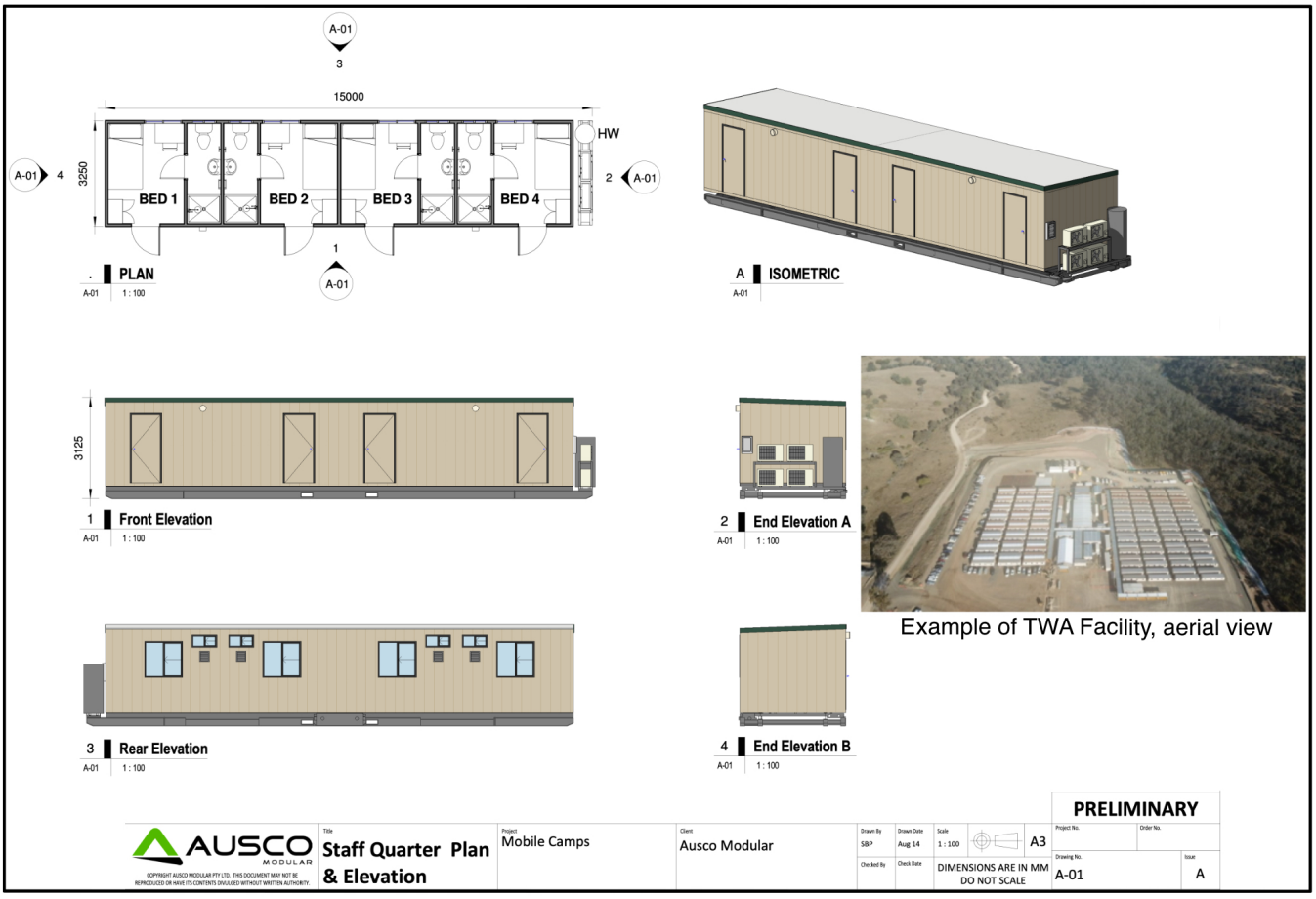
Figure 2-1
Amendment Project 2 - TWA Facility

Image supplied by Lightsource bp

Example of TWA Facility - Typical Layout



Images supplied by Lightsource bp

Example of TWA Facility, aerial view

Layout of a Standard 4-bedroom Accommodation Unit

2.3 Location of proposed TWA facility

Lightsource bp are investigating potential locations to site the TWA Facility within the western portion of the Development Footprint, referred to as the Feasibility Area, as shown in Figure 2-2. The TWA Facility could be installed anywhere within the TWA Facility Feasibility Area. The final position, design and specifications of the TWA Facility would be confirmed during the detailed design.

The location of the TWA Facility within the Feasibility Area would affect its exposure. Visibility would reduce with increased distance from Wollara Road, lower elevation, and extent of existing elements in the vicinity (such as trees and buildings).

For example, if located south of the existing residence, the TWA Facility would have lower visibility. Land elevation at this location is relatively low, and although relatively close to Wollara Road (around 150 m), there are existing trees and (at least initially) existing buildings[4] in the vicinity that would largely screen or reduce visibility.

If located in the north-west of the Feasibility Area, the TWA Facility would have higher exposure. The elevation here is higher, it could be very close to Wollara Road (around 10 m), and there are fewer trees and no buildings in the vicinity to screen or reduce visibility. Furthermore, this location is in direct line-of-sight of road users travelling south on Wollara Road.

LCVIA Addendum 2 assesses a 'worst-case' scenario location within the Feasibility Area – that is, in the north-west, adjacent to Wollara Road, the location with the highest exposure to views from that road. This location is shown in Figure 2-2 as 'Indicative TWA Facility'.

2.4 Visual changes

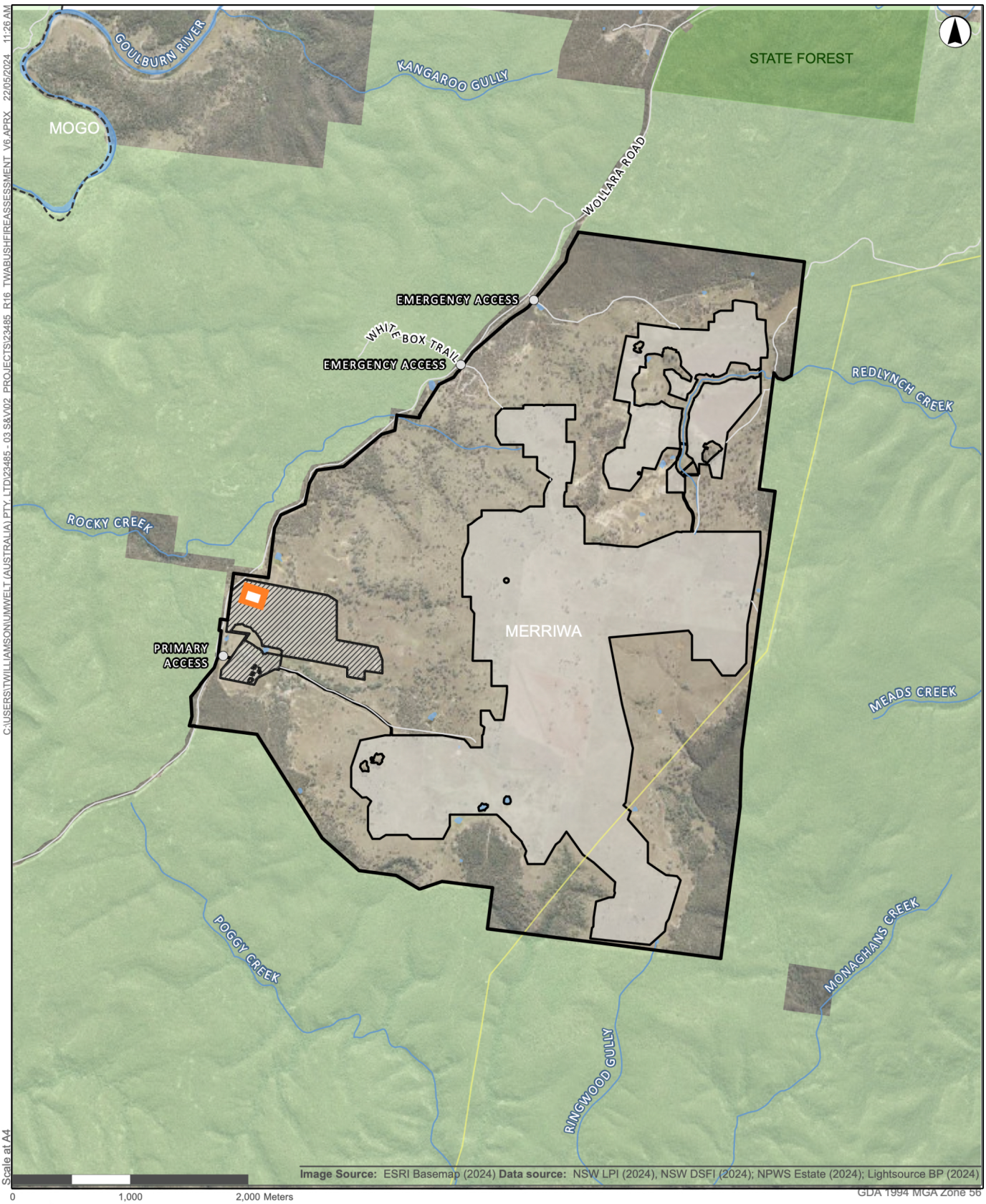
Visual changes associated with Amendment Project 2 (compared to Amendment Project 1) are:

- Multiple demountable buildings at a location within the Feasibility Area (potentially in the north-west of the Feasibility Area, close to Wollara Road), operating 24/7 for the duration of the solar farm construction.
- Lighting associated with the TWA Facility.
- Vehicle movements to/from the TWA Facility.
- Additional construction activities associated with construction of the TWA Facility (prior to construction of the solar farm, however concurrent with public road upgrades and general site establishment).

[4] Existing buildings within the Development Footprint would ultimately be removed during construction of the Solar Farm.

Figure 2-2
Feasibility Area

GOULBURN RIVER SOLAR FARM
LANDSCAPE CHARACTER AND VISUAL IMPACT ASSESSMENT



Legend

- Access Points
- Electricity Transmission Line
- Watercourse
- Roads and Tracks
- Railway
- Local Goverment Boundary
- Indicative TWA Facility
- Project Area
- Development Footprint
- TWA Facility Feasibility Area
- NSW National Parks
- NSW State Forests
- Waterbodies

3 Landscape character impact with amendments

3.1 Existing landscape character

The following landscape character zones were identified in the LCVIA and LCVIA Addendum 1:

- Open, agricultural landscape, distinguished by grazing pastures, rural infrastructure, and agricultural land use (including the Project Area).
- Dense, forested landscape distinguished by tall, native vegetation (including Goulburn River National Park west of Wollara Road).
- Golden Highway landscape, dominated by the two-lane sealed highway.

The TWA Facility would be located wholly within the open, agricultural landscape of the Project Area, in the vicinity of the forested landscape of Goulburn River National Park. Photographs illustrating the landscape character of the TWA Facility Feasibility Area are shown in Figure 3-1.

Figure 3-1: Photographs illustrating landscape character in the vicinity of proposed TWA Facility

3.2 Assessment of landscape character impact

The assessment of impact to landscape character from Amendment Project 2 (compared to Amendment Project 1), is shown in Table 3-1. The worst-case scenario was assessed, that is, with the TWA close to Wollara Road, in the north-west of the Feasibility Area.

In summary:

- Sensitivity: Landscape character sensitivity is presented in Column A:
  - There is no change to the *low* rating of existing landscape sensitivity within the open, agricultural, the dense forested landscape, or the Golden Highway landscape (compared to Amendment Project 1).
- Magnitude. The assessment of magnitude of change is presented in Column B:
  - Open, agricultural landscape zone. There is a temporary increase in magnitude of change to the open-agricultural landscape zone (compared to Amendment Project 1) from *low* to *moderate*, corresponding to the longevity of the TWA Facility. This is primarily because the temporary TWA Facility could be conspicuous if located close to Wollara Road. Following its decommissioning, the magnitude of change to landscape character would revert to *low* (as was determined in the assessment of Amendment Project 1).
  - Dense, forested landscape zone. There is no change to the *moderate* rating of magnitude of change within the dense, forested landscape zone (compared to Amendment Project 1).
  - Golden Highway landscape zone. There is no change to the *low* rating of magnitude of change within the Golden Highway landscape zone (compared to Amendment Project 1).
- Landscape character impact. The overall impact to landscape character impact is shown in Column C:
  - Open, agricultural landscape zone. There is a temporary increase in impact to the open, agricultural landscape zone (compared to Amendment Project 1) from *low* to l*ow-moderate,* corresponding to the longevity of the TWA Facility. Following its decommissioning, the impact to landscape character would revert to *low* (as was determined in the assessment of Amendment Project 1).
  - Dense, forested landscape. There is no change to the *low* rating of landscape character impact within the dense, forested landscape (compared to Amendment Project 1).
  - Golden Highway landscape. There is no change to the *low* rating of landscape character impact within the Golden Highway landscape (compared to Amendment Project 1).

Table 3-1: Assessment of landscape character impacts

Landscape character zone	Column A Sensitivity of existing landscape character to the Project			Column B Magnitude of change to landscape character			Column C Landscape Character Impact		
	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2) (based on worst-case scenario location within the Feasibility Area)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)
Open, agricultural landscape	Low (As determined in the LCVIA).	Low (As determined in LCVIA Addendum 1).	Low (no change)	Low (As determined in the LCVIA).	Low (As determined in LCVIA Addendum 1).	Moderate (increases to Moderate temporarily for the duration of the TWA Facility). If located in the north-west of the Feasibility Area, adjacent to Wollara Road, the TWA Facility would be (temporarily) conspicuous. It: ▪ Would comprise elements that are uncharacteristic of the landscape zone. ▪ Would be a noticeable change in the landscape. ▪ May dominate the experience of the landscape within its vicinity. ▪ Would be temporary, however of a moderate duration (around 27 months).	Low (As determined in the LCVIA).	Low (As determined in LCVIA Addendum 1).	Low-moderate Temporary increase in impact (temporarily for the duration of the TWA Facility). Following its decommissioning, the impact to landscape character would revert to *low* (as was determined in the assessment of Amendment Project 1).
Dense forested landscape	Low (As determined in the LCVIA).	Low (As determined in LCVIA Addendum 1).	Low (no change)	Very Low (As determined in the LCVIA).	Moderate (As determined in LCVIA Addendum 1).	Moderate (no change). Amendment Project 2 does not directly change, or indirectly affect the landscape character zone.	Very low (As determined in the LCVIA).	Low (As determined in LCVIA Addendum 1).	Low (no change)
Golden Highway landscape	Not applicable	Low (As determined in LCVIA Addendum 1).	Low (no change)	Not applicable	Low (As determined in LCVIA Addendum 1).	Low (no change). Amendment Project 2 does not directly or indirectly affect the landscape character zone.	Not applicable	Low (As determined in LCVIA Addendum 1).	Low (no change)

4 Visual impact with amendments

4.1 Assessed viewpoints

During the assessment of the EIS Project, five residences (R3, R5, R9, R21, R46) and one public road viewpoint (Wollara Road) were identified within 4 km of the EIS Project Development Footprint which required 'detailed assessment'[5].

During the assessment of the Amendment Project 1, eight additional viewpoints were identified (as proposed changes were beyond 4 km of the development footprint - Ringwood Road upgrade around 5.6 km north-east, and the Golden Highway intersection upgrade around 15 km north-east) and involved tree removal (which would potentially increase exposure to the Project). As a result, a total of 14 viewpoints were assessed:

- 11 private residential viewpoints (R3, R5, R9, R22, R29, R32, R39, R41, R44, R46 and a representative viewpoint for Ringwood Road residences.
- Three (3) public viewpoints (Wollara Road users, Ringwood Road users, and Golden Highway intersection users).

The location of viewpoints within 4 km of the Project Area (R3, R5, R9, R22, R46 and Wollara Road), are shown in Figure 4-1. Residential viewpoints beyond 4 km are shown in Appendix A.

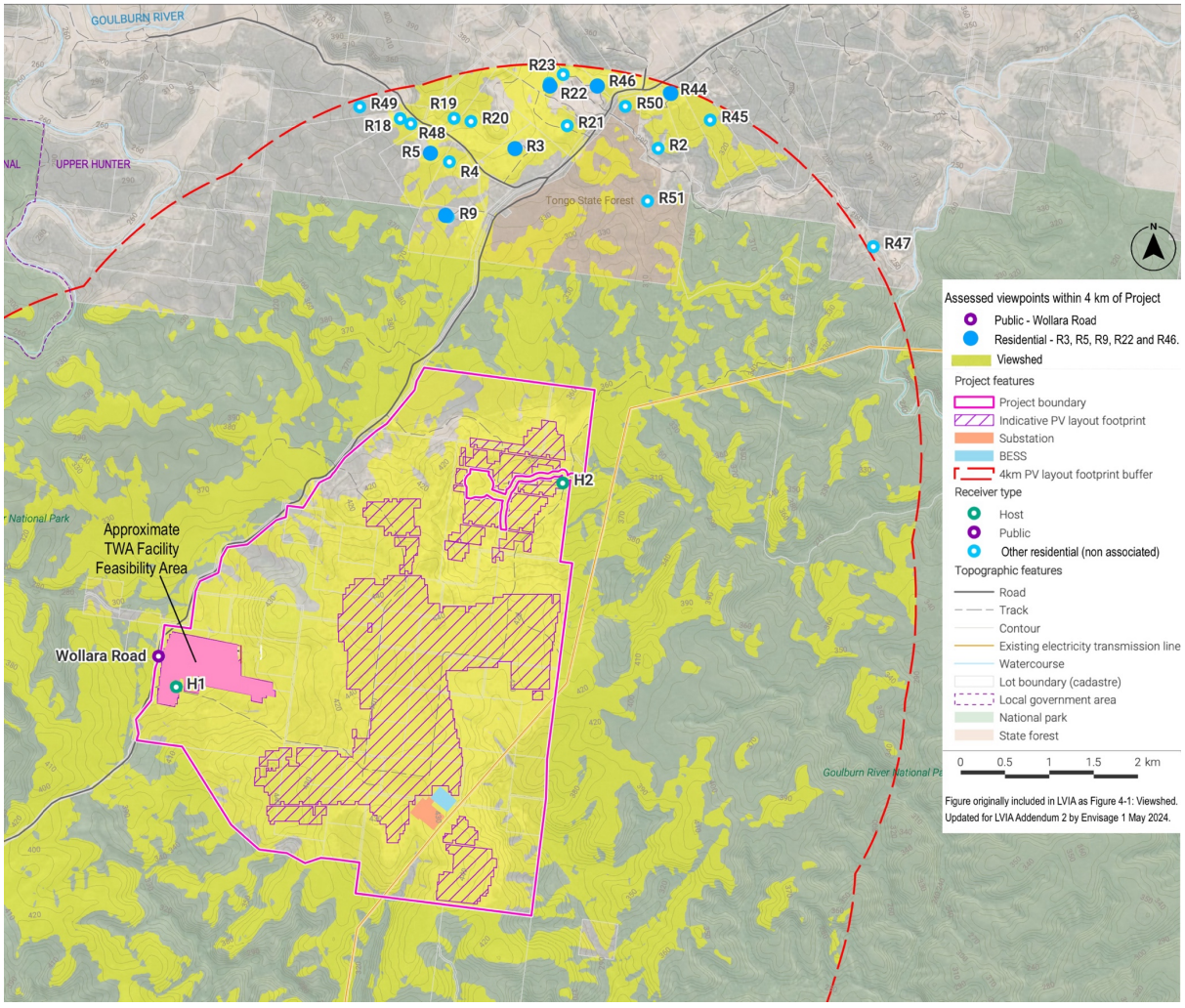


Figure 4-1: Assessed viewpoints

[5] Viewpoints were identified within 4 km from the proposed development (as per the *Technical Supplement*).

4.2 Assessment of impact

For viewpoints within 4 km of the Project, the LCVIA had determined the visual impact of the EIS Project by following the steps set out in the *Technical Supplement - Landscape and Visual Impact Assessment* (August 2022). Therefore, the 'magnitude of change' to the view was determined by producing a 180-degree panoramic photomontage (or bare earth render - BER) of the view, overlaying the *Technical Supplement's* Visual Magnitude Grid Tool, and counting the number of grid cells that the Project would occupy. The number of cells occupied determine the magnitude rating.

Lightsource bp and Umwelt consultation with DPHI (March 2024) confirmed that previous photomontages did not need to be updated for Amendment Project 2, given the temporary nature of the TWA facility.

This assessment found there would be no change to the visual impact rating for the 14 assessed viewpoints (compared to Amendment Project 1). The TWA Facility would be visible to one viewpoint, Wollara Road. It would not be visible from any of the identified residential viewpoints.

The detailed assessment of visual impact to the 14 viewpoints from Amendment Project 2 is presented in Table 4-1. The key points are:

- Sensitivity: Viewpoint sensitivity is presented in Column A. There is no change to the rating of sensitivity for the 14 assessed viewpoints (compared to Amendment Project 1).
- Magnitude: The assessment of magnitude is presented in Column B. There is no change to the magnitude of change rating for the 14 assessed viewpoints (compared to Amendment Project 1).
- Visual impact: The overall rating of visual impact of the Amended Project is presented in Column C. There is no change to the visual impact rating for the 14 assessed viewpoints (compared to Amendment Project 1).

From residential viewpoints within 4 km of the Project Area, either the EIS Project inspection determined that the Project would not be in direct line-of-sight, or EIS Project modelling determined that the Project would occupy (at most) 1 grid cell. The TWA Facility (which would be located within the development footprint) would not exacerbate the previously determined grid cell count).

For residences beyond 4 km from the Project Area (not requiring detailed assessment in accordance with the *Technical Supplement),* there would be no change to their view. The TWA Facility would not be visible from these residences.

From the one public viewpoint (Wollara Road):

- The LCVIA determined that the proposed solar farm (the EIS Project) would occupy 67 grid cells, resulting in a 'very high' magnitude of change to the view (the highest magnitude rating as per the *Technical Supplement*).
- Addendum Project 1 (which mostly comprised road upgrades) did not change the 'very high' magnitude of change rating to views from Wollara Road.
- Addendum Project 2 (with the inclusion of the TWA Facility) also does not change the 'very high' magnitude of change rating. The TWA Facility would be located wholly within the EIS Project development footprint and not exacerbate the previously determined grid cell count. 'Very high' is already the highest magnitude of change rating (as per the *Technical Supplement*).

The 'very high' magnitude of change rating, combined with the 'low' sensitivity rating, results in a 'moderate' level of visual impact to views from Wollara Road. Therefore, the moderate level of visual impact determined during the assessment of Amendment Project 1 does not change.

4.3 Performance objectives and mitigation

There is no change to the assessment of Amendment Project 1 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*.

To address 'performance objectives', the LCVIA included a draft landscape plan. There is no change to the intended landscape strategy or draft planting schedule, given the temporary nature of the TWA Facility. Mitigation measures relating to the landscape plan, as well as other measures included in the LCVIA, and LCVIA Addendum 1, are shown at Table 4-4 (Column A). Additional measures relating to the TWA Facility are shown in Column B of Table 4-4.

4.4 Residual visual impact

The residual visual impact findings are presented in Column D, Table 4-1, and shows there is no change to the residual visual impact rating for the 14 assessed viewpoints (compared to Amendment Project 1). Consistent with findings presented in LCVIA Addendum 1, residual impact for assessed viewpoints remains at low or very low.

Table 4-1: Updated visual impact assessment – Amendment Project 2

Viewpoint		Column A Visual sensitivity rating			Column B Visual magnitude rating			Column C Visual impact rating			Column D Residual impact rating		
		LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)
Private residences	R3	Moderate	Moderate	Moderate (no change)	Very low	Very Low	Very Low (no change). ▪ LCVIA modelling determined no cells would be occupied by the EIS Project. The TWA Facility would be within the development footprint, and therefore, not change the number of cells occupied. ▪ Trees between the residence and the Project Area would screen the proposed TWA Facility from view. ▪ The TWA Facility would be temporary.	Low	Low	Low (no change)	Low	Low	Low (no change)
	R5	Moderate	Moderate	Moderate (no change)	Very low	Very Low	Very Low (no change) ▪ LCVIA modelling determined one cell would be occupied by the EIS Project. The TWA Facility would be within the development footprint, and therefore, not change the number of cells occupied. ▪ Trees between the residence and the Project Area would screen the proposed TWA Facility from view. ▪ The TWA Facility would be temporary.	Low	Low	Low (no change)	Low	Low	Low (no change)
	R9	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ Based on a site inspection of R9 (for the EIS Project) it was determined that the Project Area was not visible, and therefore, the proposed TWA Facility would not be in view.	N/A	Low	Low (no change)	N/A	Low	Low (no change)

Viewpoint	Column A Visual sensitivity rating			Column B Visual magnitude rating			Column C Visual impact rating			Column D Residual impact rating		
	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)
R22	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ R22 did not meet criteria for detailed assessment of the EIS Project. ▪ The TWA Facility would be within the development footprint. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
R29	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ The residence is beyond 4 km from the Project. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
R32	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ The residence is beyond 4 km from the Project. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
R39	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ The residence is beyond 4 km from the Project. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
R44	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ The residence is beyond 4 km from the Project. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
R46	Moderate	Moderate	Moderate (no change)	Very low	Very Low (no change)	Very Low (no change). ▪ LCVIA modelling determined no cells would be occupied by the EIS Project. The TWA Facility would be within the development footprint, and	Low	Low	Low (no change)	Low	Low	Low (no change)

	Viewpoint	Column A Visual sensitivity rating			Column B Visual magnitude rating			Column C Visual impact rating			Column D Residual impact rating		
		LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)	LCVIA (EIS Project)	LCVIA Addendum 1 (Amendment Project 1)	LCVIA Addendum 2 (Amendment Project 2)
							therefore, not change the number of cells occupied.						
	Ringwood Road residential (repres-entative)	N/A	Low	Low (no change)	N/A	Low	Low (no change) ▪ The residences are beyond 4 km from the Project. ▪ The TWA Facility would not be visible from the residence.	N/A	Low	Low (no change)	N/A	Low	Low (no change)
Public	Ringwood Road	N/A	Very low	Very low (no change)	N/A	Low	Low (no change) ▪ The road is beyond 4 km from the Project. ▪ The TWA Facility would not be visible to road users.	N/A	Very low	Very low (no change)	N/A	Very low	Very low (no change)
	Wollara Road	Low	Low	Low (no change)	Very high	Very high	Very high (no change) ▪ LCVIA modelling determined 67 cells would be occupied by the EIS Project. ▪ The TWA Facility would potentially occupy more cells, however, 'very high' is already the highest magnitude rating (as per the *Technical Supplement*). ▪ Regardless, the TWA Facility would be temporary, and not increase the long-term magnitude of the Project.	Moderate	Moderate	Moderate (no change)	Very low	Very low	Very low (no change)
	Golden Hwy / Ringwood Rd intersection	N/A	Very low	Very low (no change)	N/A	Low	Low (no change) ▪ The intersection is beyond 4 km from the Project. ▪ The TWA Facility would not be visible to road users.	N/A	Very low	Very low (no change)	N/A	Very low	Very low (no change)

N/A – Not applicable. This viewpoint did not require 'detailed assessment' in the LCVIA

Table 4-2: Mitigation measures – Updated for Amendment Project 2

Intent	Timing	Column A Collated mitigation measures (LCVIA and LCVIA Addendum 1)	Column B Additional mitigation measures to address Amended Project 2
Avoid night sky impacts	Design	- Design and install lighting to follow best practice lighting principles identified within the Dark Sky Planning Guidelines [6]: 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 Solar Farm construction site at the end of the day. - Lighting to be installed in accordance with *AS4228-1997 - Control of Obtrusive Effects of Outdoor Lighting*.	- At the TWA Facility: ▪ Locate common areas within the internal zone of the TWA Facility to contain light spill. ▪ Select and design lights to avoid excessive light spill onto surrounding areas. ▪ Encourage the use of the TWA Facility shuttle to reduce vehicle headlights at night.
	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 less prominent[7]. - 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).	- Although the TWA Facility would be temporary and would not exacerbate the overall visual impact of the solar farm, the following are suggested as measures to reduce the visibility of the TWA Facility. Where possible, Lightsource bp should consider locating the TWA Facility: ▪ further from Wollara Road (compared to closer) ▪ on lower ground (compared to an elevated location) ▪ not in direct (straight ahead) line-of-sight of Wollara Road users (compared to directly in-line-of-sight) ▪ in the vicinity of existing elements (such as trees and buildings) to provide screening, or a background that would reduce contrast in the landscape.
	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.	No change

[6] Australian Government, Department of Climate Change, Energy, the Environment and Water, 2023, *National Light Pollution Guidelines for Wildlife*, and New South Wales Department of Planning & Environment, *The Dark Sky Planning Guideline*, 2023
[7] Inverters and other larger Solar Farm 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.

Intent	Timing	Column A Collated mitigation measures (LCVIA and LCVIA Addendum 1)	Column B Additional mitigation measures to address Amended Project 2
		- 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.	
	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.	No change.
Minimise impact to existing landscape character	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.	No change.
	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*).	No change.
	Operation	- Monitor disturbed trees that have been heavily impacted within their root zone for stability and longevity. - Stabilise exposed surfaces.	No change

5 Lighting

5.1 Construction of TWA Facility

Amendment Project 2 increases the extent of activities to be undertaken prior to commencement of the solar farm construction (however concurrent with site establishment and public road upgrades). Construction associated with the installation of the TWA Facility would occur during standard daytime construction hours consistent with the *Interim Construction Noise Guideline* (Department of Environment and Climate Change 2009 - ICNG) as follows:

- 7am to 6pm Monday to Friday
- 8am to 1pm on Saturdays
- No works on Sunday or public holidays.

Night construction works are not anticipated, however, there may be exceptions to ICNG hours for emergency works or where required for deliveries or dispatches due to safety reasons.

5.2 Operation of TWA Facility

As described in Section 2.2, once construction is complete, the TWA Facility could accommodate up to 400 beds, 24/7, for approximately 27 months (the anticipated period of solar farm construction. The proposed TWA Facility includes lighting of:

- Pathways (a mixture of overhead lights and low-level bollards)
- External, mounted lights attached to the buildings
- Internal lights within the buildings.

The selection of light type would be designed to avoid excessive light spillage onto the accommodation rooms and surrounding areas, and would be designed to be consistent with lighting mitigation measures (included in the LCVIA) to reduce the impact of light. The measures are based on technical information within the *NSW Dark Sky Planning Guidelines* (Department of Planning and Environment, 2023), including principles for good lighting design, use of shielded, downward facing lights and site appropriate lighting.

5.3 Impact

Temporary (during construction of the solar farm)

Temporary night lighting associated with Amendment Project 2 has increased (compared to the Amendment Project 1) due to the inclusion of the TWA Facility. However, the TWA Facility would not be in direct line-of-sight from surrounding residential viewpoints. Lights would not be directly visible (and it is very unlikely that indirect light glow would be visible).

There may be additional vehicle use of Wollara Road at night due to the TWA Facility, and the appearance of headlights as workers occasionally travel to/from the TWA Facility at night, however, headlights are a common, intermittent feature of rural roads. These would be minimised by the Project providing shuttle buses to and from Merriwa to discourage private vehicle trips.

With the inclusion of recommended lighting mitigation measures recommended in Table 4-2, night-time lighting impacts from the TWA Facility are anticipated to be contained to the immediate area.

Permanent (during operation of the solar farm)

There is no change to permanent lighting associated with Amendment Project 2(compared to the Amendment Project 2). There would be no change to the assessed impact of lighting during operation.

6 Key findings

6.1 Summary of visual changes

The proposed TWA Facility (Amendment Project 2) would result in *visible* changes (compared to Amendment Project 1) as outlined in SECTION 2.4.

This LCVIA Addendum 2 assessed a worst-case scenario location for the TWA Facility within the Feasibility Area – that is, in the north-west of the Feasibility Area, adjacent to Wollara Road (the location with the highest exposure). Visibility would reduce with increased distance from Wollara Road, lower elevation, and extent of existing elements in the vicinity (such as trees and buildings).

6.2 Landscape character impact with amendments

The TWA Facility would be located wholly within the open, agricultural landscape of the Project Area, in the vicinity of the forested landscape of Goulburn River National Park. The assessment found:

- There would be a temporary increase in impact to the open agricultural landscape zone (compared to Amendment Project 1) from *low* to l*ow-moderate,* corresponding to the longevity of the TWA Facility. Following its decommissioning and rehabilitation of the site, the impact to landscape character would revert to *low* (as was determined in the assessment of Amendment Project 1).
- There is no change to the *low* rating of landscape character impact within the dense, forested landscape (compared to Amendment Project 1).
- There is no change to the *low* rating of landscape character impact within the Golden Highway landscape (compared to Amendment Project 1).

6.3 Visual impact with amendments

This assessment found there would be no change to the visual impact rating for the 14 assessed viewpoints (compared to Amendment Project 1). The TWA Facility would be visible to one viewpoint, Wollara Road. It would not be visible from any of the identified residential viewpoints.

For road users travelling along Wollara Road:

- The LCVIA determined that the proposed solar farm (the EIS Project) would occupy 67 grid cells, resulting in a 'very high' magnitude of change to the view (the highest magnitude rating as per the *Technical Supplement*).
- Addendum Project 1 (which mostly comprised road upgrades) did not change the 'very high' magnitude of change rating to views from Wollara Road.
- Addendum Project 2 (with the inclusion of the TWA Facility) also does not change the 'very high' magnitude of change rating. The TWA Facility would be located wholly within the development footprint and not exacerbate the previously determined grid cell count. 'Very high' is already the highest magnitude of change rating (as per the *Technical Supplement*).

The 'very high' magnitude of change rating, combined with the 'low' sensitivity rating, results in a 'moderate' level of visual impact to Wollara Road. Therefore, the moderate level of visual impact determined during the assessment of Amendment Project 1 does not change. Visual impact findings are summarised in Table 4-1.

6.4 Performance objectives

There is no change to the assessment of Amendment Project 1 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'.

There is no change to the draft landscape plan prepared to address those performance objectives. Additional mitigation measures have been recommended to address impacts associated with

Amendment Project 2, including suggestions for siting the TWA Facility to reduce its visibility, such as avoiding locations directly in line-of-sight of road users, locating further from Wollara Road, and locating where there are screening elements (such as trees and/or buildings) in the landscape.

There is no change to the residual visual impact rating for the 14 assessed viewpoints (compared to Amendment Project 1). The viewpoint with the highest impact (Wollara Road at moderate) would reduce to very low over time, with proposed perimeter landscape screening established during construction and maintained during solar farm operation.

6.5 Lighting impact with amendments

There would be a temporary increase in lighting impacts, as new lighting would be installed at the TWA Facility, and there could be night-time vehicle access to, and from, the TWA Facility. Mitigation measures have been included to reduce potential temporary night-time lighting impacts.

There would be no change to the operational lighting impacts of Amendment Project 2, compared to Amendment Project 1.

7 References

Australian Government, Department of Climate Change, Energy, the Environment and Water, 2023, *National Light Pollution Guidelines for Wildlife*,

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Envisage Consulting, December 2023, *Goulburn River Solar Farm, Landscape Character and Visual Impact Assessment, Addendum.*

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

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Transport for NSW, 2020, *Guideline for Landscape Character and Visual Impact Assessment - Environmental Impact Assessment Guidance Note EIA–N04'*

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

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

Umwelt, 2024. *Goulburn River Solar Farm Temporary Workers Accommodation Facility Amendment Report.*

Appendix A
Receivers identified for assessment

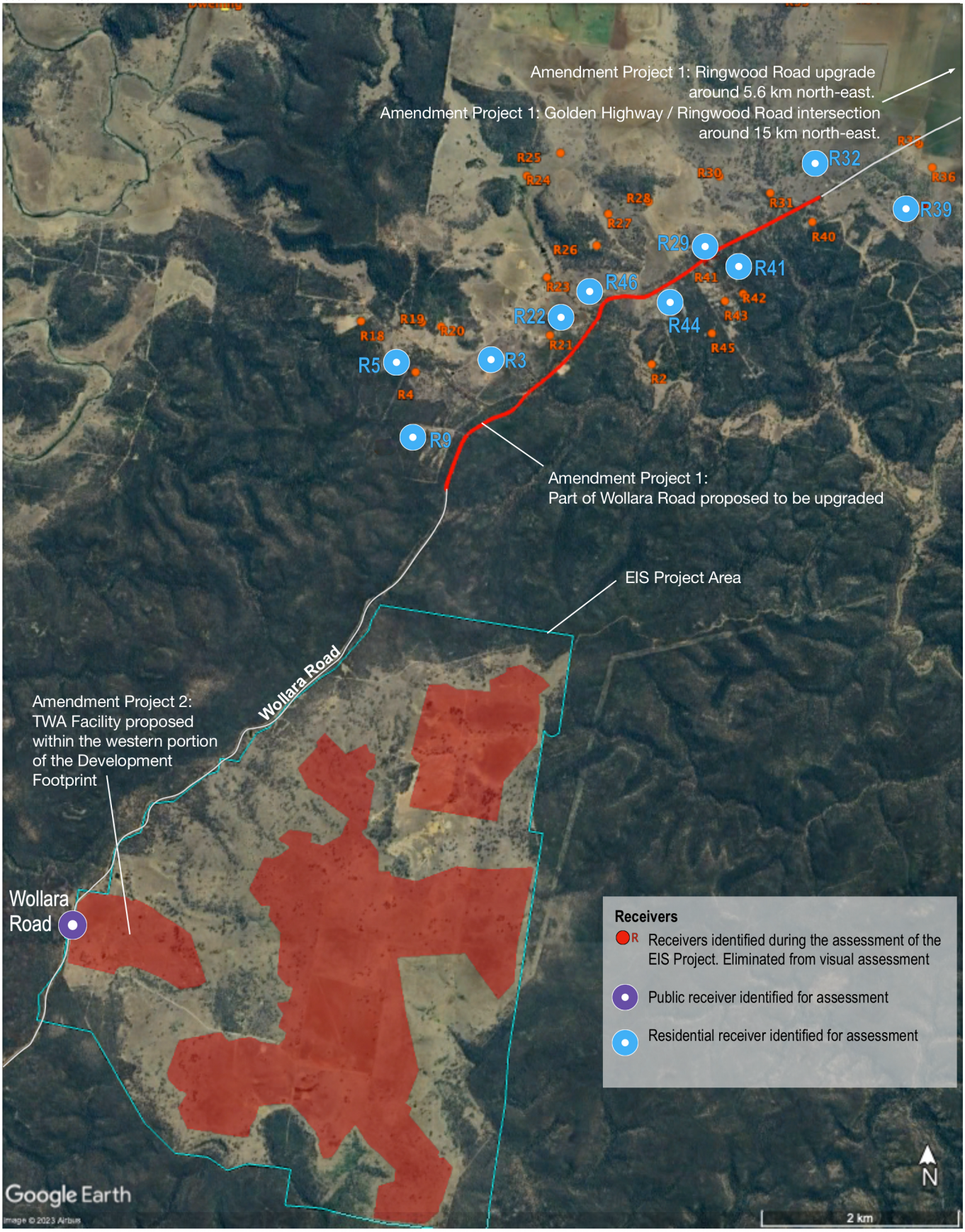
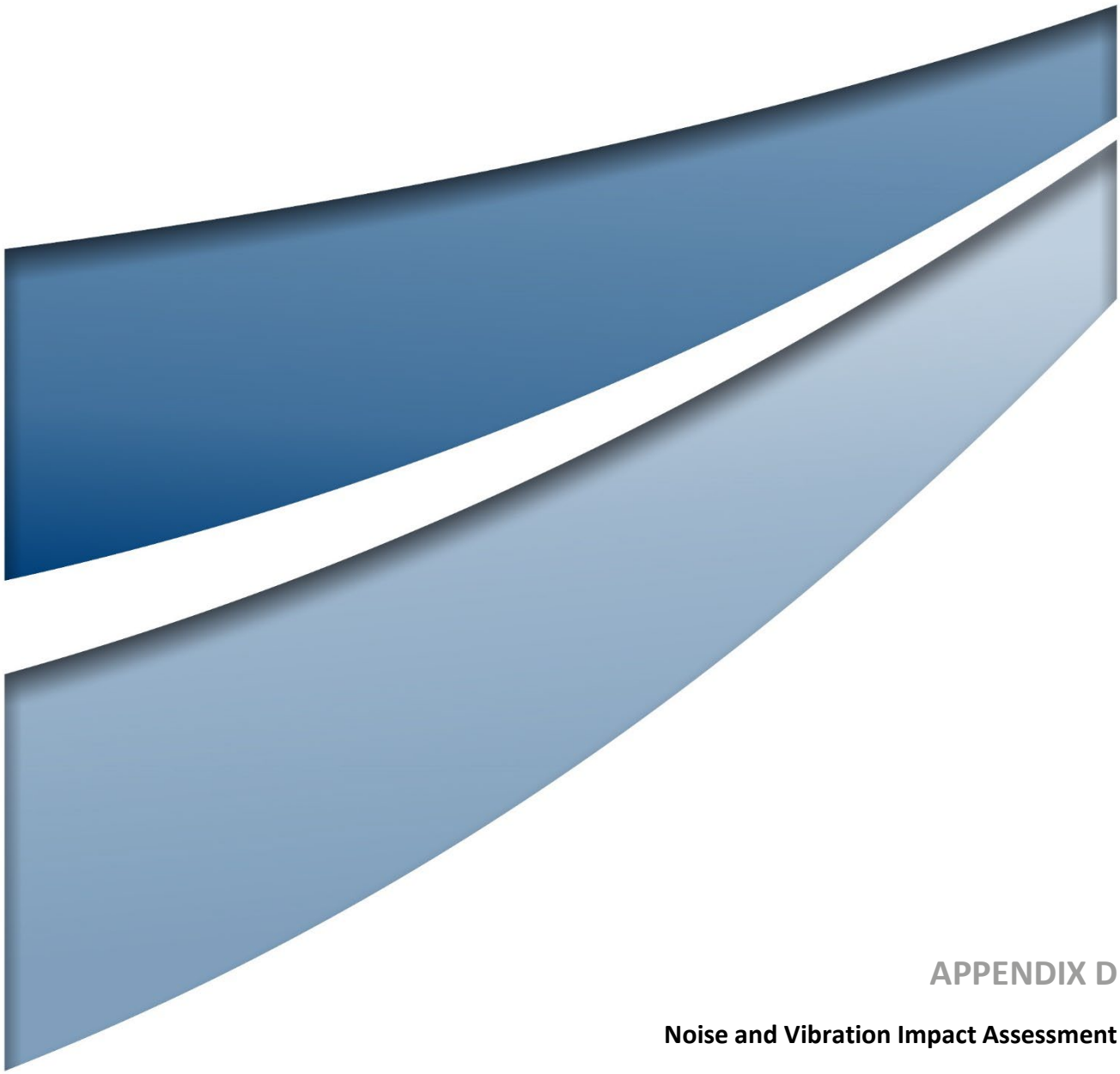


Figure originally included in *Goulburn River Solar Farm: LCVIA Addendum 1* as Figure 4-1.
Updated for *Goulburn River Solar Farm: LCVIA Addendum 2 - TWA Facility*, 3 May 2024.



APPENDIX D

Noise and Vibration Impact Assessment

umwelt
Environmental & Social Consultants

lightsource bp

GOULBURN RIVER SOLAR FARM

Appendix D - Noise and Vibration Impact Assessment TWA Facility Addendum

FINAL

May 2024

GOULBURN RIVER SOLAR FARM

Appendix D - Noise and Vibration Impact Assessment TWA Facility Addendum

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
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Project Manager: Thomas Buchan
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Technical Manager: Ben Carlyle
Report No. 23485/R15/Appendix D
Date: May 2024

umwelt
Environmental & Social Consultants

APPROVED COMPANY ISO 9001
QMS Certification Services

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V01	Tim Procter	1 May 2024	Tim Procter	1 May 2024
Final	Tim Procter	22 May 2024	Jessica Henderson Wilson	23 May 2024

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Figures

Tables

1.0 Introduction

The Goulburn River Solar Farm Project (i.e. the Project) involves the construction, operation and decommissioning of approximately 550-megawatt peak (MWp) of solar photovoltaic (PV) generation as well as a Battery Energy Storage System (BESS) with 1,030 MWp / 2,060 megawatt hour (MWh) capacity. The Project will also include a substation and connection to an existing 500 kilovolt (kV) transmission line. The Project will include various associated infrastructure, including road repairs and upgrades to Ringwood Road, temporary construction facilities, operation and maintenance buildings, internal access roads, civil works and electrical infrastructure to connect the Project to the existing transmission line which passes through the Project Area.

This Noise and Vibration Impact Assessment addendum report (NVIA Addendum 2) has been prepared to support Amendment Report 2 which assesses the inclusion of a Temporary Workers Accommodation Facility (TWA Facility) as described in **Section 2.0**. The TWA Facility is sited within the existing Development Footprint as assessed throughout EIS and Amendment Report 1. This NVIA report has assessed a worst-case location for the TWA Facility within the western portion of the Development Footprint (otherwise known as the TWA Facility Feasibility Area).

This NVIA Addendum 2 is supplementary to the previously prepared Umwelt reports, *Goulburn River Solar Farm Noise and Vibration Impact Assessment, Final*, dated April 2023 (EIS NVIA 2023) and the *Goulburn River Solar Farm Noise and Vibration Impact Assessment Addendum Report, Final*, dated December 2023 (NVIA Addendum 1).

2.0 Description of the TWA Facility

An on-site TWA Facility is being proposed to accommodate the anticipated peak workforce required to construct the Project. The requirement to develop an on-site TWA Facility was determined through consultation with government agencies and in response to agency submissions raised on the Response to Submission (RtS) (Umwelt, 2023b) and Amendment Report 1 (Umwelt, 2023a).

The TWA Facility would be developed within the existing Development Footprint assessed within the Project EIS (Umwelt, 2023a) subsequent Amendment Report 1 (Umwelt, 2023b) and this Amendment Report 2 (Umwelt, 2024), and would span an area of approximately 3 hectares (ha).

The TWA Facility is proposed to be located on site within the western portion of the Development Footprint, an area described in the Amendment Report (2) as the 'TWA Facility Feasibility Area'. A representative worst-case location for the TWA Facility has been identified within the TWA Facility Feasibility Area for the purposes of this assessment, based on proximity to nearby receivers. The worst-case location is identified on **Figure 2.1** and is adjacent to the main Project Area access point on Wollara Road.

The proposed TWA Facility will consist of prefabricated modular accommodation units, recreational facilities and support buildings interlinked with plug and play services (i.e. water, sewerage treatment and power) as well as covered walkways. The TWA Facility will be designed to accommodate up to 400, including the workers required to construct the Project as well as for the maintenance and operation of the TWA Facility itself.

This would be a temporary facility for use during the Project construction period and would be decommissioned at the conclusion of the construction period. The TWA Facility may be constructed progressively to align with the anticipated increase of construction workforce associated with the Project.

The proposed TWA Facility will include the following components:

- Prefabricated rooms.
- Kitchen and dining facilities.
- Administration buildings comprised of offices and reception.
- First aid post.
- Linen and chemical storage rooms.
- Maintenance and cleaning buildings for housekeeping equipment and laundry facilities.
- Ablutions.
- Waste water treatment plant, inclusive of storage facility.
- Electricity generating units and fuel storage.
- Water storage/supply.
- Car, bus and truck parking.
- Recreational facilities such as a gymnasium, a bar area and BBQ facilities.

2.1 Construction Traffic Movements

The primary access to the TWA Facility will be through the existing main access point at 2271 Wollara Road, Merriwa. Access to site will utilise the same traffic route assessed in the EIS NVIA 2023 and NVIA Addendum 1.

In accordance with Section 6.1 of the TWA Facility Amendment 2 (Umwelt, 2024), vehicle movements to the Project Area will be on average lower than that assessed in EIS NVIA 2023 and NVIA Addendum 1. During peak construction months, the TWA Facility is predicted to avoid approximately 40% of the private vehicle movements and approximately 60% of the shuttle bus movements as assessed in the Amendment Report 1 (Umwelt, 2023b).

Accordingly, construction traffic noise levels as a result of the TWA Facility are predicted to comply with the NSW Road Noise Policy (RNP, 2011) criteria and be less than the previously assessed traffic noise impacts in the EIS NVIA (Umwelt 2023a) and Amended NVIA (Umwelt 2023b).

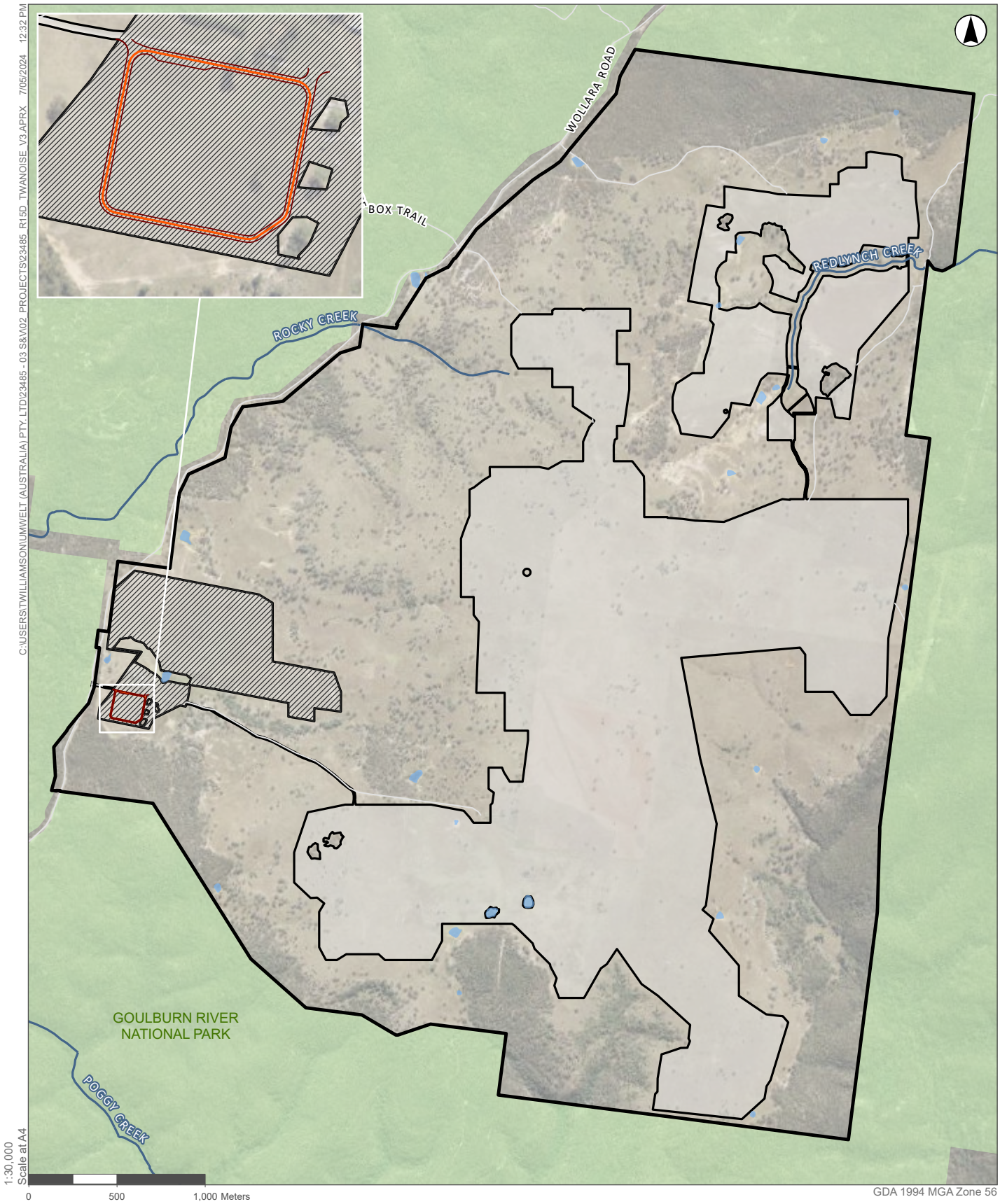

FIGURE 2.1

Approximate Location of TWA Facility within Development Footprint

Image Source: ENSW Public Imagery (2023) **Data source:** NSW LPI (2023), NSW DSFI (2023); NPWS Estate (2023); Lightsource BP (2024)

3.0 Sensitive Receivers

The nearest receivers in the area surrounding the Project are consistent with the EIS NVIA 2023 and presented in **Table 3.1** and **Figure 3.1**.

Table 3.1 Nearest Receivers

Receiver ID	Receiver Type	Address / Description	Approximate Distance (km) and direction from the Project Area	Approximate Distance (km) and direction from the TWA Facility Feasibility Area
R01 (host receiver) [1]	Residential	2771 Wollara Road, Merriwa (Lot 58 DP750956)	Within Project Area	Within TWA Facility Feasibility Area
R02	Residential	1893 Wollara Road, Merriwa (Lot 13 DP731205)	2.8 km north	> 4 km north
R03	Residential	54 Hulks Road, Merriwa (Lot 12 DP746396)	2.5 km north	> 4 km north
R04	Residential	54 Hulks Road, Merriwa (Lot 14 DP746396)	2.3 km north	> 4 km north
R05	Residential	153 Hulks Road, Merriwa (Lot 16 DP746396)	2.4 km north	> 4 km north
R06	Residential	1324 Mogo Rd, Mogo (Lot 12 DP610756)	> 4 km west	> 4 km west
R07	Residential	3483–3492 Wollara Road, Merriwa (Lot 14 DP750966)	> 4 km southwest	> 4 km southwest
R08	Residential	5657 Wollar Road, Coggan (Lot 45 DP755421)	> 4 km south	> 4 km south
R09	Residential	2076 Wollar Road, Merriwa (Lot 15 746396)	1.7 km north	> 4 km north
R10 [2]	Passive Recreation	Goulburn River National Park	Adjacent to Project Area in all directions	

Notes: [1] Receiver R01 is involved in the Project (host receiver) and therefore is not considered sensitive.

[2] For the Goulburn River National Park receiver location, given the vastness of the park and available bushwalking area, a receiver point 200 m from the Project Area was adopted for noise prediction purposes. This is considered a worst-case representative location for passive recreational users of the National Park as there are no actively managed recreation facilities in the Goulburn River National Park that are located this close to the Project.