete and piled foundations
  - excavation and installation of electrical equipment conduits, trenches and general site drainage work
  - installation of the building, site wiring and electrical equipment
  - installation of security fencing and site access gates
- installation of buried cabling from the 500 kV transmission line structures to Rye Park Wind Farm substation
- testing and commissioning of new electrical infrastructure
- demobilisation and rehabilitation of areas disturbed by construction activities.

A number of activities are expected to commence in accordance with the project conditions of approval before the key construction activities outlined above. These activities are considered pre-construction minor work and would comprise low impact activities that would begin after planning approval but prior to approval of the Construction Environmental Management Plan.

2.2.2 Construction program

Construction of the project is targeted to commence in 2024 and is estimated to take about 2.5 years to complete. The project is expected to be fully operational by the end of 2026 (refer to Figure 2-2).

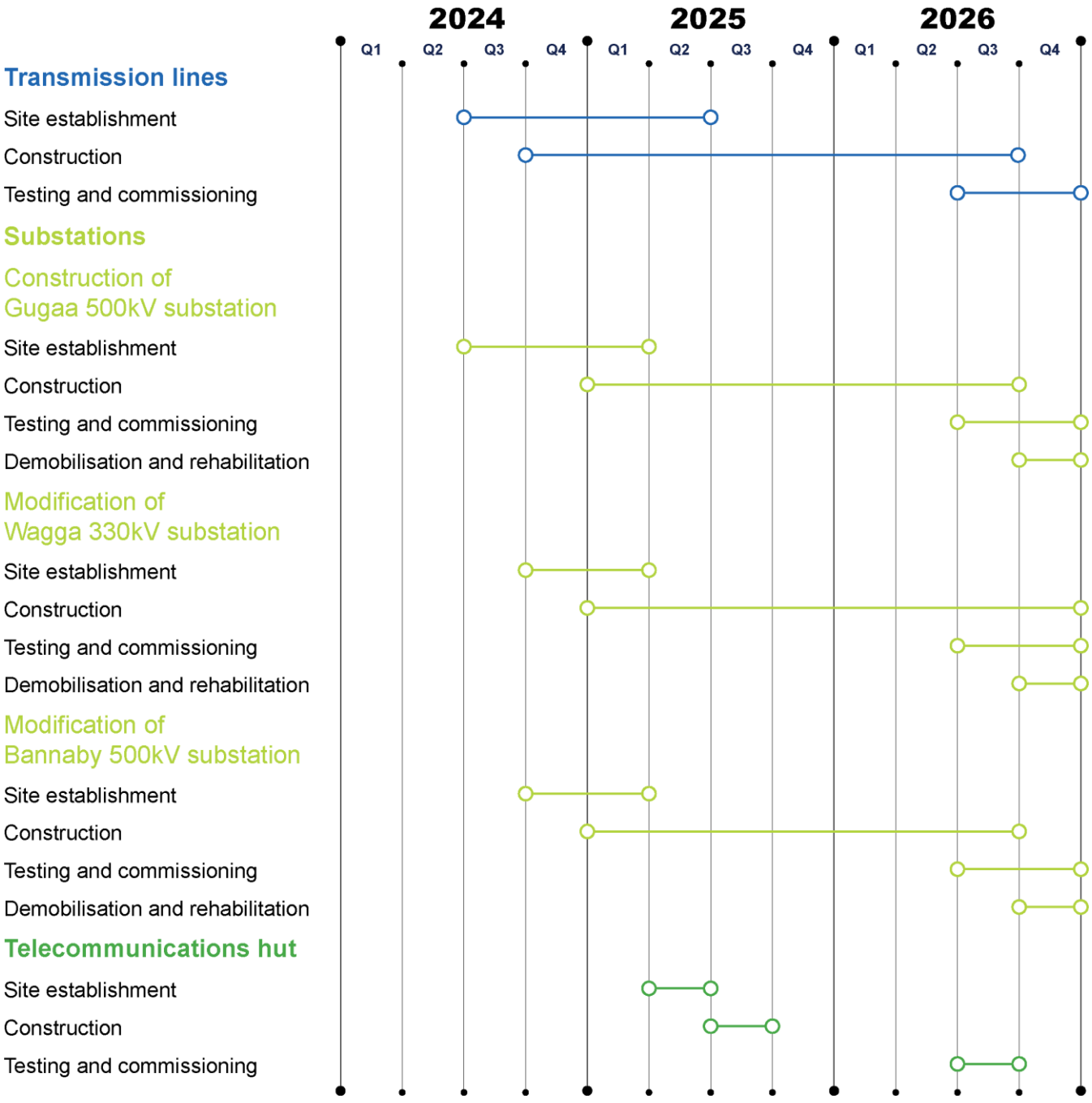


FIGURE 2-2 HUMELINK INDICATIVE CONSTRUCTION PROGRAM

Indicative duration of construction activities

Construction at each transmission line structure would be intermittent and construction activities would not occur for the full duration at any one location. Durations of any particular construction activity, and inactive/respite periods, may vary for a number of reasons including (but not limited to):

- multiple work fronts
- resource and engineering constraints
- work sequencing and location.

Figure 2-3 presents an indicative duration of construction activities associated with an individual transmission line structure.

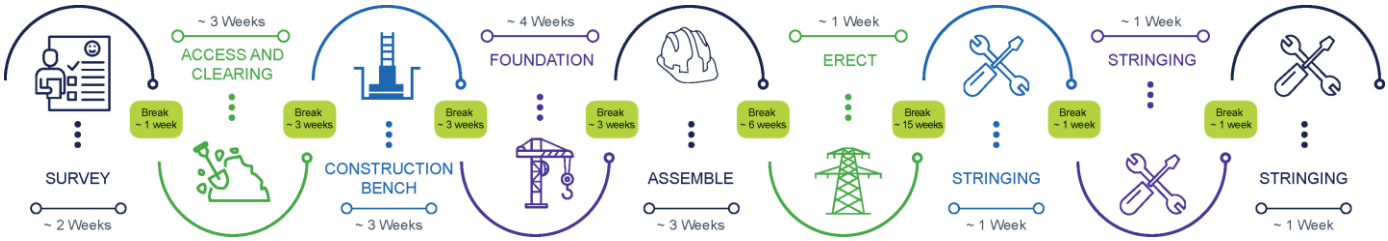


FIGURE 2-3 INDICATIVE DURATION AND SEQUENCE OF CONSTRUCTION ACTIVITIES FOR TRANSMISSION LINE STRUCTURES

Construction of the proposed Gugaa 500 kV substation could take up to 2.5 years.

2.2.3 Construction hours

It is expected that construction activities would largely be undertaken during standard construction hours. However, there would be times when working outside of standard construction hours would be required (as defined by the *Interim Construction Noise Guideline* (DECC, 2009)), subject to approval. As the details of construction methodology and project needs are developed, these hours will be refined for certain activities.

Where extended hours are proposed for activities in proximity to sensitive receivers, additional measures would be implemented and the work would be managed through an out-of-hours work protocol.

A series of work outside the standard construction hours is anticipated to include (but is not limited to) the following:

- transmission line construction at crossings of a main road or railway as these locations are expected to have restricted construction hours requiring some night work for activities such as conductor stringing over the crossing(s)
- work where a road occupancy licence (or similar) is required, depending on licence conditions
- transmission line cutover and commissioning
- the delivery of equipment or materials outside standard hours requested by police or other authorities for safety reasons (such as the delivery of transformer units)
- limited substation assembly work (eg oil filling of the transformers)
- connection of the new assets to existing assets under outage conditions (eg modification and/or connection work at Bannaby 500 kV substation, Wagga 330 kV substation and Maragle 500 kV substation), which is likely to require longer working hours
- emergency work to avoid the loss of lives and/or property and/or to prevent environmental harm
- work timed to correlate with system planning outages
- situations where agreement is reached with affected sensitive receivers

- activities that do not generate noise in excess of the applicable noise management level at any sensitive receiver.

2.2.4 Construction plant and equipment

An indicative list of construction plant and equipment likely to be required during construction is provided below.

- air compressor
- backhoe
- bobcat
- bulldozers
- concrete agitator
- concrete pump
- cranes (various sizes up to 400 tonnes)
- crawler crane with grab attachments
- drill and blast units and associated support plant/equipment
- drones
- dumper trucks
- elevated working platforms
- excavators (various sizes)
- flatbed hiab trucks
- fuel trucks
- generators
- graders
- helicopters and associated support plant/equipment
- mulchers
- piling rig
- mulchers
- pneumatic jackhammers
- rigid tippers
- rollers (10 to 15 and 12 to 15 tonnes)
- semi-trailers
- tilt tray trucks
- trenchers
- transport trucks
- watercarts
- winches.

2.2.5 Construction traffic

Construction vehicle movements would comprise vehicles transporting equipment, waste, materials and spoil, as well as workers' vehicles. A larger number of heavy vehicles would be required during the main civil construction work associated with the substations. Non-standard or oversized loads would also be required for the substation work (e.g. for transformer transport) and transportation of transmission line structure materials and conductors.

Hume Highway, Sturt Highway, Snowy Mountains Highway, Batlow Road and Gocup Road are the main national and state roads proposed to provide access to the project footprint. These roads would be supported by regional and local roads throughout the Local Government Areas (LGAs) of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional and Upper Lachlan Shire that connect to the project footprint.

2.2.6 Construction workers

The construction worker numbers would vary depending on the stage of construction and associated activities. During peak construction activities, the project could employ up to 1,200 full time equivalent construction workers across multiple work fronts. It is expected that the maximum number of construction workers at any one location would not exceed 200.

2.2.7 Testing and commissioning

Prior to energisation of the infrastructure, a series of pre-commissioning activities would be conducted. This would include testing the new transmission lines and substation earthing, primary and secondary equipment.

2.2.8 Demobilisation and rehabilitation

Demobilisation and site rehabilitation would be undertaken progressively throughout the project footprint and would include the following typical activities:

- demobilisation of construction compounds and worker accommodation facility
- removal of materials, waste and redundant structures not required during operation of the project
- removal of temporary fencing and environmental controls.

2.3 Operation phase

The design life of the project is 50 years, which can be extended to more than 70 years for some assets.

The substations and transmission lines would be inspected by field staff and contractors on a regular basis, with other operational activities occurring in the event of an emergency (as required). The project would require about five workers (in addition to Transgrid's existing workers) during operation for ongoing maintenance activities. Likely maintenance activities would include:

- regular inspection (ground and aerial) and maintenance of electrical equipment
- general building, asset protection zone and access road/track
- vegetation clearing/trimming within the easement
- fire detection system inspection and maintenance
- stormwater drainage systems maintenance.

It is expected that these activities would only require light vehicles and/or small to medium plant (depending on the work required).

3.0 Legislative and policy context

The following review identifies key documents which provide relevant guidance for the landscape character and visual impact assessment of the project.

3.1 Regional planning framework

3.1.1 Riverina Region

Riverina Murray Regional Plan 2041

The western part of the project is located in the Riverina Murray Region, including the transmission lines between Wagga Wagga and the future Maragle 500 kV substation. The region is described as … '*one of Australia's most productive agricultural regions*', giving rise to its claim to be the … '*Australia's food bowl*' (NSW Department of Planning, Industry and Environment, 2023, p.5). Protection of the region's important agricultural land identified from '*potential land use conflict and fragmentation'* is identified as a priority (Part 3, p.51).

The diversity and richness of the Riverina Murray environment is highly valued by residents, a major attraction for visitors and the foundation for the region's productive natural resources. The protection, management and restoration of the region's environmental assets, including major rivers, waterways and wetlands, '*for the ongoing enjoyment of residents and visitors*' is identified as a priority in the regional vision (p.10). Development of a strong tourism industry that celebrates the region's *'environmental, heritage and agricultural assets*' is also identified as a priority for the region (p.66).

The region relies on high-quality utility infrastructure, including electricity and telecommunications, to service agricultural and manufacturing industries and drive future economic competitiveness (Objective 11). Development of renewable energies and associated industries, including solar and wind projects, are also recognised as a priority growth sector under Objective 13 (Support the transition to net zero by 2050).

Riverina Murray Destination Management Plan 2018

The Riverina Murray Destination Management Plan (DMP) identifies and informs strategic development themes and priority projects that would encourage growth of the region's visitor economy (Destination Riverina Murray, 2018). The western and central part of the project is located in the Eastern Riverina and Snowy Valleys sub-regional areas. Of the set of nine overarching strategic development themes, the following are relevant to this technical report.

- Theme 2: Nature-Based Tourism -

  The major natural attractions and assets in the region include:

  - the extensive system of waterways which provide a number of active and passive recreational uses including Blowering Dam and Tumut River
  - Bago State Forest, home to a number of key recreational assets including the Hume and Hovell Walking Track and Blowering Dam Foreshore
  - a number of 'great walks' through the region, including the Hume and Hovell, and Tumut Riverwalk.
- Theme 5: Major Touring Routes
  - the Hume Highway and Snowy Valley Way are identified as key touring routes in the vicinity of the project.

3.1.2 South East and Tablelands Region

South East and Tablelands Regional Plan 2036

The northern part of the project is located in the South East and Tablelands Region, between Red Hill State Forest and the existing Bannaby 500 kV substation. This region is described as being renowned for its … '*distinct scenic landscapes'*, including '*green hinterlands, the spectacular high country of the Australian Alps', 'heritage towns and glorious countryside'*, which underpin region's tourism industry (p.8). A priority for the region is developing the Snowy Mountains into … '*Australia's premier year round alpine destination'* (NSW Department of Planning, Industry and Environment, 2017, Goal 1, Direction 3).

Development of renewable energies and associated industries, including wind, hydro and solar energy projects, are also recognised as a priority growth sector (Goal 1, Direction 6), taking advantage of the established and future network of high voltage transmission lines that traverse the region.

The region's landscape creates an important cultural identity for its community, including remnant vegetation within roadside corridors and travelling stock reserves. Conserving and enhancing the region's heritage, including rural and natural landscapes, is a priority (Goal 3, Direction 23).

Destination Southern NSW Destination Management Plan 2018-2020

The Destination Southern NSW (DSNSW) Regional DMP identifies and informs strategic directions and themes that would encourage growth of the region's visitor economy (DSNSW, 2018). The region stretches from the South Coast to the Snowy Monaro and across to the Canberra Region Tablelands, including the northern part of the project.

Four visitor experience themes are identified. These include '*Remarkable journeys'* through the region's '*diverse landscapes'*, including the '*Tablelands'* landscape around Yass and Upper Lachlan Shire. Scenic drives through this rural landscape are identified as leading visitor experience, featuring '*seasonal highlights'* such as canola fields, grape harvest, fruit picking (p.37).

3.2 Local planning schemes

The project would pass through the following Local Government Areas (LGAs), west to east:

- Wagga Wagga City Council
- Snowy Valleys Council
- Cootamundra-Gundagai Regional Council
- Yass Valley Council
- Upper Lachlan Shire Council.

Details of relevant planning documents are described below where a specific reference to landscape character or visual amenity, particularly in relation to energy generation, storage and transmission infrastructure, has been made.

3.2.1 Wagga Wagga City Council

Wagga Wagga Local Strategic Planning Statement

Planning for the future: Wagga Wagga 2040 (City of Wagga Wagga Council, 2021) is Wagga Wagga's Local Strategic Planning Statement (LSPS), which sets the land use framework for the local government area's economic, social and environmental land use needs over the next 20 years. The key outcome for of the LSPS is to find the '*balance between growth, the natural environment, sustainability and liveability'* (p. 8).

The project passes through the eastern part of this LGA, generally within rural areas south-east of Wagga Wagga, extending east from the existing Wagga 330 kV substation.

The LSPS considers the '*relationship between the rural areas around the urban area of Wagga Wagga is critical to the ongoing success of the entire region'*. It indicates that the '*fragmentation of lands'* should be avoided to maintain agricultural production and the '*scenic appeal of the rural landscape*' (Principle 11, p.43).

The hilly area to the south and south-west of the project, at Gelston Park/Gregadoo Hills, is identified as an '*high value environmental amenity area*' in the structure plan, to be protected and enhanced (Principle 1).

Wagga Wagga Local Environmental Plan 2010

The *Wagga Wagga Local Environmental Plan 2010* (LEP) aims to '*co-ordinate development'* such as the '*provision of public infrastructure and services*' whilst ensuring to '*avoid or minimise impacts on environmental values and protect environmentally sensitive areas*' (City of Wagga Wagga Council, 2010b, cl.1.2.2c-d).

The majority of the project, including the proposed Gugaa 500 kV substation, is located in the Primary Production zone (RU1). The project generally follows the alignment of the Wagga to Lower Tumut 330 kV transmission lines from the existing Wagga 330 kV substation to the LGA boundary near the Ellerslie Range, about six kilometres east of Westbrook Road. The RU1 land use zoning aims to encourage primary industry production whilst minimising the '*fragmentation and alienation of resource lands'* and maintaining '*the rural landscape character of the land*' (Part 2, Land Use Table, Zone RU1). The RU1 zoning also aims to '*minimise conflict between land uses within this zone and land uses within adjoining zones'* (Part 2, Land Use Table, Zone RU1).

A small part of the project passes through the eastern part of Gregadoo Waste Facility (zoned SP1 Special Activities), south of existing Wagga 330 kV substation. The SP1 zoning aims to '*facilitate development that is in keeping with the special characteristics of the site or its existing or intended special use, and that minimises any adverse impacts on surrounding land*' (Part 2, Land Use Table, Zone SP1).

The LEP aims to conserve the heritage significance of heritage items, including their '*settings and views*' (cl.5.10). The following local heritage items located near the project (west to east):

- Ivydale and nearby stone ruin, Gregadoo
- Elizabeth Nugent grave, College Creek, Humula Road.

Any landscape or visual impacts on the setting and views of these items would be identified in this assessment.

Wagga Wagga Development Control Plan 2010

Wagga Wagga Development Control Plan (DCP) (NSW Government, 2010c) supports the Wagga Wagga LEP by providing additional objectives and controls for administering development.

The '*visually prominent ridges'* areas of '*higher ground'* throughout the LGA including the Gelston Park/Gregadoo hills south of Wagga Wagga are considered to '*establish the visual setting of the city and villages*'. These hills are located in proximity to the project, west of Gregadoo East Road. The design principles in Section 5.1 (Development on ridges and prominent hills) aim to keep development '*below these points … to protect the natural skyline'* and maintain the '*visual and landscape setting'* of Wagga Wagga (s.5.1).

3.2.2 Snowy Valleys Council

Snowy Valleys Local Strategic Planning Statement

The LSPS for the Snowy Valleys, ENVISAGE 2040: Our Path to a Sustainable Future (Snowy Valleys Council, 2020), sets out the vision for the region. This vision is supported by actions that would be taken to achieve this vision. It provides the land-use planning framework for the LGA, based around four themes, including towns and villages, innovation, natural environment and infrastructure. Each theme has planning priorities, directions and actions to '*encourage future growth and economic vitality*' while maintaining the '*distinct character'* and '*attractiveness'* of the local government area (p.24, p.29).

Snowy Valleys LGA provides the northern gateway to Kosciuszko National Park. It stretches from the plains of the Riverina in Southern NSW to the western slopes of the Snowy Mountains. It is described as … '*One of the most loved features of the Snowy Valleys Council area is the beauty of the natural environment*', including '*breathtaking scenery, pristine and accessible waterways and an abundance of natural space*' (p.23). With 24 protected areas, including the Green Hills, Bago, Maragle and Tumut State forests, the region's '*rugged snow-capped mountains, exceptional natural beauty and heritage are defining characteristics'*, contribute to the region's '*special sense of place*' (p.39). The Snowy Valleys area is described as a '*picturesque slice of NSW'*, offering *'panoramic vistas'* and '*green landscapes'*, which create a '*spectacular visual setting'* (p.35, p.39).

Protecting, conserving and enhancing the Snowy Valley's landform, waterways and bushland is identified in Planning Priority 1 (Natural Environment) in the LSPS.

The project is located in the central and northern part of the region, extending through the elevated forested landscapes around Bago State Forest, north towards Red Hill State Forest and west towards the western LGA boundary near the Ellerslie Range. The towns nearest to the project include Batlow and Tumut.

Tumut Local Environmental Plan 2012

Snowy Valleys Council is still operating with the former Tumbarumba Shire Council and Tumut Shire Council LEPs. The project is located in both the former Tumbarumba and Tumut Shire LGA. The majority of the project is located in the former Tumut Shire, within the Primary Production (RU1) and Forestry (RU3) zone. The RU1 land use zoning aims to encourage primary industry production whilst minimising the '*fragmentation and alienation of resource lands'* and protecting '*natural environment, including native vegetation'* (NSW Government, 2012, Part 2, Land Use Table, Zone RU1). The RU3 zoning enables '*other development that is compatible with forestry land uses'* (Part 2, Land Use Table, Zone RU3).

The LEP aims to conserve the heritage significance of heritage items, including their '*settings and views*' (cl.5.10). The following heritage items located near the project (west to east):

- Snowy Mountains Scheme (National heritage item)
- Australian Alps National Parks and Reserves (National heritage item).

There are also several local heritage items in the towns of Batlow and Tumut.

Tumbarumba Local Environmental Plan 2010

The proposed Tumbarumba accommodation facility is located in the former Tumbarumba Shire, on the north-western outskirts of town, within the Primary Production (RU1) zone. The RU1 land use zoning aims to encourage primary industry production whilst minimising the '*fragmentation and alienation of resource lands'* and protecting and enhancing '*scenic qualities of rural areas of Tumbarumba in a manner that encourages and promotes tourist orientated development and activities'* (NSW Government, 2010a, Part 2, Land Use Table, Zone RU1). The land immediately south of the accommodation facility, south of Alfred Road, is zoned Large Lot Residential (R5). The R5 zoning aims to '*provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality'* (Part 2, Land Use Table, Zone R5).

The temporary use of land clause (cl.2.8) aims to ensure that the '*temporary use will not adversely impact on any adjoining land or the amenity of the neighbourhood*' (cl.2.8).

There are several local heritage items in the town of Tumbarumba, over one kilometre away. The LEP aims to conserve the heritage significance of heritage items, including their '*settings and views*' (cl.5.10).

Snowy Valleys Development Control Plan 2019

This DCP recognises the visual quality of the rural landscape, stating that development in rural and environmental management zones should be sited to … '*maintain the rural character'* (Snowy Valleys Council, 2019, s.4.7). While the DCP recognises the importance of the region's rural landscape character, there are no specific views, lookouts or identification of landscape character value identified.

3.2.3 Cootamundra-Gundagai Regional Council

Cootamundra-Gundagai Local Strategic Planning Statement

The Cootamundra-Gundagai Regional Council LSPS (Cootamundra-Gundagai Regional Council, 2020) sets out the vision for the area in 2040 and the actions that would be taken to achieve this vision. It provides the land-use planning framework for the region, based around five themes. Each theme includes planning priorities, objectives and actions focused on '*environmental outcomes and how these can contribute to opportunities for economic and social improvement and well as improved amenity and landscapes*' (p.25).

Cootamundra-Gundagai region is described as the '*northern gateway to the Riverina District'* (p.8). It is '*home to a diverse landscape of steep hills and forestry in the east, lush Murrumbidgee valleys in the south and renowned, highly productive croplands to the North West'*, interspersed with '*historical towns, villages and rural communities'* between landscapes of '*scenic'* and '*natural beauty*' (p.8).

Planning Priority 4 (Sustainability) in the LSPS is to protect, conserve and enhance the region's agricultural land. Protecting and enhancing the region's trees and vegetation is also a priority, for their '*aesthetic appeal'* and function in '*cooling environments'* (Planning Priority 5, Sustainability). The LSPS does not provide any mapping of scenic landscapes, apart from including the location of protected areas such as state forests, national parks and reserves.

The project is located in the south eastern part of the region, extending through Red Hill State Forest and the undulating rural landscape towards the Murrumbidgee River near Adjungbilly. The transmission line is over 20 kilometres away from the nearest town or village, including Gundagai and Jugiong.

Gundagai Local Environmental Plan 2011

Cootamundra-Gundagai Regional Council is still operating with the former Cootamundra Shire Council and Gundagai Shire Council LEPs. The project is located in the former Gundagai Shire LGA.

The Gundagai LEP aims to protect the shire's '*crop and pasture lands and vineyards'* and '*environmentally sensitive land'* and (NSW Government, 2011, cl.1.2(2b-c)). The majority of the project is located in the Primary Production (RU1) and Forestry (RU3) zone. The RU1 land use zoning aims to encourage primary industry production whilst protecting '*significant scenic landscapes'* (Part 2, Land Use Table, Zone RU1). However, the LEP does not provide any mapping or identification of what scenic landscapes require protection. The RU1 zoning also encourages development that *'does not adversely impact nearby agricultural activities'*. The RU3 zoning enables '*other development that is compatible with forestry land uses'* (Part 2, Land Use Table, Zone RU3).

The Gundagai LEP also aims to '*retain the distinctive character of Gundagai town in its riparian setting'* (cl.1.2(2a)).

Cootamundra-Gundagai Development Control Plan

A single comprehensive DCP for the entire Cootamundra-Gundagai Regional LGA has not been developed. Currently, Cootamundra-Gundagai Regional Council has a DCP that applies to the area covered by the Cootamundra LEP 2013. The area covered by Gundagai LEP 2011, including the areas containing the project, does not have a DCP in effect.

3.2.4 Yass Valley Council

Yass Valley Council Local Strategic Planning Statement

The Yass Valley Council LSPS (Yass Valley Council, 2020) sets out the 20 year vision for land use within the LGA, outlining how growth and change would be managed into the future. It defines the special characteristics which contribute to Yass Valley's identity and recognises the shared community values to be maintained and enhanced.

The landscape of the Yass Valley is described as '*gently rolling hills and grassland plains'*, predominantly consisting of '*productive rural lands'* interspersed with towns, villages and *'rural residential properties'* (p.3). Tourism is a '*significant industry*' for the Yass Valley, attracting visitors for the '*food and wine, heritage, arts and culture of the region*' (p.3).

The vision for Yass Valley is: '*to build and maintain sustainable communities while retaining the region's natural beauty*' (p.8). The land-use planning framework for the LGA is based around a set of growth principles, which have informed planning priorities, directions and actions to ensure future developments *'complement existing settlement structure, character and uses'* (p.9). Future development that recognises, protects and complements any '*unique topographic, natural or built cultural features essential to the visual setting, character, identity, or heritage significance'* is also encouraged in the LSPS.

Planning Priority 4 aims to protect, conserve and enhance the Yass Valley's natural environment and built heritage. However, the LSPS does not provide any mapping of scenic landscapes, other than the location of protected areas such as State forests, national parks and reserves.

The project is located in the northern part of the LGA, within the rural landscape east of the Murrumbidgee River, generally between Childowa and Yass. Although the project is in proximity to the Burrinjuck and Bango nature reserves, it does not pass through these protected areas. There are no formal walking tracks or lookouts identified in Burrinjuck and Bango nature reserves.

Yass Valley Local Environmental Plan 2013

The Yass Valley LEP aims to '*protect high quality agricultural land*', '*protect and enhance the character of each of the villages in Yass Valley*' and '*minimise land use conflicts'* (NSW Government, 2013, cl.1.2(2b,g,k)).

The majority of the project is located in the Primary Production (RU1) zone. The RU1 land use zoning aims to '*maintain the rural character of Yass Valley'* and '*ensure that the location, type and intensity of development is appropriate, having regard to the characteristics of the land, the rural environment and the need to protect significant natural resources, including prime crop and pasture land*' (Part 2, Land Use Table, Zone RU1). However, the LEP does not provide any mapping of scenic landscapes or landscape features for protection.

North of Yass, the project crosses through land zoned R5 Large Lot Residential, between the Main Southern Railway line and Cooks Creek. The R5 land use zoning aims to '*provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality'* (Part 2, Land Use Table, Zone R5).

The LEP aims to conserve the heritage significance of heritage items, including their '*settings and views*' (cl.5.10). The following local heritage items are located near the project (west to east):

- Derringullen Creek fossil area
- Coolalie limestone kilns and quarry.

Yass Valley Development Control Plan

The Draft Comprehensive Yass Valley Development Control Plan is currently being prepared by Council and is not yet available. There are no other DCPs covering the landscape and visual study area for this project.

3.2.5 Upper Lachlan Shire Council

Upper Lachlan Local Strategic Planning Statement

The Upper Lachlan Shire LSPS 2040 (Upper Lachlan Shire Council, 2020) sets out the vision for the area in 2040 and the actions that would be taken to achieve this vision. The shire's vision is: '*A district of villages in a beautiful diverse landscape with a prosperous agricultural and energy economy connected to Sydney, Canberra and international markets*' (p.7).

One of the shire's greatest assets are the '*beautiful rural villages set in an agricultural landscape'* with a '*vibrant green hinterland'* (p.11). The LSPS recognises the '*beauty of rural land either as a commodity or for its conservation values*' and advocates the '*protecting agricultural land'* (p.11). Wind farms are identified as an '*emerging industry'* for the shire, and a '*prominent element in the landscape*' (p.8).

The LSPS includes eight planning principles, to inform the shire's land use planning framework. The following principles in the LSPS are of relevance, including:

- Planning Principle 4: Character, Identity, and heritage: protecting and enhancing the shire's '*agricultural and village landscapes'*.
- Planning Principle 5: Lifestyle and liveability: protecting and enhancing the character and identity of the shire, with its '*rolling hills and quiet countryside'* and '*rural vistas'.*
- Planning Principle 7: Landscape: protecting and enhancing the shire's landscape of '*villages in a distinct rural setting*'.

The project is located in the southern part of the region, extending through the rural landscape between Bango and Bannaby, passing near several renewable energy developments, including Gullen Range, Crookwell and Taralga Wind Farms, and Gullen Solar Farm. The Biala Wind Farm project is also under construction, on Grabben Gullen Road, about eight kilometres east of Biala.

Upper Lachlan Local Environmental Plan 2010

The Upper Lachlan LEP aims to coordinate the orderly use and development of land in the Upper Lachlan Shire (NSW Government, 2010b, cl.1.2(2g)). The majority of the project is located in the Primary Production (RU1) and Rural Landscape (RU2) zones. The RU1 land use zoning aims to '*minimise the visual impact of development on the existing agricultural landscape character'* (Part 2, Land Use Table, Zone RU1). Similarly, the RU2 land use zoning aims to '*minimise the visual impact of development on the rural landscape*' and '*minimise the impact of development on the existing agricultural landscape character*' (Part 2, Land Use Table, Zone RU2). The LEP does it provide any mapping of scenic landscapes, landscape character areas or landscape features for protection.

The LEP aims to conserve the heritage significance of heritage items, including their '*settings and views*' (cl.5.10). The following local heritage items are located near the project (west to east):

- Flour Mill, 3408 Taralga Road
- Tarlo River National Park
- St Matthew's Anglican Church and Churchyard
- Hillas Farm Homestead and outbuildings
- Bannaby Homestead and shearing shed.

Upper Lachlan Development Control Plan 2010

This DCP places importance on the appearance and compatibility of development with the surrounding context. The following provisions in the DCP are of relevance.

Maintaining and enhancing the '*rural character'* of the shire is a priority (Upper Lachlan Shire Council, 2010, 4.1.1(2b)). In addition, rural development objectives for areas within the '*rural landscape'* include:

- protecting the scenic values of the rural landscape and environment and encouraging development to be unobtrusive and sympathetic to the surrounding rural setting
- maintaining and enhancing existing vegetation to provide buffers and landscaped visual relief within rural areas (s.2.2).

4.0 Methodology

4.1 Guidance for landscape and visual impact assessment

A range of guidance is available for the assessment of landscape and visual impact. However, the industry typically refers to the following guidance:

- *Guideline for Landscape Character and Visual Impact Assessment EIA-N04*, Transport for NSW, 2020
- *The Guidance Note for Landscape and Visual Assessment*, Australian Institute of Landscape Architects Queensland, 2018
- *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition, 2013, prepared by the Landscape Institute and Institute of Environmental Management & Assessment.

The methodology prepared for this assessment draws upon the guidance in these documents.

4.2 Assessment of landscape impact

Landscape is defined as … '*All aspects of a tract of land, including landform, vegetation, buildings, villages, towns, cities and infrastructure*.' (Transport for New South Wales (TfNSW), 2020).

Landscape character is the … '*combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place'.* (TfNSW, 2020)

The landscape assessment begins with the identification of landscape character zones (and areas). An assessment of landscape impact was then carried out by identifying the sensitivity of each landscape character area, describing the magnitude of change expected as a result of the project, and combining these factors to make an overall assessment of landscape impact.

4.2.1 Identification of landscape character zones

The landscape assessment begins with the identification of landscape character zones. A landscape character zone is … *'An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby*' (TfNSW 2020).

Due to the scale of project, the landscape and visual study area has been divided into landscape character zones, with the area further divided into sub-character areas. These character zones are defined primarily by geology, topography, vegetation, waterways, built form patterns and land use. The sub-character areas are based on the locality and reflect local landscape features.

4.2.2 Landscape sensitivity

Landscape sensitivity refers to the value placed on a landscape and its susceptibility to change. The sensitivity of a landscape may reflect the frequency and volume of users, as well as valued characteristics such as scenic amenity, its contribution to sense of place, and rarity. The value of landscapes can be described in Federal, State and local government masterplans and planning documents and protected by legislation. These protections reflect the importance of landscape resources to the local, regional and state-wide community.

Landscape sensitivity in this assessment has been considered in the broadest possible context, from those landscapes of national importance through to those considered to be landscapes of importance locally.

Table 4-1 lists the landscape sensitivity levels that apply to this assessment.

TABLE 4-1: LANDSCAPE SENSITIVITY LEVELS

Landscape sensitivity	Description
National	- Landscape feature or place protected under national legislation or international policy eg the Australian Alps National Parks and Reserves. - These landscapes are generally unique and uncommon nationally.
State	- Landscape feature or place that is heavily used and/or is iconic to the State, eg Snowy Mountains Scheme lookouts. - These landscapes are generally unique to or uncommon within the State.
Regional	- Landscape feature or place that is heavily used and valued by residents of a major portion of a city or a non-metropolitan region and / or Places with regionally important scenic value or to landscape features. - These places are generally unique or uncommon within the region.
Local	- Landscape feature valued and experienced by concentrations of residents and/or local recreational users and / or places of local scenic value or local landscape features. - These views are likely to be common within the landscape.
Neighbourhood	- Places where without any particular scenic values or local landscape features. - These places are likely to be common within the landscape.

4.2.3 Magnitude of change to the landscape

The changes to the landscape that would occur as a result of the project are assigned a magnitude of change level. This considers direct impacts on the landscape such as the removal of trees and tree canopy, open space and public realm areas, as well as indirect impacts, such as changes to the characteristics of the landscape, such as vegetation cover, landform and built form changes. It is important to note that the magnitude of change relates to the entire landscape character zone or area, not just changes to a small area.

Table 4-2 lists the magnitude of change levels that have been used in this assessment.

TABLE 4-2: LANDSCAPE MAGNITUDE OF CHANGE LEVELS

Magnitude of change	Description
Very High	- The landscape is altered such that the project dominates and / or transforms its character, amenity and / or function.
High	- The project substantially changes and / or is not compatible with the character, amenity, and function of the landscape. - This would result in an extensive and / or severe change in landscape values.
Moderate	- The project changes and / or is not compatible with the character, amenity, and function of the landscape. - This would result in a considerable and / or unsympathetic change in landscape values.
Low	- The project changes are minor and / or are compatible with the character, amenity, and function of the landscape. - It would result in a slight change in landscape values.
Negligible	- The project would not change the character, amenity and/ or function of the landscape. - If there is a change, it would not be perceived as altering the landscape values.

4.2.4 Assigning landscape impact levels

An assessment of landscape impact has been made by combining the landscape sensitivity and magnitude of change levels for each landscape character area and assigning an impact level (refer to Table 4-3).

TABLE 4-3: LANDSCAPE IMPACT LEVELS

		Sensitivity				
		National	State	Regional	Local	Neighbourhood
Magnitude	Very high	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

4.3 Assessment of visual impact – public domain views

The assessment of visual impact uses a representative viewpoint assessment approach. Representative viewpoints have been selected to show a range of views towards the project. Each view has then been assessed by identifying the magnitude of change created by the project, and the sensitivity of the expected viewer. Combined, these characteristics of the view are then used to assign a level of potential visual impact. This methodology is explained more fully in the following paragraphs.

4.3.1 Existing visual environment

Potential visibility of the project

A map has been prepared to illustrate the potential visibility of the project and extent of visibility from areas within this catchment. This visibility analysis uses a digital terrain model and points on the top of each transmission line structure along the indicative transmission line route, to identify the areas from which views to the project may be seen. The analysis shows areas where a greater number of transmission line structures are visible, as a darker colour.

The terrain data included one second SRTM Derived Hydrological (version 1.0 Geoscience Australia 2011) Light Detection and Ranging data. The model does not include land cover features (ie trees and buildings). This therefore represents a worst-case scenario and the first step in the analysis process.

4.3.2 Representative viewpoint assessment

Site inspections were carried out during March and September of 2022. These inspections verified the results of a preliminary viewshed analysis.

Views representative of the project footprint were selected, including views from areas where the greatest number of viewers are likely to congregate, such as lookouts, road corridors and scenic routes, as well as locations in sensitive recreational and natural areas.

Photomontages have been prepared for some viewpoints to support the assessment of impact. These views illustrate locations where the project would be seen from locations of higher sensitivity and also to show a typical view within each landscape character zone. Together with the photomontages prepared

for the private domain views (Refer to section 4.7.4), there are photomontages illustrating the project along the full length of the alignment.

Visual sensitivity

Visual sensitivity combines viewer sensitivity, the nature and duration of views, with scenic quality. Locations from which a view would potentially be seen for a longer duration, where there are higher numbers of potential viewers and where visual amenity is important to viewers can be regarded as having a higher visual sensitivity. Similarly, those views which capture more scenic landscapes are more highly values and have a higher visual sensitivity.

To ensure the impacts are attributed fairly, the sensitivity of each viewpoint is considered in the broadest context of possible views, including those of national importance through to those considered to have a neighbourhood importance. Table 4-4 lists the categories used to describe the level of visual sensitivity in this technical report.

TABLE 4-4: VISUAL SENSITIVITY LEVELS

Visual sensitivity	Description
National	- Heavily experienced view to a national icon, eg view from lookouts within the Australian Alps National Parks and Reserves, and / or - Views to areas with a high scenic quality, of national importance or to landscape features of the state significance, and / or - Views from World Heritage Listed Places. - These views are generally unique and uncommon nationally.
State	- Heavily experienced view to a feature or landscape that is iconic to the state, eg views from the Snowy Mountains Scheme, and / or - Views to areas with a high scenic quality which may be recognised by the state. - These views are generally unique or uncommon within the state.
Regional	- Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space, and / or - Views to areas of moderate scenic quality or to landscape features of the regional value. - These views are generally unique or uncommon within the region.
Local	- High quality view experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users, and / or - Views to areas of low scenic quality or to local landscape features. - These views are common within the landscape.
Neighbourhood	- Views where visual amenity is not particularly important to the wider community, such as views of low scenic quality briefly glimpsed from road. - These views are likely to be common within the landscape.

A visual reference for scenic quality is provided in the Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline (refer to Figure 4-1). These reference images support the scenic quality ratings referred to in Table 4-4.

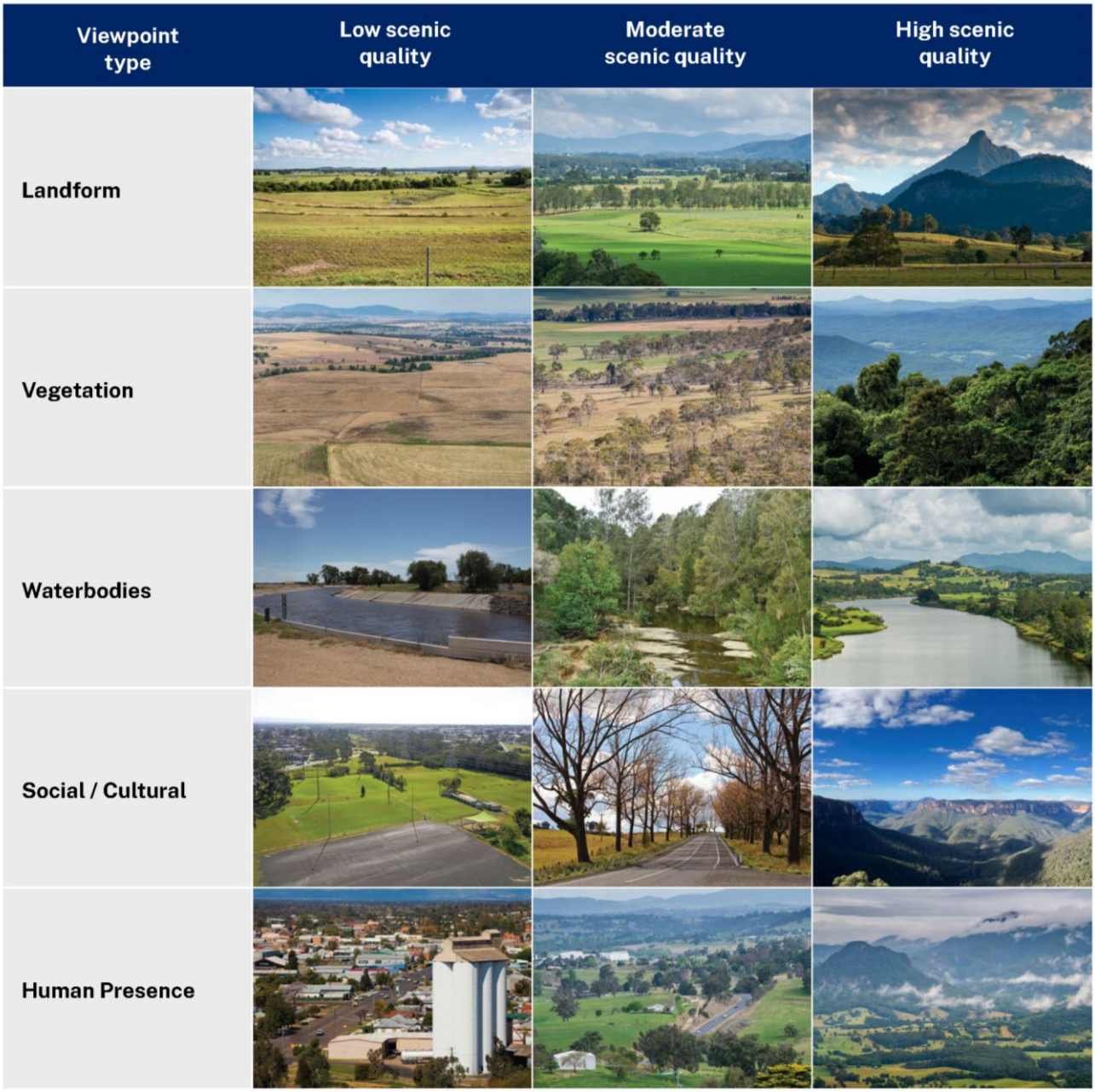


FIGURE 4-1 VISUAL REFERENCE FOR SCENIC QUALITY (SOURCE: DPE LARGE-SCALE SOLAR ENERGY GUIDELINE)

Magnitude of change

The magnitude of change refers to the change to the landscape that would occur as a result of the project from a given viewpoint. This includes what has changed, and how it has changed. The magnitude of change describes the extent of change and identifies elements which are removed or added, changed in colour and texture, and compatibility of new elements with the existing view. Changes in the characteristics of a view can result in an improvement or reduction in visual amenity.

A high magnitude of change would result if the development contrasts strongly with the existing landscape. Whereas a low magnitude of change occurs if there is minimal visual contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the development and the environment in which it sits. In this situation the development may be noticeable but does not markedly contrast with the existing view.

Table 4-5 lists the terminology used to describe the visual magnitude of change in this technical report.

TABLE 4-5: MAGNITUDE OF CHANGE LEVELS

Magnitude of change	Description
Very high	- The view is altered such that the project visually dominates and transforms the character of the view. - It would result in a substantial change in the amenity of the view.
High	- The project is visually prominent, and / or contrasts with the character of the view. - It would result in a considerable change in the amenity of the view.
Moderate	- The project is prominent and / or is not compatible with the character of the view. - It would result in a noticeable change in the amenity of the view.
Low	- The project is not visually prominent and / or is visually compatible with the character of the view. - It would result in a slight change in the amenity of the view.
Negligible	- The project is not visible, is not visually prominent in the view and / or is compatible with the character of the view. - It would result in no perceived change in the amenity of the view.

There are some general principles regarding the relationship between energy transmission infrastructure and the landscape which determine the magnitude of change level. These principles, or assumptions, relate to how well a transmission line can be absorbed into the landscape and what is considered to be more or less visually harmonious. These principles have been applied generally to the viewpoint assessment, and include:

- distance, the greater the distance, the less prominent the transmission line structures are likely to be (refer to Figure 4-3)
- form, the style and form of the infrastructure can assist in the absorption of development into a view ie lattice transmission line structures can be seen through and are more visually light weight in some settings
- backdrop and setting, when viewed against a backdrop, transmission line structures less visually prominent, the visual contrast is further reduced when viewed against a forested or varied backdrop
- scale of land use / built form, the presence of other existing infrastructure or built form of a similar character can increase the compatibility of development within a view
- alignment and line, an alignment reflecting the shapes and patterns of the existing landscape can reduce visual contrast, whereas intersecting lines and discordant alignments can increase the visual prominence of project elements.

These principles have been applied generally to the viewpoint assessment. Refer to Figure 4-2 and Figure 4-3 for illustrative examples of these principles.

FIGURE 4-2 MAGNITUDE OF CHANGE EXAMPLES

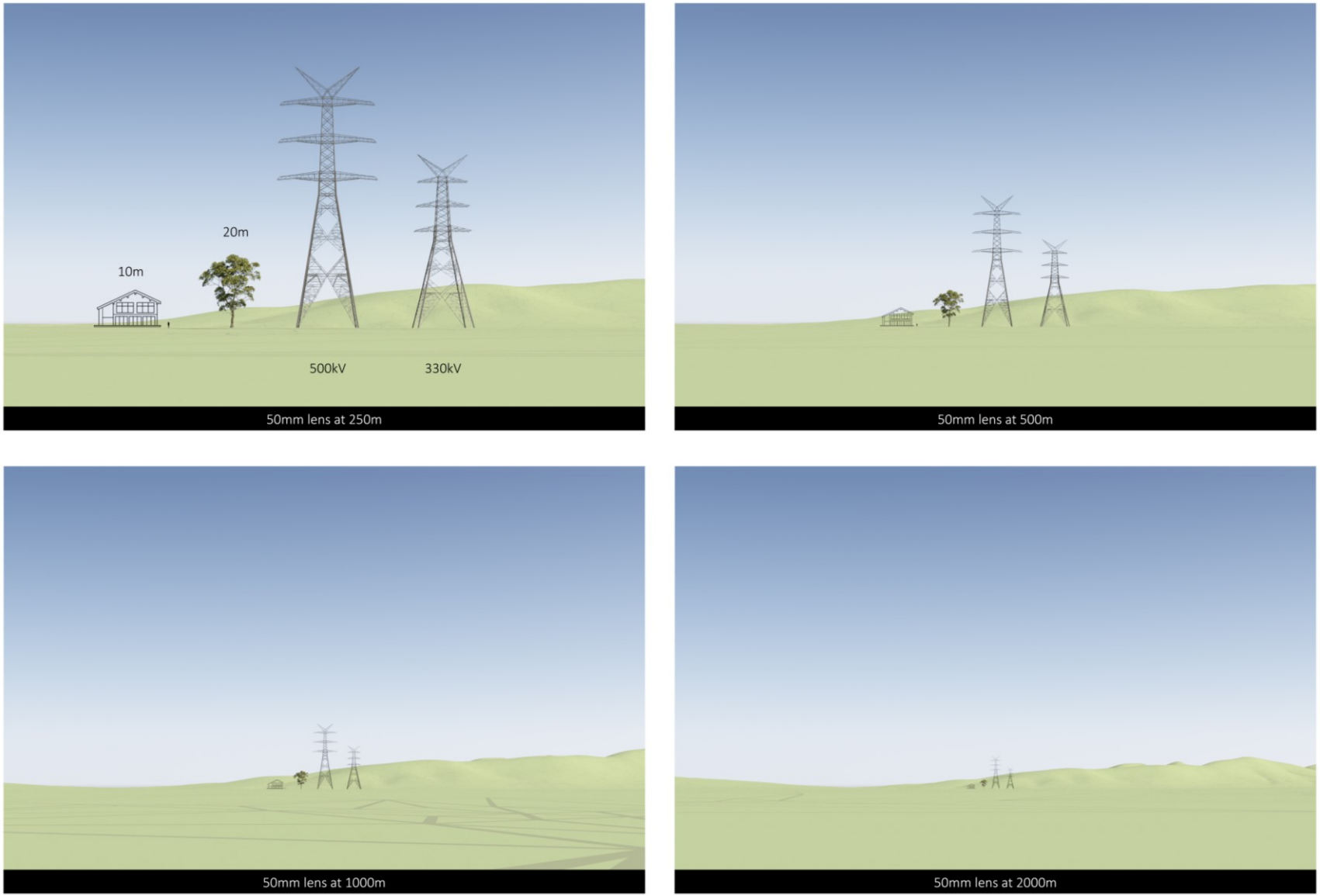


FIGURE 4-3 DISTANCE AND SCALE EXAMPLES

Assigning visual impact levels

An assessment of visual impact has been made by combining the visual sensitivity and magnitude of change levels for each representative viewpoint and assigning an impact level, as shown in Table 4-6.

TABLE 4-6: VISUAL IMPACT LEVELS

		Sensitivity				
		National	State	Regional	Local	Neighbourhood
Magnitude	Very high	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

4.3.3 Assessment of night-time visual impact

An assessment of the potential visual impacts of the project at night during construction and operation has been undertaken for each landscape character zone.

The assessment of night-time impact has been carried out with a similar methodology to the daytime assessment. However, the assessment also draws upon the guidance contained within AS4282 Control of the obtrusive effects of outdoor lighting (2019).

AS4282 identifies four main potential effects of lighting, which are, the effects on residents, transport system users, transport signalling systems and astronomical observations. Of relevance to this assessment is the effects of lighting on the visual amenity of residents and transport system users.

AS4282 identifies environmental zones which are useful for categorising night-time landscape settings. The following assessment has used these environmental zones to describe the existing night-time visual condition and assign a sensitivity to these settings.

Night-time visual sensitivity

The environmental zone (defined in AS4282) which best describes the existing night-time visual condition of the site has been selected. These zones are typical night-time settings and reflect the predominant light level of each landscape character area. Each environmental zone is assigned a level of sensitivity as shown in Table 4-7.

TABLE 4-7: ENVIRONMENTAL ZONE SENSITIVITY – NIGHT-TIME

	Environmental Zones (AS4282:2019)	
Sensitivity level	**Description**	**Examples**
Very high	A0: Intrinsically dark	UNESCO Starlight Reserve IDA Dark Sky Parks Major optical observatories No road lighting – unless specifically required by the road controlling authority
High	A1: Dark	Relatively uninhabited rural areas No road lighting – unless specifically required by the road controlling authority
Moderate	A2: Low district brightness	Sparsely inhabited rural and semi-rural areas
Low	A3: Medium district brightness	Suburban areas in towns and cities
Very low	A4: High district brightness areas	Town and city centres and other commercial areas Residential areas abutting commercial areas

Night-time magnitude of change

Following the sensitivity assessment, the magnitude of change that would be expected within each landscape character area at night is then identified. These changes are described, as relevant, in terms of:

- sky glow – which is the brightening of the night sky
- glare – condition of vision in which there is discomfort or a reduction in ability to see
- light spill – light emitted by a lighting installation that falls outside of the design area.

Table 4-8 lists the categories used to describe the visual magnitude of change at night.

TABLE 4-8: VISUAL MAGNITUDE OF CHANGE LEVELS – NIGHT-TIME

Magnitude of change	Description
Very high	- Substantial change to the level of skyglow, glare or light spill expected, and / or - the lighting of the project would transform the character of the surrounding setting at night, and / or - the effect of lighting would be experienced over an extensive area.
High	- Considerable change to the level of skyglow, glare or light spill and / or - the lighting of the project would noticeably contrast with the surrounding landscape at night and / or - the effect of lighting would be experienced across a large portion of the landscape.
Moderate	- Alteration to the level of skyglow, glare or light spill would be expected, and / or - the lighting of the project would contrast with the surrounding landscape at night, and / or - the effect of lighting would be experienced across a moderate portion of the landscape.
Low	- Alteration to the level of skyglow, glare or light spill would be expected, and / or - the lighting of the project would not contrast substantially with the surrounding landscape at night, and or - the effect of lighting would be experienced across a small portion of the landscape.

Magnitude of change	Description
Negligible	- Either the level of skyglow, glare and light spill is unchanged or - if it is altered, the change is generally unlikely to be perceived by viewers or - compatible with the existing or intended future use of the area.

Night-time visual impact levels

An assessment of night-time visual impact has been made by combining the visual sensitivity of the environmental zone with the night-time visual magnitude of change for each area generally and assigning an impact level, as shown in Table 4-9. This technical report has been undertaken for construction and operational impacts.

TABLE 4-9: VISUAL IMPACT LEVELS – NIGHT-TIME

		Sensitivity (AS4282:2019 Environmental Zone)				
		Very high (A0)	High (A1)	Moderate (A2)	Low (A3)	Very low (A4)
Magnitude	Very high	Very high	Very high	High	High-Moderate	Moderate
	High	Very high	High	High-Moderate	Moderate	Moderate-Low
	Moderate	High	High-Moderate	Moderate	Moderate-Low	Low
	Low	High-Moderate	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

4.4 Assessment of visual impact – private dwellings

4.4.1 Approach

There is no guidance for the assessment of visual impact on views for private property that applies to energy transmission projects in NSW. However, the assessment of visual impact on views from private residential properties is generally guided by the planning principles for 'view sharing' provided in the judgment of the NSW Planning Environment court in the Tenacity Consulting V Warringah Council [2004], NSWLEC 140 ('Tenacity'). View sharing is when a property … '*enjoys existing views and a proposed development would share that view by taking some of it away*.' (NSWLEC 140, 2004).

While the approach set out in this judgment is more suitable for urban settings, the principles can be applied to regional landscape settings in a more general way and with considerations of scenic preference appropriate for the range of landscapes available within the setting of the project.

In addition, the *Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline* (DPE, 2022) (the 'technical supplement') includes a two-stage process for the assessment of visual impacts on private dwellings. The first stage includes a number of tools that indicate whether a dwelling needs further detailed assessment or not, based on factors such as elevation and distance. The second stage is a detailed assessment. The method for the detailed assessment in the Technical Supplement then describes a method of private viewpoint assessment designed specifically to suit the particular visual characteristics of large-scale solar farms.

Due to the scale of this project and number of potential sensitive receivers, a similar two stage approach has been applied that suits the scale and nature of transmission infrastructure. For this reason, not all dwellings have been assessed.

The guidance in Tenacity and the Technical Supplement considers the impacts of operational infrastructure on views and do not specifically identify an approach for visual impacts during construction. Similarly, for this assessment, the impacts have been identified for the project during operation. Generally, it is expected that the visual impacts of construction would be slightly higher than the operational impacts in most locations. This is particularly the case where temporary construction support infrastructure, and the use of large equipment is proposed. These construction impacts would be temporary and experienced progressively along the project alignment.

4.4.2 Assessment stages

The assessment of visual impact from private dwellings has been undertaken in two stages.

- **Stage 1 - Preliminary assessment:** Identified those dwellings with the potential for a moderate or higher visual impact based on a desktop analysis of aerial photography, topography, and observations from nearby publicly accessible areas.
- **Stage 2 - Detailed assessment of impacts on views:** Undertake a detailed assessment of those dwellings with a potential moderate to high visual impact, to confirm their visual impact level. This included a visit to a representative sample of these private dwellings to observe and photograph views.

Further details of the process of assessment are outlined in the following sections.

4.4.3 Stage 1 - Preliminary assessment

The initial desktop assessment includes the following steps:

- All residential dwellings were identified within two kilometres of the project footprint.
- Desktop analysis of terrain and vegetation cover was used to identify properties that may have affected views.
- Those dwellings having moderate to high potential visibility of the project were identified for detailed assessment (refer Stage 2).

This desktop analysis focused upon all dwellings (including those under construction and with development approval) in the footprint and within 500 metres of the project footprint. In addition to this, where landowners have previously raised a concern regarding the impact on views from their dwelling, or where a dwelling was otherwise identified as having the potential for a moderate or high visual impact due to other factors, these dwellings were included in the preliminary desktop assessment (180 dwellings in total).

For each of these dwellings, our team considered the following factors when determining if there was the potential for a **moderate** to **high** visual impact:

- the potential visibility of the project considering landform and vegetation, noting that the greater potential visibility of the proposal, the greater likelihood of a higher visual impact
- if the view includes existing transmission lines, and whether the project would bring transmission line structures closer to the dwelling, noting that grouping like infrastructure together reduces the level of visual change to character, and reduces the potential for a higher visual impact
- if there would be a view to multiple proposed transmission line structures, a new proposed substation, adjustments to the existing substation or other supporting infrastructure, noting that a view to multiple new elements increases the potential for a higher visual impact

- if the view to the project footprint appears to be within primary view from the dwelling (evidenced by the location of ancillary structures, pools and garden areas etc.), noting that views from living areas, kitchens and the like are more important to protect than views from other areas of a dwelling such as bedrooms, bathrooms, and working areas of a farm, for example
- the viewing position relative to the location of the project ie if the project is at a similar level to the dwelling it may be in the main view line whereas if it is at a different level eg located above the dwelling, it is less likely to be visible from sensitive viewing locations within the dwelling
- if the project would be viewed against a backdrop, such as a vegetated hillside, and therefore less visually prominent
- if the project would visually intrude to a point that would result in an adverse cumulative high visual impact with other like infrastructure.

From those dwellings with a potential moderate to high visual impact, some dwellings were identified for detailed inspection (Stage 2).

4.4.4 Stage 2 – Detailed assessment of dwellings with the potential for a higher visual impact

A more detailed assessment has been undertaken on those dwellings identified as having the potential for a moderate to high visual impact (90 dwellings). This assessment was based on roadside observations and some property inspections where access was granted.

The properties selected for a site visit included dwellings to represent views from locations across the length of the project, including from within each of the landscape character areas, those where a greater potential visual impact was predicted. Dwellings that are permanently occupied were prioritised for visual assessment over secondary residences and short stay accommodation, where this was known. The purpose of these visits was to verify the desktop assessment with a sample group of locations.

During property site visits, observations were made as to the layout of the dwelling. The primary views were identified, and photographs taken from the areas immediately adjacent to the dwelling. Photographs were taken on a full frame digital Single Lens Reflex (SLR) camera positioned at eye height (about 1.5 metres), and with a 50 millimetre focal length.

The methodology for the detailed visual impact assessment is based on the guidance from various sources, including the View Sharing principles of the NSW Land and Environment Court (Tenacity Consulting v Warringah Council (2004) (NSWLEC140) and the Large Scale Solar Guideline (DPE, 2022). This methodology has been developed to reflect the scale and particular visual characteristics of transmission line infrastructure. This assessment relies on expert opinion to assign impact based on a combination of factors, and the extent of design information currently available.

The following assessment steps were undertaken:

Step 1: Identify views to be affected

- Consider the view distance, the orientation of the affected view, and key features of the view, including topography, buildings, infrastructure, vegetation and visual landmarks.

Step 2: Consider from what part of the property the views are obtained

- Identify the orientation of the dwelling, location of living areas and extent of the visibility. Noting that views from living areas (such as living rooms, verandas, entertaining areas) are considered to be more sensitive than bedrooms and working areas of the dwelling. These

'primary views', rather than side views or views from other areas of the property, are also more important to protect as people spend most time in these places.

- Select primary view to be assessed.

Step 3: Assess the extent of the impact

- Describe the likely visibility of the project and its compatibility with the character of the view from the dwelling.
- Assign a visual impact level using the levels described in Table 4-10. This table includes a range of factors that are typical indicators of each impact level, with a combination of these scenarios being present for each level of impact. Noting that a view of the project does not necessarily constitute a visual impact.

Step 4: Identify mitigation measures.

- Identify any opportunities to reduce the visual impact of the project. Where a more skilful design would reduce the impact, this is described as a mitigation measure. These measures may include considerations relating to the positioning of the structures, or the provision of localised screening vegetation, noting that any mitigation measures would be undertaken in consultation with the landowner.

It is important to note that a view of the project does not necessarily constitute a visual impact.

TABLE 4-10: VISUAL IMPACT LEVELS – PRIVATE PROPERTIES

Visual impact level	Description (typical indicators of visual impact)
High	- Potential for an overwhelming reduction in the amenity of the view / or fundamental change in the amenity of the view. - May include one or a combination of the following: ○ Transmission line structures or substation located in close proximity ○ Transmission line structure(s) obstruct the view to an icon / important landscape feature ○ Transmission line structures of a large height and scale ○ Transmission line route extending across the view with multiple structures visible and affecting a broad horizontal field of view ○ Transmission line route changes direction and may include larger corner structure(s) ○ Transmission line structures prominently located on a ridgeline ○ Limited screening by vegetation or landform ○ Large areas of vegetation removed ○ Prominent new access tracks and / or landform change visible ○ No existing transmission lines visible and limited visibility to other infrastructure, including highways, solar farms, wind turbines etc. - Primary view from a dwelling, or viewed from multiple primary viewing locations around the dwelling - View with moderate to high scenic qualities.
High-moderate	- Potential for a substantial reduction in the amenity of the view. - Primary view from a dwelling, or view with moderate or high scenic quality - May include one or a combination of the following: ○ Transmission line structures or substation located in close proximity ○ Transmission line structures of a large height and scale

Visual impact level	Description (typical indicators of visual impact)
	○ Transmission line route extending across the view with multiple structures visible and occupying a wide horizontal field of view ○ Transmission line route changes direction and may include larger corner structure(s) ○ Transmission line structures prominently located on a ridgeline ○ Some screening by vegetation or landform ○ Some areas of vegetation removed, formalised or new access tracks and / or landform change visible ○ Transmission line structure(s) reduce the prominence of a view to an icon / local landscape feature ○ A primary view with moderate to high scenic qualities ○ No existing transmission lines visible and limited visibility to other infrastructure, including highways, solar farms, wind turbines etc.
Moderate	- Potential for a considerable reduction in the amenity of the view. - May include one or a combination of the following: ○ Transmission line structures or associated infrastructure located in the middle ground ○ Transmission line structures of a moderate to large height and scale ○ Several transmission line structures visible or partly seen ○ Some screening by vegetation or landform ○ Some vegetation removal, access tracks and / or landform change visible ○ A primary view with moderate existing scenic qualities.
Low	- Potential for a noticeable reduction in the amenity of the view - May include one or a combination of the following: ○ Transmission line structures or associated infrastructure located in the middle to background ○ Transmission line structures of a moderate to large height and scale ○ Some screening by vegetation or landform ○ Several transmission line structures may be partly seen above or between vegetation ○ Some vegetation removal, access tracks and / or landform change visible ○ Not a primary view or a view of lower existing scenic quality.
Negligible	No change visible or the infrastructure would be visible and there would be no change to the amenity of the view.

4.5 Mitigation and management measures

Where a visual impact has been identified as a result of the project, methods for reducing and managing these impacts have been considered and specific mitigation approaches recommended. These mitigation and management measures address both construction and operational impacts identified for landscape impacts and visual impacts from the public domain.

Any opportunities for vegetation screening to minimise the visual impact on private domain views, would be further refined in consultation with landowners during the detailed design stage of the project.

4.6 Cumulative and interactive effects

Incorporating cumulative effects into the impact assessment widens the assessment to include not only direct effects, but also collective effects.

Cumulative effects of projects can indicate that the combination of effects created by multiple projects may be greater than the sum of the individual effects. When considering cumulative landscape character and visual effects the intended landscape character change as a result of land use planning intentions should be taken into consideration.

Cumulative impacts between projects have been addressed based on assumptions about the likely implementation of proposed projects within neighbouring areas. There is no guidance for the assignment of impact levels to cumulative landscape character and visual effects, therefore these effects have been described generally.

4.7 Photomontages and 3D model views

Photomontages have been prepared to illustrate the expected changes to views as a result of the project at a sample of representative locations along the overall length of the project footprint. Photomontages are created using a combination of 3D modelling and photo editing techniques.

The process used to prepare these images was as follows:

- GPS coordinates and details of the camera were recorded
- a digital surface model (terrain, trees and buildings) was prepared using LiDAR data
- the camera was positioned in the model using the photograph GPS data for each image
- the digital surface model was used to align the view
- the transmission line structures, wires and associated infrastructure were modelled in 3D and materials assigned to the model
- these 3D modelled components were then incorporated into the photograph using Photoshop
- further edits to the photograph were made in Photoshop including the removal of vegetation where appropriate.

For this assessment, the transmission line structure locations along an indicative transmission line route within the project footprint have been used. It is noted that the transmission line structures may be shifted slightly within the project footprint during finalisation of the project design, however the assessment presents a representative assessment of impacts.

The photomontages used in this assessment represent the operational view to the project. Photomontages of construction activity or worker accommodation facilities have not been prepared as construction activity would change continuously throughout the construction program and these activities would not be permanent.

Transmission line structures have been modelled at the maximum assumed height (76 metres for the 500 kV and 50 metres for the 330 kV transmission line structures) using a typical lattice structure that shows a worst-case scenario in terms of visual complexity. The viewpoints used to create these photomontages were chosen to represent a range of viewing locations along the transmission line route, from a distance and orientation where the project would be most visible. The photomontage locations were also chosen to illustrate views from areas with the greatest visual sensitivity and where the greatest number of viewers would be located. Distant views were not selected as the detail of the model would not be evident and the extent of change in the photograph would be less.

The new equipment proposed at the proposed Gugaa 500 kV substation has been 3D modelled to reflect an indicative layout, with elements of typical size and scale. This includes infrastructure having a maximum height of around 33 metres.

For private property views, photomontages were selected to represent the primary view corridor or to capture the project where it is most visible.

3D modelled views were prepared for some private dwelling views (where site photos were not available), using LiDAR point cloud data, aerial photography and the 3D modelled components. These 3D modelled views are spatially accurate and use points to illustrate the landform, vegetation and project components to illustrate the visibility of the project from a given location without a base photograph. Photomontages and 3D model views are presented in **Attachment I.**

4.8 Limitations:

The landscape character and visual impact assessment contained in this report has been undertaken with the following limitations:

Field work was undertaken during the day and the night-time assessment has been made from day-time observations.

- The assessment of private dwellings is informed by site inspections from a sample of dwellings, those dwellings not visited have been assessed with consideration of available desktop data, aerial photography and observations from nearby dwellings and roads where possible.
- As there is no one measure that can determine visual impact, this assessment relies on expert opinion for the assigning of impacts.
- This assessment is based on a project footprint, the design and exact location of project elements within the project footprint is not yet known. The final location of project elements may change the impact ratings contained in this assessment.
- For the preparation of photomontages, assumptions have been made as to transmission line structure designs and locations as per the indicative concept design. Similarly, the detailed layout of associated infrastructure at the substations are based on assumptions relating to the likely layout and scale of the components.
- Project construction planning would be undertaken by the project construction contractors at a later stage. For this assessment, assumptions have been made as to the scale and types of activities and infrastructure that would be required at the worker accommodation facility and construction compounds.
- The extent and detail of project lighting, required during construction and operation, is not yet defined and is subject to detailed design. Assumptions have been made as to the type and extent of lighting required.

5.0 Existing environment

5.1 Topography and landscape features

The project footprint traverses a diverse landscape, containing highly varied topography and character. The landform in the east is undulating between Wagga Wagga and Adjungbilly, where the landform is formed by the Murrumbidgee and Tumut River valleys and their tributaries including Yaven Creek and Gilmore Creek. The southern part of the project is located in the northern part of the Australian Alps, including mountainous areas with high altitude between Batlow and Maragle. This area includes extensive areas of native forest. The central part of the project includes large tracts of plantation pine forest, with a history of logging and timber milling. North of Red Hill State Forest, the landform descends and gently undulates as the project passes over the Murrumbidgee River at Adjungbilly and extends north-east towards Yass. To the north-east of Yass, the landform rises again to a series of north south aligned ridge lines, transitioning to high tableland areas around Gullen Range, Crookwell and Taralga. Further to the north-east, the landform rises again to a series of ridge lines, including the Cookbundoon Range and the rugged hilly landscape to either side, in the vicinity of Tarlo River National Park. The Cookbundoon Range is an important landscape feature in this area and the park contributes to protection of its scenic value (NSW NPWS, 1998, p.2). In the vicinity of Bannaby, the landscape includes a series of valleys, one containing the existing Bannaby 500 kV substation (refer to **Attachment B)**.

The project footprint traverses primarily rural areas with a range of land uses including cropping, grazing, horticulture, forestry, and renewable power generation (particularly wind). Other land uses in proximity to the project include residences, farm buildings and infrastructure, roads and road reserves, rural residential development, recreation, and existing transmission line easements. The project also extends across State Forests and is in proximity to nature reserves and parks such as Tarlo River and Kosciuszko national parks.

5.2 Potential visibility of the project

The visibility of the project is determined by the landform, and screening effect of building and vegetation cover. As such there would be greater potential visibility of the project in areas where the landform is flatter and there is less vegetation. The diagrams in **Attachment D** show the potential visibility of the proposed transmission line. This analysis is based on indicative transmission line structure heights and is identified using a model of the landform of the site and surrounding areas.

Generally, this analysis shows:

- Low to moderate levels of visibility in areas between Wagga Wagga and the Ellerslie Range, where the landform is gently undulating. There is scattered tree cover in this area that would provide some localised screening of views. This area is scattered with rural residences, which would potentially have views to the project, including in the vicinity of the proposed Gugaa 500 kV substation.
- Varied levels of visibility between the Ellerslie Range, Wondalga and Maragle, where the landform transitions into mountainous areas. The potential visibility of the project through this section of the project includes areas of moderate visibility northeast of Batlow and areas of potential high visibility in Bago State Forest, south of Batlow. However, the dense tree cover in much of this area would obstruct views to the project. There are also few private residences and publicly accessible roads in this area, with large areas of forest with limited public access, further limiting opportunities to view the project.

- Areas of moderate and high visibility to the north of Batlow, particularly along the Windowie Creek valley near Tumut, where the project footprint passes through a flat rural area and crosses the Snowy Mountains Highway. Areas of moderate visibility north of Tumut where the project passes through the Tumut River and Killimicat Creek valleys. In these areas there are scattered private residences and few roads that offer views towards the project. Further north of Killimicat Creek, there are potentially high levels of visibility along the Pine Mountain and Honeysuckle ranges and Red Hill. However, there is limited public access in this area, very few dwellings, and increased vegetation cover that would limit views to the project.
- Generally low visibility, between Adjungbilly and Yass where the landform is undulating with moderate potential visibility in elevated locations surrounding Yass. In this area there are large areas of cleared rural land with scattered trees and dwellings.
- Areas of moderate visibility along elevated sections of Rye Park and Grabben Gullen Road, between Yass and Grabben Gullen, where the project would be seen alongside the Yass to Gullen Range 330kV transmission line easement.
- Low to moderate visibility, between Grabben Gullen and Bannaby, the undulating landform, with steeper valleys created between ridgelines. There would be potential views to the project from scattered rural dwelling and local roads such as Range, Crookwell, Woodhouselee, Middle Arm, Taralga and Bannaby roads. However, the increased tree cover would reduce the potential visibility of the project.

This pattern of visibility is an initial step in the assessment process and was further investigated during field investigations.

5.3 Landscape and visual sensitivity of the study area

The sensitivity of the landscape and visual study area is influenced by a range of tourist routes, facilities and land uses, which are listed below. These have been used to identify representative viewpoints and define the visual sensitivity of each view.

In particular, the landscape and visual study area includes several important historic, cultural and environmental tourist places and routes. The location of a view on a tourist route or within a designated open space area or reserve typically increases its sensitivity due to the greater number of likely viewers and the greater emphasis that travellers, tourists and recreational users have on landscape appreciation.

Key receivers identified as likely to have an elevated visual sensitivity are:

- The Hume Highway, one of Australia's major inter-city national highways. The project would cross this road in two places, at Tarcutta (south-east of Wagga Wagga) and north-west of Yass.
- Snowy Valleys Way, a touring route between Gundagai and Beechworth in Victoria's High Country, passing through the western foothills of the Snowy Mountains. The project would cross this route in the vicinity of Wondalga, at Batlow Road.
- The Snowy Mountains Highway which is a major touring route through the Snowy Valleys region. The project would cross this road to the west of Tumut.
- Brindabella and Bombowlee Creek roads (also known as Tumut Road), located between Tumut and Canberra, described as a 'scenic route' in the *Snowy Valleys Destination Management Plan* (Snowy Valley Council, 2018). The project would not cross this route.
- The Wine to Caves tourist route, between Gunning, Crookwell and Tuena, running along Grabben-Gullen Road in Upper Lachlan Shire. The project would cross this road in the vicinity of Mount Marton and Merril Creek, north-east of Dalton.

- The **Main Southern Railway**, a major railway in NSW running from Sydney to Albury. The project would cross this railway north-west of Yass.
- The **Australian Alps National Parks and reserves**, consisting of twelve national parks and reserves in the Australian Alps including the Tumut region of **Kosciuszko National Park**, the closest park to the project, which has several camping grounds along Blowering Reservoir, walking trails and lookouts such as:
    - **Australian Alps Walking Track**, a long-distance trail from Walhalla at the southern end of the Australian Alps to the outskirts of Canberra, about 17 kilometres east of the project
    - **Blowering Cliffs walking track,** east of Blowering Reservoir, about 13 kilometres east of the project
    - **Black Perry lookout**, east of Blowering Reservoir, about 14 kilometres east of the project
    - **Buddong Falls walking track**, descending east from the Buddong Falls campground, east of the project.
- The project is located outside of Kosciuszko National Park.
- State forests such as the **Red Hill State Forest** and **Bago State Forest**, which include remote walking trails and lookouts such as the 'Hume and Hovell Lookout' and 'Storm Lookout', west of Blowering Reservoir.
- The **Hume and Hovell Adventure Trail**, a 426 kilometre long adventure trail that follows the expedition route of Hamilton Hume and William Hovell between Albury and Yass, including through Bago State Forest. The project would cross this trail in Bago State Forest and south-west of Yass along Black Range Road.
- Rest areas along highways and roads, including **The Big Apple** near Batlow.
- The **Bango Nature Reserve**, located on the Mundoonen Range, north-east of Yass. The project is located immediately south, and outside of this reserve.
- **Pejar Dam**, a water storage facility constructed on the Wollondilly River system, also used for recreation. The project crosses the northern part of this dam, south and parallel to the existing Gullen Range to Crookwell 330 kV transmission line.
- The **Tarlo River National Park** includes extensive areas of steep forested country along the northern part of the Cookbundoon Range and functions primarily as a nature conservation area. While public access to this national park is restricted, it contributes to the landscape character and scenic quality of views in this area. The project is located north of this national park and existing 330 kV transmission lines.

6.0 Landscape impact assessment

6.1 Landscape character zones and areas

While there is a diverse mosaic of landscapes within the project footprint, eight broad landscape character zones (and several sub-character areas) have been identified for the purposes of this assessment. These are based on similar topography, vegetation type and cover, and land use.

These landscape character zones (and sub-character areas) include (west to east):

- rural fringe landscape character zone
  - Wagga Wagga rural fringe landscape character area
- Great Dividing Range foothills landscape character zone
  - Gregadoo Great Dividing Range foothills landscape character area
  - Ellerslie Range Great Dividing Range foothills landscape character area
- rural valleys landscape character zone
  - Gregadoo to Book Book rural valleys landscape character area
  - Yaven Creek and Adelong Creek rural valleys landscape character area
  - Tumut rural valleys landscape character area
  - Adjungbilly rural valleys landscape character area
- forested hills landscape character zone
  - Green Hills forested hills landscape character area
  - Bago forested hills landscape character area
  - Minjary forested hills landscape character area
  - Red Hill and Bungongo forested hills landscape character area
- undulating rural hills and ridges landscape character zone
  - Wondalga to Batlow undulating rural hills and ridges landscape character area
  - Tumut undulating rural hills and ridges landscape character area
  - Murrumbidgee undulating rural hills and ridges landscape character area
  - Black Range to Yass undulating rural hills and ridges landscape character area
  - Jerrawa to Dalton undulating rural hills and ridges landscape character area
- upland forest landscape character zone
  - Snowy Mountains upland forest landscape character area
- rural tablelands landscape character zone
  - Crookwell rural tablelands landscape character area
- rural highland and deep valley landscape character zone
  - Taralga to Bannaby rural highland and deep valley landscape character area.

The following section includes a description of the existing conditions in each of these landscapes, the sensitivity of each landscape, the magnitude of change expected because of the project and assigns an impact level. The location of these landscape character zones and areas is shown in **Attachment C.**

6.1.1 Rural fringe landscape character zone

This landscape character zone is located in the rural areas to the south of Wagga Wagga. This landscape has a transitional character, occupied by rural activities extending south from Wagga Wagga to the foothills of the Great Dividing Range. The landform in this zone is generally flat to gently undulating plains. There is vegetation alongside roads, creeks and surrounding rural dwellings within this landscape. This tree cover encloses some views, so that views across the landscape are often contained to smaller visual catchments (refer to **Attachment C** and Figure 6-1).

The landscape has a semi-rural landscape character, including small farms and acreage properties as well as rural residential development which form the southern outskirts (fringe) of Wagga Wagga. This landscape character zone also contains some light industrial activities such as waste and recycling facilities and the existing substation. The landscape is traversed by a complex network of transmission lines connecting to the existing Wagga 330kV substation. There are a large variety of transmission line structure types and sizes in this landscape, including a parallel set of Uranquinty and Wagga 132 kV transmission lines, intersecting with the Yanco and Australian Newsprint Mills to Wagga 132 kV transmission lines, as well as three sets of larger 330 kV transmission lines extending between Wagga Wagga and Jindera, Darlington Point and Lower Tumut. This existing energy transmission infrastructure creates visual clutter and detracts from the rural character of this landscape.

Landscape sensitivity: This landscape consists of a semi-rural landscape on the land fringing the urban area of Wagga Wagga. This landscape would be appreciated by local residents and workers from the scattered farms, people travelling along the Hume Highway, as well as local roads such as Gregadoo East Road and Elizabeth Avenue. Overall, the Wagga Wagga rural fringe landscape character zone is of **neighbourhood landscape sensitivity**.

Landscape impact during construction: The transmission line route would parallel the alignment of the Lower Tumut to Wagga 330 kV transmission line (Line 51). A small section of Line 51 would be demolished and rebuilt (around two kilometres), including installation of transmission line structures of about 40 metres tall. As the landform in this landscape is predominantly flat, there would only be small and localised modifications to the terrain. Vegetation within the area used for construction would be impacted with some completely removed and some vegetation within the easement trimmed to lower heights. Full removal of all trees and ground cover vegetation is expected at each transmission line structure site, which would occur at regular locations across the landscape, and for construction access tracks. In some areas this would involve the removal of trees but in cleared rural areas this would mainly be the removal of groundcovers and grasses. There may also be vegetation removed at the Wagga 330 kV substation compound (C01), proposed for an area south of the existing Wagga 330 kV substation, at the corner of Ashfords and Boiling Down Roads. Additional access gates along Ashfords Road would be required to access the compound. Otherwise, vehicular access and movement in this area would remain much the same.

Overall, due to the vegetation removal and scale of construction activity, there would be a moderate magnitude of change to a landscape of neighbourhood landscape sensitivity, and a **low landscape impact** during construction.

Landscape impact during operation: This project would increase the presence of electricity infrastructure in this landscape and further detract from the semi-rural landscape character. The transmission line structures would be of a similar character to others within this landscape. They would be located near an existing substation and in the vicinity of other light industrial uses such as a major waste disposal facility. Although the transmission line structures would be higher, they would not substantially change the character of this part of the landscape character area.

FIGURE 6-1 RURAL FRINGE LANDSCAPE, CHARACTER IMAGES

Although the transmission line route would follow the alignment of an existing easement, the transmission line structures would be a slightly different design and range between about double to triple the height of the existing structures. There would be little opportunity for additional planting, however, due to the relatively flat topography, there would be minimal changes to the terrain.

Overall, due to the intensification of the electricity infrastructure, reducing the extent of rural landscape and vegetation within the area, there would be a moderate magnitude of change and a **low landscape impact** during operation.

6.1.2 Great Dividing Range foothills landscape character zone

Existing conditions: This landscape consists of hilly upland areas and escarpments rising above the surrounding rural plains, at the western foothills of the Australian alpine region. It is an elevated and highly undulating landscape, including deep valleys and ridges. Due to the steeper landform, there are larger areas of mature vegetation in this landscape. There are some residences scattered on some of the low-lying and flatters areas, offering views across the surrounding landscape. There are existing transmission line easements and roads crossing the lower ridgelines (refer to Figure 6-2 and **Attachment C**).

This landscape occurs in two areas along the transmission line route, including the:

- **Gregadoo landscape character area,** which is located to the south of Wagga Wagga. Southern parts of this area (outside of the project footprint) include '*visually prominent ridges and higher ground*' extending between Kapooka, Gregadoo and Gelston Park, providing '*the visual setting of the city*' and includes '*important visual reference points*' for the city of Wagga Wagga (City of Wagga Wagga Council, 2010a, s.5.1). The Wagga Wagga DCP also identifies the intention of '*keeping development below these points … to protect the natural skyline*' of Wagga Wagga (s.5.1).
- **Ellerslie Range landscape character area,** which is located between the Tarcutta and Yaven Creek valleys, and generally extends north towards Ellerslie Nature Reserve. The existing Lower Tumut to Wagga Wagga 330 kV transmission line route passes through the centre of this area, in an east/west direction, immediately north of the project, containing transmission line structures ranging between 24 to 40 metres in height.

Landscape sensitivity: This landscape includes ridgelines and hills which are visually important to the visual setting of Wagga Wagga. This landscape would be appreciated by small numbers of people travelling along the network of rural roads, including tourists and visitors to the region. Overall, the Great Dividing Range foothills landscape character zone is of **regional landscape sensitivity**.

Landscape impact during construction: The transmission line route would be located beside the existing Lower Tumut to Wagga 330 kV transmission lines, which traverse over the northern foothills of the Gregadoo landscape character area, south of Gregadoo East Road and the Ellerslie Range landscape character area, between Westbrook and Yaven Creek roads. All vegetation within the area used for construction would be removed including the site at each transmission line structure and at construction access tracks. Trees and vegetation within the transmission line easement would also be removed or trimmed as required. There are no construction compounds proposed in this landscape. As the Ellerslie Range landscape character area has a greater vegetation coverage, there would be more vegetation removal required, particularly as the project crosses the ridgelines. Due to the hilly landform, there would be some landform modification required to prepare each transmission line structure site and install the foundations.

FIGURE 6-2 GREAT DIVIDING RANGE FOOTHILLS LANDSCAPE, CHARACTER IMAGES

Overall, due to the more challenging terrain for construction, and greater vegetation cover, there would be a moderate magnitude of change to a landscape of regional landscape sensitivity, and a **moderate landscape impact** during construction.

Landscape impact during operation: While this landscape includes existing transmission line structures, the proposed structures would be about double to triple the height. The additional transmission line route would increase the presence of electricity infrastructure in this landscape as the project would parallel the existing transmission line easement and ridgeline crossings. However, the project would not cross the '*visually prominent ridges and higher ground*' that provide the '*visual setting*' of the city of Wagga Wagga (City of Wagga Wagga Council, 2010a, s. 5.1).

Due to the variation in landform and dense tree cover in this landscape, particularly the Ellerslie Range landscape character area, there would be localised landform change to create flat areas for the transmission line structures and vegetation along the easement would be either removed or trimmed. There would be little opportunity for the reinstatement of trees along the easement, however, grasses would be reinstated in impacted areas not required for operation.

Overall, the intensification of electricity infrastructure and reduction in vegetation would detract from the character of this landscape, resulting in a moderate magnitude of change and a **moderate landscape impact** during operation.

6.1.3 Rural valleys landscape character zone

Existing conditions: This landscape consists of flat to gently undulating, open plains containing mainly grazing pastures, with some areas of arable fields. The landscape is low-lying, and generally follows the alignment of creek and river valleys. It is a settled landscape, containing a network of rural roads, homesteads and cottages on rural properties and a collection of small towns. Tourism, especially heritage and nature-based tourism, as well as food and agritourism, have seen recent growth of many regional destinations, with towns such as Tumut, as well as natural attractions such as the proposed Tumut to Batlow Rail Trail (part of a larger plan for the Riverina Highlands Trail, including the existing Tumbarumba to Rosewood Rail Trail), providing interest for visitors. Infrastructure in the area includes rural structures such as sheds, yards and workshops, as well as local roads supporting the surrounding agricultural uses.

This landscape occurs in four areas along the project alignment, which vary geographically, but have a very similar landscape character (refer to Figure 6-3 and **Attachment C).** These include the:

- **Gregadoo to Book Book rural valleys landscape character area,** which is located to the south east of Wagga Wagga, between the Great Dividing Range foothills landscapes at Gregadoo and Ellerslie Range. This area contains undulating landform, with several small hills and larger peaks such as Mount Flakney (533 metres above Australian height datum (mAHD)) south of the project at Big Springs and Mount Coreinbob (463 mAHD) north of the project at Book Book. The area has been partially cleared of vegetation and is generally under agricultural use, mainly for grazing pastures with some areas of dryland farming. The project is located south of and parallel to the existing Lower Tumut to Wagga 330 kV transmission lines.
- **Yaven Creek and Adelong Creek rural valleys landscape character area,** which is located in the vicinity of Darlow and Adelong. This area has been mostly cleared of vegetation and is under agricultural use, mainly for grazing pastures. The project follows the alignment of the existing Lower Tumut to Wagga 330 kV transmission line route through this area, which contains transmission line structures ranging between 24 to 40 metres in height.

FIGURE 6-3 RURAL VALLEYS LANDSCAPE, CHARACTER IMAGES

- Tumut landscape rural valleys character area, which is located to the west of Tumut, following the Tumut River and its tributaries, including Gilmore and Brungle creeks. The rural character of this area, including cleared farmland with grazing pastures and some areas of dryland and irrigated farming, provides a scenic setting to nearby towns such as Tumut and Adelong. Nearing Tumut, there are other intensive industries such as timber mill and manufacturing plant, a waste and recycling centre, and a large paper mill on the northern side of the Snowy Mountains Highway, west of Tumut. The project would be a new feature in this area, located over two kilometres west of the existing Burrinjuck to Tumut 132 kV transmission line route, crossing the existing Tumut to Gadara 132 kV transmission line route near the paper mill.
- Adjungbilly rural valleys landscape character area, which is located along tributaries of the Murrumbidgee River, such as Adjungbilly Creek. It has mostly been cleared for agricultural use, particularly grazing pastures. This is a fairly remote area, located in the central east part of the Riverina, mostly under private ownership, with minimal public access other than local roads such as Adjungbilly Road. Bongongo Station is a historic feature of the area, located about three kilometres east of the project, on Adjungbilly Creek.
- Tumbarumba rural valleys landscape character area, which is located in areas to the west of the town of Tumbarumba. This area has mostly been cleared for agricultural use, including vineyards and grazing pastures. This area includes several local roads leading to the town of Tumbarumba. The density of dwellings increases on the outskirts of the town. There are managed forests and a large paper mill associated with the Mannus State Forest to the west of the valley.

Landscape sensitivity: This rural landscape would be appreciated by small numbers of people travelling along the network of rural roads, including mainly local residents and their visitors, as well as some tourists visiting and passing through the area. Overall, this landscape is of local landscape sensitivity.

Landscape impact during construction: Some vegetation within the area used for construction would be removed. This would involve the removal of all vegetation at each transmission line structure site, which would be located at a frequency of between around 300 and 600 metres along the route in this flat to gently undulating landscape. Within the transmission line easement, any trees which exceed vegetation clearance requirements would be removed. Within this easement, the existing shrubs, groundcovers and grasses would, however, generally be retained.

There would also be vegetation removed for construction access tracks and construction compounds, including the Gregadoo Road compound (C06) at Livingstone Gully Road and the Snowy Mountains Highway compound (C02) south-west of Tumut, and at the Tumbarumba Accommodation Facility (AC1).

As the landform of the area is flat to gently undulating, there would only be small and localised modifications to the terrain. Existing access tracks would be used where possible to avoid further disruption to the circulation and rural function (eg livestock grazing and cropping), and vehicular access and movement. During construction would be temporary altered with the presence of construction activity along the transmission line route and also vehicles transporting materials and equipment within the surrounding areas.

In the Gregadoo to Book Book landscape rural valley character area, the project would introduce large scale construction activity, particularly associated with the proposed Gugaa 500 kV substation and adjacent Gregadoo Road compound (C06), resulting in moderate magnitude of change and a moderate-low landscape impact during construction.

In the Yaven Creek and Adelong Creek, Tumut, and Adjungbilly rural valley landscape character areas, the project would introduce large scale construction activity in these peaceful rural

landscapes, resulting in a moderate magnitude of change and a **moderate-low landscape impact** during construction.

In the Tumbarumba rural valley landscape character area the establishment of the Tumbarumba Accommodation Facility (AC1) would introduce large scale construction support facilities into an otherwise rural landscape. This would result in a moderate magnitude of change and a **moderate-low landscape impact** during construction.

Landscape impact during operation: The transmission line route would follow the existing Lower Tumut to Wagga 330 kV transmission line easement through the Gregadoo to Book Book and Yaven Creek and Adelong Creek landscape character areas. In the Tumut landscape character area, the project would be a new feature, introducing large scale transmission structures in this flat rural landscape south-west of Tumut, crossing both Batlow Road and the Snowy Mountains Highway, as well as to the north of Tumut, crossing through the Tumut River valley, crossing Gocup and Brungle roads, and at the foothills of Mudjarn Nature Reserve. Similarly, the project would introduce large scale transmission line structures within an additional part of the Adjungbilly landscape character area, away from the existing Lower Tumut to Yass 330 kV transmission line easement.

The predominantly agricultural land uses would continue under the new transmission lines and around the transmission line structures, within the easement. While there would be some access tracks maintained, all other areas impacted by construction, outside the project footprint, would be stabilised and rehabilitated to a standard either as close as practicable to the pre-existing conditions and/or as agreed with the landowner. There would be little opportunity for additional planting, however, due to the relatively flat topography, there would be minimal changes to the terrain.

In the Gregadoo to Book Book and Yaven Creek and Adelong Creek landscape character areas, there would be an additional line of transmission line structures, regularly spaced across these areas, ranging between about double to triple the height of existing structures. Although these areas contain existing large scale transmission lines, the addition of a new substation at Gregadoo (the proposed Gugaa 500 kV substation) and presence of large scale transmission line structures would alter the prevailing character of the rural landscape, resulting in a moderate magnitude of change and a **moderate-low landscape impact** during operation.

In the Tumut and Adjungbilly landscape character areas, the magnitude of change would increase to moderate, due to the absence of large scale transmission line easements in these peaceful rural valleys. Although the existing paper mill detract slightly from the Tumut area, the prevailing character of this rural area is scenic, and it contributes to the landscape setting of Tumut. Overall, there would be a moderate magnitude of change and a **moderate-low landscape impact** during operation in the Tumut and Adjungbilly landscape character areas.

In the **Tumbarumba rural valley landscape character area** the Tumbarumba Accommodation Facility (AC1) site would be returned to rural use and the rural landscape character restored. There would be **no landscape character impact** during operation in this location.

6.1.4 Forested hills landscape character zone

Existing conditions: This landscape is undulating, including hills, mountains and interlinking ridgelines and valleys, ranging up to heights of 860 mAHD south of Wondalga and 1,046 mAHD east of Batlow. This landscape character area includes managed pine plantations, which are distinct from nearby tracts of native forest and areas of farmland due to the uniformity of the pine trees. The landscape includes several State forests, such as Green Hills, Bago, Red Hill and Bungongo, which are at various stages of management, resulting in large variation in tree cover and heights. It also contains two native forest reserve areas, including Minjary National Park and Mudjarn Nature Reserves, north-west and north of Tumut (refer to Figure 6-4 and **Attachment C).**

FIGURE 6-4 FORESTED HILLS LANDSCAPE, CHARACTER IMAGES

As this landscape is generally managed for forestry purposes, there are few residences in this area. There are however some dwellings north of Green Hills State Forest which have views into this area. Existing roads (most restricted to forestry vehicles) and transmission line easements crossing the area, including the Lower Tumut to Wagga and Yass 330 kV transmission lines, which largely align with the project through Green Hills and Red Hill State forests.

This landscape occurs in four areas in western and central parts of the project, including Green Hills, Bago, Minjary, and Red Hill (including Pine Mountain) and Bungongo. While a feature in the Red Hill area, located on the Pine Mountain range, north of Brungle Creek Road, this reserve is considered to be a '*striking landscape'* due to the concentration of native cypress pine (*Callitris endlicherii*) and kurrajong (*Brachychiton populneus*). This gives the reserve a very dark appearance and makes it stand out from other high points in the area (NSW DECC, 2008, p.5).

Landscape sensitivity: This landscape includes introduced plantation species, of varying levels of maturity and heights, creating variation and disunity, as well as some small areas of native forest such as Mudjarn Nature Reserve. This landscape would generally be appreciated by a small number of residences and people travelling along roads and trails accessible to the public, including tourists and visitors to the area using forestry trails. Overall, this landscape is of **local landscape sensitivity**.

Landscape impact during construction: In the Green Hills landscape character area, the project would be located beside the existing Lower Tumut to Wagga 330 kV transmission line easement. In the Bago and Minjary landscape character areas, the project would introduce a new transmission line easement.

In the Red Hill and Bungongo landscape character area, the project would follow the Lower Tumut to Yass 330 kV transmission lines easement through the southern section of Red Hill State Forest, including two nearby construction compounds, the Honeysuckle Road compound (C07) and Red Hill Road compound (C08). Elsewhere, the project would introduce a new easement in this landscape, including establishment of the Adjungbilly Road compound (C09), which would be set back from the road, behind a partially forested area.

All vegetation within the area used for construction within the project footprint would be removed including at each transmission line structure site, for construction access tracks and construction compound areas. Due to the hilly landform, there would be some landform modification required to prepare each transmission structure site and install the foundations. Trees and vegetation within the project footprint would be trimmed or removed as required. Although much of this landscape has a greater vegetation coverage, the trees are at varying stages of growth, reducing the consistency of vegetation cover and increasing the ability of this landscape to absorb further vegetation removal.

Overall, due to the more challenging terrain for construction, greater vegetation cover and absence of transmission infrastructure in the Bago and Minjary landscape character areas, there would be a moderate magnitude of change, and a **moderate-low landscape impact** during construction in these areas.

In the Green Hills and Red Hill and Bungongo landscape character areas, the magnitude of change would be low, due to the presence of transmission infrastructure, existing forestry activity and inconsistency in vegetation cover, resulting in a **low landscape impact** during construction in these areas.

Landscape impact during operation: While this project would introduce new transmission line structures, in some areas which do not contain electricity infrastructure, the character and use of the plantation forest in this landscape, including fields of trees at varying stages of growth, existing wide access tracks through the forest and presence of forestry activity (eg use of trucks, machinery and equipment) increases the ability of this landscape to absorb the project.

Due to the absence of transmission infrastructure in the Bago and Minjary landscape character areas, there would be a moderate magnitude of change to these landscapes, which are of local landscape sensitivity, and a **moderate landscape impact** during operation.

In the Green Hills and Red Hill and Bungongo landscape character areas, the magnitude of change would be low, due to the presence of transmission infrastructure, resulting in a **low landscape impact** during construction in these areas.

6.1.5 Undulating rural hills and ridges landscape character zone

Existing conditions: This landscape consists of rolling hills and ridges, which rise above the surrounding low-lying rural valleys. It is an elevated and gently undulating landscape, which has mostly been cleared for agricultural use, predominantly pastoral grazing, creating an open, rural landscape character. In southern parts of this landscape, the land use of more varied, including horticulture and some areas of arable farmland in flatter areas near Batlow. Vegetation is generally limited to road verges, fence lines, scattered within fields and within steeper areas such as hills sides and deep valleys. It is a settled landscape, with rural residences scattered on some of the low hills and flatters areas, offering views across the surrounding landscape. There are several small historic towns in this landscape, including Batlow, Jerrawa and Dalton, established to support the surrounding rural and forestry communities. There are also existing transmission line easements and roads crossing this landscape, including the hills east of Batlow and the Black Range, south-west of Yass (refer to Figure 6-5 and **Attachment C**).

This landscape occurs in five areas along the project alignment, including the:

- **Wondalga to Batlow landscape character area,** which is located in the vicinity of Wondalga and Batlow, west of Bago State Forest. The landform in this area is high undulating and largely cleared of vegetation, including smooth rolling pasture hills used for grazing livestock with a concentration of horticulture and arable farmland around Batlow. The existing Lower Tumut to Wagga Wagga 330 kV transmission lines pass through the southern part of this area, crossing the hills east of Batlow Road.
- **Tumut landscape character area,** which is located to the north and north west of Tumut, rising above the Tumut River and Brungle Creek valleys. It contains an open rural character, with open rolling pasture fields with scattered residences. The existing Lower Tumut to Yass 330 kV transmission lines pass through the western part of this area, in a north/south direction, meeting the project near Red Hill State Forest.
- **Murrumbidgee landscape character area,** which comprises of rolling hills either side of the Murrumbidgee River, north of Burrinjuck Nature Reserve. This area is quite remote, including large pastoral properties, a small number of residences and a limited local road network. Childowa Bridge is a feature in this area, a historic bridge crossing over Limestone Creek, near the river. The existing Wagga and Lower Tumut to Yass 330 kV transmission lines pass through the southern part of this area, in an east/west direction.
- **Black range to Yass landscape character area,** which extends between Burrinjuck Road and a ridgeline north of Yass. It is defined by the rolling pastoral fields associated with the Black Range. The project crosses the Hume Highway in this area, north-west of Yass. There is an area of rural lifestyle residential blocks in this landscape, along Wargeila and Fairy Hole roads, north of Yass. Otherwise, it is largely a rural landscape. Several transmission lines pass through this area, radiating from the existing Yass substation.

FIGURE 6-5 UNDULATING RURAL HILLS AND RIDGES LANDSCAPE, CHARACTER IMAGES

- Jerrawa to Dalton landscape character area, which is located between Bango and Gullen Range and includes historic rural towns such as Jerrawa and Dalton. The landform in this area is elevated and gently undulating, as the project transitions towards the tablelands landscape further to the east at Grabben Gullen and Crookwell. The existing Yass to Gullen Range and Gullen Range to Crookwell 330 kV transmission lines pass through this area, generally parallel to the project.

Landscape sensitivity: This is predominantly a rural landscape, valued and experienced by relatively low use local roads, as well as visitors to the area travelling along roads including the Hume Highway. This landscape extends across a broad area and is a relatively common landscape along the project footprint. Overall, this landscape is of **regional sensitivity**.

Landscape impact during construction: All vegetation within the area directly used for construction would be removed including at each transmission line structure site and for construction access tracks. Trees and vegetation within the transmission line easement would be removed or trimmed as required. Although this rural landscape is largely cleared of vegetation, there would be some areas where vegetation is more mature and denser, requiring more clearing of vegetation and a greater change in landscape character. These areas include the hills north-east of Batlow (Attachment C, area A), the hills between the Tumut River and Brungle Creek valleys (refer Attachment C area B), the hills west of the Murrumbidgee River (refer Attachment C area C), the areas east of Bango Nature Reserve (Attachment C area E) and between the Lachlan River and Sapphire Road (Attachment C area E).

In the Wondalga to Batlow (refer Attachment C area A) and Tumut (refer Attachment C area B) landscape character areas, due to the absence of existing electricity infrastructure and greater loss of vegetation cover in parts, there would be a moderate magnitude of change to a landscape of local landscape sensitivity. The Memorial Avenue compound (C14) in Batlow and Bowmans Lane compound (C15) south-east of Batlow would also alter the character of this part of the area during construction. Overall, there would be a **moderate landscape impact** during construction in the Wondalga to Batlow and Tumut landscape character areas.

Elsewhere in this landscape (including the Murrumbidgee, the Black Range to Yass, and Jerrawa to Dalton landscape character areas C, D and E refer Attachment C), due to the presence of existing electricity infrastructure, there would be a **moderate-low landscape impact** during construction.

Landscape impact during operation: In the southern part of the Wondalga to Batlow landscape character area, the project follows the Lower Tumut to Wagga 330 kV transmission line easement. However, north of Wondalga, the transmission line route diverts north, creating a new easement, away from power easements, towards Windowie and crossing Batlow Road south-west of Tumut. In the Tumut landscape character area, the project would continue to create a new easement, crossing the Honeysuckle Range, between the Tumut River and Brungle Creek valleys, north of Tumut. This is a hilly area, largely cleared of vegetation and under rural use, with an absence of large scale infrastructure.

Although the Murrumbidgee landscape character area contains three transmission line easements, including Lower Tumut to Yass 330 kV, Wagga to Yass 132 kV and Yass to Burrinjuck 132 kV transmission line structures, varying in size from 15 to 40 metres tall, the project would be located away (north) of these, within a new easement. The project would not be aligned with these easements, nor would they be co-located at any point.

In the southern part of the Black Range to Yass landscape character area, the project would be located parallel with the Lower Tumut to Yass 330 kV transmission line route, before diverting away (north) near Black Range Road. In the vicinity of Yass, the project would cross over several existing transmission line easements radiating from the existing Yass substation, including the Yass to Murrumburrah and two sets of Yass to Cowra transmission line structures. The existing Yass substation would be utilised as a construction compound for this project (C10). In the Jerrawa to

Dalton landscape character area, the project is parallel to the existing Yass to Gullen Range 330 kV transmission line easement.

In the Wondalga to Batlow and Tumut landscape character areas, due to the absence of existing electricity infrastructure and greater loss of vegetation cover in parts, there would be a moderate magnitude of change to a landscape of regional landscape sensitivity, and a **moderate landscape impact** during operation.

Elsewhere in this landscape (including the Murrumbidgee, the Black Range to Yass, and Jerrawa to Dalton landscape character areas), due to the presence of electricity infrastructure, there would be a **moderate-low landscape impact** during operation.

6.1.6 Upland forest landscape character zone

Existing conditions: This landscape is located in the northern part of the Australian Alps (Snowy Mountains bioregion). It occurs in one area at the southern end of the project, east of Batlow and extending south to Nurenmerenmong and Maragle. It is an elevated and highly undulating landscape, including deep valleys with mountain and hill ranges, and peaks such as Granite Mountain (1,439 mAHD), about 2.5 kilometres west of the project. Much of this landscape forms part of Bago State Forest and the local area has a history of logging. It is largely covered by forest, including large tracts of native forest with an area of managed pine plantation in the northern section. Within the areas of native forest, the tree cover is dense, mainly consisting of alpine eucalyptus species such as alpine ash, snow gum and mountain gum. This part of the landscape is close to the north western part of Kosciuszko National Park, in the Tumut area, which includes Blowering Reservoir and extensive areas of native alpine forest, drawing recreational tourists for the bushwalking tracks, scenic lookouts and camping locations. The project is crossed by the Hume and Hovell Walking Track, at the Buddong Hut, a historic mountain cabin near the Buddong Falls campground.

As this landscape is generally managed for conservation or forestry purposes, there are very few residences in this area. An exception is an area of privately owned land at Nurenmerenmong, which is partially cleared and includes a caravan park. There are also existing roads and transmission line easements crossing the area, including the Lower Tumut to Upper Tumut 330 kV transmission lines, which largely align with the project (refer to Figure 6-6 and **Attachment C)**.

Landscape sensitivity: This landscape includes ridgelines and hills which are valued local and regional landscape features. This landscape would be appreciated by small numbers of people travelling along roads and walking trails, including tourists and visitors to the region. Overall, this landscape is of **regional landscape sensitivity**.

Landscape impact during construction: In the northern part of this landscape, the project diverts south from the Lower Tumut to Wagga 330 kV transmission line easement and would introduce new electricity infrastructure, through existing forest. All vegetation within the area used for construction would be removed including at each transmission line structure site and for construction access tracks and helicopter landing pads (where required) to deliver materials and equipment to this remote landscape. Trees and vegetation within the transmission line easement would be removed or trimmed as required.

In the central part of this landscape, the project would be parallel to the existing Lower Tumut to Murray and Upper Tumut 330 kV transmission line easements. In the southern part of this landscape, the project would divert away from the Lower Tumut to Murray 330 kV easement and would stay parallel to the existing Lower Tumut to Upper Tumut 330 kV transmission line easement, passing through an existing caravan park north of Elliott Way. The Maragle 500 kV substation compound (C05) would be located at the southern side of Elliott Way, east of the existing easement. The vegetation within this site will have mostly been removed as part of the Snowy 2.0 Transmission Connection Project.

FIGURE 6-6 UPLAND FOREST LANDSCAPE, CHARACTER IMAGES

Overall, due to the more challenging terrain for construction, and greater vegetation cover within the project footprint, there would be a moderate magnitude of change to a landscape of regional landscape sensitivity, and a **moderate landscape impact** during construction.

Landscape impact during operation: The project would introduce additional transmission line structures of a similar form to those which currently exist in this landscape, although about double to triple the height. The project would increase the presence of electricity infrastructure in this remote forested landscape and introduce a new additional transmission line easement, largely cleared of vegetation, further detracting from this character of this landscape. Overall, there would be a moderate magnitude of change to this landscape and a **moderate landscape impact** during operation.

6.1.7 Rural tablelands landscape character zone

Existing conditions: This landscape is located between Gullen Range and Cookbundoon Range, south of Crookwell. The landscape consists of elevated tableland country, including a broad plateau of smooth rolling hills dissected by shallow creeks and valleys. As the landscape approaches the Tarlo River in the east, the landform has greater undulations, including deep valleys and steep hills and pronounced ridgelines, with patches of native forest, as the landscape transitions to the Cookbundoon Range. Pejar Dam is a feature in this landscape, located between Goulburn and Crookwell, including an embankment wall and spillway across the Wollondilly River. The dam includes a large surface area, generally used for passive recreation including boating, fishing and visitor amenities.

The rural tablelands landscape has been extensively cleared and used for grazing purposes. It has a long history of rural settlement, with a network of rural roads, homesteads and cottages on rural properties and a collection of small towns. The open and elevated character of this landscape has seen a concentration of wind farm development over the past 20 years, including Gullen Range, Crookwell (north of Pejar Dam) and Taralga wind farms. Gullen solar farm is also located in this landscape, co-located within the existing Gullen Range wind farm. The existing Crookwell to Bannaby 330 kV transmission lines traverse this landscape, parallel to the project. Other infrastructure in the area includes substations associated with the wind farms, and rural structures such as sheds, yards and workshops, supporting the surrounding agricultural uses (refer to Figure 6-7 and **Attachment C**).

Landscape sensitivity: This rural landscape would be appreciated by small numbers of people travelling along the network of rural roads, including mainly local residents and their visitors, as well as some tourists visiting the region. Overall, this landscape is of **local sensitivity**.

Landscape impact during construction: All vegetation within the area directly used for construction would be removed including at each transmission line structure site, for construction access tracks and at the Woodhouselee Road compound (C11), east of Pejar Dam. Trees and vegetation within the transmission line easement would be removed or trimmed as required. Although this rural landscape is largely cleared of vegetation, there would be some areas where vegetation is more mature and denser, requiring more clearing of vegetation and a greater change in landscape character. These areas include corridors of vegetation west of Middle Arm Road (about 2.5 kilometres long, south of the Crookwell to Bannaby 330 kV transmission line easement) and the forested hills between Middle Arm and Taralga roads.

The project would largely follow the route of the existing Crookwell to Bannaby 330 kV transmission line easement, including at the Pejar Dam crossing, at the northern end of the dam, away from the visitor facilities at the southern end of the dam. Overall, due to the vegetation removal and scale of construction activity, there would be a moderate magnitude of change to a landscape of local landscape sensitivity, and a **moderate-low landscape impact** during construction.

FIGURE 6-7 RURAL TABLELANDS LANDSCAPE, CHARACTER IMAGES

Landscape impact during operation: The project would increase the presence of electricity infrastructure in this landscape, including a new additional transmission line easement, which would be largely cleared of vegetation and would further detract from the character of this rural landscape. The transmission line structures would be of a similar form to those which currently exist in this landscape, although about double to triple the height. They would be seen in the context of existing large scale electricity infrastructure, including multiple wind turbines and substations. Overall, there would be a low magnitude of change to this landscape and a **low landscape impact** during operation.

6.1.8 Rural highland and deep valley landscape character zone

Existing conditions: This landscape commences from the Cookbundoon Range south of Taralga and extends east towards Bannaby. The landscape is elevated, including rolling hills with wide sheltered valleys and ridgelines along Bannaby Road. In eastern and southern parts, the landscape includes steep forested country along the Cookbundoon Range and the Tarlo River gorge, as the landscape approaches Tarlo River National Park. The Cookbundoon Range is considered to be an '*important landscape feature'* with '*scenic value'* (NSW NPWS, 1998, p.2) (refer to Figure 6-8 and **Attachment C**).

Flatter areas of this landscape have generally been cleared and used for grazing purposes, historically sheep grazing and more recently cattle. The Bannaby shearing shed (c.1886) is a feature in this landscape, with corrugated iron sheet walls and roof, providing one of the rare examples of Australian woolsheds with 19th century architecture. Other historic features in this landscape include the St Matthew's Anglican Church and Churchyard, Bannaby Homestead and the Hillas Farm Homestead and outbuildings (State Heritage Register item). The landscape includes existing electricity infrastructure, including the Bannaby 500 kV substation, located in a deep valley south of Hanworth Road. Several large scale transmission lines extend to/from the substation, including Mount Piper to Bannaby 500 kV transmission line route (including transmission structures ranging between 50 to 65 metres tall), and the Bannaby to Sydney West, Crookwell to Bannaby and Bannaby to Marulan 330 kV transmission line route. Otherwise, it is largely a remote rural landscape, including structures such as sheds and workshops, supporting the surrounding agricultural uses.

Landscape sensitivity: This rural landscape includes rolling hills, wide sheltered valleys and ridgelines, with areas of steep forest country, and historic built structures, which combine to create a scenic landscape. This landscape is remote and would be appreciated by small numbers of people travelling along roads, including residents and visitors to the area. Overall, this landscape is of **local landscape sensitivity**.

Landscape impact during construction: All vegetation within the area used for construction would be removed including at each transmission line structure site, for construction access tracks and the Bannaby **500 kV** substation compound (C12). Trees and vegetation within the transmission line easement would be removed or trimmed as required. From the Cookbundoon Range this project would divert north from the existing Crookwell to Bannaby 330 kV transmission line easement, creating a new easement through this landscape. While this rural landscape is partially cleared of vegetation, there would be some areas where the vegetation is of greater maturity and more dense, so that the clearing of vegetation would have a greater effect on the landscape character. These areas include the vegetation north of Tarlo River National Park (west of Bannaby Road), and the vegetated hills between Bannaby and Adavale roads. In the eastern part of this landscape, the project meets and runs parallel to the existing Mount Piper to Bannaby 330 kV transmission line easement.

FIGURE 6-8 RURAL HIGHLAND AND DEEP VALLEY LANDSCAPE, CHARACTER IMAGES

Overall, due to the vegetation removal and scale of construction activity, there would be a moderate magnitude of change to a landscape of local landscape sensitivity, and a **moderate-low landscape impact** during construction.

Landscape impact during operation: The project would increase the presence of electricity infrastructure in this landscape, including a new additional transmission line easement, largely cleared of vegetation, which would further detract from the character of this rural landscape. The existing 500 kV substation at Bannaby would also be expanded. The transmission line structures would be of a larger in scale than and form to the Mount Piper to Bannaby 500 kV transmission lines and would be seen in the context of existing large scale electricity infrastructure, including existing transmission easements and a substation. Overall, there would be a moderate magnitude of change to this landscape and a **moderate-low landscape impact** during operation.

6.2 Summary of landscape impacts

During construction there would be:

- a **moderate** impact on five landscape character areas
- a **moderate-low** impact on twelve landscape character areas
- a **low** impact on three landscape character areas.

The moderate impacts would be on the Great Dividing Range, Undulating rural hills and ridges and Upland forest landscape character zones where there is greater vegetation removal and temporary construction activities.

During operation, there would be:

- a **moderate** impact on five landscape character areas
- a **moderate-low** impact on ten landscape character areas
- a **low** impact on four landscape character areas.

The **moderate** impacts would continue to be on the landscape character units within the Great Dividing Range, Undulating rural hills and ridges and Upland Forest landscape character zones. In these areas there would continue to be less vegetation in a predominantly vegetated landscape, and the introduction of large transmission line structures of a larger scale into the landscape. The **moderate-low** impacts would be on the landscapes where there would be some reduction in vegetation and the transmission line route would be a new feature in the landscape.

Table 6-1 summarises the identified landscape impacts of this project.

TABLE 6-1: SUMMARY OF LANDSCAPE IMPACTS

			Construction		Operation	
	Landscape character zone	Landscape sensitivity	Magnitude of change	Landscape impact	Magnitude of change	Landscape impact
Rural fringe landscape character zone						
A	Wagga Wagga rural fringe landscape character area	Neighbourhood	Moderate	Low	Moderate	Low
Great Dividing Range landscape character zone						
A	Gregadoo Great Dividing Range foothills landscape character area	Regional	Moderate	Moderate	Moderate	Moderate
B	Ellerslie Range Great Dividing Range foothills landscape character area	Regional	Moderate	Moderate	Moderate	Moderate

			Construction		Operation	
	Landscape character zone	Landscape sensitivity	Magnitude of change	Landscape impact	Magnitude of change	Landscape impact
Rural valleys landscape character zone						
A	Gregadoo to Book Book rural valleys landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
B	Yaven Creek and Adelong Creek rural valleys landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
C	Tumut rural valleys landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
D	Adjungbilly rural valleys landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
E	Tumbarumba rural valleys landscape character area	Local	Moderate	Moderate-low	Nil	None
Forested hills landscape character zone						
A	Green Hills forested hills landscape character area	Local	Low	Low	Low	Low
B	Bago forested hills landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
C	Minjary forested hills landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low
D	Red Hill and Bungongo forested hills landscape	Local	Low	Low	Low	Low
Undulating rural hills and ridges landscape character zone						
A	Wondalga to Batlow undulating rural hills and ridges landscape character area	Regional	Moderate	Moderate	Moderate	Moderate
B	Tumut undulating rural hills and ridges landscape character area	Regional	Moderate	Moderate	Moderate	Moderate
C	Murrumbidgee undulating rural hills and ridges landscape character area	Regional	Low	Moderate-Low	Low	Moderate-Low
D	Black Range to Yass undulating rural hills and ridges landscape character area	Regional	Low	Moderate-Low	Low	Moderate-Low
E	Jerrawa to Dalton undulating rural hills and ridges landscape character area	Regional	Low	Moderate-Low	Low	Moderate-Low
Upland forest landscape character zone						
A	Snowy Mountains upland forest landscape character area	Regional	Moderate	Moderate	Moderate	Moderate
Rural tablelands landscape character zone						
A	Crookwell rural tablelands landscape character area	Local	Moderate	Moderate-low	Low	Low
Rural highland and deep valley landscape character zone						
A	Taralga to Bannaby rural highland and deep valley landscape character area	Local	Moderate	Moderate-low	Moderate	Moderate-low

7.0 Visual impact assessment

7.1 Assessment of daytime visual impacts

7.1.1 Selection of representative viewpoints

A site visit was undertaken during March and September of 2022. The following viewpoints were selected as representative of the range of views to the project. This includes views from publicly accessible locations (typically existing road corridors along the alignment) which have been identified as having increased visual sensitivity or where people are likely to congregate.

The location of views that have been assessed in this technical report are shown in **Attachment E.** An assessment of each view is contained in the following section of this report. In addition, views from the air have been addressed for the whole landscape and visual study area, at Section 7.1.3.

7.1.2 Assessment of representative viewpoints

The following section includes an assessment of each representative view and identifies the daytime visual impacts. These are arranged from west to east, along the project footprint (as shown in **Attachment E**). Photomontages have been provided for some viewpoints and also included in in **Attachment F** where the photograph alignment detail is shown.

Viewpoint 1: View south from Gregadoo East Road

FIGURE 7-1 VIEW SOUTH FROM GREGADOO EAST ROAD

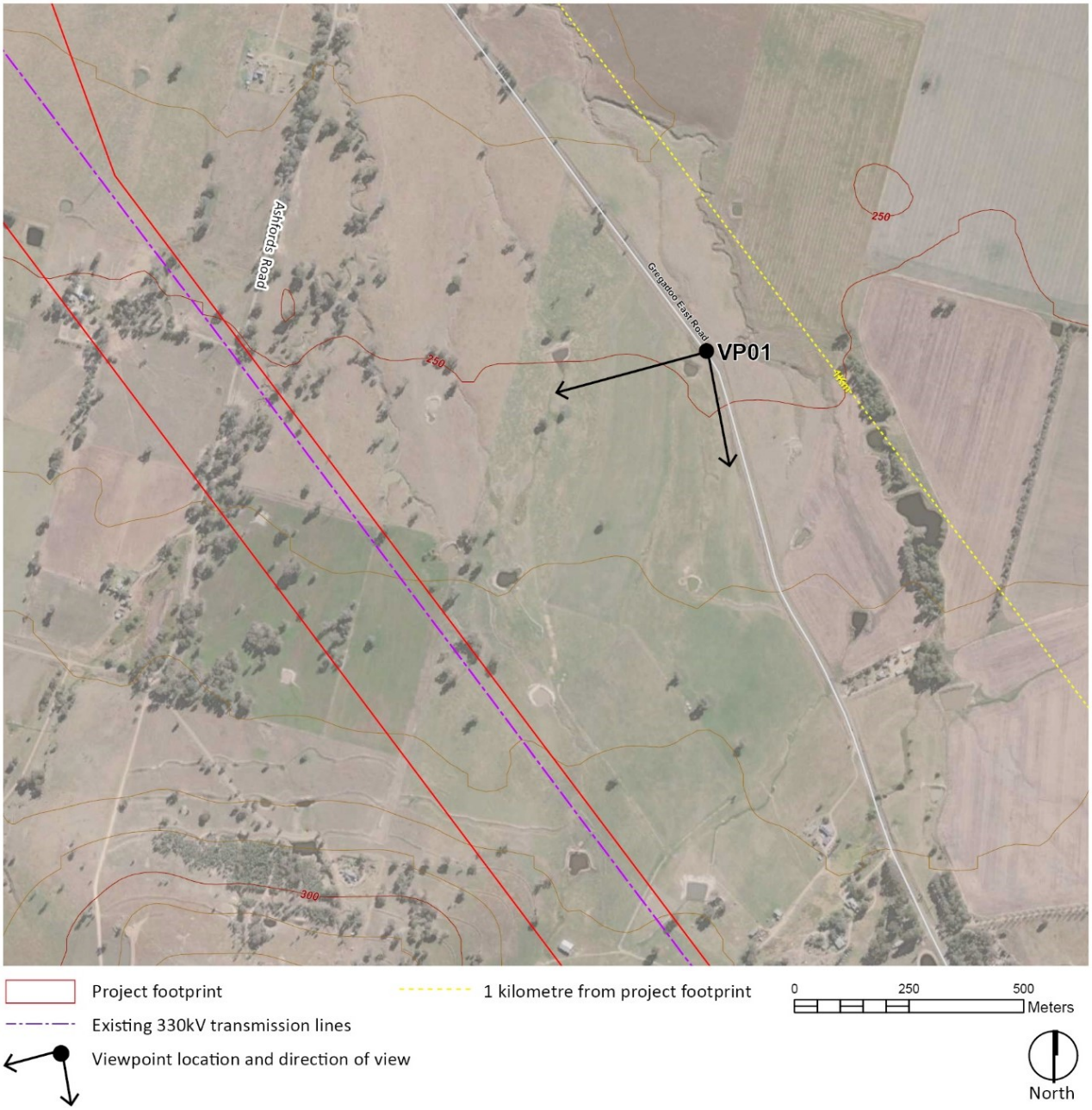


FIGURE 7-2 VIEW SOUTH FROM GREGADOO EAST ROAD, VIEW LOCATION PLAN

Location: 35°12’55.33”S, 147°24’48.12”E

Existing conditions: This view shows the rural fringe landscape south of Wagga Wagga, looking south from Gregadoo East Road (refer to Figure 7-1 and Figure 7-2). The landscape in view includes flat to gently undulating open pasture fields, ascending to partially vegetated low hills in the background of view. The existing Lower Tumut to Wagga 330 kV transmission line easement is visible, containing free-standing steel lattice structures ranging between 24 to 40 metres tall, within an easement cleared of trees.

Sensitivity: Gregadoo East Road is a two-lane sealed road providing access to local homesteads and properties south of Wagga Wagga, used mainly by residents, visitors and staff at nearby properties and facilities such as the existing Wagga 330 kV substation and waste and recycling facility. This view is of **local visual sensitivity**.

Visual impact during construction: The project would be located parallel to the existing Lower Tumut to Wagga 330 kV transmission line route (Line 51), on the far side (south) of the existing transmission line structures. A small section of Line 51 would be demolished and rebuilt (around two kilometres), including installation of 330 kV transmission structures ranging between 24 and 50 metres tall. In this largely flat, rural landscape, each transmission line structure site would be spaced apart evenly and views to the ground level works would be seen from this location, with some filtering by the vegetation within adjacent fields and along the road verge. Construction vehicles and machinery would be seen in this view, travelling along an access track within the project footprint. The installation of the galvanised steel structures and stringing of the wires and conductors would also be visible and seen rising above the skyline and within the backdrop of hills.

Although the presence of the existing transmission lines increases the capacity of this view to absorb the project, the introduction of an additional easement with transmission line structures ranging between about double to triple the height of the existing structures, would further detract from the otherwise rural view, and further disrupt views to the backdrop of hills. Overall, there would be a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: A new easement containing large scale 500 kV transmission line structures would be seen beyond and aligned parallel to the existing easement, in the middle ground of view. While the project would include steel lattice structures, they would be a slightly different design and larger in scale than the existing structures. They would also be spaced further apart and would not be grouped together with the existing transmission line structures. While existing rural uses would continue to be seen around and through the transmission line easement, the project would further add to the visual clutter created by the transmission line infrastructure seen in this view. While the presence of transmission line infrastructure in this view increases the capacity of this view to absorb this change, the spacing of the structures would be inconsistent with the existing structures and would therefore be visually prominent.

Overall, there would be visual incompatibility between the existing and proposed transmission lines, and the project would further detract from the amenity of this view. Due to the proximity and extent of the structures seen from this location, there would be a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 2: View south from Livingstone Gully Road

FIGURE 7-3 VIEW SOUTH FROM LIVINGSTONE GULLY ROAD

FIGURE 7-4 VIEW SOUTH FROM LIVINGSTONE GULLY ROAD, PHOTOMONTAGE

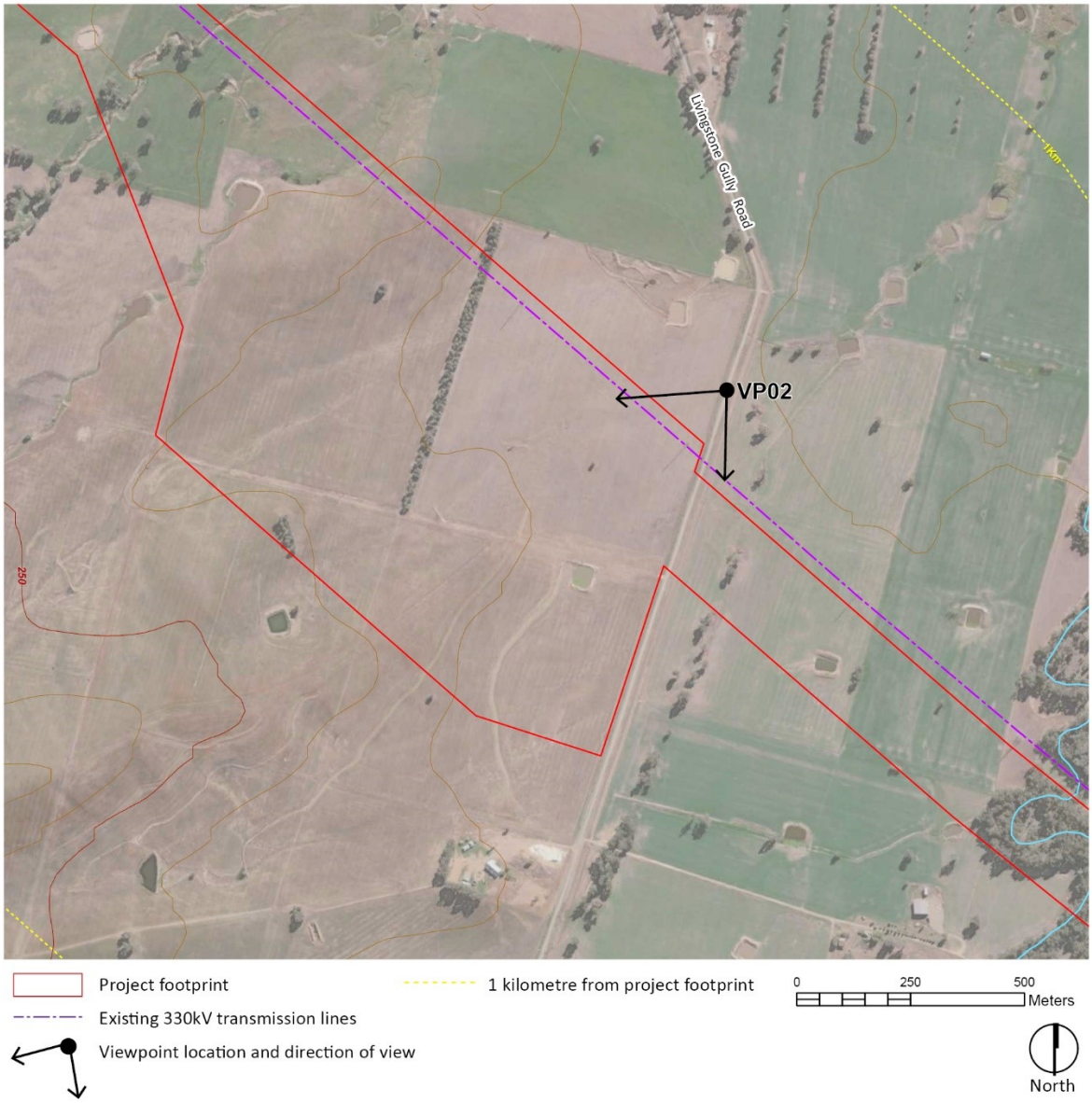


FIGURE 7-5 VIEW SOUTH FROM LIVINGSTONE GULLY ROAD, VIEW LOCATION PLAN

Location: 35°16'6.43"S, 147°29'3.57"E

Existing conditions: This view shows the Gregadoo to Book Book rural valleys landscape character area, south-east of Wagga Wagga (refer to Figure 7-3 and Figure 7-5). The landscape in view includes flat to gently undulating, open plains containing grazing pastures, with rural dwellings and large sheds seen in the background of view. The existing Lower Tumut to Wagga 330 kV transmission line easement is seen in the foreground of view, containing free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall, within an easement cleared of trees, crossing over Livingstone Road and existing local transmission lines. The '*visually prominent ridges'* and areas of '*higher ground'* at Gelston Park/Gregadoo Hills are seen in the background (right) of view, rising from the surrounding rural plains (s.5.1, Wagga Wagga DCP 2010).

Sensitivity: Livingstone Road in this location is an unsealed/gravel road providing access to local properties, used mainly by nearby residents and visitors to this area. Rural views such as this are common within this rural area south of Wagga Wagga. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: Construction of the proposed Gugaa 500 kV substation would be prominent in this view, with the adjacent Gregadoo Road compound (C06) also visible, including site offices, amenities, and construction support facilities. Construction of the proposed transmission line structure would also be visible, located behind (south) of the existing transmission line easement and extending over the road. Construction activity including the use of vehicles and machinery would be clearly seen from this location, due to the flat, open landform with very little vegetation. Installation of the galvanised steel structure and stringing of the wires and conductors would be prominent from this angle and viewed against the backdrop of the surrounding rural landscape.

While the presence of existing transmission line infrastructure would increase the compatibility of project construction activity, the scale and proximity of the project, including the substation and construction compound, and lack of screening would increase the prominence of the construction activity in this view. Overall, there would be a high magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: The proposed Gugaa 500 kV substation would be a prominent, large-scale piece of infrastructure in this view (refer to Figure 7-4). A new easement containing large scale 500 kV transmission line structures would be seen beyond and aligned parallel to the existing easement, in the middle ground of view, connecting to the substation. The form of the new steel lattice structures would be similar, being lattice structures, however, they would be taller (about double to triple the height of the existing structures) and have a more elongated shape. The new transmission line structures would also be spaced further apart than the existing and would not necessarily be grouped together with the existing structures. While the areas impacted by the Gregadoo Road compound (C06) would have been reinstated and restored to rural use, including pasture fields and existing rural uses that would continue to be seen around and within the new easement, the project would further add to the visual clutter of transmission line infrastructure seen in this view.

Overall, the proposed transmission lines and the proposed Gugaa 500 kV substation would detract from the amenity of this view. There would be a high magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 3: View south-west from Tumbarumba Road

FIGURE 7-6 VIEW SOUTH-WEST FROM TUMBARUMBA ROAD

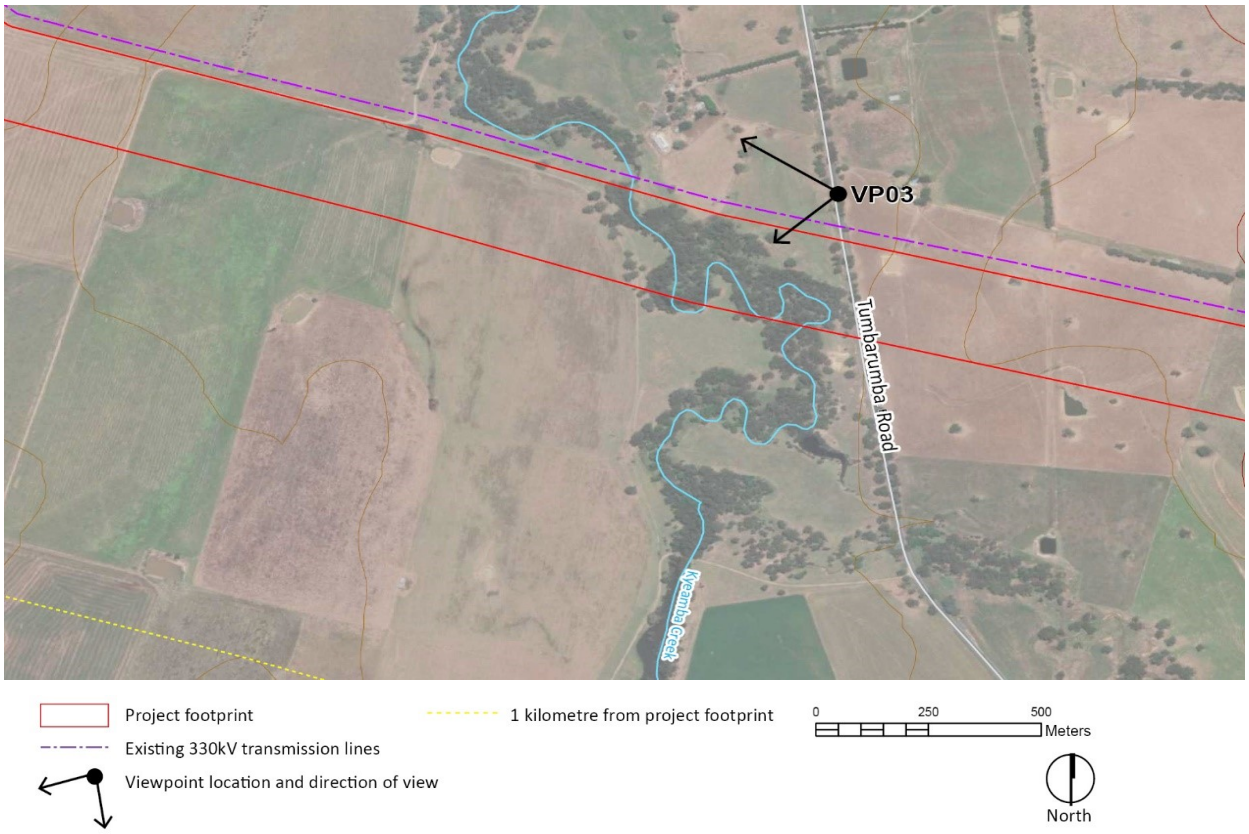


FIGURE 7-7 VIEW SOUTH-WEST FROM TUMBARUMBA ROAD, VIEW LOCATION PLAN

Location: 35°17’2.35”S, 147°31’25.06”E

Existing conditions: This view shows the Gregadoo to Book Book rural valleys landscape character area, south-east of Wagga Wagga. The landscape in view includes a flat rural landscape containing fields of grazing pastures along Tumbarumba Road, rural dwellings and large sheds seen in the middle ground of view (refer to Figure 7-6), and a backdrop of vegetation along Kyeamba Creek. The existing Lower Tumut to Wagga 330 kV transmission line route is prominent, containing free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall, within an easement cleared of trees.

Sensitivity: Tumbarumba Road in this location is a two-lane sealed road providing access between the Sturt and Hume highways, used mainly by nearby residents and their visitors. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be located parallel and to the south (refer to Figure 7-7) of the existing transmission line easement. The clearing of vegetation and the construction of several transmission structure sites would be seen from this location, extending into the background of the view. There would be machinery and construction vehicles working within the easement to install the transmission line structures and string the wires and conductors. The construction activity would be seen in proximity and the vegetation removal and construction activity would reduce the amenity of this view. Overall, there would be a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: The project would be seen in the middle ground of this view, aligned parallel to the existing transmission lines and within a wide easement cleared of vegetation. While the project would be seen in the context of the existing easement, the new 500 kV transmission line structures would be much larger in size, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures, with a more elongated shape, and spaced at wider intervals. Overall, the proposed transmission line would be seen in proximity, and prominent in this view. Overall, there would be a moderate magnitude of change and a **moderate-low visual impact** on this view during operation.

Viewpoint 4: View south-west from the Hume Highway

FIGURE 7-8 VIEW SOUTH-WEST FROM THE HUME HIGHWAY

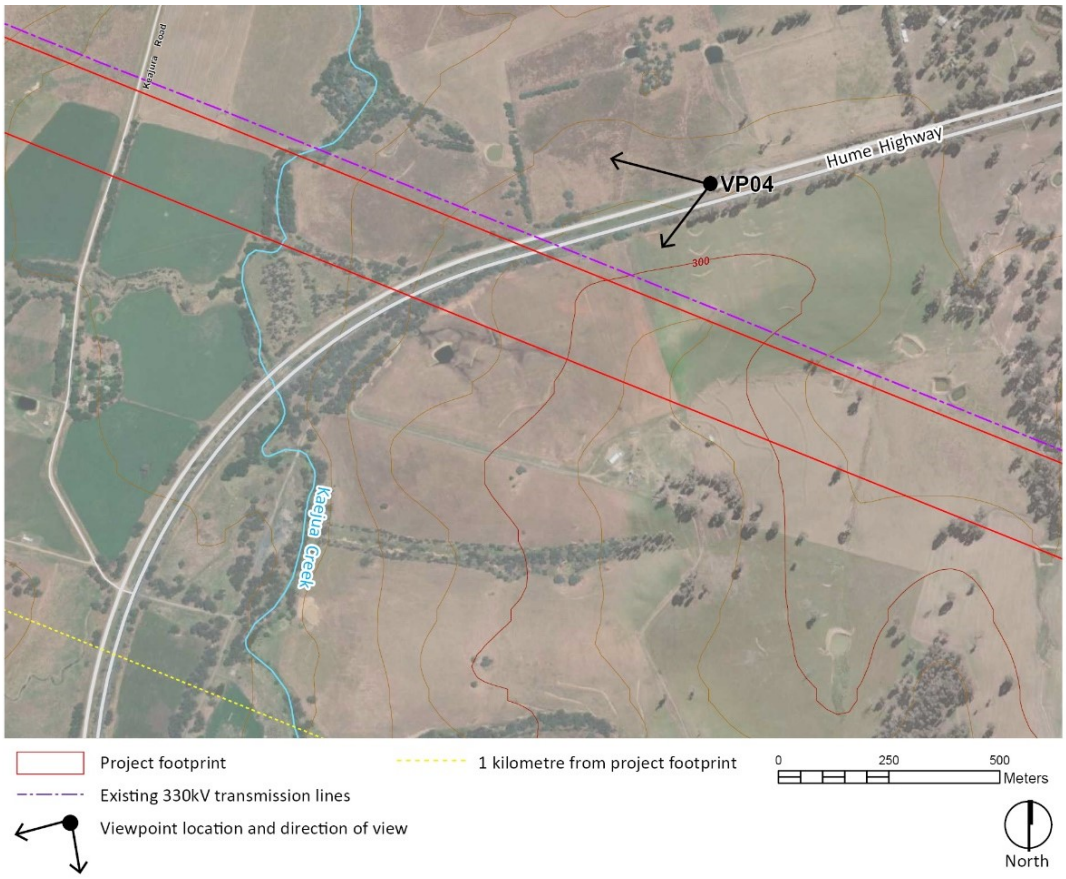


FIGURE 7-9 VIEW SOUTH-WEST FROM THE HUME HIGHWAY, VIEW LOCATION PLAN

Location: 35°19’1.18”S, 147°39’34.75”E

Existing conditions: This view shows the undulating rural valley landscape surrounding the Hume Highway, south-east of Wagga Wagga, including pasture fields with scatter trees, and corridors of vegetation aligned to creek valleys, fence lines and road corridors (refer to Figure 7-8 and Figure 7-9). The Lower Tumut to Wagga 330 kV transmission line route is seen in the middle ground of view, ascending from the Keajura Creek valley (right of view), crossing the highway and ascending to the low hills east of the highway (left of view), ranging between 24 to 40 metres tall.

Sensitivity: The Hume Highway in this location is a dual carriageway road, grade separated by a partially vegetated embankment. Rural views such as this are experienced by higher number of receivers, including tourists, residents and workers travelling on the road. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be located about 300 metres away, beyond and aligned generally parallel to the existing easement, extending either side of the highway. The vegetation along the highway and within adjacent fields would partially screen views to the construction works at some of the transmission line structure sites, however the structure installation and stringing of wires and conductors would visible, rising above the vegetation, including use of large machinery such as cranes. The eastern and western side of the highway would be used as access points to the project footprint. The construction activity would be seen from fast moving vehicles on the highway, although partially screened by intervening vegetation and landform.

Overall, the construction works would further detract from this rural view, resulting in a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: There would be an additional row of transmission line structures seen beyond and parallel to the existing easement, with 500 kV structures ranging between 50 and 76 metres tall, about double to triple the height of the existing structures. The vegetation along the highway and in adjacent fields would screen the lower section of the structures and the rural uses seen from this location would continue within and around the easement. Overall, there would be a moderate magnitude of change to this view, which is of local visual sensitivity, and a **moderate-low visual impact** during operation.

Viewpoint 5: View south-east from Westbrook Road

Location: 35°21’8.58”S, 147°48’15.54”E

Existing conditions: This view shows the Gregadoo to Book Book rural valleys landscape character area (refer to Figure 7-10, right of view), as it transitions to the Ellerslie Range Great Dividing Range foothills landscape character area (left of view). The landscape in the view foreground includes gently undulating pasture fields, with a rural dwelling seen in the centre of view. The existing Lower Tumut to Wagga 330 kV transmission line easement is seen in the background of view, crossing Westbrook Road, extending behind the residence, and ascending east towards the vegetated hills of the Ellerslie Range. The easement contains free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall, seen against a backdrop of vegetated hills.

Sensitivity: Westbrook Road in this location is a sealed road providing access between the Hume Highway and Lower Bago Road, used mainly by nearby residents and their visitors. Although the vegetated hills in the Ellerslie Range are a local feature, rural views such as this are common within this area around Oberne Creek. This view is of **neighbourhood visual sensitivity**.

FIGURE 7-10 VIEW SOUTH-EAST FROM WESTBROOK ROAD

FIGURE 7-11 VIEW SOUTH-EAST FROM WESTBROOK ROAD, PHOTOMONTAGE

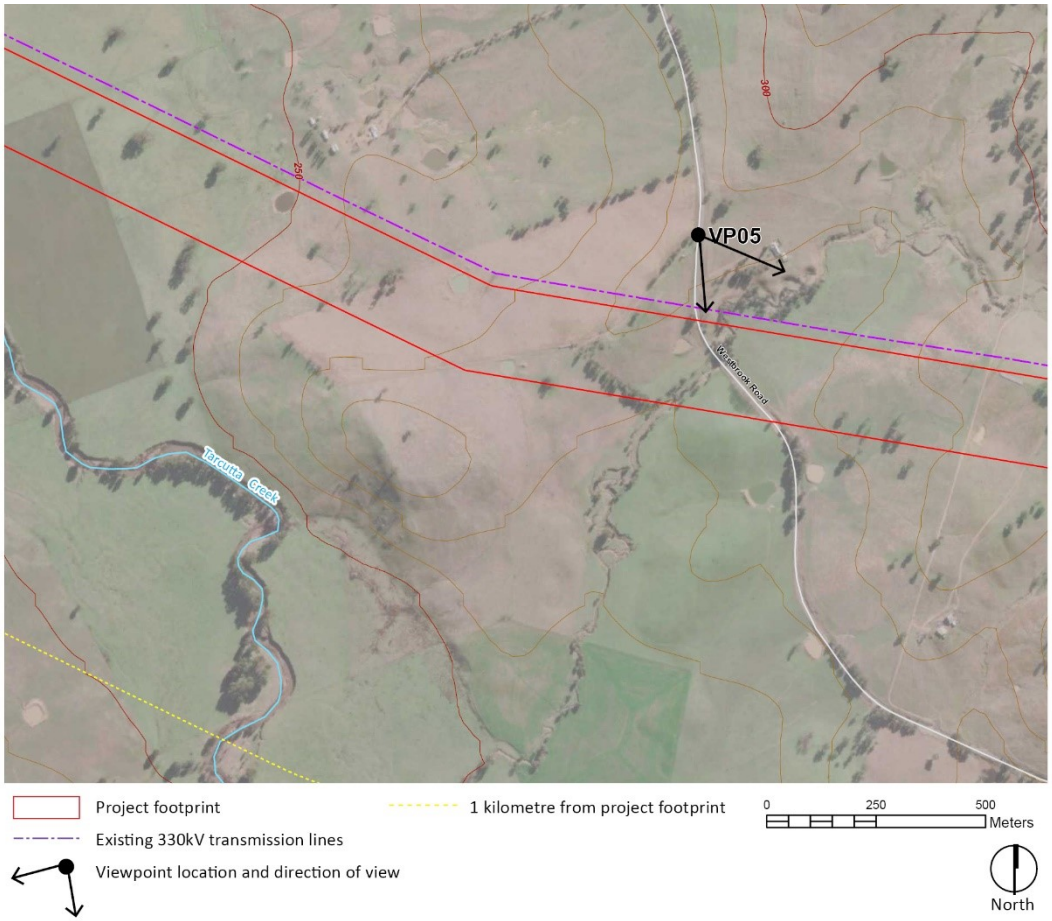


FIGURE 7-12 VIEW SOUTH-EAST FROM WESTBROOK ROAD, VIEW LOCATION PLAN

Visual impact during construction: The project footprint is located beyond and aligned generally parallel to the existing transmission line easement (refer to Figure 7-12), which crosses the view and rises to the east from the road towards the hills, in the background of view. The vegetation within this view, including trees within fields and the garden surrounding the dwelling, would partially screen views to the construction works at some of the transmission line structure sites. However, the removal of vegetation within the project footprint and installation of transmission line structures and stringing of wires and conductors would be seen rising above the intervening vegetation, in the background of this view. Construction vehicles and machinery would also be seen in this view, travelling along the road and the access track within the easement.

While the view already contains transmission infrastructure, the works would be more visually prominent and contrast with the rural character of this view, resulting in a high magnitude of change and a **moderate-low visual impact** temporarily during construction.

Visual impact during operation: A new, additional easement containing large 500 kV transmission line structures would be visible beyond and aligned parallel to the existing easement, in the background of view (refer to Figure 7-11). While there are existing transmission line structures visible from this location, the new transmission line structures would be of different design, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures. The structures would be spaced further apart and not grouped together with the existing structures, increasing the presence of power infrastructure and visual clutter in the view. Overall, the project would detract from the amenity of this view. There would be a moderate magnitude of change to this view and a **low visual impact** during operation.

Viewpoint 6: View south from Yaven Creek Road

FIGURE 7-13 VIEW SOUTH FROM YAVEN CREEK ROAD

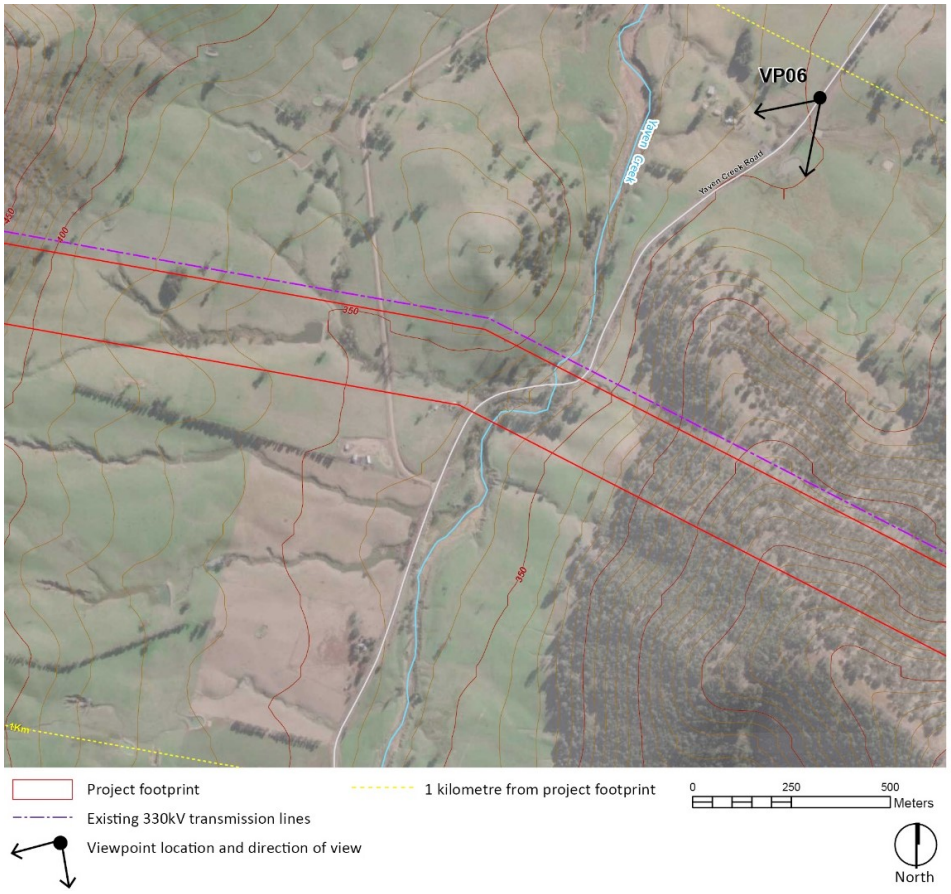


FIGURE 7-14 VIEW SOUTH FROM YAVEN CREEK ROAD, VIEW LOCATION PLAN

Location: 35°21’33.13”S, 147°56’6.68”E

Existing conditions: This view shows the Yaven Creek rural valley landscape character area south-west of Adelong, a narrow low-lying landscape between the Ellerslie Range (refer to Figure 7-13, right of view) and Green Hills State Forest. The landscape in the foreground of view includes gently undulating pasture fields with scattered trees extending either side of Yaven Creek, with a rural dwelling and collection of outbuildings seen in the centre of view. The existing Lower Tumut to Wagga 330 kV transmission line easement is seen in the background of view, descending from the Ellerslie Range and crossing Yaven Creek, extending behind the residence, and ascending east towards the vegetated hills of Green Hills State Forest. The easement contains free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall, seen against a backdrop of hills.

Sensitivity: Yaven Creek Road in this location is a sealed road providing access between the Snowy Mountains Highway and Lower Bago Road, used mainly by nearby residents and their visitors. Although the vegetated hills in the Ellerslie Range are a local feature, rural views such as this are common within this area around Darlow. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would be located beyond, to the south and parallel to the existing transmission line (refer to Figure 7-14). There would be construction vehicles and machinery visible working within the easement including works on the top of the ridge (refer Figure 7-13, right of view). While the undulating terrain and scattered trees would partially screen views to some of the transmission line structure sites, the machinery used to install the structures and string the wires and conductors would be visible and seen against the backdrop of hills. The construction activity would detract from the remote rural character of this view, resulting in a high magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures ranging between 50 and 76 metres tall would be seen beyond and aligned parallel to the existing easement, in the background of view (refer to Figure 7-13). The new structures would be spaced across the view, at a wider spacing than the existing. As such, there would be several transmission line structures visible, with vegetation and landform partially screening the lower sections of the structures in some instances. The transmission line structures would be visible crossing the Yaven Creek valley and hills, including prominently on the ridgeline crossing, adding to the presence of large-scale infrastructure in this view. While the project would include steel lattice structures, they would be of a different shape and between about double to triple the height of the existing structures. The new structures would add to the visual clutter and increase the presence of transmission line infrastructure into the view. Overall, there would be a high moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 7: View south from Wondalga Road

FIGURE 7-15 VIEW SOUTH FROM WONDALGA ROAD

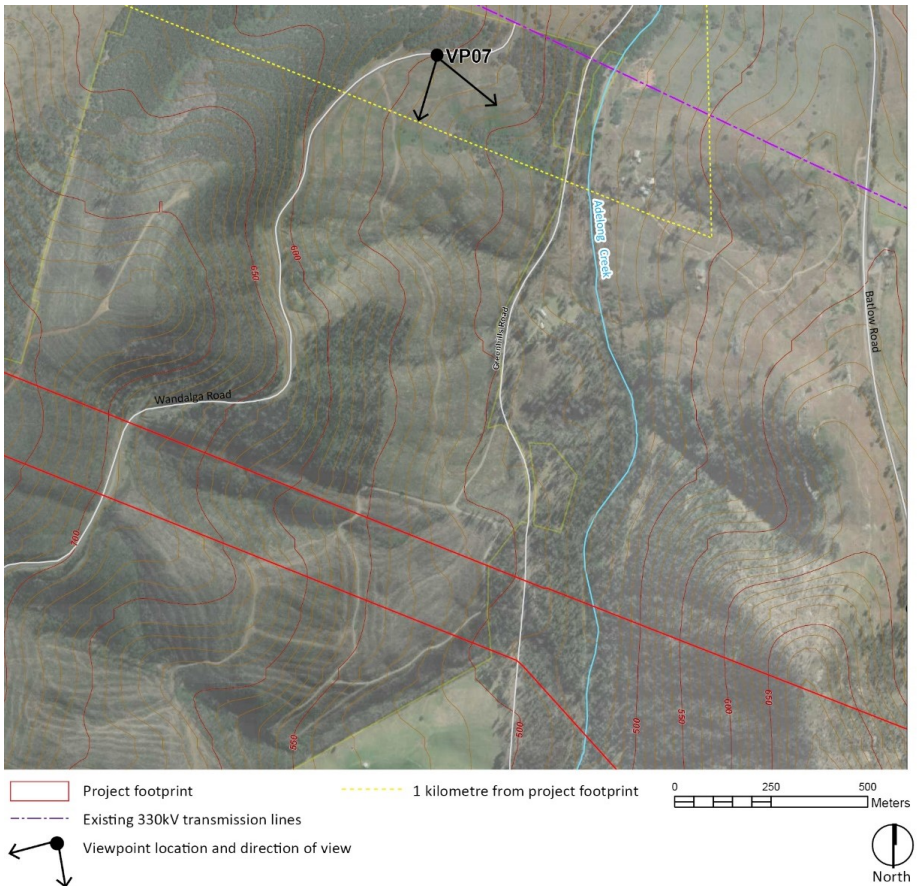


FIGURE 7-16 VIEW SOUTH FROM WONDALGA ROAD, VIEW LOCATION PLAN

Location: 35°25’1.39”S, 148° 6’55.30”E

Existing conditions: This view is located on the northern edge of Green Hills State Forest. The hillside in the middle ground of view includes recently planted plantation pine forest, which in time would enclose and partially block views to the hills beyond (refer to Figure 7-15 and Figure 7-16). The landscape in the background of this view is highly undulating, including rolling hills of partially cleared pasture fields and forested areas, descending to various creek valleys in this area south of Wondalga, including the Adelong and Wilsons Creek valleys. There are several rural dwellings and sheds seen in this view, located on hill sides and linked by gravel roads. The existing Lower Tumut to Wagga 330 kV transmission line structures can be seen crossing the hills in the distant background of view.

Sensitivity: Wondalga Road in this location is a two-lane sealed road providing access south of Wondalga, through Green Hills State Forest, used mainly by staff and visitors to Green Hills State Forest, as well as nearby residents and their visitors. While the rolling hills and forest are a feature in the background of this view, views such as this are common within the rural area to the south of Wondalga. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be seen in the background of this view, extending through the Adelong Creek valley, between Green Hills State Forest to the south-west (refer to Figure 7-15, right of view) and the hill to the south east (left of view). From this location, the progressive removal of vegetation within a new transmission line easement would be visible. Installation of the transmission line structures and stringing of the wires and conductors would be seen rising above the intervening vegetation, including use of large machinery such as cranes. Due to the distance to the project footprint (about 1.2 kilometres away), the screening effect of vegetation (including existing and emerging forest), would reduce the prominence of the works in this view slightly. Overall, there would be a moderate magnitude of change to this view, and a **moderate-low visual impact**.

Visual impact during operation: In this view there would be a new cleared easement visible, containing several of the 500 kV transmission line structures ranging between 50 and 76 metres tall. The vegetation in the foreground of view would screen the lower section of the structures and the rural and forestry uses seen from this location would continue within and around the easement. Overall, there would be a moderate magnitude of change to this view, which is of local visual sensitivity, and a **moderate-low visual impact** during operation.

Viewpoint 8: View north-east from Batlow Road, Wondalga

Location: 35°25’43.11”S, 148° 7’50.21”E

Existing conditions: This view shows the Wondalga to Batlow undulating rural hills and ridges landscape character area, north-east of Batlow (refer to Figure 7-17). The landscape in view is highly undulating, including rolling hills of largely cleared pasture fields with scattered trees, descending to various creek valleys in this area, including the Wilsons and Cockatoo Creek valleys. The existing Lower Tumut to Wagga 330 kV transmission line easement (refer to Figure 7-19) is seen in the middle ground of view, ascending along a hillside, generally parallel to Batlow Road, containing free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall.

Sensitivity: This part of Batlow Road forms part of Snowy Valleys Way, a scenic touring route between Gundagai and Beechworth, passing through the western foothills of the Snowy Mountains. Rural views such as this are experienced by moderate to high number of receivers, including tourists, residents and freight transporters. This view is of **local visual sensitivity**.

FIGURE 7-17 VIEW NORTH-EAST FROM BATLOW ROAD, WONDALGA

FIGURE 7-18 VIEW NORTH-EAST FROM BATLOW ROAD, WONDALGA, PHOTOMONTAGE

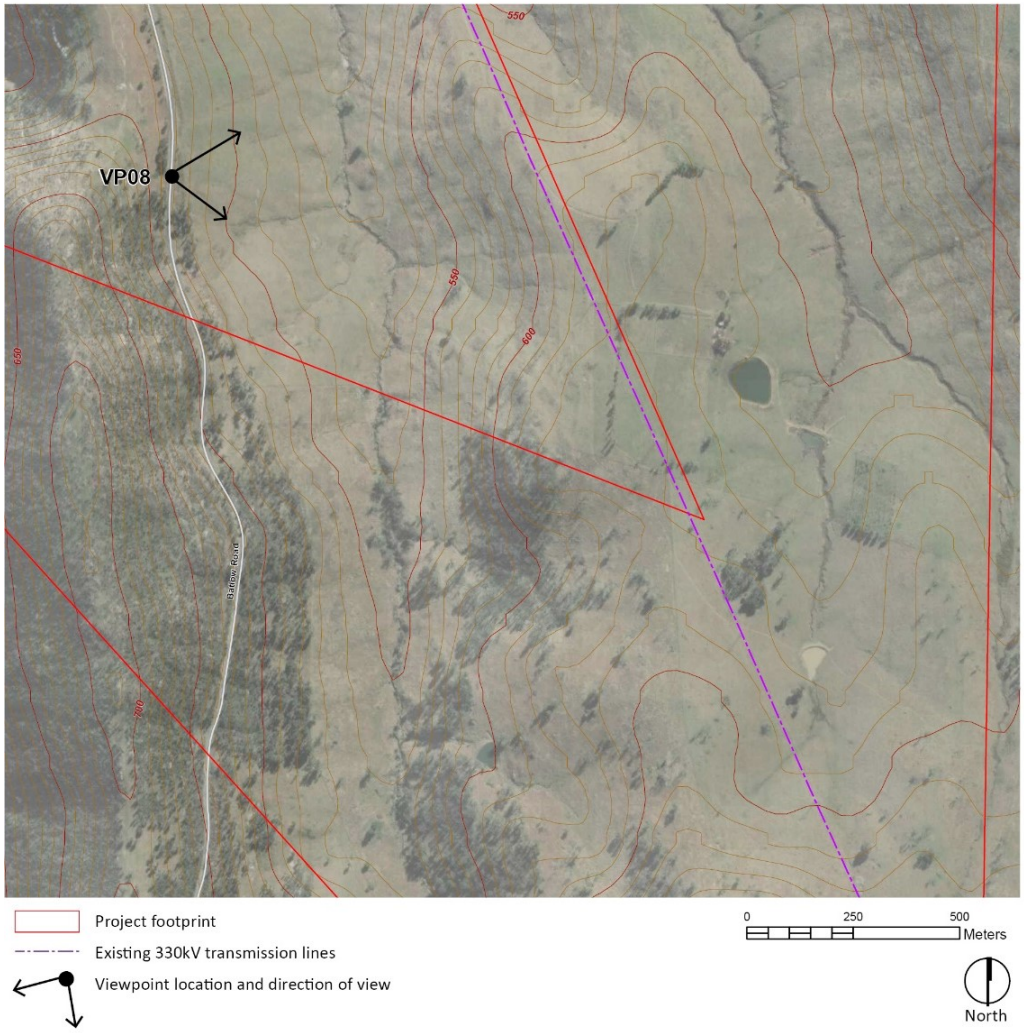


FIGURE 7-19 VIEW NORTH-EAST FROM BATLOW ROAD, WONDALGA, VIEW LOCATION PLAN

Visual impact during construction: The project footprint would be located about 800 metres away, beyond but not parallel to the existing easement, extending through the hills in the middle ground of view. There would be construction works at each of transmission line structure sites, including the structure installation and stringing of wires and conductors with use of large machinery such as cranes. The construction activity would also be seen further to the south, crossing Batlow Road, about 350 metres away. Overall, the construction works would detract from this rural view, resulting in a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: There would be an additional row of transmission line structures seen beyond the existing easement, with 500 kV structures ranging between 50 and 76 metres tall, about double to triple the height of the existing structures (refer to Figure 7-18). The structures would rise slightly above the ridgeline which includes cleared rural uses, but would be mostly seen against the hillside, reducing the prominence of the structures in this view. Overall, the increase in transmission line structures would detract from the rural character of this view, which is of local visual sensitivity, resulting in a low magnitude of change and a **low visual impact** during operation.

Viewpoint 9: View east from The Big Apple, Stewarts Road, Batlow

FIGURE 7-20 VIEW EAST FROM THE BIG APPLE, STEWARTS ROAD, BATLOW

FIGURE 7-21 VIEW EAST FROM THE BIG APPLE, STEWARTS ROAD, VIEW LOCATION PLAN

Location: 35°29’27.09”S, 148° 9’19.57”E

Existing conditions: This view is located on the northern outskirts of Batlow, which contains a high concentration of apple orchards, and the site of Batlow’s ‘Big Apple’ (refer to Figure 7-20). The landscape in the foreground of view includes pasture fields, descending to the Mudhole Creek valley. An orchard is seen on the hillside in the middle ground of view. In the background of view, the landscape is highly undulating, as it ascends to Bago State Forest. The existing Lower Tumut to Wagga 330 kV transmission line easement (refer to Figure 7-21) is seen in the middle ground of view, extending over the hills and ridgelines towards Bago State Forest, containing free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall. Beyond this, the elevated forested hills within the northern part of Kosciuszko National Park are seen in the far distance, providing a scenic backdrop to this view.

Sensitivity: The Big Apple is located near the Snowy Valleys Way, a scenic touring route between Gundagai and Beechworth, passing through the orchards north of Batlow. Rural views such as this are experienced by moderate number of receivers, including tourists and residents. This view is of local visual sensitivity.

Visual impact during construction: The project footprint would be located beyond and parallel to the existing easement, in the background of this view. From this angle, the progressive removal of vegetation within the new easement would be visible. Installation of the transmission line structures and stringing of the wires and conductors would be seen rising above the remaining vegetation and seen through and alongside the existing easement, including use of large machinery such as cranes. Due to the distance to the project footprint (about 2.5 kilometres away), the screening effect of vegetation and context of existing transmission line infrastructure, would reduce the prominence of the works in this view. Overall, there would be a low magnitude of change to this view, and a low visual impact.

Visual impact during operation: The project would be seen in the background of this view, aligned parallel to the existing easement. The 500 kV transmission line structures would be evenly spaced, extending across the hilly terrain in view, and visible rising above the intervening vegetation. While these structures would be of a similar form to the existing transmission line structures, they would not be grouped together and would be larger in height, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures, and add further transmission line infrastructure to this view. White the project would be visible, it would not be visually prominent or change the prevailing character of the view, nor would it obstruct the views of Kosciuszko National Park beyond. Overall, there would be a low magnitude of change, and a low visual impact.

Viewpoint 10: View north from Batlow Road, Windowie

FIGURE 7-22 VIEW NORTH FROM BATLOW ROAD, WINDOWIE

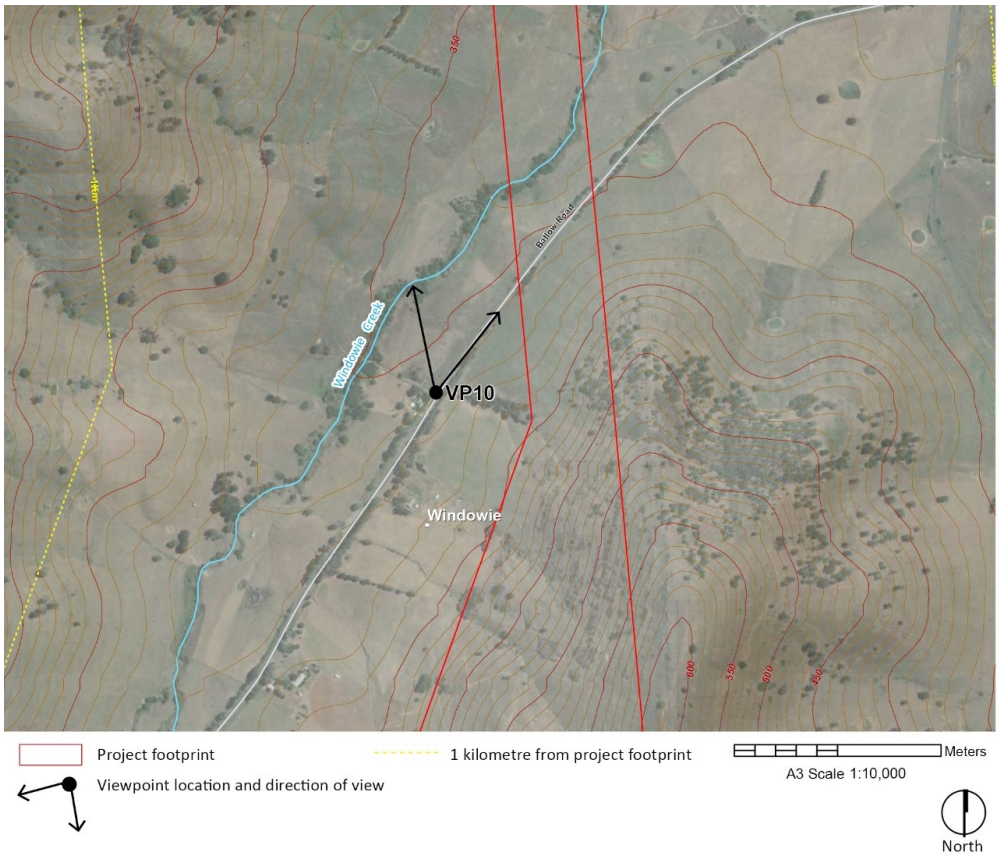


FIGURE 7-23 VIEW NORTH FROM BATLOW ROAD, WINDOWIE, VIEW LOCATION PLAN

Location: 35°22’18.04”S, 148° 8’11.20”E

Existing conditions: This view shows the rural valley landscape extending along the Windowie Creek valley south-west of Tumut, including largely cleared pasture fields and scattered rural dwellings (refer to Figure 7-22 and Figure 7-23). The landform west of Windowie Creek rising abruptly (left of view), including partially vegetated hills extending north towards the Snowy Mountains Highway. The paper mill is a prominent built feature in the centre of this view, located at the foothills of Tabletop Mountain (south of Minjary National Park), including large scale shed structures and multiple steaming chimney stacks. Otherwise, this view contains a rural character.

Sensitivity: This part of Batlow Road forms part of Snowy Valleys Way, a scenic touring route between Gundagai and Beechworth. Rural views such as this are experienced by moderate to high number of receivers, including tourists, residents and freight transporters. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would extend north from Batlow Road, through the rural landscape, in the centre of this view. The works at several transmission line structure sites would be visible, in the background of the view, including excavation and levelling works, vegetation removal and foundation construction. Construction vehicles and machinery would be seen in this view, travelling along an access track within a new easement. Installation of the transmission line structures and stringing of the wires and conductors would also be visible and seen against the backdrop of low hills. The construction activity would be viewed against the backdrop of hills and would detract from the rural character of this view. Overall, there would be a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: The project would introduce new, large scale 500 kV transmission line structures ranging between 50 to 76 metres tall, in this rural valley setting. The transmission line route would cross Batlow Road and Windowie Creek, traversing in a straight line through the rural landscape in the centre of this view, at the foot of the hills. While the structures would be partly screened by intervening trees and some the project would detract from the rural amenity of this view. Due to the proximity and extent of the structures seen from this location, there would be a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 11: View south from Snowy Mountains Highway

Location: 35°19’19.14”S, 148° 8’37.39”E

Existing conditions: This view shows the Tumut rural valley landscape character area south-west of Tumut, consisting of a wide low-lying rural landscape at the foothills of Tabletop Mountain, Gadara (refer to Figure 7-24 and Figure 7-26). The landscape in the middle ground of view includes flat pasture and arable fields with trees along fence lines and roads, and scattered dwellings. The landform abruptly ascends in the background of view to the partly vegetated Wondalga to Batlow undulating rural hills and ridges landscape character area, which provide a scenic backdrop to this view. Although this view contains a strong rural character with few large scale built structures, a major paper mill is visible from this location, north of the highway (out of this view), about 2.5 kilometres away.

Sensitivity: The Snowy Mountains Highway is a major touring route through the Snowy Valleys region, experienced by moderate to high number of receivers, including tourists, residents and freight transporters. This view is of **local visual sensitivity**.

FIGURE 7-24 VIEW SOUTH FROM SNOWY MOUNTAINS HIGHWAY

FIGURE 7-25 VIEW SOUTH FROM SNOWY MOUNTAINS HIGHWAY, PHOTOMONTAGE

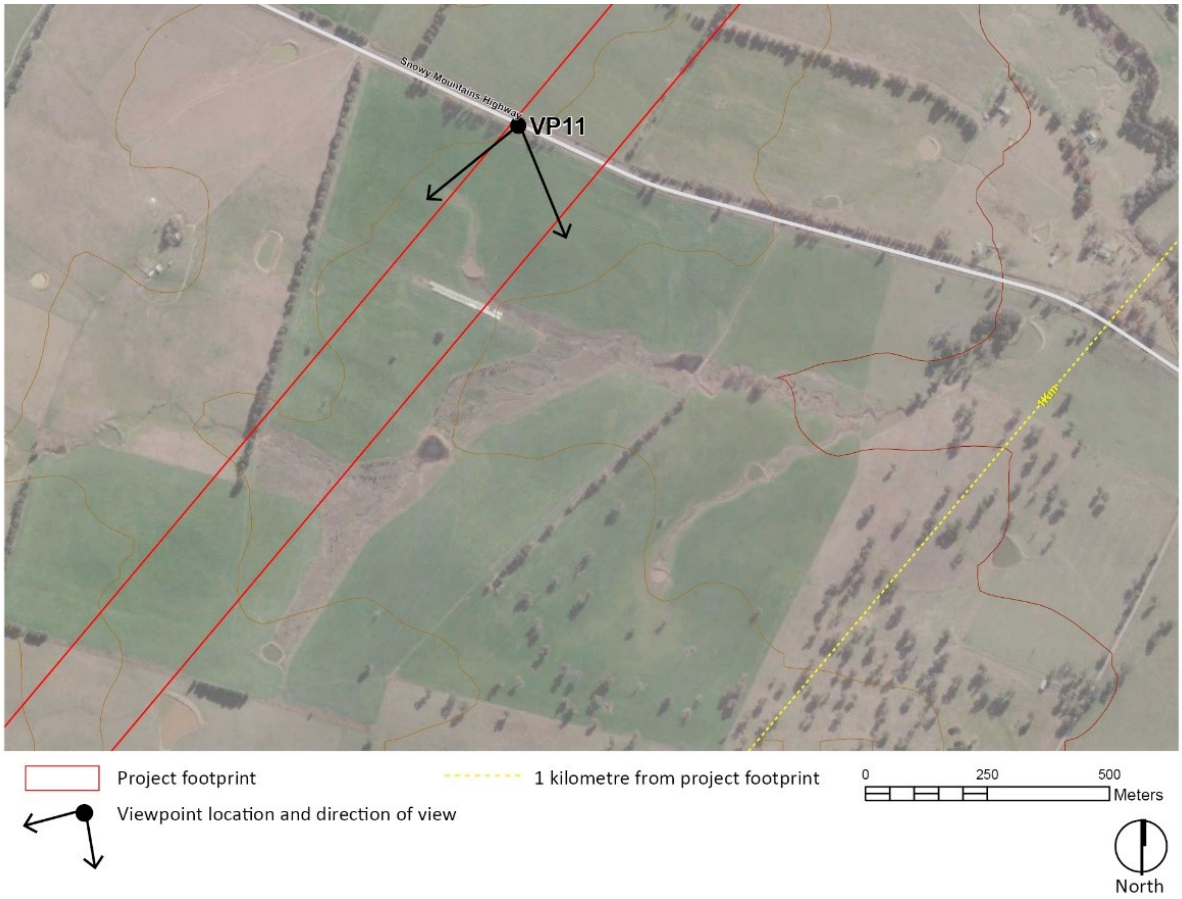


FIGURE 7-26 VIEW SOUTH FROM SNOWY MOUNTAINS HIGHWAY, VIEW LOCATION PLAN

Visual impact during construction: The project footprint would be located to the south of the highway, in the centre of this view. The proposed transmission line would extend through the flat rural landscape, towards the background of view. The works at multiple transmission line structure sites would be visible, including removal of vegetation, leveling works and foundation construction. Vehicles and machinery would be seen in this view, travelling along an access track within a new easement. The installation of the transmission line structures and stringing of the wires and conductors would also be visible. The construction activity would contrast with and detract from the rural character of this view. Overall, there would be a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: There would be a new transmission line easement in the centre of this view, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall (refer to Figure 7-25). The project would cross the highway, then extend in a straight line through the flat rural landscape seen in this view and viewed against a backdrop of hills foot of the surrounding range. The project would detract from the rural amenity of this view, which does not currently include large scale power infrastructure. Due to the proximity and extent of the project seen from this location, there would be a high magnitude of change and a **moderate visual impact** during operation.

Viewpoint 12: View north from Gocup Road

FIGURE 7-27 VIEW NORTH FROM GOCUP ROAD

FIGURE 7-28 VIEW NORTH FROM GOCUP ROAD, PHOTOMONTAGE

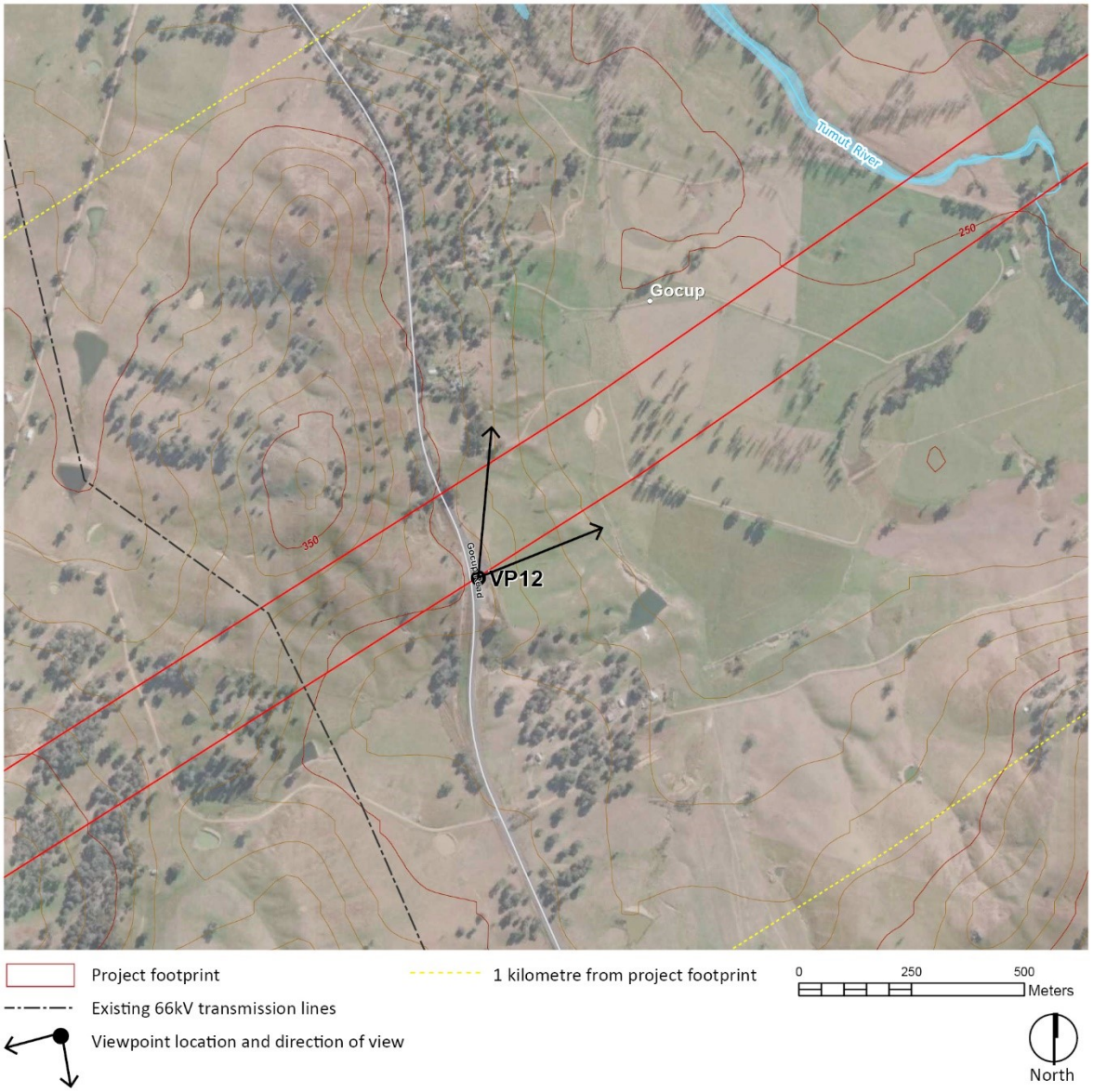


FIGURE 7-29 VIEW NORTH FROM GOCUP ROAD, VIEW LOCATION PLAN

Location: 35°14'15.58"S, 148°11'52.20"E

Existing conditions: This is an elevated view across the flat, low-lying rural landscape extending along the Gocup Creek and Tumut River valleys, north of Tumut (refer to Figure 7-27 and Figure 7-29). The landscape in view contains pasture fields, with scattered rural dwellings, gravel access roads and a concentration of planted poplar trees on the flats. The landform ascends in the background of view, to the partly vegetated hills east of the Tumut River. Beyond this, the elevated forested hills within Mudjarn Nature Reserve are seen in the far distance, providing a scenic backdrop to this view.

Sensitivity: Gocup Road forms part of Snowy Valleys Way, a scenic touring route between Gundagai and Beechworth. Rural views such as this are experienced by moderate to high number of receivers, including tourists and residents. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would extend north-east of Gocup Road, through the flat rural river valley landscape, in the centre of this view, and across the hills in the background of view. The works at multiple transmission line structure sites would be visible, including removal of vegetation within fields, leveling works, foundation construction and brake and winch sites. Vehicles and machinery would be seen in this view, travelling along an access

track within a new easement. The installation of the transmission line structures and stringing of the wires and conductors would also be visible. The construction activity would detract from the rural character of this view and be viewed against the scenic backdrop of hills. Overall, there would be a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: There would be a new transmission line easement seen in the centre of this view, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall (refer to Figure 7-28). The project would cross Gocup Road, then extend in a straight line through the flat rural landscape seen in this view, cross the Tumut River valley and crossing the low hills seen in the middle ground of view. While the project would not cross the hills associated with Mudjarn Nature Reserve, seen in the view backdrop, the transmission line structures would detract from the amenity of this view, which does not currently include large scale power infrastructure. Due to the proximity and extent of the project seen from this location, there would be a high magnitude of change and a **moderate visual impact** during operation.

Viewpoint 13: View south-east from Brungle Road

FIGURE 7-30 VIEW SOUTH-EAST FROM BRUNGLE ROAD

FIGURE 7-31 VIEW SOUTH-EAST FROM BRUNGLE ROAD, PHOTOMONTAGE

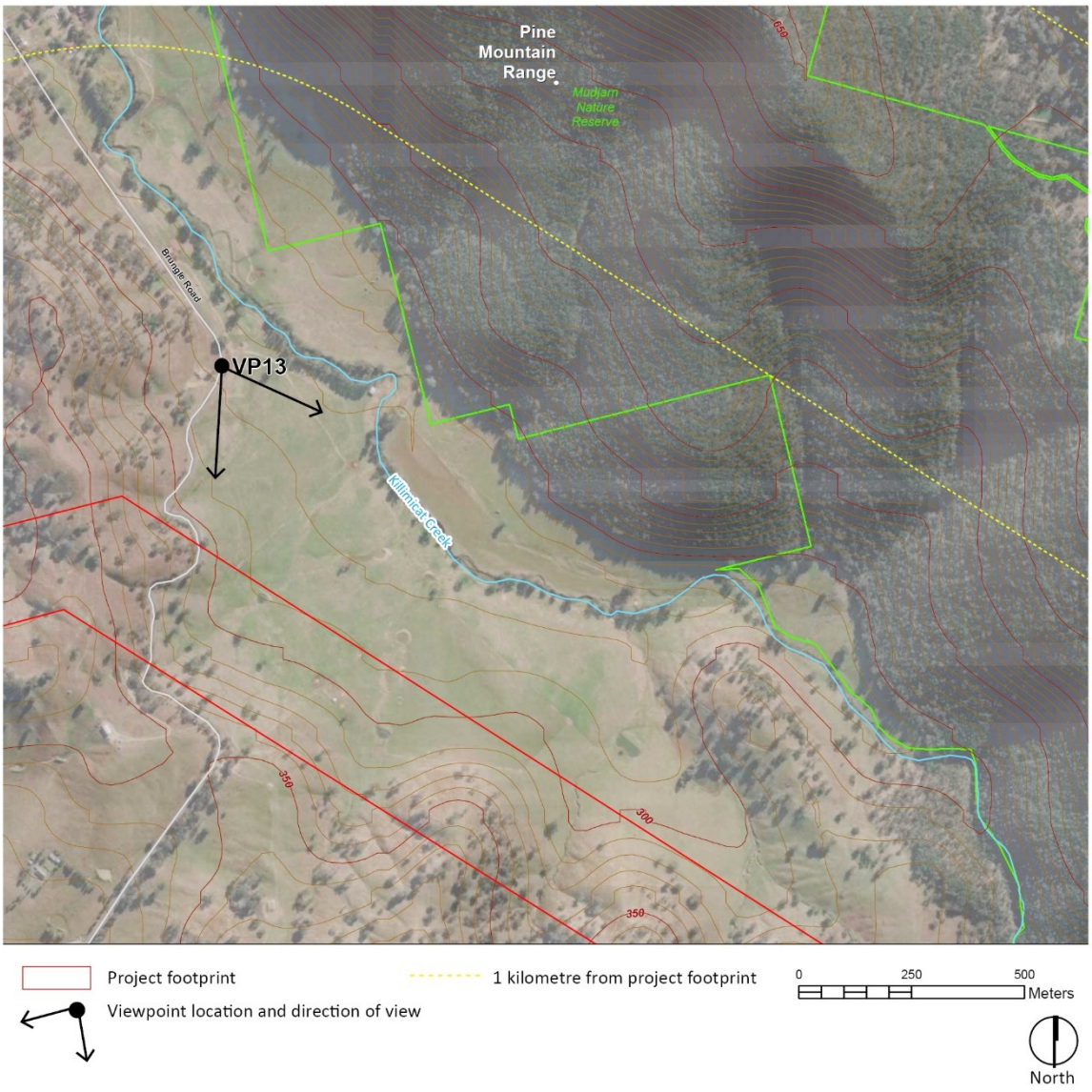


FIGURE 7-32 VIEW SOUTH-EAST FROM BRUNGLE ROAD, VIEW LOCATION PLAN

Location: 35°12’17.30”S, 148°14’38.05”E

Existing conditions: This view shows the undulating landform between the Tumut River and Killimicat Creek, including rolling hills and valleys. The landscape includes largely cleared pasture fields with scattered trees and rural dwellings, and arable fields on the flat low-lying fields beside Killimicat Creek (refer to Figure 7-30, left of view). The view contains a strong rural character with few large scale built structures. The landform rises abruptly to the north, to the elevated forested hills within Mudjarn Nature Reserve (refer to Figure 7-32), which provide a scenic backdrop to this view.

Sensitivity: Brungle Road in this location is a sealed road, winding through the hills, providing access north of Tumut towards Brungle, used mainly by nearby residents and their visitors. The vegetated hills in Mudjarn Nature Reserve are a feature in this view. Overall, this view is of **local visual sensitivity**.

Visual impact during construction: From the hills to the south (refer to Figure 7-32, right of view), the project footprint would extend south-east of Brungle Road, through the undulating pasture fields, towards the centre background of the view, around the foothills of Mudjarn Nature Reserve. The works at several transmission line structure sites would be visible, including removal of vegetation within fields, minor leveling works, foundation construction, installation of the

transmission line structures and stringing of the wires and conductors. Vehicles and machinery would be seen in this view, travelling along an access track within a new easement. The construction activity would detract from the amenity of the view and introduce new transmission line infrastructure into an otherwise rural view. Overall, there would be a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: There would be a new transmission line seen in the centre of this view, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall. The project would extend from the hills (refer to Figure 7-31, right of view), cross over Brungle Road, and extend in a straight line through the undulating rural landscape, towards the low hills seen in the background of the view. While the project would not cross the hills or remove any vegetation within Mudjarn Nature Reserve, the transmission line structures would introduce new transmission line infrastructure into an otherwise rural and bushland character view. Due to the proximity and extent of the project seen from this location, and the contrast with the rural setting, there would be a high magnitude of change and a **moderate visual impact** during operation.

Viewpoint 14: View east from Elliott Way

FIGURE 7-33 VIEW EAST FROM ELLIOTT WAY

Location: 35°47'30.87"S, 148°18'38.67"E

Existing conditions: This view is located along Elliott Way, in Bago State Forest, near Kosciuszko National Park (refer to Figure 7-33). This part of the forest is characterised by native eucalyptus species such as alpine ash, snow gum and mountain gum, and does not contain plantation pine forest. The existing Lower Tumut to Upper Tumut 330 kV transmission line easement is seen in the foreground of view, located in an easement largely cleared of vegetation, with transmission line structures ranging between 24 to 40 metres tall. The future Maragle 500 kV substation will soon be constructed as part of the Snowy 2.0 Transmission Connection Project and seen in the centre of view.

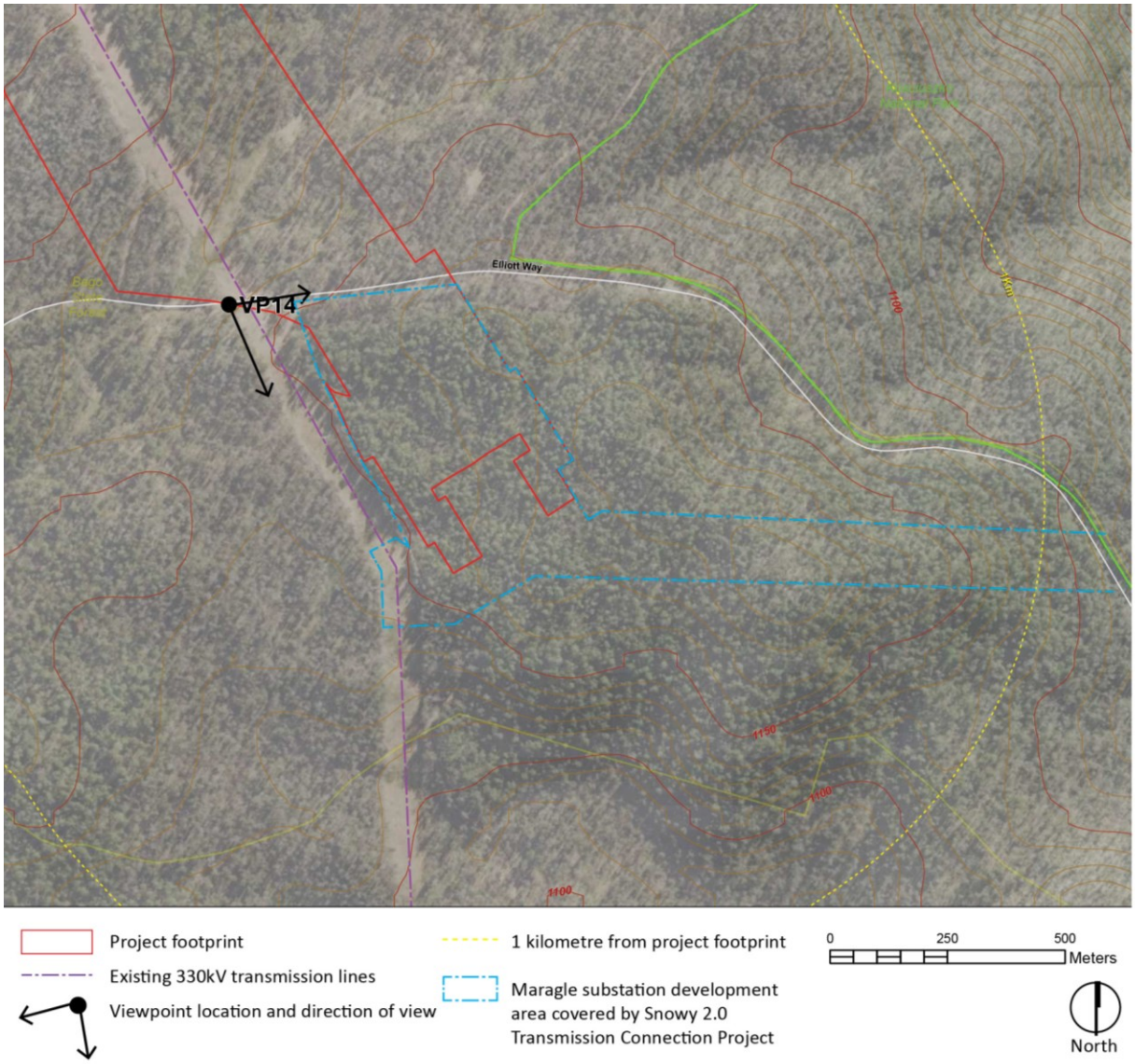


FIGURE 7-34 VIEW EAST FROM ELLIOTT WAY, VIEW LOCATION PLAN

Sensitivity: This part of Bago State Forest is close to the north western part of Kosciuszko National Park (refer to Figure 7-34), known as the Tumut area, which includes extensive areas of native forest, drawing recreational tourists for the bushwalking tracks, scenic lookouts and camping locations. Views such as this are common within this part of Bago State Forest and are experienced by a low number of receivers, including tourists and residents in the area. This view is of **local visual sensitivity**.

Visual impact during construction: The Maragle 500 kV substation compound (C05) would be seen in the centre of this view, to the south of the road, beyond the existing easement with site offices, amenities and construction support facilities visible. The vegetation in this area will have been mostly removed as part of the Snowy 2.0 Transmission Connection Project and the future Maragle 500 kV substation would be prominent in this view. The project footprint would extend north of the road, including vegetation clearance along the easement and construction of several transmission line structure sites parallel to the existing easement. Construction activity, including the use of vehicles and machinery within the project footprint, would be clearly seen from this location, from a short section of the road, close to the site. Overall, the scale and proximity of the project construction, including a large construction compound, would contrast with the character of this view, resulting in a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: The area impacted by the Maragle 500 kV substation compound (C05) would have been dismantled, opening up views to the new Maragle 500 kV substation. Large scale 500 kV transmission line structures would be seen extending from the north, crossing the road and connecting to the substation. The project would be parallel to the existing easement, creating a wider easement area cleared of vegetation. The new steel lattice transmission line structures would have a different form, being taller and much larger in size than the existing structures, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures. The form, spacing and height of the transmission line structures would be different to the existing structures, adding to the visual clutter, however, the presence of other existing transmission lines and the future Maragle 500 kV substation (that will be built by the Snowy 2.0 Transmission Connection project) would increase the capacity of this view to accommodate the project elements. A large section of the project would be seen at close range from a short section of Elliot Way, resulting in a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 15: View west from Adjungbilly Road

FIGURE 7-35 VIEW WEST FROM ADJUNGBILLY ROAD

FIGURE 7-36 VIEW WEST FROM ADJUNGBILLY ROAD, VIEW LOCATION PLAN

Location: 35° 4'26.53"S, 148°23'15.27"E

Existing conditions: This view shows the gently undulating rural landscape along Adjungbilly Creek valley, west of Adjungbilly, consisting of cleared agricultural land used for grazing. This rural valley is located between the forestry reserves of Red Hill State Forest, to the north (refer to Figure 7-35, centre, background of view) and south (out of this view). Although this view contains no large scale built structures, the existing Lower Tumut to Yass 330 kV transmission line structures (ranging between 24 to 40 metres tall) are located to the east, crossing Adjungbilly Creek and Adjungbilly Road, about one kilometre away (refer to Figure 7-36).

Sensitivity: Adjungbilly Road in this location is a sealed road providing access between the Hume Highway and Adjungbilly, used mainly by nearby residents and their visitors. Although the vegetated hills in Red Hill State Forest are a local feature, rural views such as this are common within this area around Adjungbilly. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would extend across this view to the north of Adjungbilly Road, through the undulating rural river valley landscape, in the centre of this view. The alignment would continue into the background of view at Red Hill State Forest. Establishment of the Adjungbilly Road compound (C09) may also be seen in the background of this view, including some vegetation clearance. The works at multiple transmission line structure sites would be seen in this view, including removal of vegetation within fields, leveling works and foundation construction. Vehicles and machinery may be visible travelling along an access track within a new easement, extending north and south of the road. The installation of the transmission line structures and stringing of the wires and conductors would also be visible. Overall, the construction activity would detract from the amenity of this view resulting in a moderate magnitude of change and a **low visual impact**.

Visual impact during operation: There would be a new transmission line easement in the centre of this view, about one kilometre away, extending north and south of the road, including several large scale 500 kV transmission line structures between 50 to 76 metres tall. Although the undulating terrain would partially screen views to the structures, the project would introduce transmission line infrastructure, away from the existing Lower Tumut to Yass 330 kV transmission lines, which are behind the viewer, reducing the rural amenity of this view. Overall, there would be a moderate magnitude of change and a **low visual impact** during operation.

Viewpoint 16: View south-east from Childowa Road

FIGURE 7-37 VIEW SOUTH-EAST FROM CHILDOWA ROAD

FIGURE 7-38 VIEW SOUTH-EAST FROM CHILDOWA ROAD, VIEW LOCATION PLAN

Location: 34°53'34.07"S, 148°35'29.26"E

Existing conditions: This view shows the remote elevated rural area north of Burrinjuck Nature Reserve, rising east from the Murrumbidgee River (refer to Figure 7-37). This landscape in view contains a highly undulating and hilly landscape with pasture fields and scattered trees. There are a small number of rural dwellings in this area, none of which are be seen from this location along Childowa Road. Although there are no structures seen in this view, the existing Wagga to Yass and Lower Tumut to Yass 132 and 330 kV transmission line routes are located further to the south, about one to two kilometres away (refer to Figure 7-38), containing structures between 15 and 40 metres tall in separated easements beyond the ridgeline, and are not seen from this location.

Sensitivity: Black Range Road in this location is a sealed road providing access to the rural areas south-west of Yass, used mainly by nearby residents and their visitors. Rural views such as this are common within this area around Derringullen Creek. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would extend generally parallel to Childowla Road, through the rural landscape in the centre of this view, about 200 metres away and set below the ridgeline. The works at several transmission line structure sites would be visible, extending across the view, including excavation and levelling works, vegetation removal and foundation construction. Construction vehicles and machinery would be seen in this view, travelling along an access track within a new easement. The installation of the transmission line structures and stringing of the wires and conductors would be visible on the hills and rising above the skyline, increasing their prominence. The construction activity would detract from the rural character of this view. Overall, there would be a high magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: The project would introduce a new easement, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall, in this hilly rural setting. The transmission line route would traverse in a straight line, generally parallel to Childowla Road, through the rural landscape in the centre of this view, at the foot of the ridgeline. The transmission line structures would rise above and be viewed against the skyline in this view. Overall, the project would detract from the amenity of this view. Due to the proximity and extent of the structures seen from this location, there would be a high magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 17: View east from Burrinjuck Road

FIGURE 7-39 VIEW EAST FROM BURRINJUCK ROAD

FIGURE 7-40 VIEW EAST FROM BURRINJUCK ROAD, VIEW LOCATION PLAN

Location: 34°52’43.25”S, 148°41’13.45”E

Existing conditions: This view shows the elevated, undulating rural landscape east of Burrinjuck Road, north of Burrinjuck Dam, consisting of cleared agricultural land used for grazing (refer to Figure 7-39). There are scattered trees within fields, along fence lines, roads, and Burnt Hut Creek valley, seen in the middle ground of view. The forested hills along the Murrumbidgee River and surrounding Burrinjuck Dam and are seen in the far distance, providing a scenic backdrop to the view. The existing Lower Tumut to Yass 330 kV transmission line route is visible, crossing Burrinjuck Road, and extending east along the hills (refer to Figure 7-40), containing free-standing steel lattice transmission line structures ranging between 24 to 40 metres tall. The Wagga to Yass, and Yass to Burrinjuck 132 kV transmission line routes are located further to the south in a parallel easement, beyond the ridgeline, and are not seen from this location.

Sensitivity: Burrinjuck Road is a two-lane sealed road providing access to local homesteads and properties south of Yass, used mainly by residents, visitors and staff at nearby properties and as well as tourists visiting Burrinjuck Dam. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be located parallel and in front of (north of) the existing easement. In this hilly rural landscape, the construction at several transmission structure sites would be visible, including excavation and levelling works, vegetation removal and foundation construction, although partially screened by the vegetation within adjacent fields and hilly terrain. Construction vehicles and machinery would be seen in this view, travelling along an access track within the easement. Installation of the transmission line structures and stringing of the wires and conductors would also be visible rising above the undulating landscape, increasing their prominence in the view.

Although there are existing transmission lines seen in this, the proximity and extent of construction activity would detract from the amenity of this view, resulting in a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures, ranging between 50 and 76 metres tall, would be seen in front of and aligned parallel to the existing transmission line, in the middle ground of view. While the project would include steel lattice transmission line structures, they would be about double to triple the height of the existing structures. They would also be spaced further apart and would not be grouped together with the existing structures. While existing rural uses would continue to be seen around and within the new easement, the project would further add to the visual clutter seen in this view. Overall, the quantity and scale of transmission line infrastructure seen in this view would increase, detracting from the amenity of this view. Due to the proximity, scale and extent of the structures seen from this location, there would be a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 18: View west from Black Range Road

FIGURE 7-41 VIEW WEST FROM BLACK RANGE ROAD

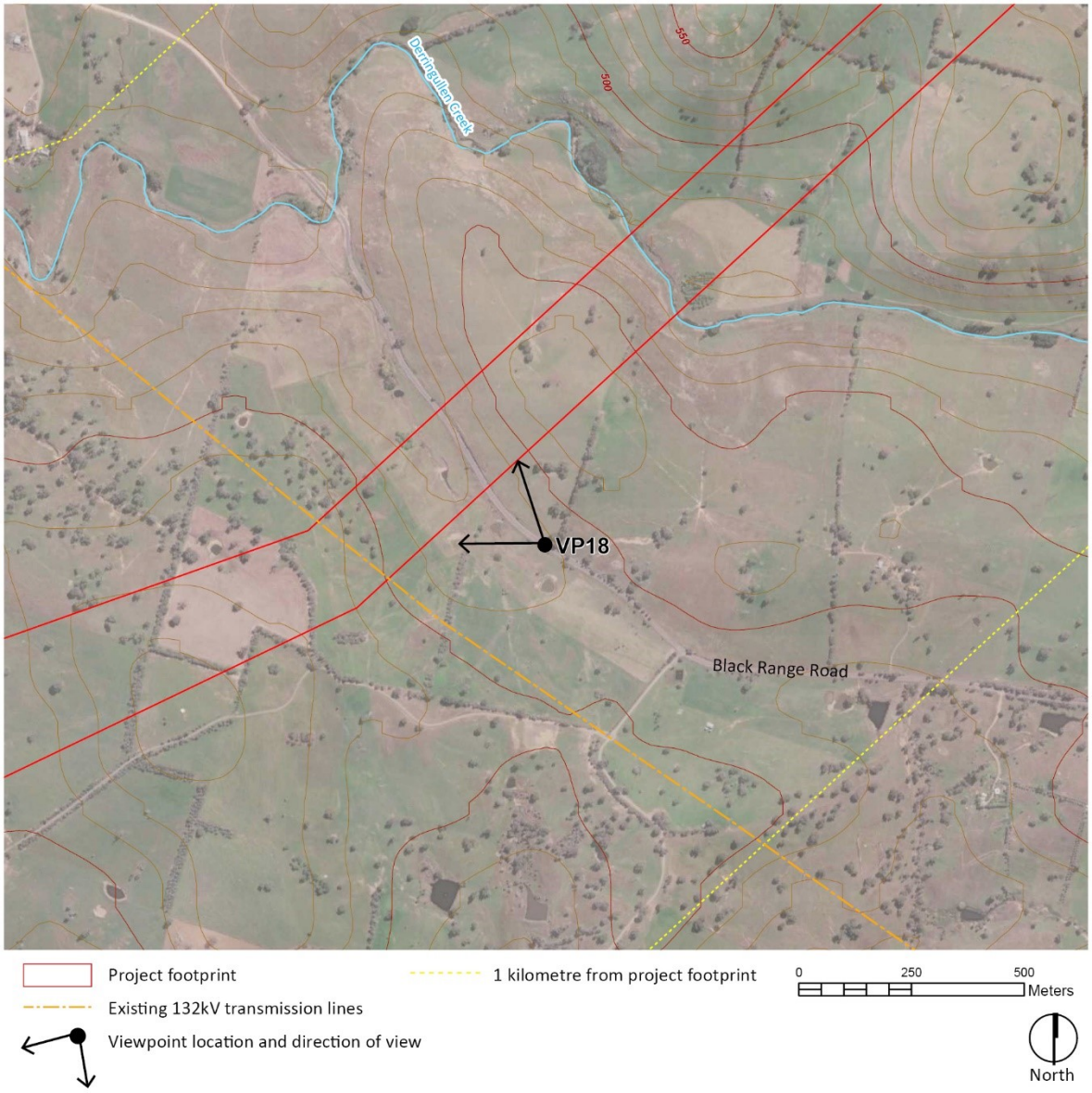


FIGURE 7-42 VIEW WEST FROM BLACK RANGE ROAD, VIEW LOCATION PLAN

Location: 34°49'20.22"S, 148°50'4.82"E

Existing conditions: This view shows the elevated rural landscape west of Yass, rising from the Murrumbidgee River to undulating and hilly pasture farmland with scattered trees. There are scattered rural homesteads in this area, which are generally surrounded by garden vegetation and outbuildings (refer to Figure 7-41, centre of view). The existing Yass to Murrumburrah 132 kV transmission line structures (refer to Figure 7-42) are visible, crossing Burrinjuck Road, and extending east along the hills, containing twin-pole structures ranging between 15 to 30 metres tall. There are also some local transmission line structures seen to the north of the road.

Sensitivity: Black Range Road in this location is a sealed road providing access to the rural areas south-west of Yass, used mainly by nearby residents and their visitors. Rural views such as this are common within this area around Derringullen Creek. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would extend to either side of the road, through the undulating terrain, in the centre of this view. Due to the varying landform, the works at a small number of transmission line structure sites (one or two) would be seen in this view, including removal of vegetation within fields, leveling works and foundation construction. Vehicles and machinery would be seen in this view, travelling along an access track within a new easement, extending north and south of the road. Installation of the transmission line structures and stringing of the wires and conductors would also be visible above the skyline, crossing over the road. Although the construction activity would detract from the amenity of this view, only a small part of the project would be seen from this location, resulting in a moderate magnitude of change and a **low visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures ranging between 50 to 76 metres tall would be seen in the centre of this view, crossing over the road, between the existing easements. The project would include steel lattice transmission line structures, the structures would be a different shape and about double to triple the height of the existing structures. Two structures seen in this view, either side of the road and with other structures glimpsed at a greater distance from the road. While existing rural uses would continue to be seen around and within the new easement, the project would increase the presence of power infrastructure in this view. Overall, the project would be seen at close range and detract from the amenity of this view, resulting in a moderate magnitude of change and a **low visual impact** during operation.

Viewpoint 19: View east from the Hume Highway, Yass

FIGURE 7-43 VIEW EAST FROM THE HUME HIGHWAY, YASS

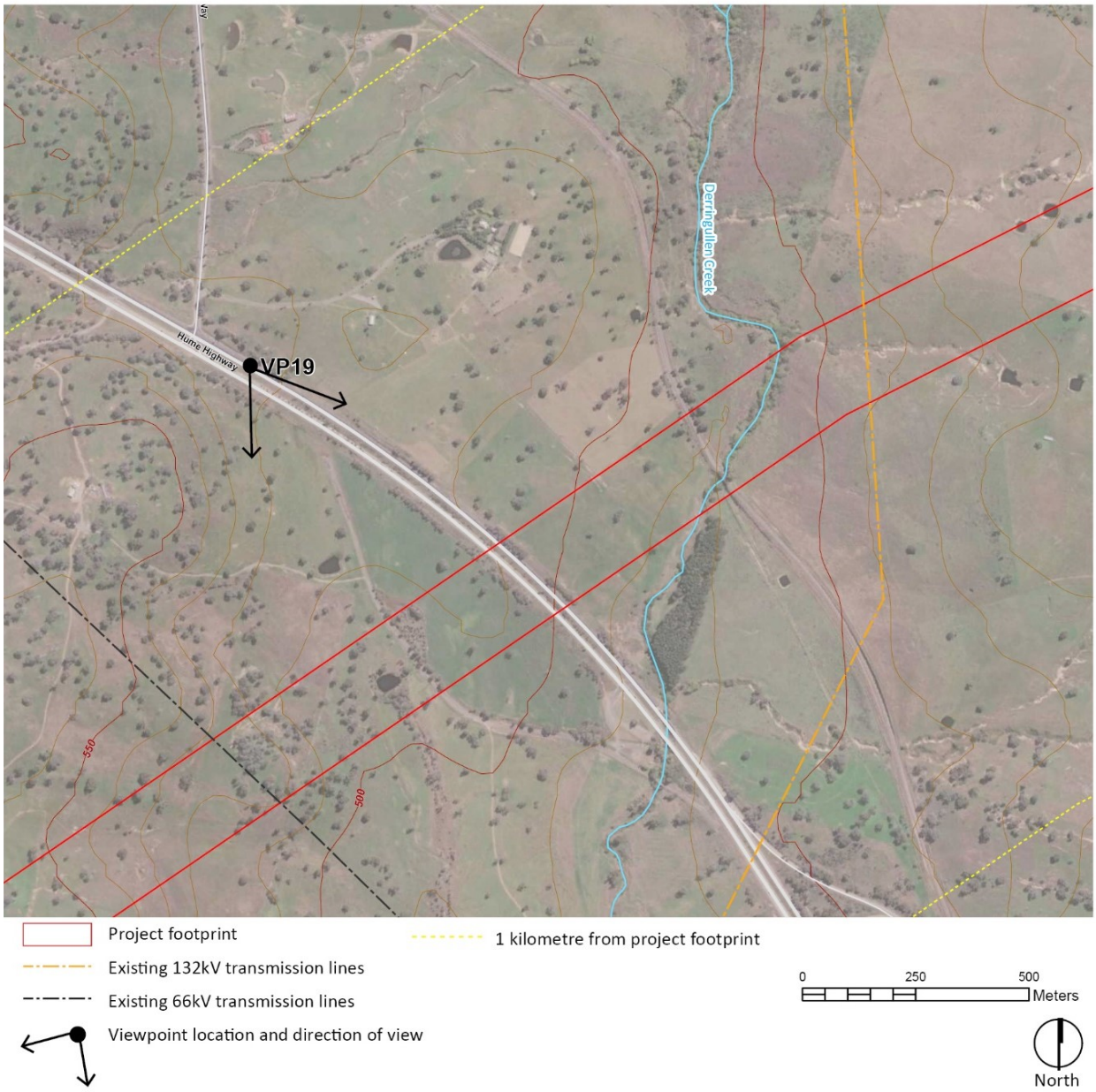


FIGURE 7-44 VIEW EAST FROM THE HUME HIGHWAY, YASS, VIEW LOCATION PLAN

Location: 34°47'20.09"S, 148°51'31.97"E

Existing conditions: This view shows a section of the Hume Highway, north-west of Yass, as it curves towards the intersection of Yass Valley Way and bypasses the town (refer to Figure 7-43 and Figure 7-44). The highway includes a dual carriageway, separated by a vegetated median. The landscape either side of the road includes undulating pasture fields with scattered trees, and corridors of vegetation aligned to creek valleys, fence lines and road corridors. The Yass to Gullen Range 330 kV transmission line route is seen in the background of view, ascending to the low hills west of Yass and crossing the highway about three kilometres away, containing transmission line structure ranging between 24 to 40 metres in height.

Sensitivity: Rural views such as this are experienced by higher number of receivers travelling along the highway, including tourists, residents and workers travelling on the road. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be located about 600 metres away, beyond the overhead steel gantry structure (visible in the centre of this view, refer to Figure 7-43) and extending either side of the highway. The vegetation along the highway and within adjacent fields would partially screen views to the construction works at some of the transmission line structure sites. However, the structure installation and stringing of wires and conductors would visible, rising above the vegetation and low hills, including use of large machinery such as cranes. The construction activity would be seen in the background of this view, from fast moving vehicles on the highway and partially screened by intervening vegetation. Overall, while there are already transmission and highway infrastructure visible, the construction activity would be prominent and there would be a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: There would be a new easement seen in the background of this view containing 500 kV steel lattice transmission line structures ranging between 50 to 76 metres tall, with overhead wires crossing the highway. The vegetation along the highway and in adjacent fields would partly screen the lower section of the structures and the rural uses seen from this location would continue to see seen within and around the easement. The presence of existing transmission line infrastructure and context of a busy highway containing multiple lanes of traffic increases the capacity of this view to absorb this change. However, due to the scale and visual prominence of the structures closest to the highway, there would be a moderate magnitude of change to this view, which is of local visual sensitivity, and a **moderate-low visual impact** during operations.

Viewpoint 20: View north-west from Orion Street, Yass

FIGURE 7-45 VIEW NORTH-WEST FROM ORION STREET, YASS

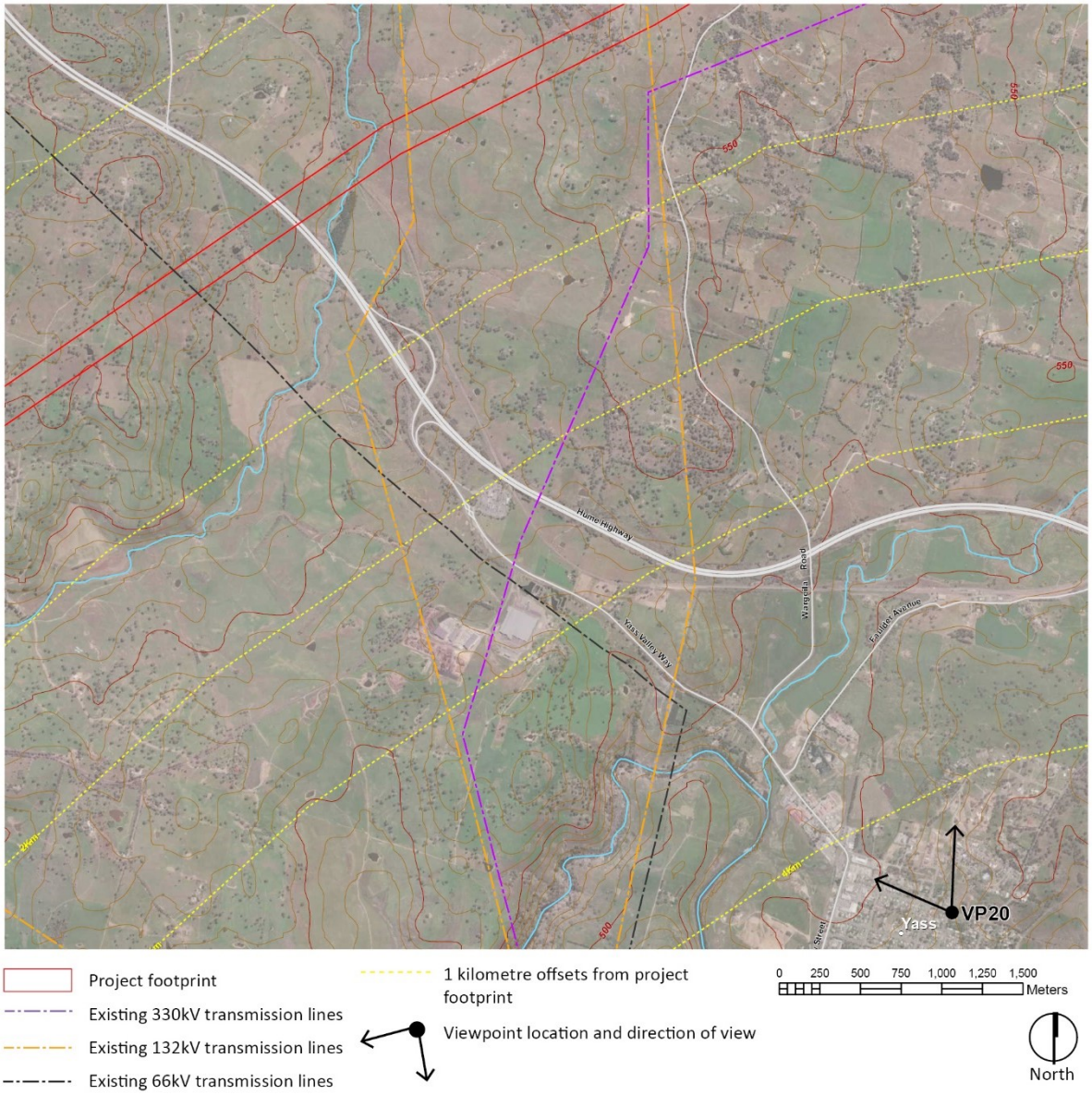


FIGURE 7-46 VIEW NORTH-WEST FROM ORION STREET, YASS, VIEW LOCATION PLAN

Location: 34°49'36.28"S, 148°54'58.85"E

Existing conditions: This view is from a historic part of north Yass, where there are traditional stone and brick dwellings (local heritage items in Yass Valley LEP 2013), which contribute to the amenity of the view (refer to Figure 7-45). The elevated rural landscape north of Yass provides a backdrop to the view, containing undulating pasture fields with scattered trees and larger tracts of vegetation along the steeper hilltops and valleys. Mount Bowning is seen in the background of view, rising to a peak of 791 metres AHD. The Yass to Gullen Range 330 kV Mount Bowning transmission line route (refer to Figure 7-46) is seen crossing the landscape in front of this mountain, about five kilometres away, traversing the hills north of Yass between the Black Range and Cooks Hill, and crossing the Hume Highway, containing transmission line structures ranging between 24 to 40 metres in height.

Sensitivity: Although the historic buildings and rural landscape surrounding Mount Bowning are visual features, views to the rural setting north of Yass from streets such as Orion Street are common and generally experienced by local residents and their visitors. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would be located beyond and aligned generally parallel to the existing Yass to Gullen Range 330 kV transmission easement, glimpsed in the background of view, set amongst the undulating terrain and field containing vegetation. The vegetation within this view, including trees within intervening rural fields, would mostly screen views to the construction works. However, the installation of the transmission line structures and stringing of wires and conductors may be seen, rising above the vegetation, in the background of this view. Overall, the works would be seen at a long distance, over five kilometres away, and would not appreciably alter the rural character of views seen from the outskirts of Yass. This would result in a low magnitude of change and a **negligible visual impact**.

Visual impact during operation: Glimpses of the project would be seen in the far background of this view, with 500 kV transmission line structures aligned parallel to the existing transmission easement. The transmission line structures would be evenly spaced, extending across the hilly terrain, and visible rising above the intervening vegetation. White the project would be seen; it would not be visually prominent nor alter the prevailing character of the view. The visual setting of the historic buildings along Orion Street and to Mount Bowning would not be adversely affected. Overall, there would be a low magnitude of change, and a **negligible visual impact**.

Viewpoint 21: View south from Cooks Hills Road

Location: 34°45'41.35"S, 148°56'51.49"E

Existing conditions: This view shows the rolling hills and ridges to the north of Yass, rising from the Murrumbidgee River towards Bango and Cooks Hill (refer to Figure 7-47). It is an elevated and gently undulating landscape, which has mostly been cleared for agricultural use, predominantly pastoral grazing, creating an open, rural landscape character, with long range views to the forested hills in Burrinjuck Nature Reserve. The Yass to Gullen Range 330 kV transmission line route (refer to Figure 7-49) is seen in the middle ground of view, traversing to the undulating hills north of Yass and crossing Cooks Hills Road about 350 metres away, containing transmission line structures ranging between 24 to 40 metres in height.

Sensitivity: Cooks Hills Road in this location is a two-lane sealed road providing access to the rural areas north of Yass, used mainly by nearby residents and their visitors, as well as tourists and staff of nearby facilities such as the Rye Park Wind Farm project, currently under construction. This view is of **local visual sensitivity**.

FIGURE 7-47 VIEW SOUTH FROM COOKS HILLS ROAD

FIGURE 7-48 VIEW SOUTH FROM COOKS HILLS ROAD, PHOTOMONTAGE

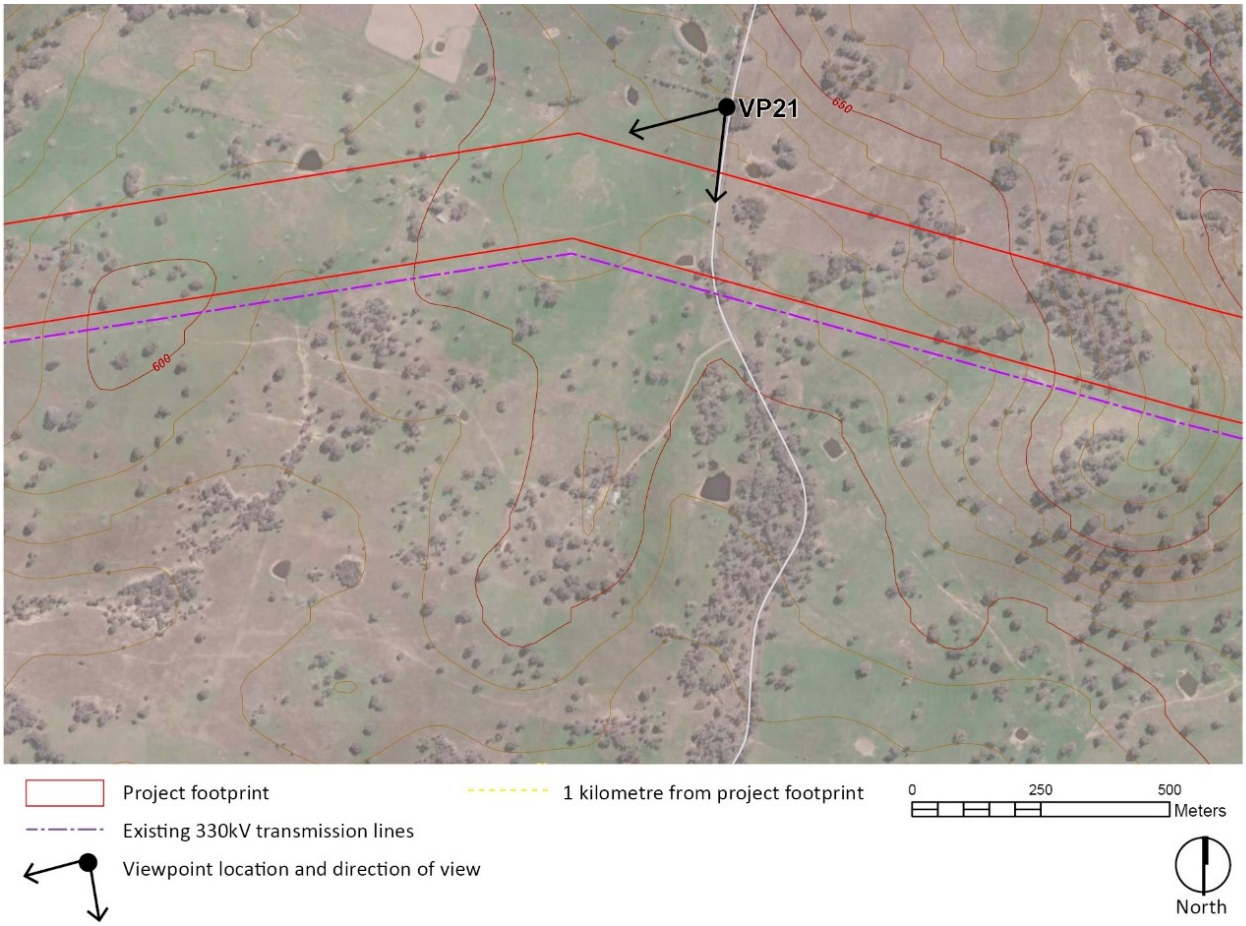


FIGURE 7-49 VIEW SOUTH FROM COOKS HILLS ROAD, VIEW LOCATION PLAN

Visual impact during construction: The project footprint would extend either side of the road, through the undulating terrain, closer to the viewer than the existing easement. Due to the varying landform and vegetation along the road and within adjacent fields, the works at a small number of transmission line structure sites would be seen in this view, with further sites visible extending into the background of view west of the road (right of view). Construction vehicles and machinery would be visible, travelling along an access track within the new easement. Work would include the removal of vegetation, leveling works and foundation construction at structure sites. The installation of the transmission line structures and stringing of the wires and conductors would be visible, crossing over the road and obstruct a view across the valley and towards the distant hills. While there are existing transmission line structures in this view, the project would introduce large scale works into the foreground of a view which includes attractive background features. Overall, the construction activity would detract from the amenity of this view, resulting in a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: There would be an additional row of transmission line structures seen in front of and adjacent to the existing easement (refer to Figure 7-48). The new 500 kV transmission line structures would be much larger in size, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures, with a different shape, and spaced at wider intervals. The undulating terrain and vegetation along the road and in adjacent fields would screen the lower section of the structures and the rural uses seen from this location would continue within and around the easement. The transmission line structures would obstruct the view to the backdrop of hills in the distance, further reducing the amenity of this view. Due to the proximity and increase in transmission infrastructure seen from this location, there would be a high magnitude of change and a **moderate visual impact** during operation.

Viewpoint 22: View south-east from Greendale Church

FIGURE 7-50 VIEW SOUTH-EAST FROM GREENDALE CHURCH

FIGURE 7-51 VIEW SOUTH-EAST FROM GREENDALE CHURCH, PHOTOMONTAGE

FIGURE 7-52 VIEW SOUTH-EAST FROM GREENDALE CHURCH, VIEW LOCATION PLAN

Location: 34°42’23.05”S, 149° 8’55.88”E

Existing conditions: This view shows the flat rural fields south of Greendale Church, along the Jerrawa Creek valley, rising to rolling hills and ridges in the background of view towards Dalton (refer to Figure 7-50). The landscape has mostly been cleared for agricultural use, predominantly pastoral grazing, creating an open, rural landscape character. The Yass to Gullen Range 330 kV transmission line route (refer to Figure 7-52) is seen in the middle ground of view, traversing through the Jerrawa Creek valley about 220 metres away, containing transmission line structures ranging between 24 to 40 metres in height.

Sensitivity: Greendale Church is a local church, servicing the surrounding rural areas north-east of Yass, used mainly by nearby residents and their visitors. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be parallel to and in front of the existing easement. The works at a small number of transmission line structure sites would be seen in this view, against a backdrop of hills. Construction vehicles and machinery would be visible, travelling along an access track within a new easement, including removal of vegetation, leveling

works and foundation construction. The installation of the transmission line structures and stringing of the wires and conductors would also be visible, crossing over roads and through fields. Overall, the construction activity would be visually prominent and detract from the visual amenity of this view, resulting in a high magnitude of change and a **moderate visual impact**.

Visual impact during operation: There would be an additional row of transmission line structures seen in front of and adjacent to the existing easement (refer to Figure 7-51). The new 500 kV transmission line structures would be much larger in size, ranging between 50 and 76 metres tall, about double to triple the height of the existing structures, with a slightly different shape, but spaced at wider intervals. The vegetation along the road and in adjacent fields would screen the lower section of some of the structures. The rural uses seen from this location would also continue within and around the easement. Due to the proximity and scale of the structures and increase in prominence of transmission infrastructure seen from this location, there would be a high magnitude of change and a **moderate visual impact** during operation.

Viewpoint 23: View north from Rugby Road

FIGURE 7-53 VIEW NORTH FROM RUGBY ROAD

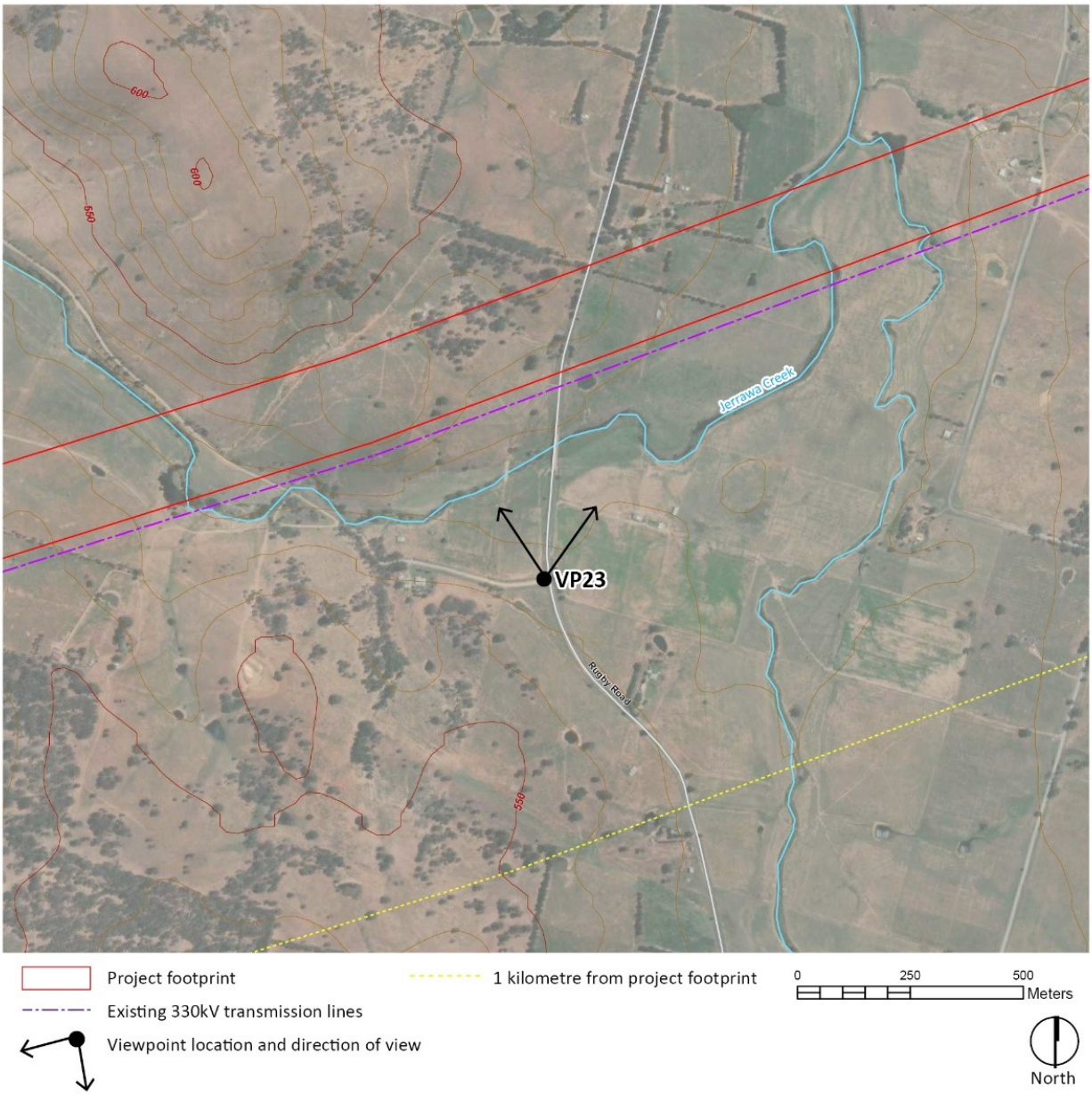


FIGURE 7-54 VIEW NORTH FROM RUGBY ROAD, VIEW LOCATION PLAN

Location: 34°42’11.30”S, 149°10’25.18”E

Existing conditions: This view shows the gently undulating rural landscape north of Dalton (refer to Figure 7-53). Jerrawa Creek meanders along the eastern side of the road (right of view), surrounded by pasture fields with scattered trees and rural dwellings (right of view), generally orientated to capture views over the Jerrawa Creek rural valley. The landform rises to a small plateau in the background of view, as the landscape transitions to the rural tablelands landscape at Gullen Range. The existing Lower Yass to Gullen Range 330 kV transmission line route (refer to Figure 7-54) is prominent, containing free-standing steel lattice structures ranging between 24 to 40 metres tall, within an easement cleared of trees.

Sensitivity: Rugby Road in this location is a sealed road providing access to the rural areas north of Jerrawa, used mainly by nearby residents and their visitors. Although the Jerrawa Creek rural valley are a local feature, rural views such as this are common within this area north of Dalton. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would extend either side of Rugby Road, through the undulating rural river valley landscape, beyond and parallel to the existing easement. The works at multiple transmission line structure sites would be visible, including removal of vegetation within fields, leveling works and foundation construction. Vehicles and machinery would be seen in this view, travelling along an access track within a new easement. The installation of the galvanised steel structures and stringing of the wires and conductors would also be visible, crossing over the road. The proximity an extent of construction activity seen in this view would detract from the rural character, resulting in a high magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures ranging between 50 and 76 metres tall would be seen beyond and aligned parallel to the existing transmission lines, in the middle ground of view. Although the project would include steel lattice structures, they would range between 50 and 76 metres tall, about double to triple the height of the existing structures and spaced at wider intervals. While the presence of transmission line infrastructure increases the capacity of this view to absorb this change, the spacing of the structures would be inconsistent with the existing structures, increasing the prominence and presence of power infrastructure in this view. Overall, the project would detract further from the rural amenity of this view, resulting in a moderate magnitude of change and a **low visual impact** during operation.

Viewpoint 24: View south-west from Grabben Gullen Road

FIGURE 7-55 VIEW SOUTH-WEST FROM GRABBEN GULLEN ROAD

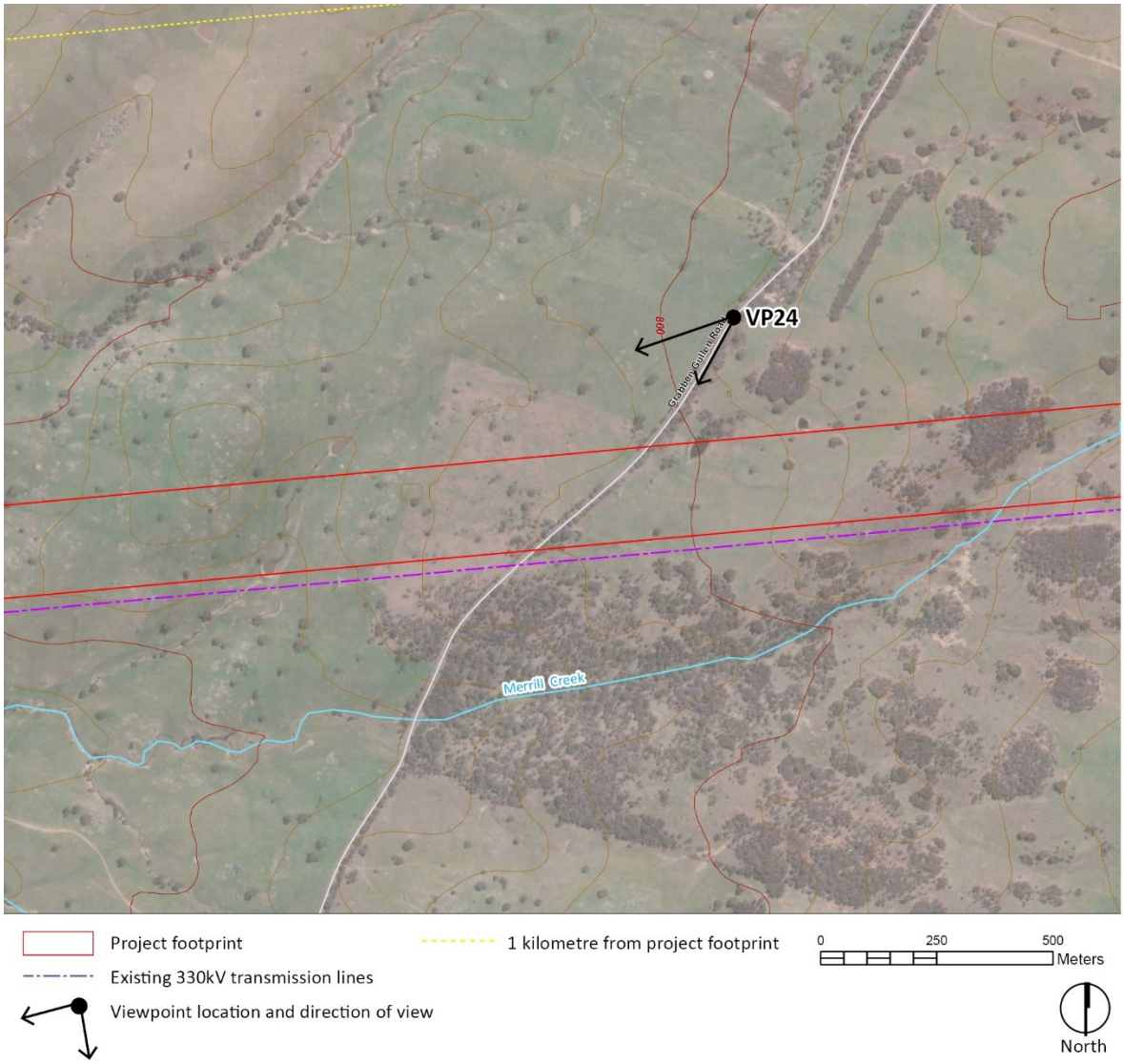


FIGURE 7-56 VIEW SOUTH-WEST FROM GRABBEN GULLEN ROAD, VIEW LOCATION PLAN

Location: 34°38’39.42”S, 149°19’51.62”E

Existing conditions: This view shows the rural tableland landscape extending north of Gunning, towards Crookwell (refer to Figure 7-55 and Figure 7-56). It is an elevated and gently undulating landscape, which has mostly been cleared for agricultural use, predominantly pastoral grazing, creating an open, rural landscape character, with long range views to the forested hills in Mundoonen Nature Reserve. The upper section of the Yass to Gullen Range 330 kV transmission line structures are seen in the middle ground of view, traversing to the undulating hills and crossing Grabben Gullen Road about 700 metres away (to the left, out of this view), ranging between 24 to 40 metres in height.

Sensitivity: Grabben Gullen Road in this location is a two-lane sealed road providing access to the rural areas north of Gunning, used mainly by nearby residents and their visitors, as well as tourists visiting nearby locations such as the Gullen Range wind and solar farm. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would extend through the undulating terrain, in front of the existing easement. Due to the varying landform and vegetation within fields, the works at a small number of transmission line structure sites would be seen in this view, receding into the background of view. Construction vehicles and machinery would be visible, travelling along an access track within a new easement, including removal of vegetation, leveling

works and foundation construction. The installation of the transmission line structures and stringing of the wires and conductors would also be visible, crossing over the road (left, out of this view). Overall, the construction activity would detract from the rural character of this view, resulting in a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures ranging between 50 to 76 metres tall would be seen in front of and aligned parallel to the existing transmission lines, in the middle ground of view. While the presence of transmission line infrastructure increases the capacity of this view to absorb this change, the design and spacing of the structures would be inconsistent with the existing structures. They would also be about double to triple the height of the existing structures, increasing the prominence and presence of power infrastructure in this view. Overall, the project would detract further from the rural amenity of this view, resulting in a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 25: View north from Pejar Dam visitor area

Location: 34°35'11.36"S, 149°34'48.46"E

Existing conditions: This view from the southern end of Pejar Dam, at the visitor facilities, shows the dam and spillway in the foreground and extending about three kilometres north into the into the background of the view (refer to Figure 7-57). The landform beyond the lake rises abruptly to a tableland landscape, including elevated pasture fields. The southern end of Crookwell 2 wind farm is a prominent feature, located on the tablelands extending between Monument Hill and Pigmans Hill, with several turbines reaching up to 160 metres to the blade tip height. The Gullen Range to Crookwell 330 kV transmission line route (refer to Figure 7-59) is also visible, crossing the northern end of the dam, in the background of view, with transmission line structures ranging between 24 to 40 metres in height.

Sensitivity: This viewpoint is available from the visitor area at Pejar Dam, including a lookout, shelter and visitor information boards. The dam is a local place of recreation, mainly for boating and fishing and travellers breaking along Crookwell Road. Overall, this view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would be located at the northern end of the dam, over two kilometres away, aligned with the Gullen Range to Crookwell 330 kV transmission line easement. The works at multiple transmission line structure sites would be visible, including removal of vegetation within fields, leveling works, foundation construction and brake and winch sites. Vehicles and machinery would be seen in this view, travelling along an access track within the easement. The installation of the transmission line structures and stringing of the wires and conductors would also be visible. The project would be in the background of view, and not be prominent. Overall, the construction activity would be absorbed into the complex view so that it would not only slightly reduce the amenity of this view, resulting in a low magnitude of change and a **low visual impact**.

FIGURE 7-57 VIEW NORTH FROM PEJAR DAM VISITOR AREA

FIGURE 7-58 VIEW NORTH FROM PEJAR DAM VISITOR AREA, PHOTOMONTAGE

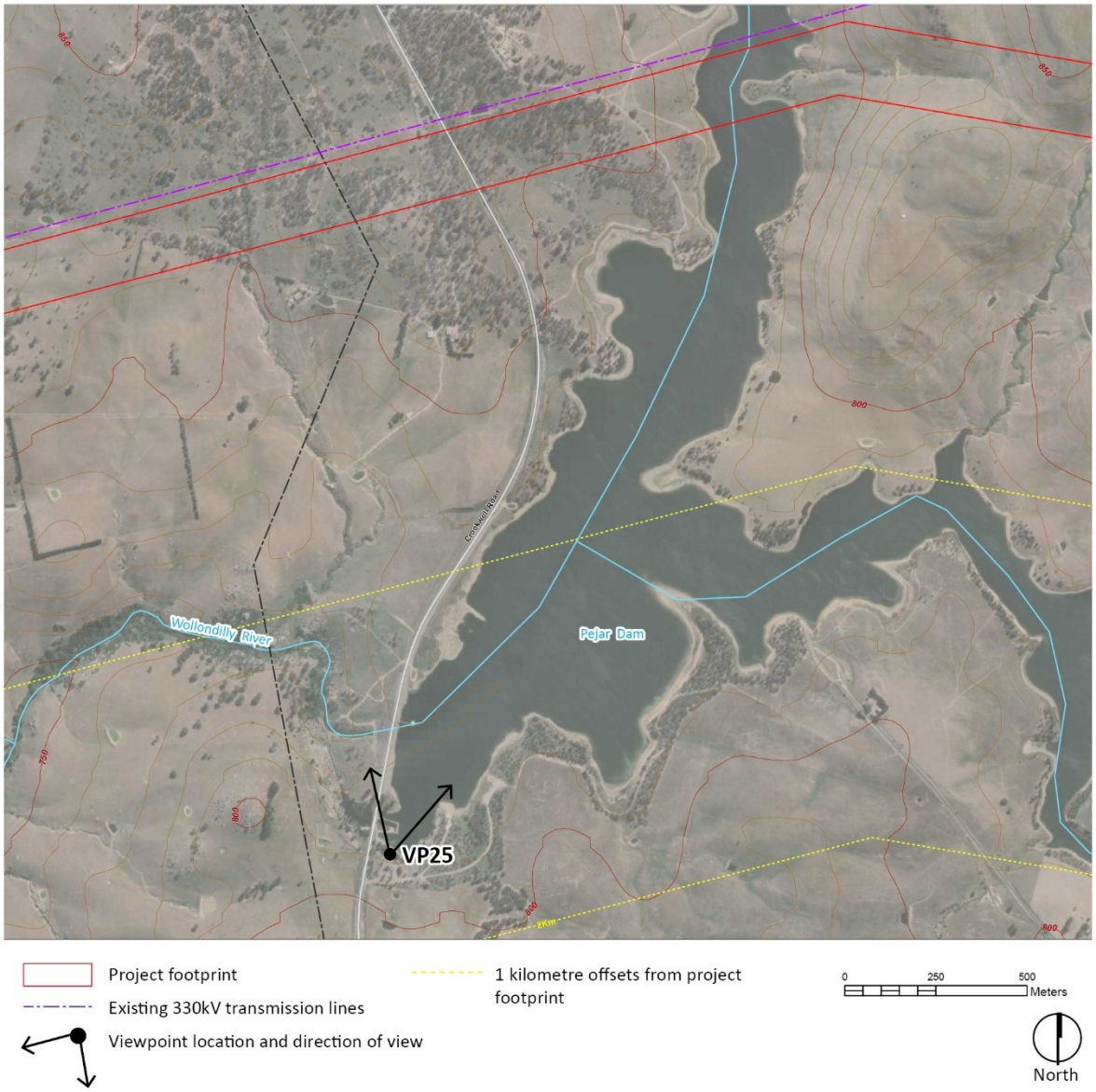


FIGURE 7-59 VIEW NORTH FROM PEJAR DAM VISITOR AREA, VIEW LOCATION PLAN

Visual impact during operation: The project would be seen in the background of this view, in the context of an existing wind farm with large scale wind turbines and transmission line easement (refer to Figure 7-58). The 500 kV transmission line structures would be evenly spaced, extending across the hilly terrain in the background of view, and crossing the dam parallel to the existing transmission line. These structures would be of a different shape to the existing structures and would be about double to triple the height, adding further power infrastructure to this view. White the project would be visible, it would not be visually prominent nor change the prevailing character of the view, views of the dam in the fore and middle ground would remain unobstructed. Overall, there would be a low magnitude of change, and a **low visual impact**.

Viewpoint 26: View north from Taralga Road

FIGURE 7-60 VIEW NORTH FROM TARALGA ROAD

FIGURE 7-61 VIEW NORTH FROM TARALGA ROAD, PHOTOMONTAGE

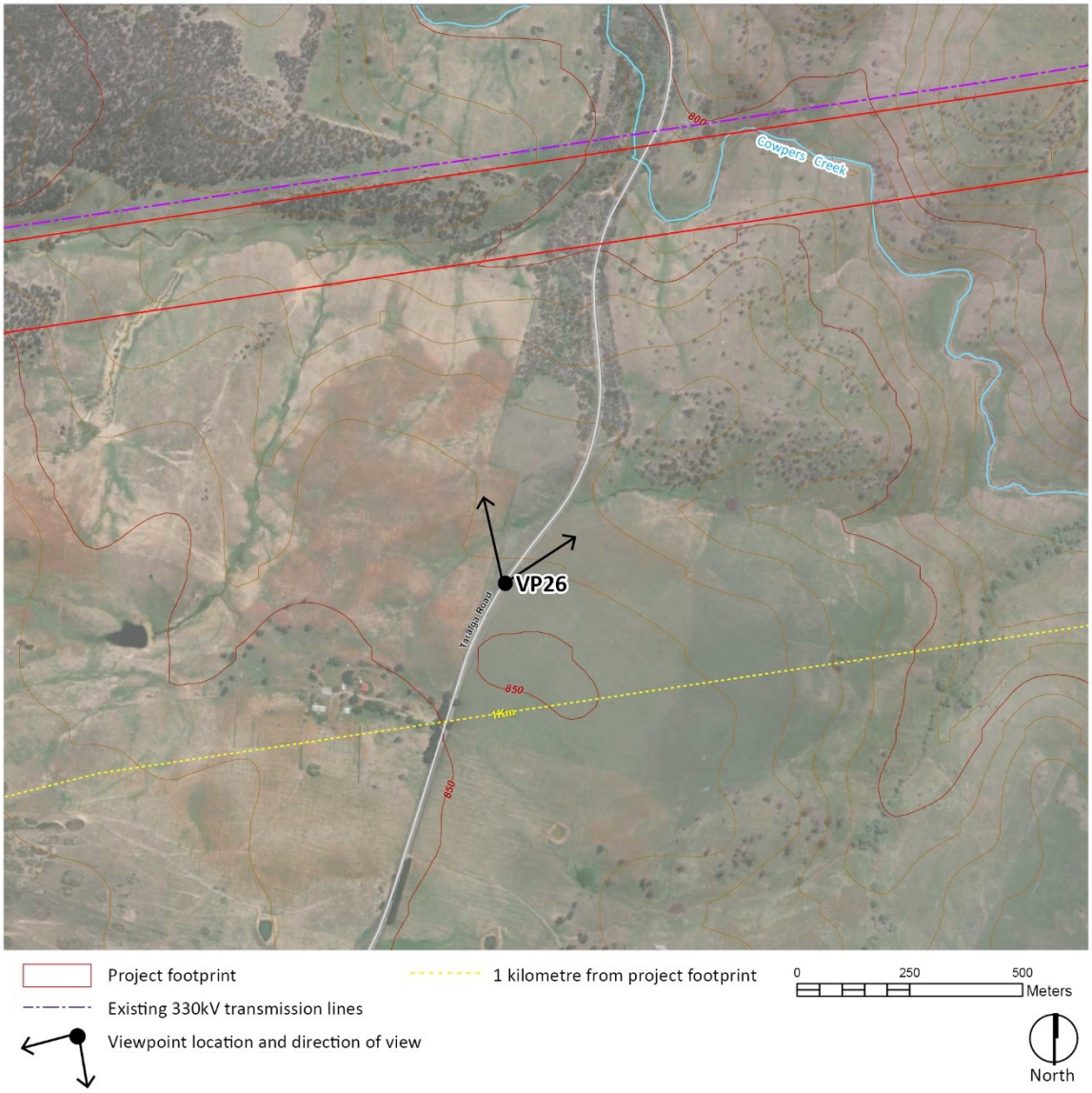


FIGURE 7-62 VIEW NORTH FROM TARALGA ROAD, VIEW LOCATION PLAN

Location: 34°30'34.15"S, 149°48'41.19"E

Existing conditions: This view shows the undulating tableland landscape south of Taralga (refer to Figure 7-60). It is an elevated landscape, which has mostly been cleared for agricultural use, predominantly pastoral grazing, creating an open, rural landscape character. The Crookwell to Bannaby 330 kV transmission line route (refer to Figure 7-62) is seen in the middle ground of view, crossing Taralga Road about one kilometre away and traversing through the undulating hills, ranging between 24 to 40 metres in height. Taralga wind farm is a prominent feature in the background of view, located on the tablelands extending between Bannaby Hill and Tarlo River National Park, about eight kilometres away. Multiple turbines are visible, located on varying ground levels and reaching up to 130 metres to the blade tip height.

Sensitivity: Taralga Road in this location is a two-lane sealed road providing access to the rural areas between Goulburn and Taralga, used mainly by nearby residents and their visitors, as well as tourists visiting the area. This view is of **local visual sensitivity**.

Visual impact during construction: The project footprint would extend either side of Taralga Road, through the undulating tableland landscape in the centre of this view, in front of and parallel to the existing easement. The works at multiple transmission line structure sites would be visible, including removal of vegetation within fields, leveling works and foundation construction. Vehicles and machinery travelling along an access track within a new easement would be seen. The installation of the transmission line structures and stringing of the wires and conductors would also be seen, crossing over the road. The extent of construction activity seen in this view would detract from the amenity of this view, resulting in a moderate magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: A new easement containing large 500 kV transmission line structures ranging between 50 to 76 metres tall would be seen in front of and aligned parallel to the existing transmission lines, in the middle ground of view (refer to Figure 7-61). While the project would include steel lattice structures, they would be a different shape and reach about double to triple the height of the existing structures. They would also be spaced further apart and would not be grouped together with the existing structures. The transmission line structures would rise above the undulating landform with little intervening vegetation and landform, and be viewed against the sky, increasing their visual prominence. While there is a transmission line seen in this view, the larger scale of the structures would increase the visual prominence and presence of power infrastructure in this view. Overall, the project would detract from the rural amenity of this view, resulting in a moderate magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 27: View west from Bannaby Road

Location: 34°25’51.14”S, 149°56’26.62”E

Existing conditions: This view shows the elevated rural landscape east of Taralga, along Bannaby Road, including gently undulating pasture farmland with scattered trees within fields and a corridor of trees along the road verge (refer to Figure 7-63 and Figure 7-65). Taralga wind farm is a feature in the background of view, located on the tablelands east of Taralga, in the vicinity of Bannaby Hill, about five kilometres away. From this angle, the upper section of multiple turbines are visible, including the hubs and blade tips.

Sensitivity: Bannaby Road in this location is a sealed road providing access to the rural areas between Taralga and Bannaby, used mainly by nearby residents and their visitors. Rural views such as this are common within this area around Bannaby Road, north of Tarlo River National Park. This view is of **neighbourhood visual sensitivity**.

FIGURE 7-63 VIEW WEST FROM BANNABY ROAD

FIGURE 7-64 VIEW WEST FROM BANNABY ROAD, PHOTOMONTAGE

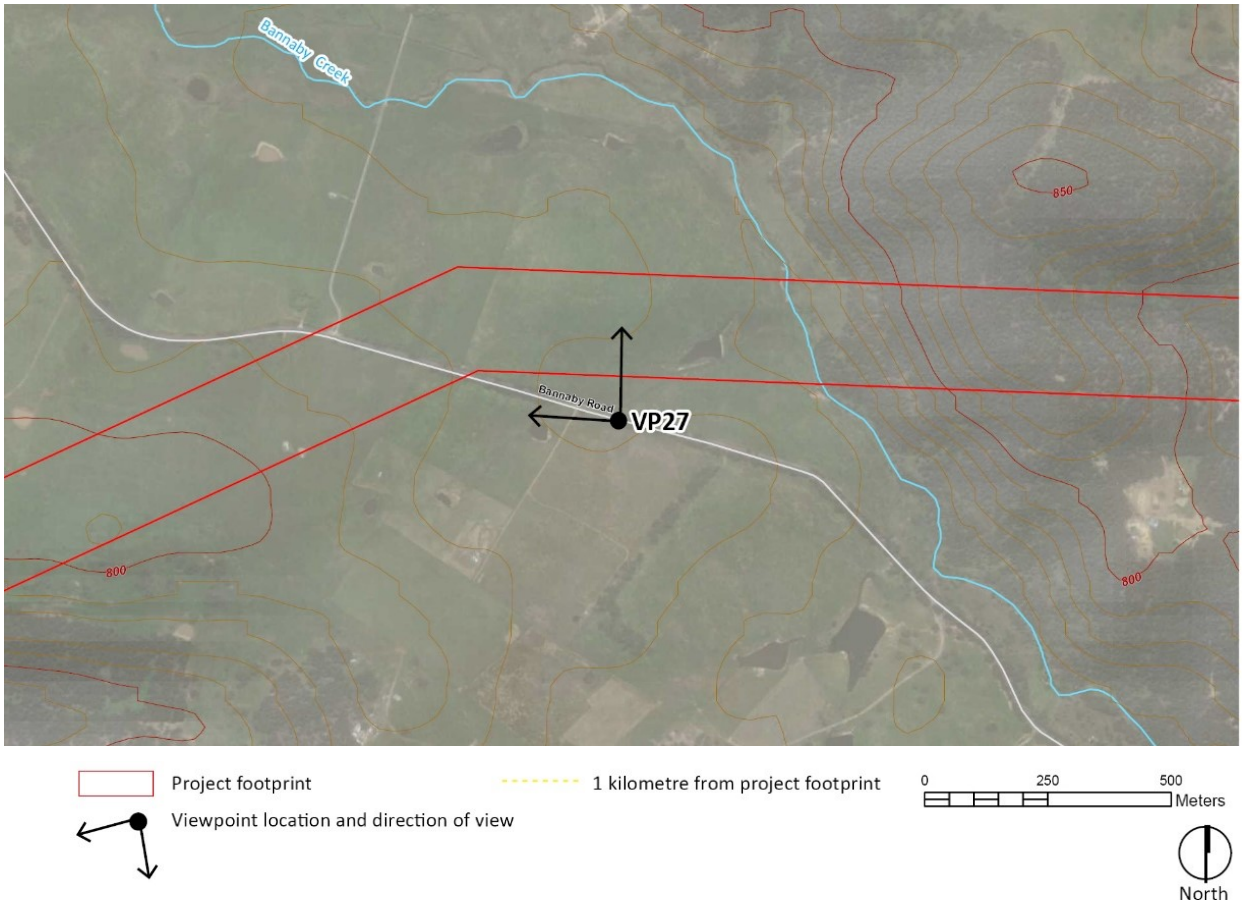


FIGURE 7-65 VIEW WEST FROM BANNABY ROAD, VIEW LOCATION PLAN

Visual impact during construction: The project footprint would extend either side of the road, through the gently undulating rural landscape, in the centre of this. The works at multiple transmission line structures site would be visible, including removal of vegetation, leveling works and foundation construction. Vehicles and machinery would be seen in this view, travelling along an access track within a newly formed easement. The installation of the galvanised steel structures and stringing of the wires and conductors would also be visible, crossing over the road diagonally. The construction activity would be seen in proximity, introducing transmission line infrastructure into the view and detracting from the rural character of this view. Overall, there would be a high magnitude of change and a **moderate-low visual impact**.

Visual impact during operation: There would be a new transmission line easement in the centre of this view, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall (refer to Figure 7-64). The transmission line route would cross the road diagonally, then change direction to the north of the road (right of view), extending in a straight line towards and through the vegetated hills (left, out of view). The project would detract from the rural amenity of this view, which contains no large scale power infrastructure. Due to the proximity and extent of the project seen from this location, there would be a high magnitude of change and a **moderate-low visual impact** during operation.

Viewpoint 28: View north-west from Hanworth Road

FIGURE 7-66 VIEW NORTH-WEST FROM HANWORTH ROAD

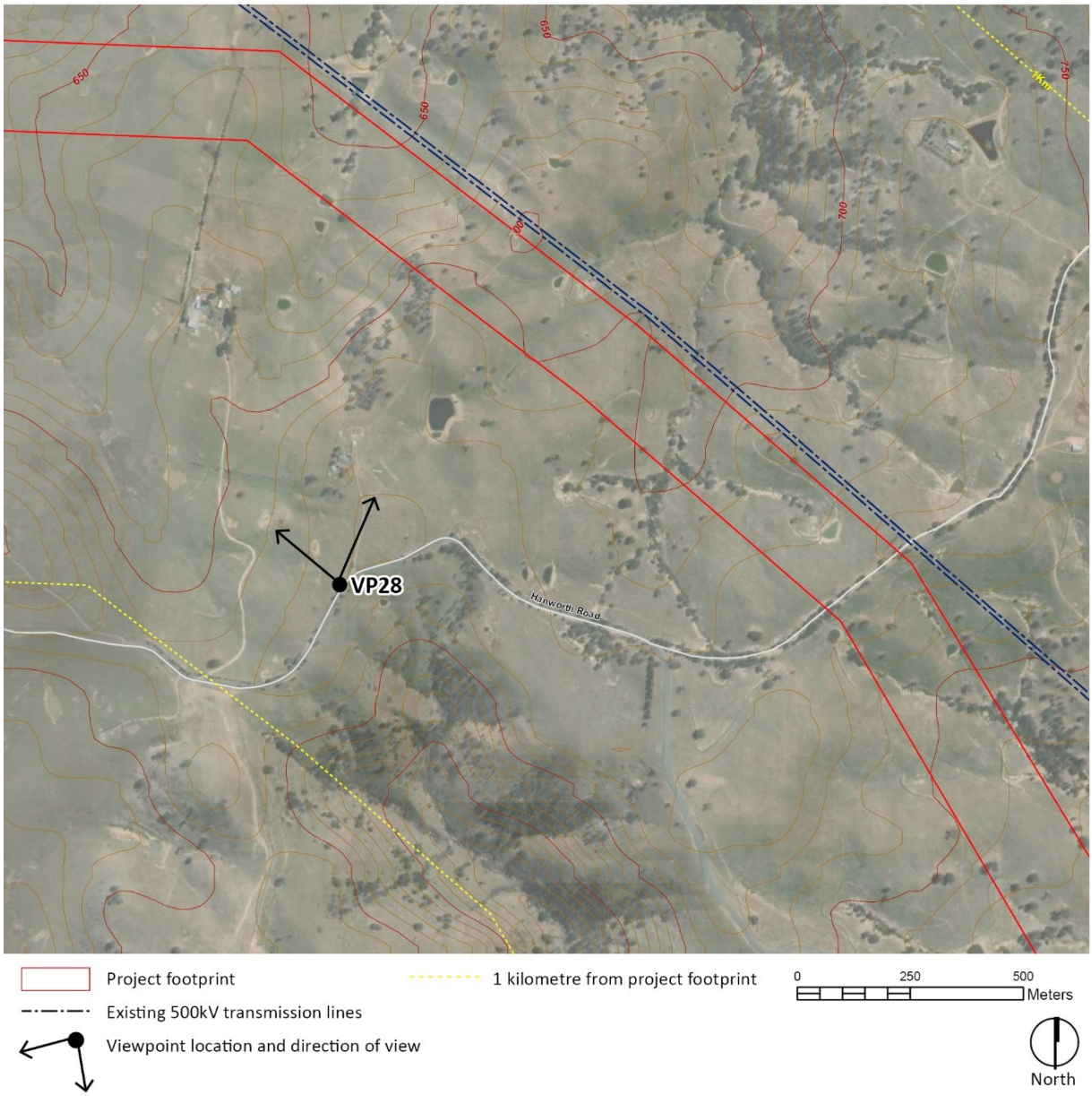


FIGURE 7-67 VIEW NORTH-WEST FROM HANWORTH ROAD, VIEW LOCATION PLAN

Location:’34°25”56.60"S, ’50° 1”49.02"E

Existing conditions: This view shows the elevated rural landscape extending north of the Tarlo River, along Hanworth Road (refer to Figure 7-66). This area includes highly undulating partially cleared farmland, with scattered trees within pasture fields and deep vegetated valleys. It is a remote rural landscape, containing a small number of dwellings and outbuildings such as sheds and water tanks. The Mount Piper to Bannaby 500 kV transmission line route (refer to Figure 7-67) is visible in the background of view, containing large scale steel lattice structures ranging between 50 to 65 metres tall, traversing the hills and valleys about one to two kilometres away, through an easement cleared of vegetation.

Sensitivity: Hanworth Road in this location is a sealed road providing access to the rural areas of Bannaby, used mainly by nearby residents and their visitors. Rural views such as this are common within this area around Hanworth Road, north of the Tarlo River. This view is of **neighbourhood visual sensitivity**.

Visual impact during construction: The project footprint would divert away from the existing easement and extend through the undulating rural landscape in the middle ground of this view. The site would traverse through the valleys and hills about 400 metres beyond the sheds seen in this view. The works at multiple transmission line structure sites would be seen in the background of the view, including removal of vegetation, leveling works, foundation construction, as well as the installation of the transmission line structures and stringing of the wires and conductors. Vehicles and machinery also would be visible, travelling along an access track within the new easement. The construction activity would detract from the scenic rural character of this view, however, due to the distance, this would result in a moderate magnitude of change and a **low visual impact**.

Visual impact during operation: There would be a new transmission line easement in the centre of this view, containing large scale 500 kV transmission line structures ranging between 50 to 76 metres tall. Although the eastern part of the project would be located with the existing easement, the section seen in this view would divert away from this easement, crossing the hills and valleys in the middle ground of view. While the existing transmission line infrastructure is visible, the project would increase the prominence and presence of power infrastructure in this view. Overall, the project would detract further from the rural amenity of this view, resulting in a moderate magnitude of change and a **low visual impact** during operation.

7.1.3 Views from the air

The following assessment of views from the air has been undertaken generally in accordance with the approach described in section 4.3 of this report, Assessment of visual impact – public domain views. It considers views from the air generally rather than as on representative viewpoint.

Existing conditions:

There are recreational flights operating from the Wagga Wagga Airport, including adventure and scenic flights, offering views over the city, Lake Albert and the surrounding agricultural areas, as well as longer flights to enjoy scenic views of Blowering Dam. There are also recreational flights operating from the Tumut Airport, offering scenic views over the vineyards and wineries of the high country, the rolling hills of Tumut and Tumbarumba, along the three dams of Talbingo, Journama and Blowering, and the Snowy Hydro Scheme. No hot air ballooning flights were identified near the project.

Sensitivity: The scenic flights offered from these airports are for tourist and recreational purposes, from both helicopters and planes. The views from these flights are the focus of these journeys and, where they fly over the surrounding landscape, are of **regional visual sensitivity**.

Visual impact during construction: The southern extent of the project footprint would be visible from these scenic flights, including the works occurring between Wagga Wagga, Maragle and Tumut. These works would be seen from the air, within the undulating rural landscape surrounding Wagga Wagga and Tumut, as well as the forested landscape south of Tumut, within Bago State Forest, near Kosciuszko National Park. In forested areas, the progressive removal of vegetation within the proposed easement between the Snubba Road compound (C03) and Maragle 500 kV substation compound (C05) would be noticeable. Elsewhere, construction of the project would be viewed in the context of existing transmission lines already visible crossing the landscape, particularly between Wagga Wagga and Snubba Road and in the vicinity of the future Maragle 500 kV substation, where the project would be viewed in proximity to the Snowy Hydro Scheme infrastructure at Talbingo Dam. While the removal of vegetation and placement of transmission line structures would be visible at lower heights, they would be seen in a vast and highly varied landscape and would not contrast substantially with the surrounding landscape.

Overall, there would be a reduction in the amenity of the views from the air in the vicinity of Bago State Forest, south of Tumut, near Kosciuszko National Park. These would be localised impacts

where the project footprint would be viewed together with the future Maragle 500 kV substation and also the existing Snowy Hydro Scheme infrastructure. In these localised areas there would be a moderate magnitude of change and a **moderate visual impact**.

In other areas, while construction of the project would be visible unobstructed from the air, it would be seen within a complex landscape where other transmission and related infrastructure are seen and largely absorbed. This would result in a low magnitude of change and a **moderate-low visual impact**.

Note, there would be no visual impact on commercial flights as they are not operated for the purposes of appreciating views and are mostly operating at heights that would limit visibility of the project.

Visual impact during operation: The 500 kV transmission line route would create a strong line across the landscape in views from the air. The project would be a new built feature in Bago State Forest, which is a local visual feature and visually noticeable from the air. There would continue to be a reduction in the amenity of the views from the air in the vicinity of Bago State Forest due to the presence of the large transmission line structures, within a cleared easement, including several turns as it traverses this hilly, forested landscape, between Snubba Road and the future Maragle 500 kV substation. In this area, there would be a low magnitude of change and a **moderate-low visual impact** in the views from the air.

In other areas surrounding Wagga Wagga and Tumut, the new 500 kV transmission line easement and proposed Gugaa 500 kV substation would be seen within a varied and complex landscape where other transmission and related infrastructure are noticeable and would be largely absorbed into the view. Overall, there would be a low magnitude change in areas north of Snubba Road and an overall **moderate-low visual impact**.

7.1.4 Summary of daytime visual impacts

The daytime visual impacts are listed in Table 7-1.

TABLE 7-1: SUMMARY OF VISUAL IMPACTS

			Construction		Operation	
	Location	Visual sensitivity	Magnitude of change	Visual impact	Magnitude of change	Visual impact
1	View south from Gregadoo East Road	Local	Moderate	**Moderate-low**	Moderate	**Moderate-low**
2	View south from Livingstone Gully Road	Neighbourhood	High	**Moderate-low**	High	**Moderate-low**
3	View west from Tumbarumba Road	Local	High	**Moderate**	Moderate	**Moderate-low**
4	View south-west from the Hume Highway	Local	Moderate	**Moderate-low**	Moderate	**Moderate-low**
5	View south-east from Westbrook Road	Neighbourhood	High	**Moderate-low**	Moderate	**Low**
6	View south from Yaven Creek Road	Neighbourhood	High	**Moderate-low**	High	**Moderate-low**
7	View south from Wondalga Road	Local	Moderate	**Moderate-low**	Moderate	**Moderate-low**
8	View north-east from Batlow Road, Wondalga	Local	Moderate	**Moderate-low**	Low	**Low**
9	View east from The Big Apple, Stewarts Road, Batlow	Local	Low	**Low**	Low	**Low**

			Construction		Operation	
	Location	Visual sensitivity	Magnitude of change	Visual impact	Magnitude of change	Visual impact
10	View north from Batlow Road, Windowie	Local	Moderate	Moderate-low	Moderate	Moderate-low
11	View south from Snowy Mountains Highway	Local	High	Moderate	High	Moderate
12	View north from Gocup Road	Local	High	Moderate	High	Moderate
13	View south-east from Brungle Road	Local	High	Moderate	High	Moderate
14	View east from Elliott Way	Local	Moderate	Moderate-Low	Moderate	Moderate-low
15	View west from Adjungbilly Road	Neighbourhood	Moderate	Low	Moderate	Low
16	View south-east from Childowla Road	Neighbourhood	High	Moderate-low	High	Moderate-low
17	View east from Burrinjuck Road	Local	High	Moderate	Moderate	Moderate-low
18	View west from Black Range Road	Neighbourhood	Moderate	Low	Moderate	Low
19	View east from the Hume Highway, Yass	Local	Moderate	Moderate-low	Moderate	Moderate-low
20	View north-west from Orion Street, Yass	Neighbourhood	Low	Negligible	Low	Negligible
21	View south from Cooks Hills Road	Local	High	Moderate	High	Moderate
22	View south-east from Greendale Church	Local	High	Moderate	High	Moderate
23	View north from Rugby Road	Neighbourhood	High	Moderate-low	Moderate	Low
24	View south-west from Grabben Gullen Road	Local	Moderate	Moderate-low	Moderate	Moderate-low
25	View north from Pejar Dam visitor area	Local	Low	Low	Low	Low
26	View north from Taralga Road	Local	Moderate	Moderate-low	Moderate	Moderate-low
27	View west from Bannaby Road	Neighbourhood	High	Moderate-low	High	Moderate-low
28	View north-west from Hanworth Road	Neighbourhood	Moderate	Low	Moderate	Low
Views from the air						
1.	Views from the air in the vicinity of Bago State Forest, south of Tumut, near Kosciuszko National Park	Regional	Moderate	Moderate	Low	Moderate-low
2.	Views from the air elsewhere, north and west of Tumut	Regional	Low	Moderate-low	Low	Moderate-low

7.2 Assessment of night-time impacts

The eight broad landscape character zones (and several sub-character areas) have been used to assess the night-time impacts of the project (refer to **Attachment C**). The following section includes a description of the existing conditions in each of these landscapes at night, the night-time sensitivity of each landscape, the magnitude of change expected because of the project and assigns an impact level, during construction and operation.

Note, there would be no visual impact on views from aircraft at night as scenic flights are operated during daylight hours and there is limited lighting proposed as a part of the project.

7.2.1 Rural fringe landscape character zone

Existing conditions and sensitivity: At night, the Wagga Wagga rural fringe landscape character area would have medium light levels with scattered rural residences across the landscape and a greater density of residences on the southern outskirts of Wagga Wagga. While the vegetation cover would provide some screening of light sources within this area, there would be a bright skyglow associated with the city of Wagga Wagga. This would include the lights from vehicles travelling along roads within this area as well as the Wagga Wagga Airport. Overall, this landscape is an area of medium district brightness (A3) and has a **low visual sensitivity** at night.

Visual impact during construction: There would be lighting required at the Wagga 330 kV substation compound (C01), located at the corner of Boiling Down and Ashfords roads. While there is no worker accommodation facility planned in this landscape, there would be works along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement, between the Wagga 330 kV substation compound (C01) and Ivydale Road. This lighting is likely to be absorbed within the surrounding area of medium district brightness. This effect would only occur for a short duration each day and for a short time within the project construction program.

Overall, there would be a low magnitude of change to this landscape, which is of low sensitivity, and a **low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. The Wagga 330 kV substation compound (C01) would be decommissioned and there would be no additional lighting at the existing Wagga 330 kV substation. Overall, there would be a negligible magnitude of change to this landscape which is of low sensitivity, and a **negligible visual impact** at night during operation.

7.2.2 Great Dividing Range foothills landscape character zone

Existing conditions and sensitivity: At night, both the Gregadoo and Ellerslie Range Great Dividing Range foothills landscape character areas would have low light levels with the sparse number of rural residences across the landscape and a greater density of trees on the steeper, hilly landscape. This landform and vegetation cover would provide some screening of light sources within this area. There are also less roads crossing the hilly terrain, and therefore fewer vehicle headlights seen in these areas. There are no densely settled areas within these landscape character areas, however, the towns and highways in the surrounding landscapes would influence the light levels in these areas. Overall, the landscape character areas in this zone are of low district brightness (A2) and have a **moderate visual sensitivity** at night.

Visual impact during construction: While there is no construction compound and worker accommodation facility proposed in this landscape, there would be work along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement. This lighting is likely to contrast with the surrounding area of low district brightness. This effect would only occur for a short duration each day and for a short time within the project construction program.

Overall, there would be a low magnitude of change to this landscape, which is of moderate sensitivity, and a **moderate-low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. Therefore, there would be a negligible magnitude of change to this landscape which is of moderate sensitivity, and a **negligible visual impact** at night during operation.

7.2.3 Rural valleys landscape character zone

Existing conditions and sensitivity: At night, the landscape character areas within this zone would have low light levels with scattered rural residences across the landscape. There would be some denser clusters of residences in the vicinity of towns such as Tumut and Batlow, where there would also be more vehicles travelling along local roads and highways, as well as some intensive industries such as timber mill and manufacturing plant, a waste and recycling centre, and a large paper mill on the northern side of the Snowy Mountains Highway, west of Tumut, all contributing to the light levels. There would be a general sky glow above the settlements which would also influence this character of this landscape. Overall, the landscape character areas in this zone are of low district brightness (A2) and have a **moderate visual sensitivity** at night.

Visual impact during construction: The Gregadoo Road compound (C06) and Snowy Mountains Highway compound (C02) (including site offices, amenities and construction support facilities) may operate outside standard construction hours, requiring lighting. The Tumbarumba Accommodation Facility (AC1) would be located in this zone, north of the town, which would require lighting. There would also be works at the proposed Gugaa 500 kV substation and along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at the substation, at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement.

Overall, the lighting at the at the proposed Gugaa 500 kV substation would contrast with the surrounding low district brightness landscape and there would be a moderate magnitude of change to the Gregadoo to Book Book rural valleys landscape character area, which is of moderate visual sensitivity, resulting in a **moderate visual impact** at night. This impact would be experienced from localised areas surrounding the easement, substation and Gregadoo Road compound (C06), including from local roads where they are located within view of the works, including Gregadoo East Road. Elsewhere, the lighting along the easement, at the Tumbarumba Accommodation Facility (AC1) and at the Snowy Mountains Highway compound (C02) would result in a low magnitude of change to the Yaven Creek and Adelong Creek, Tumbarumba, and Tumut and Adjungbilly landscape character areas, resulting in a **moderate-low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route, resulting in a negligible magnitude of change to the Yaven Creek and Adelong Creek, Tumut and Adjungbilly landscape character areas, and a **negligible visual impact** during operation. There would however be low-level lighting at the proposed Gugaa 500 kV substation, affecting the Gregadoo to Book Book rural valleys landscape character area, resulting in a low magnitude of change to this landscape which is of moderate sensitivity, and a **moderate-low visual impact** at night during operation.

7.2.4 Forested hills landscape character zone

Existing conditions and sensitivity: At night, this landscape would have low light levels. Comprised mainly of State forest and reserves, this landscape contains no dwellings, with only lights from vehicles travelling along local roads and occasional night-time works at forestry sites contributing to the light levels. Overall, this is a dark (A1) landscape and has a **high visual sensitivity** at night.

Visual impact during construction: The facilities at the Honeysuckle Road compound (C07), Red Hill Road compound (C08) and Adjungbilly Road compound (C09) may operate outside standard construction hours, requiring lighting. While there is no worker accommodation facility planned in this landscape, there would be works along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement.

Overall, the lighting at these sites would contrast with the surrounding predominantly dark landscape and there would be a low magnitude of change to this landscape, which is of high visual sensitivity, resulting in a **moderate visual impact** in these locations at night. This impact would be experienced in very limited and localised areas surrounding the construction compounds and from local roads where they are located within view of the works, including Wondalga and Brungle roads.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. Therefore, there would be a negligible magnitude of change to this landscape which is of moderate sensitivity, and a **negligible visual impact** at night during operation.

7.2.5 Undulating rural hills and ridges landscape character zone

Existing conditions and sensitivity: This rural landscape has low level light sources at night, such as lighting associated with the scattered homesteads and agricultural buildings on rural properties and vehicles travelling along local roads. There would be some denser clusters of residences in the vicinity of the towns such as Batlow and Yass, where there would also be more vehicles travelling along local roads as well as the Hume Highway north-west of Yass, contributing to the light levels. There would be a general sky glow above the settlements which would also influence this character of this landscape, particularly around Yass. Overall, this landscape is an area of low district brightness (A2) and has a **moderate visual sensitivity** at night.

Visual impact during construction: The facilities at the Memorial Avenue and Bowmans Lane construction compounds (C14 and C15) would include site offices, amenities and construction support facilities, which may operate outside standard construction hours, and would require lighting. Although there would be lighting required at the Snubba Road compound (C03), the vegetation to the east and west of this site would largely contain the light spill and associated views to this lighting. The Yass substation compound (C10) would be located to the south of the Black Range to Yass landscape character area, within the existing substation site and would be largely absorbed within the existing lighting in this location, on the southern outskirts of Yass.

There would also be construction works along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement. This lighting is likely to contrast with the surrounding area of low district brightness. This effect would only occur for a short duration each day and for a short time within the project construction program.

Overall, there would be a low magnitude of change to this landscape, which is of moderate sensitivity, and a **moderate-low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. The construction compounds would be decommissioned and there would be a negligible magnitude of change to this landscape and a **negligible visual impact** at night during operation.

7.2.6 Upland forest landscape character zone

Existing conditions and sensitivity: At night, this landscape would have low light levels. Although there would be a few residences scattered throughout this landscape and lights from vehicles travelling along local roads, it is predominantly a dark landscape with substantial areas of forest reserves. Although the future Maragle 500 kV substation would have been constructed as part of Snowy 2.0 Transmission Connection Project, the surrounding dense forest vegetation would contain the light spill of this facility. Overall, this is a dark (A1) landscape and has a **high visual sensitivity** at night.

Visual impact during construction: The Maragle 500 kV substation compound (C05) would be established adjacent to the future Maragle 500 kV substation (constructed as part of Snowy 2.0 Transmission Connection Project). The facilities at the Maragle 500 kV substation compound (C05) may operate outside standard construction hours, requiring lighting. While there is no worker accommodation facility planned in this landscape, there would be works along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement, between the Maragle 500 kV substation compound (C05) and Snubba Road.

Overall, the lighting at these sites would contrast with the surrounding predominantly dark landscape and there would be a low magnitude of change to this landscape, which is of high visual sensitivity, resulting in a **moderate visual impact** in these locations at night. This impact would be experienced in very limited and localised areas surrounding the Maragle 500 kV substation compound (C05) and from roads and residences where they are located within view of the works, including Elliott Way.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. The Maragle 500 kV substation compound (C05) would be decommissioned and there would be a negligible magnitude of change to this landscape and a **negligible visual impact** at night during operation.

7.2.7 Rural tablelands landscape character zone

Existing conditions and sensitivity: This rural landscape has low level light sources at night, such as lighting associated with homesteads and agricultural buildings on rural properties, and vehicles on local roads such as Range, Crookwell and Taralga roads. The low level security lighting at the Gullen Range, Crookwell and Taralga wind farm substations, also contribute to the light levels at night. Overall, this landscape is an area of low district brightness (A2) and has a **moderate visual sensitivity** at night.

Visual impact during construction: There would be lighting required at the Woodhouselee Road compound (C11), located between Wollondilly River and Woodhouselee Road, about 900 metres south of the existing Crookwell wind farm and substation. There would also be construction works along the transmission line route within the project footprint that would occur during the standard hours for construction, which would require lighting during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission line structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement. This lighting is likely to contrast with the surrounding area of low district brightness. This effect would only occur for a short duration each day and for a short time within the project construction program.

Overall, there would be a low magnitude of change to this landscape, which is of moderate sensitivity, and a **moderate-low visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. The Woodhouselee Road compound (C11) would be decommissioned and there would be a negligible magnitude of change and a **negligible visual impact** at night during operation.

7.2.8 Rural highland and deep valley landscape character zone

Existing conditions and sensitivity: At night, this landscape would have low light levels. It is sparsely settled, with scattered rural residences across the landscape. There would be some denser clusters of residences near towns such as Taralga, and light from vehicles travelling along local roads such as Bannaby Road, contributing to the light levels. Lighting at the existing Bannaby 500 kV substation may also influence this landscape. Overall, this is a dark landscape (A1) and has a **high visual sensitivity** at night.

Visual impact during construction: The Bannaby 500 kV substation compound (C12) would be located in a deep valley beside the existing substation and may operate outside standard construction hours. In this area there is more vegetation and landform, which would largely contain views to this lighting. There would also be works along the transmission line easement that would occur between 7am-6pm, during weekdays. Consequently, there would be lighting required during winter (and potentially for other periods) for a short duration in the early evening. This would include lighting at each transmission structure site as well as headlights from staff and construction vehicles accessing and moving along the transmission line easement. This lighting is likely to contrast with the surrounding predominantly dark landscape.

Overall, there would be a low magnitude of change to this landscape which is of high sensitivity, and a **moderate visual impact** at night.

Visual impact during operation: During operation there would not be any lighting proposed along the transmission line route. There would, however, be some minor security lighting provided at the modified Bannaby 500 kV substation, which would operate from dusk until dawn, seven days a week. This lighting would generally be contained by the hills and vegetation within the surrounding landscape, and any view to the substation lighting would be seen in the context of an

existing substation. Overall, there would be a negligible magnitude of change to this landscape and a **negligible visual impact** at night.

7.2.9 Summary of night-time visual impacts

These identified visual impacts at night are listed in summarised in Table 7-2.

TABLE 7-2: SUMMARY OF VISUAL IMPACTS AT NIGHT

			Construction		Operation	
	Landscape character zone	Visual sensitivity	Magnitude of change	Visual impact	Magnitude of change	Visual impact
Rural fringe landscape character zone						
A	Wagga Wagga rural fringe landscape character area	Low	Low	**Low**	Negligible	**Negligible**
Great Dividing Range landscape character zone						
A	Gregadoo Great Dividing Range foothills landscape character area	Moderate	Low	**Moderate-low**	Negligible	**Negligible**
B	Ellerslie Range Great Dividing Range foothills landscape character area					
Rural valleys landscape character zone						
A	Gregadoo to Book Book rural valleys landscape character area	Moderate	Moderate	**Moderate**	Low	**Moderate-low**
B	Yaven Creek and Adelong Creek rural valleys landscape character area	Moderate	Low	**Moderate - low**	Negligible	**Negligible**
C	Tumut rural valleys landscape character area					
D	Adjungbilly rural valleys landscape character area					
Forested hills landscape character zone						
A	Green Hills forested hills landscape character area	High	Low	**Moderate**	Negligible	**Negligible**
B	Bago forested hills landscape character area					
C	Minjary forested hills landscape character area					
D	Red Hill and Bungongo forested hills landscape					
Undulating rural hills and ridges landscape character zone						
A	Wondalga to Batlow undulating rural hills and ridges landscape character area	Moderate	Low	**Moderate-low**	Negligible	**Negligible**

			Construction		Operation	
	Landscape character zone	Visual sensitivity	Magnitude of change	Visual impact	Magnitude of change	Visual impact
B	Tumut undulating rural hills and ridges landscape character area					
C	Murrumbidgee undulating rural hills and ridges landscape character area					
D	Black Range to Yass undulating rural hills and ridges landscape character area					
E	Jerrawa to Dalton undulating rural hills and ridges landscape character area					
Upland forest landscape character zone						
A	Snowy Mountains upland forest landscape character area	High	Low	**Moderate**	Negligible	**Negligible**
Rural tablelands landscape character zone						
A	Crookwell rural tablelands landscape character area	Moderate	Low	**Moderate-low**	Negligible	**Negligible**
Rural highland and deep valley landscape character zone						
A	Taralga to Bannaby rural highland and deep valley landscape character area	High	Low	**Moderate**	Negligible	**Negligible**

7.3 Assessment of views from private residences

The assessment of visual impact from private residences has been undertaken in two stages.

- **Stage 1 - Preliminary desktop assessment of views from private residences:** Identified those views with the potential for a moderate or higher visual impact based on a desktop analysis of aerial photography, topography, and observations from nearby publicly accessible areas
- **Stage 2 - Detailed assessment of impacts on views from private residences:** Completed a detailed assessment of those dwellings to confirm their visual impact level. This included a visit to some dwellings to photograph views.

Further details of the process of assessment are outlined in Section 7.3.1 to 7.3.3 of this technical report.

7.3.1 Stage 1 - Preliminary assessment

This desktop assessment reviewed 180 dwellings, which are either located in the project footprint, within 500 metres of the project footprint or have otherwise been identified as having the potential for a visual impact (refer to **Attachment J** for location of dwellings). Of these, 90 dwellings were identified as having the potential for a moderate or higher visual impact and requiring further assessment. This desktop assessment is summarised in **Attachment G**.

This preliminary assessment was informed by visibility plans contained in **Attachment H,** which shows the visibility of transmission structures to 2 kilometres, where they would have the potential for the greatest visual impact.

7.3.2 Stage 2 - Detailed assessment of visual impact from dwellings

A more detailed assessment has been undertaken on those dwellings identified as having the potential for a moderate or higher visual impact. This assessment was based on roadside observations and some property inspections, where access was granted.

A summary of the site observations and analysis undertaken for each identified dwelling is contained in Table 7-3**.** This includes pre-mitigation visual impact levels. **Attachment I** contains maps and photographs of the dwellings visited.

TABLE 7-3: DETAILED VISUAL IMPACT ASSESSMENT – SUMMARY OF IMPACTS ON ALL SHORTLISTED DWELLINGS

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Ashfords Road						
A24	202 Ashfords Road	394	- Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Project footprint in close proximity to dwelling - Some intervening vegetation in field and on road	N	N	Moderate
A28	216 Ashfords Road	336		N	N	Moderate
A29	202 Ashfords Road	39	Dense hedge around garden boundary screens and encloses views from dwelling	N	N	Moderate-low
A33	231 Ashfords Road	310	- Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Project footprint in close proximity to dwelling - Some intervening vegetation	Y	N	High-Moderate
Ivydale Road						
A40	112 Ivydale Road, Gregadoo	In project footprint	- Existing view to transmission lines - Project footprint very close to dwelling and crossing driveway - Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt	Y	N	High
A41	112 Ivydale Road, Gregadoo	In project footprint		Y	N	High
A51	10 Ivydale Road	365	- Existing view to transmission lines - Multiple structures would be visible - Project footprint closer than existing transmission lines	N	Y	High-moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
			- Existing 2 km section of Line 51 may be demolished and rebuilt - Some existing intervening vegetation			
A45	152 Ivydale Road	269	- Existing view to transmission lines (north-east facing) - Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Some existing intervening vegetation	Y	N	High-moderate
A60	191 Ivydale Road	253	- Elevated location - View over and between existing transmission line structures.	Y	Y	Moderate
Gregadoo East Road						
B12	477 Gregadoo East Road	434	- Limited intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Proposed Gugaa 500 kV substation would be located mostly beyond landform and cut into slope.	Y	Y	High-moderate
Big Springs Road						
B3	848 Big Springs Road	108	- Existing view to transmission lines - Project footprint closer than existing transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Primary view east, not towards project footprint	Y	N	High
Livingstone Gully Road						
B15	1070 Livingstone Gully Road	805	- Some intervening vegetation - Existing view to transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt - Project footprint closer than existing transmission lines - View to proposed Gugaa 500 kV substation	Y	N	Moderate-low
B18	1070 Livingstone Gully Road	325, 682 to substation	- Some intervening vegetation - Existing view to transmission lines - Existing 2 km section of Line 51 may be demolished and rebuilt	Y	N	High-moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
			- Project footprint closer than existing transmission lines - View to proposed Gugaa 500 kV substation			
Tumbarumba Road						
B21	8095 Tumbarumba Road	212	- Limited intervening vegetation - Existing view to transmission lines - Project footprint beyond existing transmission lines - Owners raised visual impact as a concern	Y	N	High-moderate
Burkinshaws Lane						
C4	107 Burkinshaws Lane	408	- Some intervening vegetation - Existing view to transmission lines - Project footprint beyond existing transmission lines	Y	N	Moderate
Keajura Road						
C10	171 Keajura Road, Tarcutta	413	- Some intervening vegetation - Existing view to transmission lines - Project footprint beyond existing transmission lines	Y	N	Moderate
Wilds Road						
C21	170 Wilds Road, Tarcutta	In project footprint	- Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	High
Humula Road						
C28	1725 Humula Road, Tarcutta	475	- Intervening vegetation (creek) - Existing view to transmission lines - Project footprint beyond existing transmission lines	Y	N	Moderate-low
C29	1615 Humula Road, Tarcutta	112	- Some intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines. - Very close range	Y	Y	High
C35	1532 Humula Road, Tarcutta	491	- Some intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines.	N	N	Moderate
Westbrook Road						
D8	3563 Westbrook Road, Oberne Creek	203	- Limited intervening vegetation - Existing view to transmission lines	Y	N	High-Moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
D9	3563 Westbrook Road, Oberne Creek	184	- Project footprint beyond existing transmission lines - Ridgeline crossing in view	Y	N	High-Moderate
Yaven Creek Road						
D25	1154 Yaven Creek Road, Ellerslie	In project footprint	- Some intervening vegetation (dwelling) - Project footprint closer than existing transmission lines	Y	N	High
Westwood Road						
D31	158 Westwood Road, Westwood	388	- Some intervening vegetation (creek) - Existing view to transmission lines - Project footprint beyond existing transmission lines	Y	N	Moderate
Snubba Road to Elliott Way						
E61	Yesteryear plantations	209	- Dwelling oriented north and away from the project - Intervening vegetation - View to two existing transmission lines - Project footprint beyond existing transmission - Would include intersecting / crossing existing lines and turning corner.	Y	N	Low
Batlow Road north						
E27	Batlow Road, Tumut	600	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible elevated on hillside - Some intervening vegetation	N	N	Moderate-low
E29	Batlow Road, Tumut	550	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible elevated on hillside - Limited intervening vegetation	Y	N	High-moderate
E68	Batlow Road, Tumut	350	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible elevated on hillside - Limited intervening vegetation	Y	N	High-moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
H10	Batlow Road, Tumut	500	- Some intervening landform and vegetation - No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be glimpsed elevated on hillside	N	N	Moderate
H13	Batlow Road, Tumut	300	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible	Y	N	Moderate
H16	Batlow Road, Tumut	200	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible	Y	N	High-moderate
H19	Batlow Road, Windowie	266	- Some existing intervening vegetation (around dwelling) - No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling, more distant in primary view (view away from Highway)	N	N	Moderate
H20	Batlow Road, Windowie	460	- Some intervening vegetation (creek) - No existing transmission line in vicinity of project footprint - Viewed against hillside	Y	N	Moderate
H40	Batlow Road, Tumut	100	- No existing transmission line in vicinity of project footprint - Project footprint located on hillside, above the dwelling - Multiple structures would be visible elevated on hillside	N	N	Moderate
Gadara Lane / Snowy Mountains Highway						
H25	348 Gadara Lane, Windowie	319	- Some existing intervening landform and vegetation - No existing transmission line in vicinity of project footprint - Viewed against hillside	Y	N	Moderate-low
H33	1393 Snowy Mountains Highway, Gadara	379	- Some existing intervening vegetation (around dwelling and adjacent fields) - No existing transmission line in vicinity of project footprint	Y	N	Moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Meadow Creek Road / Gocup Road						
K21	676 Gocup Road, Gocup	426	- Some existing intervening vegetation - No existing transmission line in vicinity of project footprint	Y	N	Moderate
K26	Gocup Road	397		Y	N	Moderate
K23	Gocup Road	190	- Some existing intervening vegetation (around dwelling) - No existing transmission line in vicinity of project footprint - Transmission line changing directions in mid ground of view.	N	N	High-moderate
Cockatoo Road						
K35	188 Cockatoo Road, Killimicat	272	- Some existing intervening vegetation (around dwelling) - No existing transmission line in vicinity of project footprint - Transmission line changing directions near dwelling - Owners raised visual impact as a concern	Y	N	High-moderate
Webbs / Wee Jasper Road						
K41	133 Wee Jasper Road, Wyangle	454	- Some existing intervening vegetation (around dwelling) - No existing transmission line in vicinity of project footprint - Removal of vegetation along project footprint - Would be viewed against vegetated backdrop - Potential corner structure, and change in direction	Y	Y	High-moderate
Brungle Creek Road						
N2	Brungle Creek Link Road Darbalara	251	- Limited existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines - Viewed against forestry	Y	N	Moderate
Adjungbilly Road						
N8	1675 Adjungbilly Road, Adjungbilly	306	- Some existing intervening vegetation (dwelling) - No existing transmission line in vicinity of project footprint (not co-located near the Lower Tumut to Yass 330 kV transmission lines to the east) - View to project footprint doesn't appear to be primary view	Y	N	Moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
			- Potential view to			
Parsons Creek Road						
N11	977 Parsons Creek Road, Gobarralong	510	- Some existing intervening vegetation - No existing transmission line in vicinity of project footprint - Project in primary view from residence	Y	Y	High-moderate
N13	866 Parsons Creek Road, Adjungbilly	400	- Some existing intervening vegetation - No existing transmission line in vicinity of project footprint	Y	Y	Moderate
N37	867 Parsons Creek Road, Adjungbilly	75		Y	N	Moderate
Childowla Road						
N28	1546 Childowla Road, Bookham	386	- Some existing intervening vegetation - Existing view to transmission lines - Project footprint would add a third set of transmission lines	Y	N	High-moderate
Talmo Road						
N32	142 Talmo Road, Bookham	296	- View across undulating rural fields to project footprint, crossing Talmo Road and hillside in middle ground of view - No existing transmission line in vicinity of dwelling	Y	Y	High-moderate
N33	142 Talmo Road, Bookham	490		Y	Y	Moderate
Black Range Road (south of)						
O12	1623 Black Range Road, Woolgarlo	493	- Some existing intervening vegetation - Existing view to two sets of transmission lines - Project footprint closer than existing transmission lines	Y	N	Moderate
O13	1381 Black Range Road, Woolgarlo	181		Y	Y	High
Black Range Road (north of)						
O29	27205 Hume Highway, Bowning	388	- Limited existing intervening vegetation - No existing transmission line in vicinity of project footprint	Y	N	Moderate
O31	230 Black Range Road, Bowning	142	- Limited existing intervening vegetation - No existing transmission line in vicinity of project footprint - Close proximity	Y	N	Moderate-low
Wargalla Road						
O43	561 Wargalla Road, Bango	269	- Some intervening landform and vegetation - Existing view to existing transmission lines - Project footprint beyond existing transmission lines with a change in direction	Y	N	Moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Fairy Hole Road						
Q10	557 Fairy Hole Road, Bango	283	- Some intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines and very close to dwelling	Y	N	Moderate
Q19	561 Fairy Hole Road, Bango	48		Y	Y	High
Q62	Fairy Hole Road	140	- Limited existing intervening vegetation - Existing view to transmission lines - Project further than existing transmission lines	Y	Y	Moderate-low
Cooks Hill Road						
Q27	787 Cooks Hill Road, Bango	218	- Existing view to transmission lines - Project footprint closer than existing transmission lines - Project footprint close to dwelling and crossing driveway	Y	Y	High-moderate
Coolalie Road / Bushs Road						
Q36	Coolalie Road, Jerrawa	In project footprint	- Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	High
Q40	Bushs Road	320	- Existing view to transmission lines - Project footprint beyond existing transmission lines - Some intervening vegetation - Proposed house	Y	N	Moderate
Q63	Bushs Road	240	- Existing view to transmission lines - Project footprint closer than existing transmission lines - Some intervening vegetation	Y	N	High-moderate
Stink Pot Road / Flacknell Creek Road						
Q44	Stink Pot Road, Broadway	In project footprint	- Some intervening vegetation (around dwelling) - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	High
Q45	Flacknell Creek Road, Broadway	132		N	N	Moderate
Howards Road						
Q53	Howards Road, Broadway	72	- Project footprint through densely vegetated area limiting view, but requiring vegetation clearance - Existing transmission lines enclosed by vegetation - Project footprint closer than existing transmission lines and crossing driveway	Y	N	High

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Rye Park Road						
R3	1661 Rye Park Road, Broadway	79	- Limited existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	Y	High
R5	1661 Rye Park Road, Broadway	257		Y	N	Moderate
Felled Timber Road						
R20	53 Felled Timber Road, Dalton	250	- Limited existing intervening vegetation - Existing view to transmission lines	Y	N	High-moderate
R23	Felled Timber Road, Blakney Creek	Within project footprint		Y	Y	High-moderate
R24	31 Felled Timber Road, Dalton	325		N	N	Moderate
Rugby Road						
R26	308 Rugby Road, Blakney Creek	Within project footprint	- Limited existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	Y	High
R27	308 Rugby Road, Blakney Creek	50		Y	N	High
Clancys / Sapphire Road						
R40	812 Sapphire Road, Biala	260	- Some existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	Moderate
R43	451 Clancys Road, Biala	413		Y	N	Moderate
Grabben Gullen / Gurrundah Road						
R45	1755 Gurrundah Road, Gurrundah	385	- Some existing intervening vegetation - Existing view to transmission lines	Y	N	Moderate
R46	1755 Gurrundah Road, Gurrundah	492		Y	N	Moderate
Bannister Lane						
R50	1016 Bannister Lane, Gurrundah	In project footprint	- Limited existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	High
S3	Bannister Lane, Gurrundah	125		Y	Y	High
Range Road						
S29	2811 Range Road, Bannister	199	- No existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	N	High-moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Crookwell Road						
T3	2611 Crookwell Rd, Pejar 2583	161	- Some existing intervening vegetation - Existing view to transmission lines - Project footprint closer than existing transmission lines	Y	Y	Moderate-low
Back Arm / Middle Arm Road						
T32	Middle Arm Road, Middle Arm	118	- Limited existing intervening vegetation - Existing view to transmission lines	Y	Y	Moderate
T39	172 Back Arm Road, Middle Arm	43		Y	Y	High
Rhyanna Road						
T49	1367 Rhyanna Road, Chatsbury	189	- Some existing intervening vegetation - Existing view to transmission lines - Some vegetation removal	Y	Y	Moderate
T50	1325 Rhyanna Road, Chatsbury	150		Y	Y	High-moderate
T54	1363 Rhyanna Road, Middle Arm	350	- Dense existing intervening vegetation - Project footprint closer than existing transmission lines and crossing driveway	Y	N	Moderate-low
Hillcrest Road						
U24	703 Hillcrest Road Myrtleville	265	- Some existing intervening vegetation (dwellings and fields) - Existing view to transmission lines	Y	N	High-moderate
U25	Menzies Lane, Myrtleville	190	- Some intervening vegetation reduces visibility to the southwest - Likely existing view to transmission lines to the southeast - Project footprint beyond existing transmission lines - Project footprint changes direction in this view	Y	N	High-moderate
Soldiers Settlement Road						
U27	152 Soldiers Settlement Road South, Myrtleville	460	- Intervening vegetation - Existing view to transmission lines - Project footprint beyond existing transmission lines	Y	N	Moderate
Bannaby Road						
V10	1344 Bannaby Road Bannaby	336	- Limited existing intervening vegetation - No existing transmission lines in view	N	N	High-moderate

Building ID	Location / address	Distance to project footprint (metres)	Reasoning	Project footprint located on property (Y/N)	Property visit undertaken (Y/N)	Potential visual impact
Hanworth Road						
V28	365 Hanworth Road, Bannaby	260	- Some existing intervening vegetation - Existing view to transmission lines - Project footprint closer and parallel to existing transmission lines - Close proximity	Y	N	High-moderate
V29	409 Hanworth Road Bannaby	400	- Some existing intervening vegetation - Existing view to transmission lines - Project footprint closer and parallel to existing transmission lines	Y	N	Moderate

7.3.3 Summary of visual impact private dwellings

Visual impacts during operation

There are 180 dwellings which are either located in the project footprint, within 500 metres of the project footprint or have otherwise been identified as having the potential for a higher visual impact. Of these, 90 dwellings were identified as having the potential for a moderate or higher visual impact and requiring further assessment. This desktop assessment is summarised in Attachment G.

In summary, the detailed assessment of visual impact (refer to Section 7.3.2) identified the following visual impacts from private dwellings:

- 17 dwellings would have a high visual impact.
- 27 dwellings would have a high- moderate visual impact.
- 36 dwellings would have a moderate visual impact.

All remaining dwellings would have a moderate-low, low, or negligible visual impact.

These potential visual impact levels have the potential to be further reduced by mitigation measures.

Of these dwellings, 13 would not host the infrastructure i.e., the project would not be located on the property. Of these non-host dwellings:

- 3 dwellings would have a high- moderate visual impact, and
- 8 dwellings would have a moderate visual impact.

The remaining would have a moderate-low or low visual impact.

Visual impacts during construction

There may be temporary visual impacts from dwellings located with a view to one of the proposed construction compounds with the level of impact varying according to the visibility (distance and intervening landform and vegetation) and sensitivity of the viewing location. This would include views from private dwellings towards some construction compounds in rural areas, including the Gregadoo Road compound (C06), Honeysuckle Road compound (C07), Red Hill Road compound (C08), Adjungbilly Road compound (C09), Woodhouselee Road compound (C11) and Bowmans Lane compound (C15).

Where the construction compounds have been located near to the existing substations (Wagga 330 kV substation compound (C01), Maragle 500 kV substation compound (C05), Yass substation compound (C10) and Bannaby 500 kV substation compound (C12)) there would be limited visibility from private dwellings and no visual impacts. There would also be no visual impacts where the construction compounds are located in industrial and commercial areas where there are few residential dwellings such as the Snowy Mountains Highway compound (C02) and Memorial Avenue compound (C14). There would also be no visual impact from private dwellings at the Snubba Road compound (C03) which is enclosed by vegetation.

There would be some temporary visual impacts in views from dwellings surrounding the Tumbarumba Accommodation Facility (AC1) where a denser urban facility is located with a rural setting including the removal of some vegetation.

8.0 Cumulative impact

8.1 Cumulative landscape character and visual impacts

The cumulative impact assessment was prepared in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (DPE, 2022). The following assessment considers the impacts of the project together with other nearby development projects of a similar nature and scale. Projects with the potential for cumulative impacts with HumeLink were identified through a review of publicly available information and environmental impact assessments from the following databases in March 2023:

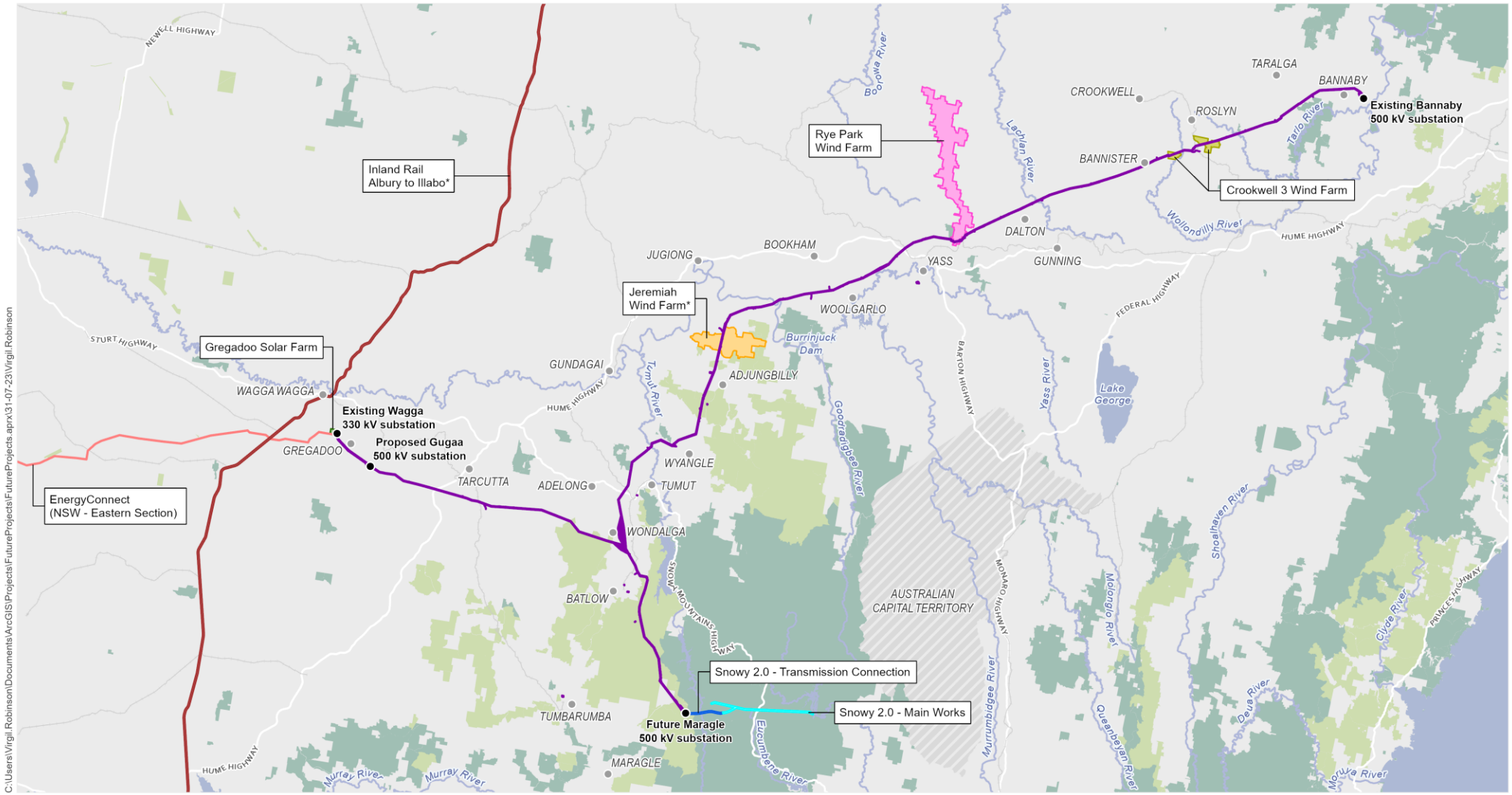
- DPE's Major Projects register
- DPE's Southern Regional Planning Panel project register
- NSW Independent Planning Commission project register
- EPBC Act Public Portal
- Transport for NSW Projects Map

Searches were limited to the local government areas of Wagga Wagga City, Snowy Valleys, Yass Valley, Cootamundra-Gundagai Regional Upper Lachlan Shire, Goulburn-Mulwaree, and Hilltops.

Based on the above searches, the following projects are to be considered in the cumulative impact assessment for each of the key matters:

- EnergyConnect (NSW – Eastern Section)
- Gregadoo Solar Farm
- Jeremiah Wind Farm
- Rye Park Wind Farm
- Victoria to NSW Interconnector West (VNI West)
- Snowy 2.0 – Transmission Connection
- Snowy 2.0 – Main Works
- Inland Rail – Albury to Illabo
- Crookwell 3 Wind Farm.

Figure 8-1 shows the location of these projects and Table 8-1 contains a summary of the cumulative impact assessment.



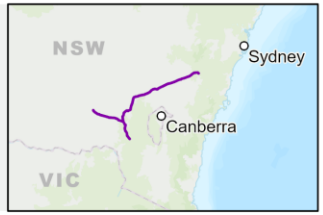
C:\Users\Virgil.Robinson\Documents\ArcGIS\Projects\FutureProjects\FutureProjects.aprx\31-07-23\Virgil.Robinson

Project footprint
National park and reserve
State forest
Waterbody
Waterway
Major road
Railway
Substation

Relevant future projects

Crookwell 3 Wind Farm
EnergyConnect (NSW - Eastern Section)
Gregadoo Solar Farm
Inland Rail Albury to Illabo*
Jeremiah Wind Farm*
Rye Park Wind Farm
Snowy 2.0 - Main Works
Snowy 2.0 - Transmission Connection

*Note: Subject to approval



Source: *Aurecon, Transgrid, Spatial Services (DCS), ESRI Basemap*

1:925,000
0 20 40km

Projection: GDA 1994 MGA Zone 55

FIGURE 8-1: Relevant future projects

TABLE 8-1 CUMULATIVE IMPACT ASSESSMENT

Project	Description	Distance / Interface	Cumulative impacts
EnergyConnect (NSW – Eastern Section)	The NSW – Eastern Section of EnergyConnect includes a new transmission line connecting the existing Buronga substation and existing Wagga 330 kV substation, and construction of the new Dinawan substation (170 kilometres west of Wagga Wagga). The project also involves associated infrastructure (optical repeater structures), new and/or upgrade of access tracks as required and ancillary works to support construction. Project began construction in early 2023 and is expected to be complete by late 2024.	HumeLink and EnergyConnect (NSW – Eastern Section) both require upgrades of the existing Wagga 330 kV substation.	Potential cumulative landscape impact: This project would be seen together with HumeLink in views to the south of Wagga Wagga, within the rural fringe landscape character zone. The changes would be similar in nature to those proposed by HumeLink, including some minor landform changes, the removal of vegetation and introduction of additional large scale transmission line and substation infrastructure. This would further change the landscape character of this area from rural to a character where electricity infrastructure prevails. If approved, there would be a cumulative landscape impact associated with HumeLink in combination with this project, potentially during construction and operation. Potential cumulative visual impact: This project would be seen sequentially and together with HumeLink in areas south of Wagga Wagga. When viewed together they would further alter the character with additional transmission line structures seen in the vicinity of the existing Wagga 330 kV substation. If approved, there would be a cumulative visual impact associated with HumeLink and this project, potentially during construction and operation. However, this would be in views seen primarily from Ashfords Road, Gregadoo East Road and Boiling Down Road, near the substation. Furthermore, the landscape seen in these views has a high capacity for electrical infrastructure due to the existing substation and transmission lines and surrounding vegetation.
Gregadoo Solar Farm	Gregadoo Solar Farm has been approved and includes 43 megawatt solar farm to the west of the existing Wagga 330 kV substation, north of Boiling Down Road, with a development footprint of approximately 96 hectares. The project would be set back from Boiling Down Road, to the north of the existing transmission line easement, and include about 130,000 solar panels mounted on single axis tracking system, substation, overhead and underground electrical cables, an operations and maintenance building,	On land adjacent the existing Wagga substation. Gregadoo Solar Farm is proposed to connect to existing the Wagga 330 kV substation on the northern side of substation.	Potential cumulative landscape impact: The solar farm would require some minor landform changes, removal of vegetation and would introduce further energy generation infrastructure and additional transmission lines into the landscape south of Wagga Wagga, within the Rural fringe landscape character zone. These changes would further transform the landscape character from rural to a character where electricity infrastructure prevails. If approved, there would be a cumulative landscape impact associated with HumeLink in combination with this project, potentially during construction and operation. Potential cumulative visual impact: This project would be seen sequentially and together with HumeLink in areas south of Wagga Wagga. When viewed together they would further alter the character with additional transmission structures and lines and the introduction of solar infrastructure. There is, however, a visual compatibility between the existing substation and existing transmission lines with further similar character infrastructure. As the landscape is relatively

Project	Description	Distance / Interface	Cumulative impacts
	internal access tracks, car parking and security fencing. Construction of the project is expected to commence in mid-2023 and is expected to take up to nine months. Construction is expected to commence mid-2023 and take 9 months.		flat in this area, it has some capacity to accommodate further infrastructure with existing scattered areas of vegetation which separate the proposal areas from surrounding rural and suburban properties. If approved, there would be a cumulative visual impact associated with HumeLink and this project, potentially during construction and operation. However, this would be in views seen primarily from a small section of Boiling Down Road. Furthermore, the landscape seen in these views have a strong visual precedent of electrical infrastructure due to the presence of existing energy generation infrastructure and surrounding vegetation.
Jeremiah Wind Farm	Jeremiah Wind Farm is located approximately 29 km east of Gundagai around the Adjungbilly area. An EIS for the project is currently being prepared. The project proposes 65 wind turbine generators with a maximum tip height of 300 metres, a battery energy storage system and associated ancillary infrastructure including site offices, internal roads, hardstands, underground and overhead cabling, wind monitoring masts, substation, and a battery and a switching station. The project proposes connection to the existing Lower Tumut to Yass 330 kV transmission line, which passes through the site, with structures ranging between 24-40 metres in height. Project approval is anticipated in 2023 with construction expected to be 24 to 30 months.	Transmission lines between the proposed Gugaa 500 kV substation and Bannaby 500 kV substation, and the future Maragle 500 kV substation go through the Jeremiah Wind Farm development area	Potential cumulative landscape impact: HumeLink is located in the western part of the proposed Jeremiah Wind Farm site, extending north-south between Red Hill State Forest and the Wagga to Yass 132 kV transmission lines, crossing Parsons Creek Road. This area forms part of the Adjungbilly rural valleys landscape character area, which is a fairly remote area, located in the central east part of the Riverina, mostly under private ownership, with minimal public access other than local roads such as Adjungbilly Road. Jeremiah Wind Farm would introduce energy generation infrastructure and additional transmission lines into the landscape. These changes in addition to HumeLink would transform the landscape character from rural to a character where electricity infrastructure is larger in scale and more prevalent. If approved, there would be a cumulative landscape impact associated with this project in combination with HumeLink within the Adjungbilly rural valleys landscape character area, potentially during construction and operation. Potential cumulative visual impact: Jeremiah Wind Farm would be seen sequentially and together with HumeLink in areas north of Adjungbilly. As this area is fairly remote, the projects would be seen from sections of Parsons Creek Road and Nanangroe Road, and from surrounding rural properties. HumeLink proposes transmission line structures about double to triple the height of the existing Lower Tumut to Yass 330 kV transmission line, and the proposed wind turbines would be about triple the height of the proposed HumeLink transmission line structures. If approved, there would be a cumulative visual impact associated with Jeremiah Wind Farm and HumeLink, potentially during construction and operation.

Project	Description	Distance / Interface	Cumulative impacts
Rye Park Wind Farm	Rye Park Wind Farm is located to the west of Rye Park, to the north-west of Yass and south-east of Boorowa. Modification 1 was approved 2021, including maximum 80 wind turbines with a maximum tip height of 200 metres. This project also includes construction of associated infrastructure (substations, operation and maintenance facilities) and upgrades to local roads. The wind farm will connect to the Yass to Gullen Range 330 kV transmission line via a new substation. The project is currently under construction. Modification 2 is now on exhibition and includes revision of a small number of site access tracks. Under construction since December 2021 with commissioning scheduled for July 2023.	Transmission lines between the proposed Gugaa 500 kV substation and Bannaby 500 kV substation, and the future Maragle 500 kV substation and Bannaby 500 kV substation go through the southern end of the wind farm project boundary at Bango (near Bango Nature Reserve). HumeLink includes the connection of optical ground wire (OPGW) from the HumeLink 500 kV transmission line into the Rye Park 330 kV switching station auxiliary services building (the Rye Park Wind Farm substation).	Potential cumulative landscape impact: HumeLink is located immediately to the south of the proposed wind farm, south of the proposed substation and existing Yass to Gullen Range 330 kV transmission line. If approved, there would be a cumulative landscape impact associated with the project in combination with Rye Park Wind Farm, as there would be a greater presence of electricity infrastructure in the rural landscapes to the south-east of Bango Nature Reserve. Potential cumulative visual impact: Rye Park Wind Farm would be seen sequentially and together with HumeLink in areas east of Bango Nature Reserve. As this area is fairly remote, the projects would be seen from sections of Bushs Road and Coolalie Road, and from nearby rural properties. HumeLink proposes transmission line structures about double to triple the height of the existing Yass to Gullen Range 330 kV transmission line, and the proposed wind turbines would be about triple the height of the proposed HumeLink transmission line structures. If approved, there would be a cumulative visual impact associated with HumeLink and Rye Park Wind Farm, potentially during construction and operation.
Victoria to NSW Interconnector West (VNI West)	This project involves targeted interconnector expansion between Victoria and NSW to address transmission network limitations and improve supply reliability, including a new high capacity 500 kilovolt (kV) double-circuit overhead transmission line. VNI West is still in scoping/market modelling phase. Several options have been developed with new interconnector corridors connecting to the existing Wagga 330 kV substation and there is potential for a preferred option to intersect the project footprint between the	VNI West may require connection at existing the Wagga 330 kV substation (depending on preferred option)	Potential cumulative landscape impact: VNI West may include new interconnector corridors connecting to the existing Wagga 330 kV substation and to intersect the project footprint between the existing Wagga 330 kV substation and proposed Gugaa 500 kV substation. It is likely that there would be cumulative landscape impacts south of Wagga Wagga, within the Wagga Wagga rural fringe landscape character area, the Great Dividing Range foothills landscape - Gregadoo and Ellerslie Range landscape character areas during operation. There is likely to be consecutive construction programs and the potential for a cumulative landscape character impact during construction. Potential cumulative visual impact: VNI West would potentially be seen together with the project in views and potential cumulative visual impacts south of Wagga Wagga and east to Gregadoo during operation. These views would be from nearby roads and rural properties, such as along Boiling Down, Ashfords and Gregadoo East, Big Springs and Livingstone Gully roads. There is likely to be consecutive construction programs

Project	Description	Distance / Interface	Cumulative impacts
	existing Wagga 330 kV substation and proposed Gugaa 500 kV substation. Construction is proposed to commence in 2026 with commissioning by 2028.		and the potential for a cumulative visual impact during construction.
Snowy 2.0 – Transmission Connection	This project involves new transmission connection between the proposed Snowy 2.0 pumped hydro and generation project to the existing high voltage transmission network. This includes construction of a new substation in Bago State Forest (future Maragle 500 kV substation), new access tracks and upgrade of existing access tracks and ancillary works to support construction. Construction expected to begin in late 2023 with expected completion by end of 2025.	HumeLink to connect to the future Maragle 500 kV substation being constructed as part of the Snowy 2.0 – Transmission Connection project	Potential cumulative landscape impact: HumeLink would connect to the future Maragle 500 kV substation being constructed as part of the Snowy 2.0 – Transmission Connection project. The changes expected for the projects would be similar, including minor landform changes, the removal of vegetation and introduction of large scale energy transmission line infrastructure. This would further change the character of this this part of the Snowy Mountains upland forest landscape character area, potentially during construction and operation. Potential cumulative visual impact: HumeLink would connect to the future Maragle 500 kV substation being constructed as part of the Snowy 2.0 – Transmission Connection project. As such, these projects would be seen together in nearby views from Elliott Way. There are few locations where these projects would be Viewed together from the public realm or private properties, due site locations in State Forest, with minimal access and private properties. If approved, there would be a cumulative visual impact associated with HumeLink and this project, potentially during construction and operation. However, the projects would be in views seen primarily from a small section of Elliott Way. Furthermore, the landscape seen in these views have a higher visual absorption capacity for electrical infrastructure due to the presence of existing transmission lines and surrounding vegetation.
Snowy 2.0 – Main Works	This proposal includes an underground pumped hydro power station and ancillary infrastructure. Main works at the Talbingo Reservoir site include excavated rock placement, portal construction and tunnelling, access roads and ancillary facilities for emplacement activities and tunnelling support. Modification 1 was approved in 2022 and relates the main access Tunnel and Marica areas of the project (further east	Talbingo Reservoir site is approximately 5 km east of transmission lines between the future Maragle 500 kV substation and Bannaby 500 kV substation	Potential cumulative landscape impact: The Talbingo Reservoir site is located about 5 km east of HumeLink, outside of the landscape and visual study area. As such, there would not be a cumulative landscape impact associated with this proposal and HumeLink. Potential cumulative visual impact: The Talbingo Reservoir site is located about 5 km east of HumeLink and would not be seen together in any views within the landscape and visual study area. As such, there would not be a cumulative visual impact associated with this proposal and HumeLink.

Project	Description	Distance / Interface	Cumulative impacts
	than Talbingo Reservoir site). Construction began in October 2020 with expected completion by 2026.		
Inland Rail – Albury to Illabo	The project involves the upgrade of 185 kilometres of rail track from Albury to Illabo and passes through Wagga Wagga. It is located approximately nine kilometres north-west of existing Wagga 330 kV substation. Construction is proposed to commence in early 2024 and would take 16 months.	Roughly 9 km north-west of existing Wagga 330 kV substation	Potential cumulative landscape impact: At the closest point, Inland Rail (Albury to Illabo) would be located over nine kilometres away (north-west of) the proposed modification works to the existing Wagga 330 kV substation. Due to the distance and separation from these projects, if approved, there would not be a cumulative landscape impact associated with this project in combination with HumeLink within the landscape and visual study area. Potential cumulative visual impact: Inland Rail (Albury to Illabo) would be located to the north-west of this project and would not be seen together in any views within the landscape and visual study area. As such, there would not be a cumulative visual impact associated with Inland Rail and HumeLink.
Crookwell 3 Wind Farm	The project involves 16 wind turbines up to 157 metres in height, connected to the grid via the 330 kV transmission line. This project site is directly under the project footprint. Detailed design and pre-construction activities are being carried out with main construction work expected to take about 18 months once commenced.	Project site is under the project footprint	Potential cumulative landscape impact: HumeLink would pass through the centre of the proposed Crookwell 3 Wind Farm, alongside the existing Yass to Gullen Range 330 kV transmission line. If approved, there would be a cumulative landscape impact associated with the project in combination with Crookwell 3 Wind Farm as there would be further greater presence of electricity infrastructure in the rural landscape north-east of Pejar Dam. Potential cumulative visual impact: Crookwell 3 Wind Farm would be seen sequentially and together with HumeLink in areas east of Crookwell Road, to the north-east of Pejar Dam. The projects would be seen from sections of Crookwell and Woodhouselee roads, and from nearby rural properties. HumeLink proposes transmission line structures about double to triple the height of the existing Yass to Gullen Range 330 kV transmission line, and the proposed wind turbines would be about double to triple the height of the proposed HumeLink transmission line structures. If approved, there would be a cumulative visual impact associated with HumeLink and Crookwell 3 Wind Farm, during construction and operation.

8.2 Summary

If approved, there would be cumulative landscape and visual impacts associated with this project and the following proposals, due to the proximity and associated potential for the projects to be seen together and change the character of the surrounding landscape:

- EnergyConnect (NSW – Eastern Section)
- Gregadoo Solar Farm
- Jeremiah Wind Farm
- Rye Park Wind Farm
- Crookwell 3 Wind Farm
- Victoria to NSW Interconnector West (VNI West)
- Snowy 2.0 – Transmission Connection.

There is unlikely to be cumulative landscape or visual impacts associated with HumeLink and the following proposals, due to the large distance between the projects:

- Inland Rail – Albury to Illabo
- Snowy 2.0 – Main Works.

9.0 Management of impacts

9.1 Mitigation already incorporated into the project

The location of the project footprint, indicative transmission line route and key project components have been developed in consideration of visual amenity, including through extensive consultation with landowners. This included:

- paralleling existing transmission line easements where possible to minimise new areas with transmission lines where there is no visual precedent
- consideration of the topography and any existing screening vegetation or other features
- minimising the overall transmission line length, where practicable
- maximising the distance from existing dwellings and towns along the transmission line easement, including by following a route which is located a distance to the south of Yass and Tumut
- minimising vegetation clearance requirements where practicable, including development of refined vegetation clearance areas rather than full easement clearance
- minimising impacts on conservation areas and cultural heritage places
- using the existing Wagga 330 kV substation and Bannaby 500 kV substation for the additional substation infrastructure so as to co-locate and consolidate this infrastructure in a location which is away from residential receivers and other prominent community viewpoints
- Setting the proposed Gugaa 500 kV substation back from Livingstone Gully Road and the nearest private properties. Utilising natural landform to shield the substation infrastructure and reduce the visibility of the project.

The final transmission line route will continue to be developed with an aim to minimise visual impacts wherever practicable in consultation with landowners and other relevant stakeholders.

9.2 Design refinement considerations

The following design considerations would be incorporated into the ongoing refinement of the project.

9.2.1 Transmission line structure design

Further consideration of transmission line structure design should be undertaken during detailed design to reduce visual impacts in areas across the project where moderate, high-moderate and high visual impacts on the public domain and private properties have been identified.

Where reasonable and feasible, these options could include consideration of different transmission line structure types (pole and lattice), height and shapes (slim and tall or short and wide) and spacing (fewer larger structures or more smaller structures) for example.

9.2.2 Location of transmission line structures

Where feasible, transmission line structures may be located so that they are at the maximum distance from sensitive viewpoints, so that they are viewed against a more visually absorptive background or so that intervening landform and vegetation will block views.

Where possible, transmission line structures should be located at a maximum spacing at road crossings. This would be a suitable mitigation technique for roads such as at the Snowy Mountains Highway (refer to Viewpoint 11) and Gocup Road (refer to Viewpoint 12). In these locations there is no landform to provide screening, and screening vegetation would not be effective.

Where the proposed transmission line is visible for a long duration, such as along Gregadoo East Road (refer Viewpoint 1), the symmetry of the structures in relation to the roadway and regular spacing of the transmission line structures, would reduce the potential visual impact within the otherwise broad open landscape.

In sections of the project footprint where there is some undulating landform and where taller vegetation exists, such as at Yaven Creek Road (refer viewpoint 6 and Adjungbilly Road (refer Viewpoint 15), the positioning of transmission line structures could reduce the visibility of the project from the road.

Where there is existing mature vegetation, the visibility of the project may be decreased with the considered location of the transmission line structures. This would both be due to the reduced need for vegetation clearing and the screening effect of vegetation.

Transmission line structures should be sensitively located near creeklines and avoid the need to remove vegetation where possible.

When seen adjacent to other existing transmission lines, such as in views from Gregadoo Road East (Viewpoint 1), Livingstone Gully Road (Viewpoint 2), Tumbarumba Road (Viewpoint 3), Humelink Highway (Viewpoint 4), Westbrook Road (Viewpoint 5), Yaven Creek Road (Viewpoint 6), Burrinjuck Road (Viewpoint 17), Cooks Hill Road (Viewpoint 21), views from the Greendale Church (Viewpoint 22), Rugby Road (Viewpoint 23), Grabben Gullen Road (Viewpoint 24) and Taralga Road (Viewpoint 26), having a similar structure spacing and aligning the project footprint parallel to the existing lines would assist in the absorption of the project into views without creating a visually jarring or overdeveloped visual effect.

Where there is a potential view to the project from the primary view of a residential dwelling, resulting in a moderate, high-moderate or high visual impact, the placement of the transmission structures should be undertaken in consultation with landowners to minimise visibility and visual impact.

9.2.3 Screening vegetation

Screening vegetation would have a limited effect in mitigating the public domain visual impacts of the project due to the height of the structures and time required for vegetation to establish. However, the retention of existing vegetation and additional vegetative screening should be considered to filter and screen views where there would be a beneficial effect, such as at the proposed Gugaa 500 kV substation.

However, where there is the potential to reduce the visual impact on private residential properties identified as having high or above visual impacts, screening vegetation should be investigated. Vegetative screening located at these residential properties (outside of the project footprint) should be considered in consultation with the landowner. This vegetation would be installed as a part of the project but maintained by the landowner.

9.3 Mitigation measures

The following mitigation measures should be considered to further reduce the potential visual impacts identified in this assessment.

TABLE 9-1: MITIGATION MEASURES

Reference	Mitigation measure	Timing	Relevant location(s)
LV1	Opportunities for the retention and protection of existing trees within the disturbance area would be identified during detailed construction planning. Identified trees of high conservation significance would be retained and protected where practicable.	Detailed design	All locations
LV2	Temporary and permanent access would be designed to minimise vegetation removal, changes to landform, and visual impacts where practicable.	Detailed design	All locations
LV3	Lighting at construction compounds and worker accommodation facility would be designed and operated in accordance with *AS 4282 2019 Control of the obtrusive effects of outdoor lighting*.	Detailed design and construction	Construction compounds and worker accommodation facility
LV4	The Tree Protection Zone of retained trees within or immediately adjacent to the disturbance area would be managed in accordance with AS 4970-2009 Protection of Trees on Development Sites where practicable to minimise the impact of the works on the long-term health of these trees.	Detailed design	All locations
LV5	For residences where the project is predicted to have a moderate to high visual impact, opportunities for screening vegetation would be investigated. Appropriate visual screening or other options (for example planting of vegetation) would be confirmed in consultation with the affected landowner and implemented where practicable. Vegetative screening would be maintained by the landowner.	Detailed design, construction and operation	Transmission line
LV6	Lighting at the substations would be designed and operated in accordance with AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.	Operation	Substations

10.0 Conclusion

10.1 Landscape impact

The study area includes landscapes of regional, local and neighbourhood landscape sensitivity.

During construction there would be:

- a **moderate** impact on five landscape character areas
- a **moderate-low** impact on twelve landscape character areas
- a **low** impact on three landscape character areas.

The moderate impacts would be on the Great Dividing Range and Upland forest landscape character zones where there is greater vegetation removal and temporary construction activities.

During operation, there would be:

- a **moderate** impact on five landscape character areas
- a **moderate-low** impact on ten landscape character areas
- a **low** impact on four landscape character areas.

The **moderate** impacts would continue to be on the landscape character units within the Great Dividing Range and Upland forest landscape character zones. In these areas there would continue to be less vegetation in a predominantly vegetated landscape, and the introduction of large transmission line structures of a larger scale into the landscape. The **moderate-low** impacts would be on the landscapes where there would be some reduction in vegetation and the transmission line route would be a new feature in the landscape.

10.2 Visual impact

The study area includes views of local and neighbourhood landscape sensitivity.

Of the 28 representative views assessed in this technical report, during construction there would be:

- a **moderate** impact on seven representative views
- a **moderate-low** impact on 15 representative views
- a **low** impact on five representative views
- a **negligible** impact on one representative view.

The **moderate** impacts would be in locations close to the project footprint, where there are clear views towards the construction activities, including vegetation removal.

During operation, there would be:

- a **moderate** impact on five representative views
- a **moderate-low** impact on 14 representative views
- a **low** impact on eight representative views
- a **negligible** impact on one representative view.

The **moderate** impacts would continue be in locations close to the project footprint, where there are clear views towards the project, including views with little intervening vegetation and/or where there are no existing transmission line structures visible.

10.3 Scenic or significant vistas and road corridors in the public domain

There are no adverse impacts anticipated on significant vistas within the landscape and visual study area. Several lookouts were identified in the landscape and visual study area, however, none are located in close proximity to the project or in a location where there would be a visual impact.

Views within the landscape study area were considered with a focus on views from road corridors that are scenic routes and include views to landscapes with scenic value. In most locations the alignment of the project footprint crosses roads and the Highways, rather than being aligned parallel to them, reducing the potential for a visual impact that would be experienced for a long duration. Notably, there would be moderate adverse visual impacts from the Snowy Mountains Highway, Gocup Road and Brungle Road where the landscape is more open and the project would be visible across broad valleys and crossing elevated hills. In these areas the alignment changes direction, extending its visibility within the view and there are no existing transmission line structures in view.

10.4 Air traffic

There are recreational flights operating from the Wagga Wagga Airport, offering views over the city, Lake Albert and the surrounding agricultural areas, as well as longer flights to enjoy scenic views of Blowering Dam. There are also recreational flights operating from the Tumut Airport, offering scenic views over the vineyards and wineries of the high country, the rolling hills of Tumut and Tumbarumba, along the three dams of Talbingo, Journama and Blowering, and the Snowy Hydro Scheme.

There would be a moderate and moderate-low visual impact in these areas during construction due to a reduction in the amenity of the views from the air in the vicinity of Bago State Forest, south of Tumut, near Kosciuszko National Park. These would be localised impacts where the project footprint would be viewed together with the future Maragle 500 kV substation and also the existing Snowy Hydro Scheme infrastructure.

During operation there would be moderate-low visual impacts from the air as the transmission line route would create a strong line across the landscape in these views. The project would be a new built feature in Bago State Forest, there would be cleared vegetation, and several turns as the project traverses the hilly, forested landscape between Snubba Road and the future Maragle 500 kV substation. In other areas surrounding Wagga Wagga and Tumut, there would be a moderate-low visual impact as the new transmission line easement and proposed Gugaa 500 kV substation would be seen within a varied and complex landscape where other transmission and related infrastructure are noticeable and would be largely absorbed into the view.

10.5 Night lighting

The study area includes landscapes of high, moderate and low visual sensitivity at night.

During construction there would be:

- a **moderate** impact on seven landscape character areas
- a **moderate-low** impact on 11 landscape character areas
- a **low** impact on one landscape character areas.

The **moderate** impacts would be on the rural valleys (Gregadoo to Book Book), forested hills, upland forest and rural highland and deep valley landscape character zones where there is greater vegetation removal and temporary construction activities, including for the proposed Gugaa 500 kV substation at Gregadoo.

During operation, there would be a **moderate-low** impact on the Gregadoo to Book Book Rural Valleys landscape character area, due to the operation of the proposed Gugaa 500 kV substation

at Gregadoo. Elsewhere, the project would have a negligible visual impact on the remaining landscape character areas within the study area at night, due to the negligible requirement for lighting within the project footprint.

10.6 Views from surrounding residences

Visual impacts during operation:

There are 180 dwellings, which are either located within 500 metres of the project footprint or have otherwise been identified as having the potential for a higher visual impact. Of these, 90 dwellings were identified as having the potential for a moderate or higher visual impact and requiring further assessment. This desktop assessment is summarised in **Attachment G**.

In summary, the detailed assessment of visual impact (refer to Section 7.3.2) identified the following visual impacts from private dwellings:

- 17 dwellings would have a **high** visual impact.
- 27 dwellings would have a **high-moderate** visual impact.
- 36 dwellings would have a **moderate** visual impact.

All remaining dwellings would have a **moderate-low**, **low**, or **negligible** visual impact.

These potential visual impact levels have the potential to be further reduced by mitigation measures.

Visual impacts during construction:

There may be temporary visual impacts from dwellings located with a view to some construction compounds in rural areas, including the Gregadoo Road compound (C06), Honeysuckle Road compound (C07), Red Hill Road compound (C08), Adjungbilly Road compound (C09), Woodhouselee, Road compound (C11) and Bowmans Lane compound (C15). There would also be some temporary visual impacts in views from dwellings surrounding the Tumbarumba Accommodation Facility (AC1) where a denser urban facility is located with a rural setting including the removal of some vegetation.

10.7 Cumulative landscape and visual impact

If approved, there would be cumulative landscape and visual impacts associated with this project and the following proposals, due to the proximity and associated potential for the projects to be seen together and change the character of the surrounding landscape:

- EnergyConnect (NSW - Eastern Section)
- Gregadoo Solar Farm
- Jeremiah Wind Farm
- Rye Park Wind Farm
- Crookwell 3 Wind Farm
- Victoria to NSW Interconnector West (VNI West)
- Snowy 2.0 - Transmission Connection.

There is unlikely to be cumulative landscape or visual impacts associated with HumeLink and the following proposals, due to the large distance between the projects:

- Inland Rail – Albury to Illabo
- Snowy 2.0 - Main Works.

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