Figure 4-1 **Receivers - Wollara Road**

GOULBURN RIVER SOLAR FARM ADDENDUM LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT

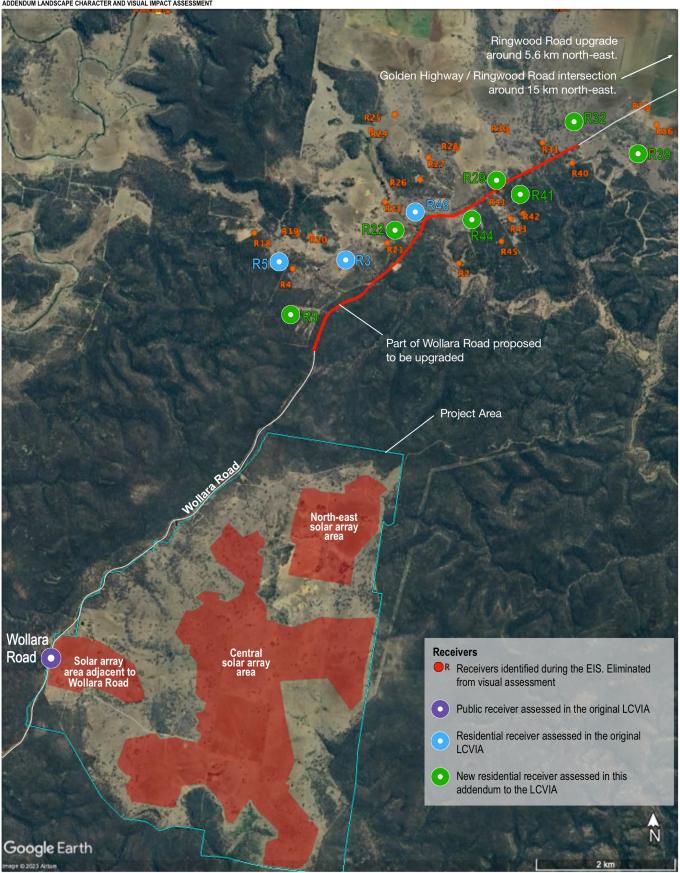
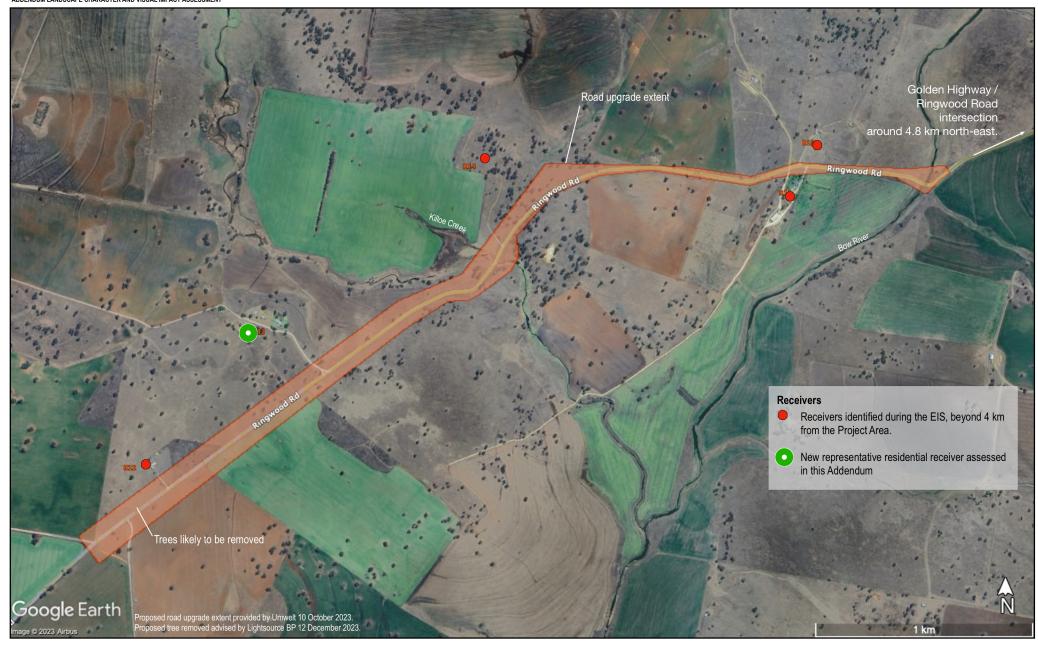


Figure 4-2
Receivers - Ringwood Road
GOULBURN RIVER SOLAR FARM

GOULBURN RIVER SOLAR FARM ADDENDUM LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT



4.3 Assessment of impact

The assessment of visual impact to the 14 viewpoints is presented in Table 4-3. The key points are:

- <u>Sensitivity:</u> Viewpoint sensitivity is presented in Column A:
 - There is <u>no change</u> to the rating of sensitivity for the four originally assessed viewpoints (R3, R5, R46 and Wollara Road).
 - Viewpoint sensitivity rating for the additional seven Wollara Road viewpoints (R9, R22, R29, R32, R39, R41 and R44) was determined using Tables 5, 6 and 7 of the *Technical Supplement*. Sensitivity was determined as *low or very low*.
 - Viewpoint sensitivity for Ringwood Road residents (representative viewpoint) was determined as *low*.
 - Viewpoint sensitivity for the two new public road user viewpoints (Ringwood Road and the Golden Highway/Ringwood Road intersection) was determined as very low.
- <u>Magnitude:</u> The assessment of magnitude is presented in Column B:
 - There is <u>no change</u> to the rating of magnitude for the four originally assessed viewpoints.
 - The magnitude rating for the additional seven Wollara Road residential viewpoints, and the representative Ringwood Road residential viewpoint was determined as *low*.
- <u>Visual impact</u>: The overall rating of visual impact of the Amended Project is presented in Column C;
 - There is <u>no change</u> to the visual impact rating for the four originally assessed viewpoints.
 - The visual impact rating for the additional seven Wollara Road residential viewpoints is *low*.
 - The visual impact rating for the representative Ringwood Road residential viewpoint is <u>low.</u>
 - The visual impact rating for the additional two public viewpoints (that would see the proposed Ringwood Road upgrade or Golden Highway / Ringwood Road upgrade) is <u>very low.</u>

Table 4-3: Updated visual impact assessment – Project with amendments

		Visı	Column A ual sensitivity rating	Column B Visual magnitude rating		Column C Visual impact rating		Column D Residual impact rating	
	Viewpoint	LCVIA Amended Project LCVIA Amended Project		LCVIA	Amended Project	LCVIA	Amended Project		
	R3	Moderate	Moderate	Very low	Very Low (no change) The Amended Project would not affect the cell count of the 'modelled view' of the EIS Project. Therefore, there is no change to the original rating of magnitude. Although there would be tree removal along Wollara Road, an area of trees (over 450 m wide) would remain between the residence and Wollara Road reserve. Therefore, the proposed Wollara Road upgrade would not be seen from the residence.	Low	Low (no change)	Low	Low (no change)
	R5	Moderate	Moderate	Very low	Very Low (no change) The Amended Project would not affect the cell count of the 'modelled view' of the EIS Project Therefore, there is no change to the original rating of magnitude. The residence is over 3 km from Wollara Road and there are tall trees between the residence and the road reserve. Therefore, the proposed Wollara Road upgrade would not be seen from the residence.	Low	Low (no change)	Low	Low (no change)
Private residences	R9	N/A	Low There is a secondary view from the rural dwelling toward Wollara Road which includes forested landscape.	N/A	Low The residence is around 530 m from Wollara Road. There may be a minor change to the existing view east because of proposed tree removal. There may be a larger section of Wollara Road seen, and therefore, more traffic visible from the residence. However, overall, there would be a minor change to the view.	N/A	Low	N/A	Low
Private re	R22	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward Wollara Road which would include forested landscape.	N/A	Low The residence is over 340 m from Wollara Road. There would be a minor change to the existing view east because of proposed tree removal. There may be a larger section of Wollara Road seen, and therefore, more traffic visible from the residence, however, overall, there would be a minor change to the view.	N/A	Low	N/A	Low
	R29	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward Wollara Road which would include forested landscape	N/A	Low The residence is around 90 m from Wollara Road. There is an area of trees (around 50 m wide) between the residence and the road, however, it is likely Wollara Road would be seen beyond the trees. There would be a change to the existing view south-east because of proposed tree removal within the road reserve, however, overall, there would be a minor change to the view.	N/A	Low	N/A	Low
	R32	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward	N/A	Low The residence is around 250 m from Wollara Road. There are relatively few trees between the residence and the road reserve. There would be a change to the existing view south to south-east because of proposed tree removal. There would be a larger section of the road seen, and therefore, more traffic	N/A	Low	N/A	Low

	Viewpoint	Column A Visual sensitivity rating		Column B Visual magnitude rating		Column C Visual impact rating		Column D Residual impact rating	
	viewpoint	LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project
			Wollara Road which would include forested landscape		visible from the residence, however, overall, there would be a minor change to the view.		,		,
	R39	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward Wollara Road which would include forested landscape	N/A	Low Wollara Road is over 500 m from the residence, however, there are relatively few trees between the residence and the road reserve. There would be a change to the existing view west because of proposed tree removal. There would be a larger section of the road seen, and therefore, more traffic visible from the residence, however, However, overall, there would be a minor change to the view.	N/A	Low	N/A	Low
	R44	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward Wollara Road which would include forested landscape	N/A	Low The residence is over 120 m from Wollara Road. There are relatively few trees between the residence and the road reserve. There would be a change to the existing view north to north-west because of proposed tree removal. There would be a larger section of the road seen, and therefore, more traffic visible from the residence, however, overall, there would be a minor change to the view.	N/A	Low	N/A	Low
	R46	Moderate	Moderate	Very low	Very Low (no change) The Amended Project does not affect the cell count of the 'modelled view' of the EIS Project. Therefore, there is no change to the original rating of magnitude. Although there would be tree removal along Wollara Road, an area of trees (around 180 m wide) would remain between the residence and Wollara Road reserve. Therefore, the proposed Wollara Road upgrade would not be seen from the residence.	Low	Low (no change)	Low	Low (no change)
	Ringwood Road residential (repres- entative)	N/A	Low It has been assumed there would be a secondary view from the rural dwelling toward Ringwood Road which would include the open, agricultural landscape.	N/A	The five residences range from around 100 m to 300 m to the road corridor. The road corridor is generally at a lower elevation compared to the residence, and it is likely the road would not be prominent in views. All residences have trees surrounding the residence, or between the residence and the road corridor, that would be retained. Tree removal would not result in a significant change to the view. It would be unlikely to increase the extent of road surface in view. It may open the view slightly to agricultural landscape.	N/A	Low	N/A	Low
Public	Ringwood Road	N/A	Very low Local sealed road with view of open, agricultural landscape.	N/A	Low Ringwood Road users would initially notice removal of mature trees, however, visual changes associated with road upgrades (such as the widened road surface, and realignment of the road) are an expected experience for road users and, would be unlikely to significantly impact views.	N/A	Very low	N/A	Very low

Viewpoint	Column A Visual sensitivity rating		Column B Visual magnitude rating		Column C Visual impact rating		Column D Residual impact rating	
viewpoint	LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project
Wollara Road	Low	Low	Very high	 Very high (no change) The visual magnitude cell count of the 'modelled view' of the EIS Project, was 'very high'. This is the highest magnitude rating (as per the <i>Technical Supplement</i>). The Amended Project reduces the extent of solar panels that would be in view (due to relocation of panels from the TSR). However, as the originally modelled view represents a 'worst-case scenario' and was used as the basis to develop the landscape plan. the 'modelled view' has not been updated. However, the following visual differences associated with the Amended Project are noted compared to the EIS Project: The proposed decentralised BESS units, although a similar height to the solar panels, would be lighter in colour and contrast to the darker panels, and be seen within the solar array. One of the wider internal roads may be partly seen; however, it would not be prominent. Tree removal along the 4.7 km section of Wollara Road to be upgraded would be clearly apparent and adversely affect the scenic experience for many road users. The extent of trees to be removed would change the view - from an enclosed, tree-lined, unsealed road corridor to a wider, more open, sealed road corridor. 	Moderate	Moderate (no change)	Moderate	Moderate (no change)
Golden Hwy / Ringwood Rd intersection	N/A	Very low The Golden Highway is a classified main road.	N/A	Views of the intersection for road users would be brief and temporary. Proposed tree removal would be apparent, at least initially, to regular travellers using the intersection. However, visual changes associated with highway upgrades (such as the proposed new acceleration lane and widened road surface) are an expected experience for road users of a main road and, would be unlikely to impact views.	N/A	Very low	N/A	Very low

 ${\rm N/A-Not}$ applicable. This viewpoint did not require 'detailed assessment' in the LCVIA

4.4 Performance objectives and mitigation

There is <u>no change</u> to the EIS Project assessment which found the Wollara Road public viewpoint (with a moderate visual impact rating) was the only viewpoint requiring mandatory consideration against the 'performance objectives' in the *Technical Supplement*.

Draft landscape plan

To address 'performance objectives', the EIS Project assessment included a draft landscape plan (presented in the LCVIA as Figure 6-11).

Due to the relatively minor amendments, there is no change to the intended landscape strategy or draft planting schedule. The draft landscape plan would be finalised as part of management plans, including adjustment of any fencing to accommodate the proposed landscaping.

Additional mitigation measures

Mitigation measures were included in the LCVIA and are shown in Column A, Table 4-4. Additional mitigation measures, including clarification of measures associated with the landscape plan, have been added to address impacts associated with the Amended Project, as shown in Column B, Table 4-4.

Lighting

There is no change to operational lighting from the EIS Project, however, the proposed road upgrades increase the construction zone, and likelihood for lighting during construction. To reduce the potential impact of construction light, mitigation measures included in the EIS Project assessment (to address potential dark sky impacts) are applicable and should be implemented for the Amended Project.

4.5 Residual visual impact

The residual visual impact of the Amended Project is presented in Column D, Table 4-3, and shows:

- There is no change to the residual visual impact rating for the four originally assessed viewpoints. A photomontage of Wollara Road with proposed mitigation screening was included in the LCVIA and showed the likely effectiveness of proposed landscaping, reducing the magnitude rating from very high (67 cells) to very low (3 cells), and the visual impact from moderate to very low.
- The residual visual impact rating for the additional seven Wollara Road residential viewpoints (that would see the Wollara Road upgrade) and the representative Ringwood Road residential viewpoint is <u>low</u>, consistent with the visual impact determined following construction.
- The residual visual impact rating for the two additional public viewpoints (that would see the proposed Ringwood Road upgrade or Golden Highway / Ringwood Road upgrade) is *very low,* consistent with the visual impact determined following construction.

4.6 Cumulative visual impact

There is <u>no change</u> to the LCVIA of cumulative impact. The Amended Project would increase the area affected by construction; however, construction would be temporary and road upgrades would occur within existing road corridors. Following construction there would be no ongoing visual connection or association between the upgraded roads and the solar farm.

Table 4-4: Mitigation measures

Intent	Timing	Column A	Column B
	<u> </u>	Original mitigation measures	Additional mitigation measures to address Amended Project
Avoid night sky impacts	Design	 Design and install lighting to follow best practice lighting principles identified within the Dark Sky Planning Guidelines ⁵: 1. Eliminate upward spill light 2. Direct light downwards, not upwards 3. Use shielded fittings 4. Avoid 'over' lighting 5. Switch lights off when not required 6. Use energy efficient bulbs 7. Use asymmetric beams, where floodlights are used 8. Ensure lights are not directed towards reflective surfaces 9. Use warm white lighting colours. 	No change
	Construction	 Ensure all lights are turned off before vacating the construction site at the end of the day. Lighting to be installed in accordance with AS4228-1997 - Control of Obtrusive Effects of Outdoor Lighting. 	No change
	Operation	 Switch lights off when not required. Ensure lights are only used in exceptional circumstances – emergency or security situations. 	No change
Reduce visibility and contrast of Project in the landscape	Design	 Select an inconspicuous colour for the office/storage containers if possible, so they are darker in colour and less prominent⁶. Dark grey is generally considered a good colour for ancillary infrastructure. Fences surrounding the solar modules should have a dulled finish to reduce contrast. Do not install highly reflective materials. 	 Subsequent to project approval, as part of the management plans, the draft landscape plan would be refined, detailed and finalised, including adjustment of any fencing to accommodate the proposed landscaping. The aim of the detailed landscape plan is to establish a quick growing, dense screen to reduce public views of the solar panels from Wollara Road, as well as providing additional ecological benefits. The detailed landscape plan is to be: Prepared prior to landscape implementation. Be guided by ongoing consultation with NP&WS, Upper Hunter Shire Council and TfNSW (particularly regarding plant species, spacing, and whether soil improvement is required and road safety measures/tree clearance zones and TFNSW relevant policy).
	Construction	 Locate the construction compound, vehicle parking and equipment storage areas, in the vicinity of the Post War homestead (as shown on Project Area plans) so they are set back from Wollara Road and partially (or fully) screened from view (from Wollara Road) via existing vegetation or landform. Keep site tidy and neat. If soils are disturbed (e.g., during the construction of internal roads or due to wear and tear of surfaces from vehicle movement), introduce wind erosion controls to reduce the potential for dust: bring water cart to site and water exposed surfaces avoid ground disturbance on high wind days cover stockpiles of loose materials (if any). 	Implement the detailed landscape plan. Progressively stabilise surfaces as construction is completed.

⁵ Australian Government, Department of the Environment and Energy, *National Light Pollution Guidelines for Wildlife*, January 2020 and New South Wales Department of Planning & Environment, *The Dark Sky Planning Guideline*, 2023 ⁶ Inverters and other larger facility components that are colour-treated two to three shades darker than the background landscape colour, better match the surroundings and decrease their visibility and contrast. White is generally the most conspicuous colour. Lighter colours should be avoided.

Intent	Timing	Column A Original mitigation measures	Column B Additional mitigation measures to address Amended Project
	Operation	 Do not install commercial messages or large-scale signage. Signage (if required) should be of sufficient size to contain only information sufficient for the basic facility and company identification, for safety, navigation, and delivery purposes. 	Implement ongoing maintenance of landscaping as detailed in the landscape plan. Monitor road upgrade to ensure the stabilisation of verges. Implement correctional measures if erosion occurs or dust is an issue.
Minimise	Design	- Retain as much existing vegetation within the solar farm Project Area as possible.	- Retain trees where possible within/near the road upgrade construction zone.
impact to existing landscape character	Construction	- Protect existing trees (that are to be retained) during construction activities.	 Protect trees within/near the road upgrade construction zone in accordance with TfNSW guidelines (Vegetation Management (Protection and Removal) Guideline. DMS-SD-111). Replace native trees to be removed at the Ringwood Road upgrade, and the Golden Highway / Ringwood Road intersection, in accordance with TfNSW guidelines (Vegetation Offset Guide DMS-SD-087).
	Operation		 Monitor disturbed trees that have been heavily impacted within their root zone for stability and longevity. Stabilise exposed surfaces.

5.1 Summary of visual changes

The Amended Project would result in the following <u>visible</u> changes compared to the originally assessed Project:

- Tree clearing, earthworks and road widening associated with an upgrade of the Golden Highway / Ringwood Road intersection.
- Road widening, realignment, and likely removal of around 20 trees along Ringwood
 Road at the location of the upgrade. Some trees to be removed are mature native trees.
- Tree clearing, vegetation removal, realignment and bitumen surfacing of a 4.7 km unsealed section of Wollara Road.
- Option for decentralised BESS units throughout all three (originally identified) solar array areas.
- Minor relocation of solar panels within the solar array area adjacent to Wollara Road.
- Increased width of an internal access road within the solar farm.

The following proposed amendments would not be seen:

- Increased capacity of centralised BESS (located near the Project substation)
- Relocation of solar array to avoid threatened species habitat (located in the northeastern solar array area)
- One of the widened internal roads (located between the central and north-east solar array areas).
- Construction of an additional transmission tower (located near the substation).

5.2 Landscape character impact with amendments

Additional landscape character zone

A new 'Golden Highway' landscape character zone has been added to the assessment, as the proposed Golden Highway / Ringwood Road intersection upgrade is beyond the two originally described landscape character areas. The intersection is within a distinct landscape character zone centred along the highway.

Landscape sensitivity

There was <u>no change</u> to the *low* rating of landscape sensitivity for the two original landscape character zones. The Golden Highway character zone was determined by this assessment to have *low* sensitivity.

Landscape magnitude to change

The magnitude of change to landscape character from the Amended Project:

- Remains at *low* within the open agricultural landscape zone. The Amended Project would not exacerbate the extent of visual change to occur in the landscape.
- Increases to *moderate* (from *very low*) along the road corridor within the dense, forested landscape zone due to proposed tree removal, widening and sealing of Wollara Road. Although native vegetation would still flank both sides of the road, visual character would change from a narrower enclosed landscape with an unsealed road; to a more open landscape, with a wider, sealed, road.
- Is assessed as low within the Golden Highway landscape zone. Removal of trees, road widening, cut and fill would have a minor change overall on the visual environment of the intersection.

Impact to landscape character

Landscape character findings are summarised in Table 5-1. The overall rating of impact to each landscape character zone from the Amended Project is determined as:

- low within the open agricultural landscape character zone (no change from the LCVIA)
- low within the dense, forested landscape character zone (increasing from very low in the LCVIA)
- low within the Golden Highway landscape character zone.

Table 5-1: Summary of assessment of landscape character impacts

Landscape character zone	Column A		mn B of change	Column C Landscape Character Impact		
Zanascape character Zone	Sensitivity	LCVIA	Amended Project	LCVIA	Amended Project	
Open, agricultural landscape	Low	Low	Low	Low	Low	
Dense forested landscape	Low	Very Low	Moderate	Very low	Low	
Golden Highway landscape	Low	Not applicable	Low	Not applicable	Low	

5.3 Visual impact with amendments

Viewpoints

The LCVIA identified viewpoints within 4 km of the Project Area and determined four viewpoints (three residences: R3, R5 and R46); and one public receiver: Wollara Road users) required 'detailed assessment'⁷. In this Addendum, viewpoints within 4 km of the Project Area that were previously eliminated from 'detailed assessment', as well as viewpoints beyond 4 km of the Project Area, were re-examined to determine if there would be potential views of the Amended Project.

Ten additional viewpoints have subsequently been identified for detailed assessment in this Addendum:

- Seven additional Wollara Road residential receivers (R9, R22, R29, R32, R39, R41 and R44)
- One representative Ringwood Road residential viewpoint (representing five Ringwood Road residences (R11, R12, R13, R14 and R15), and
- Two public road user viewpoints (Ringwood Road users and Golden Highway / Ringwood Road intersection users).

There is now a total of 14 viewpoints assessed in this addendum.

Viewpoint sensitivity

There is no change to the rating of sensitivity for the four originally assessed viewpoints.

Viewpoint sensitivity ratings for the additional viewpoints have been determined to be *low* or *very low* for the seven residences and *very low* for the two public road viewpoints.

<u>Magnitude</u>

There is $\underline{\text{no change}}$ to the rating of magnitude for the four originally assessed viewpoints.

The magnitude rating for the additional residential and public road user viewpoints was determined as \underline{low} .

Visual impact

There is <u>no change</u> to the visual impact rating for the four originally assessed viewpoints. The visual impact rating for the additional eight viewpoints was determined as:

- <u>low</u> for the additional seven residences (that would see the proposed Wollara Road upgrade) and the viewpoint representative of Ringwood Road residences.
- veny low for the two additional public road user viewpoints (that would see the proposed Ringwood Road upgrade or Golden Highway / Ringwood Road upgrade).

⁷ Detailed assessment as per the *Technical Supplement*. Originally five receivers within 4 km of the Project required 'detailed assessment', however, two were subsequently eliminated as vegetation obstructed views.

Visual impact findings are summarised in Table 5-2.

Table 5-2: Summary of visual impact assessment impacts

	\(\(\);	Column A Visual sensitivity rating		Column B Visual magnitude rating		Column C Visual impact rating		Column D Residual impact rating	
Viewpoint		LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project	LCVIA	Amended Project
	R3	Moderate	Moderate	Very Iow	Very Low	Low	Low	Low	Low
	R5	Moderate	Moderate	Very Iow	Very Low	Low	Low	Low	Low
	R9	N/A	Low	N/A	Low	N/A	Low	N/A	Low
Ices	R22	N/A	Low	N/A	Low	N/A	Low	N/A	Low
Private residences	R29	N/A	Low	N/A	Low	N/A	Low	N/A	Low
GS .	R32	N/A	Low	N/A	Low	N/A	Low	N/A	Low
vate	R39	N/A	Low	N/A	Low	N/A	Low	N/A	Low
Pri	R44	N/A	Low	N/A	Low	N/A	Low	N/A	Low
	R46	Moderate	Moderate	Very low	Very Low	Low	Low	Low	Low
	Ringwood Road residential	N/A	Low	N/A	Low	N/A	Low	N/A	Low
	Ringwood Road	N/A	Very low	N/A	Low	N/A	Very low	N/A	Very low
()	Wollara Road	Low	Low	Very high	Very high	Moderate	Moderate	Moderate	Moderate
Public	Golden Highway / Ringwood Road intersection	N/A	Very low	N/A	Low	N/A	Very low	N/A	Very low

5.4 Performance objectives

There is no change to the LCVIA which determined that the Wollara Road viewpoint (with a moderate visual impact rating) is the only viewpoint requiring mandatory assessment against the *Technical Supplement* 'performance objectives'.

The draft landscape plan prepared to address those performance objectives has been prepared and would be detailed prior to implementation of the Project to reflect the final solar farm layout, and additional mitigation measures have been recommended to address impacts associated with the Amended Project, including removal of trees associated with road upgrades.

There is no change to the findings of cumulative visual impact associated with the Amended Project.

Australian Government, Department of the Environment and Energy, *National Light Pollution Guidelines for Wildlife*, January 2020.

Envisage Consulting, April 2023, Goulburn River Solar Farm, Landscape Character and Visual Impact Assessment.

Landscape Institute and Institute of Environmental Management and Assessment, 2013 (3rd Edition). 'Guidelines for Landscape and Visual Impact Assessment'. Routledge, United Kingdom.

New South Wales Department of Planning and Environment, August 2022, *Technical Supplement – Landscape and Visual Impact Assessment. Large-Scale Solar Energy Guideline.*

NSW Government Department of Planning and Environment, August 2022, *Large-Scale Solar Guideline*.

New South Wales Department of Planning and Environment, June 2023, *Dark Sky Planning Guideline: protecting the observing conditions at Siding Springs.*

Transport for NSW, 2020, Guideline for Landscape Character and Visual Impact Assessment - Environmental Impact Assessment Guidance Note EIA–NO4'

Transport for NSW, 2022, Vegetation Management (Protection and Removal) Guideline. DMS-SD-111.

Transport for NSW, 2022, Vegetation Offset Guide. DMS-SD-087.

Appendix A



Figure A - 1: Existing view from R9 looking toward the Project Area (8 February 2023)



Figure A - 2: Existing view from R21 looking toward the Project Area (8 February 2023)