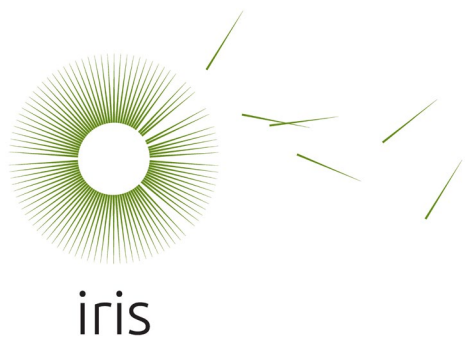




Yanco Battery Energy Storage System Project

Landscape character and visual impact assessment



August 2024

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Definitions and Abbreviations

Associated dwellings	Dwellings on land that is owned by the host landholder and associated with the project.
BESS	Battery energy storage system
DCP	Development Control Plan
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
kV	Kilovolt
LGA	Local government area
LEP	Local Environmental Plan
LSPS	Local Strategic Planning Statement
MW	Megawatts
Proposal site	120 Houghton Road, Yanco, NSW (Lots 516 and 521 DP 751745).
PV	Photovoltaic
REZ	Renewable Energy Zone
SEARs	Secretary's Environmental Assessment Requirements

1. Introduction

This report has been prepared to assess the visual impacts of the proposed Yanco Battery Energy Storage System (BESS) project (the proposal) at 120 Houghton Road, Yanco.

This report identifies the potential visual impacts of the proposal on views from surrounding areas. This will include an assessment of the impact on views from the public domain (including Houghton Road) and nearby private dwellings.

1.1. Assessment requirements

This report addresses the Secretary's Environmental Assessment Requirements (SEARS) issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) on the 28th of February 2024.

For this visual impact assessment, the SEAR is:

'Visual – including a detailed assessment of the likely visual impacts (including night lighting) of all components of the project (including transmission lines, substations and any other ancillary infrastructure) on surrounding residences (including approved developments, lodged development applications and dwelling entitlements) and key locations, scenic or significant vistas and road corridors in the public domain and provide details of measures to mitigate and/or manage potential impacts.

To address this requirement, this assessment includes:

- An assessment of views from the public domain (including scenic or significant vistas and road corridors) (refer to section 5.3)
- An assessment of views from surrounding dwellings (refer to section 5.5)
- An assessment of visual impact at night (refer to section 5.6)
- An assessment of cumulative impact (refer to section 7)
- Proposed measures to manage the visual impacts of the project (refer to section 1).

1.2. Guidance for visual impact assessment

This visual impact assessment has generally been guided by the following documents:

- *Large-Scale Solar Energy Guideline* (NSW DPE 2022), including the *Technical Supplement - Landscape and Visual Impact Assessment*;
- *Guidance note EIA-N04 Guidelines for Landscape Character and Visual Impact Assessment*, TfNSW 2020); and
- *The Guidance Note for Landscape and Visual Assessment* (GNLVA), Australian Institute of Landscape Architects Queensland (2018).

The assessment contained in this report will draw upon the direction offered by these documents. Further detail on the methodology used for assessing the visual impact of the proposal is described in Section 5 of this report.

1.3. Proposal study area

An area of between one and two kilometres from the proposal has been used as the study area for this assessment. This area includes a visual catchment, which varies according to the land cover (vegetation and built form) and topography of the landscape and includes the proposal site.

2. The proposal

The proposal is located on a site that includes two lots (Lots 516 and 521 DP 751745). The proposal is located towards the northeastern boundary of the site and has a total area of around 10.3 hectares. Minor road works at the intersection of Houghton Road and Irrigation Way to provide a BAR/BAL intersection treatment. This would include localised widening and re-surfacing, and some minor changes to drainage.

This area encompasses the construction and operational footprint of the proposal and is referred to as the 'proposal footprint'.

The proposal includes the following key infrastructure:

- New compound with battery and inverter station enclosures, each resembling a 20ft container and, separated into rows
- Connection infrastructure
- Up to around 450 metres of 132 kV overhead or underground sub-transmission line connection to the existing Yanco Transgrid substation
- An operations and maintenance compound that includes site office and parking
- Noise walls to the south of BESS area (up to about 4.5 metres high), and around the transformers (up to about 4 metres high)
- Up to 1.8-metre-tall chainmesh security fencing and access gates surrounding the proposal
- Internal access roads with new access from Hume Road
- Outdoor security lighting (activated by sensor)
- Minor road works at the intersection of Houghton Road and Irrigation Way including localised widening and re-surfacing, and some minor changes to drainage.
- Native screen planting proposed along the outside of the perimeter fence (refer to Figure 2-1 and **Appendix A** Landscape Concept Plan).

Construction would take up to eight months. The batteries would be manufactured offsite and delivered ready for installation.

Site preparation works would include minor earthworks to level the development site and construct a flat platform on which to install the proposal.

The BESS would operate 24 hours a day, seven days a week. Although the project will be monitored and controlled remotely during operation, some routine maintenance will be periodically performed on-site. On-site maintenance activities will only require limited personnel.

The BESS would be operational for a period of approximately 23 years after which time the BESS would be removed and the site would be decommissioned. Decommissioning would include the removal of all above ground infrastructure and the remediation of the site.

The infrastructure may be upgraded rather than decommissioned, and the lifespan extended.

The layout of the BESS and associated infrastructure is shown on Figure 2-1.

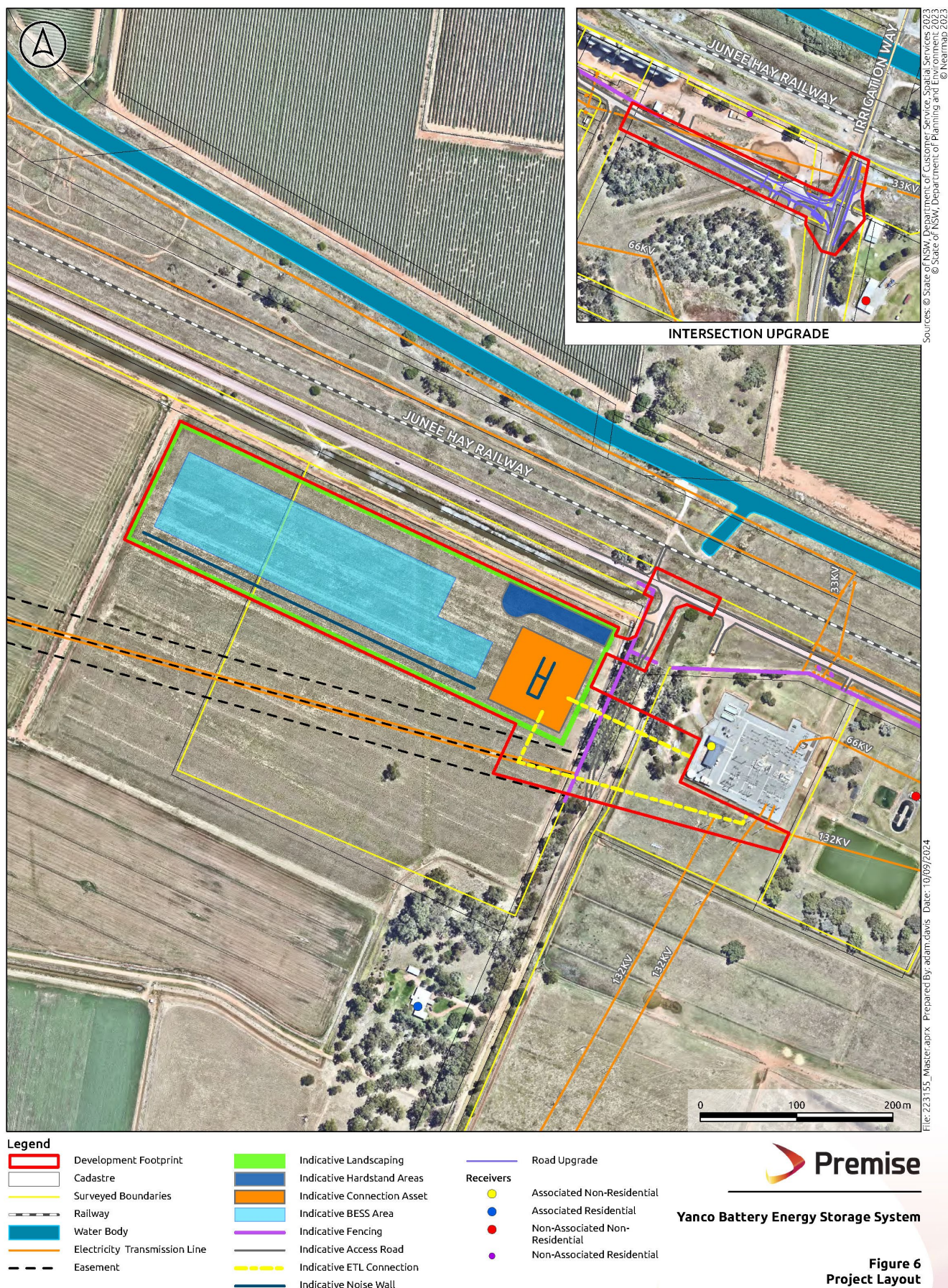


FIGURE 2-1 YANCO BESS DEVELOPMENT PLAN

3. Planning context

There are several state and local government planning documents which provide relevant guidance for the consideration of visual impact and also set out the desired planning outcomes for the study area. These are summarised in the following paragraphs

3.1.State and regional planning documents

3.1.1. Riverina Murray Regional Plan 2041

The *Riverina Murray Regional Plan 2041* (DPE, 2023) is the NSW Government's strategy for guiding land use planning decisions for the Hunter Region over the next 20 years.

The plan sets out the vision for the region in 2041, supported by District-level goals and regionally focused actions to meet the vision.

Priority 13 aims to... *"Support the transition to net zero by 2050"* through... *"greater renewable electricity generation, transmission and storage"* such as BESS projects. However, land use conflict issues, including... *"visual impacts"* is noted as a potential community land use conflict issue (p.59). The proposal is located in the central part of the region, to the east of (and outside of) the South West Renewable Energy Zone.

3.2.Local Government planning

The proposal is located in the Leeton Shire Council area. This project is State Significant Development, and not subject to the local planning provisions, however, the relevant parts of the Leeton Local Strategic Planning Statement (LSPS), Leeton Local Environmental Plan 2014 (LEP) and Leeton Council Comprehensive Development Control Plan 2022 (DCP) are summarised in the following paragraphs for context.

3.2.1. Leeton Local Strategic Planning Statement

Leeton LSPS (Leeton Shire Council, 2020) sets out a vision for the shire in 2040 and the actions that will be taken to achieve this vision. It provides the land-use planning framework for the shire, based around eight priorities.

Priority 1: Agriculture, aims to protect agricultural land functions within the Shire. The proposal site is located in the Murrumbidgee Irrigation Area. The... *"growth of*

Solar farms resulting in a potential loss of irrigated farmland for non-agricultural production" is listed as a key challenge for the shire (p.21).

To address this challenge, Council intends to prepare a Rural Land Use Study to identify... *"all areas of important Agricultural Land within the Shire to protect them from land use conflict ..."* (Action 1). This study will also aim to *"identify appropriate locations and transition zones for incompatible land uses to grow, for example urban expansion and solar farms"* (p.28). This study is not available and there is no information available on the progress of this study.

3.2.2. Leeton Local Environmental Plan 2014

Land use zoning

The site is zoned RU1 Primary Production. Relevant objectives of this zone include ... *"To minimise conflict between land uses within this zone and land uses within adjoining zones."* (Land Use Table, Zone RU1 objectives)

Land to the north, south and west of the site are also zoned RU1 Primary Production, consisting mainly of irrigated arable farmland between the Murrumbidgee River and Gogeldrie branch canal.

Land to the east of the proposal site is zoned SP2 Infrastructure and includes the existing Yanco Transgrid substation and Yanco Sewerage Treatment Plant.

Of relevance to this assessment, is the potential influence of the proposal on the rural landscape character of the area, and views from existing and future dwellings.

Heritage

There are no State or local heritage listed places within or near the site.

The closest item is the Yanco Powerhouse Museum, located around one kilometre to the east of the site, along Binya Street, Yanco. The State Heritage listed Yanco Agricultural High School (former Sir Samuel McCaughey's Homestead) is located around 2.5 kilometres south of the site. Both places are outside of the visual catchment and would not have views to the proposal.

3.2.4. Leeton Council Comprehensive Development Control Plan 2022

Part E: Rural Development provides planning controls for areas zoned for rural use (RU1 Primary Production), which includes the site. Although this DCP does not provide specific controls for development such as a BESS, the DCP includes the following controls which are relevant to the assessment of landscape character and visual impacts in rural areas that provides some guidance on the development of buildings and structures within this land use zone.

Farm buildings:

Site selection

Structures are positioned on the land to limit the amount of clearing of any remnant native trees or other native understorey vegetation, especially along the perimeter of the site. (Part E1.1(c)).

Site selection avoids the peak height of any farm building from protruding above the ridge line of the highest hill within the 100m of the building location. (Part E1.1(e)).

Building Design

Farm buildings are constructed of materials that:

- i. minimise the use of zincalume where the building location is highly visible from a public road or neighbouring properties.*
- iii. Include low reflective, neutral/earth tones which blend in naturally with the rural landscape. (Part E1.1(n)).*

Rural based land-use activities:

Building and site design

Landscaping is strategically provided to screen or minimise the visual impact of the development from surrounding properties and significant public vantage points. (Part E2.3(s)).

4. Existing conditions

4.1. The study area

The site is located in a flat, rural landscape around 1.5 kilometres south west of Yanco (refer to Figure 4-1 Site location and context and Figure 4-2 Topography).

The Murrumbidgee Valley National Park is located around 3.5 km south of the development site along the Murrumbidgee River.

The Junee Hay railway is located around 90 metres to the north of the site, aligned parallel to Houghton Road. The section of the line between Yanco and Hay, however, is now closed, with no passenger services. About 600 metres to the east, the Yanco to Griffith railway line is operational and used for various freight trains.

The existing Yanco Transgrid substation is located to the east of the site (about 127 metres), on the eastern side of Hume Road. There are existing transmission lines converging on the substation, including the 132kV transmission lines that pass through the fields directly to the south of the development site.

Yanco Solar Farm (approved, not yet constructed) is located approximately 1.8 kilometres north of the development site and Leeton Solar Farm (operational) is located around seven kilometres north of the site.

There are rural homesteads scattered across the landscape to the north, west and south the site. Yanco. These dwellings are typically surrounded by trees and mature gardens. There are also numerous large agricultural sheds in this landscape, often clustered around the rural dwellings.

The nearest dwellings are associated receivers which are located around 290 metres to the south (R3) and around 420 metres to the southwest of the development site, both at 120 Houghton Road (R724) (refer to R3 and R724, Figure 4-1).

The nearest non- associated dwellings are located about 8340 metres to the south, at 135 River Road (R6), and about 741 metres to the east of the development site at 26 Euroley Road (R4), and 800 metres to the east at 44 River Road (R5). The township of Yanco is located about one kilometre northeast of the development site, with the nearest dwellings located along Cudgel and Binya streets. McCaughey Bicentennial Park is also located on the western

outskirts of Yanco, around one kilometre northeast of the development site.

Historically, the surrounding area has been cleared and used as cultivated farmland. There are several irrigation channels fanning out across the landscape, drawing water from the Murrumbidgee River and Gogeldrie branch canal. These channels have slightly raised embankments, providing some screening and channelling of views along roads. Patches of roadside vegetation and vegetation surrounding the rural dwellings in this area also provide some screening between the development site and nearby dwellings.

4.2. The development site

The development site is located at the northeastern portion of the site, near the corner of Houghton and Hume roads.

Hume Road is an unsurfaced local road. Houghton Road has 9.5 m wide unsealed section for the majority of the subject length, including at the intersection with Hume Road, and 5.5 m wide sealed section for 600 m from Irrigation Way, past the GrainCorp facility. There are mature eucalyptus trees along Hume Road, separating the site from the Yanco Transgrid substation in the east (about 127 metres from the development). There are multiple transmission lines in the vicinity of the site, connection to the substation, including a 132 kV easement to the south of the development site. To the east of the substation is the Yanco Sewerage Treatment Plant (about 220 m from the development). There is security fencing and several buildings associated with this infrastructure.

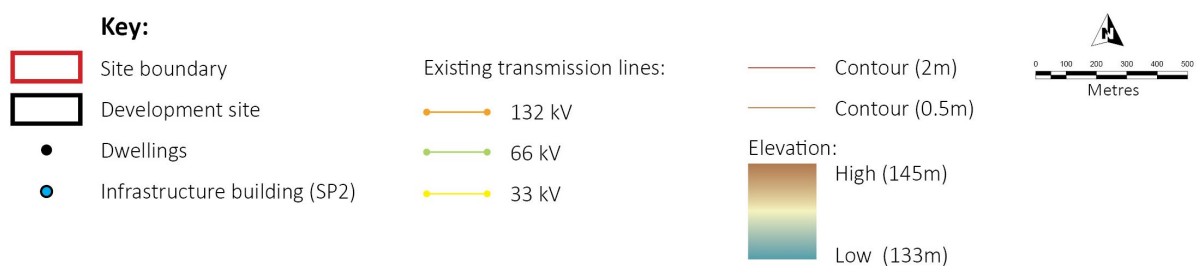
The landform within the site is largely flat and forms part of a large level platform of land, including the substation, north of the Murrumbidgee River.

The development site is mostly cleared of vegetation, comprising an arable field. An irrigation channel runs along the northern site boundary, alongside Houghton Road, outside of the proposed development site.

Although the development site is cleared of vegetation, there are groups of mature trees and shrubs to the east and south of the site, along Hume and River roads, and associated with existing dwellings and agricultural structures.



FIGURE 4-1 SITE LOCATION AND CONTEXT



IRIS Visual Planning + Design

5. Landscape character assessment

5.1. Approach

This assessment of landscape character has been undertaken in the following steps:

- Identify **landscape character zone** for the project site and surrounding study area
- Describe the **existing conditions** of the landscape character zone
- Identify the **sensitivity** of the landscape character zone
- Identify the **magnitude of change** created by the proposal
- Combine these factors to assign a level of **landscape character impact**.

The following paragraphs describe this process in further detail.

5.1.1.1. Identifying landscape character zones

The landscape assessment begins with the identification of landscape character zones.

‘Landscape character zones should divide the landscape based on common distinguishing visual characteristics including landforms and major land cover patterns. These patterns are formed by combinations of vegetation, water bodies, landforms and land use, from which the key landscape features can also be identified.’ (Page 10, NSW DPE 2022)

5.1.1.2. Landscape sensitivity

The sensitivity of a landscape is described by NSW DPE in the Technical Supplement as ... *‘the capacity of a landscape or viewpoint to absorb the impacts from a proposed land use change and/or built form’* (NSW DPE 2022). Generally, the sensitivity level assigned to a landscape will also reflect the valued characteristics of landscape such as scenic quality value and rarity.

A frame of reference for the scenic quality values of landscapes in NSW have been provided in the Technical Supplement (NSW DPE, 2022). This includes a description of the typical characteristics of the landscape features which contribute to scenic quality. These descriptions are provided in Table 5-1.

From this frame of reference, a matrix has been developed that combines scenic quality rankings from the Technical Supplement (NSW DPE, 2022) with the absorption capacity of the landscape, to determine a sensitivity level (refer to Table 5-2).

5.1.1.3. Magnitude of change

The changes to landscape character that would occur as a result of the proposal are assigned a magnitude of change level. The Technical Supplement (NSW DPE, 2022) recommends that the magnitude of change for landscape character considers the:

- *Size and scale of the change, including:*
 - *the extent of existing landscape elements that may be lost and the contribution of that element to the character of the landscape*
 - *the extent to which the project becomes a minor or major element in the landscape and its dominance in the visual catchment*
 - *the extent to which the project changes the key characteristics of the landscape, which are critical to its distinctive character*
- *geographical area – the area of the landscape over which the effects will be experienced, having regard to the nature and scale of the project’s effects. This could vary from the immediate setting of the site to larger scales where the project may influence several landscape characters zones*
- *duration and reversibility of the effects on the landscape.’* (NSW DPE, 2022)

Table 5-3 Includes examples of the size and scale, geographical area, duration and reversibility factors that contribute to assigning a magnitude of change level.

5.1.1.4. Assigning impact levels

A landscape impact level has been determined by combining the sensitivity and magnitude level according to the matrix presented in Table 5-4.

This matrix is based on the impact rating matrix contained in the ... *Technical Supplement – Landscape and Visual Assessment*, NSW DPE 2022 (Table 9 Visual impact matrix, p.28, NSW DPE 2022), with the addition of a negligible magnitude of change level where there is no change. This matrix has been used as there is no specific impact matrix identified for landscape character impact levels.

TABLE 5-1 FRAME OF REFERENCE FOR SCENIC QUALITY VALUES (TABLE 6, PAGE 26, NSW DPE 2022)

Landscape feature	Low scenic quality	Moderate scenic quality	High scenic quality
Landform	Large expanses of flat or gently undulating terrain Indistinct, dissected or unbroken landforms that provide little illusion of spatial definition or landmarks with which to orient.	Steep, hilly and undulating ranges that are not visually dominant Broad shallow valleys Moderately deep gorges or moderately steep valley walls Minor rock outcrops.	Isolated peaks, steep rocky ridges, cones or escarpments with distinctive form and/or Large areas of distinctive rock outcrops or boulders Well defined steep sided valley gorges.
Vegetation	Extensively cleared and cropped areas with very limited variation in colour and texture.	Predominantly open forest of woodland combined with some natural openings in patterns that offer some visual relief Vegetative stands that exhibit a range of size, form, colour texture and spacing including human influenced vegetation such as vineyards, and orchards	Strongly defined patterns with combinations of native forest, naturally appearing openings, streamside vegetation and/or scattered exotics.
Waterbodies	Absence of natural waterbody. Farm dams, irrigation canals or stormwater infrastructure.	Intermittent streams, lakes and rivers, swamps and reservoirs	Visually prominent lakes, reservoirs, rivers, streams, wetlands and swamps
Social / cultural	Places of worship, cemeteries / memorial parks, private open space	Local heritage sites Distinguishable entry ways to a regional city identified in the Transport and Infrastructure SEPPs	Culturally important sites, world heritage areas, national parks / reserves Commonwealth and state heritage sites
Human presence	Dominating presence of infrastructure, human settlements, highly modified landscapes and higher density populations such as regional cities, industrial areas, agricultural transport or electricity infrastructure.	Dispersed yet evident presence of human settlement such as villages small towns, isolated pockets of production and industry, lower scale and trafficked transport infrastructure.	Natural / undisturbed landscape Minimal evidence of human presence and production.

TABLE 5-2 LANDSCAPE SENSITIVITY LEVELS

Sensitivity level	Details
High	Landscape features (landform, vegetation, waterbodies, social/cultural, human presence) are predominantly of high scenic quality (refer to Table 6-1) These landscapes have a low inherent capability to absorb changes from the proposal.
Moderate	Landscape features (landform, vegetation, waterbodies, social/cultural, human presence) are predominantly of moderate scenic quality (refer to Table 6-1) These landscapes have a moderate inherent capability to absorb changes from the proposal.
Low	Landscape character includes features (landform, vegetation, waterbodies, social/cultural, human presence) which have low scenic quality values (refer to Table 6-1) These landscapes have a high inherent capability to absorb changes from the proposal.

TABLE 5-3 MAGNITUDE OF CHANGE LEVELS

Magnitude level	Size and scale	Geographical area	Duration and reversibility
High	Extensive loss of existing landscape elements The lost landscape elements make a substantial contribution to the character of the landscape The proposal would become a major element in the landscape and dominant in the visual catchment The proposal fundamentally changes the key characteristics of the landscape, which are critical to its distinctive character	Very large geographical area impacted This would result in an extensive and / or severe change in landscape values.	Permanent change Irreversible changes to the landscape
Moderate	Moderate extent of existing landscape elements will be lost The lost landscape elements make a considerable contribution to the character of the landscape The proposal would become a major element in the landscape and somewhat dominant in the visual catchment The proposal results in moderate changes the key characteristics of the landscape, which are critical to its distinctive character	Large geographical area impacted This would result in a considerable and / or unsympathetic change in landscape values.	Long term change Changes are somewhat reversible
Low	Small extent of existing landscape elements will be lost The lost landscape elements make a notable contribution to the character of the landscape The proposal would become a minor element in the landscape and would somewhat prominent in the visual catchment The proposal results in minor changes the key characteristics of the landscape, which are important to its distinctive character	Moderate geographical area impacted It would result in a slight change in landscape values.	Medium term change Changes are reversible
Very low	Very small extent of existing landscape elements will be lost The landscape elements do not make a particular contribution to the character of the landscape The proposal would become a very minor element in the landscape and would not be prominent in the visual catchment The proposal results in very minor changes the characteristics of the landscape, which are not particularly important to its distinctive character	Very small geographical area impacted If there is a change, it would not be perceived as altering the landscape values.	Short term change Changes are entirely reversible
Negligible	The proposal would not change the landscape characteristics, or There would be improvement to the landscape character as a result of the proposal.	No direct impact	No change

TABLE 5-4 LANDSCAPE IMPACT LEVELS

	High sensitivity	Moderate sensitivity	Low sensitivity
High magnitude	High	Moderate	Moderate
Moderate magnitude	Moderate	Moderate	Low
Low magnitude	Moderate	Low	Low
Very low magnitude	Low	Low	Very low
Negligible	Negligible	Negligible	Negligible

5.2. Assessment of landscape character

5.2.1. Landscape character of the study area

The study area has one homogeneous landscape character zone (LCZ) associated with the flat rural plain north of the Murrumbidgee River around Yanco. For the purposes of this assessment, this zone has been called the Yanco rural plain landscape character zone (LCZ1).

This zone forms a part of the Murrumbidgee Irrigation Area, with a predominantly flat landform and consisting of low-lying rural plains crossed by irrigation channels. This landscape includes large, irrigated fields used for cropping with associated rural dwellings. There are groups of smaller rural lifestyle holdings to the north and north-east for the proposal, on the outskirts of Yanco, zoned R5 Large Lot Residential.

The trees in this landscape are generally grouped along field boundaries and roads. The dwellings in this landscape are located nearby agricultural buildings and often surrounded by vegetation within gardens.

The northern part of this landscape includes an approved solar farm development, Yanco solar farm, which will include solar panel arrays and ancillary infrastructure, north of Houghton Road. The Yanco Transgrid Substation is located immediately east of the proposal, with large scale electrical structures. There are also existing transmission lines crossing this landscape, influencing the character of this zone.

Refer to Figure 5-1 to Figure 5-4 for photos showing the existing landscape character and features of the Yanco rural plain LCZ.



FIGURE 5-1 MATURE TREES ALONG HUME ROAD



FIGURE 5-2 EXISTING YANCO TRANSGRID SUBSTATION



FIGURE 5-3 IRRIGATION CHANNEL NORTH OF PROPOSAL SITE



FIGURE 5-4 TRANSMISSION LINES CROSSING PROPOSAL SITE

5.2.2. Assessment of landscape character impact

The analysis undertaken for the assessment of impacts on the Yanco rural plain LCZ is presented in Table 5-5. Overall, there would be a **low landscape character impact** on the Yanco rural plain LCZ. This is because of the low scenic quality, low landscape sensitivity and low magnitude of change.

TABLE 5-5 LANDSCAPE CHARACTER IMPACT ASSESSMENT – YANCO RURAL PLAIN, LANDSCAPE CHARACTER ZONE (LCZ1)

Consideration	Assessment
Landscape sensitivity	Low
Absorption capacity	High inherent capability to absorb changes from the proposal due to existing presence of electricity infrastructure and rural structures, flat landform, and absence of vegetation i.e. (development site already cleared of mature vegetation and used for crop rotations). Low
Scenic quality	Low
Landform	<i>Flat to gently undulating, no topographical features</i> Low
Vegetation	<i>Vegetation mostly cleared for agricultural use</i> Low
Waterbodies	<i>Waterbodies include irrigation channels and farm dams</i> Low
Social / cultural	<i>Modified landscape with presence of electricity infrastructure; local and state heritage sites located over one kilometre away</i> Low
Human presence	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads</i> Low
Magnitude of change	Low
Size and scale	<i>The proposal would become a minor element in the landscape and would not be prominent in the visual catchment.</i> Low
Geographical area	<i>The proposal would impact a small geographical area of this landscape character zone and result in a slight change in landscape values.</i> Low
Duration and reversibility	<i>Medium to long term change, with changes that are reversible.</i> Low
Landscape character impact	Low

6. Visual Impact Assessment

6.1. Visual catchment

The visual catchment is the theoretical area from which the proposal would be seen. This area has been identified using a digital surface model (landform and vegetation) and the height of the proposed BESS enclosures using GIS software.

The visual catchment area does not include the screening effect of future vegetation or development. However, it identifies the areas where there is the potential for a direct line of sight between the BESS and surrounding areas.

The visual catchment map shows that views to this proposal is limited by the surrounding landform and vegetation (refer to Figure 6-1). The trees located to the east and south of the development site, along Hume and River roads, and southwest of the development site in the vicinity of the rural dwelling (R724), restrict views from the east, south and southwest.

Generally, the visual catchment shows the potential for views extending:

- North and northeast to the fields and rural properties along Research Road
- East to Hume Road, with views from areas further to the east blocked by existing vegetation along Hume Road
- South across the fields to River Road
- West across the fields to around 1.5 kilometres.

This visual catchment was used to inform fieldwork and the selection of viewpoints for the assessment of public domain views and views from private dwellings.

The visual catchment map and site investigations confirmed that there would not be a view to the proposal from the following locations, and therefore there would not be a visual impact from these locations:

- Residential communities in Yanco, including schools (including Yanco Public School, a local heritage register item in Leeton Shire LEP 2014), parks (including McCaughey Bicentennial Park), sporting fields, and Yanco Powerhouse Museum (also a local heritage register item)

- Yanco Agricultural Institute, located to the east of the site along the Murrumbidgee River at 2198 Irrigation Way Yanco, (also a local heritage register item)
- Yanco Agricultural High School, located to the south of the site along the Murrumbidgee River at 259 Euroley Road Yanco, (a State Heritage Register item).

6.2. Assessment of impact on views in the public domain

6.2.1. Approach

Views have been selected from within the visual catchment to represent the range of locations from which the proposal would be seen from the public domain. These viewing locations have prioritised locations where there would be a larger number of potential viewers, in this case, that is views from surrounding roads.

An assessment of each public domain view has been undertaken in the following steps:

- Describe the existing view
- Identify the visual sensitivity:
 - Determine the **viewpoint sensitivity** of the view (refer Table 6-1)
 - Determine the **scenic quality** of the view (refer Table 6-2)
 - Combine the viewpoint sensitivity and scenic quality rating to determine the **visual sensitivity** (refer Table 6-3)
- Identify the **magnitude of change** created by the proposal (refer Table 6-4)
- Combine the viewpoint sensitivity and magnitude of change characteristics to assign a level of **visual impact** (refer Table 6-5).

This methodology is explained more fully in the following paragraphs.

Visual sensitivity

Visual sensitivity combines viewpoint sensitivity with the scenic quality of the view.

Table 5-1 includes the viewpoint sensitivity levels as described in the *Technical Supplement – Landscape and Visual Assessment Large-Scale Solar Energy Guideline* (NSW DPE 2022).

Table 5-2 describes the scenic quality values of landscapes (*Technical Supplement – Landscape and Visual Assessment Large-Scale Solar Energy Guideline*, NSW DPE 2022) and explains the sensitivity levels that have been used for this assessment.

These factors have been combined to assign a visual sensitivity according to the visual sensitivity matrix in Table 5-3. This table is based on the ‘Visual sensitivity matrix’ contained in the *Technical Supplement - Landscape and Visual Impact Assessment Large-Scale Solar Energy Guideline* (Table 8, p.28, NSW DPE, 2022).

Magnitude of change

Magnitude is the ... “*measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer.*” (TfNSW 2020)

The magnitude of change considers the extent of change resulting from the proposal and the

compatibility of these new elements with the surrounding landscape.

Magnitude of change will be determined by characteristics of the view, such as distance, landform, backdrop, intervening vegetation etc. There are also characteristics of the proposal which are: scale, form and line/alignment. Changes to a view can result in an improvement or reduction in visual amenity.

A high magnitude of change would result if the proposal contrasts strongly with the existing characteristics of the view. A low magnitude of change occurs if there is a high level of integration of form, line, shape, pattern, colour or texture values between the proposal and its visual setting.

Table 6-4 lists the categories used to describe the magnitude of change.

Assigning impact levels

A visual impact level has been determined for each view by combining the sensitivity and magnitude level according to the matrix presented in Table 6-5.

This matrix is generally based on the ‘Visual sensitivity matrix’ contained in the *Technical Supplement - Landscape and Visual Impact Assessment Large-Scale Solar Energy Guideline* (Table 8, p.28, NSW DPE, 2022).

TABLE 6-1 VIEWPOINT SENSITIVITY LEVELS

Viewpoint type	Very low viewpoint sensitivity	Low viewpoint sensitivity	Moderate viewpoint sensitivity	High viewpoint sensitivity
Transport / infrastructure	Local sealed and unsealed roads Passenger rail lines with daily daylight services State highways, freeways and classified main roads Walking tracks and navigable waterways	Tourist roads and scenic drives Walking tracks and navigable waterways	N/A	N/A
Social / cultural	Private recreation areas and sporting fields (defined as land zoned RE2)	Cemeteries, memorial parks	Tourist and visitor accommodation and places of worship (such as bed and breakfasts, motels, hotels) Tourist uses in tourist areas (land zoned SP3) Publicly accessible green and open spaces including picnic areas, parks, public recreation areas Town centres and central business districts	N/A

TABLE 6-2 SCENIC QUALITY LEVELS

Scenic quality level	Description
Low scenic quality	Landscape character includes features (landform, vegetation, waterbodies, social/cultural, human presence) which have scenic quality values of predominantly of low scenic quality (refer to Table 5-1). These landscapes have a high inherent capability to absorb changes from the proposal.
Moderate scenic quality	Landscape features (landform, vegetation, waterbodies, social/cultural, human presence) are predominantly of moderate scenic quality (refer to Table 5-1). Landscape features (landform, vegetation, waterbodies, social/cultural, human presence) are a mix of moderate sensitivity. These landscapes have a moderate inherent capability to absorb changes from the proposal.
High scenic quality	Landscape features (landform, vegetation, waterbodies, social/cultural, human presence) are predominantly of high scenic quality (refer to Table 5-1). These landscapes have a low inherent capability to absorb changes from the proposal.

TABLE 6-3 VISUAL SENSITIVITY MATRIX

	High scenic quality	Moderate scenic quality	Low scenic quality
High viewpoint sensitivity	High	High	Moderate
Moderate viewpoint sensitivity	High	Moderate	Moderate
Low viewpoint sensitivity	Moderate	Low	Low
Very low viewpoint sensitivity	Low	Very low	Very low

TABLE 6-4 MAGNITUDE OF CHANGE LEVELS

Magnitude level	Description
High	The project is visually dominant and / or contrasts substantially with the character of the view. It would result in a substantial change in the amenity of the view.
Moderate	The project is somewhat 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.

TABLE 6-5 VISUAL IMPACT LEVELS

	High magnitude	Moderate magnitude	Low magnitude	Negligible
High sensitivity	High	Moderate	Moderate	Negligible
Moderate sensitivity	Moderate	Moderate	Low	Negligible
Low sensitivity	Moderate	Low	Low	Negligible
Very low sensitivity	Low	Low	Very low	Negligible

6.2.2. Assessment of representative public viewpoints

The following viewpoints from the public domain were selected to represent the views from nearby roads and dwellings:

- Viewpoint 1: Views from Houghton Road
- Viewpoint 2: Views from Hume Road
- Viewpoint 3: Views from River Road
- Viewpoint 4: Views from Binya Street
- Viewpoint 5: Views from Research Road.

The location of these views is shown in Figure 6-1. An assessment of visual impact has been summarised in the following pages.

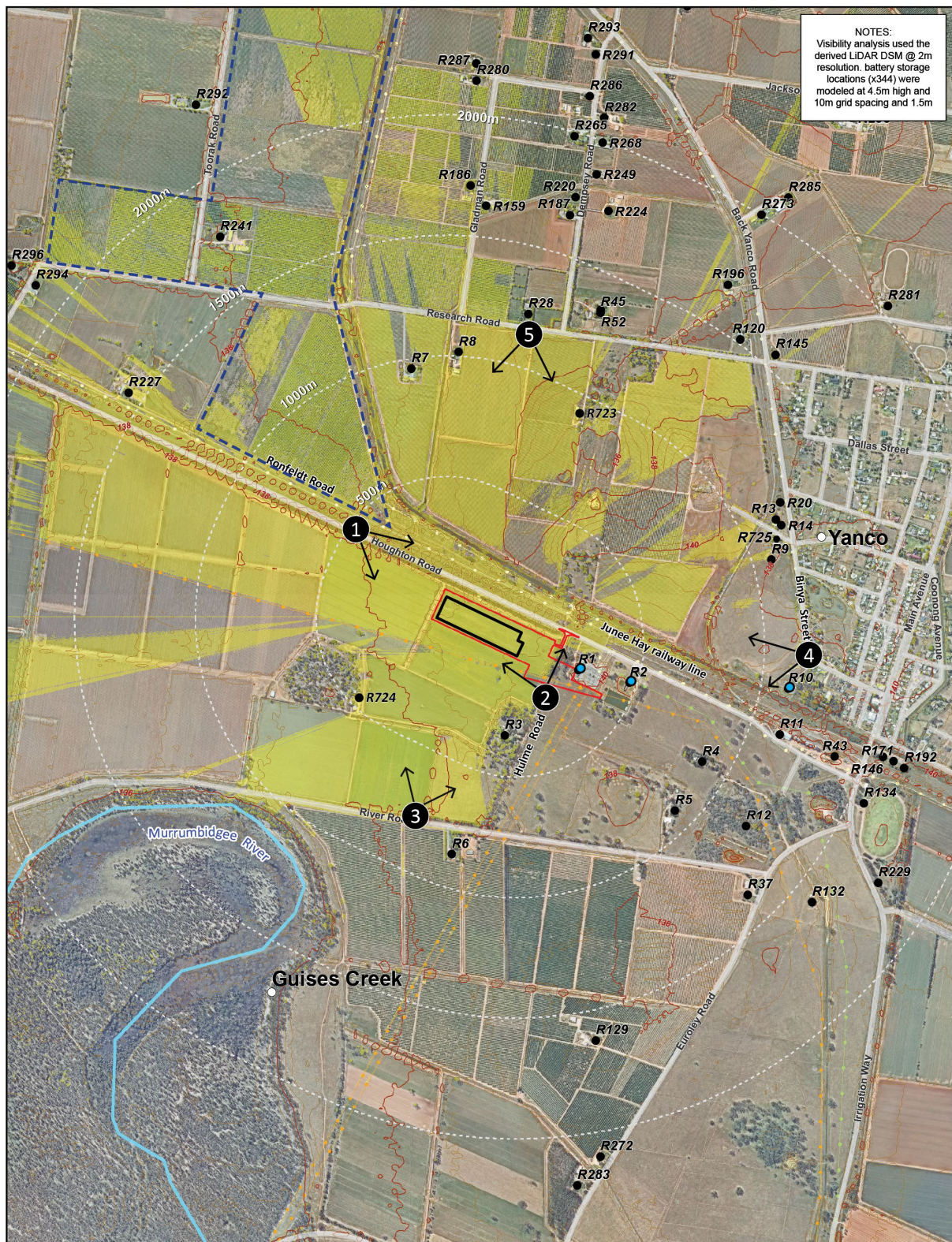


FIGURE 6-1 PLAN SHOWING VISUAL CATCHMENT OF THE PROPOSAL AND REPRESENTATIVE VIEWPOINT LOCATIONS

6.2.3. Viewpoint 1: View southeast from Houghton Road



FIGURE 6-2 VIEWPOINT 1: VIEW SOUTHEAST FROM HOUGHTON ROAD- EXISTING VIEW



FIGURE 6-3 VIEWPOINT 1: VIEW SOUTHEAST FROM HOUGHTON ROAD — PHOTOMONTAGE

TABLE 6-6 VIEWPOINT ASSESSMENT – VIEWPOINT 1: VIEWS FROM HOUGHTON ROAD

Existing view	View across the irrigation channel and aquatic vegetation to arable fields in the middle ground. This view is enclosed by vegetation in the background, including trees along Hume Road, and around the existing dwelling and sheds, which can be seen in the middle to background. The Yanco Transgrid substation is located beyond the trees and largely out of view from this location.	
Visual sensitivity	Very low	
Viewpoint type	Local unsealed road not identified as a tourist road or scenic drive.	Very low
Scenic quality	Views contain landscape character of predominantly low scenic quality comprising:	Low
<i>Landform</i>	<i>Flat, modified landform with no topographical natural features.</i>	<i>Low</i>
<i>Vegetation</i>	<i>Vegetation mostly cleared for agricultural use, some mature trees along road verges</i>	<i>Low</i>
<i>Waterbodies</i>	<i>Waterbodies include irrigation channels and farm dams.</i>	<i>Low</i>
<i>Social / cultural</i>	<i>Modified rural landscape with presence of electricity infrastructure, irrigation channels, roads and railway.</i>	<i>Low</i>
<i>Human presence</i>	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads.</i>	<i>Low</i>
Magnitude of change	Low	
without mitigation	- The Proposal would be seen in the middle ground of this view, occupying part of the field between an existing irrigation channel and the transmission line easement, about 50 metres south of Houghton Road. - The embankments along the irrigation channel will partially block views to the development site from Houghton Road. - Noise walls (up to 4 metres tall) would be located on the southern side of the BESS and installed around the transformers. These walls would block views to much of the transformer area and be seen rising above, forming a backdrop to the Proposal. - The trees along Hume Road, would continue to be visible rising above the proposal. There may be some tree removal for the connection infrastructure, which would not be noticeable at this distance, and viewed against other trees.	
Visual impact	Very low	
Magnitude of change	Negligible	
with screening vegetation	Planting would be installed along the northern and western boundary of the proposal. This vegetation would establish over time to screen views of the BESS, noise walls and lower portions of the switching station and connection infrastructure.	
Visual impact	Negligible	



FIGURE 6-4 VIEW 1A: VIEW SOUTHEAST FROM HOUGHTON ROAD — PHOTOMONTAGE, WITH SCREENING VEGETATION

6.2.4. Viewpoint 2: View northwest from Hume Road



FIGURE 6-5 VIEWPOINT 2: VIEW NORTH FROM HUME ROAD

TABLE 6-7 VIEWPOINT ASSESSMENT – VIEWPOINT 2: VIEWS FROM HUME ROAD

Existing view	View to an open arable field (left of view) and enclosed by mature eucalyptus trees along Hume Road (right of view). There are scattered trees in the background, and some existing transmission lines crossing the view.	
Visual sensitivity	Very low	
Viewpoint type	Local unsealed road not identified as a tourist road or scenic drive.	Very low
Scenic quality		Low
<i>Landform</i>	<i>Flat, modified landform with no topographical natural features.</i>	<i>Low</i>
<i>Vegetation</i>	<i>Vegetation mostly cleared for agricultural use, some mature trees along road verges</i>	<i>Low</i>
<i>Waterbodies</i>	<i>None</i>	-
<i>Social / cultural</i>	<i>Modified rural landscape with presence of electricity infrastructure, irrigation channels, roads and railway.</i>	<i>Low</i>
<i>Human presence</i>	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads.</i>	<i>Low</i>
Magnitude of change	Low	
without mitigation	- The proposal would be set back about 50 metres west of Hume Road and include the transformer area and switching station in the middle ground and battery enclosure compound beyond. - The grid connection, between the transformer area and existing substation, would cross the view, including a 132 kV overhead sub-transmission line crossing Hume Road, where a wide section of the existing mature trees would be removed. - Noise walls would be installed along the southern side of the BESS area (up to 4 metres high) and around the transformer area within the switching station. The southern noise wall would be a long, low structure extending through the field, blocking views to the BESS and transformer infrastructure. - This infrastructure would obstruct the open view across the fields and scattered vegetation beyond. - The proposal would be enclosed by security fencing with new gates and fencing alongside Hume Road, in the background of the view. - There would be glimpses to vehicles accessing the site near the corner of Houghton Road.	
Visual impact	Very low	
Magnitude of change	Low	
with screening vegetation	- Planting would be installed along the southern and eastern boundary of the proposal. This vegetation would establish over time to screen views of the noise walls. - The grid connection infrastructure, including the 132 kV overhead sub-transmission line would continue to be seen in the middle ground, and crossing Hume Road. - There would be glimpses to the transformer area and switching station, where the connection crosses the site boundary. - The vegetation removed from Hume Road would not be replaced and would reduce the leafy character of this section of the road.	
Visual impact	Very low	

6.2.5. Viewpoint 3: View north from River Road



FIGURE 6-6 VIEWPOINT 3: VIEW NORTH FROM RIVER ROAD



FIGURE 6-7 VIEWPOINT 3: VIEW NORTH FROM RIVER ROAD, PHOTOMONTAGE



FIGURE 6-8 VIEWPOINT 3: VIEW NORTH FROM RIVER ROAD, PHOTOMONTAGE, ZOOMED DETAIL



FIGURE 6-9 VIEWPOINT 3: VIEW NORTH FROM RIVER ROAD, PHOTOMONTAGE INCLUDING SCREENING VEGETATION



FIGURE 6-10 VIEWPOINT 3: VIEW NORTH FROM RIVER ROAD, PHOTOMONTAGE INCLUDING SCREENING VEGETATION, ZOOMED DETAIL

TABLE 6-8 VIEWPOINT ASSESSMENT – VIEWPOINT 3: VIEWS FROM RIVER ROAD

Existing view	Open view across flat arable fields with scattered trees and a block of vegetation (left of view), background. There are some existing transmission lines crossing the view, and glimpses to agricultural buildings and homesteads amongst the existing trees.
Visual sensitivity	Very low
Viewpoint type	Local unsealed road not identified as a tourist road or scenic drive. Very low
Scenic quality	Low
<i>Landform</i>	<i>Flat, modified landform with no topographical natural features.</i> Low
<i>Vegetation</i>	<i>Vegetation mostly cleared for agricultural use, some mature trees in the background</i> Low
<i>Waterbodies</i>	<i>None</i> -
<i>Social / cultural</i>	<i>Modified rural landscape with presence of electricity infrastructure and unsealed roads.</i> Low
<i>Human presence</i>	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads.</i> Low
Magnitude of change	Low
without mitigation	- The proposal would be seen in the background of views from River Road, around 650 metres to the north, occupying part of the field north of the existing 132kV transmission line easement. - The BESS enclosures would be low rise and comprise a small part of the vertical field of view, however, it would comprise a large part of the horizontal field of view, extending for around 350 metres in length. - The proposed grid connection between the transformer area and existing substation would be visible in the background of view, crossing over Hume Road east of the site, requiring clearance of vegetation. - Noise walls would be installed along the southern side of the BESS area (up to 4 metres high) and around the transformer area within the switching station. The southern noise wall would be a long, low structure extending through the field, blocking views to the BESS and transformer infrastructure. - The Noise walls would largely block views to the battery enclosures. - This infrastructure would obstruct the open view across the fields and scattered vegetation beyond. The noise wall would have a uniform layout of enclosures and supporting infrastructure, and somewhat similar to the shapes and forms of the surrounding flat, arable landscape. - The BESS grid connection equipment and O&M buildings would also be visible in the background of the view, at the eastern end of the development site, including glimpses of the switchgear and transformer bays with gantry columns and beams.
Visual impact	Very low
Magnitude of change	Negligible
with screening vegetation	- Planting would be installed along the southern boundary of the proposal. This vegetation would establish over time to screen views of the noise walls. - The grid connection infrastructure, including the 132 kV overhead sub-transmission line would continue to be seen in the background. However, this infrastructure would be seen in the context of existing power lines and not be prominent in the view, due to distance and there only being a small extent of the proposal visible.
Visual impact	Negligible

6.2.6. Viewpoint 4: Views southwest from Binya Street



FIGURE 6-11 VIEWPOINT 5: VIEW WEST FROM BINYA STREET – EXISTING VIEW



FIGURE 6-12 VIEWPOINT 5: VIEW WEST FROM BINYA STREET – EXISTING VIEW, ZOOMED DETAIL VIEW

TABLE 6-9 VIEWPOINT ASSESSMENT – VIEWPOINT 5: VIEW WEST FROM BINYA STREET

Existing view	Open view across fields under pasture which is largely flat and divided by irrigation channels formed by embankments. In the background of the view, embankments along the Yanco to Griffith railway line and irrigation channels provide some screening of the proposal site. There are blocks of vegetation and scattered trees form the background of this view. Within this vegetation there are glimpses to the Yanco Transgrid substation, and there are existing transmission lines crossing the view also in the background.	
Visual sensitivity	Very low	
Viewpoint type	Local unsealed road not identified as a tourist road or scenic drive.	Very low
Scenic quality		Low
<i>Landform</i>	<i>Flat, modified landform with no topographical natural features.</i>	<i>Low</i>
<i>Vegetation</i>	<i>Vegetation mostly cleared for agricultural use, some mature trees in the background</i>	<i>Low</i>
<i>Waterbodies</i>	<i>None</i>	-
<i>Social / cultural</i>	<i>Modified rural landscape with presence of electricity infrastructure.</i>	<i>Low</i>
<i>Human presence</i>	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads.</i>	<i>Low</i>
Magnitude of change	Negligible	
without mitigation	- The proposal would be around one kilometre from this location, in the far background of the view. The intervening landform and vegetation would screen the lower portion of the proposal. - Although there would require some vegetation removal along Hume Street for the proposed grid connection, the majority of trees along Houghton and Hume roads would be retained. - The grid connection gear and transmission lines would rise above the intervening landform and would be viewed against a backdrop of vegetation along surrounding roads and fields. - Due to the distance, the proposal would not be prominent in the view. The proposal would also be seen in the context of an existing substation and intermittent freight trains travelling along the Yanco to Griffith railway line.	
Visual impact	Negligible	
Magnitude of change	Negligible	
with screening vegetation	Planting would be installed along the northern boundary of the proposal. This vegetation would establish over time and provide additional screening of the upper portions of the proposal including the grid connection infrastructure.	
Visual impact	Negligible	

6.2.7. Viewpoint 5: View south from Research Road



FIGURE 6-13 VIEWPOINT 6: VIEW SOUTH FROM RESEARCH ROAD – EXISTING VIEW

TABLE 6-10 VIEWPOINT ASSESSMENT – VIEWPOINT 6: VIEW SOUTH FROM RESEARCH ROAD

Existing view	Open view across a vineyard on an open flat land. There are existing dwellings and large agricultural buildings within the rural landscape in the fore and middle ground. Blocks of vegetation and scattered trees form the background of this view. Within this vegetation there are glimpses to several existing power lines connecting to the Yanco Transgrid substation, which is out of view.	
Visual sensitivity	Very low	
Viewpoint type	Local road not identified as a tourist road or scenic drive.	Very low
Scenic quality		Low
<i>Landform</i>	<i>Flat, modified landform with no topographical natural features.</i>	<i>Low</i>
<i>Vegetation</i>	<i>Vineyards in the foreground and some mature trees in the background</i>	<i>Low</i>
<i>Waterbodies</i>	<i>None</i>	-
<i>Social / cultural</i>	<i>Modified rural landscape with grape vines and the presence of electricity infrastructure.</i>	<i>Low</i>
<i>Human presence</i>	<i>Dispersed dwellings, presence of electricity infrastructure, lower scale and trafficked roads.</i>	<i>Low</i>
Magnitude of change	Negligible	
without mitigation	- The proposal would be seen in the distant background, around 1.1 kilometres away. - The embankments along the irrigation channel, extending along Houghton Road, would be retained and partially block views to the lower sections of the proposal from this angle. - The BESS enclosures and associated infrastructure, including the grid connection gear and transmission lines, would be seen rising above the irrigation channel embankments and viewed against a backdrop of vegetation along surrounding roads and fields. - The BESS enclosures would be low rise and comprise a small part of the vertical field of view. From this location, it would also comprise a small part of the horizontal field of view, due to the distance from proposal. - Where visible, the BESS would also have a uniform layout of enclosures and supporting infrastructure; somewhat similar to the shapes and forms of the surrounding flat, arable landscape with rows of crops. - Although there would require some vegetation removal along Hume Road for the proposed grid connection, the majority of trees along Houghton and Hume roads would be retained. - Due to the distance, the proposal would not be prominent in the view. The proposal would also be seen in the context of existing transmission lines and intermittent freight trains travelling along the Yanco to Griffith railway line.	
Visual impact	Negligible	
Magnitude of change	Negligible	
with screening vegetation	Planting would be installed along the northern boundary of the proposal. This vegetation would establish over time and provide additional screening of the proposal including the grid connection infrastructure.	
Visual impact	Negligible	

6.2.8. Summary of representative viewpoint assessment

Table 6-11 summarises the impacts identified in the viewpoint assessment.

There were no scenic or significant vistas identified near or within the visual catchment of the proposal. The closest scenic vistas include views within the Murrumbidgee National Park, which is located around 3.5 kilometres south of the development site and is outside of the visual catchment.

6.2.9. Views during construction

During construction, works to install the BESS would be seen across the site including construction vehicles and machinery used to prepare and install the site and install the access road, fencing, noise walls, operations and maintenance buildings, BESS enclosures and supporting infrastructure, and connection infrastructure. There would be cranes and other equipment rising above the proposal elements for their installation. Construction vehicles would be seen using Houghton Road for deliveries and to access the proposal site.

During this time the proposal would be slightly more prominent in views, and there is the potential for higher visual impacts temporarily during this time.

TABLE 6-11 SUMMARY OF ASSESSMENT OF REPRESENTATIVE VIEWPOINTS – PUBLIC DOMAIN

Viewpoint number and location	Visual sensitivity	Magnitude – no mitigation	Visual impact	Magnitude – with screening vegetation	Visual impact
Viewpoint 1: View southeast from Houghton Road	Very low	Low	Very low	Negligible	Negligible
Viewpoint 2: View northwest from Hume Road	Very low	Low	Very low	Negligible	Negligible
Viewpoint 3: View north from River Road	Very low	Low	Very low	Negligible	Negligible
Viewpoint 4: View from Binya Street	Very low	Negligible	Negligible	Negligible	Negligible
Viewpoint 5: View southwest from Research Road	Very low	Negligible	Negligible	Negligible	Negligible

6.3.Views at night

6.3.1. Approach

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) and the *Dark Sky Planning Guideline, Protecting the observing conditions at Siding Spring* (NSW DPE 2023).

AS4282 identifies environmental zones which are useful for categorising night-time landscape settings. This methodology uses these environmental zones to describe the existing night-time visual condition and assign a sensitivity to these settings.

6.3.1.1. 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 described in Table 6-12.

6.3.1.2. Night-time magnitude of change

The magnitude of change that would be expected within each landscape character area at night is then identified. Table 6-13 lists the categories used to describe the visual magnitude of change at night.

TABLE 6-12 ENVIRONMENTAL ZONE SENSITIVITY – NIGHT-TIME

Environmental Zones (AS4282:2019)		
Sensitivity level	Description	Examples
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

6.3.1.3. Assigning 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 (refer to Table 6-5).

TABLE 6-13 VISUAL MAGNITUDE OF CHANGE LEVELS – NIGHT-TIME

Magnitude of change	Description
High	Substantial change to the level of skyglow, glare or light spill expected, and / or The lighting of the proposal would transform the character of the surrounding setting at night, and / or The effect of lighting would be experienced over an extensive area and / or
Medium	Considerable change to the level of skyglow, glare or light spill and / or The lighting of the proposal 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.
Low	Alteration to the level of skyglow, glare or light spill would be expected, and / or The lighting of the proposal 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.
Very Low	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.

6.3.2. Assessment of views at night

Sensitivity of views at night

At night the proposal site and surrounding landscape would have a relatively low level of lighting. There would be some light emitted from the scattered rural residences and outbuildings which are widely spread around the site. There would be more lighting on the outskirts of Yanco where the density of residences increases.

There would be headlights from vehicles travelling along nearby roads such as Houghton Road and Hume Road. There would also be a greater concentration of vehicles using Binya Street, on the outskirts of the Yanco township.

There would be a general sky glow above the township of Yanco, located about 1.5 km to the northeast of the proposal, however, this would not noticeably influence the character of the proposal site.

Overall, the proposal site and surrounding landscape has low district brightness (A2) and has a moderate visual sensitivity at night (refer to Table 7 6).

With potential further development of the R5 Large Lot Residential land to the northeast of the proposal, west of Binya Street, there could be a slight increase in lighting expected in the future.

Night time visual impact during construction

Night construction works are not proposed for this proposal. There may, however, be infrequent after-hours deliveries or vehicles accessing the proposal site in the early morning during winter which would introduce some lighting. There may also be some security lighting established during construction that would introduce some additional lighting to the site and surrounding area.

Overall, any lighting would be set back from surrounding dwellings and seen in the context of headlights from vehicles using nearby roads. There would be a **negligible** magnitude of change and a visual impact at night during construction.

Night time visual impact during operation:

During operation there would be some minor security lighting provided within the fenced area. This may include lighting mounted outside the operations and maintenance building. This lighting would meet the requirements of *AS4282 Control of the obtrusive effects of outdoor lighting* and would not noticeably alter the prevailing light levels in the study area.

There would not be any direct light spill on private dwellings due to the large distance between the proposal and neighbouring dwellings. There would also be limited potential for additional sky glow and upward projected light with the implementation of cut off light fittings as would be expected for a design complying with the Australian Standards.

Overall, there would be a low magnitude of change to a landscape of moderate visual sensitivity, and a **low visual impact** at night during operation.

6.4. Impact on views from surrounding dwellings

This section provides an assessment of the impact on views from private residences in close proximity to the proposal site.

6.4.1. Approach

The assessment of views from private dwellings has been undertaken in the following steps:

- Identify potential dwellings within one kilometre of the proposal and confirm dwellings that would have a view to the proposal (refer to Table 6-15 and Table 6-17)
- Identify visual sensitivity by combining:
 - viewpoint sensitivity (refer to Table 6-14), as described in the Technical Supplement (NSW DPE 2022)) and
 - scenic quality (refer to Table 6-2)
 to determine visual sensitivity (refer to Table 6-5).
- Describe the likely magnitude change to the view (refer to Table 6-4)
- Identify potential view impact (refer to Table 6-5)
- Describe any mitigation measures proposed to reduce any impacts.

If the potential for a moderate to high visual impact was identified, further detailed visual assessment was undertaken. Refer to Figure 6-1 for location of dwellings.

TABLE 6-14 VIEWPOINT SENSITIVITY

Viewpoint type	Very low viewpoint sensitivity	Low viewpoint sensitivity	Moderate viewpoint sensitivity	High viewpoint sensitivity
Residential	No place of residence present	Secondary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4, and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3, and C4) Dwellings used for residential purposes located on land zoned IN1 and IN2.	Primary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4, and RU6), large lot residential areas (zoned R5) and in environmental or conservation areas (zoned C2, C3, and C4)	Dwellings in residential areas and rural villages (land zoned R1, R2, R3, R4 and RU5)

6.4.2. Assessment of private views

6.4.2.1. Private dwellings

Dwellings within one kilometre of the proposal have been considered for potential view impacts. These dwellings are shown on Figure 6-1. Beyond this, the proposal is unlikely to be prominent in views, and therefore unlikely to cause an impact on private views. Note, there are two associated dwellings at 120 Houghton Road located to the south of the development site (R3 and R724), as shown on Figure 6-1.

6.4.2.2. There are also several dwellings located on the western outskirts of Yanco, along Cudgel and Binya streets (refer to Figure 6-1.). This includes a large lot at 35-37 Cudgel Street, zoned R2: Low Density Residential, which has approval for a seven lot subdivision. Two of these lots have been developed (refer to R9 and R725). The closest part of this R2 zoned land is around 650 metres from the development site. Dwelling entitlements

Premise conducted a review of available data to determine if there are any properties near to the development site that are lawfully capable of accommodating a dwelling. This was completed via two methods.

- Review of the LSC DA tracker for dwelling and subdivision approvals; and
- Review of commercially available spatial data to identify land parcels within the visual catchment of the project that achieve the relevant minimum lot size as per Clause 4.2B of the LEP.

A review of the LSC DA tracker for street addresses (by reference to NSW Six Maps data) within 2km of the development site identified five (5) approved development applications that provided for either dwelling development or subdivision of land for dwelling purposes. Due to the way information was stored in the Council tracking system, it was not clear whether the properties identified were within the 2km study area or not. Premise sought details of these (5) five applications from Council to enable

review of the property and consent details. As a consequence of this review, it was determined that either the relevant consent did not provide for further dwelling development (i.e., a two lot subdivision with an express condition prohibiting dwellings) or that the consent was outside of the 2 kilometre study area. As such, no additional dwelling entitlements were identified within 2km of the development site via this review.

Consideration of the visual catchment informed the scope of the surrounding land requiring analysis from a minimum lot size perspective. By reference to the visual catchment, properties with a potential view of the development site and which are located within 2km were considered. Each lot was identified, together with the zoning, the size of the lot and the existence, or not, of a dwelling on the land. All of the lots within the visual catchment area, and within 2km of the development site, are within the RU1 zone with a minimum lot size of 150 ha.

None of the lots within the visual catchment and within 2km of the site achieve a size of greater than 150 ha, and therefore none of these properties have a dwelling entitlement.

Based on the analysis outlined above, there are no dwelling entitlements within the visual catchment of the project that require consideration in the visual impact assessment.

6.4.2.3. Preliminary assessment

Using the preliminary visual catchment analysis and field work, each identified dwelling has been reviewed to confirm if there is the potential for a view to the proposal (refer to Table 6-15).

Note, this assessment of private views has not applied the preliminary assessment tools contained in the Large-Scale Solar Energy Guideline, Technical Supplement - Landscape and Visual Impact Assessment (DPE 2022) as this applicable to the scale and unique visual characteristics of solar energy projects and is not suitable for the assessment of stand-alone BESS infrastructure.

TABLE 6-15 PRELIMINARY ASSESSMENT OF DWELLINGS
WITHIN AROUND ONE KILOMETRE OF THE PROPOSAL

No.	Address	Potential view to proposal (Y/N)
R3 and R724	120 Houghton Road, Yanco	Y
R4	26 Euroley Road, Yanco	N
R5	44 River Road, Yanco	N
R6	135 River Road, Yanco	Y
R7	235 Research Road Yanco	Y
R8	215 Research Road Yanco	Y

No.	Address	Potential view to proposal (Y/N)
R9	35-37 Cudgel Street Yanco	Y
R723	27 Grant Road, Leeton	Y

6.4.2.4. Detailed assessment

A detailed assessment of those dwellings with a potential view to the site is contained in Table 6-17 and a summary of this analysis is shown in Table 6-16.

As this desktop assessment has identified very low potential for a view to the project, and negligible visual impacts, no photomontages have been prepared from private property.

TABLE 6-16 SUMMARY OF ASSESSMENT OF VIEWS FROM THE PRIVATE DWELLINGS

Dwelling location / location		Viewpoint sensitivity	Magnitude of change (no mitigation)	Visual impact	Magnitude of change (with screening vegetation)	Visual impact
R3	120 Houghton Road, Yanco (associated dwelling)	Moderate	Low	Low	Negligible	Negligible
R724	120 Houghton Road, Yanco (associated dwelling)	Moderate	Low	Low	Negligible	Negligible
R6	135 River Road, Yanco	Moderate	Negligible	Negligible	Negligible	Negligible
R7	235 Research Road Yanco	Moderate	Negligible	Negligible	Negligible	Negligible
R8	215 Research Road Yanco	Moderate	Negligible	Negligible	Negligible	Negligible
R9	35-37 Cudgel Street Yanco	Moderate	Negligible	Negligible	Negligible	Negligible
R723	27 Grant Road, Leeton	Moderate	Negligible	Negligible	Negligible	Negligible

TABLE 6-17 DETAILED ASSESSMENT OF VIEWS FROM THE PRIVATE DWELLINGS

Dwelling location / location		Distance to proposal	Viewpoint sensitivity	Scenic Quality	Visual sensitivity level	Magnitude of change (no mitigation)	Visual impact	Magnitude of change (with screening vegetation)	Visual impact
R3	120 Houghton Road, Yanco (associated dwelling)	290m	Moderate Potential primary northerly view from dwelling in RU1 zone.	Low Flat landform, clumps of trees with open fields of crops, and presence of energy infrastructure, houses and farm structures.	Low	Low The proposal would be glimpsed through existing bushland to the north of the dwelling. Views would include the long, 4.5 metre high, noise wall, and tree removal on Hume Road and new connection infrastructure.	Low	Negligible There would be screening vegetation along the southern and western site boundaries that would screen the noise wall over time, reducing the visibility of the proposal. The remaining glimpses to additional transmission lines would be seen in the context of existing transmission lines and would be absorbed into the setting, which has existing power lines and infrastructure.	Negligible
R724	120 Houghton Road, Yanco (associated dwelling)	420m	Moderate Potential primary north-easterly view from dwelling in RU1 zone.	Low Flat landform, sparse vegetation with fields of crops, and presence of energy infrastructure, houses and farm structures.	Low	Low The proposal would be seen in the middle ground of views, through existing trees in the garden north of the dwelling. Views would include the long, 4.5 metre high, noise wall along the southern boundary of the proposal site, tree removal on Hume Road and connection infrastructure.	Low	Negligible There would be screening vegetation along the southern and western site boundaries that would screen the noise wall over time, reducing the visibility of the proposal. The remaining glimpses to additional transmission lines would be seen in the context of existing transmission lines and would be absorbed into the setting, which has existing power lines and infrastructure.	Negligible
R6	135 River Road, Yanco	830m	Moderate Potential primary north-easterly view	Low Flat landform some blocks of vegetation, open fields of crops, and	Low	Negligible Views to the proposal would be blocked by existing vegetation in the garden and north of River Road.	Negligible	Negligible The proposal would be out of view.	Negligible

Dwelling location / location		Distance to proposal	Viewpoint sensitivity	Scenic Quality	Visual sensitivity level	Magnitude of change (no mitigation)	Visual impact	Magnitude of change (with screening vegetation)	Visual impact
			from dwelling in RU1 zone.	presence of energy infrastructure and farm structures.					
R7	235 Research Road Yanco	904m	Moderate Potential primary southerly views from dwelling in RU1 zone.	Low Flat landform, some blocks of vegetation with fields of crops, existing presence of large-scale farm structures.	Low	Negligible The proposal would be mostly blocked by intervening modified landforms (irrigation channels) and existing shed structures to the rear of this dwelling. Some minor glimpses would be viewed against a backdrop of vegetation.	Negligible	Negligible Screening vegetation along the northern boundary of the proposal will further reduce the visibility of the proposal.	Negligible
R8	215 Research Road Yanco	992m	Moderate Potential primary southerly views from dwelling in RU1 zone.	Low Flat landform, some blocks of vegetation with fields of crops, existing presence of large-scale farm structures.	Low	Negligible Views to the proposal would be mostly blocked by intervening modified landforms (irrigation channels) and existing shed structures to the rear of this dwelling. Any minor glimpses would be viewed against a backdrop of vegetation.	Negligible	Negligible Screening vegetation along the northern boundary of the proposal will further reduce the visibility of the proposal.	Negligible
R9	35-37 Cudgel Street Yanco	1,000m+	Moderate Potential primary southerly views from dwelling in RU1 zone.	Low Flat landform, some blocks of vegetation with fields of crops, existing presence of large-scale farm structures.	Low	Negligible Views to the proposal would be mostly blocked by intervening modified landforms (irrigation channels). Any minor glimpses to the proposal would be viewed against a backdrop of vegetation.	Negligible	Negligible Screening vegetation along the northern boundary of the proposal will further reduce the visibility of the proposal.	Negligible

Dwelling location / location		Distance to proposal	Viewpoint sensitivity	Scenic Quality	Visual sensitivity level	Magnitude of change (no mitigation)	Visual impact	Magnitude of change (with screening vegetation)	Visual impact
R723	27 Grant Road, Leeton	890m	Moderate Potential primary southerly views from dwelling in RU1 zone.	Low Flat landform, some blocks of vegetation with fields of crops, existing presence of rail infrastructure, power lines and large-scale farm structures.	Low	Negligible Views to the proposal would be mostly blocked by intervening modified landforms (irrigation channels). Any minor glimpses to the proposal would be viewed against a backdrop of vegetation.	Negligible	Negligible Screening vegetation along the northern boundary of the proposal will further reduce the visibility of the proposal.	Negligible

7. Cumulative impacts

The following 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 proposal together with other nearby development proposals of a similar nature and scale.

Projects with the potential for cumulative impacts with Yanco BESS proposal were identified through a

review of publicly available information and environmental impact assessments from the following databases in March 2024, including DPHI's Major Projects register.

The following projects have been considered in the cumulative impact assessment:

- Yanco Solar Farm, and
- Yanco Delta Wind Farm.

TABLE 7-1 CUMULATIVE IMPACT ASSESSMENT

Project	Description	Distance / Interface	Cumulative impacts
Yanco Solar Farm	The Yanco Solar Farm project, which was approved on 16th July 2020. The project includes solar panel arrays within a development footprint of around 183 hectares, extending north of Ronfeldt Road in a linear site.	Located around 430 metres northwest of the proposal, at its closest point.	<u>Landscape character impacts:</u> The proposed Yanco Solar Farm will be located within the Yanco rural plain landscape character zone (LCZ1). The changes to the landscape from this project would be similar in nature to those proposed by Yanco BESS proposal, including some minor landform changes, the removal of crops and introduction of electrical and transmission infrastructure. Together these projects would change the landscape character of this area from a predominantly rural landscape to a character where energy generating, storage and transmission infrastructure is integrated into the rural landscape. The Yanco BESS, would only make a relatively small contribution to this character change. If approved, there is the potential for a small cumulative landscape character impact associated with Yanco BESS proposal in combination with the Yanco Solar Farm project, during construction and operation. <u>Visual impacts:</u> There is the potential for the Yanco Solar Farm project to be seen sequentially and together with the proposal in areas southwest of Yanco. This would include in views from Research Road and Houghton Road. From Houghton Road, these views would also include views of the transmission lines, the Yanco substation, Yanco Sewerage Treatment Plant and freight train line. The landscape seen in these views, therefore, has a relatively high capacity for change due to this infrastructure, flat landform with blocks of vegetation and embankments. Due to the limited visibility of the proposal, that would be further screened by vegetation over time, there is not likely to be a material cumulative effect on views during construction or operation due to the proposal.
Yanco Delta Wind Farm	Wind farm containing up to 208 wind turbine generators, to a maximum tip height of 270 metres.	Located around 70 kilometres southwest of the proposal.	Due to the large distance between the projects, there would not be a cumulative landscape character or visual impact.

8. Mitigation

8.1. How potential impacts have been avoided and/or minimised

The following measures have been incorporated into the design of the proposal:

- The proposal has been located in an area that is close to existing electricity infrastructure and maximises the distance from the areas where most dwellings exist.
- The proposal has been located to avoid landscape features such as the existing irrigation channels and mature Eucalyptus trees along Hume Road.
- Screen planting is proposed along the outer sides of the perimeter fence and include species that reflect the local character (refer to **Attachment A** Landscape Concept Plan). This screening vegetation reduces the visibility and visual impacts of the project from surrounding areas, integrates the project into the landscape setting and enhances the local landscape character.

8.2. Proposed additional mitigation measures

The following mitigation measures should be considered to further reduce the potential visual impacts identified in this assessment (refer to Table 8-1).

TABLE 8-1 MITIGATION MEASURES

	Mitigation measure
LV1	Lighting during construction and operation would be designed and operated in accordance with AS4282-2019 Control of the obtrusive effects of outdoor lighting.
LV2	Noise walls and buildings (excluding electrical facilities such as MVPS and BESS containers) to be painted a colour that blends with the local landscape (such as Colorbond Cottage Green, Woodland grey, Pale Eucalypt or similar) to reduce their prominence of these structures in views to the proposal.