Memorandum

SUBJECT
Updated visual impact assessment

DATE
29 April 2022

OUR REF
30123695

CLIENT
Greenspot Wallerawang Pty Ltd

LOCATION
Old Wallerawang Power Station

1 Introduction

The Environmental Impact Statement (EIS) for the Wallerawang Battery Energy Storage System Project (the Project), which was on public exhibition between 9 February 2022 and 8 March 2022. Public exhibition provides the community, interested parties and key stakeholders (including government agencies and councils) with an understanding of the Project and provides the opportunity for interested parties to make a submission on the EIS.

This memo was prepared in response to the following comments from the Department of Planning and Environment (DPE) made during the exhibition period:

Provide further information and clarification in the visual assessment, including:

- *A table listing the viewpoints, visual sensitivity, magnitude to visual change, distances and elevation differences;*
- *Consideration of the combined visual impact of the proposed works with changes to ground levels and proposed 5 m+ high noise barriers;*
- *Images of the proposed project layout from Viewpoints 1 and 2; and*

The selection of Viewpoint 4 as the most representative of residential properties in Wallerawang and consider provision of an additional viewpoint from the eastern boundary of the residential area, including an analysis of visual impacts in the event of the future removal of the interceding pine plantation.

These comments have addressed and incorporated into an updated visual assessment which is provided below. The updated assessment also addresses some refinement of the project that has occurred since the exhibition of the EIS, specifically the configuration of noise barriers that may be constructed if required to comply with relevant noise criteria.

2 Methodology

The visual impact of the Project was assessed via the following key steps:

1. **Viewpoint identification:** A review of the applicable guidelines and a desktop analysis of the surrounding area was undertaken to identify areas that would potentially be subject to visual impacts as a result of the Project. Based on this assessment, viewpoints were selected and are identified further in Table 4 and Figure 1. An additional viewpoint (Viewpoint 7) was assessed at the request of DPE.
2. **Site inspection:** Through a site inspection, the relevance of the locations identified in the previous step could be validated. Photographs were taken from key viewpoints and are presented in Figure 1. An additional site visit was undertaken in March 2022 in response to DPE comments.

3. **Assessment of visual impact:** The visual impact from the key viewpoints was then assessed qualitatively on the basis of prescribed assessment criteria. This included identification of the sensitivity of the viewer and the magnitude of the modification to the view created by the Project.

The visual impact of the Project was assessed using a range of criteria against which the relative importance of each observer location was determined, including:

- Context and visual setting
- Visual elements
- Visual character
- Development and surrounding land use
- Distance to view (foreground, middle-ground, and background)
- Visual prominence of the development
- Potential changes to the view setting
- Category of viewer (e.g. resident, works, open space user)
- Importance of the view including consideration of perceived cultural and historical values.

For each viewpoint, these criteria were addressed under three categories, described in Table 1 below.

Table 1 Visual impact assessment criteria

Criteria	Description
Visual sensitivity	Visual sensitivity refers to the susceptibility of a view to accommodate change without losing valued attributes. The values of a view refer to any aspect of landscape or views people consider to be important. Visual sensitivity depends on the distance between the viewer and a development, the category of the viewer (e.g. resident, worker, open space user) and the importance of the view (e.g. is it a view people deliberately seek out). In general, views can be classified as: • High sensitivity – Locations where the quality of view is important to the viewer, there is a sustained duration of view and/or large numbers of viewers (e.g. public look-out spots) • Moderate sensitivity – Locations where the quality of view is important to the viewer, but the duration of views and/or number of viewers are lower than high sensitivity views (residential communities with direct view) • Low sensitivity – Locations where the quality of view is not particularly important to the viewer (e.g. industrial areas with employees focused on work).
Magnitude of visual change	• The magnitude of visual change refers to the scale of the Project and the extent and proximity of the view to it. The four levels of magnitude used in the assessment are as follows: • High magnitude – Considerable or uncharacteristic modification to the visual setting • Moderate magnitude – Prominent but not substantially uncharacteristic modification to the visual setting • Low magnitude – Minimal alteration and modification consistent with the existing visual setting • Negligible magnitude – No discernible change to the existing visual setting.
Visual impact	• The visual impact is a result of the visual sensitivity and the visual modification and is summarised on a qualitative basis. The resulting overall visual impact rating for each viewpoint was then determined using the assessment matrix presented in Table 2 below.

Table 2 Overall impact rating as a combination of visual sensitivity and visual adaption

		Magnitude of visual change			
		High	**Moderate**	**Low**	**Negligible**
Visual sensitivity	**High**	High	High-moderate	Moderate	Negligible
	Moderate	High-moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible

3 Existing environment

The Project Site is located immediately south of the retired Wallerawang Power Station site, approximately 10 kilometres north of Lithgow and 115 kilometres north-west of the Sydney Central Business District (CBD). The town of Wallerawang is located approximately 1.5 kilometres west of the Project Site.

The Project Site is in an established industrial/power generation area that consists of a mix of industrial developments and electrical infrastructure including power lines, low density residential, local commercial businesses and other uses including recreational activities on Lake Wallace. The regional area is characterised by mining and agriculture.

The surrounding landscape consists of large undulating hills and fields. The landscape east of the Project Site comprises of an escarpment and native forestry backing onto Newnes Nature Reserve. Marrangaroo National Park is located approximately five kilometres to the south.

The Project Site is situated within a relatively flat landscape, adjacent to the Coxs River and Lake Wallace that runs west of the Project Site. A strip of vegetation is located alongside the Castlereagh Highway and screens from passing vehicles. Several pine forest plantations surround the Project Site. These include sparse forest located approximately 700 metres west of the Project Site, extending from the north-west to south-east to screen any potential views from the Wallerawang township and residential area. Dense forest located 150 metres east of the Project Site parallel to the Castlereagh Highway screens residential receivers along Millers Road. Where appropriate, the impact of harvesting of pine plantations has been taken into account in the assessment.

Infrastructure including a series of powerlines, cooling tower, and buildings associated with the retired Wallerawang Power Station site are located north of the Project Site and can be seen from multiple locations in Wallerawang. The previously prominent stacks from the decommissioned power station were demolished in 2021.

The closest residential dwellings to construction activities are located approximately 150 metres south-east of the Project Site on Springvale Lane. The Lithgow City Rangers Soccer Club is located within the Wallerawang Power Station site, 400 metres north-east of the Project Site. The nearest business is located approximately 600 metres south of the Project Site.

4 Potential impacts

1.1.1 Construction

Construction works may be visible from Viewpoints 1 and 2. The most visible elements include construction plant and equipment such as cranes, cherry pickers and forklifts used during construction. The delivery of the BESS components would most likely occur at night with heavy vehicles travelling along the Castlereagh Highway. Given the low-rise

nature of construction works and surrounding industrial land uses, it is unlikely that these works would be overly intrusive and visual impacts would be localised and temporary in nature.

1.1.2 Operation

The operation of the Project would generally be consistent with the visual built form and visual character of the broader power generation area and is not anticipated to result in substantial visual impacts to the surrounding receivers. The elements of the Project that would potentially be viewed include the overhead transmission line towers (that typically be around 40m high), the Wallerawang 330 kV Substation and BESS facility. The BESS facility may be surrounded by noise barriers 8 m high.

Table 3 provides an indicative list of the materials and finishes that will be used on these structures (noting that these may change during detailed design).

Table 3 Material and finishes

Infrastructure	Item	Indicative materials	Indicative colour palette
BESS facility and substation	Inverters and transformers	Steel	Mix of black and grey cladding
	Noise barriers	Concrete	Grey
	Overhead transmission lines	Towers – galvanised steel. Conductors – copper or aluminium	Grey
Site entrance	Site entrance gate / wall	Steel	Grey/Black

Glare and reflectivity

It is not anticipated that any substantial glare or reflectivity effects would occur due to the materials used for the various Project components.

Night lighting

Night lighting will be located at the Project Site for security purposes. Lighting will be designed to ensure that there is minimal impact on surrounding receivers consistent with the night lighting standards.

Visual impact assessment

The viewpoint locations selected for the visual impact assessment are identified in Table 4 and displayed in Figure 1. Viewpoints were selected on the basis of:

- The most likely locations surrounding the Project Site which would be potentially subject to views of the Project. This was related to proximity and/or elevation.
- Representation of the range of viewer types in the area.

Table 4 Viewpoints surrounding the Project Site

Viewpoint ID	Location	Type	Reason for selection
01	East of the Project Site, along Springvale Lane	Residential	The closest residential land use to the east of the Project Site.
02	East of the Project Site, Project Site Access Road and Castlereagh Highway intersection	Public highway	The most likely location for the Project to be visible to users of the Castlereagh Highway.
03	North-west of the Project Site, Black Gold Motel	Commercial	The closest visually sensitive receiver to the Project Site, within the township of Wallerawang.
04	West of the Project Site, Blackett Drive, Wallerawang	Residential	Likely location within the main residential area of Wallerawang to receive views of the Project.
05	South of the Project Site, Lake Wallace foreshore	Public open space	The most likely area of public open space to receive views of the Project.
06	South of the Project Site, GoodEarth driveway	Commercial	Representative of views from a commercial land use to the south of the Project Site.
07	Eastern end of Blaxland Street, Wallerawang	Residential	Likely location within the main residential area of Wallerawang to receive views of the Project.

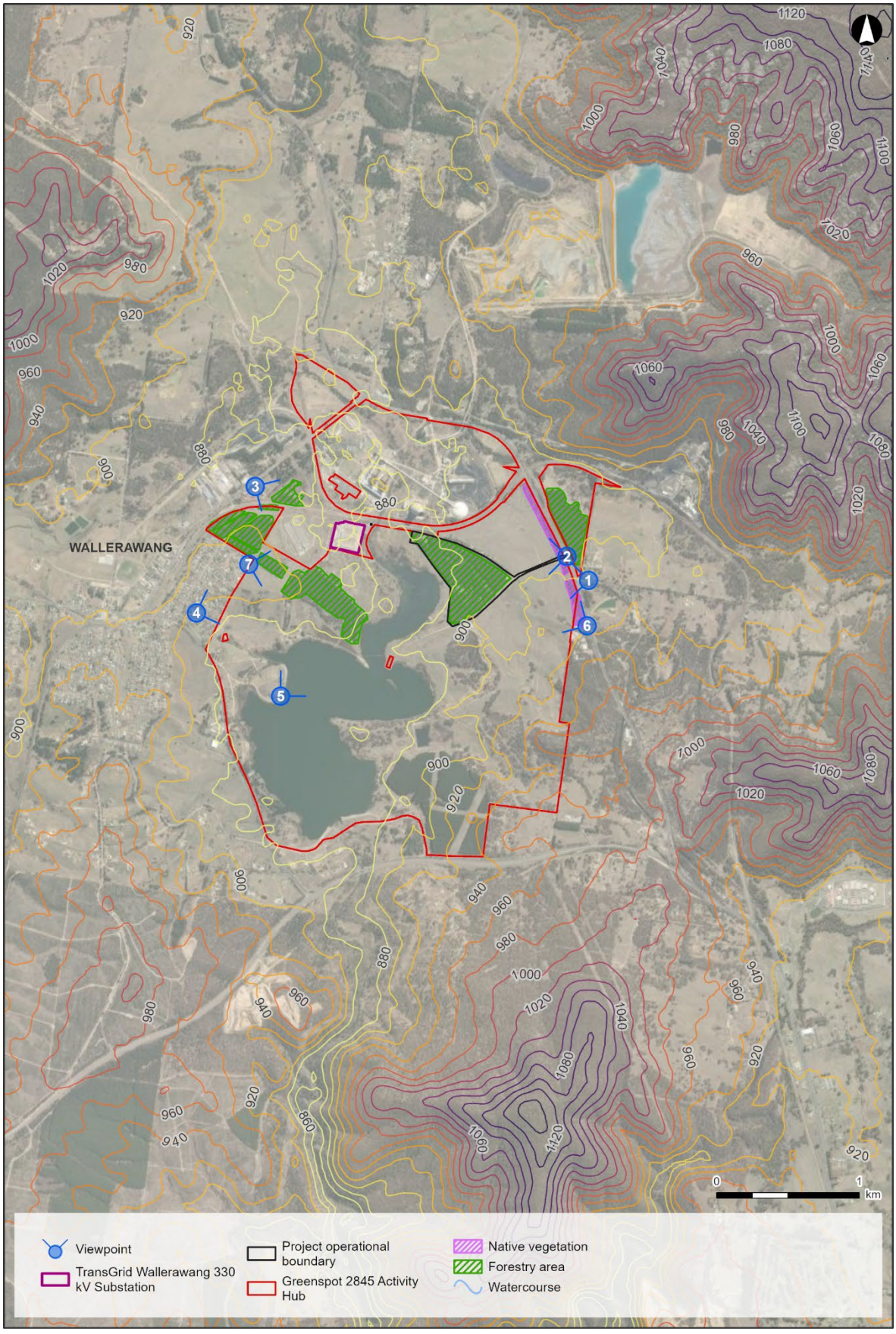


Figure 1 Viewpoint locations

Viewpoint 1 – East of the Project Site, along Springvale Lane

Visual sensitivity - moderate

This viewpoint represents residential views south-east of the Project Site. There are a relatively small number of viewers, but the importance of viewing quality is important, and views are of long duration. Therefore, this viewpoint is of moderate sensitivity.

Magnitude of visual change - low

This location is slightly lower in elevation in comparison to the Project Site. The BESS facility is located approximately 500 m from the residential receivers located on Springvale Lane. These receivers may potentially have glimpses of the BESS facility and substation, including the proposed noise barriers. These would not however be dominant features in the landscape given the distance from the viewpoint. Intervening vegetation would screen most site elements.

Based on a moderate sensitivity and low magnitude, this viewpoint would be subject to a **moderate-low visual impact**.

Viewpoint 1
The TransGrid 330kV Substation would be immediately behind the BESS facility in this view. Intervening vegetation would largely screen both, however, there may be some glimpses between foreground vegetation and above middle ground vegetation.

Viewpoint 2 – East of the Project Site, Project Site Access Road and Castlereagh Highway intersection

Visual sensitivity - moderate sensitivity

This viewpoint is representative of the public road users on the Castlereagh Highway. It is looking down a gap in the vegetation along the highway, down the entrance access road to the site. This highway setting is characterised by rural landscape and some industrial land uses. Views of the Project Site would be brief; however, many road users would potentially be subject to these views.

Magnitude of visual change - low magnitude

Castlereagh Highway is located approximately 350 m from the operational Project Site. Road users may potentially glimpse the Project Site (predominantly the noise barriers associated with the BESS facility) and associated infrastructure through gaps in roadside vegetation. To achieve the view shown in the photograph below, a road user would need to be viewing the site at around 90 degrees from the highway, hence this represents a worst-case and a view that would not commonly be experienced in this direct manner.

Based on a moderate sensitivity and low magnitude, this viewpoint would be subject to a **moderate-low visual impact**.

Viewpoint 2
Castlereagh Highway road users would potentially glimpse the noise barriers of the BESS facility and associated infrastructure if looking perpendicular to the highway. The TransGrid 330kV Substation would be obscured behind the roadside pine trees in the foreground.

Viewpoint 3 – North-west of the Project Site, Black Gold Motel

Visual sensitivity - high sensitivity

This viewpoint is representative of the public who may stay at the Black Gold Motel, north-west of the Project Site. The quality of view is somewhat important to these viewers, and there are a relatively large number of viewers. This view is therefore of high sensitivity.

Magnitude of visual change - negligible

The Black Gold Motel is approximately 800 m from the Project Site. These receivers may be subject to potential glimpses of the existing TransGrid Wallerawang 330 kV Substation and the proposed transmission line towers through dense intervening vegetation on the perimeter, however these are likely to be barely discernible. No other Project elements would be visible.

Based on a high sensitivity and negligible magnitude, this viewpoint would be subject to **negligible visual impact**.

Viewpoint 3
The TransGrid 330kV Substation, BESS Facility and proposed transmission line towers would all be in approximate alignment from this view. There may be glimpses of the Substation and transmission line towers through gaps in intervening vegetation. The BESS facility would likely be obscured behind the Substation.

Viewpoint 4 – West of the Project Site, Blackett Drive, Wallerawang

Visual sensitivity - high

This viewpoint represents residential areas in the town of Wallerawang, west of the Project Site. The quality of view would be of importance to the residential viewers and would be subject to long viewing durations. This view is therefore of high sensitivity.

Magnitude of visual change - negligible

The elevation rises to the east of the residential area and would obstruct any potential views of the Project Site. Views of the Project would be also obstructed (in some cases) by other residential dwellings and intervening vegetation.

Based on a high sensitivity and negligible magnitude, this viewpoint would be subject to **negligible visual impact.**

Viewpoint 4
Intervening topography, vegetation and houses would screen all elements of the Project from receivers in this location, noting that this viewpoint was chosen as having the highest potential for views to the Project in terms of Wallerawang residential areas.

Viewpoint 5 – South of the Project Site, Lake Wallace foreshore

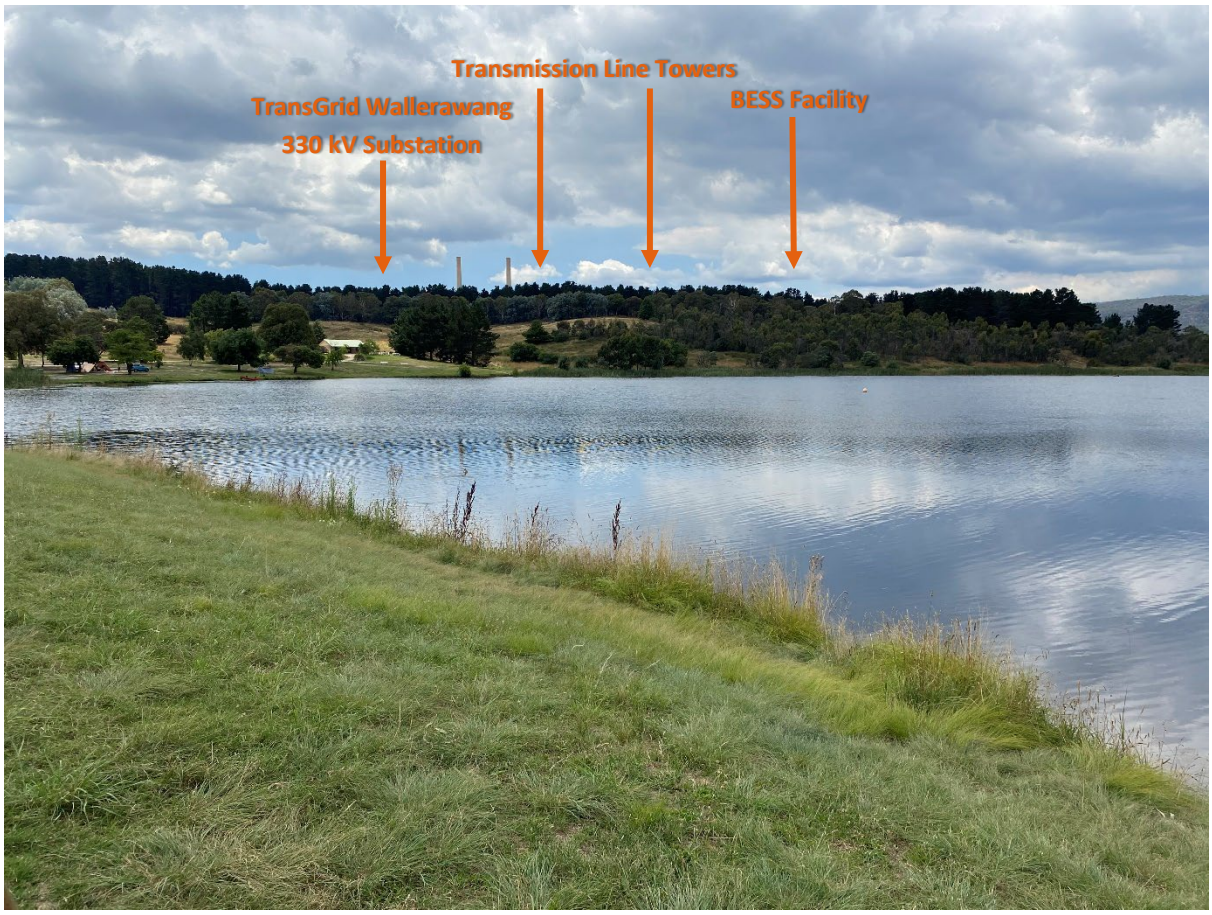
Visual sensitivity - high

This viewpoint is located on the foreshore of Lake Wallace, south-west of the Project Site. This location is used for recreational activities and a large number of viewers would be present. It is therefore of high sensitivity.

Magnitude of visual change - negligible

The stacks[1] from the Wallerawang Power Station site are visible from the photo approximately 1.3 km away. These have since been demolished. The elevation and intervening vegetation obstruct any potential view of the Project. Receivers may be subject to glimpses of the top of the transmission line towers; however, these would be barely discernible given the distance from the viewpoint even with harvesting of the pine trees that are in the view.

Based on a high sensitivity and negligible magnitude, this viewpoint would be subject **to negligible visual impact**.



Viewpoint 5
Intervening topography and vegetation would screen all elements of the Project except potentially the tops of the transmission line towers from receivers at Lake Wallace foreshore. The upper portions of the now demolished Wallerawang Power Station stacks are visible and illustrate the screening effect of the topography and vegetation. Harvesting of pine plantations in the view would only marginally reveal more of the transmission line towers as retained vegetation in front of the pines would still provide a visual screen.

[1] These photographs were taken in February 2021, prior to the demolition of the Wallerawang Power Station stacks in November 2021.

Viewpoint 6 – South of the Project Site, GoodEarth driveway

Visual sensitivity - low

This viewpoint is located at the entrance of GoodEarth, a business located on the Castlereagh Highway, 600 m south of the Project Site. This location is used by customers for short durations and its quality is of limited importance to viewers. It is therefore of low sensitivity.

Magnitude of visual change - negligible

Receivers may be subject to potential glimpses of the Project Site through intervening vegetation; however, the Project would be barely discernible if visible at all given the density of the vegetation that occurs immediately to the rear of the property.

Based on a low sensitivity and negligible magnitude, this viewpoint would be subject **to negligible visual impact**.

Viewpoint 6
Intervening vegetation would screen potential views of the Project Site at this location

Viewpoint 7 – Eastern end of Blaxland Street, Wallerawang

Visual sensitivity - high

This viewpoint represents residential areas in the northern section of the town of Wallerawang, west of the Project Site. The quality of view would be of importance to the residential viewers and would be subject to long viewing durations. This view is therefore of high sensitivity.

Magnitude of visual change - low

The current view is dominated by pine plantations which are proposed to be harvested in the relatively near future. This intervention, which is not part of the project, will fundamentally change the character of this view. It will make it more open and allowing both rural elements and existing electrical and residual power station infrastructure to become prominent, including multiple high voltage transmission lines, the TransGrid 330kV substation and the power station cooling tower. It would also enable project elements including the BESS facility noise barriers and the 330kV transmission line towers to be visible, albeit in the context of a view containing a complex array of electrical infrastructure. Open Eucalypt woodland on the western side of the Coxs River that would be likely to act as ap partial screen between this viewpoint and the project. This vegetation is likely to screen a portion of the BESS facility noise barriers, while taller elements of the project such as the transmission towers may be more visible, in the distance (more than 1km away). The project would not be prominent in this view after the harvesting of the pine plantation, noting that visual impacts that occur after this harvesting would be attributable to that activity rather than the project.

Based on a high sensitivity and low magnitude, this viewpoint would be subject **to moderate visual impact**. This rating is conservative in that it assumes a future baseline where the pine plantations in the view are removed. Under the existing situation, the project would not be visible and this viewpoint would therefore be subject to a negligible visual impact.

Viewpoint 7 - Harvesting of pine plantations would open up views from this location towards the project site. Intervening mature Eucalypt vegetation on the western side of the Coxs River is likely to partially screen the project. Some higher elements such as upper portions of transmission line towers may be visible along with many other existing electrical infrastructure elements if the pine plantation is harvested. The impact assessment

is conservative, noting that the project would not be visible under current conditions, with any impact being the result of a separate activity (the harvesting of the pine plantations).

Visual impact summary

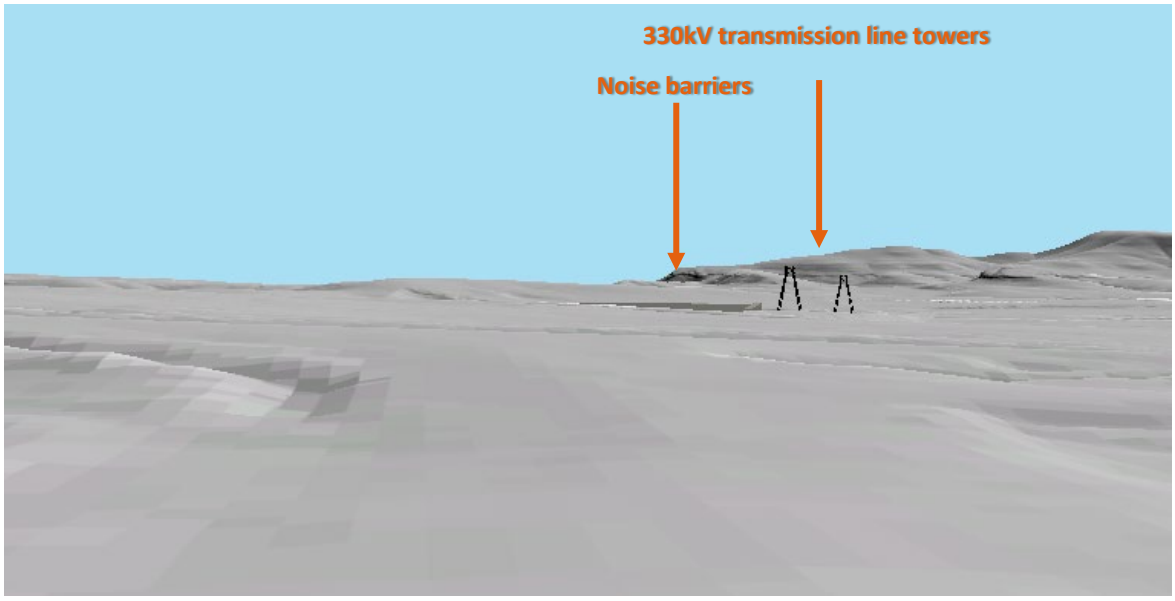
A summary of the visual impact assessment is provided in Table 5.

Table 5 Visual impact summary

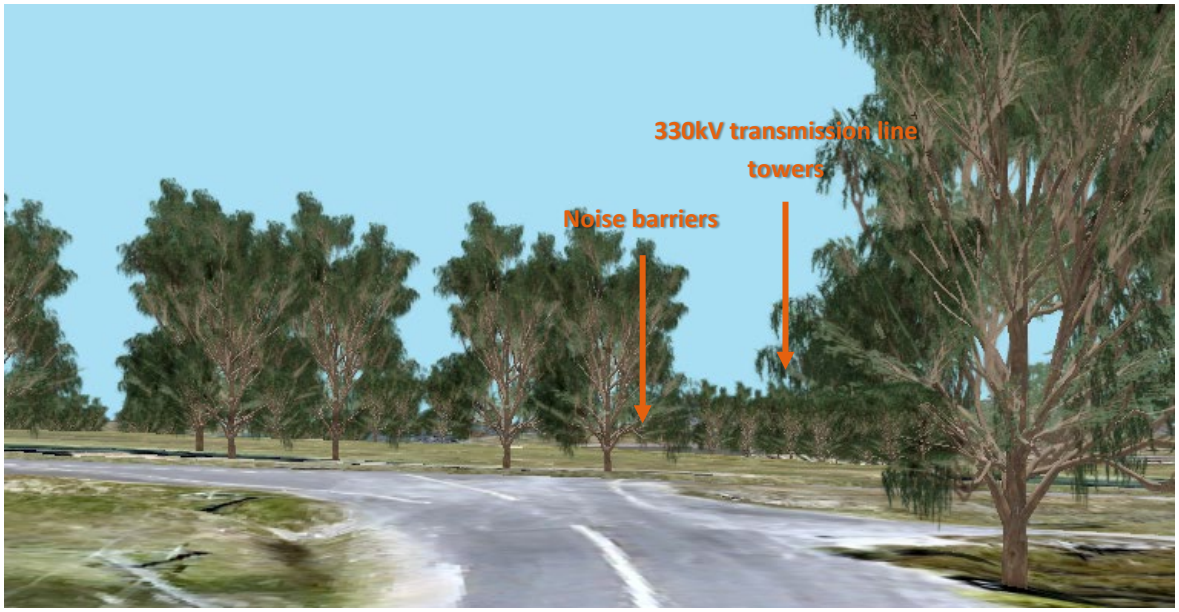
Viewpoint ID	Location	Distance to BESS Facility	Visual sensitivity	Magnitude of change	Visual impact
01	East of the Project Site, along Springvale Lane	520m	Moderate	Low	**Moderate-low**
02	East of the Project Site, Project Site Access Road and Castlereagh Highway intersection	400m	Moderate	Low	**Moderate-low**
03	North-west of the Project Site, Black Gold Motel	1.2km	High	Negligible	**Negligible**
04	West of the Project Site, Blackett Drive, Wallerawang	1.7km	High	Negligible	**Negligible**
05	South of the Project Site, Lake Wallace foreshore	1.2km	High	Negligible	**Negligible**
06	South of the Project Site, GoodEarth driveway	680m	Low	Negligible	**Negligible**
07	Eastern end of Blaxland Street, Wallerawang	1.2km	High	Low	**Moderate**

Visualisations

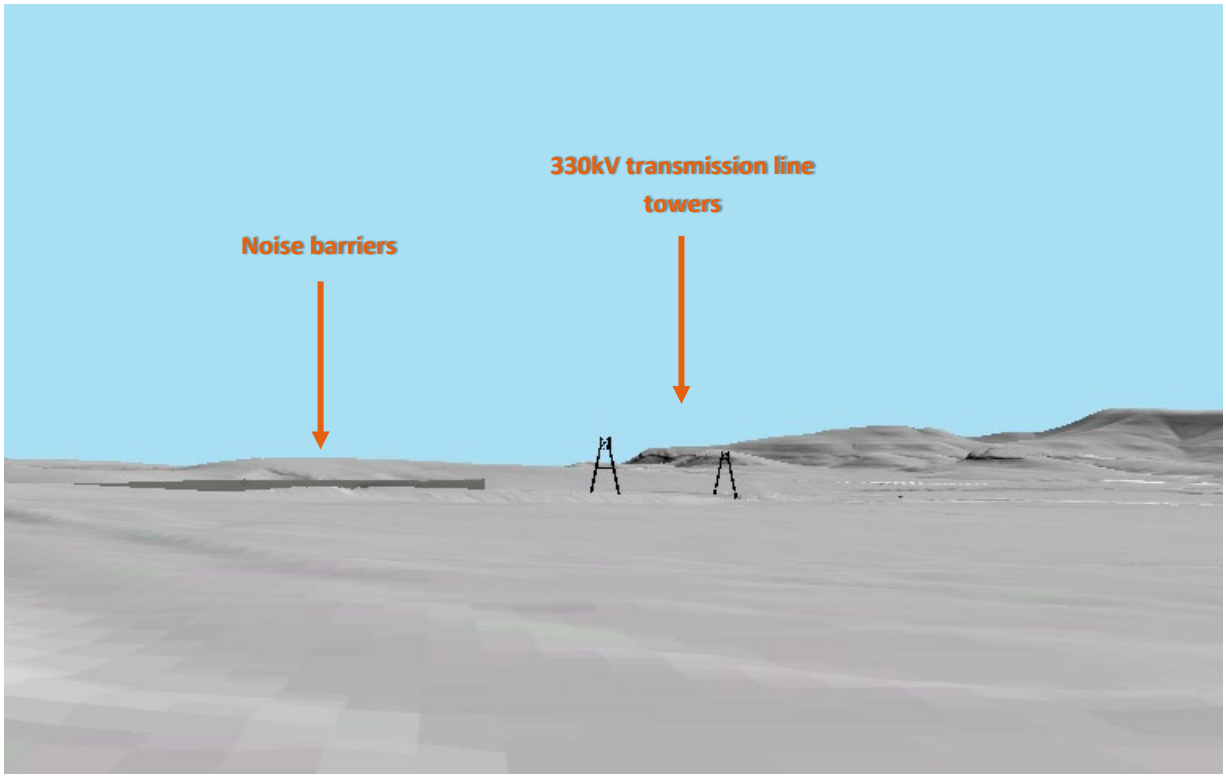
At the request of DPE, visualisations were created to provide further detail on visual impacts from Viewpoints 1, 2 and 7. These have been created in GIS software and is intended to show the scale and general visibility of the project from these viewpoints rather than providing a photorealistic view. A raw view for each viewpoint (shown with terrain only) is provided, along with a view that simulates the screening effect of existing vegetation. The modelled project configuration is as shown in the updated Noise and Vibration Impact Assessment (ie including the noise barriers assessed in that report).



Viewpoint 1 Raw view (Project shown with terrain only).

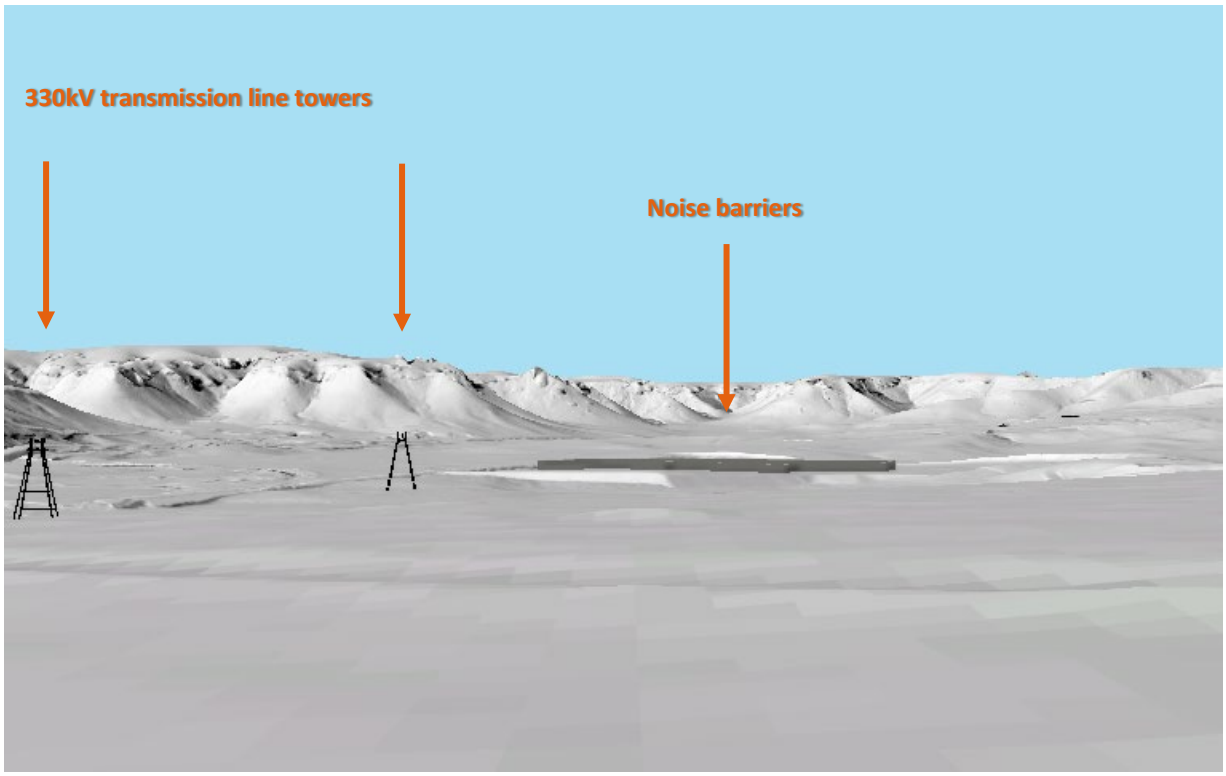


Viewpoint 1 – View with simulation of existing vegetation

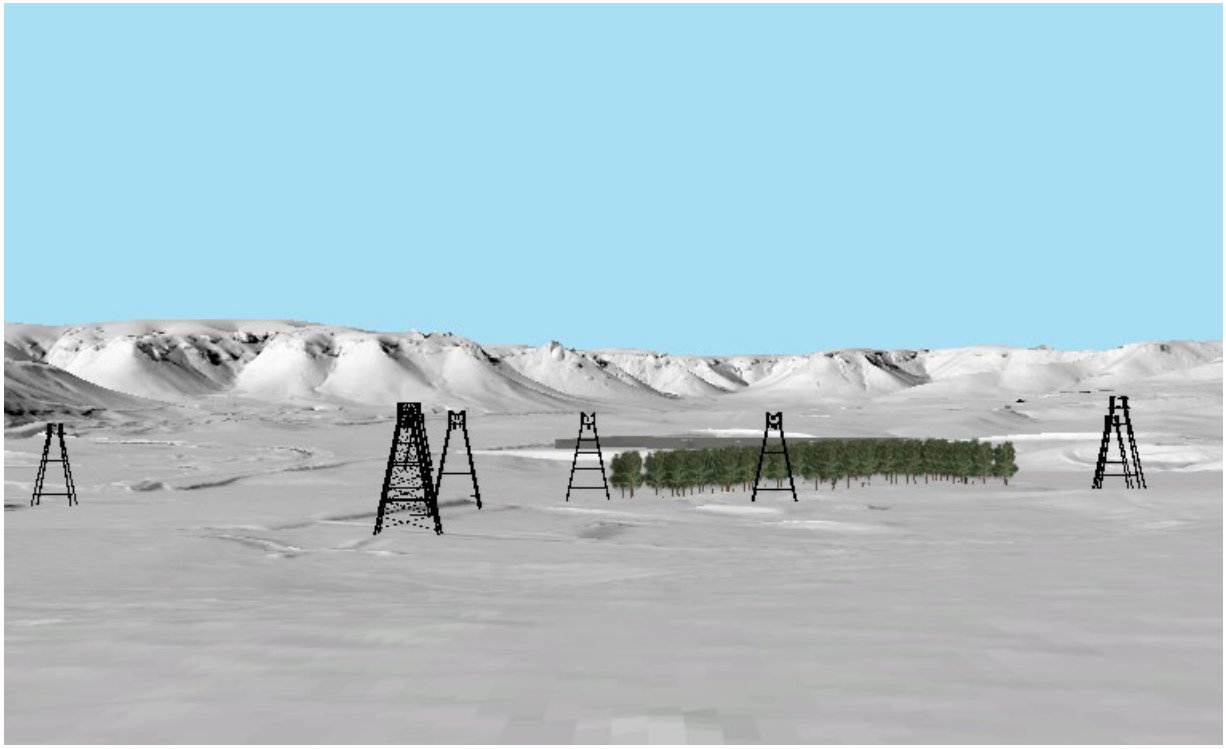


Viewpoint 2 Raw view (project shown with terrain only).

Viewpoint 2 – View with simulation of existing vegetation



Viewpoint 7 - Raw view (project shown with terrain only)



Viewpoint 7 - View with simulation of partial screening by existing vegetation on the western side of Coxs River. Existing high voltage transmission towers are added for context, noting that other (lower voltage) transmission lines would also be visible along with TransGrid substation infrastructure.

5 Mitigation measures

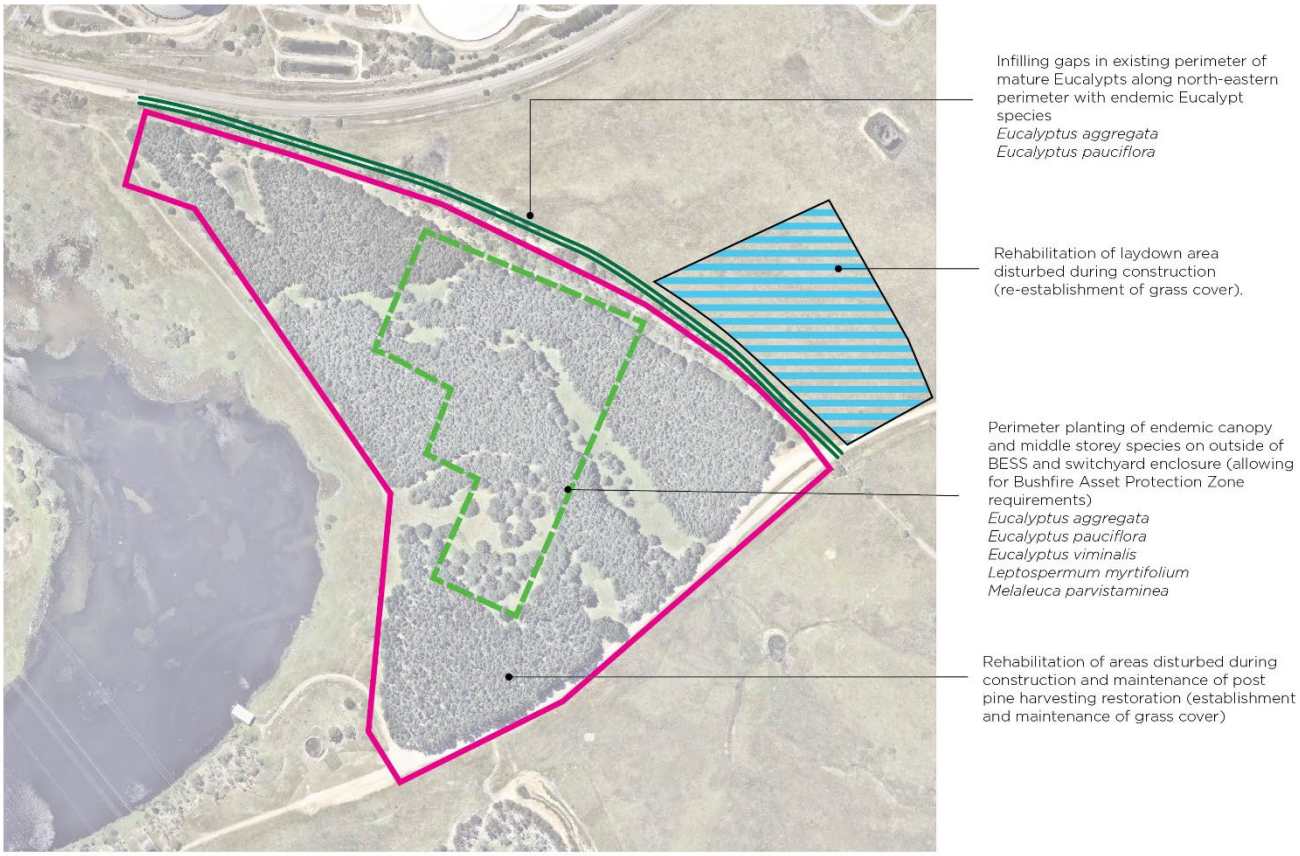
The Project Site has been determined to have a negligible impact on visual amenity at most viewpoints. Table 6 outlines the following mitigation measures that would be implemented by Greenspot to further minimise any landscape and visual amenity impacts.

Table 6 Visual amenity mitigation measures

ID	Mitigation Measure
V1	The design of the proposed BESS facility will consider the use of materials that integrate with the surrounding landscape.
V2	Cut off and direct light fittings (or similar technologies) would be used where appropriate to minimise glare and light spill onto private property.
V3	Reflective and glare materials and surfaces will be minimised, where possible.
V4	~~A Landscape Plan will be prepared during detailed design to help the Project into the surrounding landscape and provide screening where appropriate.~~ **In accordance with the preliminary landscape plan, establish perimeter screen planting around the BESS facility.**

6 Preliminary landscape plan

A preliminary landscape plan has been prepared. This is a high-level plan that indicates the broad principles that would be applied to the landscape treatment of the site. Given the limited visibility of the project from the surrounding area, there is not a strong driver for screening. The focus of the landscape plan is therefore on general visual amenity.



Wallerawang Battery Energy Storage System
Preliminary Landscape Plan