Transport for NSW

Hume Motorway Alternative Heavy Vehicle Rest Area

Minor works review of environmental factors

November 2024

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which the Hume Motorway Alternative Heavy Vehicle Rest Area is proposed.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

Approval and authorisation

Title	Project Development Manager
Accepted on behalf of Transport for NSW by:	Louise Moran
Signed	[redacted]
Date:	November 2024

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1. Introduction

The purpose of the minor works review of environmental factors (REF) is to describe the proposal, to document the likely impacts of the proposal on the environment, to detail mitigation measures to be implemented and to determine whether or not the proposal can proceed. For the purposes of this work Transport for NSW (Transport) is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The description of the proposed works and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021, Guidelines for Division 5.1 Assessments (DPE, 2022), the *Biodiversity Conservation Act 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act) and the *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).

In doing so the REF helps to fulfil the requirements of section 5.5 of the EP&A Act including that Transport examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The potential for the proposal to significantly impact a matter of national environmental significance, including nationally listed threatened biodiversity matters, or the environment of Commonwealth land. Where a significant impact is considered likely on nationally listed biodiversity matters, either the proposal must be reconsidered or a project REF must be prepared.

2. The proposal

2.1 Description

2.1.1 Proposal location

Table 2-1: Proposal location details

Location details	
Title	Hume Motorway Alternative Rest Area MWREF
File number	
Road name and number	Hume Motorway (M31)
Closest crossroad(s)	Moreton Park Road
Chainage of works	
Local government area	Wollondilly
Transport for NSW region	Greater Sydney

2.1.2 Proposal description

Proposal

Transport proposes to construct an Oversize and/or Overmass (OSOM) and Heavy Vehicle rest area along the western side of the Hume Motorway in Menangle, located about 500 metres north of Patridge VC Rest area (the proposal). The proposal area is about 1.3 kilometres long and extends from the median to the verge of the Hume Motorway. The proposal would provide a rest area for OSOM vehicles traveling northbound and would replace an existing informal heavy vehicle rest area, which is colloquially known as the 'Dustbowl'. The proposal is shown in Figure 2-1 , Figure 2-2, Figure 2-3 and Appendix C.

The proposal would support the delivery of the Spring Farm Parkway Stage 1 project which is a new four lane divided road to link the new Menangle Park development with the Hume Motorway and Menangle Road. Spring Farm Parkway Stage 1 includes a northbound on-ramp to the Hume Motorway that extends past the existing 'Dustbowl', an informal heavy vehicle rest area. The existing informal heavy vehicle rest area is primarily used as a stopping/staging area to allow compliance with the Sydney heavy vehicle curfew.

Transport is also progressing an interim OSOM rest area on the Hume Motorway in Douglas Park for use by OSOM vehicles in the period between the existing 'Dustbowl' being closed and this proposal being opened. The interim OSOM rest area is subject to separate assessment and approval.

Key features of the proposal include:

- About 150 metre long and 29 metre wide stop area
- Provision of a bypass lane at the front the rest area
- A safety barrier between the rest area and the Hume Motorway
- About 160 metre long diverge lane
- About 150 metre long deceleration lane
- About 295 metre long acceleration lane
- About 240 metre long merge lane
- A spill containment basin.

Figure 2-1: Proposal location

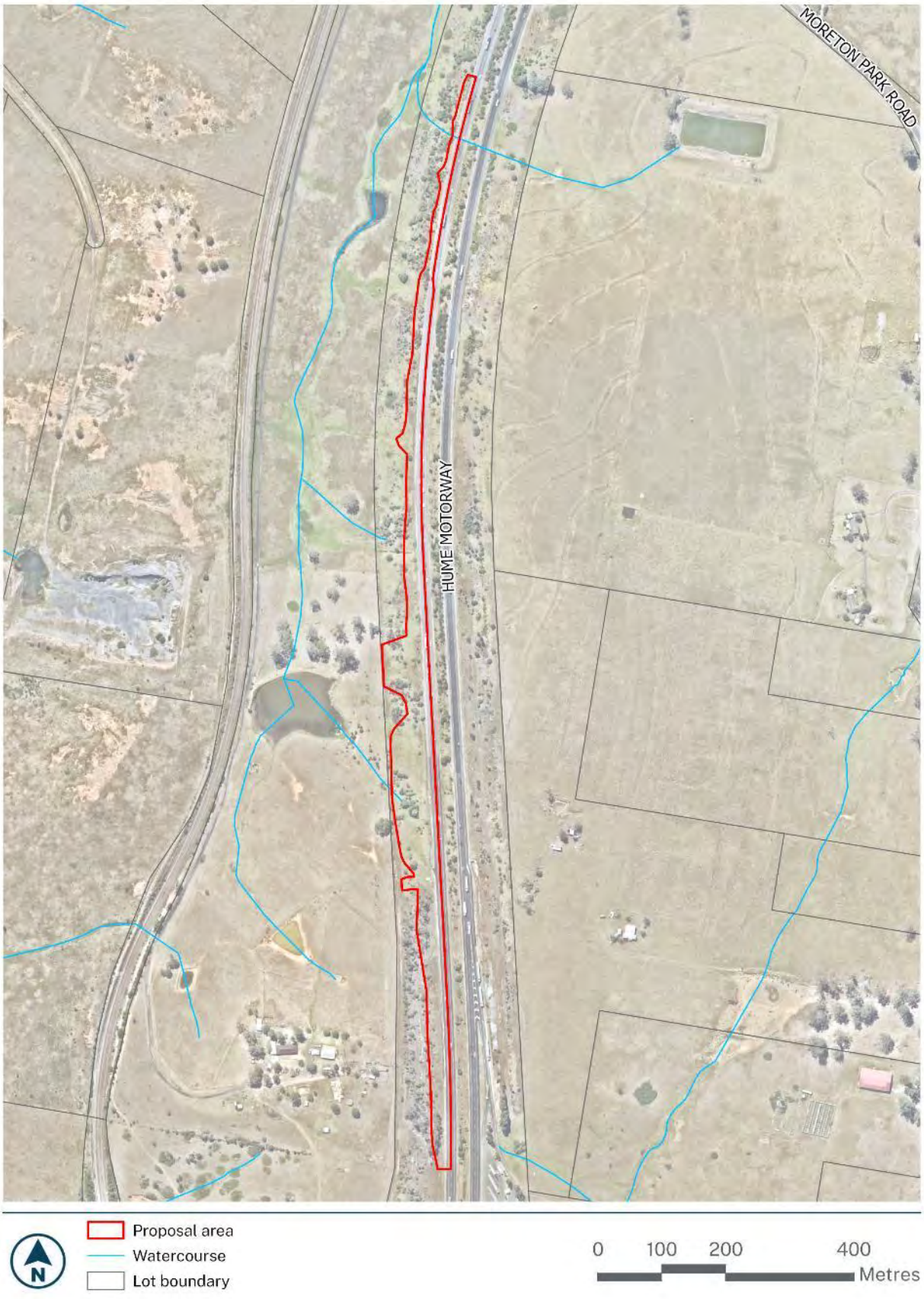


Figure 2-2: Proposal area

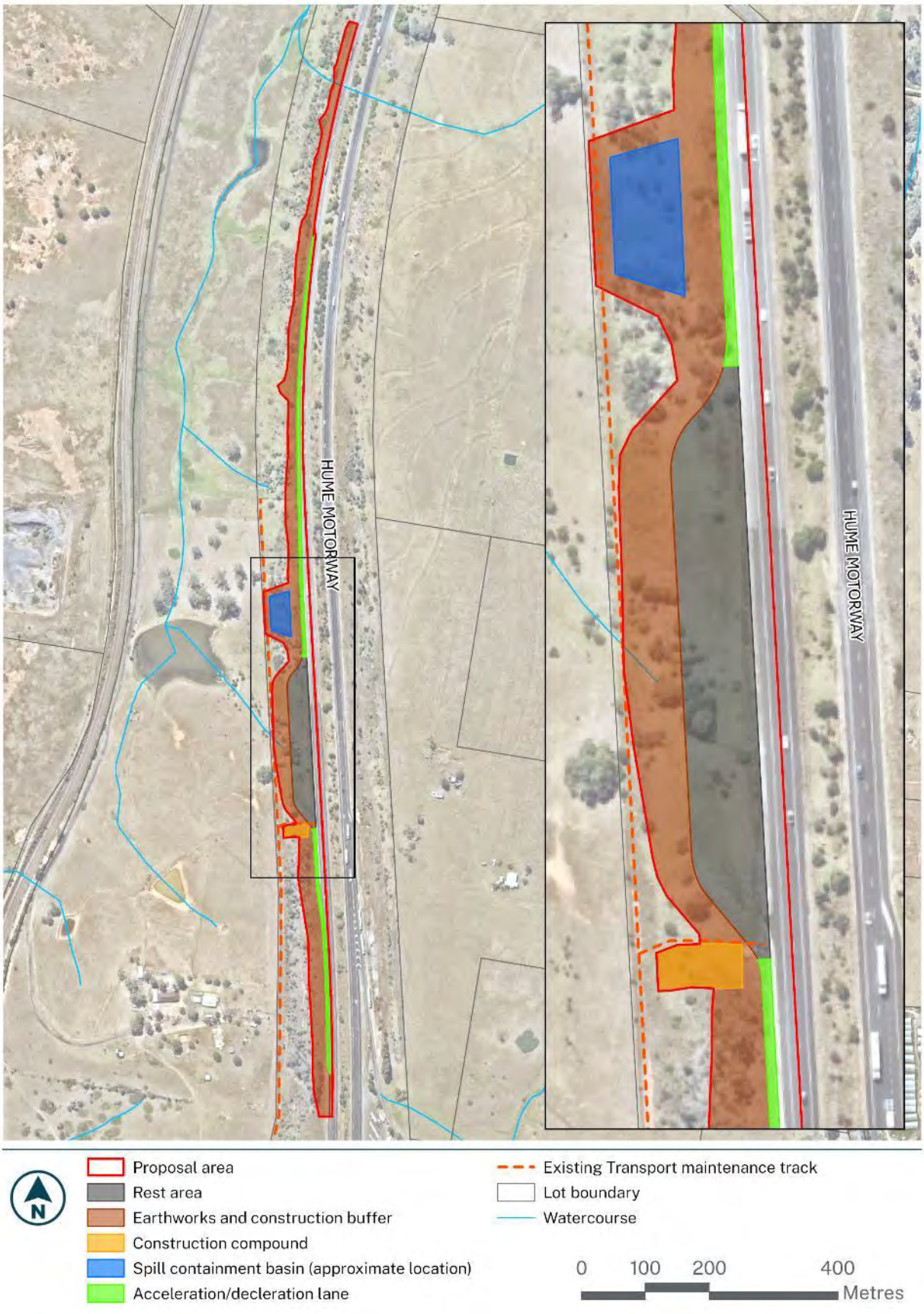


Figure 2-3: Details of proposal

Work Methodology

The proposal is anticipated to involve the following work methodology:

- Establish the construction site including traffic and environmental control measures
- Clear vegetation, import fill material and form ground level and slope batters as per design requirements
- Lay pavement for new rest area and replacement of pavement in the existing road shoulder where required
- Form access from rest area to existing Transport maintenance track on western side of Hume Motorway
- Construct a spill containment basin
- Install safety barriers with end terminals, fencing, kerbs and stormwater drains as per design requirements
- Line marking
- Demobilise construction site and remove traffic and environmental control measures.

Plant and Equipment

The plant and equipment required for the proposal is anticipated to include the following:

- Utility vehicles
- Line marking machine
- Asphalt paver
- Asphalt profiler
- Tipper truck
- Truck mounted attenuators
- Mobile floodlight towers
- Excavator
- Water cart
- Small crew cab truck
- Flat bed truck
- Smooth drum roller
- Pad foot roller
- Multi tyre roller

Construction Hours

Where possible, works would occur during standard construction work hours as follows:

- Monday to Friday: 7am – 6pm
- Saturday: 8am to 1pm
- Sunday and Public Holidays: No work.

However, to minimise disruption to traffic and provide a safe work environment for the work crews and the public, most of the works would be carried out outside of standard working hours from 8pm to 5am Sunday to Thursday with no works on public holidays, subject to Road Occupancy Licences (ROLs) and construction staging.

2.1.3 Proposal objectives

The proposal objectives are:

- Provide a northbound rest area area along the Hume Motorway to replace the informal 'Dustbowl' and support the delivery of the **Spring Farm Parkway Stage 1.**
- Improve safety for road users by providing a formalised facility with defined entry and exit routes, a deceleration lane, an acceleration lane, sign posting and appropriate pavement marking.

2.1.4 Ancillary facilities

Table 2-2: Ancillary facilities

Ancillary facilities		
Will the proposal require the use or installation of a compound site? The proposal requires the use of a compound / site office during construction. The compound / site office would be located adjacent to the rest stop area, to the south. The compound would be above 30 metres x five metres as in identified in Figure 2-3.	Yes ☒	No ☐
Will the proposal require the use or installation of a stockpile site? A stockpile site is proposed about one kilometre south of Partridge VC Rest Area. This stockpile site is the same site used for the interim truck rest area. Any stockpiles would be managed in accordance with the Stockpile Site Management Guideline (EMS-TG-10).	Yes ☒	No ☐
Are any other ancillary facilities required (e.g. temporary plants, parking areas, access tracks)? No other ancillary facilities are required.	Yes ☐	No ☒

2.1.5 Proposed date of commencement

The proposal is due to start in February 2025.

2.1.6 Estimated length of construction period

The proposal will take up to 12 months to complete.

2.2 Need and options

2.2.1 Options considered

The options considered for the proposal included:

- Option 1: do nothing
- Option 2: construct rest area with acceleration and deceleration lanes
- Option 3: use the interim OSOM rest area as a permanent solution.

The preferred option is Option 2 (construct rest area with acceleration and deceleration lane) as it best aligns with the proposal objectives identified in Section 2.1.3.

A review of the options against the proposal objectives is provided in Table 2-3. While Option 2 would have some potential environmental impacts, these would be short-term, minor and adequately addressed through the application of safeguards and environmental management measures (refer to Chapter 5).

Table 2-3: Evaluation of options against the proposal objectives

Proposal objectives	Option 1: Do Nothing	Option 2: Construct Rest Area	Option 3: Interim OSOM Rest Area
Provide a northbound rest area along the Hume Motorway to replace the informal 'Dustbowl' and support the delivery of the Spring Farm Parkway.	The location of the existing 'Dustbowl' will not be able to be safely accessed and used as a rest area as a result of the **Spring Farm Parkway Stage 1 project**. Option 1 would not provide **an alternative northbound rest area along the Hume Motorway**. **Does not meet objective** ×	Option 2 provides **an alternative northbound rest area along the Hume Motorway** allowing heavy vehicles to stop in the same way that they currently use the 'Dustbowl'. **Meets objective** ✓	Option 3 provides a northbound rest area along the Hume Motorway, however due to size restrictions, the rest stop is for OSOM vehicles only and would not support the future demand required for heavy vehicles on the Hume Motorway **Does not meet objective** ×
Improve safety for road users by providing a formalised facility with defined entry and exit routes, a deceleration lane, an acceleration lane, sign posting and appropriate pavement marking.	Option 1 would not provide any safety improvements and may cause further impacts to safety should heavy vehicles use other informal areas to stop along the Hume Motorway. **Does not meet objective** ×	Option 2 would provide a formalised rest area with **defined entry and exit routes, a deceleration lane, an acceleration lane, sign posting and appropriate pavement marking and create a safe road environment along the Hume Motorway near the proposal.** **Meets objective** ✓	Option 3 would provide a formalised rest area with **defined entry and exit routes, a deceleration lane, an acceleration lane, sign posting and appropriate pavement marking and creating a safe road environment along the Hume Motorway near the proposal.** **Meets objective** ✓

2.2.2 Justification for the proposal

An informal heavy vehicle (including OSOM vehicle) rest area (colloquially known as the 'Dustbowl') is located adjacent to the northbound carriageway off the Hume Motorway in Menangle Park. The 'Dustbowl' is used by heavy vehicle drivers as a rest / staging area to achieve compliance with the Sydney heavy vehicle curfew. Spring Farm Parkway Stage 1 project involves the construction of a new interchange with the Hume Motorway to the south of the existing 'Dustbowl'. The northbound on-ramp and acceleration lane from this new interchange extends past the existing 'Dustbowl' heavy vehicle rest area. As a result, safe entry and exit to the existing 'Dustbowl' is not possible. The proposal will operate in the same way as the 'Dustbowl', however it will improve safety for truck drivers and general traffic on the Hume Motorway. The proposal will be a formalised facility with defined entry and exit routes, an acceleration lane, deceleration lane, sign posting and pavement marking.

Transport has constructed an interim OSOM rest area on the Hume Motorway in Douglas Park for use by OSOM vehicles in the period between the 'Dustbowl' being closed and this proposal being opened. The interim OSOM rest area is subject to separate assessment and approval. Due to size limitations and usage intended for OSOM vehicles only, the interim OSOM rest area is not appropriate for a permanent solution.

Figure 2-4: Context of proposal

2.3 Statutory and planning framework

2.3.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the state. This includes roads and road infrastructure facilities, and port, wharf or boating facilities.

Section 2.109 of the SEPP (Transport and Infrastructure) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the proposal is appropriately characterised as development for the purposes of a road or road infrastructure facilities and is to be carried out by or on behalf of Transport, it can be assessed under Division 5.1 of the EP&A Act. Development consent from council is not required.

The proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021
- State Environmental Planning Policy (Precincts – Central River City) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Planning Systems) 2021.

2.3.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 6 (Water Catchments) of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 relates to the use of land within four regulated catchments as defined in the SEPP:

- the Sydney Drinking Water Catchment
- the Sydney Harbour Catchment
- the Georges River Catchment
- the Hawkesbury-Nepean Catchment.

The proposal is located in the Hawkesbury Nepean Catchment.

Transport has assessed the proposals impact to water quality and quantity, aquatic ecology, flooding, and recreation and public access. An assessment of these factors is provided in Appendix B. The assessment concluded the proposal would not have any significant impacts on water quality in the Hawkesbury Nepean catchment.

2.3.3 Wollondilly Local Environmental Plan 2011

The Wollondilly Local Environmental Plan 2011 (WLEP 2011) applies to the proposal area. The proposal area is located entirely within the SP2 – Infrastructure zone. The objectives of the SP2 zone under the WLEP 2011 are:

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.

The proposal is aligned with the objectives of the SP2 zone as it provides for road infrastructure.

Figure 2-5: Land use zoning within and near the proposal

2.3.4 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the NSW Environment Protection Authority (EPA). It provides an integrated system of licenses to set out protection of the environment policies and to adopt more innovative approaches to reduce pollution in the environment, having regard to the need to maintain ecologically sustainable development (ESD). Measures to address potential pollution as a result of the proposal have been prescribed in this Minor Works REF and are included in Section 3.1 and Section 3.2.

The POEO Act requires an Environmental Protection Licence (EPL) for scheduled development work and the carrying out of scheduled activities. The proposal does not involve undertaking a scheduled activity and therefore an EPL is not required.

2.3.5 Heritage Act 1977

The *Heritage Act 1977* provides for the conservation of buildings, work, relics and places that are of historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance to the State.

An excavation permit is required to disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed. A permit is also required to disturb or excavate any land on which the person has discovered or exposed a relic. Section 139(4) of the *Heritage Act 1977* makes provision for the issuing of an exception in certain prescribed circumstances. An excavation permit is not required for the proposal.

2.3.6 National Parks and Wildlife Act 1974

The harming or desecrating of Aboriginal objects or places is an offence under section 86 of the *National Parks and Wildlife Act 1979*. Under section 90, an Aboriginal heritage impact permit may be issued in relation to a specified Aboriginal object, Aboriginal place, land, activity or person or specified types or classes of Aboriginal objects, Aboriginal places, land, activities or persons. An Aboriginal heritage impact permit is not required for the proposal.

The proposal is not located near any national parks and not expected to impact on any Aboriginal heritage items or places (refer to Section 3.5). No permits under the *National Parks and Wildlife Act 1979* are required for the proposal.

2.3.7 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act, a referral to the Australian Minister for the Environment is required for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Appendix A of this Minor Works REF.

A referral is not required for the proposal that may affect nationally listed threatened species, endangered ecological communities and migratory species. This is because requirements for considering impacts to these biodiversity matters are the subject of a strategic assessment approval granted under the EPBC Act by the Australian Government in September 2015.

Potential impacts to biodiversity from the proposal are discussed in Section 3.7.

The assessment of the proposal's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the proposal has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water under the EPBC Act.

2.3.8 Native Title Act 1993

The *Native Title Act 1993* recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions that affect native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act, a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Tribunal Native Title Vision website was carried out on 2 April 2024, with no Native Title holders/claimants identified.

2.4 Community

2.4.1 SEPP (Transport and Infrastructure) consultation

Part 2.2 of the SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local councils and other public authorities prior to the commencement of certain types of development. This is detailed below:

Table 2-4: Consultation required with Council

Is consultation with Council required under sections 2.10 - 2.12 and 2.14 of the SEPP (Transport and Infrastructure)?		
Are the works likely to have a substantial impact on the stormwater management services which are provided by council?	Yes ☐	No ☒
Are the works likely to generate traffic to an extent that will strain the capacity of the existing road system in a local government area?	Yes ☐	No ☒
Will the works involve connection to a council owned sewerage system? If so, will this connection have a substantial impact on the capacity of the system?	Yes ☐	No ☒
Will the works involve connection to a council owned water supply system? If so, will this require the use of a substantial volume of water?	Yes ☐	No ☒
Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a minor or inconsequential disruption to pedestrian or vehicular flow?	Yes ☐	No ☒
Will the works involve more than a minor or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes ☐	No ☒
Is there a local heritage item (that is not also a state heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential? The northern end of the proposed works is located within Landscape Conservation Area C6 – Menangle Landscape Conservation Area. A Statement of Heritage Impact (SOHI) has been prepared to inform the preparation of this MWREF. The SOHI is available in Appendix E: Statement Of Heritage Impact. The assessment determined that the potential impacts to the heritage significance of the conservation area would not be more than minor or inconsequential. Notwithstanding, Wollondilly Shire Council has been consulted on the matter of potential impacts to local heritage items. A letter was sent to Council on the 18 April 2024 along with a draft version of the Statement of Heritage Impact prepared to inform this MWREF. Transport did not receive a response from Council within the 21 day notice period.	Yes ☐	No ☒
Is the proposal within the coastal vulnerability area and inconsistent with a certified coastal management program applying to that land?	Yes ☐	No ☒
Are the works located on flood liable land? If so, will the works change flooding patterns to more than a minor extent?	Yes ☐	No ☒

Table 2-5: Consultation with other public authorities

Is consultation with a public authority (other than Council) required under sections 2.13, 2.15 and 2.16 of the SEPP (Transport and Infrastructure)?		
Are the works located on flood liable land? (to any extent) If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?	Yes ☐	No ☒
Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	Yes ☐	No ☒
Are the works on land in Zone C1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	Yes ☐	No ☒
Do the works include a fixed or floating structure in or over navigable waters?	Yes ☐	No ☒
Are the works for the purpose of residential development, an educational establishment, a health services facility, a correctional facility or group home in bush fire prone land?	Yes ☐	No ☒
Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	Yes ☐	No ☒
Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in clause 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011).	Yes ☐	No ☒
Are the works on land in a mine subsidence district within the meaning of the *Coal Mine Subsidence Compensation Act 2017*? The proposal is located within the South Campbelltown Mine Subsidence District. The Mine Subsidence Board NSW has been consulted under SEPP (Transport and Infrastructure) about the proposal as per the requirements of section 2.15. The Subsidence Advisory was consulted in response to the proposal being located within a mine subsidence district. A letter was sent by Transport to the Subsidence Advisory regarding the proposal on the 18 April 2024 and a response was received on the 3 May 2024. The response advised that proposal is within an existing exploration authority and coal mining lease. Future coal mining is possible beyond 25 years into the future. Infrastructure should be designed for potential subsidence parameters – 3mm/m strain (tensile or compressive), 7mm/m tilt and 5 km radius of curvature (hogging and sagging). The suggested design specifications have been used to inform the design of the proposal.	Yes ☒	No ☐
Are the works on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region Work Heritage Property?	Yes ☐	No ☒
Are the works within a Western City operational area specified in Schedule 2 of the *Western Parkland City Authority Act 2018* with a capital value of $30 million or more?	Yes ☐	No ☒

Table 2-6: Notification of council and occupiers of adjoining land

Do Council and occupiers of adjoining land need to be notified under section 2.111 of the SEPP (Transport and Infrastructure)?		
Does the proposal include a car park intended for the use by commuters using regular bus services?	Yes ☐	No ☒
Does the proposal include a bus depot?	Yes ☐	No ☒
Does the proposal include a permanent road maintenance depot or associated infrastructure, such as garages, sheds, tool houses, storage yards, training facilities and workers amenities?	Yes ☐	No ☒

2.4.2 Other agency and community engagement

Transport for NSW aims to provide genuine opportunities for community and stakeholder involvement. This is to ensure that stakeholders understand and are accepting of the decision.

Community engagement

The following ongoing consultation will be undertaken:

- Engagement with directly impacted and adjacent property owners.
- Engagement with Wollondilly Shire Council to inform them of the project.
- Engagement with the freight industry on design and maintenance.
- Development of a complaints management system for the construction phase.
- Regular updates and information as required on Transport for NSW website.

Freight industry involvement

Transport is committed to engaging with the freight industry on Heavy Vehicle Rest Areas. There is a strong desire from the industry to improve heavy vehicle rest stops. This includes the nuanced needs of OSOM vehicle drivers and the constraints surrounding where they can safely and legally travel and stop to rest, allowing them to adhere to curfews.

Transport undertook focused engagement with the road freight industry between November 2022 and March 2023. The resulting feedback is contained within the Heavy Vehicle Rest Stop Stakeholder Engagement Report published in September 2023. The report is available online: https://www.haveyoursay.nsw.gov.au/heavy-vehicle-rest-stops.

Transport also undertook targeted consultation in December 2023 and January 2024, specifically on the 'Dustbowl' and that it would no longer be used by light and heavy vehicles as well as changes to the configuration. As part of this consultation, the industry indicated the need for the 'Dustbowl' to continue as a rest area, which is why these alternatives are being proposed to ensure these requirements can continue to be met.

This broad and targeted industry feedback is guiding this work to ensure it meets the current and future needs of heavy vehicle drivers and the growing freight task. As part of this process, Transport will continue to engage the freight industry.

3. Environmental assessment

This chapter provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environmental potentially impacted upon by the proposal are considered. This includes consideration of the factors specified in s171 of the Environmental Planning and Assessment Regulation 2021.

The matters of national environmental significance under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) are also considered in Appendix A. Site-specific safeguards are provided to ameliorate the identified potential impacts.

3.1 Soil

Table 3-1: Soil

<table>
<tr><th colspan="3">Description of existing environmental and potential impacts</th></tr>
<tr><td>Are there any known occurrences of salinity or acid sulfate soils in the area?
A search of the eSpade Viewer shows that the proposal area is not prone to acid sulfate soils. The proposal area has a moderate potential for salinity.</td><td>Yes ☒</td><td>No ☐</td></tr>
<tr><td>Does the proposal involve the disturbance of large areas (e.g., >2ha) for earthworks?
The proposal area is about three hectares in size, the majority of which will have earthworks occurring on it. Indicative cut and fill volumes are provided in the table below.
<table>
<tr><th></th><th>Indicative volume (m^3)</th></tr>
<tr><td>Pavement Quantities</td><td>11,150</td></tr>
<tr><td>Cut Volume</td><td>10,850</td></tr>
<tr><td>Fill Volume</td><td>10,200</td></tr>
</table></td><td>Yes ☒</td><td>No ☐</td></tr>
<tr><td>Does the site have constraints for erosion and sedimentation controls such as steep gradients or narrow corridors?</td><td>Yes ☐</td><td>No ☒</td></tr>
<tr><td>Are there any sensitive receiving environments that are located in or nearby the likely proposal area or that would likely receive stormwater discharge from the proposal?
Sensitive receiving environments include (but are not limited to) wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments).
The proposal area is located within the Hawkesbury – Nepean Catchment. There are two non-perennial unnamed tributaries of the Nepean River within or immediately adjacent to the proposal, located to the east and the west.</td><td>Yes ☒</td><td>No ☐</td></tr>
<tr><td>Is there any evidence within or nearby the likely footprint of potential contamination?
A review of NSW history imagery identifies that the proposal is located in an area that contains unknown fill material from the original construction of Hume Motorway in the late 1970's. Due to this, contamination or contaminated materials may be present within the proposal area. During construction, this would be managed through safeguards to address any contaminated areas which may be encountered.</td><td>Yes ☒</td><td>No ☐</td></tr>
<tr><td>Is the likely proposal footprint in or nearby highly sloping landform?
The proposal area sits on a gentle slope, starting at about 145 metres above sea level (asl) in the south and dropping to about 110 metres asl in the north.</td><td>Yes ☐</td><td>No ☒</td></tr>
<tr><td>Is the proposal likely to result in more than 2.5ha (area) of exposed soil?</td><td>Yes ☒</td><td>No ☐</td></tr>
</table>

The proposal area is about three hectares in size, the majority of which will have earthworks occurring on it, including exposed soils. The proposal involves about 10,850m^3 of cut, with about 10,200m^3 of fill.		

Figure 3-1: Watercourses within and near the proposal area

Safeguards

Safeguards to be implemented are:

E1	Erosion and sediment control measures are to be implemented and maintained to: • Minimise sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site. (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).
E2	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
E3	Erosion and sediment control measures are not to be removed until the works are complete and areas are stabilised.
E4	Work areas are to be stabilised progressively during the works.
E5	A progressive erosion and sediment control plan is to be prepared for the works.
E6	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA.
E7	Where material is proposed to be removed from the proposal area, a waste classification must be undertaken on the materials in accordance with the NSW EPA *Waste Classification Guidelines* 2014.
E8	Where waste materials are proposed to be imported to the proposal area, the waste material is to be classified as virgin excavated natural material, or under a NSW EPA Resource Recovery Order, and be accompanied by certification of this classification.
E9	If suspected contamination (including asbestos) is identified all work would cease and the Transport for NSW Project Manager contacted immediately.

3.2 Waterways and water quality

Table 3-2: Waterways and water quality

Description of existing environmental and potential impacts		
Is the proposal located within, adjacent to or near a waterway? The proposal is located near an unnamed tributary which drains into the Nepean River (Figure 3–1).	Yes ☒	No ☐
Is the location known to flood or be prone to water logging? **The Wollondilly Shire Council online GIS system, accessed 13 May 2024, indicates the proposal area is not flood prone.**	Yes ☐	No ☒
Is the proposal located within a regulated catchments covered by chapter 6 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 (SEPP (Biodiversity and Conservation))? The proposal is located in the Hawkesbury – Nepean Catchment. An assessment of impacts is located in Appendix B. The assessment concluded the proposal would not have any significant impacts on water quality in the Hawkesbury Nepean catchment.	Yes ☒	No ☐
Would the proposal be undertaken on a bridge or ferry?	Yes ☐	No ☒
Is the proposal likely to require the extraction of water from a local water course (not mains)?	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

W1	There is to be no release of dirty water into drainage lines and/or waterways.

W2	Water quality control measures are to be used to minimise any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.
W3	Refuelling of minor plant and equipment is to occur offsite in an impervious bunded area, where practicable.
W4	If an incident (e.g. spill) occurs, the Environmental Incident Procedure (Transport for NSW, 2021) is to be followed and the Transport for NSW Contract Manager and Environment Manager notified immediately
W5	An emergency spill kit will be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
W6	Plant and equipment will be inspected regularly to ensure there are no leakages of fuel, oil and hydraulic fluid.

3.3 Noise and vibration

Table 3-3: Noise and vibration

Description of existing environmental and potential impacts		
A Noise and Vibration Assessment Report (NVAR) has been prepared by Muller Acoustic Consulting in accordance with Transport's *Construction Noise and Vibration Guideline (for Road and Maritime works)* (EMF-NV-GD-0056), the *Road Noise Criteria Guideline* (EMF-NV-GD-0024) and the *Road Noise Mitigation Guideline* (EMF-NV-GD-0024). The NVAR is available in Appendix D: Noise and Vibration Assessment Report.		
Are there any residential properties or other noise sensitive areas near the location of the proposal that may be affected by the work (i.e., church, school, hospital)? The distance from the proposal to the nearest residential receiver would be about 140 metres. Two noise catchment areas (NCA) have been determined to group receivers that are within similar noise environment. NCA1 captures about 12 residential receivers within 600 metres of the proposal area and the ancillary site, where the existing noise environment is influenced by traffic noise on the Hume Motorway. NCA2 captures about 23 residential receivers, one place of worship and one industrial premises 600 to 1500 metres from the proposal area and ancillary site, where there is a smaller influence from Hume Motorway noise. The nearest non-residential receivers are the Appin Mine Ventilation and Access site to the west of the proposal area and the Ethel Ministries to the north east of the proposal site, within NCA2. A figure showing the NCAs and the location of sensitive receivers relevant to the proposal is provided in Figure 3-1 of Appendix D: Noise and Vibration Assessment Report.	Yes ☒	No ☐
Is the proposal going to be undertaken only during standard working hours? Standard working hours • Monday-Friday: 7:00am to 6.00pm • Saturday: 8.00am to 1.00pm • Sunday and Public Holidays: no work Where possible, works would occur during standard construction work hours. However, to minimise disruption to traffic and provide a safe work environment for the work crews and the public, most of the works would be carried out outside of standard working hours from 8pm to 5am Sunday to Thursday with no works on public holidays, subject to Road Occupancy Licences (ROLs) and construction staging. Work outside of standard construction hours is defined by the Construction Noise and Vibration Guideline as Out-of-Hours Work (OOHW) and can be divided into two periods of sensitivity. OOHW Period 1 is defined as Monday to Saturday 6:00pm to 10:00pm (evenings), Saturday 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) and Sunday and public holidays 8:00am to 6:00pm (days). OOHW Period 2 is defined as Monday to Saturday 10:00pm to 7:00am (nights) and Sundays and public holidays 6:00pm to 8:00am (nights).	Yes ☐	No ☒
Is any explosive blasting required for the proposal?	Yes ☐	No ☒
Would construction noise or vibration from the proposal affect sensitive receivers?	Yes ☒	No ☐

Construction noise The NVAR found that, noise predictions for the standard construction hours, OOHW – day and OOHW – evening indicated that construction noise levels would comply with the NMLs for all construction activities at all receiver locations within NCA 1 and NCA 2. Noise impacts are predicted during OOHW – night during compound establishment, corridor clearing, bulk earthworks, asphalt paving works and resurfacing works, with predicted NML exceedances of up to 5dBA for up to three residential receivers within NCA 1, and up to 4dBA for up to two residential receivers within NCA 2. It is expected that in applying standard mitigation measures, construction noise emissions would be reduced by about 5 – 10dBA. Where standard mitigation measures are implemented, construction noise levels would likely remain below the recommended additional mitigation measure perception categories for all receivers, during each construction scenario. **Construction traffic noise** During the peak of construction activity, up to 20 construction related vehicle movements may occur over the course of a working shift. According to Transport's Traffic Volume Viewer, the Hume Motorway carries about 52,000 vehicles per day, which corresponds to a traffic volume increase of less than 0.001%. Hence, due to high existing road traffic noise levels in the locality, construction road traffic noise levels would be negligible, with increases in traffic noise levels anticipated to remain below the 2dB LAeq(period) increase criterion of the Road Noise Mitigation Guideline.		
Would operation of the proposal alter the noise environment for sensitive receivers? **Road traffic noise** The nearest residential receiver is located about 145 metres from the existing outer northbound lane of the Hume Motorway. The distance from the proposed diverge lane to the nearest residential receiver would be about 141.5 metres, or 3.5 metres closer than the existing Hume Motorway. Traffic surveys completed by Transport indicate that the maximum usage of the heavy vehicle rest area would be about 25 heavy vehicles, 25 light vehicles and one OSOM vehicle per day. A review of annual average daily traffic (AADT) volumes from Transport's Traffic Volume Viewer (2017, Station id: 07737), identifies that the Hume Motorway carries about 52,500 vehicles per day, comprising about 23 per cent heavy vehicles. As the proposal would not affect the volume of vehicles on the Hume Motorway and the reduction in offset distance would be about 3.5 metres for up to 25 heavy vehicles, 25 light vehicles and one OSOM vehicle per day, the increase in road traffic noise levels at the nearest residential receiver are anticipated to be less than 0.1dBA. Therefore, the proposal would not increase road traffic noise levels by more than the 2dBA increase criterion for minor works projects and operational noise attenuation measures are not required. **Rest area noise** Existing background noise levels for receivers located in NCA 1 were measured between 44dBA during the night time and 56dBA during the day time, while for receivers located within NCA 2, setback more than 600 metres from the Hume Motorway, background noise levels were measured between 32dBA during the night time and 44dBA during the day time. The proposal would comprise up to 12 heavy vehicle parking spaces and 20 light vehicle spaces and would be operational 24 hours per day. Modelled operational noise sources included light vehicles idling and driving at low speed, heavy vehicle idling and driving at low speed, heavy vehicle rooftop cabin air conditioning units and heavy vehicle trailer refrigeration units. Airbrake release was modelled for maximum noise level events. The results of the assessment demonstrated that operational noise levels would range from <30dB to 35dB LAeq(15min) for receivers in NCA 1, which is below the minimum criterion (night period) of 46dBA. For receivers in NCA 2, operational noise levels were predicted to be below 30dB LAeq(15min) at all receiver locations, which is below the minimum criterion (night period) of 37dBA. Maximum noise levels were predicted at up to 37dBA for the nearest residential receivers in NCA 1 and <30dBA for the nearest	Yes ☐	No ☒

residential receivers in NCA 2, which is below the criteria of 59dB LAmax for NCA 1 and 52dB LAmax for NCA 2. Therefore, the rest area would not cause adverse impacts on sensitive receivers from noise generated during operation.		
Would the proposal result in vibration being experienced by any surrounding properties or infrastructure during operation? Proposed works would be outside of the minimum working distances for the potential for vibration levels to cause human annoyance or cosmetic damage to structures to residential receivers, as set out in the Construction Noise and Vibration Guideline. Furthermore, there are no heritage items or sensitive structures within the applicable minimum working distances.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

NV1	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All project specific and relevant standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures
NV2	Residences within 1500 metres of the proposal area will be notified a minimum of five working days prior to the start of works. The notification will include information about the proposed works, the hours of work and a Transport for NSW contact.
NV3	Unnecessary noise will be avoided including: • No swearing or unnecessary shouting or loud stereos/radios on site. • No dropping of materials from height, throwing of metal items and slamming of doors.
NV4	Plant used intermittently will be throttled down or shut down.
NV5	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out-of-hours work.
NV6	The noisiest works near sensitive receivers, such as corridor clearing, bulk earthworks, asphalt paving works and resurfacing works, will be scheduled to occur before 11pm, where possible.

3.4 Air quality

Table 3-4: Air quality

Description of existing environmental and potential impacts		
Is the proposal likely to result in large areas (>2ha) of exposed soils? The proposal area is about three hectares in size, the majority of which will have earthworks with exposed soils occurring on it. The total amount of dust generated from earthworks would depend on the silt and moisture content in the soil, prevailing weather conditions and the types of activities being carried out. Where dust is able to be mobilised, it may cause air quality impacts to nearby receivers. Any dust impacts would be highly localised and can be managed with the proposed safeguards.	Yes ☒	No ☐
Are there any dust-sensitive receivers located within the vicinity of the proposal during the construction period?	Yes ☒	No ☐

There are two residences located within 140 metres of the proposal area.		
Is there likely to be an emission to air during construction? Emissions during construction would be from the plant and equipment required for the proposal, in addition to the potential for exposed soils impacting air quality. Pavement works may generate some odour associated with the laying of asphalt. The proposal would not result in a material increase in air pollution. The proposal would result in minor exhaust emissions and odours from equipment and vehicles. Given the scale of the proposal and implementation of appropriate controls, the potential for adverse air quality impacts on receivers and the general environment is considered minor.	Yes ☒	No ☐
Is there likely to be an emission to air during operation? Emissions during operation would be from vehicles entering and exiting the rest area and also from vehicles idling while parked. The proposal is adjacent to the Hume Motorway, a major dual carriage way with high volumes of vehicles. The proposal would not generate additional vehicle trips on the Hume Motorway and would not result in a material increase in air pollution compared to the existing environment.	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

AQ1	Work (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high level of dust or air borne particulates are likely.
AQ2	Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.

3.5 Aboriginal cultural heritage

Table 3-5: Aboriginal cultural heritage

Description of existing environmental and potential impacts		
Would the proposal involve disturbance in any area that has not been subject to previous ground disturbances? The proposal area is located adjacent to a road corridor which is surrounded by agricultural land and a rail line. 1978 Historical imagery (NSW Spatial Services) taken during construction of the Hume Motorway shows the area of the proposal was cleared at that point in time. The proposal area is likely to have been previously highly disturbed from clearing and road construction activities.	Yes ☐	No ☒
Has an online Aboriginal Heritage Information Management System (AHIMS) search been completed? An extensive AHIMS Search was carried out on 14 May 2024. It found no Aboriginal sites located within or adjacent to the proposal area. The nearest Aboriginal site identified in the search is about 730 metres from the proposal area.	Yes ☒	No ☐
Is there potential for the proposal to impact on any items of Aboriginal cultural heritage? There are no Aboriginal sites or places located within or adjacent to the proposal area. As the proposal is located in an area that has been highly disturbed, it is unlikely that items of Aboriginal cultural heritage would be disturbed during construction.	Yes ☐	No ☒
Would the proposal involve the removal of mature native trees? The proposal would require the removal of mature native trees. These trees are located within the road corridor in the area that was previously cleared for the construction of the Hume Motorway in the late 1970's to early 1980's and are likely to be no more than 40-50 years old. Therefore, these trees are unlikely to be culturally modified or hold Aboriginal cultural significance.	Yes ☒	No ☐

Is the proposal consistent with the requirements of Transport's *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI)? A preliminary assessment of the proposal based on Stage 1 of the PACHCI has been conducted by Transport. The Stage 1 assessment determined that the proposal is unlikely to have an impact on Aboriginal cultural heritage based on the following due diligence considerations (Appendix G): • The proposal is unlikely to harm known Aboriginal objects or places • The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area • The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Heritage NSW's Due diligence Code of Practice for the Protection of Aboriginal objects in NSW and the Transport for NSW's procedure • The cultural heritage potential of the study area appears to be reduced due to past disturbance • There is an absence of sandstone rock outcrops likely to contain Aboriginal art.	Yes ☒	No ☐

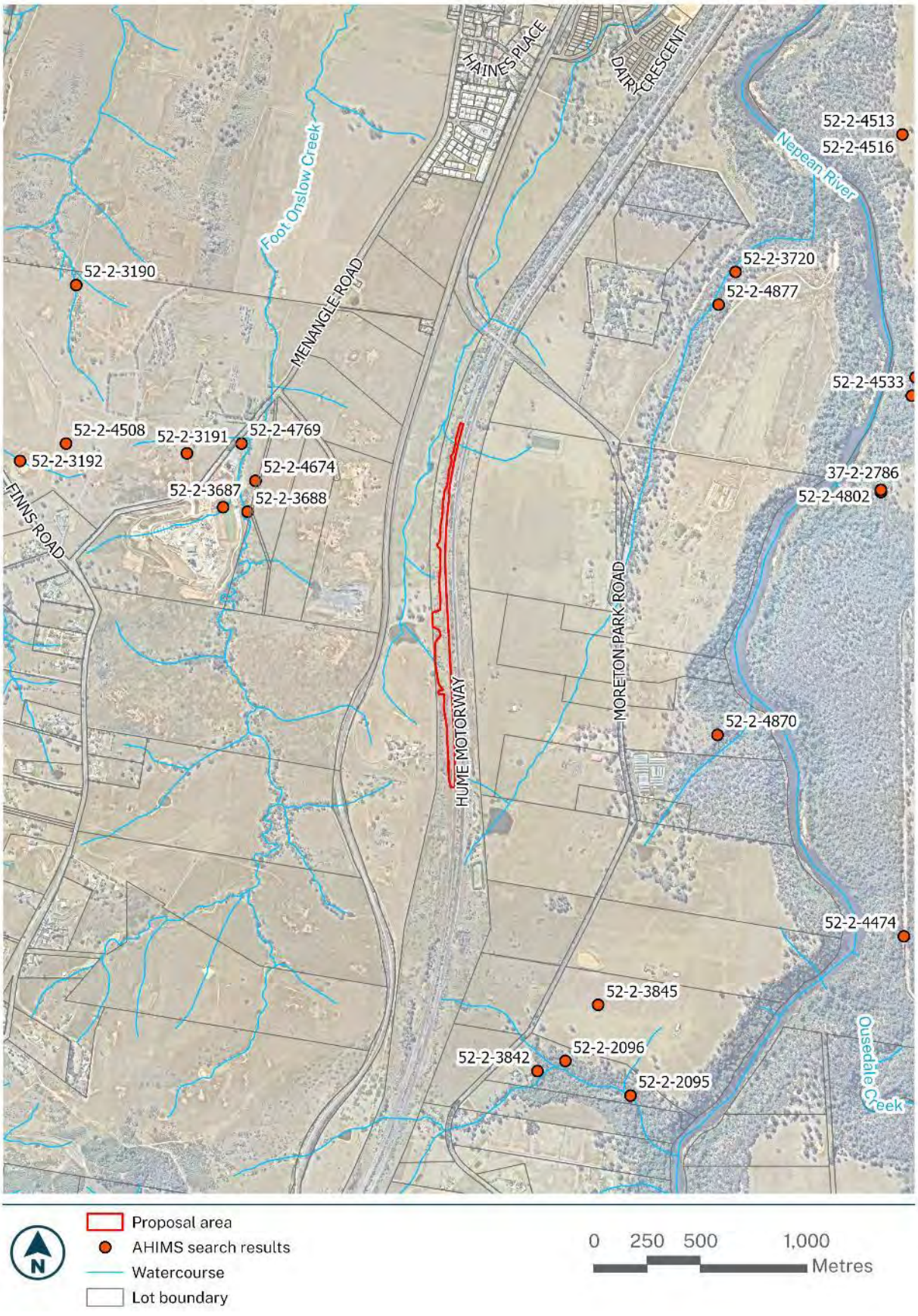


Figure 3-2: AHIMS search results

Safeguards

Safeguards to be implemented are:

AH1	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Transport Aboriginal cultural heritage officer and Senior Manager Environment and Sustainability contacted immediately. Refer to steps in the Transport Unexpected heritage items procedure (EMF-HE-PR-0076) which must be followed.

3.6 Non-Aboriginal heritage

Table 3-6: Non-Aboriginal heritage

Description of existing environmental and potential impacts		
A Statement of Heritage Impact (SOHI) has been prepared for the proposal by OzArk Environment and Heritage in accordance with the *Guidelines for preparing a statement of heritage impact* (Department of Planning and Environment 2023). The SOHI is available in Appendix E: Statement Of Heritage Impact.		
Have online heritage database searches been completed? • Transport (including legacy Roads and Maritime) section 170 register • NSW Heritage database • Commonwealth Heritage List, established under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) • Australian Heritage Places Inventory • Local Environmental Plan(s) heritage items. The above heritage databases searches were conducted on 14 May 2024	Yes ☒	No ☐
Are there any items of non-Aboriginal heritage or heritage conservation areas listed on relevant heritage databases/registers that are located within the vicinity of the proposal? The SOHI identifies one non-Aboriginal heritage item relevant to the proposal. This item is the Menangle Landscape Conservation Area, listed under the Wollondilly LEP. About 100 metres of the northern portion of the proposal area is located within the Menangle Landscape Conservation Area where the acceleration lane is proposed. The Menangle Landscape Conservation Area was established in September 2013 and was instituted to conserve the natural and cultural heritage values of the land surrounding the Menangle village, which is encompassed by the separate Menangle Conservation Area. The draft Wollondilly Heritage Planning Proposal currently on public exhibition recommends the Menangle Landscape Conservation Area be updated on the LEP to specify that it holds local heritage significance. The Menangle Landscape Conservation Area includes the built landscape of the Menangle village, its rural setting, and infrastructure of heritage significance. The Menangle Landscape Conservation Area also includes parts of the State Heritage Register (SHR) listed Camden Park Estate (SHR ID 01697) and two railway heritage items of state heritage significance (Menangle Rail Bridge [SHR ID 01047] and Menangle Railway Station group [SHR ID 01191]). The SOHI determined that although the study area overlaps with a section of the Menangle Landscape Conservation Area, none of the items of heritage significance identified within the conservation area are present within the Hume Motorway road corridor. The current alignment of the Hume Motorway is a modern development and is not associated with the heritage values of the Old Hume Motorway routes further to the west. One of the significant view corridors identified to and from the village of Menangle passes near the proposal area and is shown in Figure 3-3, referred to as the 'southern' view. There are no remaining physical elements of the historical landscape remaining within the proposal area and the Hume Motorway does not contribute to the well-conserved heritage values of the Menangle landscape. No significant heritage items of the Menangle Landscape Conservation Area would be impacted by the proposal.	Yes ☒	No ☐

The 'southern' view corridor to and from Menangle village may be affected by the vegetation removal and addition of the acceleration lane at the northern portion of the proposal within the Menangle Landscape Conservation Area. These works are minor in scale and do not represent a significant change to the current landscape along the Hume Motorway. The change to the southern view corridor is unlikely to be discernible at the completion of the works and the proposal is situated at a location that will not affect the significant views associated with the Menangle Landscape Conservation Area. To reduce the impacts of vegetation removal on the southern view corridor, vegetation removed within the Menangle Landscape Conservation Area will be replaced along the proposal to retain the screening benefits of the Hume Motorway it provides to the Menangle Landscape Conservation Area.		
Is the proposal likely to impact trees that form part of a heritage listing or have other heritage value? The proposal would not impact trees that form part of a heritage listing, however would require the removal of vegetation within the Menangle Landscape Conservation Area. As discussed above, vegetation removed within the Menangle Landscape Conservation Area will be replaced along the proposal to retain the screening benefits the Hume Motorway provides to the Menangle Landscape Conservation Area and to not compromise the integrity of the southern view corridor.	Yes ☐	No ☒
Is the proposal likely to occur in or near features that indicate potential archaeological remains? There are no known archaeological deposits at the proposal area. The proposal is not located near any non-aboriginal heritage items that indicate the potential for archaeological remains. The proposal is located within an area that was highly disturbed during the construction of the Hume Motorway. It is unlikely that the proposal area contains any potential archaeological remains.	Yes ☐	No ☒

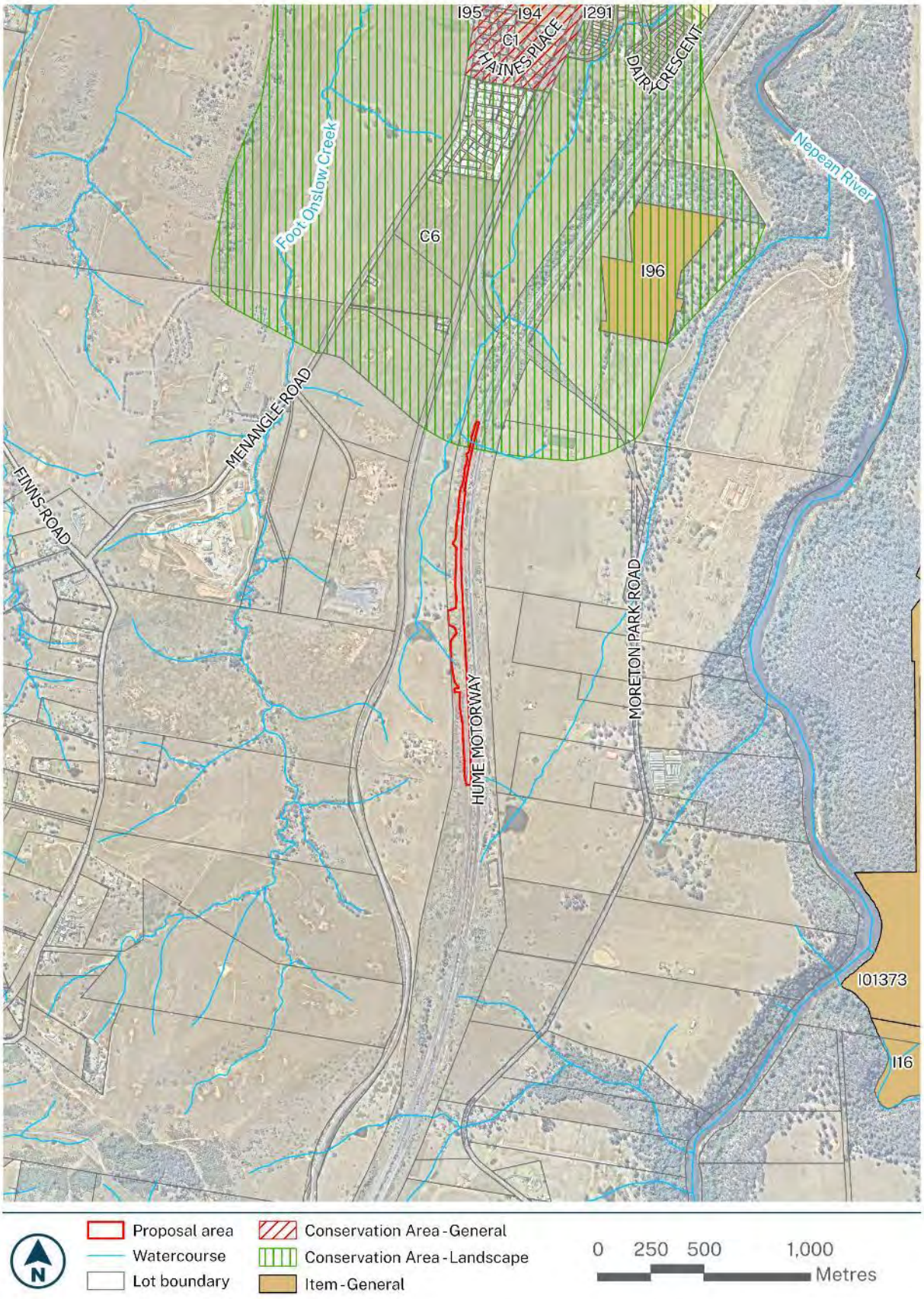


Figure 3-3: Non-Aboriginal heritage items

Safeguards

Safeguards to be implemented are:

NH1	Vegetation removed within the Menangle Landscape Conservation Area is to be appropriately replaced with Cumberland Plain species.
NH2	If unexpected heritage items are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Unexpected Heritage Items Procedure (Transport for NSW, 2022) must be followed. The Transport for NSW Environment Manager must be contacted immediately.

3.7 Biodiversity

Table 3-7: Biodiversity

Description of existing environmental and potential impacts

A Biodiversity Assessment Report Memo (BAR Memo) has been prepared for the proposal by East Coast Ecology and is available in Appendix F: Biodiversity Assessment Report Memo.

Have relevant database searches been carried out? Yes ☒ No ☐

The following database searches were completed in preparation of the BAR Memo:

- BioNet threatened species records within the locality (e.g. 10km radius)
- Regional vegetation mapping and BioNet Vegetation Classificiation database (including a search by the relevant CMA/s to identify potential TECs present)
- NSW WeedWise (DPI) website.
- Commonwealth EPBC Act Protected Matters Search Tool (PMST)
- NSW DPI Fisheries Spatial Data Portal.

Did the database searches identify any endangered ecological communities, threatened flora and/or threatened or protected fauna, or migratory species in or within the vicinity of the proposed works? Both Commonwealth and State listed matters must be considered. Yes ☒ No ☐

Endangered ecological communities

Owing to the soil mapping (i.e. Wianamatta shale), location in the landscape (undulating terrain between Douglas Park and Campbelltown) and presence of characteristic eucalypts, the plant community type (PCT) PCT 3320: Cumberland Shale Plains Woodland was assigned to the areas of native vegetation within the proposal area.

PCT 3320 is associated with Cumberland Plain Woodland, a Critically Endangered Ecological Community (CEEC) under the BC Act. Although PCT 3320 is also associated with the EPBC Act listed CEEC - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, the vegetation within Vegetation Zone 1 consists of an exotic dominated understorey and does not meet the eligibility criteria for listing as the EPBC Act CEEC.

Areas of vegetation that were dominated by environmental and priority weeds could not be assigned to a PCT and were classified as 'Exotic' (Vegetation Zone 2).

The proposed activity is likely to impact 0.17 hectares of moderate condition PCT 3320. A 5-part test was prepared to assess whether the impacts to the BC Act threatened Ecological Community (TEC) could constitute a significant impact. The results of the 5-part test was that a significant impact is not likely. The 5-part test is available in Appendix F.

Vegetation Integrity scores for Vegetation Zones is shown below:

Veg zone	PCT	Condition class	TEC	Area within subject land (ha)	VI score
Zone 1	PCT 3320: Cumberland Shale Plains Woodland	Moderate	Cumberland Plain Woodland (CEEC)	0.17	27.4
Zone 2	Exotic	N/A	Not at TEC	2.98	N/A

Threatened flora species Database searches revealed 19 threatened flora occur, or have potential to occur, within a five kilometre radius of the proposal area. No threatened flora species were determined to have a moderate or higher likelihood of occurrence within the proposal area. The BAR determined that no further impact assessment on threatened flora species was required. **Threatened fauna species** Database searches revealed 53 threatened fauna occur, or have potential to occur, within a five kilometre radius of the proposal area. A full list of threatened species is available in Appendix F: Biodiversity Assessment Report Memo. The results from the site assessment, including targeted habitat surveys, were used to assess each species' likelihood of occurrence within the proposal area. Evidence of one threatened fauna species was detected during the site assessment: • *Meridolum corneovirens* (Cumberland Plain Land Snail, Endangered under the BC Act only). Several empty shells likely belonging to this species were detected in leaf litter just outside of the southern extent of the proposal area. No live specimens were found during the site assessment. Leaf litter identified nearby to the proposal area could provide foraging and breeding habitat for Cumberland Plain Land Snail. Unlike more mobile species, there is the potential that the proposed activity could impact the Cumberland Plain Land Snail. An assessment as to whether Cumberland Plain Land Snail is likely to experience a significant impact as a result of the proposed activity has been undertaken. The assessment determined that the proposal is not likely to cause a significant impact to Cumberland Plain Land Snail with the mitigation measures, described below. Two species credits are required due to the impact of the Cumberland Plain Land Snail. A biodiversity offset strategy will need to be provided to outline how Transport intend to offset the impacts of the proposal. The degraded vegetation, lack of breeding habitat and location adjacent to the Hume Motorway indicates that although threatened birds and mammals could potentially be occasional visitors to the proposal area, such as flying over, it is unlikely to be used regularly or for any important life cycle events, such as breeding or roosting. As a result, any potential impacts to threatened birds and mammals are likely to be minor.		
Does the proposal involve pruning, trimming or removal of any tree/s? Efforts have been made to position the proposal in disturbed areas (i.e. exotic vegetation) and avoid specialist breeding habitat (e.g. hollow-bearing trees) where possible. The proposed activity will impact a small area (<0.1703ha) of moderate condition PCT 3320: Cumberland Shale Plains Woodland. PCT 3320 is associated with Cumberland Plain Woodland, a CEEC under the BC Act. The BC Act assessment concluded a significant impact was not likely to occur to the Cumberland Shale Plains Woodland. The vegetation within the proposal area does not meet the eligibility criteria for the EPBC Act listed community. Three ecosystem credits are required due to the impact of the PCT 3320. A biodiversity offset strategy will need to be provided to outline how Transport intend to offset the impacts of the proposal.	Yes ☒	No ☐
Is the proposal likely to impact nationally listed threatened species, ecological communities or migratory species? The proposed activity will impact a small area (<0.1703ha) of moderate condition PCT 3320: Cumberland Shale Plains Woodland. PCT 3320 is associated with Cumberland Plain Woodland, a CEEC under the BC Act. This area was also found to be habitat for Cumberland Plain Land Snail–listed as Endangered under the BC Act. Measures to minimise direct impacts to this community/ fauna habitat will be implemented, however cannot be totally avoided as part of the proposal. A significant impact is not likely to occur to either Cumberland Shale Plains Woodland or Cumberland Plain Land Snail as a result of the proposal.	Yes ☒	No ☐

Database searches revealed six migratory terrestrial species, or their habitat, are known to occur near the proposal area: • *Cuculus optatus* (Oriental Cuckoo) • *Hirundapus caudacutus* (White-throated Needletail) • *Monarcha melanopsis* (Black-faced Monarch) • *Motacilla flava* (Yellow Wagtail) • *Myiagra cyanoleuca* (Satin Flycatcher) • *Rhipidura rufifrons* (Rufous Fantail) The degraded vegetation within the proposal area and roadside nature of the environment is unlikely to provide habitat for these migratory species. The proposal area is unlikely to be used by migratory species and therefore the proposal unlikely cause an impact upon them.		
Would the proposal require the removal of any other vegetation? The proposal would also require the removal of exotic weed species present within the proposal area. Three priority weeds, *Senecio madagascariensis* (Fireweed), *Olea europaea subsp. cuspidata* (African Olive) and *Opuntia* species were identified within the proposal area and are to be appropriately managed in accordance with the *Biosecurity Act 2015* to prevent further invasion occouring as a result of the proposal. All shrubs identified had a diameter at breast height less than five centimetres and do not qualify for the tree and hollow replacement requirements (per Transport's *Tree and Hollow Replacement Guidelines 2023)*.	Yes ☒	No ☐
Would the proposal require the removal of any tree hollows? The proposal is not expected to require the removal of any tree hollows. Should tree hollows be required to be removed for the proposal the hollows would be replaced with artificial hollows within or nearby the proposal area at a ratio of three to one and in accordance with Transport's Tree and Hollow Replacement Guidelines 2023.	Yes ☐	No ☒
Are there any known areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' under chapter 2 of SEPP (Resilience and Hazards) in or within the vicinity of the proposed work? No areas of outstanding biodiversity value or areas mapped as 'littoral rainforest' or 'coastal wetland' occur within the proposal area or surrounding area.	Yes ☐	No ☒
Would the proposal provide any additional barriers to the movement of wildlife? The surrounding areas consist of agricultural land and support little, if any, habitat connectivity with the proposal area. The proposal would involve clearing of vegetation along the edge of the Hume Motorway. This would not introduce any additional barriers to the movement of wildlife in and around the proposal area.	Yes ☐	No ☒
Would the proposal disturb any natural waterways or aquatic habitat? The proposal does not involve any works to natural waterways or nearby aquatic habitats.	Yes ☐	No ☒
Would the proposal impact (directly or indirectly) any potential microbat roosting or breeding habitat such as on bridges and culverts? The proposal does not include any works to bridges, culverts or other structures that could provide habitat to microbats.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

B1	Retained vegetation in close proximity to construction activities will not be damaged or removed.

B2	A Biodiversity Offset Strategy in accordance with Transport 'No Net Loss Guideline' (Transport, 2022a) will be developed to outline the offsetting strategies for biodiversity impacts that exceed Transport offset thresholds.
B3	Native vegetation removal will be minimised through detailed design and installation. The clearing would be limited as far as practicable. An onsite ecologist is recommended during clearing to assist in minimizing potential impacts to native vegetation.
B4	Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with Guide 1: Pre-clearing process of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
B5	Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
B6	An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a). The procedure is to be followed if threatened ecological communities, either new TECs or new occurrences of known TECs, not assessed in the biodiversity assessment, are identified in the Project site.
B7	Flora and Fauna Management Plan will be prepared in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a) and implemented as part of the CEMP. It will include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling. • Procedures addressing relevant matters specified in the DPI Policy and guidelines for fish habitat conservation and management (2013). • Protocols to manage weeds, pathogens and pest species
B8	Threatened fauna habitat removal will be minimised through detailed design.
B9	Fauna encountered on-site during construction will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a). Any live CPLS will be relocated to areas of retained habitat.
B10	Habitat removal will be undertaken by staged clearing in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).
B11	Habitat will be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock and Guide 8: Artificial hollows *of the* Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).
B12	Changes to existing surface water flows will be minimised through detailed design.
B13	Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).
B14	Fauna will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).
B15	Weed species will be managed in accordance with Guide 6: Weed management of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).
B16	Pathogens will be managed in accordance with Guide 7: Pathogen management of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a).

3.8 Traffic and transport

Table 3-8: Traffic and transport

Description of existing environmental and potential impacts		
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during construction? The proposal would require the short-term closure of the left hand northbound lane of the Hume Motorway, reducing lane speeds during some stages of construction. Lane closures on the Hume Motorway would be during night time only when traffic numbers	Yes ☒	No ☐

are at their lowest in order to minimise the impact on traffic volumes and travel speeds. No detours are needed for the proposal. Information would be made publicly available to heavy vehicle operators and the general community about changes to traffic conditions regarding construction and operation of the proposal. There are expected to be about 15 truck movements in total to transfer material between the proposal area and the stockpile site. The impact to traffic and transport is considered to be negligible.		
Is the proposal likely to result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? The proposal would operate with deceleration and acceleration lanes to allow for OSOM and heavy vehicles to enter and exit the rest area in a forward direction and not impact on the two existing northbound Hume Motorway lanes. Therefore, there would be minimal impact to the existing traffic flow along the Hume Motorway. The proposal would improve the safety of traffic flow during operation over the informal rest area as it would provide a dedicated acceleration and deceleration lanes that are separated from the existing Hume Motorway.	Yes ☐	No ☒
Is the proposal likely to affect any other transport nodes or transport infrastructure (e.g., bus stops, bus routes) in the surrounding area? Or result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? There are no other transport nodes or other transport infrastructure located within or near the proposal.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

TT1	During construction traffic and/or pedestrian movements would be managed in accordance with Traffic control at work sites – Technical manual (version 6.1, 2022) as necessary.
TT2	Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to minimise unnecessary traffic delays.
TT3	Information is to be made publicly available to OSOM operators and the general community about changes to traffic conditions regarding construction and operation of the rest area.

3.9 Socio-economic

Table 3-9: Socio-economic

Description of existing environmental and potential impacts		
Is the proposal likely to impact on local business? There are no businesses located near the proposal.	Yes ☐	No ☒
Is the proposal likely to require any property acquisition? The proposal is located within the existing road corridor. No property acquisition is required.	Yes ☐	No ☒
Is the proposal likely to alter any access for properties (either temporarily or permanently)? No access to properties would need to be altered for this proposal.	Yes ☐	No ☒
Is the proposal likely to alter any on-street parking arrangements (either temporarily or permanently)? There is no on street parking on the section of the Hume Motorway near the proposal.	Yes ☐	No ☒
Is the proposal likely to change pedestrian movements or pedestrian access (either temporarily or permanently)?	Yes ☐	No ☒

Dedicated pedestrian and cyclist facilities are not present near the proposal. The NSW Cycleway finder identifies that cyclists are permitted to use the shoulder of the Hume Motorway. The proposal would utilise the existing northbound shoulder/breakdown lane on the Hume Motorway for the deceleration and acceleration lanes of the rest area. This would mean cyclists utilising the Hume Motorway would need to use the deceleration and acceleration lanes as they are travelling past the proposal area. The proposal does not include adding a breakdown lane next to the deceleration and acceleration lanes in order to minimise the area required to be cleared to accommodate the proposal. This is comparable to other nearby sections of the Hume Motorway at interchanges where cyclists are required to pass on and off ramp lanes as they travel on the shoulder. Therefore, the proposal would not change the current traffic conditions for cyclists on the Hume Motorway. The proposal is expected to have minimal impact due to cyclists using this section of the Hume Motorway.		
Is the proposal likely to impact on any items or places of social value to the community (either temporarily or permanently)?	Yes ☐	No ☒
Is the proposal likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)? There are no businesses or business signs visible from the Hume Motorway at the proposal area.	Yes ☐	No ☒
Is the proposal likely to impact trees planted by a community group, Landcare group or by council or a tree that is a memorial or part of a memorial group e.g., has a plaque?	Yes ☐	No ☒
Is the proposal likely to impact trees that form part of a streetscape, an avenue or roadside planting? The proposal will impact a small area (<0.1703ha) of moderate condition PCT 3320: Cumberland Shale Plains Woodland. These trees are located within the road corridor in the area that was previously cleared for the construction of the Hume Motorway in the late 1970's to early 1980's and are likely to be no more than 40-50 years old. Where trees are removed, it would be offset in accordance with the safeguards outlined in Section 3.7. The proposal would also require the removal of a portion of vegetation located within the Menangle Landscape Conservation Area. Where vegetation is removed within the Menangle Landscape Conservation Area, it would be replaced in accordance with the safeguards outlined in Section 3.6 to reduce the impact of the proposal on the views of the Menangle Landscape Conservation Area. The removal of trees or vegetation outside of the Menangle Landscape Conservation Area would not impact on the visual character or streetscape of the Hume Motorway or Menangle.	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

SE1	All complaints are to be recorded on a complaints register and attended to promptly.

3.10 Landscape character and visual amenity

Table 3-10: Landscape character and visual amenity

Description of existing environmental and potential impacts		
Is the proposed work over or near an important physical or cultural element or landscape? (For example, heritage items and areas, distinctive or historic built form, National Parks, conservation areas, scenic highways etc.) The northern extent of the proposal area is partially located within the Menangle Landscape Conservation Area. An outline of the Menangle Landscape Conservation Area and an assessment of the impacts of the proposal is provided in Section 3.6. The assessment concluded that the proposal is minor in scale and does not represent a significant change to the current landscape. The northern section of the study area is currently screened by vegetation. Though the proposal is unlikely to remove a substantial amount of screening, if clearing is required, appropriate replacement of this screening vegetation is required to soften the inconsequential visual impact of the proposal. This is included in the safeguards outlined in Section 3.6.	Yes ☒	No ☐
Would the proposal obstruct or intrude upon the character or views of a valued landscape or urban area? (For example, locally significant topography, a rural landscape or a park, a river, lake or the ocean or a historic or distinctive townscape or landmark) As outlined above, the proposal may clear screening vegetation within the Menangle Landscape Conservation Area within the northern portion of the proposal. These impacts would be reduced by appropriately replacing the screening vegetation. This is included in the safeguards outlined in Section 3.6.	Yes ☒	No ☐
Would the proposal require the removal of mature trees or stands of vegetation, either native or introduced? The proposal will impact a small area (0.17 hectares) of moderate condition PCT 3320: Cumberland Shale Plains Woodland. The BC Act assessment concluded a significant impact was not likely to occur to the Cumberland Shale Plains Woodland. The vegetation within the proposal area does not meet the eligibility criteria for the EPBC Act listed community. The proposal will require the removal of a mix of native and exotic species vegetation. A portion of this vegetation is located within the Menangle Landscape Conservation Area. Where vegetation is removed within the Menangle Landscape Conservation Area, it would be appropriately replaced in accordance with the safeguards outlined in Section 3.6 to soften the inconsequential visual impact of the proposal. The removal of vegetation outside of the Menangle Landscape Conservation Area would not impact on the visual character of the Hume Motorway.	Yes ☒	No ☐
Would the proposal result in large areas of shotcrete visible from the road or adjacent properties? No large areas of shotcrete would be required for this proposal.	Yes ☐	No ☒
Would the proposal involve new noise walls or visible changes to existing noise walls? No new noise walls are proposed.	Yes ☐	No ☒
Would the proposal involve the removal or reuse of large areas of road corridor, landscape, either verges or medians? The proposal would involve the use of a small area of the road corridor for the rest area. During construction the proposal would involve the use of a small compound site adjacent to the rest area and the use of an existing stockpile site, both within the road corridor. The proposal would not substantially change the character of this section of the Hume Motorway.	Yes ☒	No ☐

Would the proposal involve substantial changes to the appearance of a bridge (including piers, girders, abutments and parapets) that are visible from the road or residential areas? The proposal would not involve changes to the appearance of any bridge structures.	Yes ☐	No ☒
If involving lighting, would the proposal create unwanted light spillage on residential properties at night (in construction or operation)? The proposal would require temporary lighting during the construction phase to enable works outside of daytime hours. The closest receiver is located about 140 metres away and is not expected to be impacted by temporary lighting for out of hours works. Notwithstanding, a safeguard has been proposed to minimise the risk of slight lighting on adjacent properties during construction. There would be no light spillage during operation as the closest receiver is about 140 metres away.	Yes ☒	No ☐
Would any new structures or features to be constructed, result in over shadowing to adjoining properties or areas? The proposal does not include any structures that would create any overshadowing impacts on adjacent properties.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

LV1	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
LV2	Site lighting would be positioned to minimise light spill impacts on adjacent properties in line with the Guide to control of the obtrusive effects of outdoor lighting AS4282-2019.

3.11 Waste

Table 3-11: Waste

Description of existing environmental and potential impacts		
Is the proposal likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)? The proposal is not likely to generate over 200 tonnes of waste material during construction. Waste material likely to be generated from the proposal includes: • General waste • Mulched vegetation • Pavement waste • Waste construction materials. The proposal would not generate waste during operation. Any waste within the rest area during its operation would be managed through general maintenance of the Hume Motorway by Transport.	Yes ☐	No ☒
Is the proposal likely to require a licence from EPA?	Yes ☐	No ☒
Is the proposal likely to require the removal of asbestos? The proposal is unlikely to require the removal of asbestos, however due to the proposal involving a historical fill for a road reserve there is an unknown risk that asbestos may be encountered. Safeguard would be in place to address unexpected encountering of asbestos.	Yes ☐	No ☒

Safeguards

Safeguards to be implemented are:

WS1	Resource management hierarchy principles are to be followed: • Avoid unnecessary resource consumption as a priority • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance & Resource Recovery Act 2001*
WS2	Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification.
WS3	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day, where practicable.
WS4	In the event that indicators of asbestos or other contamination are encountered during construction (such as visual identification of contaminated materials etc.), work in the immediate area would cease, and the finds would be managed in accordance with an unexpected contamination finds procedure.

3.12 Climate change and greenhouse gas emissions

Table 3-12: Climate change and greenhouse gas emissions

Description of existing environmental and potential impacts		
Is the proposal located in an area likely to be permanently or tidally inundated in the future or subject to increased duration and intensity of flooding? The proposal is not within the tidal zone.	Yes ☐	No ☒
Have opportunities for reduced energy consumption during construction and operation been considered. Opportunities for the use of energy efficient construction plant will be considered during construction planning. Local suppliers will be used where practicable to minimise transport related fuel use. Transport, wherever possible, will minimise energy consumption.	Yes ☒	No ☐
Greenhouse gas emissions sources during construction are likely to be largest from operation of plant and equipment during construction and transporting materials to site. During operation emission sources would include use of the proposal by OSOM vehicles.		

Safeguards

Safeguards to be implemented are:

CC1	Opportunities for the use of energy efficient construction plant will be considered during construction planning.
CC2	Local suppliers will be used where practicable to minimise transport related fuel use.

3.13 Cumulative impact

Table 3-13: Cumulative impact

Description of existing environmental and potential impacts		
Are there other projects and developments in the study area which could add to potential impacts in both construction and operation? • Spring Farm Parkway, Menangle (In construction) – Traffic management during construction may further increase impacts to travel times Menangle Park development (In construction) – Construction traffic using the road network during construction.Cumulative impacts would be managed through the safeguards outlined in Section 3.	Yes ☒	No ☐

Safeguards

Safeguards to be implemented are:

CU1	Current and upcoming projects with the potential to interact with the proposal will be monitored. Where potential cumulative impacts are identified, the scheduling of works will be coordinated with interacting projects to minimise potential impacts. This will include: • Scheduling works to allow suitable respite periods for construction noise • Scheduling of works to minimise consecutive construction noise impacts, where feasible.

4. Summary of safeguards

4.1 Safeguards and environmental management measures

This section provides a summary of the site-specific environmental safeguards and management measures identified in described in chapter 3 of this minor works REF. These safeguards will be implemented to reduce potential environmental impacts throughout construction and operation. A framework for managing the potential impacts is provided with reference to environmental management plans and relevant Transport QA specifications. Any potential licence and/or approval requirements required prior to construction are also listed.

Table 4-1: Summary of site-specific safeguards for proposed work

Factor	Safeguards	
General - minimise environmental impacts during construction	G1	A CEMP will be prepared and submitted for review and endorsement of the Transport for NSW Senior Manager Environment and Sustainability prior to commencement of the activity. As a minimum, the CEMP will address the following: • any requirements associated with statutory approvals • details of how the project will implement the identified safeguards outlined in the REF • issue-specific environmental management plans • roles and responsibilities • communication requirements • induction and training requirements • procedures for monitoring and evaluating environmental performance, and for corrective action • reporting requirements and record-keeping • procedures for emergency and incident management • procedures for audit and review. The endorsed CEMP will be implemented during the undertaking of the activity.
Soil	E1	Erosion and sediment control measures are to be implemented and maintained to: • Minimise sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets • Reduce water velocity and capture sediment on site • Minimise the amount of material transported from site to surrounding pavement surfaces • Divert clean water around the site. (in accordance with the Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book)).
	E2	Erosion and sedimentation controls are to be checked and maintained on a regular basis (including clearing of sediment from behind barriers) and records kept and provided on request.
	E3	Erosion and sediment control measures are not to be removed until the works are complete and areas are stabilised.
	E4	Work areas are to be stabilised progressively during the works.
	E5	A progressive erosion and sediment control plan is to be prepared for the works.
	E6	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary

		site-specific controls or further actions identified in consultation with the Transport for NSW Environment Manager and/or EPA.
	E7	Where material is proposed to be removed from the proposal area, a waste classification must be undertaken on the materials in accordance with the NSW EPA *Waste Classification Guidelines* 2014.
	E8	Where waste materials are proposed to be imported to the proposal area, the waste material is to be classified as virgin excavated natural material, or under a NSW EPA Resource Recovery Order, and be accompanied by certification of this classification.
	E9	If suspected contamination (including asbestos) is identified all work would cease and the Transport for NSW Project Manager contacted immediately.
Waterways and water quality	W1	There is to be no release of dirty water into drainage lines and/or waterways.
	W2	Water quality control measures are to be used to minimise any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways.
	W3	Refuelling of minor plant and equipment is to occur offsite in an impervious bunded area, where practicable.
	W4	If an incident (e.g. spill) occurs, the Environmental Incident Procedure (Transport for NSW, 2021) is to be followed and the Transport for NSW Contract Manager and Environment Manager notified immediately
	W5	An emergency spill kit will be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use.
	W6	Plant and equipment will be inspected regularly to ensure there are no leakages of fuel, oil and hydraulic fluid.
Noise and vibration	NV1	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All project specific and relevant standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on high noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures
	NV2	Residences within 1500 metres of the proposal area will be notified a minimum of five working days prior to the start of works. The notification will include information about the proposed works, the hours of work and a Transport for NSW contact.
	NV3	Unnecessary noise will be avoided including: • No swearing or unnecessary shouting or loud stereos/radios on site. • No dropping of materials from height, throwing of metal items and slamming of doors.
	NV4	Plant used intermittently will be throttled down or shut down.
	NV5	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out-of-hours work.
	NV6	The noisiest works near sensitive receivers, such as corridor clearing, bulk earthworks, asphalt paving works and resurfacing works, will be scheduled to occur before 11pm, where possible.

Air quality	AQ1	Work (including the spraying of paint and other materials) will not be carried out during strong winds or in weather conditions where high level of dust or air borne particulates are likely.
	AQ2	Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation.
Aboriginal cultural heritage	AH1	If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Transport Aboriginal cultural heritage officer and Senior Manager Environment and Sustainability contacted immediately. Refer to steps in the Transport Unexpected heritage items procedure (EMF-HE-PR-0076) which must be followed.
Non- Aboriginal heritage	NH1	Vegetation removed within the Menangle Landscape Conservation Area is to be appropriately replaced with Cumberland Plain species.
	NH2	If unexpected heritage items are uncovered during the works, all works must cease in the vicinity of the material/find and the steps in the Unexpected Heritage Items Procedure (Transport for NSW, 2022) must be followed. The Transport for NSW Environment Manager must be contacted immediately.
Biodiversity	B1	Retained vegetation in close proximity to construction activities will not be damaged or removed.
	B2	A Biodiversity Offset Strategy in accordance with Transport 'No Net Loss Guideline' (Transport, 2022a) would be developed to outline the offsetting strategies for biodiversity impacts that exceed Transport offset thresholds.
	B3	Native vegetation removal will be minimised through detailed design and installation. The clearing would be limited as far as practicable. An onsite ecologist is recommended during clearing to assist in minimizing potential impacts to native vegetation.
	B4	Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with Guide 1: Pre-clearing process of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B5	Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B6	An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a). The procedure is to be followed if threatened ecological communities, either new TECs or new occurrences of known TECs, not assessed in the biodiversity assessment, are identified in the Project site.
	B7	Flora and Fauna Management Plan will be prepared in accordance with Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a) and implemented as part of the CEMP. It will include, but not be limited to: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Pre-clearing survey requirements • Procedures for unexpected threatened species finds and fauna handling. • Procedures addressing relevant matters specified in the DPI Policy and guidelines for fish habitat conservation and management (2013). • Protocols to manage weeds, pathogens and pest species
	B8	Threatened fauna habitat removal will be minimised through detailed design.

	B9	Fauna encountered on-site during construction will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a). Any live CPLS will be relocated to areas of retained habitat.
	B10	Habitat removal will be undertaken by staged clearing in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B11	Habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Artificial hollows of the Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B12	Changes to existing surface water flows will be minimised through detailed design.
	B13	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B14	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B15	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
	B16	Pathogens will be managed in accordance with *Guide 7: Pathogen management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).
Traffic and transport	TT1	During construction traffic and/or pedestrian movements would be managed in accordance with Traffic control at work sites – Technical manual (version 6.1, 2022) as necessary.
	TT2	Where possible, current traffic movements and property accesses are to be maintained during the works. Any disturbance is to be minimised to minimise unnecessary traffic delays.
	TT3	Information is to be made publicly available to OSOM operators and the general community about changes to traffic conditions regarding construction and operation of the rest area.
Socio-economic	SE1	All complaints are to be recorded on a complaints register and attended to promptly.
Landscape character and visual amenity	LV1	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
	LV2	Site lighting would be positioned to minimise light spill impacts on adjacent properties in line with the Guide to control of the obtrusive effects of outdoor lighting AS4282-2019.
Waste	WS1	Resource management hierarchy principles are to be followed: • Avoid unnecessary resource consumption as a priority • Avoidance is followed by resource recovery (including reuse of materials, reprocessing, recycling and energy recovery) • Disposal is undertaken as a last resort (in accordance with the *Waste Avoidance & Resource Recovery Act 2001*
	WS2	Waste material is to be reused in accordance with any waste exemptions or disposed of legally in accordance with its waste classification.

	WS3	Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
	WS4	In the event that indicators of asbestos or other contamination are encountered during construction (such as visual identification of contaminated materials etc.), work in the immediate area would cease, and the finds would be managed in accordance with an unexpected contamination finds procedure.
Climate change and greenhouse gas emissions	CC1	Opportunities for the use of energy efficient construction plant will be considered during construction planning.
	CC2	Local suppliers will be used where practicable to minimise transport related fuel use.
Cumulative impacts	CU1	Current and upcoming projects with the potential to interact with the proposal will be monitored. Where potential cumulative impacts are identified, the scheduling of works will be coordinated with interacting projects to minimise potential impacts. This will include: • Scheduling works to allow suitable respite periods for construction noise • Scheduling of works to minimise consecutive construction noise impacts, where feasible.

4.2 Licensing and approvals

Table 4-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
Coal Mine Subsidence Compensation Act 2017	Approval to alter or erect improvements or to subdivide land within a mine subsidence district from the Chief Executive of Subsidence Advisory NSW.	Prior to start of the activity.
Roads Act 1993	Transport will regulate traffic by means of barriers and notices conspicuously displayed on the road in connection with the carrying out of these works to provide for the safety of workers and road users, and to optimise network efficiency during the works. The manner in which it will do so will be recorded for convenience in a road occupancy licence ordinarily required under s138 of the *Roads Act 1993* for carrying out work on, including disturbance of, a public road.	Road occupancy licence will be in place prior to start of the activity.

5. Certification

This minor works REF provides a true and fair review of the proposal in relation to its potential effects on the environment. It addresses, to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposal.

Name:	Jaime Bohm
Position:	Associate – Environment
Company name:	Bd infrastructure
Date:	28 October 2024

I certify that I have reviewed and endorsed the contents of this minor works REF, and to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading. I determine that Transport for NSW may proceed with the activity.

Name:	Fleur Johnson
Position:	Director, Western Parklands City
Transport region/ program:	Community and Place
Date:	14 November 2024

5.1 EP&A Regulation publication requirement

Table 5-1: EP&A Regulation publication requirement

Requirement		
Does this minor works REF need to be published under section 171(4) of the EP&A Regulation?	Yes ☒	No ☐

6. Definitions

Table 6-1: Definitions

Term	Definition
AHIMS	Aboriginal Heritage Information Management System
BC Act	Biodiversity Conservation Act 2016 (NSW)
dbA	A-weighted decibels
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPHI	Department of Planning, Housing and Industry
EPA	Environmental Protection Agency
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EPL	Environmental Protection Licence
EP&A Act	Environmental Planning and Assessment Act 1979
ESD	Ecologically Sustainable Development
FM Act	Fisheries Management Act 1994
LEP	Local Environmental Plan
LoS	Level of Service
NML	Noise Management Level
NPW Act	National Parks and Wildlife Act 1974
OOHW	Out of hours works
OSOM	Over Size and/or Over Mass
PACHCI	Roads and Maritime Procedure for Aboriginal cultural heritage consultation and investigation
POEO Act	Protection of the Environment Operations Act 1997
REF	Review of environmental factors
ROL	Road Occupancy Licence
SEPP	State Environmental Planning Policy
SOHI	Statement of Heritage Impact
TISEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
Transport	Transport for NSW
WLEP 2011	Wollondilly Local Environmental Plan 2011

Appendix A: Consideration of State and Commonwealth environmental factors

Environmental Planning and Assessment Regulation 2021 section 171(2) factors

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have been considered to assess the likely impacts of the proposal on the natural and built environment. This consideration is required to comply with sections 5.5 and 5.7 of the EP&A Act.

Table A1: Consideration of section 171 of the EP&A Regulation factors

Factor	Description of impact	Duration and extent
a) Environmental impact on the community.	• The proposal would have a minor and short-term impact on the community, such as traffic delays and temporary noise and dust impacts. Safeguards have been proposed to address identified potential impacts. • The proposal would have no long-term environmental impact on the community.	Short-term (minor) negative.
b) The transformation of the locality.	• The proposal would involve the construction of a rest area on the Hume Motorway. • The proposal would not transform any locality.	Nil.
c) Any environmental impact on the ecosystems of the locality.	• The proposal will impact the Cumberland Shale Plains Woodland, a CEEC under the BC Act. A significant impact is not likely to occur to the Cumberland Shale Pains Woodland under the BC Act. Ecosystem credits may be required. This is further discussed in Section 3.7.	Minor (negative) long-term.
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	• During construction there may be a potential reduction in quality or value of the localities due to minor traffic, noise and light spill, however the proposal area is not located within a sensitive environment and anticipated impacts would be managed through the proposed safeguards. During operation, the proposal would involve a rest area on the Hume Motorway, which would not detract from the quality or value of the locality for the proposal area.	Short-term (minor) negative.
e) Any effect on any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.	• The proposal would not impact any place of significance or other special value for present or future generations. • As noted in the SOHI, a small portion of the proposal is located in the Menangle Landscape Conservation Area however the assessment determined that the potential impacts to the heritage significance of the conservation area would not be more than minor or inconsequential.	Nil.
f) Any impact on the habitat of protected fauna (within the	The proposal will impact the Cumberland Plain Land Snail. Ecosystem and species credits will be required. This is further discussed in Section 3.7.	Minor (negative) long-term.

Factor		Description of impact	Duration and extent
	meaning of the Biodiversity and Conservation Act 2016).		
g)	Any endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air.	The proposal will impact the Cumberland Plain Land Snail and the Cumberland Shale Plains Woodland. Ecosystem and species credits may be required. This is further discussed in Section 3.7	Minor (negative) long-term.
h)	Any long-term effects on the environment	• The proposal would require the removal of vegetation for the rest area. Potential impacts would be minimised with the implementation of the proposed safeguards as part of this minor works REF.	Minor negative (long-term)
i)	Any degradation of the quality of the environment.	• The proposal may cause minor short-term environmental impacts on the environment. Potential impacts would be minimised with the implementation of the proposed safeguards as part of this minor works REF.	Short-term (minor) negative.
j)	Any risk to the safety of the environment.	• Any safety issues associated with construction would be managed through the proposed safeguards. • The proposal would provide a rest area to enable OSOM and heavy vehicles to stop to allow compliance with the Sydney heavy vehicle curfew.	Nil (short-term) Positive (long-term)
k)	Any reduction in the range of beneficial uses of the environment.	• The proposal would not reduce the range of beneficial uses of the environment.	Negligible impact
l)	Any pollution of the environment.	• Any dust impacts would be highly localised and can be managed with the proposed safeguards.	Negative (minor short-term)
m)	Any environmental problems associated with the disposal of waste	• Waste generated during construction would be transported from the proposal area, tracked and disposed of at a licenced waste facility.	Nil
n)	Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	• The proposal would not increase demand for resources which are likely to become in short supply.	Nil
o)	The cumulative environmental effect with other existing or likely future activities.	• The proposal would not result in any cumulative environmental effects as it would have a negligible overall environmental impact.	Nil
p)	Any impact on coastal processes and coastal	• The proposal would not influence coastal processes and/or coastal hazards.	Nil

Appendix B: Environmental Planning and Assessment Regulation 2021 section 171(A) factors – activities in catchments

SEPP (Biodiversity and Conservation) – Chapter 6 (Water Catchments)

Chapter 6 of SEPP (Biodiversity and Conservation) relates to the use of land within regulated catchments. In these catchments, Transport is required to consider the environmental impact of activities to which Division 5.1 of the EP&A Act applies before carrying out the activity.

The four regulated catchments are:

a) Sydney Drinking Water Catchment

b) Sydney Harbour Catchment

c) Georges River Catchment

d) Hawkesbury-Nepean Catchment.

In undertaking an activity in a regulated catchment Transport must satisfy sections 6.6(2), 6.7(2), 6.8(2) and 6.9(2) and consider environmental impacts listed in sections 6.6(1), 6.7(1), 6.8(1) and 6.9(1) of State Environmental Planning Policy (Biodiversity and Conservation) 2021. This includes specific consideration of water quality and quantity, aquatic ecology, flooding, and recreation and public access.

The proposal is located in the Hawkesbury-Nepean Catchment, the below tables consider the impacts of the proposal on each of the identified factors.

Water quality and quantity

Table C1: Water quality and quantity considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.6(2)(a)	The effect on the quality of water entering a natural waterbody will be as close as possible to neutral or beneficial.	The proposal would not impact the quality of water entering a natural waterbody and would therefore have a neutral impact on water quality.
6.6(2)(b)	The impact on water flow in a natural waterbody will be minimised.	The proposal would not impact the water flow of any natural waterbody.
The project must consider the below before undertaking the activity:		
6.6(1)(a)	Consider whether the development will have a neutral or beneficial effect on the quality of water entering a waterway.	The proposal would not impact the quality of water entering a natural waterbody and would therefore have a neutral impact on water quality.
6.6(1)(b)	Consider whether the development will have an adverse impact on water flow in a natural waterbody.	The proposal would not impact the water flow of any natural waterbody.
6.6(1)(c)	Consider whether the development will increase the amount of stormwater run-off from a site.	The proposal would result in a minor increase in stormwater run-off as it involves creating additional impermeable areas. This would be a negligible increase in the stormwater run-off created along the Hume Motorway near the proposal.

6.6(1)(d)	Consider whether the development will incorporate on-site stormwater retention, infiltration or reuse.	The proposal includes an onsite detention basin for stormwater retention as a part of the overall drainage design to appropriately manage stormwater on the site.
6.6(1)(e)	Consider the impact of the development on the level and quality of the water table.	The proposal would not impact on the level or quality of the water table.
6.6(1)(f)	Consider the cumulative environmental impact of the development on the regulated catchment.	The proposal would have a negligible overall environment impact and therefore is not expected to contribute to a cumulative environmental impact on the relevant regulated catchments.
6.6(1)(g)	Consider whether the development makes adequate provision to protect the quality and quantity of ground water.	The proposal would not impact the quality or quantity of groundwater.

Aquatic ecology

Table C2: Aquatic ecology considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.7(2)(a)	The direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation will be kept to the minimum necessary for the carrying out of the development.	The proposal would have a negligible impact on animals and vegetation.
6.7(2)(b)	The development will not have a direct, indirect or cumulative adverse impact on aquatic reserves	The proposal would not impact aquatic reserves.
6.7(2)(c)	If a controlled activity approval under the *Water Management Act 2000* or a permit under the *Fisheries Management Act 1994* is required in relation to the clearing of riparian vegetation — the approval or permit has been obtained.	The permit is not a controlled activity under the *Water Management Act 2000* and a permit is not required under the *Fisheries Management Act 1994*.
6.7(2)(d)	The erosion of land abutting a natural waterbody or the sedimentation of a natural waterbody will be minimised.	The proposal would not result in erosion or sedimentation impacts to any natural waterway.
6.7(2)(e)	The adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area will be minimised.	The proposal would not have an adverse impact on wetlands.
The project must consider the below before undertaking the activity:		
6.7(1)(a)	Consider whether the development will have a direct, indirect or cumulative adverse impact on terrestrial, aquatic or migratory animals or vegetation.	The proposal would have a negligible impact on animals and vegetation. Potential impacts would be limited to those outlined in Chapter 3 of the minor works REF.
6.7(1)(b)	Consider whether the development involves the clearing of riparian vegetation and, if so, whether the development will require — (i) a controlled activity approval under the *Water Management Act 2000*, or (ii) a permit under the *Fisheries Management Act 1994*.	The development would not involve clearing of riparian vegetation.

Section	Factor	Impact/comment
6.7(1)(c)	Consider whether the development will minimise or avoid — (i) the erosion of land abutting a natural waterbody; or (ii) the sedimentation of a natural waterbody.	The proposal would not result in erosion or sedimentation impacts to any natural waterway.
6.7(1)(d)	Consider whether the development will have an adverse impact on wetlands that are not in the coastal wetlands and littoral rainforests area.	The proposal would not have an adverse impact on wetlands.
6.7(1)(e)	Consider whether the development includes adequate safeguards and rehabilitation measures to protect aquatic ecology.	The proposal would not impact aquatic ecology.
6.7(1)(f)	Consider if the development site adjoins a natural waterbody — whether additional measures are required to ensure a neutral or beneficial effect on the water quality of the waterbody. Example — Additional measures may include the incorporation of a vegetated buffer between the waterbody and the site.	The proposal does not adjoin a natural waterbody.

Flooding

Table C3: Flooding considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.8(2)(a)	On flood liable land in a regulated catchment, the development will not — If there is a flood, result in a release of pollutants that may have an adverse impact on the water quality of a natural waterbody; or	The proposal is not located on flood liable land.
6.8(2)(b)	On flood liable land in a regulated catchment, the development will not have an adverse impact on the natural recession of floodwaters into wetlands and other riverine ecosystems.	The proposal is not located on flood liable land.
The project must consider the below:		
6.8(1)	Consider the likely impact of the development on periodic flooding that benefits wetlands and other riverine ecosystems.	The proposal would not impact flood schemes for wetlands or other riverine ecosystems.

Recreation and public space

Table C4: Recreation and public space considerations SEPP (Biodiversity and Conservation)

Section	Factor	Impact/comment
The project must be satisfied of the below before undertaking the activity:		
6.9(2)(a)	The development will maintain or improve public access to and from natural waterbodies for recreational purposes, including fishing, swimming and boating, without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	The proposal would not impact public access to and from natural waterbodies for recreational purposes and would not impact natural waterbodies, watercourses, wetlands or riparian vegetation.

6.9(2)(b)	New or existing points of public access between natural waterbodies and the site of the development will be stable and safe.	The proposal would not impact any points of public access to natural waterbodies.
6.9(2)(c)	If land forming part of the foreshore of a natural waterbody will be made available for public access as a result of the development but is not in public ownership — public access to and use of the land will be safeguarded.	The proposal does not relate to land forming part of the foreshore of a natural waterbody.
The project must consider the below before undertaking the activity:		
6.9(1)(a)	Consider the likely impact of the development on recreational land uses in the regulated catchment.	The proposal would not impact recreational land uses.
6.9(1)(b)	Consider whether the development will maintain or improve public access to and around foreshores without adverse impact on natural waterbodies, watercourses, wetlands or riparian vegetation.	The proposal would not impact public access to and from natural waterbodies for recreational purposes and would not impact natural waterbodies, watercourses, wetlands or riparian vegetation.

Appendix C: Noise and Vibration Assessment Report

Transport for NSW

Hume Motorway Heavy Vehicle Stop Noise and vibration assessment report

October 2024

NSW GOVERNMENT

transport.nsw.gov.au

Acknowledgement of Country

Transport for NSW acknowledges the traditional custodians of the land on which we work and live.

We pay our respects to Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.

Prepared by Muller Acoustic Consulting Pty Ltd.

Table of contents

1. Introduction

Transport proposes to construct an Oversize and/or Overmass (OSOM) and heavy vehicle stop along the western side of the Hume Motorway at Menangle, located 500 metres (m) north of Partridge VC Rest area. The proposal would replace an existing informal heavy vehicle rest area, colloquially known as the 'Dustbowl'. The new heavy vehicle stop would function in the same manner as the existing informal heavy vehicle stop, however, it will also comprise a deceleration lane and an acceleration lane.

The proposal would be delivered as part of the Spring Farm Parkway Project.

Key features of the proposal include:

- 150m long and 29m wide stop area
- 160m long diverge lane
- 150m long deceleration lane
- 295m long acceleration lane
- 240m long merge lane
- A spill containment basin.

The proposal concept design is provided in Appendix A.

2. Location

The proposal site is located on the western side of the Hume Motorway at Menangle, about 500m north of the Partridge VC Rest Area and 12km southwest of Campbelltown in the Macarthur Region of New South Wales. A compound site would be established adjacent to the southern end of the proposal site, while an existing Transport stockpile site, located within the road corridor of the southbound carriageway of the Hume Motorway, about 1 kilometre (km) of the Partridge VC Rest Area, would also be utilised.

The area surrounding the proposal site is predominantly described as a rural environment, comprising residential dwellings on acreages and lifestyle blocks, and market gardens and agricultural facilities. An area of medium density housing, including the Durham Green Retirement Village is located to the north of the proposal area. Other land uses in the locality include the Partridge VC rest area on the eastern side of the Hume Motorway, and the Appin Mine ventilation and access facility about 1.3km to the northwest of the proposed heavy vehicle truck stop.

The study area for the proposal is illustrated in Figure 2-1.

FIGURE 2-1

Proposal Site

MAC242115-01

Hume Mwy OMOS Stop

KEY

Proposal Site

Compound Site

Ancillary Site

0 175 350 525 700 m

N

MAC
Muller Acoustic Consulting

3. Existing ambient noise environment

3.1 Noise catchment areas

Proposal specific noise catchment areas (NCAs) have been identified as:

- NCA 1 is all sensitive receivers located within about 600m of the Hume Motorway and the proposal site, where road traffic noise from the Hume Motorway is the dominant source.
- NCA 2 is all sensitive receivers between 600m and 1,500m of the Hume Motorway, where local sources, including local road traffic noise and environmental noise (insects and birds), contribute to the ambient noise environment.

The NCAs are shown in Figure 3-1.

3.2 Noise sensitive receivers

A review of aerial imagery identifies that the study area in the vicinity of the proposal area comprises predominantly rural residential properties, with about 12 residential receivers located within about 600m of the proposal site and ancillary site, and about 23 residential receivers located between about 600m and 1,500m of the proposal site and ancillary site. The nearest non-residential receivers are the Appin Mine Ventilation and Access site to the west of the proposal area and Ethel Ministries to the north east of the proposal site.

The number of modelled receivers for each NCA is provided in Table 3-1, and the location of the sensitive receivers is shown graphically in Figure 3-1.

Table 3-1: Modelled receivers

Receiver Type	Number of Modelled Receivers		Total
	NCA1	NCA2	
Residential	12	23	35
Place of Worship	0	1	1
Industrial Premises	0	1	1
Total	**12**	**25**	**37**

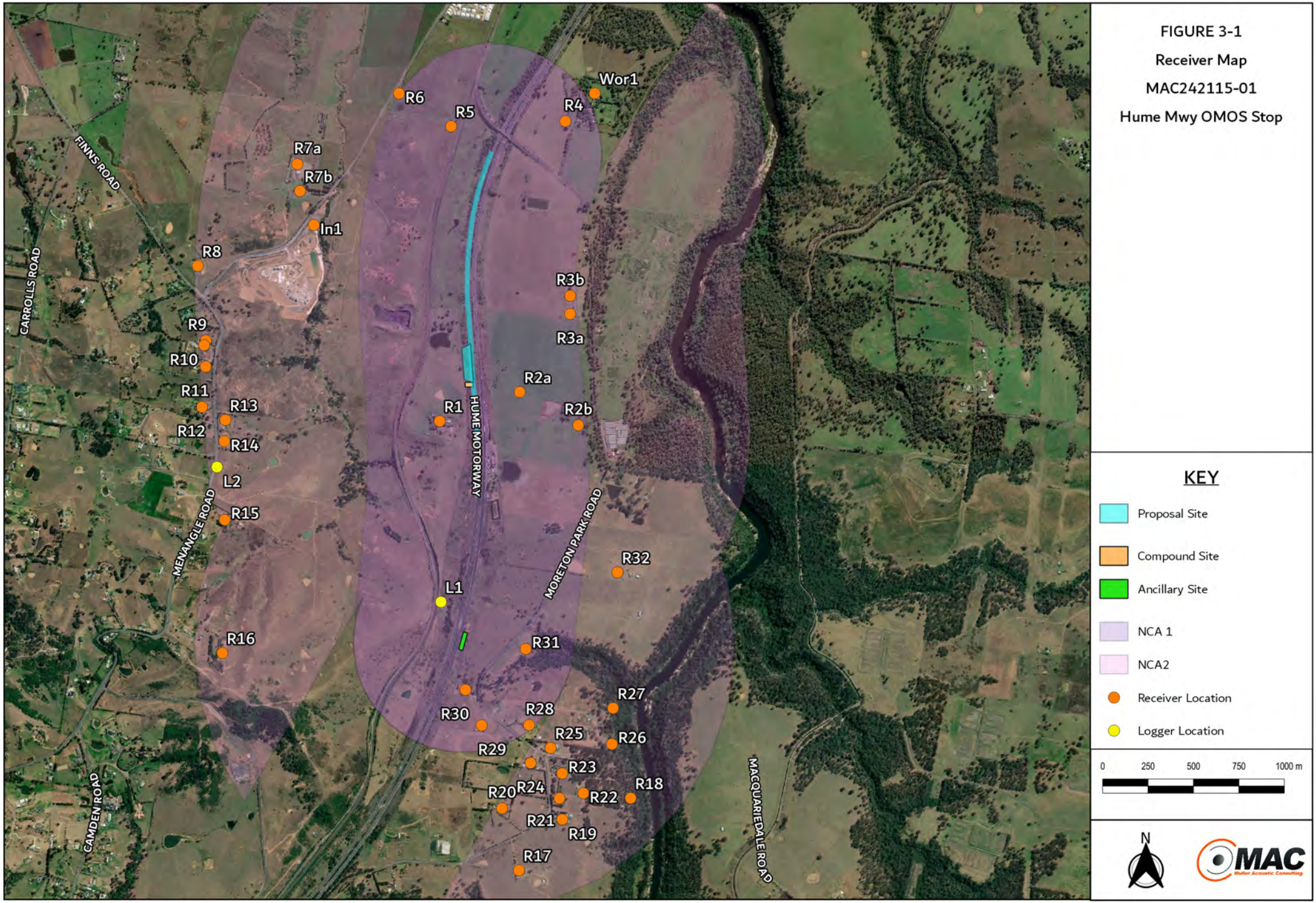


FIGURE 3-1
Receiver Map
MAC242115-01
Hume Mwy OMOS Stop
KEY
Proposal Site
Compound Site
Ancillary Site
NCA 1
NCA2
Receiver Location
Logger Location
0 250 500 750 1000 m
N
MAC
Muller Acoustic Consulting
R6
R5
R4
Wor1
R7a
R7b
In1
R8
R3b
R3a
R9
R10
R11
R13
R12
R14
L2
R15
R16
R2a
R2b
R1
R32
L1
R31
R30
R28
R27
R25
R26
R29
R23
R18
R20
R24
R22
R21
R19
R17
FINNS ROAD
CARROLLS ROAD
HUME MOTORWAY
MORETON PARK ROAD
MENANGLE ROAD
CAMDEN ROAD
MACQUARIEDALE ROAD

3.3 Noise monitoring and analysis

The community's reaction to noise from construction is generally influenced by the time of day that work is carried out, and the magnitude of the noise emissions above background levels. Residents are potentially more affected by work that occurs during out of hours (OOH) periods (ie evening or night periods). Therefore, it is important to understand the existing noise environment surrounding the proposal to manage and minimise potential noise impact on the environment and local community.

The unattended noise survey was conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" to quantify and characterise the existing noise environment in the area surrounding the proposal site. The selected monitoring location is shown in Figure 3-1 and Table 3-2. The noise monitoring charts for the background monitoring assessment are provided in Appendix B.

The measurements were carried out at two monitoring locations representative of the nearest residential receivers to the Hume Motorway (Logger L1) and residences off Menangle Road (L2), set back from the Hume Motorway. Monitoring was undertaken using Svantek Type 1, Svan 977 noise monitors from Tuesday 30 April 2024 to Friday 10 May 2024. Observations on-site identified that road traffic noise was the dominant noise source at each of the monitoring locations, with aircraft and train noise also observed at location L1, and wind-blown vegetation, birds and dogs barking also observed at location L2.

All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed ±0.5dBA.

Table 3-2: Summary of monitoring locations and equipment

Monitoring Location	Equipment Type / Serial No.	Location (MGA 56)		Photo
		Easting	Northing	
L1 – Hume Motorway	SVAN 977 / SN:59657	290012	6218119	
L2 – Menangle Road	SVAN 977 / SN:45762	291245	6217376	

The results of the long-term unattended noise monitoring were used to determine the RBL for the assessment during the day, evening and night periods in accordance with the NPI, as required by the ICNG. Data affected by adverse meteorological conditions, including wind speeds above 5m/s at microphone height and rain have been excluded from the calculation of the RBLs in accordance with methodologies provided in Fact Sheet A4 of the NPI. The results of long-term unattended noise monitoring are provided in Table 3-3.

Table 3-3: Summary of existing background noise levels

Location	Measured background noise level, RBL, dBA			Measured ambient noise level, dB LAeq		
	Day 7am to 6pm	Evening 6pm to 10pm	Night 10pm to 7am	Day 7am to 6pm	Evening 6pm to 10pm	Night 10pm to 7am
L1	56	53	44	64	62	61
L2	44	38	32	72	69	66

Note: Excludes periods of wind or rain affected data, meteorological data obtained from the Bureau of Meteorology Campbelltown (Mount Annan) (34.06°S 150.77°E 112m AMSL).

4. Operational noise assessment

The following guidelines have been used for the operational noise assessment:

- Operational Road Traffic Noise:
  - Transport for NSW, Noise and Vibration Assessment Procedure (for road traffic and construction) February 2023.
  - Transport for NSW, Road Noise Criteria Guideline (RNCG) April 2022.
  - Transport for NSW, Road Noise Mitigation Guideline (RNMG) March 2022.
  - NSW Environment Protection Authority (EPA) (2011), NSW Road Noise Policy (RNP).
- Operational Noise (Heavy Vehicle Stop):
  - NSW Environment Protection Authority (EPA) (2017), Noise Policy for Industry (NPI).

4.1 Noise criteria

4.1.1 Road traffic noise criteria

Noise criteria are assigned to sensitive receivers using Transport's Road Noise Criteria Guideline (RNCG). Transport's RNCG provides guidance on how to implement the EPA's *NSW Road Noise Policy*. The assessment timeframe for the criteria is in the year of opening and 10 years after opening.

The project assessment area extends to where noise levels are dominated by other roads that are not being assessed as part of this project as defined in Transport's RNCG. This is typically up to a maximum distance of 600 metres from the project works.

Key features of the proposal include a heavy vehicle stop area, diverge and deceleration lanes, and acceleration and merge lanes. Hence, in accordance with Section 4.5 of the Noise Criteria Guideline (RNCG) (Transport, 2022), the proposal is classified as minor work. Section 5.5 of the NCG is reproduced below:

> *Some works may be primarily to improve safety. This may include minor straightening of curves, installing traffic control devices, intersection widening and turning bay extensions or making minor road realignments. These works are not considered redeveloped or new as they are not intended to increase the traffic carrying capacity of the overall road or accommodate a significant increase in heavy vehicle traffic.*

Section 5.6 of the NCG outlines that the existing road criteria applies where the minor work increases noise levels by more than 2dBA relative to the existing noise levels at the worst affected receiver.

4.1.2 Operational noise criteria (heavy vehicle stop)

Assessment of operational noise from noise generated by activities at the heavy vehicle stop, is undertaken in accordance with the NSW Environment Protection Authority (2017) Noise Policy for Industry (NPI).

The NPI sets out a process for industrial noise management involving the following key steps:

1. Determine the Project Noise Trigger Levels (PNTLs) (ie criteria) for a development. These are the levels (criteria), above which noise management measures are required to be considered. They are derived by considering two factors: shorter-term intrusiveness due to changes in the noise environment; and maintaining the noise amenity of an area.
2. Predict or measure the noise levels produced by the development with regard to the presence of annoying noise characteristics and meteorological effects such as temperature inversions and wind.
3. Compare the predicted or measured noise level with the PNTL, assessing impacts and the need for noise mitigation and management measures.
4. Consider residual noise impacts – that is, where noise levels exceed the PNTLs after the application of feasible and reasonable noise mitigation measures. This may involve balancing economic, social and environmental costs and benefits from the proposed development against the noise impacts, including consultation with the affected community where impacts are expected to be significant.

5. Set statutory compliance levels that reflect the best achievable and agreed noise limits for the development.
6. Monitor and report environmental noise levels from the development.

The PNTL is the lower (ie, the more stringent) of the **Project Intrusiveness Noise Level** (PINL) and **Project Amenity Noise Level** (PANL) determined in accordance with Section 2.3 and Section 2.4 of the NPI.

The PINL (LAeq(15min)) is the rating background level (RBL) + 5dB, and seeks to limit the degree of change a new noise source introduces to an existing environment. The PANL is relevant to a specific land use or locality. To limit continuing increases in intrusiveness levels, the ambient noise level within an area from all combined industrial sources should remain below the recommended Amenity Noise Levels specified in Table 2.2 (of the NPI).

In accordance with Section 2.4.1 of the NPI, where the level of transportation noise is high enough to make noise from an industrial source effectively inaudible, the PANL may be derived from the $LA_{eq,period(traffic)}$ minus 15dBA.

Table 4-1 presents the derivation of the PNTLs in accordance with the methodologies outlined in the NPI.

Table 4-1: Project Noise Trigger Levels

Receiver Type	Noise Amenity Area	Assessment Period[1]	PINL dB LAeq(15min)	PANL dB LAeq(15min)	PNTL dB LAeq(15min)
Residential	NCA1	Day	61	49	49
		Evening	58	47	47
		Night	49	46	46
Residential	NCA2	Day	49	48	48
		Evening	43	43	43
		Night	37	38	37
Place of Worship	n/a	When in use	n/a	58[2]	58[2]
Industrial	n/a	When in use	n/a	68	68

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.
Note 2: External level based on 20dB loss through a closed façade.

The maximum noise trigger levels shown in Table 4-2 are based on night time RBLs and trigger levels as per Section 2.5 of the NPI. The trigger levels will be applied to transient noise events that have the potential to cause sleep disturbance.

Table 4-2: Project Noise Trigger Levels

LAeq(15min)		LAmax	
40dB LAeq(15min) or RBL + 5dB		52dB LAmax or RBL + 15dB	
NCA 1			
Trigger	40	Trigger	52
RBL + 5dB	49	RBL + 15dB	59
Highest	**49**	**Highest**	**59**
NCA 2			
Trigger	40	Trigger	52
RBL + 5dB	37	RBL + 15dB	47
Highest	**40**	**Highest**	**52**

Note: Monday to Saturday; Night 10pm to 7am. On Sundays and Public Holidays Night 10pm to 8am. Morning Shoulder 5am to 7am; Evening Shoulder 10pm to 12am.
Note: NPI identifies that maximum of the two values is to be adopted which is shown in bold font.

4.2 Triggers for qualifying a receiver for consideration of noise mitigation

The *Road Noise Mitigation Guideline* (RNMG) provides guidance in managing and controlling road traffic generated noise and describes the principles to be applied when reviewing noise mitigation.

The RNMG notes that the most effective way of minimising noise from vehicles and traffic is to control vehicle noise at the source. Where source measures are not feasible or reasonable (including for example not providing sufficient noise reduction), other feasible and reasonable methods are required to reduce levels to within acceptable margins. Such additional methods may include noise barriers and/or consideration of at-property treatment.

The RNMG provides three triggers where a receiver may qualify for consideration of noise mitigation (beyond the adoption of road design and traffic management measures). These are:

- The predicted Build noise level exceeds the RNCG controlling criterion and the noise level increase due to the project (i.e., the noise predictions for the Build minus the No Build) is greater than 2dBA.

or

- The predicted Build noise level is 5dBA or more above the criteria (exceeds the cumulative limit) and the receiver is significantly influenced by project road noise, regardless of the incremental impact of the project.

or

- The noise level contribution from the road project is acute (daytime $LA_{eq(15hour)}$ 65dB or higher, or night-time $L_{Aeq(9hour)}$ 60dB or higher) then it qualifies for consideration of noise mitigation even if noise levels are dominated by another road.

The eligibility of receivers for consideration of additional noise mitigation is determined before the benefit of additional noise mitigation (quieter pavement and noise barriers) is included. The requirement for the proposal is to provide reasonable and feasible additional mitigation for these eligible receivers to meet the RNCG controlling criterion. If the RNCG criterion cannot be satisfied with quieter pavement and/or noise barriers, then the receiver is eligible for consideration of at- property treatment.

4.3 Operational road traffic noise assessment

The proposal would deliver an Oversize and/or Overmass vehicle stop in the northbound carriageway (western side) of the Hume Motorway. The proposal would replace an existing informal heavy vehicle rest area, colloquially known as the 'Dustbowl'. The new heavy stop would function in the same manner as the existing informal truck stop, however, it will also comprise a deceleration lane and an acceleration lane.

A review of aerial imagery and the design drawings identifies the nearest residential receiver is located about 145m from the outer northbound lane of the Hume Motorway. Under the proposal, the distance from the diverge lane to the nearest residential receiver would be about 141.5m, or 3.5m closer than the Hume Motorway.

Traffic surveys completed by Transport indicate that the maximum usage of the heavy vehicle stop would be about 25 heavy vehicles, 25 light vehicles and one OSOM vehicle per day. A review of annual average daily traffic (AADT) volumes from Transport's *Traffic Volume Viewer* (2017, Station id: 07737), identifies that the Hume Motorway carries about 52,500 vehicles per day, comprising about 23% heavy vehicles.

To achieve an increase in road traffic noise levels of 2dBA, the separation distance for all traffic on the Hume Motorway would need to be reduced by about 40%, or there would need to be an increase in traffic volumes of about 60%. As the proposal would not affect the volume of vehicles on the Hume Motorway and the reduction in offset distance would be about 3.5m for up to 25 heavy vehicles, 25 light vehicles and one OSOM vehicle per day, the increase in road traffic noise levels at the nearest residential receiver are anticipated to be less than 0.1dBA.

Therefore, proposal would not increase road traffic noise levels by more than the 2dBA increase criterion for minor works projects and ameliorative measures are not required. Additionally, an *Operational Noise Attenuation Measures Report* is not applicable.

4.4 Maximum noise level assessment for road traffic

The maximum noise level assessment (sleep disturbance) criterion of 65dB LAmax is referred to in Section 2.1.5 of the NVAP and Appendix E of the CNVG-RM. For the assessment of maximum noise levels from operational road traffic noise, the following aspects must be considered:

- maximum noise level for each passby, where the LAmax noise levels (individual) is greater than 65dBA and where LAmax – LAeq(1hour) is greater than 15dBA;
- number of events greater than 65dBA per hour, including the number and distribution of the LAmax – LAeq(1hour) from road traffic noise on an hourly basis between 10pm and 7am; and
- number of events greater than LAeq(1hour) per hour.

A review of unattended monitoring data from the nearest residential receiver to the Hume Motorway indicates that the $L_{Aeq(1hr)}$ noise levels for the night period (67dBA) exceeds the maximum noise level assessment criterion of 65dB LAmax. Furthermore, $L_{A1(9hr)}$ noise levels were measured on the order of 69dB with a +2.5dB correction for façade reflection. It is therefore considered that existing vehicle passby events typically exceed the maximum noise level criterion, and the addition of a diverge lane is unlikely to significantly alter the nature of maximum noise level events.

4.5 Operational noise assessment (heavy vehicle stop)

4.5.1 Modelling methodology

A computer model was developed to quantify project noise emissions to neighbouring receivers using DGMR (iNoise, Version 2024) noise modelling software. iNoise is an intuitive and quality assured software for industrial noise calculations in the environment. 3D noise modelling is considered industry best practice for assessing noise emissions from projects. The model calculation method used to predict noise levels was in accordance with ISO 9613:1 and ISO 9613:2 including corrections for meteorological conditions using CONCAWE1. The ISO 9613 standards are the most used noise prediction method worldwide.

The model incorporated a three-dimensional digital terrain map giving all relevant topographic information used in the modelling process. Additionally, the model uses relevant noise source data, ground type, attenuation from barrier or buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Where relevant, modifying factors in accordance with Fact Sheet C of the NPI have been applied to calculations.

4.5.2 Operational modelling parameters

The proposed Hume Motorway Heavy Vehicle Stop would comprise up to 12 heavy vehicle parking spaces and 20 light vehicle spaces and would be operational 24 hours per day. For the purpose of this assessment, it has been assumed that during any 15-minute assessment period, up to three heavy vehicles would start up, idle and drive off. Furthermore, it has been conservatively assumed that three heavy vehicles would have rooftop cabin air conditioning units and three heavy vehicles would have trailer refrigeration units.

The sound power levels for each noise source modelled in this assessment are presented in Table 4-3. It is noted that sound power levels were sourced from in-field measurements at similar project sites.

[1] Report no. 4/18, "the propagation of noise from petroleum and petrochemical complexes to neighbouring communities", Prepared by C.J. Manning, M.Sc., M.I.O.A. Acoustic Technology Limited (Ref.AT 931), CONCAWE, Den Haag May 1981

Table 4-3: Acoustically significant sources – sound power levels (*re 10^{-12} Watts*)

Item and number modelled per 15 minutes	Sound Power Level, dB LAeq	Total Source Sound Power Level, dB LAeq(15min)	Source Height[1]
Operation			
Light Vehicle idle, start up and drive off (x10)[2]	73	76	0.5m
Heavy Vehicle idle, start up and drive off (x3)	90	95	1.0m
Heavy Vehicle Rooftop Cabin AC Unit (x3)	70	75	1.5m
Heavy Vehicle Trailer Refrigeration Unit (x3)	94	99	1.5m
Sleep disturbance assessment (LAmax), Night time periods (10pm to 7am)			
Air Brake Release	112	112	0.3m

Note 1: Height above the relative ground or building below source.
Note 2: Includes a duration adjustment assuming vehicles operate for three minutes continuously within a period of 15-minutes.

A detailed analysis of the significance of noise enhancing conditions has not been undertaken. Hence, the default noise enhancing meteorological conditions, as defined in Table D1 of the NPI (reproduced in Table 4-4) have been adopted for this assessment.

Table 4-4: Modelled meteorological parameters

Assessment Period	Temperature	Wind Speed[2] / Direction	Relative Humidity	Stability Class[2]
Day	20°C	3m/s all directions	50%	D
Evening	10°C	3m/s all directions	50%	D
Night	10°C	2m/s all directions	50%	F

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.
Note 2: Implemented using CONCAWE meteorological corrections.

4.5.3 Predicted operational noise levels

Noise predictions from all sources have been quantified at surrounding receivers to the project site and are presented in Table 4-5. The results of the operational noise assessment demonstrate that the received noise level at all assessed receivers satisfies the applicable PTNLs during all periods.

Table 4-5: Operational noise predictions

Receiver/NCA	Predicted noise level, dB LAeq(15min)			PNTL, dB LAeq(15min)		
	Day	Evening	Night	Day	Evening	Night
NCA 1	<30 - 35	<30 - 35	<30 - 35	49	47	46
NCA 2	<30	<30	<30	48	43	37
Place of Worship	<30	<30	<30	58		
Industrial	<30	<30	<30	68		

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5.4 Predicted maximum noise levels

In assessing maximum noise events, typical LAmax noise levels from transient events were assessed at the nearest residential receivers. For the sleep disturbance assessment, a sound power level of 112dBA for a truck air brake release was adopted for maximum noise level (LAmax) events during the night period.

Predicted noise levels from LAmax events for assessed receivers are presented in Table 4-6. Results identify that the maximum noise trigger levels will be satisfied for all assessed receivers.

Table 4-6: Maximum noise level assessment (night period[1])

Receiver	Predicted noise level, dB LAmax	Maximum trigger levels, dB LAmax
NCA 1	37	59
NCA 2	<30	52

5. Construction noise and vibration assessment

The following guidelines have been used for the construction noise and vibration assessment:

- Construction Noise:
  - Transport for NSW, Noise and Vibration Assessment Procedure (for road traffic and construction) February 2023.
  - Transport for NSW, Construction Noise and Vibration Guideline (for road and maritime works) June 2022.
  - NSW Department of Environment and Climate Change (DECC) (2009), Interim Construction Noise Guideline (ICNG).
  - Standards Australia – AS 2436-2010 (R2016) Guide to Noise Control on Construction, Maintenance and Demolition Sites.
- Construction Vibration:
  - NSW Department of Environment and Conservation (DEC) (2006), Assessing Vibration: A Technical Guideline.
  - British Standard BS 7385: Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2”.
  - German Institute for Standardisation – DIN 4150 (1999-02) Part 3 (DIN4150-3) – Structural Vibration - Effects of Vibration on Structures.

5.1 Construction noise and vibration criteria

The assessment and management of noise from construction work is completed with reference to the Construction Noise and Vibration Guideline (for road and maritime works) (CNVG-RM). This guideline outlines the approach Transport takes when assessing and mitigating construction noise. The guideline provides the detail required to identify feasible and reasonable noise mitigation measures for construction, minor work and maintenance projects and needs to be considered for all Transport managed projects.

Construction noise impacts and mitigation measures need to be evaluated at various stages of a project to inform the concept design, environmental impact assessment, detail design and construction process.

The guideline describes the principles to be applied when reviewing and assessing construction noise, vibration and construction traffic. It also describes procedures to assist in reviewing noise and vibration mitigation.

The intention in all situations is to meet the following principles:

1. Good engagement with the community will be maintained to facilitate effective project delivery with balanced community impact.
2. Construction noise and vibration levels at sensitive receivers will be minimised where feasible and reasonable.
3. Feasible and reasonable mitigation will reflect the time of day, and/or the degree and duration of the impact.
4. The community will be informed of the dates for the intended work, sequencing, and timing of noisy events. Where possible this will include an indicative schedule over a 24-hour period.
5. Minimising construction noise and vibration will be viewed as a continuous improvement exercise that is inclusive of stakeholders where no idea is too small to be considered.
6. Staff and community will be informed of the effort and methods undertaken to reduce noise and vibration for the work.
7. Any operational noise and vibration improvements resulting from the work will be promoted to the community.

5.1.1 Proposed construction hours

Table 5-1 summaries the CNVG-RM recommended standard and Out of Hours (OOHs) periods for construction. Note, although not mandatory, strong justification is required to work outside of normal construction hours.

Table 5-1: Recommended hours for construction

Hour	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM
Monday																								
Tuesday																								
Wednesday								Standard											OOHW					
Thursday	OOHW							Hours											Period 1					
Friday	Period 2																		(Evening)					
Saturday																								
Sunday								OOHW Period 1											OOHW					
Public Holiday									(Day)										Period 2					

OOHs work is divided into two periods of sensitivity and cover the hours listed below:

- OOH Period 1 (day/low risk period): Saturdays – 7am to 8am & 1pm to 6pm, Sundays/Public Holidays – 8am to 6pm.
- OOH Period 1 (evening/low risk period): Monday to Friday – 6pm to 10pm.
- OOH Period 2 (night/medium to high-risk period): Monday to Friday – 10pm to 7am, Saturdays/Sundays/Public Holidays – 6pm to 7am (8am on Sunday mornings and Public Holidays).

It is noted that construction works may be undertaken during standard construction hours and OOH work periods.

5.1.2 Construction noise objectives

In accordance with the CNVG-RM, construction Noise Management Levels (NMLs) are established with reference to the NSW Interim Construction Noise Guideline (ICNG). The ICNG is specifically aimed at managing noise from construction work regulated by the EPA and is used to help in setting statutory conditions in licences or other regulatory instruments.

The ICNG sets out management levels for noise at residential based on the RBL, which is the overall single-figure background noise level measured in each relevant assessment period (standard construction hours or OOH work periods).

Where the predicted or measured LAeq(15min) noise level is greater than the NML, the proponent should apply all feasible and reasonable work practices to meet the relevant NML. Following the implementation of standard mitigation measures, where residual noise impacts occur, Additional Mitigation Measures (AMMs) should be implemented.

Table 5-2 reproduces the ICNG management levels for residential receivers. The construction NML is the sum of the management level and relevant RBL for each specific assessment period.

Table 5-2: ICNG residential noise management levels

Time of day	Noise Management Level LAeq(15min)	How to apply
Recommended standard hours: Monday to Friday 7am to 6pm Saturday 8am to 1pm No work on Sundays or public holidays	Noise affected RBL + 10dB.	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: • times identified by the community when they are less sensitive to noise such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. • if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours.	Noise affected	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

Table 5-3 reproduces the ICNG management levels for other receiver types.

Table 5-3: Noise management levels for other noise sensitive receivers

Land use	Where objective applies	Management level LAeq(15min)[1]
Classrooms at schools and other educational institutions	Internal noise level	45dB
Hospital wards and operating theatres	Internal noise level	45dB
Places of worship	Internal noise level	45dB
Active recreation areas	External noise level	65dB
Passive recreation areas	External noise level	60dB
Commercial premises	External noise level	70dB
Industrial premises	External noise level	75dB

Note 1: Noise management levels apply when receiver areas are in use only.

5.1.3 Construction noise management levels

The NMLs for standard and OOHs work periods are summarised in Table 5-4 for residential receivers and Table 5-5 for applicable non-residential receivers.

Table 5-4: Construction NMLs for residential receivers

Receiver	Assessment period	RBL,dBA	NML dB LAeq(15min)	Highly noise affected NML dB LAeq(15min)
NCA 1 Receivers R1 – R6	Standard Hours	56	66	75
	OOHW – Day	56	61	75
	OOHW – Evening	53	58	75
	OOHW – Night	44	49	75
NCA 2 Receivers R7a – R16	Standard Hours	44	54	75
	OOHW – Day	44	49	75
	OOHW – Evening	38	43	75
	OOHW – Night	32	37	75

Note 1: The highly noise affected NML is a hypothetical level that is adopted to ensure the avoidance of strong community reaction. Should this level be exceeded the construction methodology is to be reviewed to reduce the impact on surrounding sensitive receivers.

Table 5-5: Noise management levels for other noise sensitive receivers

Receiver	Assessment Period	Where NML applies	NML, dB LAeq(15min)
Places of worship	When in use	Internal noise level	45dB
Industrial premises	When in use	External noise level	75dB

5.1.4 Maximum noise level assessment (construction)

Appendix E of the CNVG-RM nominates a maximum noise level assessment (sleep disturbance) criterion of 65dB LAmax for the operation of individual items of plant and equipment during the night period.

5.1.5 Construction traffic noise criteria

The EPA ICNG references the EPA *NSW Road Noise Policy* for the assessment of construction traffic on public roads.

For Transport projects, an initial screening test should first be applied by evaluating whether noise levels will increase by more than 2dBA due to construction traffic or temporary reroute due to a road closure. Where increases are 2dBA or less, then no further assessment is required.

Where noise levels increase by more than 2dBA, further assessment is required based on Transport's RNCG. Consideration should also be given under the RNCG as to whether the construction traffic or temporary reroute triggers new road criteria due to changes in road category.

5.1.6 Construction vibration criteria

5.1.6.1 Structural Damage

Residential and non-residential buildings

British Standard BS 7385:Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2", gives guidance on the levels of vibration which building structures could be damaged. BS7385 also takes into consideration the frequency of the vibration which is critical when assessing the likelihood of building damage.

Guide values are set for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to result in a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

The recommended limits (guide values) for transient vibration to ensure minimal risk of cosmetic damage to residential and heavy commercial/industrial buildings are presented in Table 5-6. Where sources of continuous vibration may give rise to dynamic magnification due to resonance, the values provided in Table 5-6 should be reduced by 50%, this is especially the case with respect to Peak Particle Velocity (PPV) at lower frequencies.

Table 5-6: Transient vibration guide values – minimal risk of cosmetic damage

Type of building	Peak Component Particle Velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Heritage items

It is noted that the CNVG-RM and BS7385 do not specify recommended vibration limits or minimum working distances for heritage items or other sensitive structures. BS7385 indicates that heritage buildings and structures should not be assumed to be more sensitive to vibration unless they are found to be structurally unsound. If a heritage building or structure is structurally unsound (following inspection) a more conservative cosmetic damage objective as per DIN 4150 would be applicable.

German Standard DIN 4150 - Part 3: 1999 provides guideline values for vibration velocity to be used with evaluating the effects of short-term vibration on structures, including for sensitive structures such as heritage items. The DIN 4150 values are summarised in Table 5-7.

Table 5-7: Structural damage guideline – heritage structures

Type of structure	Vibration velocity in mm/s			
	Less than 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz	… at horizontal plane of highest floor (all frequencies)
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that because of their particular sensitivity to vibration do not correspond to those above and have intrinsic value (e.g. heritage buildings)	3	3 to 8	8 to 10	8

Table 5-7 demonstrates that for sensitive buildings such as heritage structures, the guideline vibration values for effects on structures are typically half of those for dwellings. Therefore, based on the DIN 4150 structural damage guidelines, the minimum working distance for heritage structures that are found to be structurally unsound would be approximately equal to twice the minimum working distance for other building types. Human Comfort – Assessing Vibration a Technical Guideline.

5.1.6.2 Human Comfort – Assessing Vibration a Technical Guideline

Humans are far more sensitive to vibration than is commonly realised and may detect vibration levels which are well below levels that may cause damage to buildings or structures. Assessing vibration: a technical guideline was published in February of 2006 by the DECC and is based on guidelines contained in BS 6472 – 1992, Evaluation of human exposure to vibration in buildings (1-80 Hz) and provides guidance on assessing vibration against human comfort.

The guideline presents preferred and maximum vibration values for use in assessing human responses to vibration and provides recommendations for measurement and evaluation techniques. At vibration values below the preferred values, there is a low probability of adverse comment or disturbance to building occupants. Where all feasible and reasonable mitigation measures have been applied and vibration values are still beyond the maximum value, it is recommended the operator negotiate directly with the affected community.

The guideline defines three vibration types and provides direction for assessing and evaluating the applicable criteria, and has been reproduced in Table 5-8.

Table 5-8: Examples of types of vibration (from Table 2.1 of the guideline)

Continuous Vibration	Impulsive Vibration	Intermittent Vibration
Machinery, steady road traffic, continuous construction activity (such as tunnel boring machinery)	Infrequent: Activities that create up to three distinct vibration events in an assessment period, e.g. occasional dropping of heavy equipment, occasional loading and unloading. Blasting is assessed using ANZECC (1990)	Trains, intermittent nearby construction activity, passing heavy vehicles, forging machines, impact pile driving, jack hammers. Where the number of vibration events in an assessment period is three or fewer these would be assessed against impulsive vibration criteria.

Continuous Vibration

Appendix C of the guideline outlines acceptable criteria for human exposure to continuous vibration (1-80 Hz), the criteria are dependent on both the time of activity (usually daytime or night-time) and the occupied place being assessed. Table 5-9 reproduces the preferred and maximum criteria relating to measured peak velocity.

Table 5-9: Criteria for exposure to continuous vibration

Place	Time[1]	Peak velocity in mm/s	
		Preferred	Maximum
Critical working Areas (e.g. hospital operating theatres, precision laboratories)	Day or Night	0.14	0.28
Residences	Day	0.28	0.56
	Night	0.20	0.40
Offices	Day or Night	0.56	1.1
Workshops	Day or Night	1.1	2.2

Note: rms velocity (mm/s) and vibration velocity value (dB re 10 -9 mm/s) values given for most critical frequency >8Hz assuming sinusoidal motion.
Note 1: Daytime is 7am to 10pm and Night-time is 10pm to 7am.

Impulsive Vibration

Appendix C of the guideline outlines acceptable criteria for human exposure to impulsive vibration (1-80 Hz), these criteria are dependent on both the time of activity (usually daytime or night-time) and the occupied place being assessed. Impulsive vibration (as defined in Section 2.1 of the guideline) is generally associated with infrequent activities that create up to three (3) distinct vibration events in an assessment period e.g. occasional dropping of heavy equipment, occasional loading and unloading.

Table 5-10 reproduces the preferred and maximum criteria relating to measured peak velocity.

Table 5-10: Criteria for exposure to impulsive vibration

Place	Time[1]	Peak velocity in mm/s	
		Preferred	Maximum
Critical working Areas (e.g. hospital operating theatres, precision laboratories)	Day or Night	0.14	0.28
Residences	Day	8.6	17.0
	Night	2.8	5.6
Offices	Day or Night	18.0	36.0
Workshops	Day or Night	18.0	36.0

Note 1: Daytime is 7am to 10pm and Night-time is 10pm to 7am.

Intermittent Vibration

Intermittent vibration (as defined in Section 2.1 of the guideline) is assessed using the vibration dose concept which relates to vibration magnitude and exposure time.

Intermittent vibration is representative of activities such as impact hammering, rolling or general excavation work (such as an excavator tracking).

Section 2.4 of the Guideline provides acceptable values for intermittent vibration in terms of vibration dose values (VDV) which requires the measurement of the overall weighted RMS (root mean square) acceleration levels over the frequency range 1-80 Hz. To calculate VDV the following formula (refer section 2.4.1 of the guideline) was used:

$$VDV = \left[\int_0^T a^4(t)dt \right]^{0.25}$$

Where VDV is the vibration dose value in m/s1.75, a (t) is the frequency-weighted RMS of acceleration in m/s2 and T is the total period of the day (in seconds) during which vibration may occur.

The Acceptable Vibration Dose Values (VDV) for Intermittent Vibration is reproduced in Table 5-11.

Table 5-11: Criteria for exposure to impulsive vibration

Place	Daytime		Night-time	
	Preferred value $m/s^{1.75}$	Maximum value $m/s^{1.75}$	Preferred value $m/s^{1.75}$	Maximum value $m/s^{1.75}$
Critical areas	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

Note: Daytime is 7am to 10pm and Night-time is 10pm to 7am.
Note: These criteria are indicative only, and there may be a need to assess intermittent values against continuous or impulsive criteria for critical areas.

There is a low probability of adverse comment or disturbance to building occupants at vibration values below the preferred values. Adverse comment or complaints may be expected if vibration values approach the maximum values. The guideline states that activities should be designed to meet the preferred values where an area is not already exposed to vibration.

5.2 Construction noise assessment

5.2.1 Noise assessment methodology

A computer model was developed to quantify project noise emissions to neighbouring receivers using DGMR (iNoise, Version 2024) noise modelling software. iNoise is an intuitive and quality assured software for industrial noise calculations in the environment. 3D noise modelling is considered industry best practice for assessing noise emissions from projects.

The model incorporated a three-dimensional digital terrain map giving all relevant topographic information used in the modelling process. Additionally, the model uses relevant noise source data, ground type, attenuation from barrier or buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers. Where relevant, modifying factors in accordance with Fact Sheet C of the NPI have been applied to calculations.

The model calculation method used to predict noise levels was in accordance with ISO 9613-1 'Acoustics - Attenuation of sound during propagation outdoors. Part 1: Calculation of the absorption of sound by the atmosphere' and ISO 9613-2 'Acoustics - Attenuation of sound during propagation outdoors. Part 2: General method of calculation' including corrections for meteorological conditions using CONCAWE2. The ISO 9613 standard from 1996 is the most used noise prediction method worldwide. Many countries refer to ISO 9613 in their noise legislation. However, the ISO 9613 standard does not contain guidelines for quality assured software implementation, which leads to differences between applications in calculated results. In 2015 this changed with the release of ISO/TR 17534-3. This quality standard gives clear recommendations for interpreting the ISO 9613 method. iNoise fully supports these recommendations. The models and results for the 19 test cases are included in the software.

5.2.2 Proposed works and construction scenarios

Construction activities considered to have the greatest potential for noise impact on nearby receivers were determined in consultation with Transport. The construction scenarios included in this assessment are described in Table 5-12 and the typical plant and equipment, along with the fleet Sound Power Level (SWL) and maximum noise levels (LAmax) for each of the construction activities are provided in Table 5-13. The fleet SWL, and maximum noise levels were sourced from Transport's *Construction and Maintenance Noise Estimator Tool* (CMNET).

[2] Report no. 4/18, "the propagation of noise from petroleum and petrochemical complexes to neighbouring communities", Prepared by C.J. Manning, M.Sc., M.I.O.A. Acoustic Technology Limited (Ref.AT 931), CONCAWE, Den Haag May 1981

It is noted that operation of the ancillary site is assumed to occur during Scenario 2 to Scenario 8, inclusive, while operation of the compound site is assumed to occur during Scenario 3 to Scenario 8 inclusive. Typical plant and equipment, along with the fleet Sound Power Level (SWL) and maximum noise levels (LAmax) for the operation of the ancillary site and compound site are provided in Table 5-14.

The precise locations and types of equipment used for construction are yet to be determined for the concept design phase of the proposal. Hence, the construction fleet for each activity was modelled across the potential extent of the proposal area, with all plant and equipment operating simultaneously and at maximum capacity for the duration of the assessment period. It is noted that typical construction plant and equipment are unlikely to operate simultaneously but may be used sequentially across the construction area. On that basis, this assessment provides a broad assessment of the likely worst-case impacts from each stage of the construction works.

Table 5-12: Proposed construction scenarios

Scenario	Description
Scenario 1 – Site establishment (initial works)	• Installation of traffic barriers • Installation of erosion and sediment control
Scenario 2 – Establishment of c**ompound** site	• Level site and formation of all-weather hardstand • Installation of site buildings
Scenario 3 – Corridor clearing	• General land clearing and stripping of topsoil
Scenario 4 – Bulk earthworks	• Excavation and formation of alignment, including rock hammering / rock breaking • Placement and compaction of sublayers
Scenario 5 – Drainage infrastructure	• Excavation of trenches and pits • Delivery and placement of pipes and pits
Scenario 6 – Paving / Asphalting	• Delivery of raw materials • Laying of new pavement
Scenario 7 – Resurfacing works	• Milling of existing asphalt • Laying new asphalt to bring up to route standard
Scenario 8 – Road furniture installation	• Installation of signposts • Line marking

Table 5-13: List of construction plant and associated works and sound power levels

Plant	SWL, dBA	Initial works	Compound establishment	Corridor clearing	Bulk earthworks	Drainage works	Paving / asphalt	Resurfacing works	Road furniture
Truck	103	X	X						
Road Truck	108	X		X	X	X			X
EWP	98	X							X
Franna	98	X							X
Mobile crane	105		X						
Excavator	110		X	X	X	X			
Hydraulic Hammer	122			X	X				
Dozer	116			X	X				
Scraper	110				X				
Grader	113		X		X				
Concrete Saw	118						X		
Backhoe	104					X			
Chainsaw	114			X					
Tub Grinder	116			X					
Loader	112		X					X	
Concrete Truck	109					X	X		
Genset/ Lighting	98		X					X	
Truck Compressor	75					X			
Pavement Layer	114						X	X	
Asphalt Truck	106						X	X	
Profiler	117							X	
Rollers	107		X		X	X	X	X	
Compactor	106				X				
Line Marking	108								X
Water Cart	107				X				
Total fleet SWL		115	118	121	123	115	118	118	110
	Maximum Noise Level Assessment (LAmax), Night-time periods (10pm to 7am)								
Fleet LAmax		116	n/a[2]	n/a[2]	n/a[2]	116	130	123	116

Note 1: Includes an adjustment for duration.
Note 2: Not recommended as OOHW, as per the CMNET.

Table 5-14: Sound power levels – operation of compound and ancillary sites

Plant	SWL, dBA	Compound site	Ancillary site
Light vehicles	103	X	X
Genset	98	X	
Day maker	88	X	
Skid steer	91		X
Excavator (13.5t)	104		X
Road Truck	108		X
Total fleet SWL		104	108
Maximum Noise Level Assessment (LAmax), Night-time periods (10pm to 7am)			
Fleet LAmax		105	110

Note 1: Includes an adjustment for duration.

5.2.3 Construction noise levels

Construction noise levels have been predicted for sensitive receiver locations for each of the construction scenarios described in Section 5.2.2. The predicted L_{Aeq}(15min) noise emission ranges for receivers in each NCA are presented in Table 5-15 and the predicted number of exceedances are presented in Table 5-16. Noise contours for the construction scenario with the highest potential noise impact (asphalt paving works), and detailed results from construction noise predictions for all assessed receiver locations are provided in Appendix C.

Noise impacts are predicted during OOHW – night during compound establishment, corridor clearing, bulk earthworks, asphalt paving works and resurfacing works, with predicted NML exceedances of up to 5dBA for up to three residential receivers within NCA 1, and up to 4dBA for up to two residential receivers within NCA 2. The typical offset distance to the nearest sensitive receivers (or land uses) from the nearest works is 35 metres with the catchment extending approximately 1,430 metres away from the works area for residential receivers in NCA 2 during asphalt paving works. It is noted that in accordance with Transport's CMNET, corridor clearing works and bulk earthworks are not recommended during OOHW – night.

Noise predictions for the standard construction hours, OOHW – day and OOHW – evening indicated that construction noise levels would comply with the NMLs for all construction activities at all receiver locations within NCA 1 and NCA 2.

Maximum noise levels, above which sleep disturbance impacts may occur, are predicted to be below the MNLA criterion of 65dB L_{Amax} at all receiver locations during each construction scenario. It is noted that maximum noise levels are predicted at up to 65dB L_{Amax} at one receiver location during asphalt paving works, during the operation of the concrete saw.

Table 5-15: Summary of construction works and predicted construction noise levels

NCA	Period	NML, dBA	Typical offset	Initial works	Compound establishment	Corridor clearing	Bulk earthworks	Drainage works	Paving / asphalt	Resurfacing works	Road furniture
NCA 1	Standard Hours	66	35 – 75m	<30 – 47dBA	<30 – 50dBA	41 – 52dBA	43 – 54dBA	38 – 49dBA	43 – 54dBA	42 – 53dBA	33 – 44dBA
	OOHW - Day	61	70 – 130m	<30 – 47dBA	<30 – 50dBA	41 – 52dBA	43 – 54dBA	38 – 49dBA	43 – 54dBA	42 – 53dBA	33 – 44dBA
	OOHW – Evening	58	110 – 200m	<30 – 47dBA	<30 – 50dBA	41 – 52dBA	43 – 54dBA	38 – 49dBA	43 – 54dBA	42 – 53dBA	33 – 44dBA
	OOHW - Night	49	290 – 410m	<30 – 47dBA	<30 – 50dBA	41 – 52dBA	43 – 54dBA	38 – 49dBA	43 – 54dBA	42 – 53dBA	33 – 44dBA
	MNLA	65	40 – 80m	36 – 49dBA	n/a[2]	n/a[2]	n/a[2]	36 – 49dBA	48 – 65dBA	41 – 58dBA	36 – 49dBA
NCA 2	Standard Hours	54	170 – 330m	<30 – 31dBA	<30 – 31dBA	<30 – 39dBA	<30 – 41dBA	<30 – 36dBA	<30 – 40dBA	<30 – 39dBA	<30dBA
	OOHW - Day	49	290 – 410m	<30 – 31dBA	<30 – 31dBA	<30 – 39dBA	<30 – 41dBA	<30 – 36dBA	<30 – 40dBA	<30 – 39dBA	<30dBA
	OOHW – Evening	43	410 – 730m	<30 – 31dBA	<30 – 31dBA	<30 – 39dBA	<30 – 41dBA	<30 – 36dBA	<30 – 40dBA	<30 – 39dBA	<30dBA
	OOHW - Night	37	650 – 1,430m	<30 – 31dBA	<30 – 31dBA	<30 – 39dBA	<30 – 41dBA	<30 – 36dBA	<30 – 40dBA	<30 – 39dBA	<30dBA
	MNLA	65	40 – 80m	<30 – 32dBA	n/a[2]	n/a[2]	n/a[2]	<30 – 32dBA	<30 – 44dBA	<30 – 37dBA	<30 – 32dBA
Place of worship	When in use	65[1]	40 – 80m	<30dBA	<30dBA	40dBA	42dBA	37dBA	42dBA	41dBA	31dBA
Industrial	When in use	75	25 – 35m	31dBA	32dBA	40dBA	42dBA	37dBA	41dBA	40dBA	32dBA

Note 1: External level based on 20dB loss through a closed façade.

Note 2: Not recommended as OOHW, as per the CMNET.

Table 5-16: Number of predicted exceedances during each construction scenario

NCA	Period	Initial works	Compound establishment	Corridor clearing	Bulk earthworks	Drainage works	Paving / asphalt	Resurfacing works	Road furniture
NCA 1	Standard Hours	--	--	--	--	--	--	--	--
	OOHW - Day	--	--	--	--	--	--	--	--
	OOHW – Evening	--	--	--	--	--	--	--	--
	OOHW - Night	--	1[1]	3[1]	3[1]	--	3	3	--
	MNLA	--	--	--	--	--	--	--	--
NCA 2	Standard Hours	--	--	--	--	--	--	--	--
	OOHW - Day	--	--	--	--	--	--	--	--
	OOHW – Evening	--	--	--	--	--	--	--	--
	OOHW - Night	--	--	2	3	--	2	2	--
	MNLA	--	--	--	--	--	--	--	--
Place of worship	When in use	--	--	--	--	--	--	--	--
Industrial	When in use	--	--	--	--	--	--	--	--

Note 1: Not recommended as OOHW, as per the CMNET.

5.2.4 Construction traffic noise levels

Construction traffic will generate noise over a relatively wide area and beyond the construction site itself. It would be expected that traffic noise would be greatest where there is a concentration of vehicle movements, such as the main construction area.

It is understood that during the peak of construction activity, up to 20 construction related vehicle movements may occur over the course of a working shift. According to Transport's *Traffic Volume Viewer*, the Hume Motorway carries approximately 52,000 vehicles per day, which corresponds to a traffic volume increase of less than 0.001%. Hence, due to high existing road traffic noise levels in the locality, construction road noise levels would be negligible, with increases in noise levels anticipated to remain below the 2dB LAeq(period) increase criterion.

5.3 Vibration assessment

For road construction projects, items of plant with the greatest potential for vibration typically include hydraulic hammers and vibratory rollers. It is understood that hydraulic hammers may be used during bulk earthworks, while vibratory rollers may be used during bulk earthworks, drainage works, pavement works and road resurfacing.

Table 5-17 provides the minimum working distances for the use of various vibration intensive sources to nearby receivers to meet cosmetic damage and human response criteria. It is important to note that the minimum working distances are indicative and will vary depending on the particular item of plant and local geotechnical conditions.

A review of aerial imagery identifies that the nearest sensitive receivers are within approximately 140m of the proposal site. It is therefore anticipated that the works would be outside of the minimum working distances for the potential for vibration levels to cause human annoyance or cosmetic damage to structures to residential receivers. Furthermore, there are no heritage items or sensitive structures within the applicable minimum working distances.

Table 5-17: Construction plant – typical minimum working distances (metres)

Plant item	Rating / description	Minimum working distance		
		Cosmetic damage (BS 7385)	Heritage item (DIN 4150)	Human response (OH&E)
Vibratory Roller	< 50 kN (Typically 1-2 tonnes)	5m	10m	15m to 20m
	< 100 kN (Typically 2-4 tonnes)	6m	12m	20m
	< 200 kN (Typically 4-6 tonnes)	12m	24m	40m
	< 300 kN (Typically 7-13 tonnes)	15m	30m	100m
	> 300 kN (Typically 13-18 tonnes)	20m	40m	100m
	> 300 kN (> 18 tonnes)	25m	50m	100m
Small Hydraulic Hammer	(300 kg - 5 to 12t excavator)	2m	4m	7m
Medium Hydraulic Hammer	(900 kg – 12 to 18t excavator)	7m	14m	23m
Large Hydraulic Hammer	(1600 kg – 18 to 34t excavator)	22m	44m	73m
Vibratory Pile Driver	Sheet piles	2m to 20m	up to 40m	20m
Pile Boring	≤ 800 mm	2m (nominal)	4m	4m
Jackhammer	Hand held	1m (nominal)	2m	2m
Profiler	Wirtgen W210	4m	8m	n/a
Asphalt Paver	Vogele Super 1800-3	1m	2m	n/a
Oscillating Roller	Hamm HD70 (Oscillating)	2m	4m	n/a
Static Roller	Hamm HD70 (Static)	1m	2m	n/a

Note: Source, CNVG-RM (Transport, 2023) and/or CMNET (Transport 2022).

5.4 Mitigation

5.4.1 Standard mitigation measures

The CNVG-RM outlines noise management and mitigation measures to minimise the noise and vibration impacts from construction activities on nearby sensitive receivers. Adopting the standard mitigation measures may result in an attenuation of up to 20dBA where noise source noise mitigation measures (silencers, mufflers etc) can be combined with noise barriers and other management techniques. The standard mitigation measures as per the CNVG-RM are reproduced in Table 5-18.

Table 5-18: Construction plant – typical minimum working distances (metres)

Action required	Details
Management measures	
Implementation of any project specific mitigation measures required	Implementation of any project specific mitigation measures required.
Implement community consultation or notification measures	Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night-time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Please contact Roads and Maritime Communication and Stakeholder Engagement for guidance. ▪ Website (If required) ▪ Contact telephone number for community ▪ Email distribution list (if required) ▪ Community drop-in session (if required by approval conditions).
Site inductions	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: ▪ All relevant project specific and standard noise and vibration mitigation measures ▪ Relevant licence and approval conditions ▪ Permissible hours of work ▪ Any limitations on noise generating activities ▪ Location of nearest sensitive receivers ▪ Construction employee parking areas ▪ Designated loading/unloading areas and procedures ▪ Site opening/closing times (including deliveries) ▪ Environmental incident procedures.
Behavioural practices	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Verification	Where specified under Appendix C of the CNVG-RM a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions. Verification of noise and/or vibration levels should be undertaken as part of routine checks or following reasonable complaints. Where Additional Mitigation Measures require the spot check verification, attended measurements are to be undertaken within a period of 14 days from the commencement of construction activities.

	Verification of construction noise emissions is required when noise levels exceed the "Moderately Intrusive" AMM trigger for standard construction hours and OOH Period 1 and the "Clearly Audible" AMM trigger for OOH Period 2.
Attended vibration measurements	Where vibration intensive works are planned to occur within the minimum working distances for cosmetic damage, attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plan	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Where vibration intensive works are planned to occur within the minimum working distances for cosmetic damage, building dilapidation surveys should be undertaken on all buildings located within the minimum working distance prior to commencement of activities with the potential to cause property damage.
Source controls	
Construction hours and scheduling	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating noise with special audible characteristics and/or vibration levels should be scheduled during less sensitive time periods
Construction hours and scheduling	OOH work would be undertaken over a maximum of two consecutive nights, and no more than three nights total in any week.
Construction respite period	Please refer to Appendix C of the CNVG-RM for more details on the following respite measures: ▪ Respite Offers (RO) ▪ Respite Period 1 (R1) ▪ Respite Period 2 (R2) ▪ Duration Respite (DR)
Equipment selection	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.
Plant noise levels	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the CNVG-RM. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturers specifications or Appendix H of the CNVG-RM.
Rental plant and equipment	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG-RM.
Use and siting of plant	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.

Plan worksites and activities to minimise noise and vibration.	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noisy activities should be scheduled for normal working hours. If the work cannot be undertaken during the day, it should be completed before 11:00pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduce equipment power	Use only the necessary size and power.
Non-tonal reversing alarms	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Engine compression brakes	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained original equipment manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls	
Shield stationary noise sources such as pumps, compressors, fans etc	Stationary noise sources should be enclosed or shielded whilst ensuring that the occupational health and safety of workers is maintained. Appendix D of AS2436:2010 lists materials suitable for shielding
Shield sensitive receivers from noise activities	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.
Receptor Controls	
See Appendix C of the CNVG-RM for Additional Mitigation Measures	In some instances Additional Mitigation Measures may be required.

5.4.2 Additional Mitigation Measures

Standard noise mitigation and management measures in accordance with the CNVG-RM and ICNG would be implemented for the proposal where practicable.

The CNVG-RM also outlines a range of additional mitigation measures (AMMs) to be implemented to manage residual noise impacts following implementation of standard mitigation measures. The CNVG-RM AMMs reproduced in Table 5-19 will be considered by Transport or the construction contractor following incorporation of feasible and reasonable mitigation measures for the proposal. Appendix D provides a definition of each AMMs listed below.

Table 5-19: CNVG-RM triggers for additional mitigation measures – airborne noise

Perception	Predicted airborne LAeq(15min) noise level at receiver		Additional Mitigation Measures Type	Mitigation Levels
	dB(A) above RBL	dB(A) above NML		
All hours				
75dBA or greater			N, V, PC, RO	HA
Standard Hours: Mon - Fri (7am – 6pm), Sat (8am – 1pm), Sun/Pub Holidays (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly audible	10 to 20	< 10	-	NML
Moderately intrusive	20 to 30	10 to 20	N, V	NML+10
Highly intrusive	> 30	> 20	N, V	NML+20
OOHW - evening: Mon – Fri (6pm – 10pm), Sat (7am – 8am & 1pm – 10pm), Sun/Pub Hol (8am – 6pm)				
Noticeable	5 to 10	< 5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly intrusive	> 30	> 25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW - night: Mon – Fri (10pm – 7am), Sat (10pm – 8am), Sun/Pub Holidays (6pm – 7am)				
Noticeable	5 to 10	< 5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderately intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly intrusive	> 30	> 25	AA, V, IB, N, PC, SN, R2, DR	NML+25

Notes: AA = Alternative accommodation, R1 = Respite Period 1, V = Validation of predicted noise levels (not required for projects less than 3 weeks), PC = Phone calls, IB = Individual briefings (not required for projects less than 3 weeks), SN = Specific notifications, N = Notification, R2 = Respite Period 2, DR = Duration Respite, Perception = relates to level above RBL, NML = Noise Management Level (see Appendix C), HA = Highly Affected (> 75 dB(A) - applies to residences only).

The noise prediction results presented in Section 5.2.3 identify that up to three residential receivers in NCA 1 and up to three residential receivers in NCA 2 would potentially experience construction noise levels above the relevant NMLs during OOHW - night. Construction noise levels are predicted to meet the relevant NMLs for standard construction hours, OOHW – day and OOHW – evening at all receiver locations during each construction scenario.

The highest predicted exceedance in NCA 1 is anticipated to be up to 5dB $L_{Aeq(15min)}$ over the NML during bulk earthworks (not recommended for OOHW periods) and asphalt paving works, while the highest predicted exceedance in NCA 2 is anticipated to be up to 4dB $L_{Aeq(15min)}$ during bulk earthworks (not recommended for OOHW periods) and 3dB $L_{Aeq(15min)}$ during asphalt paving works.

A summary of the predicted exceedances, AMM perception categories and AMMs to be implemented are presented in Table 5-20. It is noted that the highest predicted exceedance and nominated applicable AMMs assume unmitigated construction noise emissions. It is expected that in applying standard mitigation measures, construction noise emissions would be reduced by at least 5 – 10dBA. Hence, the assessment of applicable AMMs is considered highly conservative. Where standard mitigation measures are implemented, construction noise levels would be likely to remain below the AMM perception categories for all receivers, during each construction scenario.

Table 5-20: Summary of applicable AMMs – OOHW - night

NCA	Perception category	Receivers impacted	Highest exceedance	Applicable AMMs
NCA 1	Noticeable	R1, R2a	4dBA	N
	Clearly audible	R5	5dBA	V, N, R2, DR
	Moderately intrusive	--	n/a	n/a
	Highly intrusive	--	n/a	n/a
NCA 2	Noticeable	R7a, R7b, R32	4dBA	N
	Clearly audible	--	n/a	n/a
	Moderately intrusive	--	n/a	n/a
	Highly intrusive	--	n/a	n/a

6. Conclusion

6.1 Operational Noise

6.1.1 Operational road traffic noise

The existing environment is dominated by the Hume Motorway with ambient noise levels ranging from 63dBA in the day period (7am to 10pm) and 61dBA in the night time (10pm to 7am) for receivers near the road.

The proposal would deliver an Oversize and/or Overmass vehicle stop in the northbound carriageway (western side) of the Hume Motorway. The new heavy vehicle stop would function in the same manner as the existing informal truck stop, however, it will also comprise a diverge/deceleration lane and an acceleration lane.

Traffic surveys indicate that the maximum usage of the heavy vehicle stop would be about 25 heavy vehicles, 25 light vehicles and one OSOM vehicle per day. Annual average daily traffic volumes on the Hume Motorway are about 52,500 vehicles per day, comprising about 23% heavy vehicles. The location of the proposed diverge lane would result in a reduction in the minimum offset distance to the nearest residential receiver from about 145m to about 141.5m. Hence, based on the high existing road traffic volumes, the negligible change in offset distance, and the low expected daily usage of the heavy vehicle stop, the change in operational road traffic noise levels from vehicles using the diverge/deceleration and acceleration lanes would not increase road traffic noise levels by more than the 2dBA increase criterion for minor works projects.

6.1.2 Operational noise levels (heavy vehicle stop)

Existing background noise levels for receivers located in NCA 1 were measured between 44dBA during the night time and 56dBA during the day time, while for receivers located within NCA 2, setback more than 600m from the Hume Motorway, background noise levels were measured between 32dBA during the night time and 44dBA during the day time.

The proposed Hume Motorway Heavy Vehicle Stop would comprise up to 12 heavy vehicle parking spaces and 20 light vehicle spaces and would be operational 24 hours per day. Modelled operational noise sources included light vehicles idling and driving at low speed, heavy vehicle idling and driving at low speed, heavy vehicle rooftop cabin air conditioning units and heavy vehicle trailer refrigeration units. Airbrake release was modelled for maximum noise level events.

The results of the assessment demonstrated that operational noise levels would range from <30dB to 35dB $L_{Aeq(15min)}$ for receivers in NCA 1, which is below the minimum criterion (night period) of 46dBA. For receivers in NCA 2, operational noise levels were predicted to be below 30dB $L_{Aeq(15min)}$ at all receiver locations, which is below the minimum criterion (night period) of 37dBA. Maximum noise levels were predicted at up to 37dBA for the nearest residential receivers in NCA 1 and <30dBA for the nearest residential receivers in NCA 2, which is below the criteria of 59dB L_{Amax} for NCA 1 and 52dB L_{Amax} for NCA 2.

6.2 Construction noise and vibration

Construction noise levels have been predicted for sensitive receiver locations during initial site establishment works, compound establishment, corridor clearing, bulk earthworks, installation of drainage structures, asphalt paving works, resurfacing works, and line marking and road furniture installation.

Noise impacts are predicted during OOHW – night during compound establishment, corridor clearing, bulk earthworks, asphalt paving works and resurfacing works, with predicted NML exceedances of up to 5dBA for up to three residential receivers within NCA 1, and up to 4dBA for up to two residential receivers within NCA 2. The typical offset distance to the nearest sensitive receivers (or land uses) from the nearest works is 35 metres with the catchment extending approximately 1,430 metres away from the works area for residential receivers in NCA 2 during asphalt paving works. It is noted that in accordance with Transport's CMNET, corridor clearing works and bulk earthworks are not recommended during OOHW – night.

Noise predictions for the standard construction hours, OOHW – day and OOHW – evening indicated that construction noise levels would comply with the NMLs for all construction activities at all receiver locations within NCA 1 and NCA 2.

Maximum noise levels, above which sleep disturbance impacts may occur, are predicted to be below the MNLA criterion of 65dB L_{Amax} at all receiver locations during each construction scenario. It is noted that maximum noise levels are predicted at up to 65dB L_{Amax} at one receiver location during asphalt paving works, during the operation of the concrete saw.

Standard mitigation measures as per the CNVG-RM have been recommended for OOHW to minimise construction noise impacts. Following the implementation of standard mitigation measures, it is anticipated that there would not be any residual impacts above the AMM triggers, however, where standard mitigation measures are not implemented, or are not effective, one receiver in NCA 1 may experience construction noise levels within clearly audible perception range during OOHW - night, while up to two receivers in NCA 1 and up to three receivers in NCA 2 may experience construction noise levels in the noticeable range during OOHW – night. Hence, AMMs have been recommended as per the CNVG-RM.

As the offset distance from the closest point of the proposal site to the nearest sensitive receiver is more than 100m, it is anticipated that vibration levels would comply with the acceptable limits for human comfort and cosmetic damage at all sensitive receivers, during all construction activities.

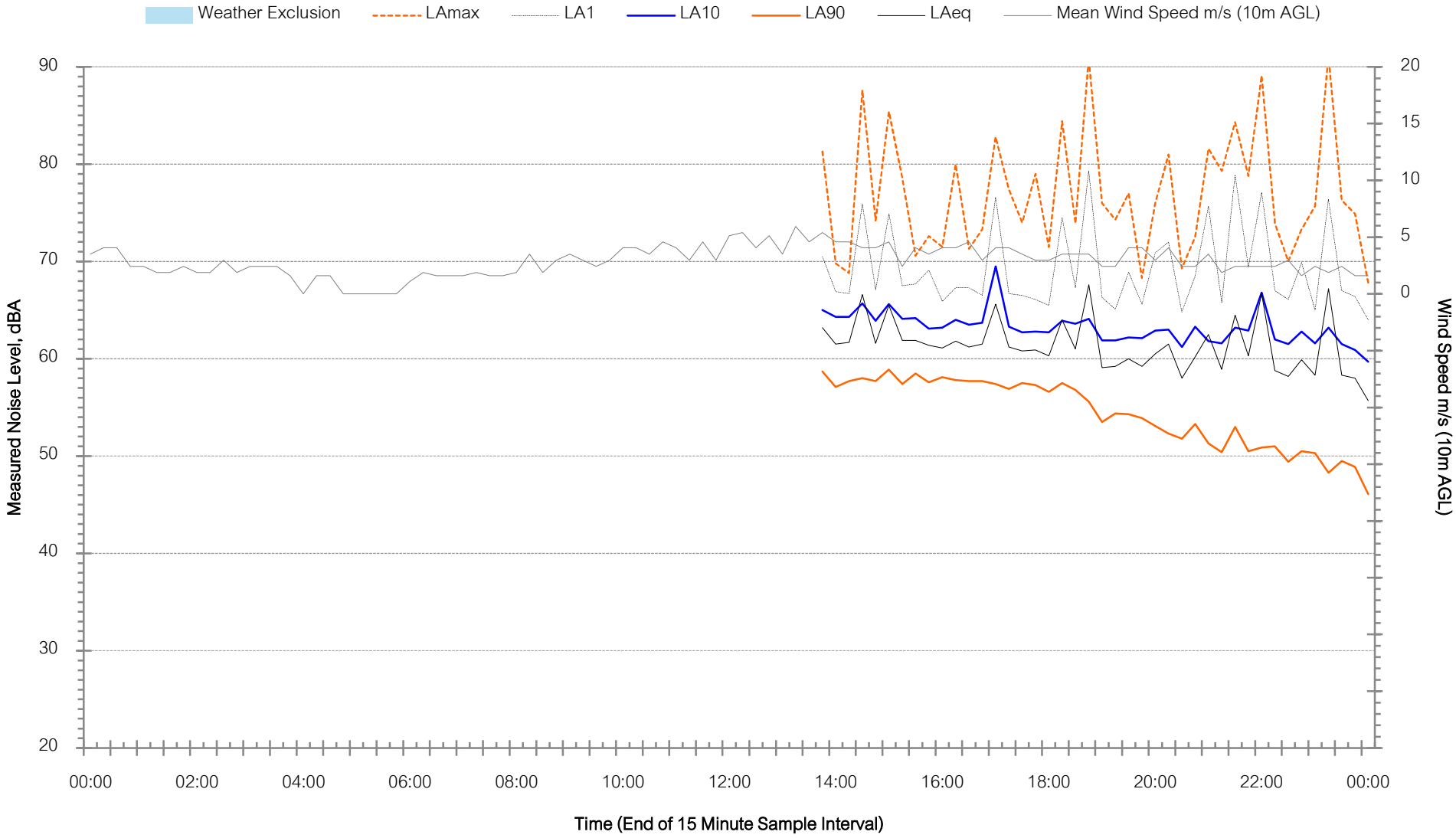
7. Definitions

Term	Definition
A–frequency weighting	A frequency based adjustment made to sound level measurement, by means of an electronic filter, in line with international standards. This approximates the frequency response of the human ear and accounts for reduced sensitivity at low frequency.
Background noise level	The underlying level of noise present in the ambient noise when extraneous noise is removed and excluding noise from the project under consideration. This is described using the L_{A90} descriptor.
CoA	Minister's Conditions of Approval
CNVG-RM	Transport's *Construction noise and vibration guideline (for roads and maritime works)*
Day	Defined as 7am-10pm.
Decibel (dB)	A measure of sound level. The decibel is a logarithmic way of describing a ratio. The ratio may be power, sound pressure, voltage, intensity or other parameters. In the case of sound pressure, it is equivalent to 10 times the logarithm (to base 10) of the ratio of a given sound pressure squared to a reference sound pressure squared.
Decibel (A-weighted; dBA)	Unit used to measure 'A-weighted' sound pressure levels. A-weighting is a frequency-based adjustment made to sound-level measurement to approximate the response of the human ear.
Design year	Typically, 10 years after project opening (refer to EPA Road Noise Policy)
L_{A10}	The A-weighted sound pressure level measured using fast time weighting that is exceeded for 10% of the time over the relevant time period.
L_{A90}	The 'Background Noise Level' in the absence of project activities. This parameter represents the average minimum noise level during the daytime, evening and night-time periods respectively. It is the A-weighted sound pressure level measured using fast time weighting that is exceeded for 90% of the time over the relevant time period.
L_{Aeq}	Energy average A-weighted sound level – the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.
$L_{Aeq(15hour)}$	The L_{Aeq} noise level between the period of 7am–10pm.
$L_{Aeq(9hour)}$	The L_{Aeq} noise level between the period of 10pm–7am.
L_{Amax}	The 'Maximum Noise Level' for an event, used in the assessment of potential sleep disturbance during night-time periods. The subscript 'A' indicates that the noise levels are filtered to match normal human hearing characteristics (i.e. A-weighted). 'Fast' time constant is used for this measurement.
Night	Defined as 10pm-7am.
RNCG	*Road Noise Criteria Guideline* (Transport for NSW)
RNMG	*Road Noise Mitigation Guideline* (Transport for NSW)
REF	Review of Environmental Factors
EIS	Environmental Impact Statement

Appendix A: Noise monitoring charts

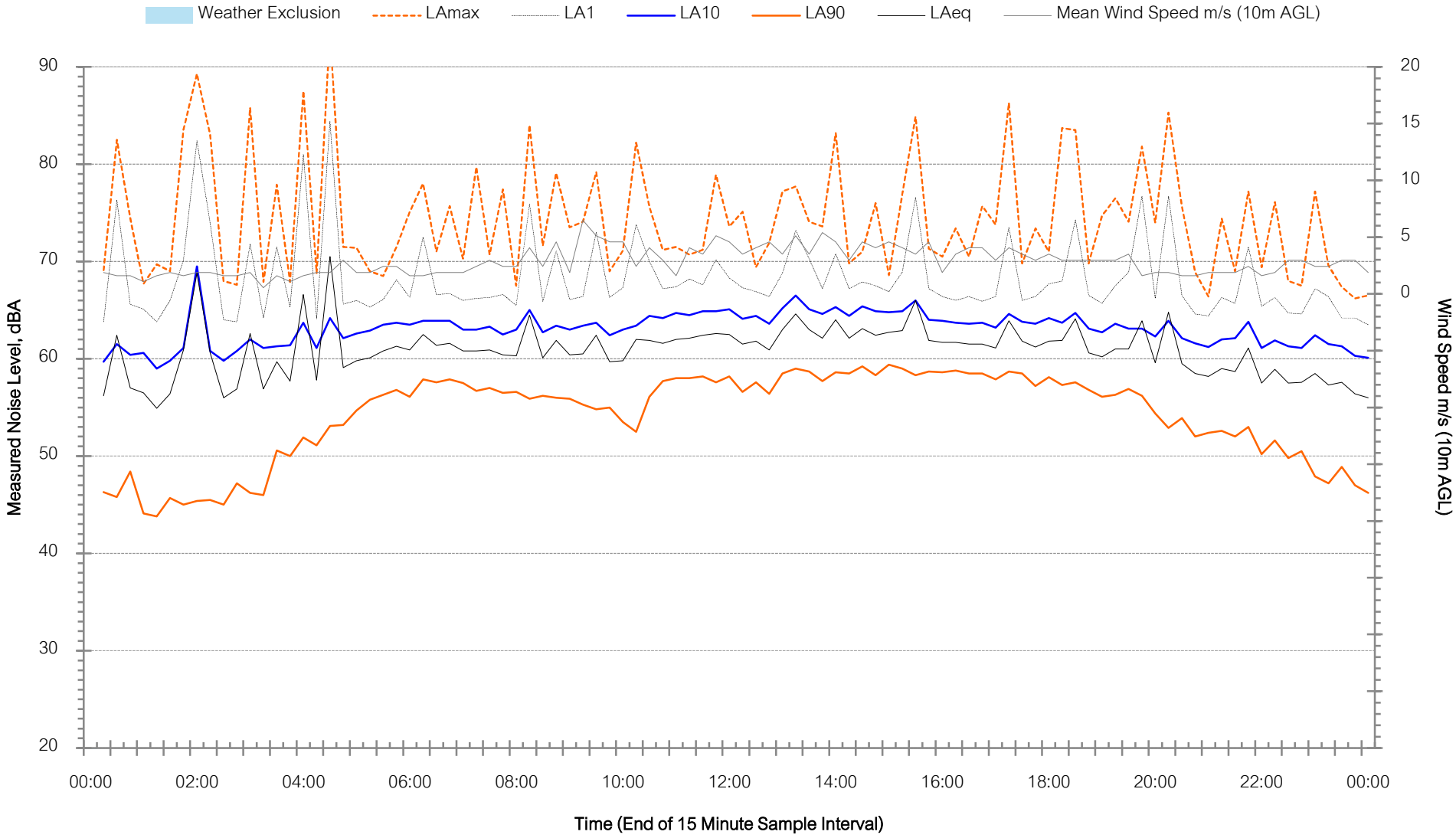
Background Noise Levels

Hume Motorway - Tuesday 30 April 2024



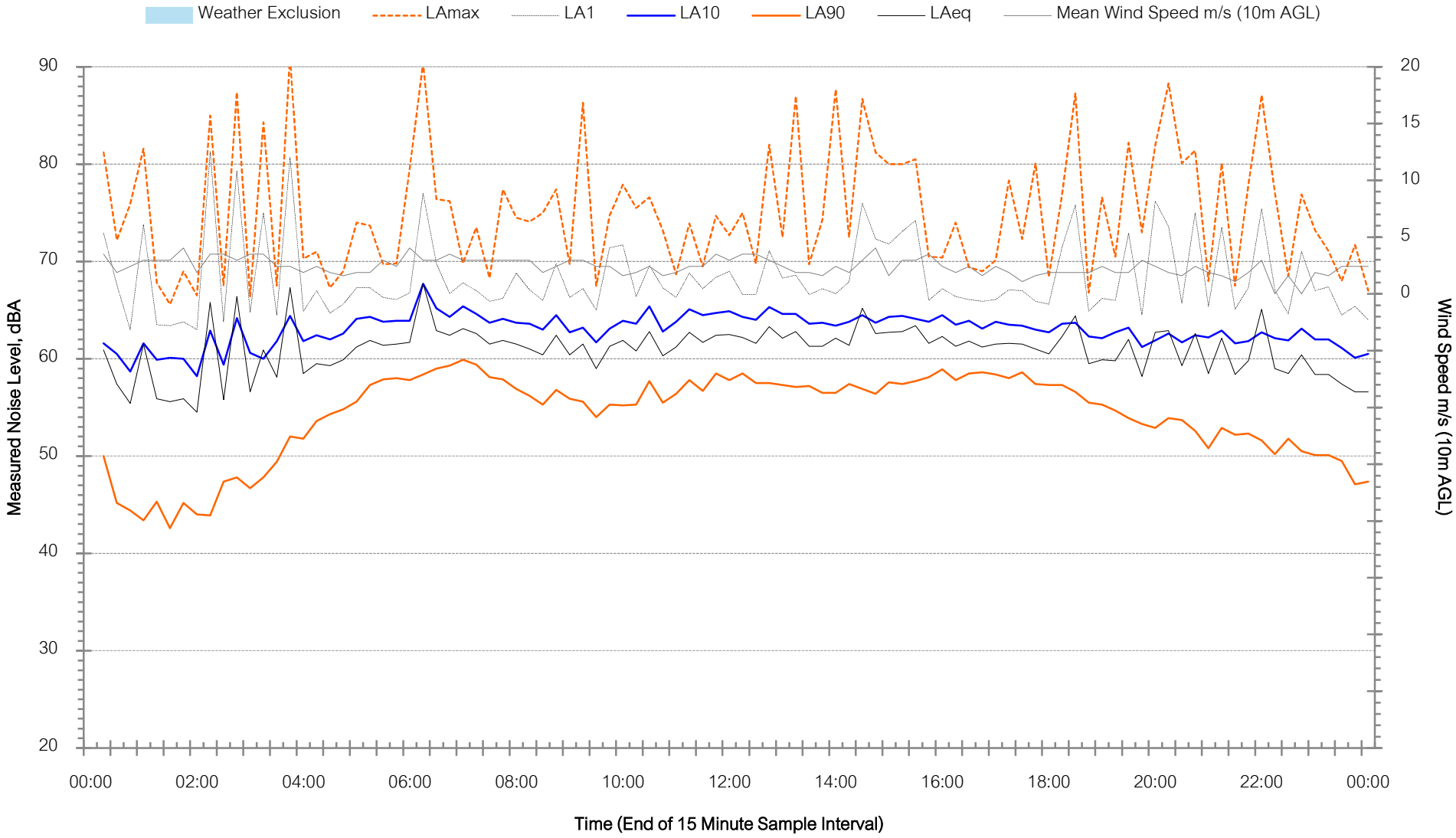
Background Noise Levels

Hume Motorway - Wednesday 1 May 2024



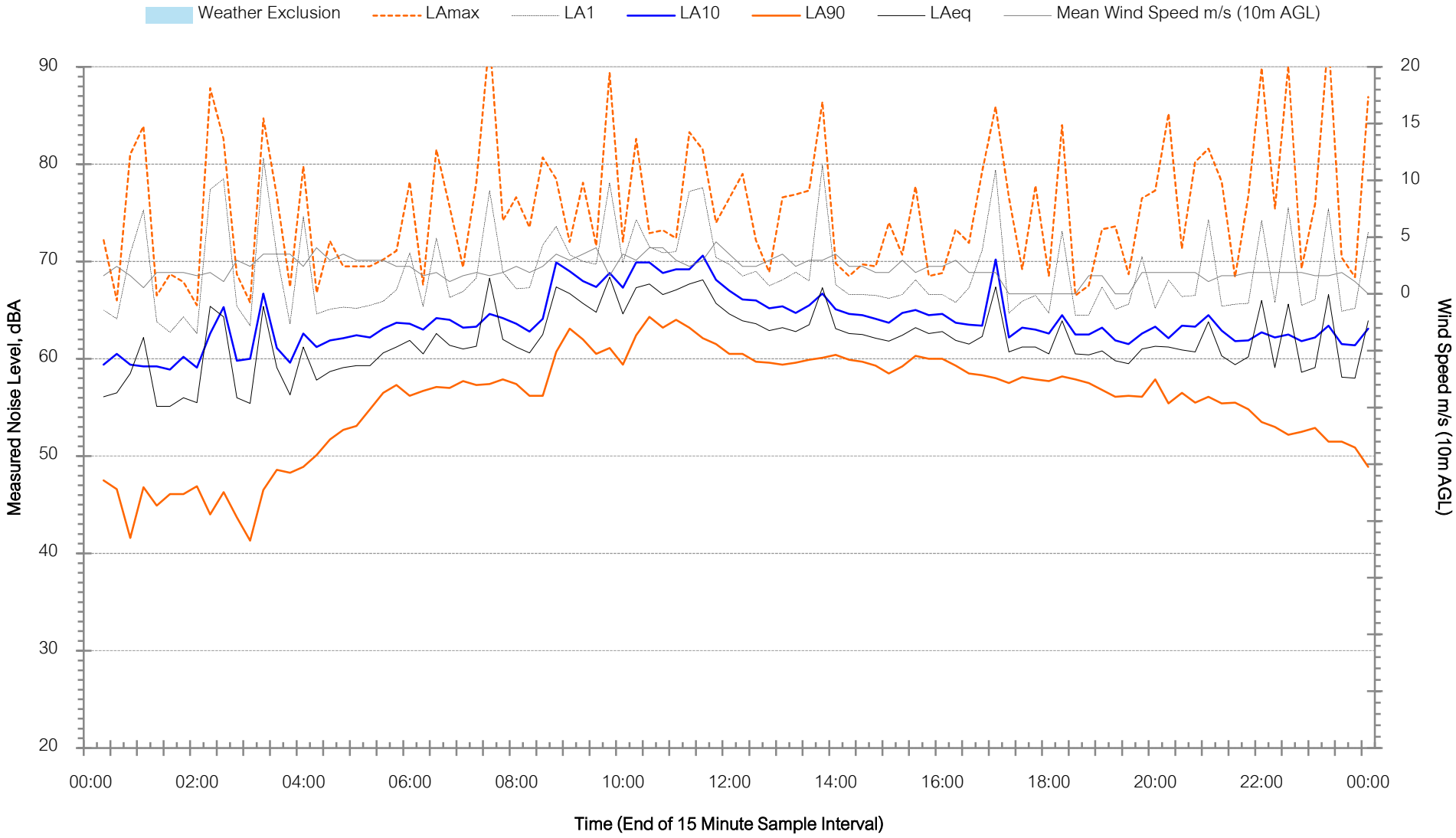
Background Noise Levels

Hume Motorway - Thursday 2 May 2024



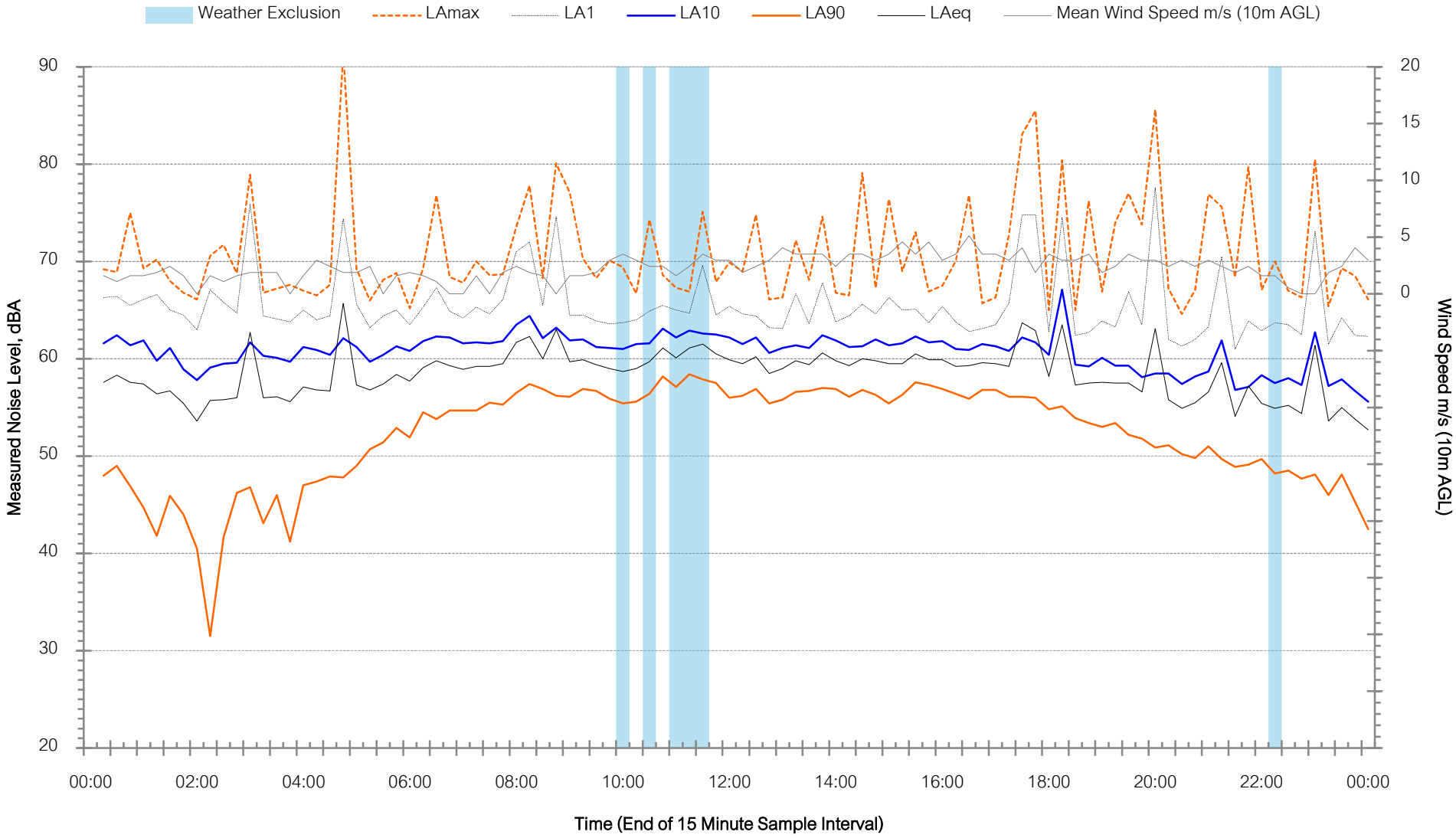
Background Noise Levels

Hume Motorway - Friday 3 May 2024



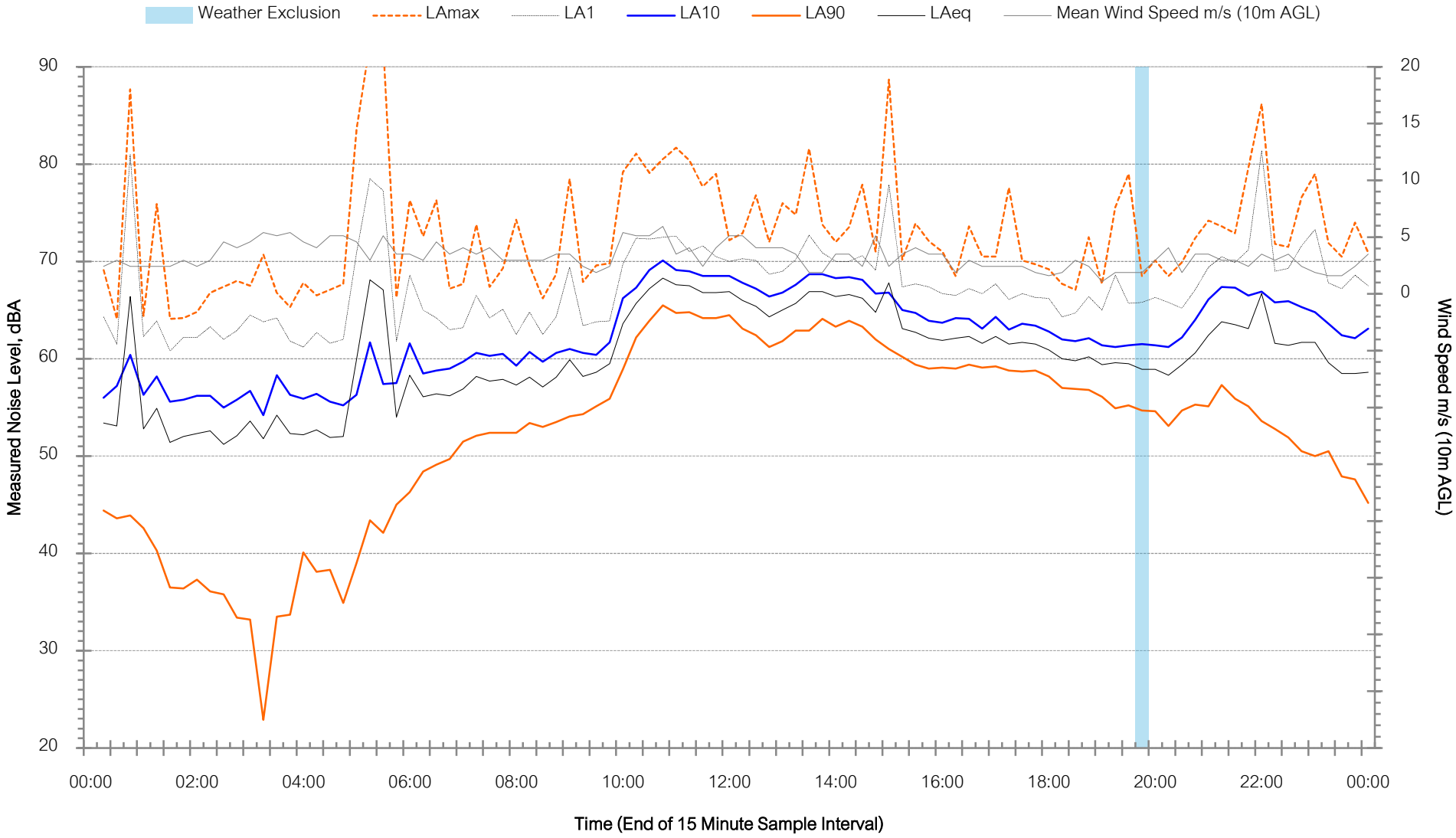
Background Noise Levels

Hume Motorway - Saturday 4 May 2024



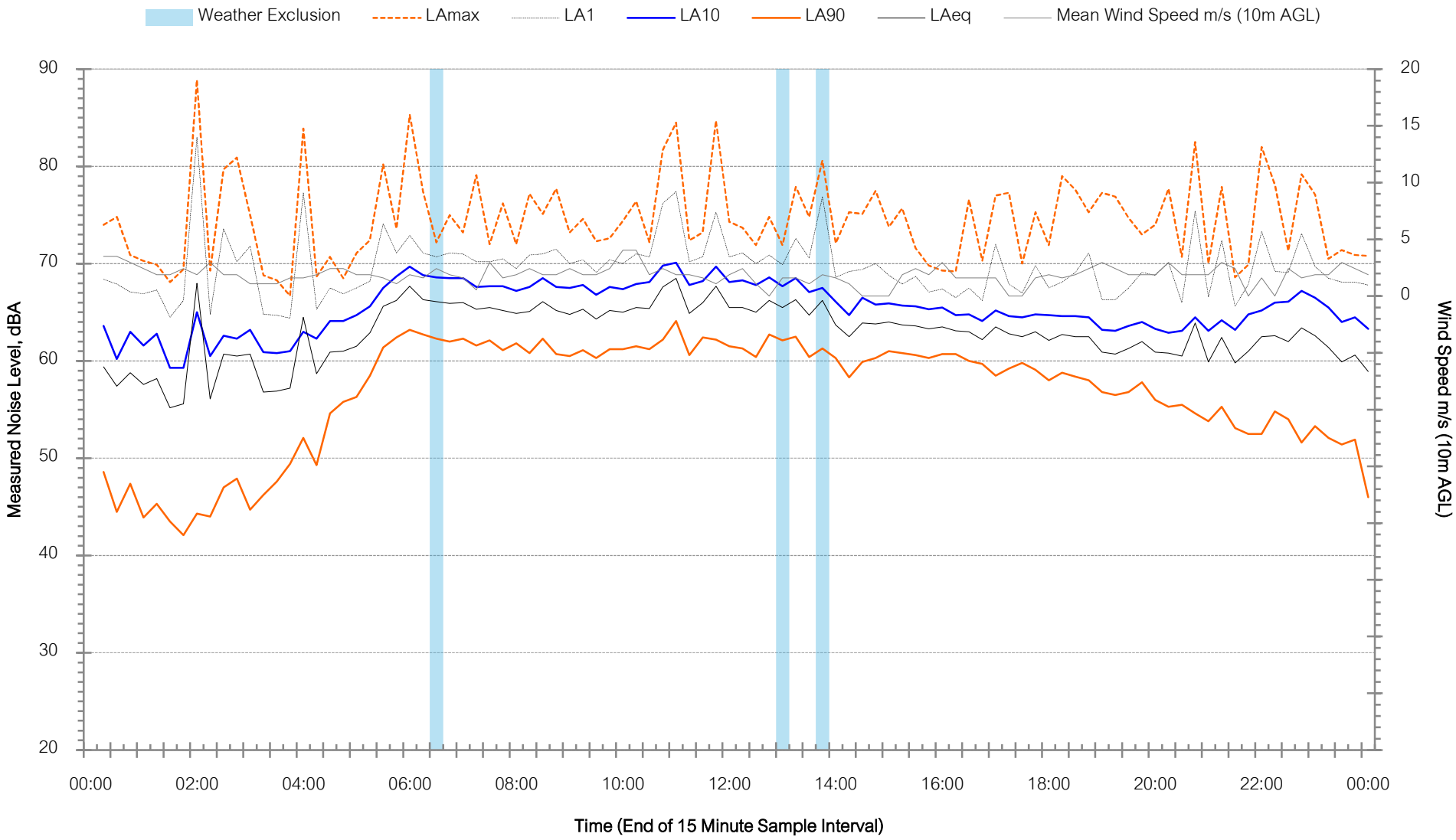
Background Noise Levels

Hume Motorway - Sunday 5 May 2024



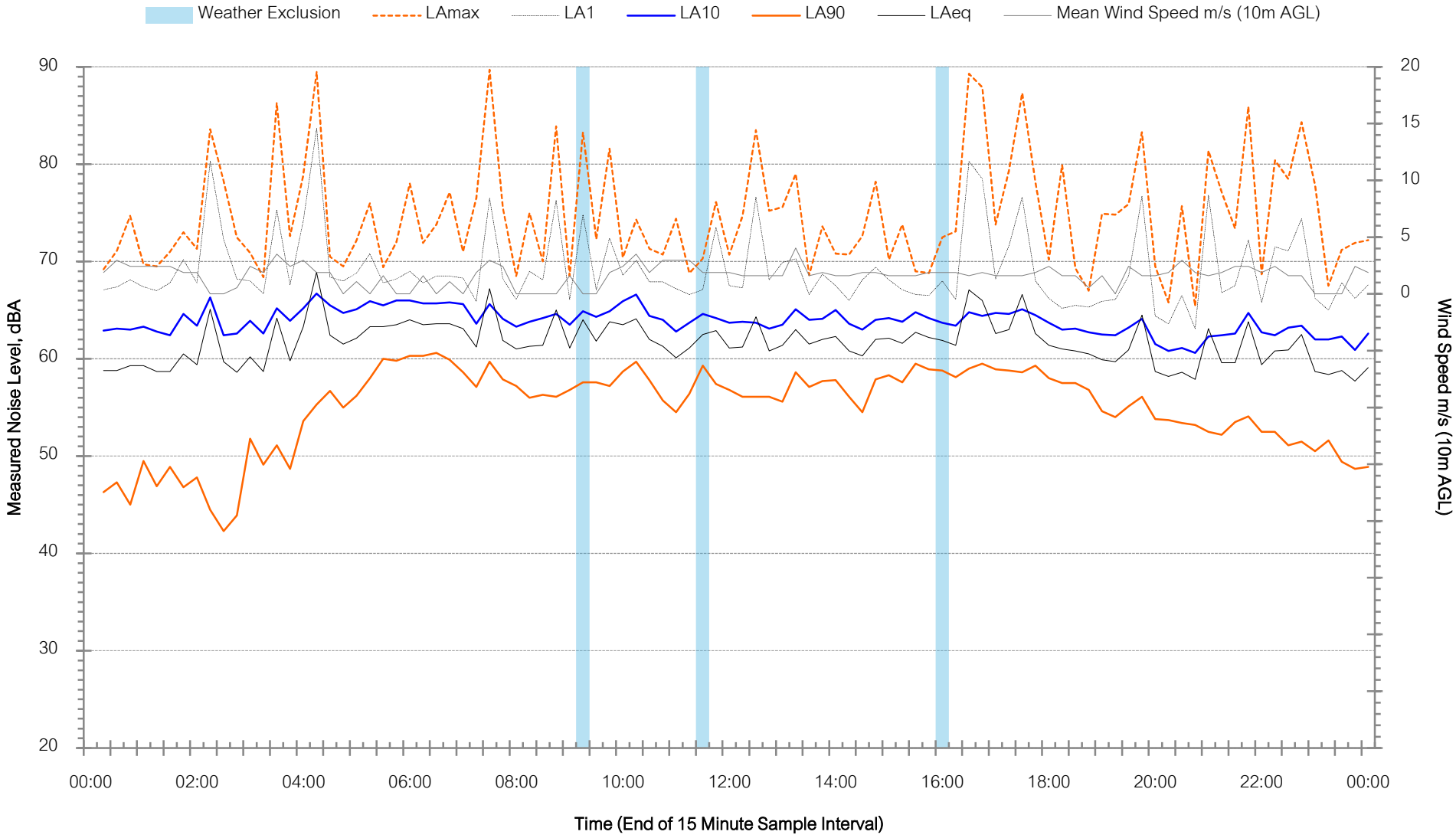
Background Noise Levels

Hume Motorway - Monday 6 May 2024



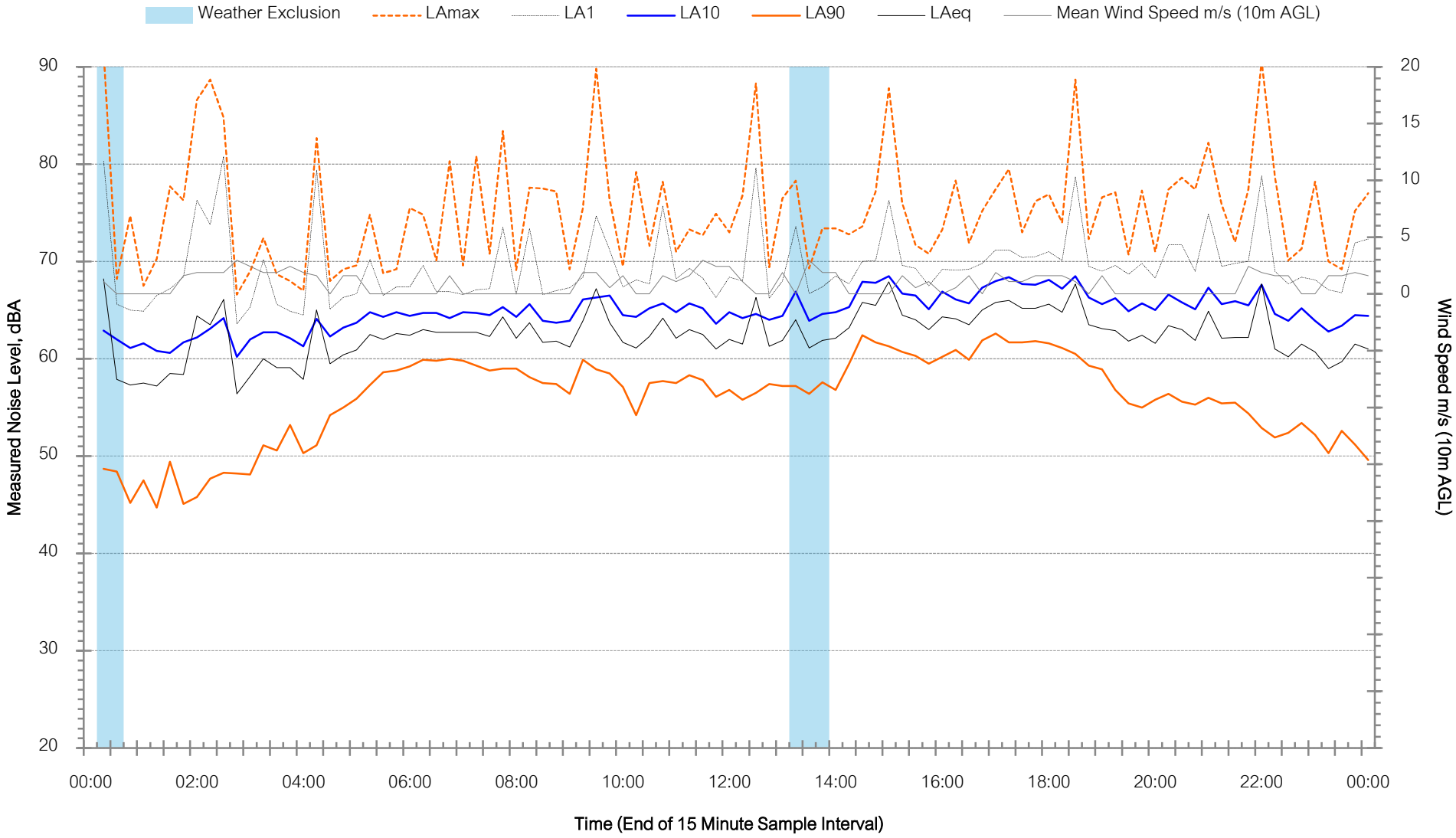
Background Noise Levels

Hume Motorway - Tuesday 7 May 2024



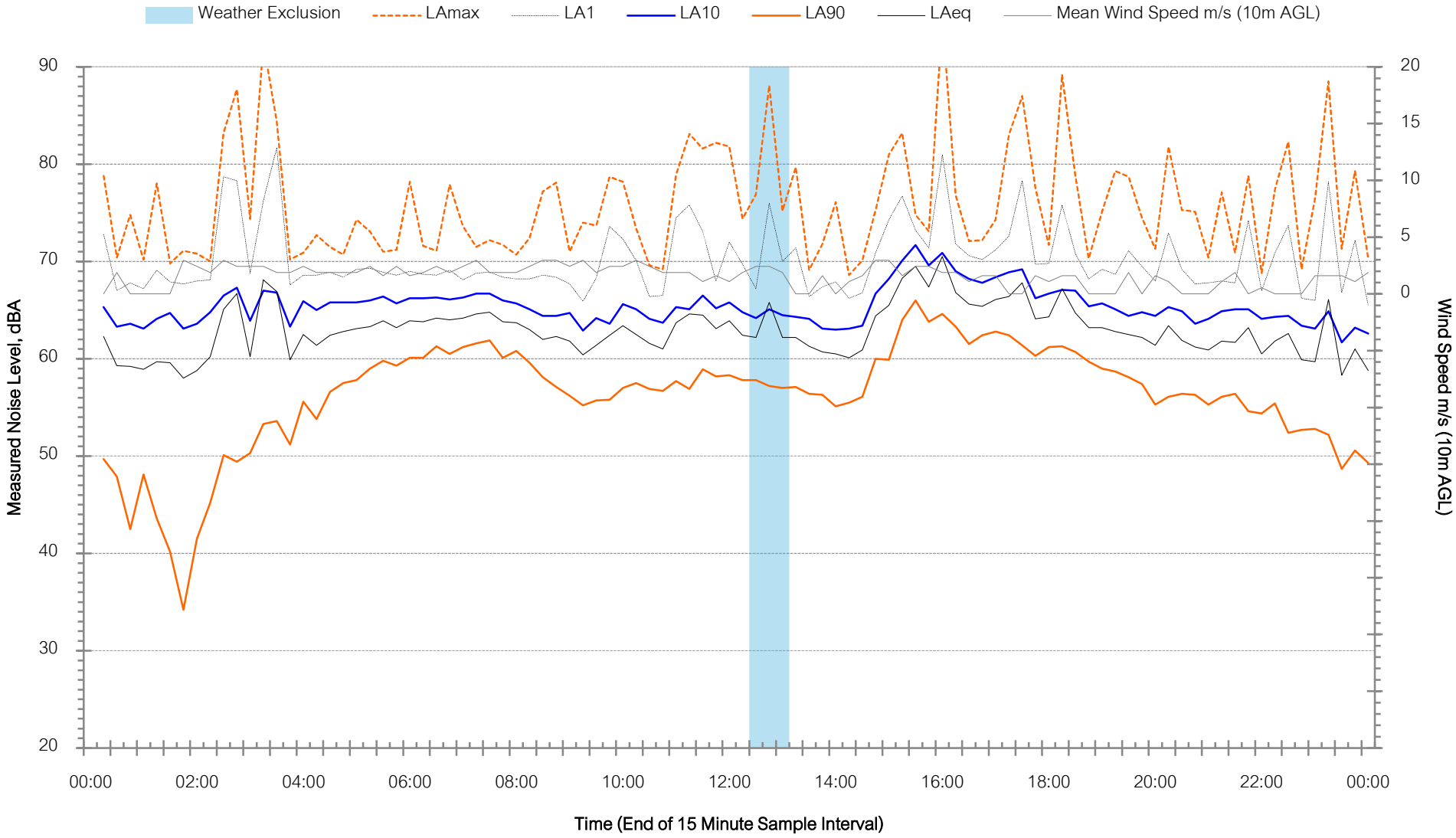
Background Noise Levels

Hume Motorway - Wednesday 8 May 2024



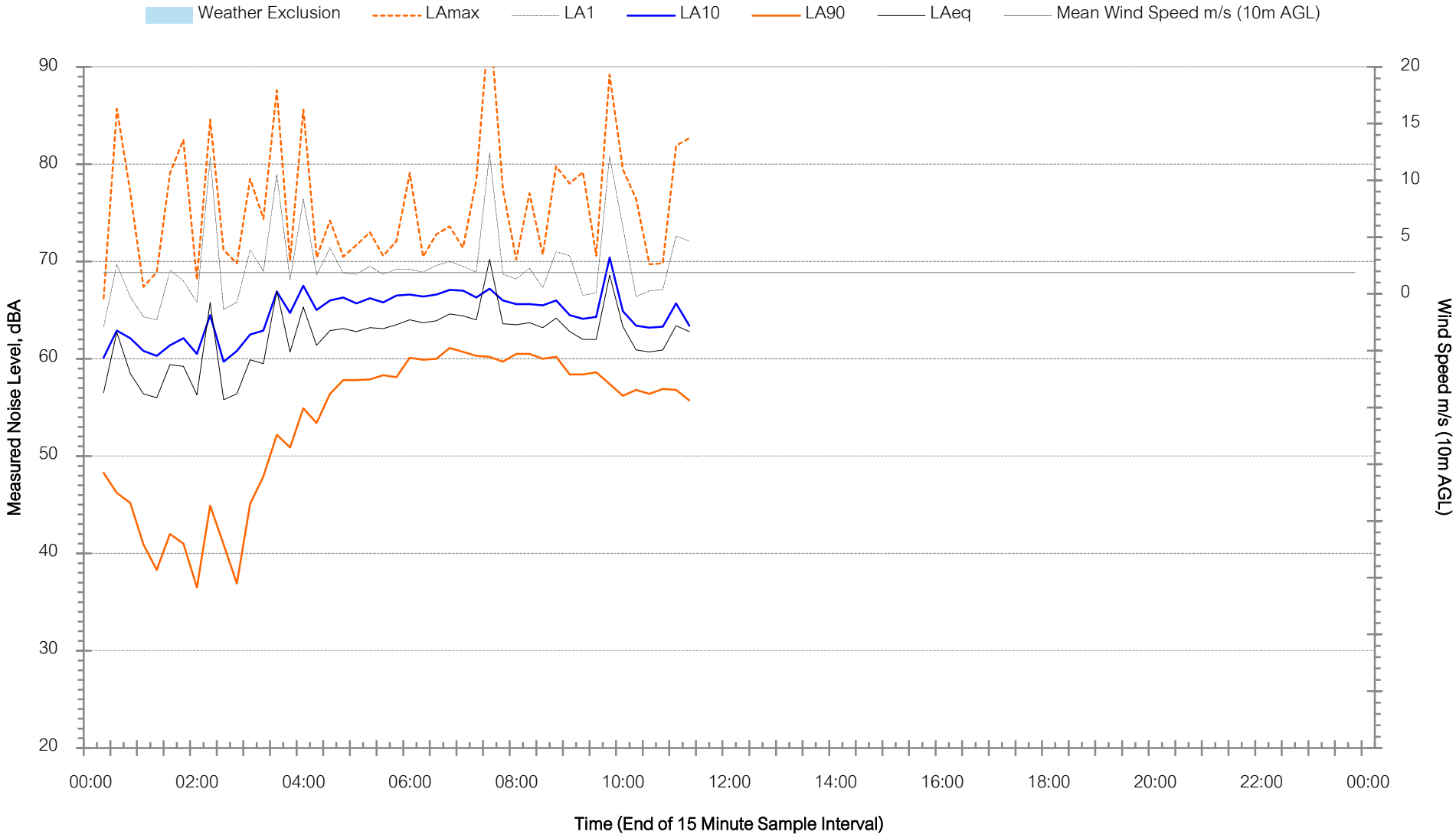
Background Noise Levels

Hume Motorway - Thursday 9 May 2024



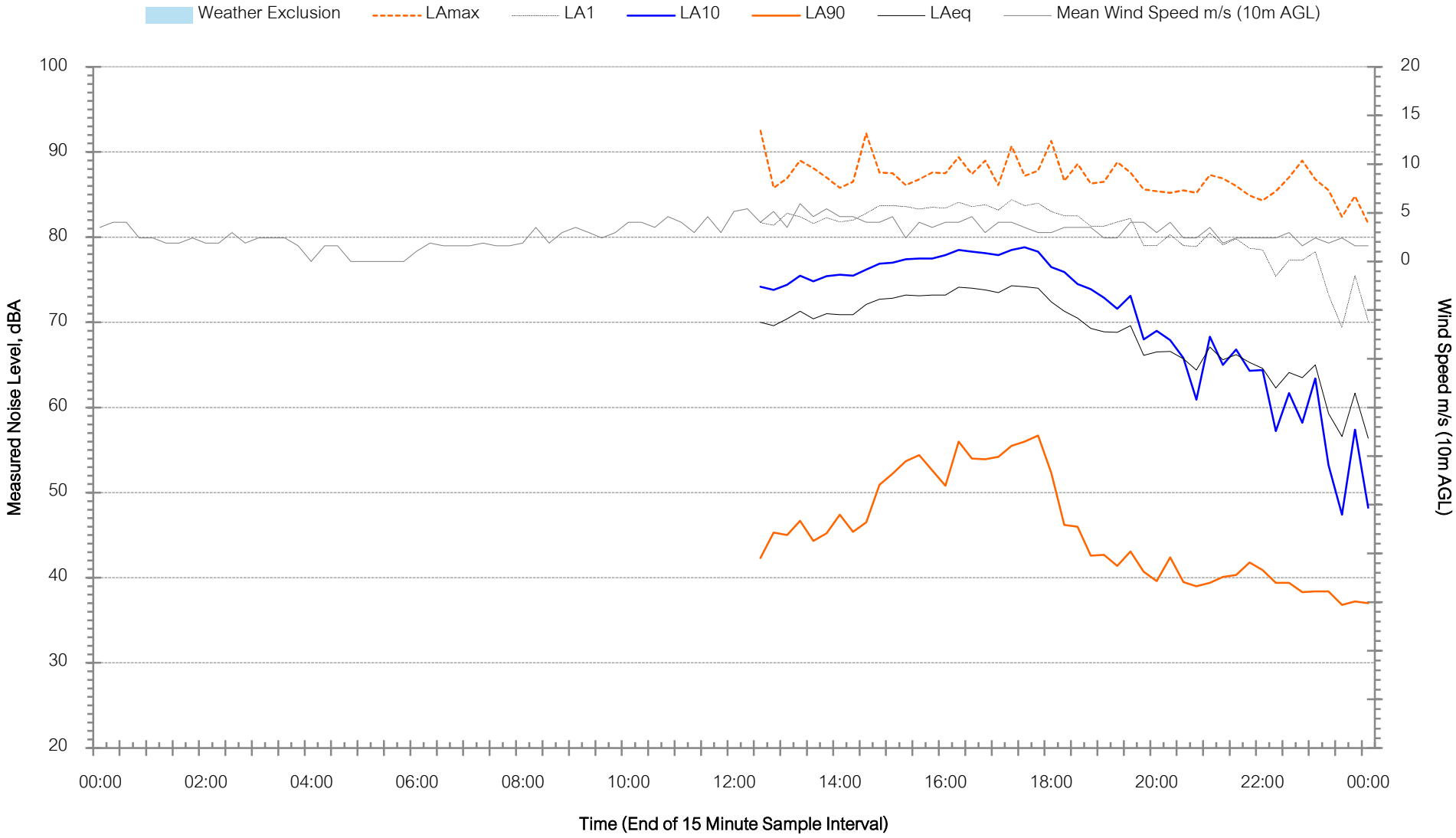
Background Noise Levels

Hume Motorway - Friday 10 May 2024



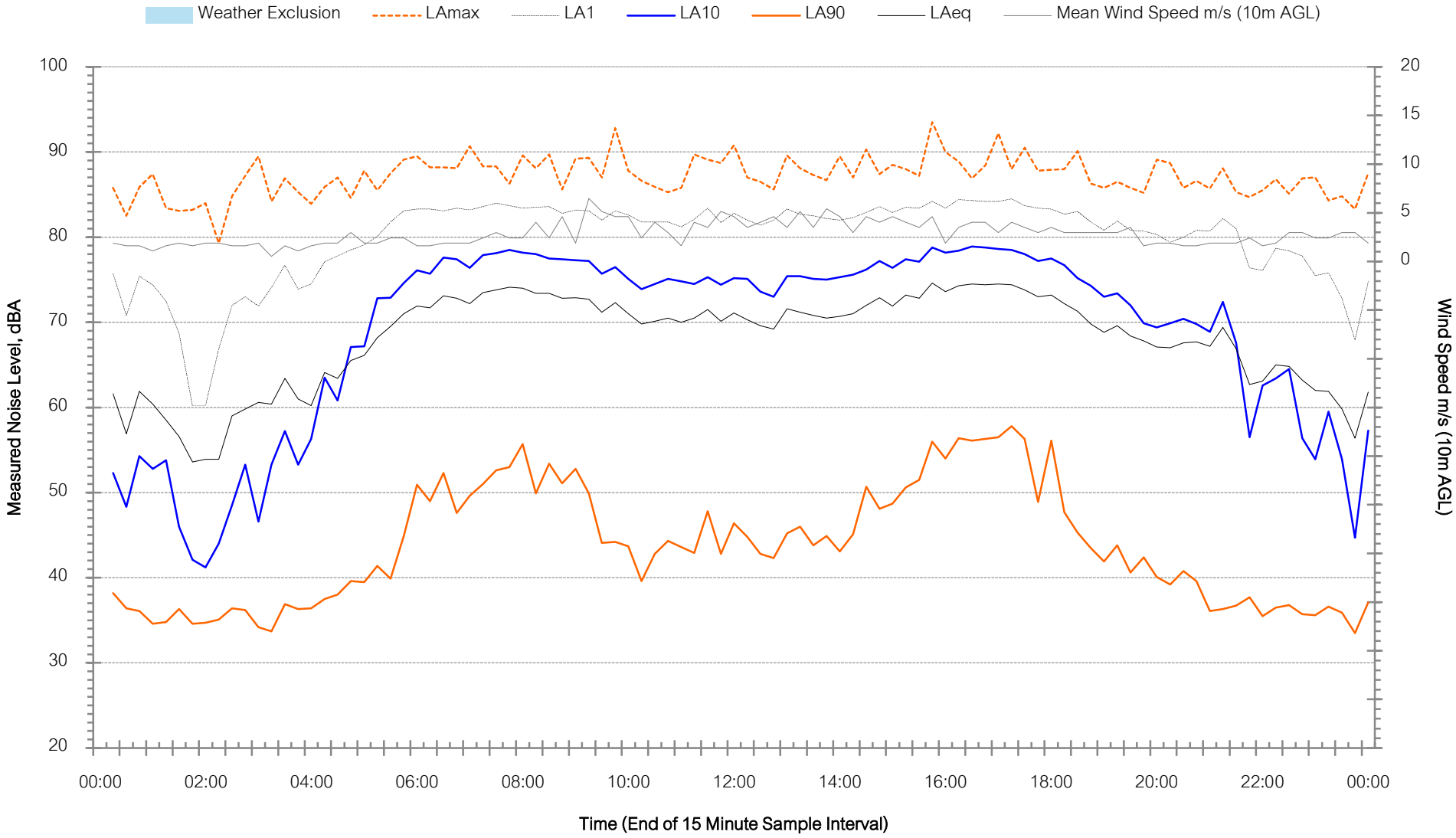
Background Noise Levels

Menangle Road - Tuesday 30 April 2024



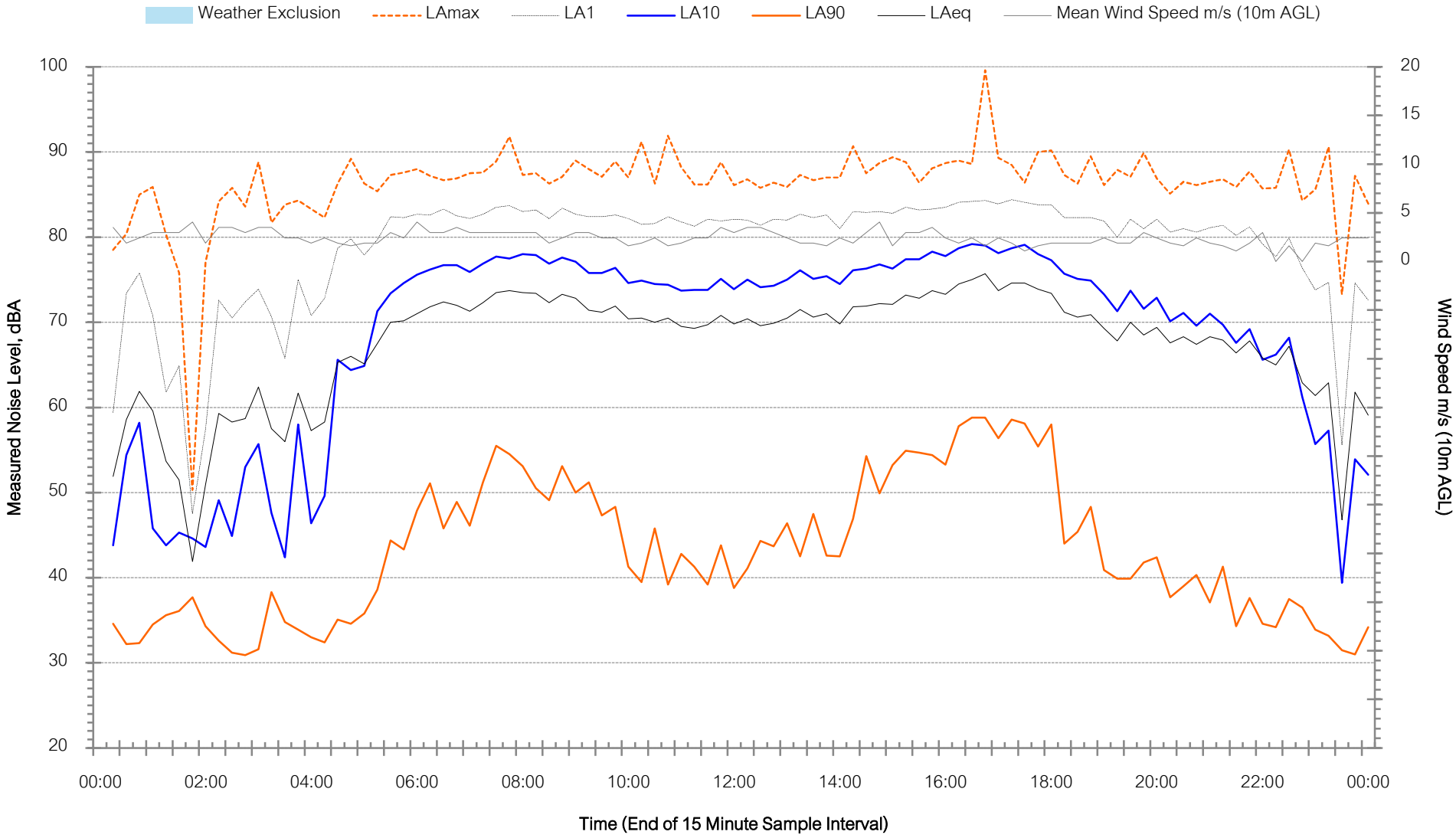
Background Noise Levels

Menangle Road - Wednesday 1 May 2024



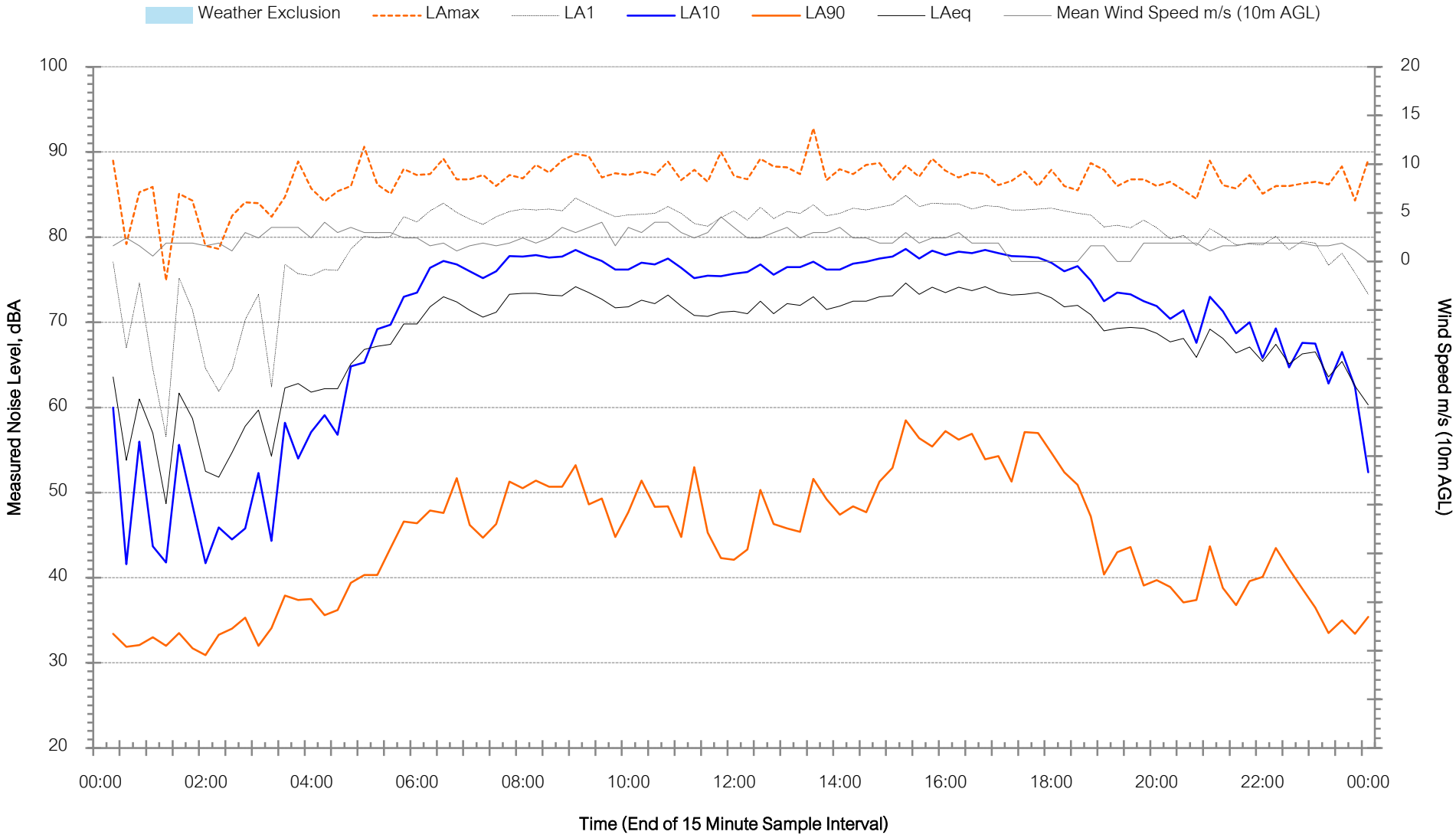
Background Noise Levels

Menangle Road - Thursday 2 May 2024



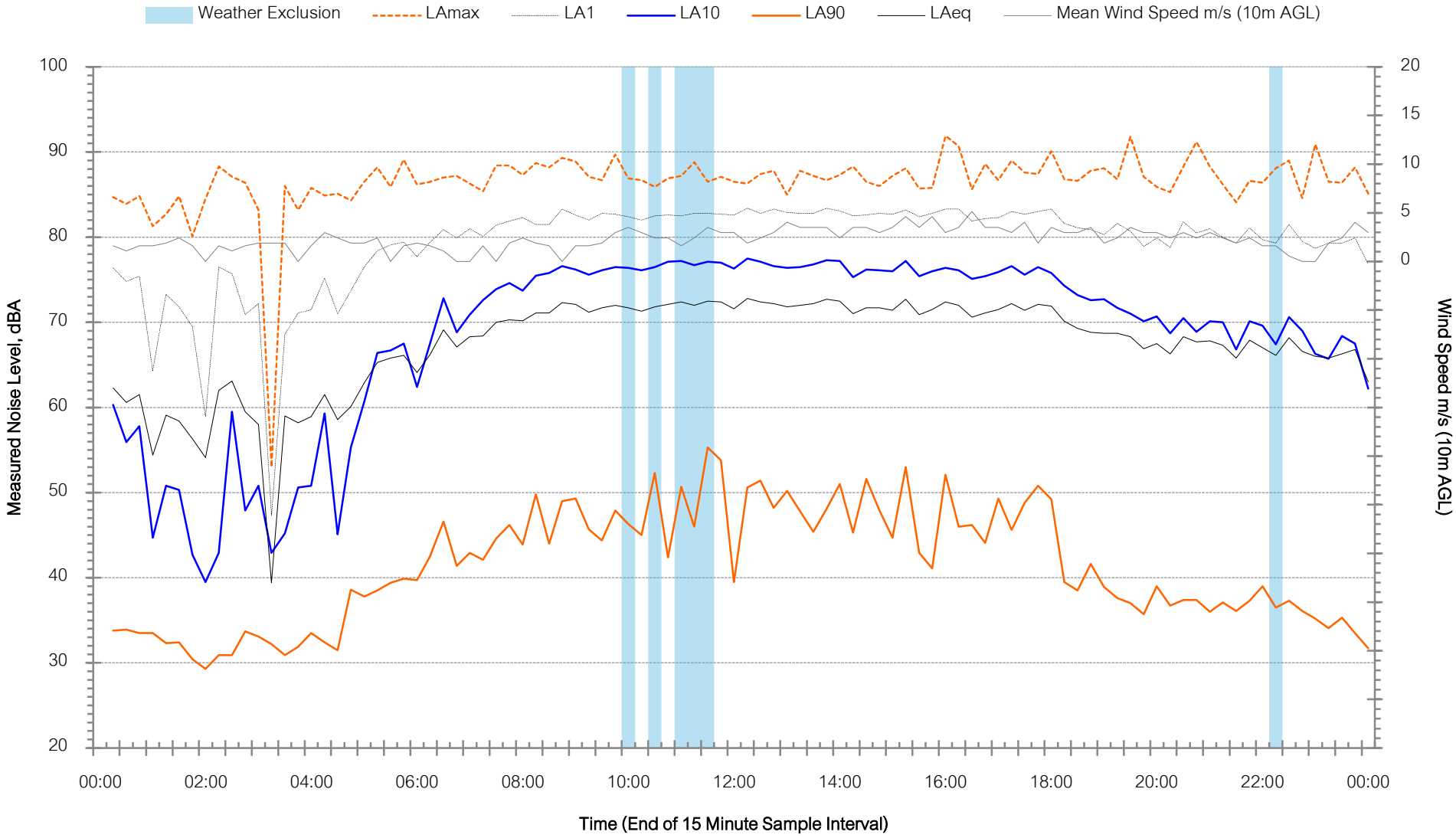
Background Noise Levels

Menangle Road - Friday 3 May 2024



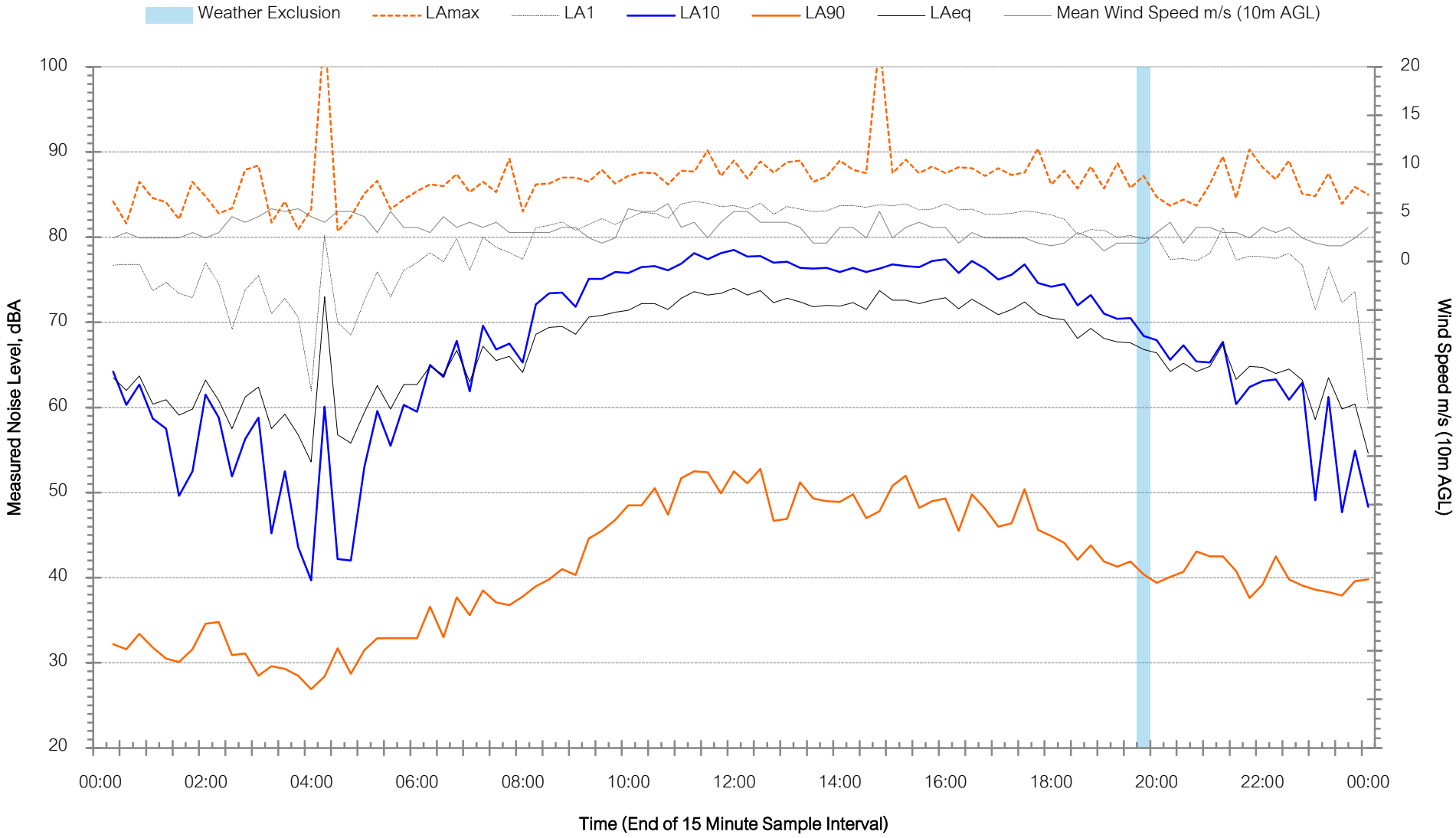
Background Noise Levels

Menangle Road - Saturday 4 May 2024



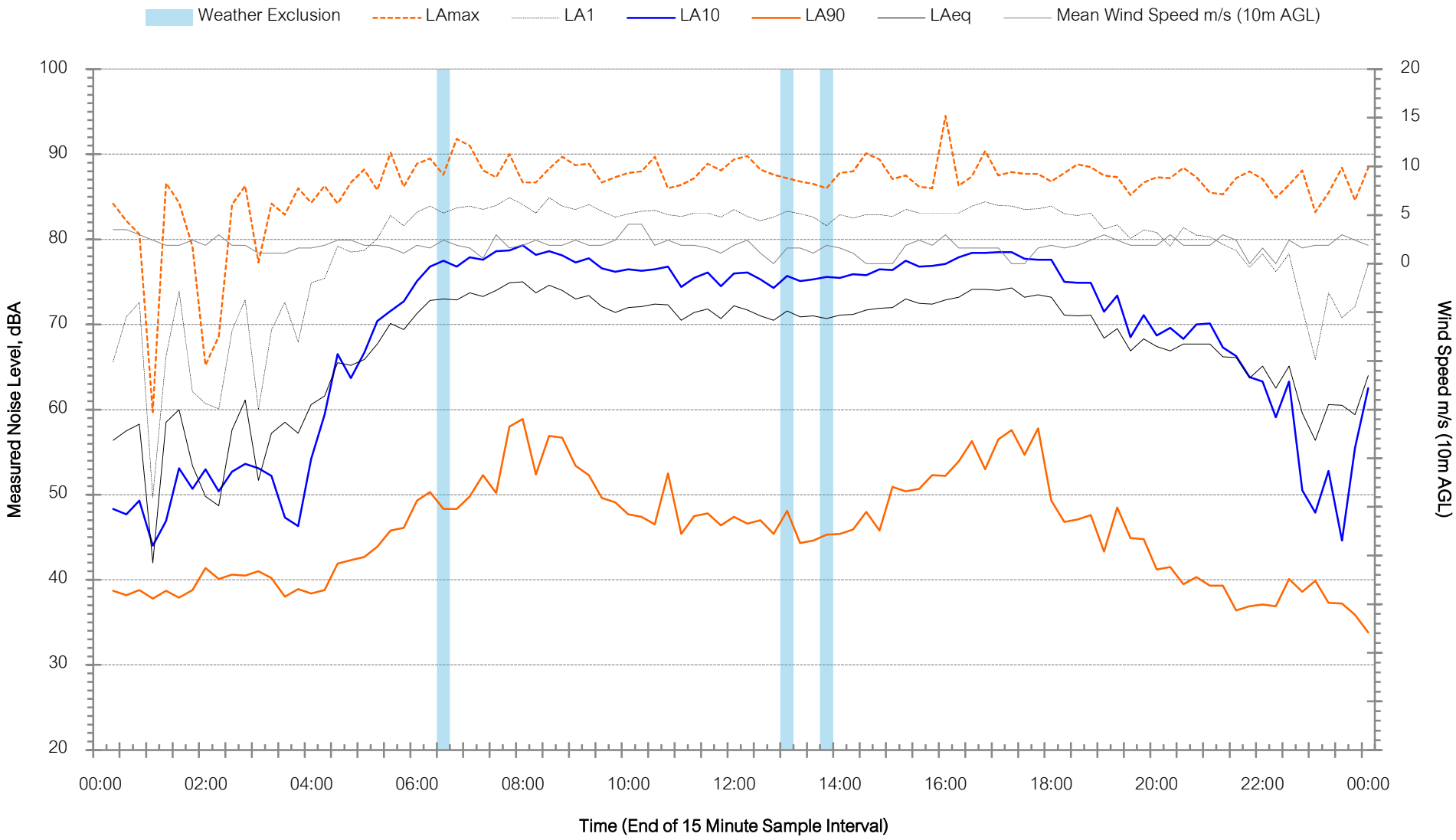
Background Noise Levels

Menangle Road - Sunday 5 May 2024



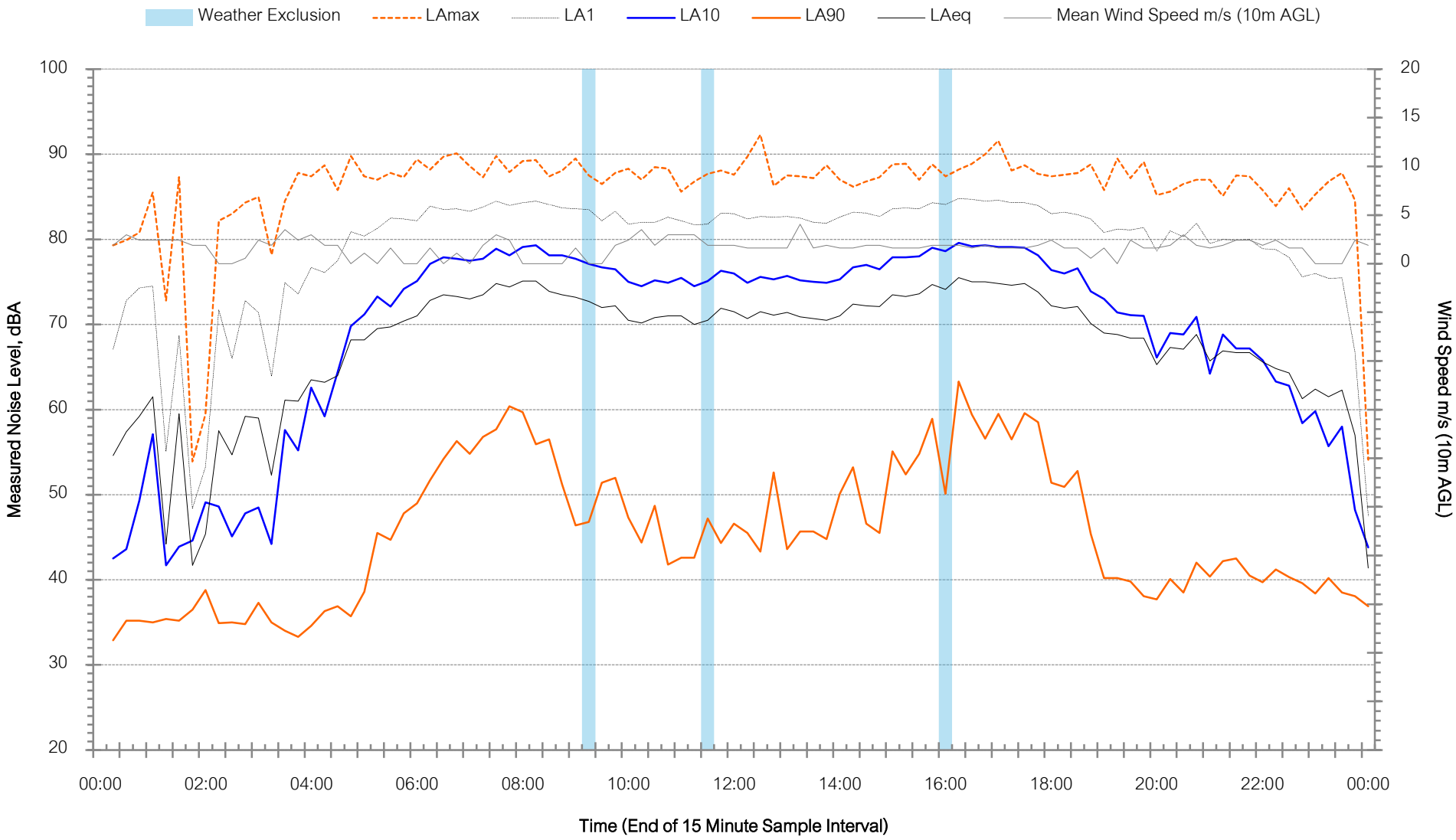
Background Noise Levels

Menangle Road - Monday 6 May 2024



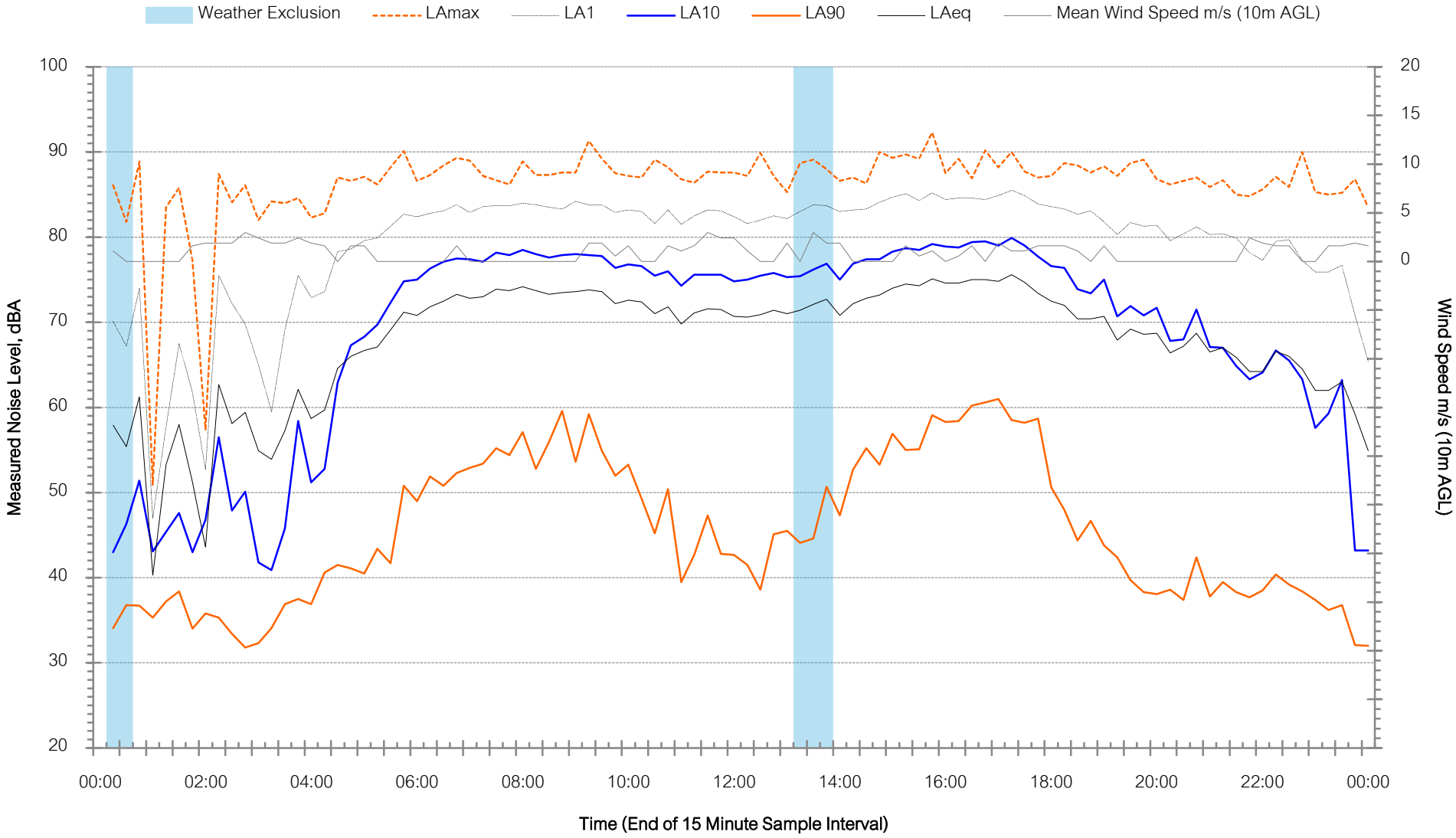
Background Noise Levels

Menangle Road - Tuesday 7 May 2024



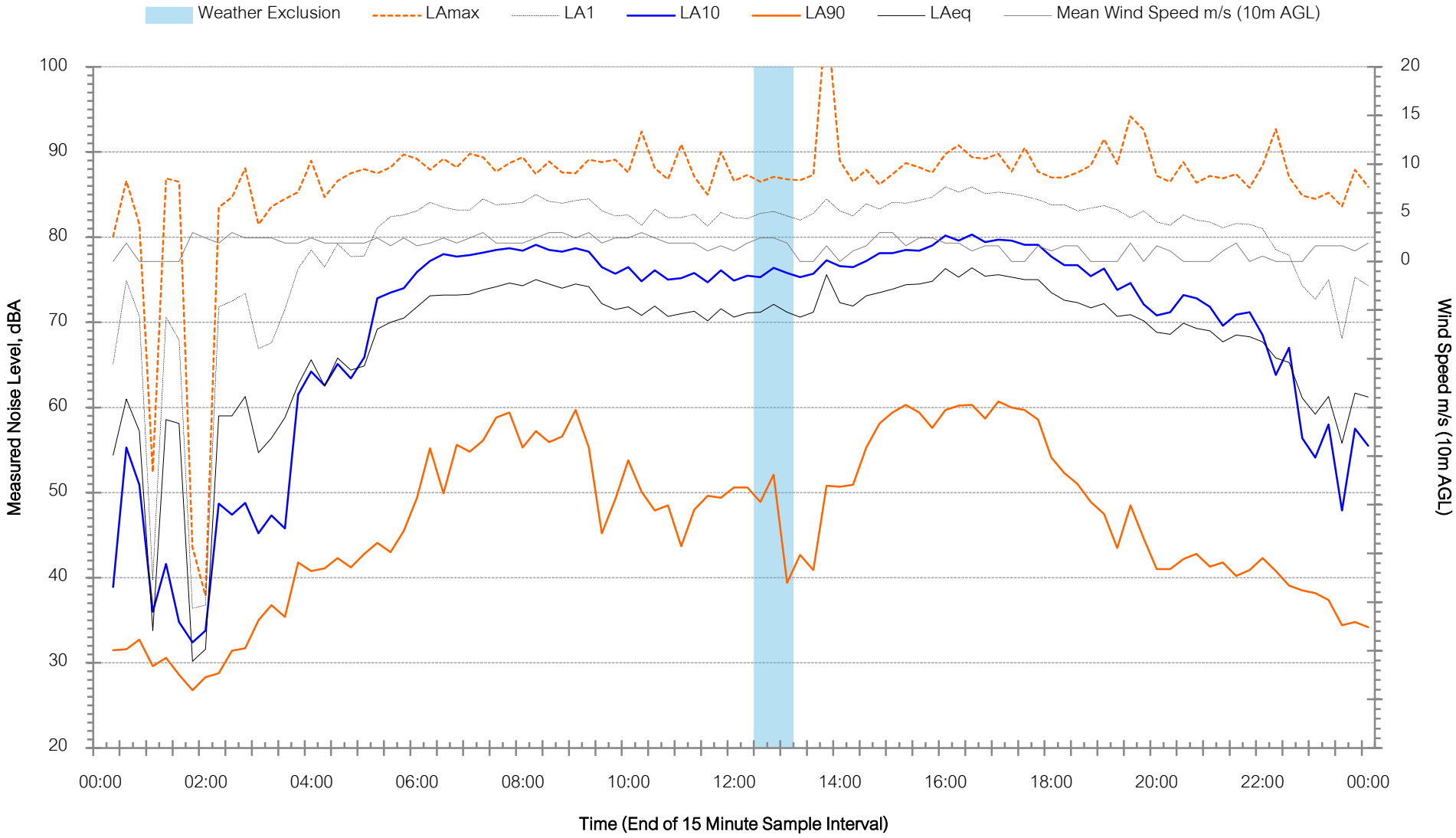
Background Noise Levels

Menangle Road - Wednesday 8 May 2024



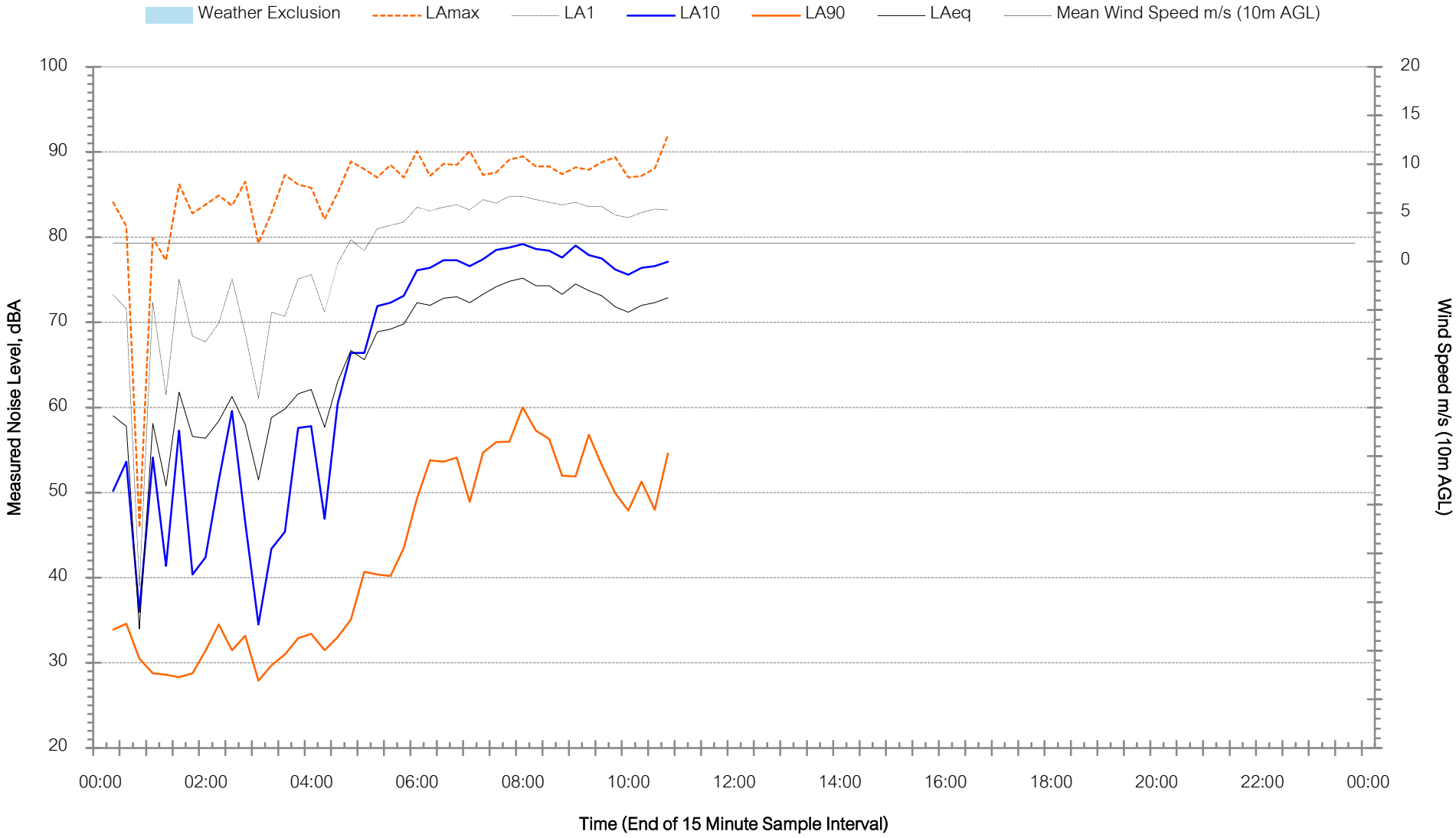
Background Noise Levels

Menangle Road - Thursday 9 May 2024



Background Noise Levels

Menangle Road - Friday 10 May 2024



Appendix B: Detailed construction noise predictions

Table C-1 Detailed construction noise levels

Receiver ID	Address	Receiver type	NCA	Initial works	Compound establishment	Corridor clearing	Bulk earthworks	Drainage works	Paving / asphalt	Resurfacing works	Road furniture
R1	775 Moreton Park Rd	Residential	NCA 1	47	50	50	53	46	50	50	43
R2a	565 Moreton Park Rd	Residential	NCA 1	42	48	52	53	46	51	50	41
R2b	565 Moreton Park Rd	Residential	NCA 1	38	41	47	48	41	46	45	37
R3a	610 Moreton Park Rd	Residential	NCA 1	37	41	44	47	40	45	44	36
R3b	610 Moreton Park Rd	Residential	NCA 1	37	40	44	47	40	45	44	36
R4	480 Moreton Park Rd	Residential	NCA 1	29	29	44	46	41	46	45	35
R5	251 Menangle Rd	Residential	NCA 1	33	33	52	54	49	54	53	43
R6	235 Menangle Rd	Residential	NCA 1	28	28	41	43	38	43	42	33
R7a	310 Menangle Rd	Residential	NCA 2	28	29	38	40	35	39	38	30
R7b	310 Menangle Rd	Residential	NCA 2	29	30	39	41	36	40	39	31
R8	10 Finns Rd	Residential	NCA 2	30	30	35	37	32	36	35	28
R9	430 Menangle Rd	Residential	NCA 2	28	29	33	36	31	35	34	27
R10	436 Menangle Rd	Residential	NCA 2	28	29	33	36	30	35	34	26
R11	450 Menangle Rd	Residential	NCA 2	28	29	33	36	30	35	34	27
R12	470 Menangle Rd	Residential	NCA 2	28	27	31	34	29	33	32	25
R13	475 Menangle Rd	Residential	NCA 2	31	31	35	37	31	35	35	28
R14	485 Menangle Rd	Residential	NCA 2	31	30	34	37	31	35	34	28
R15	505 Menangle Rd	Residential	NCA 2	28	29	34	36	30	34	33	27
R16	575 Menangle Rd	Residential	NCA 2	24	25	31	33	28	31	31	25
R17	290 Moreton Park Rd	Residential	NCA 2	3	5	11	13	8	12	12	6
R18	346 Moreton Park Rd	Residential	NCA 2	21	22	30	31	28	30	30	27
R19	310 Moreton Park Rd	Residential	NCA 2	21	22	29	31	27	30	29	26

R20	295 Moreton Park Rd	Residential	NCA 2	22	23	33	34	31	33	32	30
R21	320 Moreton Park Rd	Residential	NCA 2	22	23	30	32	28	31	30	27
R22	336 Moreton Park Rd	Residential	NCA 2	22	23	31	33	30	32	31	29
R23	330 Moreton Park Rd	Residential	NCA 2	23	24	33	34	31	33	33	31
R24	345 Moreton Park Rd	Residential	NCA 2	23	25	34	35	33	34	34	33
R25	348 Moreton Park Rd	Residential	NCA 2	24	25	35	35	33	35	34	33
R26	380 Moreton Park Rd	Residential	NCA 2	23	24	31	33	29	31	31	27
R27	380A Moreton Park Rd	Residential	NCA 2	24	26	33	34	30	33	32	28
R28	350 Moreton Park Rd	Residential	NCA 2	24	26	37	38	36	37	37	36
R29	375 Moreton Park Rd	Residential	NCA 2	25	26	39	39	39	39	39	38
R30	385 Moreton Park Rd	Residential	NCA 2	26	27	45	45	45	45	45	44
R31	480 Moreton Park Rd	Residential	NCA 2	26	28	42	43	42	42	42	42
R32	480 Moreton Park Rd	Residential	NCA 2	28	31	37	38	33	36	36	30
Wor1	710 Moreton Park Rd	Place of worship	NCA 2	27	27	40	42	37	42	41	31
In1	345 Menangle Rd	Industrial	NCA 2	31	32	40	42	37	41	40	32

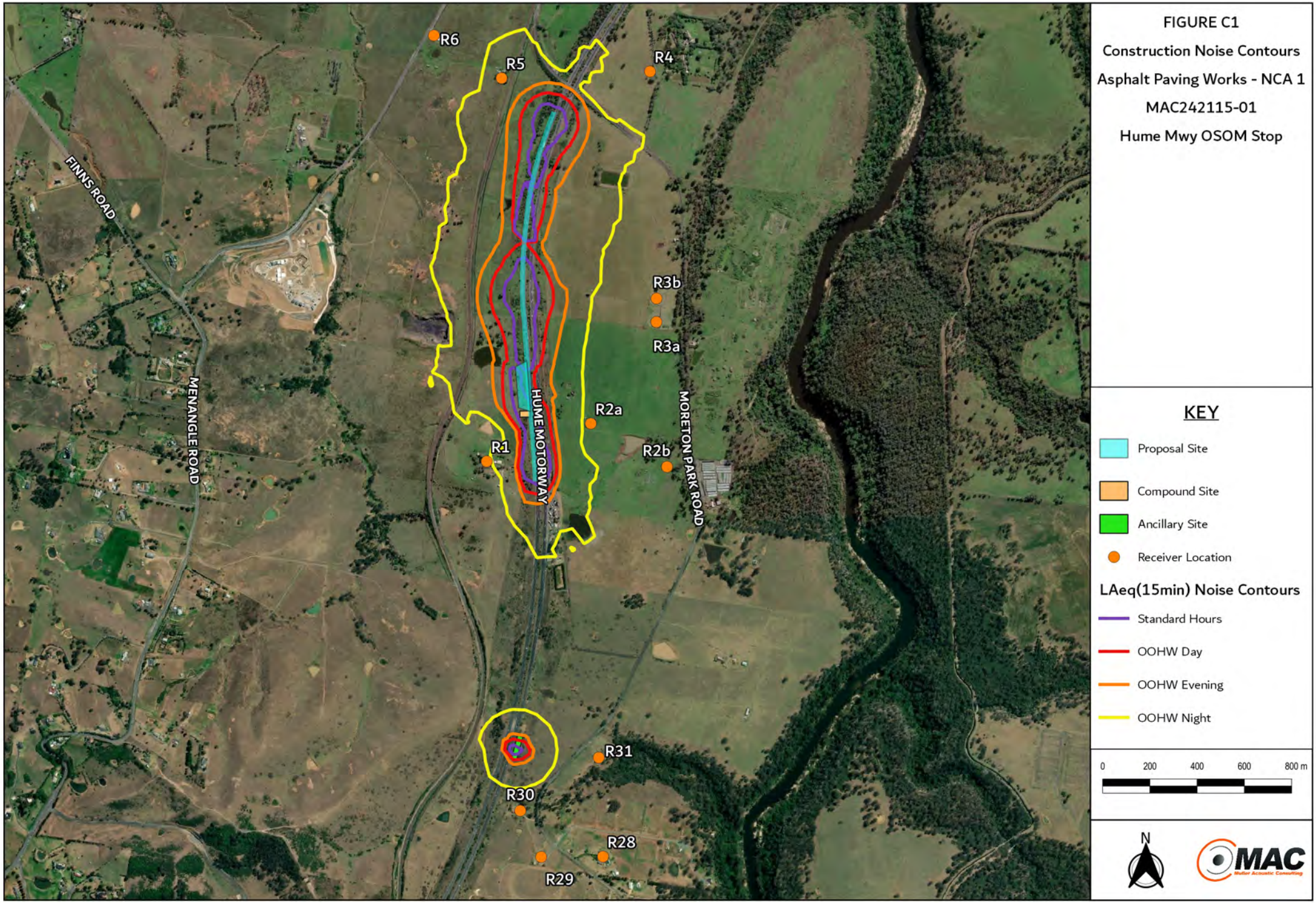


FIGURE C1

Construction Noise Contours

Asphalt Paving Works - NCA 1

MAC242115-01

Hume Mwy OSOM Stop

KEY

- Proposal Site
- Compound Site
- Ancillary Site
- Receiver Location

LAeq(15min) Noise Contours

- Standard Hours
- OOHW Day
- OOHW Evening
- OOHW Night

0 200 400 600 800 m

N

MAC
Muller Acoustic Consulting

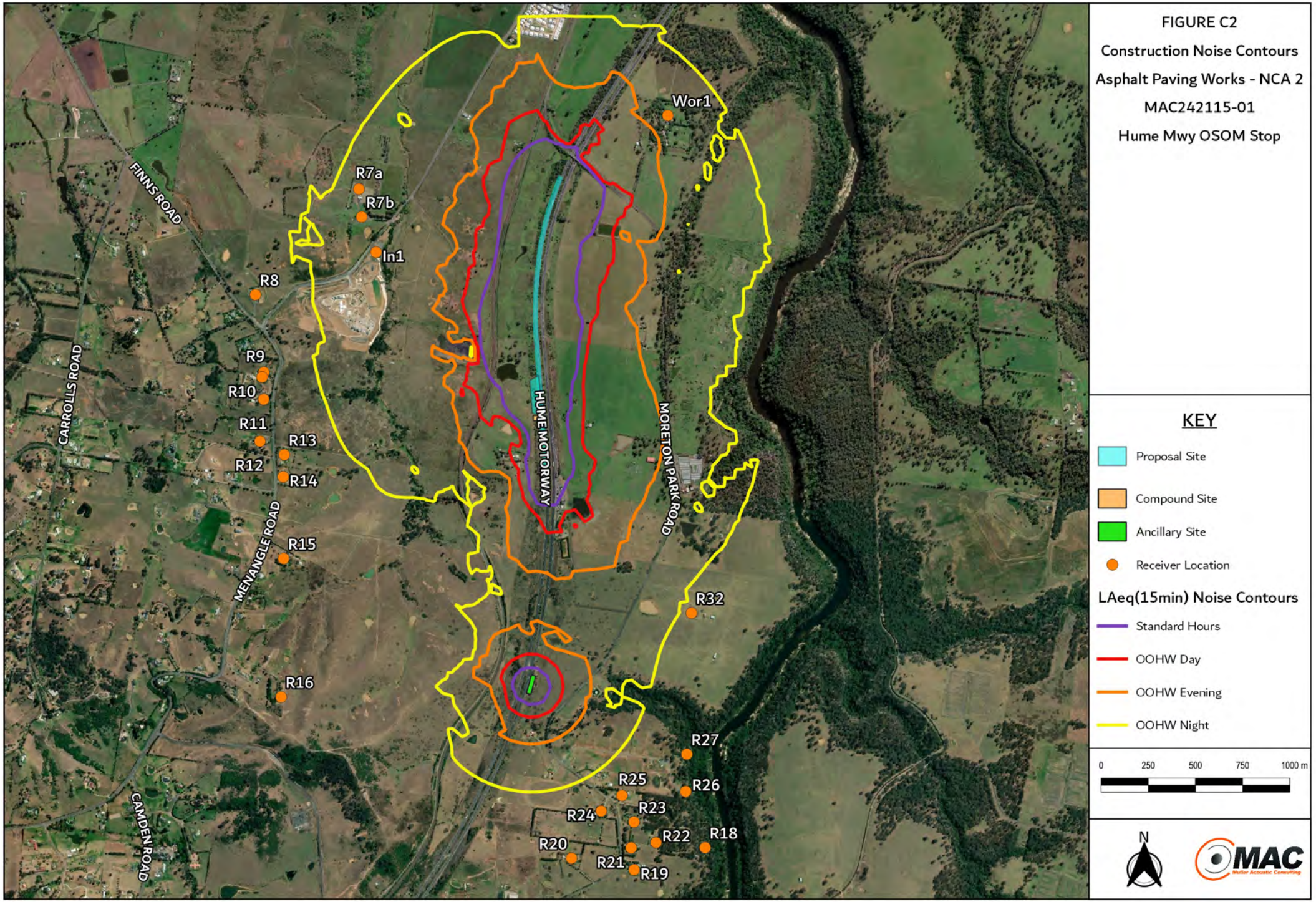


FIGURE C2
Construction Noise Contours
Asphalt Paving Works - NCA 2
MAC242115-01
Hume Mwy OSOM Stop
KEY
Proposal Site
Compound Site
Ancillary Site
Receiver Location
LAeq(15min) Noise Contours
Standard Hours
OOHW Day
OOHW Evening
OOHW Night
0
250
500
750
1000 m
N
MAC
Wor1
R7a
R7b
In1
R8
R9
R10
R11
R13
R12
R14
R15
R16
R32
R27
R25
R26
R24
R23
R22
R18
R20
R21
R19
FINNS ROAD
CARROLLS ROAD
MENANGLE ROAD
CAMDEN ROAD
HUME MOTORWAY
MORETON PARK ROAD

Appendix C: Additional mitigation measures

Additional Mitigation Measures as outlined in Appendix C of the CNVG-RM are summarised below. Many of these measures require communication with the community.

Notifications (letterbox drop or equivalent) (N)

Advance warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of 5 working days prior to the start of works. The Approval Conditions for projects may also specify requirements for notification to the community about works that may impact on them.

Specific notifications (SN)

Specific notifications are letterbox dropped or hand distributed to identified stakeholders no later than seven days ahead of construction activities that are likely to exceed the noise objectives. The exact conditions under which specific notifications would proceed are defined in the relevant Additional Mitigation Measures (Tables C1 to C3). This form of communication is used to support periodic notifications, or to advertise unscheduled work.

Phone calls (PC)

Phone calls detailing relevant information would be made to identified/affected stakeholders within seven days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs etc.

Individual briefings (IB)

Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Communications representatives from the contractor would visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the proposal.

Respite Offer (RO)

Respite Offers should be made where there are high noise and vibration generating activities near receivers. As a guide work should be carried out in continuous blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite should be flexible to accommodate the usage of and amenity at nearby receivers.

The purpose of such an offer is to provide residents with respite from ongoing impact. This measure is evaluated on a project-by-project basis and may not be applicable to all projects.

Respite Period 1 (R1)

Out of hours construction noise in out of hours period 1 shall be limited to no more than three consecutive evenings per week except where there is a Duration Respite. Work during these periods should be separated by not less than one week and no more than six evening per month.

Respite Period 2 (R2)

Night time construction noise in out of hours period 2 shall be limited to two consecutive nights except for where there is a Duration Respite. For night work, these periods of work should be separated by not less than one week and six nights per month. Where possible, high noise generating works shall be completed before 11pm.

Duration Respite (DR)

Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the number of evenings or nights worked through Duration Respite so that the proposal can be completed more quickly.

The project team should engage with the community where noise levels are expected to exceed the NML to demonstrate support for Duration Respite.

Where there are few receivers above the NML each of these receivers should be visited to discuss the proposal to gain support for Duration Respite.

Alternative accommodation (AA)

Alternative accommodation options should be provided to residents living in close proximity to construction work that are likely to incur noise levels significantly above the applicable level (Tables C1-C3). The specifics of the offer will be determined on a proposal-by-proposal basis.

Verification

Appendix F of the CNVG-RM provides details about verification of Noise and Vibration levels following complaints and as part of routine checks of noise levels.

NSW GOVERNMENT

Appendix D: Statement Of Heritage Impact

View along the Hume Highway from Menangle towards Douglas Park in the 1980s (DMR, n.d.).

STATEMENT OF HERITAGE IMPACT

HUME HIGHWAY HEAVY VEHICLE STOP

MENANGLE

JUNE 2024

Report prepared by

OzArk Environment & Heritage

for Transport for NSW

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DOCUMENT CONTROLS

Proponent	Transport for NSW (TfNSW)
Client	bd infrastructure
Document Description	Statement of Heritage Impact: Hume Highway Heavy Vehicle Stop
File Location	OzArk Job No.
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Document Status: V3.0 Final	Date: 27 June 2024
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Draft V2: OzArk and client edits	V2.0 BC prepares for client release. 15/4/24 V2.1 client comments 15/6/24
Final V3: Final document	V3.0 final 27/6/24
Prepared for	Prepared by
Jaime Bohm Associate – Project Management Bd infrastructure	Harrison Rochford Archaeologist OzArk Environment & Heritage

Acknowledgement

OzArk acknowledge the traditional custodians of the area over which this assessment has been completed and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by the bd infrastructure on behalf of Transport for NSW (TfNSW, the proponent) to complete a Statement of Heritage Impact (SOHI) in relation to the proposed construction of a heavy vehicle rest stop on the Hume Highway near Menangle (the proposal).

The heritage item relevant to the study area is the Menangle Landscape Conservation Area, one of the heritage conservation areas listed on the Wollondilly Local Environmental Plan 2011. The study area overlaps with the Menangle Landscape Conservation Area in the north where the Moreton Park Road overpass crosses the Hume Highway. Approximately 500 metres (m) of the proposed slip lane at the north of the study area will be within the Menangle Landscape Conservation Area.

The proposal will result in a minor change to the layout of the Hume Highway at a location that will be visible in the 'southern' view corridor to and from the Menangle Landscape Conservation Area. However, the alterations to the Hume Highway, an existing intrusive element to the 'southern' view corridor, will have an inconsequential additional impact on the view corridor and its heritage values.

The assessment has concluded that the proposal will have an inconsequential impact on the heritage values of the Menangle Landscape Conservation Area. The following recommendations concerning the proposal are made:

1. The vegetation along the northern 500 m section of the study area currently softens the visual impact of the Hume Highway on the 'southern' view corridor to and from the Menangle Landscape Conservation Area. Should this vegetation be cleared for the proposal, then it should be appropriately replaced according to TfNSW (2023) guidelines and/or recommendations provided by the specialist biodiversity report(s) for the proposal.
2. Although the risk of the proposal affecting archaeological deposits at the study area has been assessed as low, the TfNSW unexpected finds procedure should be followed if potential significant heritage items are encountered during construction.

CONTENTS

FIGURES

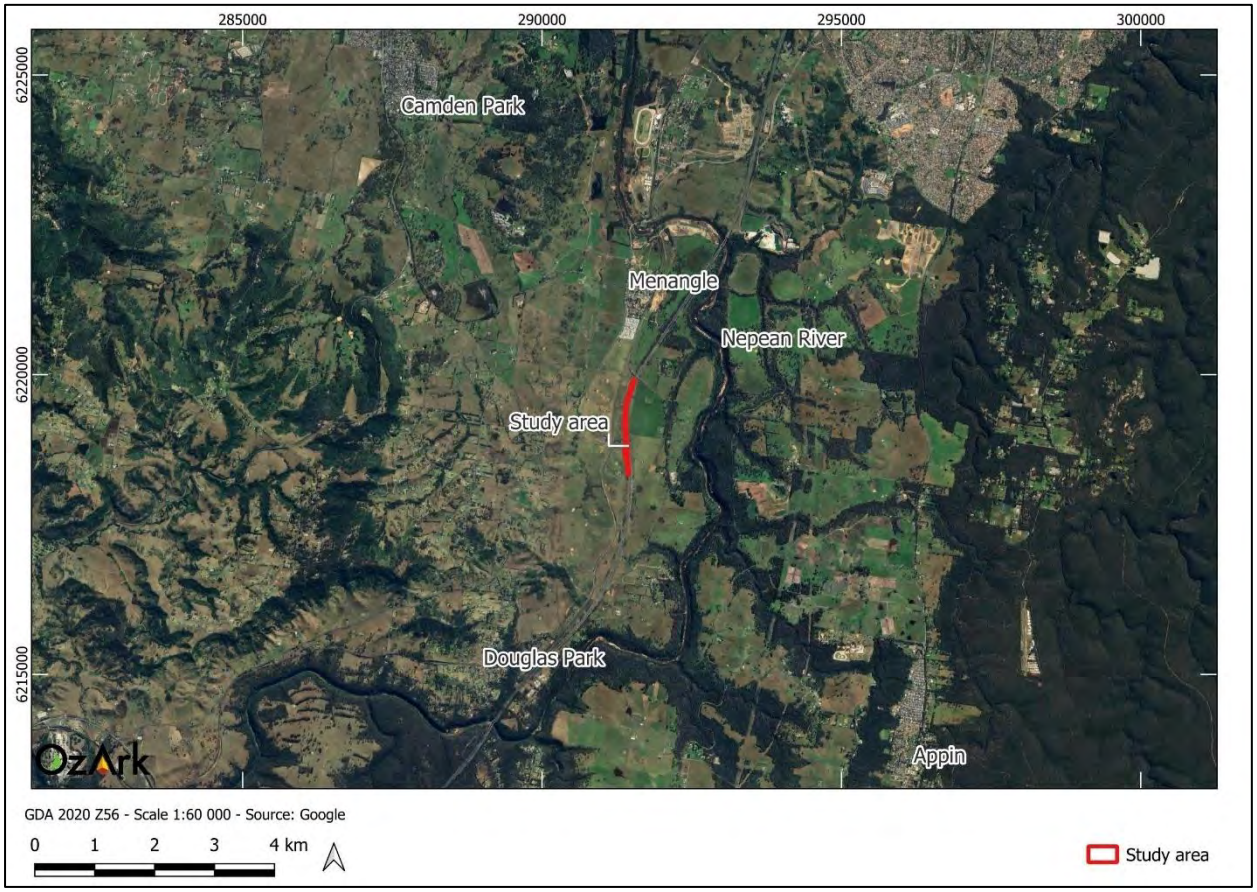
TABLES

1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by the bd infrastructure on behalf of Transport for NSW (TfNSW, the proponent) to complete a Statement of Heritage Impact (SOHI) in relation to the proposed construction of a heavy vehicle rest stop on the Hume Highway near Menangle (the proposal). The proposal is in the Wollondilly Local Government Area (LGA) (**Figure 1-1**).

Figure 1-1. Map showing the location of the proposal.



1.2 ASSESSMENT APPROACH

The SOHI will apply the *Guidelines for preparing a statement of heritage impact* (DPE 2023a). The SOHI also references the Heritage Council's *Historical Archaeology Code of Practice* (Heritage Council 2006), the International Council on Monuments and Sites' *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Burra Charter 2013), and the *Guidelines for assessing places and objects against the Heritage Council of NSW criteria* (DPE 2023b).

This assessment has been prepared at the desktop level and an inspection of the study area has not been completed.

1.3 STUDY AREA

The study area for the proposal is the extent of work for the proposal, which includes approximately 1.6 kilometres (km) of the western (northbound) road reserve of the Hume Highway between the Partridge VC Rest Area and Moreton Park Road overpass. The study area is shown on **Figure 1-2** and the design of the proposed work is shown on **Figure 1-3**.

The study area is situated on gentle to moderate slopes that have been substantially modified by the construction of the Hume Highway. There are no pre-existing structures within the study area that are not associated with the highway. Vegetation within the study area consists of regrowth and planted trees.

1.4 THE HERITAGE ITEM

The heritage item relevant to the study area is the Menangle Landscape Conservation Area, one of the heritage conservation areas listed on the Wollondilly Local Environmental Plan (LEP) 2011. An excerpt of the Wollondilly LEP 2011 heritage mapping is shown on **Figure 1-4**.

The Menangle Landscape Conservation Area was established in September 2013 and was instituted to conserve the natural and cultural heritage values of the land surrounding the Menangle village, which is encompassed by the separate Menangle Conservation Area. The draft Wollondilly Heritage Planning Proposal currently on public exhibition recommends the Menangle Landscape Conservation Area be updated on the LEP to specify that it holds local heritage significance.

The Menangle Landscape Conservation Area includes the visual catchment to and from the village of Menangle, which has been assessed as holding local heritage significance under all of the criteria established under the *Heritage Act 1977* (Betteridge 2012: 136–7). The heritage significance of the Menangle Landscape Conservation Area is outlined in **Section 3.4**. The Menangle Landscape Conservation Area includes the built landscape of the Menangle village, its rural setting, and infrastructure of heritage significance. The Menangle Landscape Conservation Area includes parts of the State Heritage Register (SHR) listed Camden Park Estate (SHR ID 01697) and two railway heritage items of state heritage significance (Menangle Rail Bridge [SHR ID 01047] and Menangle Railway Station group [SHR ID 01191]).

The study area overlaps with the Menangle Landscape Conservation Area in the north where the Moreton Park Road overpass crosses the Hume Highway. Approximately 500 metres (m) of the proposed slip lane at the north of the study area will be within the Menangle Landscape Conservation Area.

Figure 1-2: Aerial showing the study area.

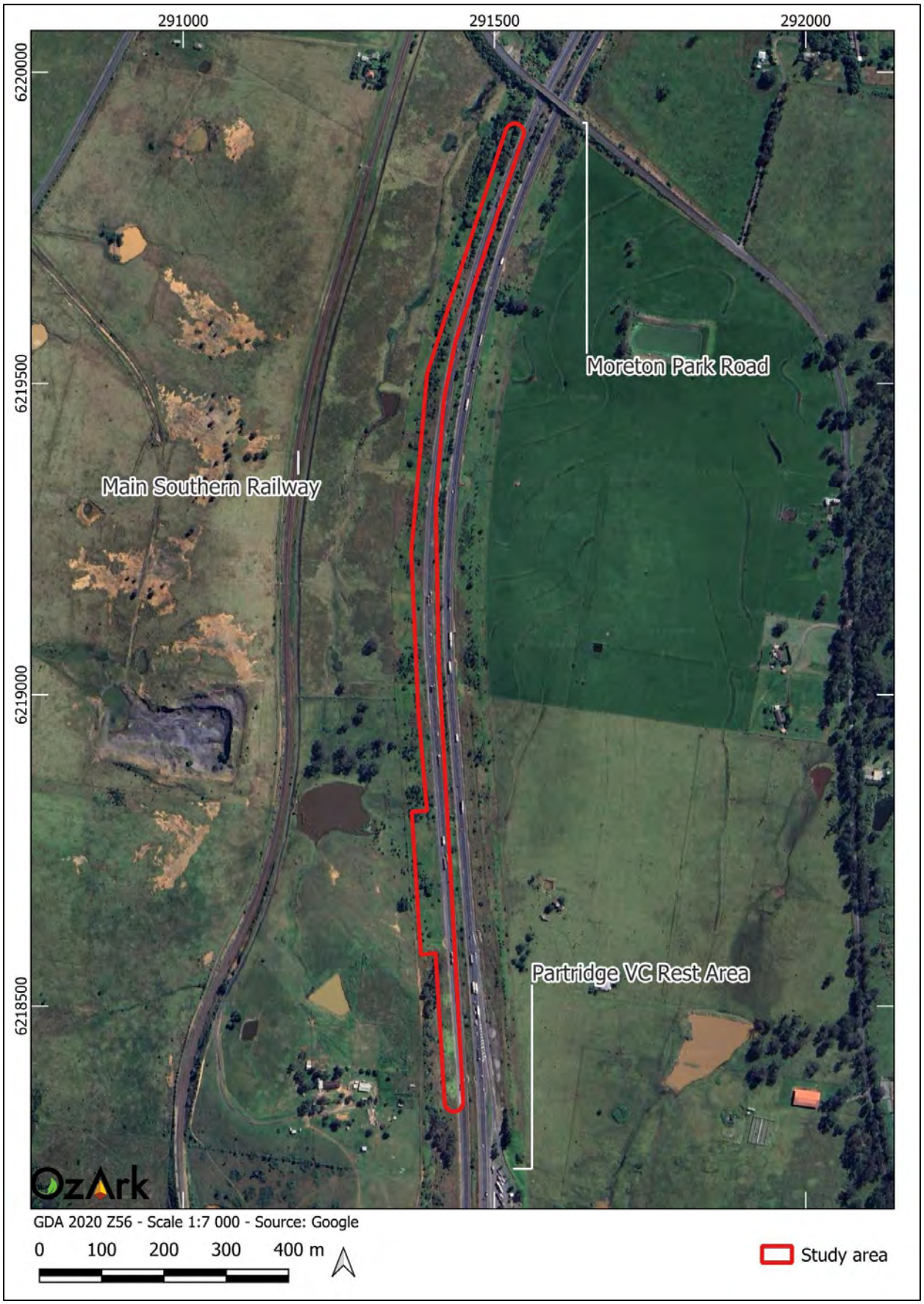
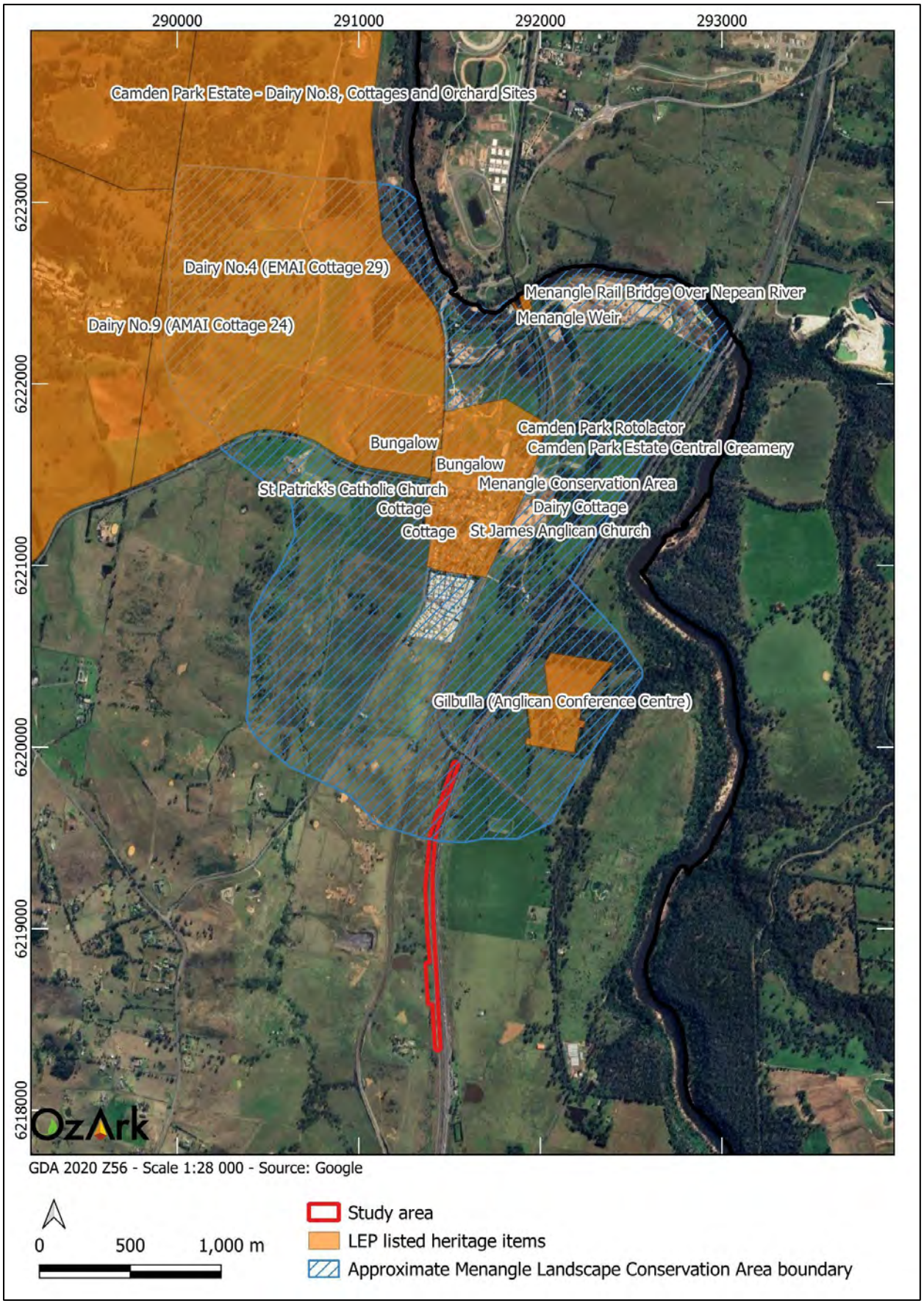


Figure 1-3: Approximate curtilage of the Menangle Landscape Conservation Area.



2 LEGISLATIVE REQUIREMENTS

2.1 APPLICABLE LEGISLATION

2.1.1 *Heritage Act 1977*

The Heritage Act is applicable to the current assessment. This Act established the Heritage Council of NSW (the Heritage Council). The Heritage Council's role is to advise the government on the protection of heritage assets, make listing recommendations to the Minister in relation to the SHR, and assess/approve/decline proposals involving modification to heritage items or places listed on the SHR. Most proposals involving modification are assessed under Section 60 of the Heritage Act.

Automatic protection is afforded to 'items' of state or local significance, where items mean a place, building, work, relic, moveable object, or precinct. 'Relics' are defined as 'any deposit or material evidence relating to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and which holds state or local significance' (note: formerly the Act protected any 'relic' that was more than 50 years old. Now the age determination has been dropped from the Act and relics are protected according to their heritage significance assessment rather than purely on their age). Excavation of land on which it is known or where there is reasonable cause to suspect that 'items' will be exposed, moved, destroyed, discovered, or damaged is prohibited unless approved under an excavation permit.

There are no items on the SHR within the study area.

2.1.2 Wollondilly Local Environmental Plan 2011

The Menangle Landscape Conservation Area is listed as item C6 on Schedule 5 (Environmental Heritage: Heritage Conservation Areas) of the Wollondilly LEP 2011.

The heritage conservation objectives of the Wollondilly LEP 2011 are as follows:

> *(a) to conserve the environmental heritage of Wollondilly,*
>
> *(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
>
> *(c) to conserve archaeological sites,*
>
> *(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.*

2.1.3 *State Environmental Planning Policy (Transport and Infrastructure) 2021*

The *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) notes that works to a locally listed heritage item or works occurring in a heritage conservation area that will create more than a minimal impact must have the impact

assessed and written notice provided to the relevant council. Development cannot be carried out without consent if it requires the demolition of structures or buildings that are state or local heritage items.

Specifically, the requirement to notifying council 21 days prior to the commencement of works is set out in Section 2.11 of the Transport and Infrastructure SEPP:

> *Section 2.11: Consultation with councils—development with impacts on local heritage*
>
> *(1) This section applies to development carried out by or on behalf of a public authority if the development—*
>
> *(a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a state heritage item, in a way that is more than minor or inconsequential*
>
> *(b) is development that this Chapter provides may be carried out without consent.*
>
> *(2) A public authority, or a person acting on behalf of a public authority, must not carry out development to which this section applies unless the authority or the person has—*
>
> *(a) had an assessment of the impact prepared*
>
> *(b) given written notice of the intention to carry out the development, with a copy of the assessment and a scope of works, to the council for the area in which the heritage item or heritage conservation area (or the relevant part of such an area) is located*
>
> *(c) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.*

3 SIGNIFICANCE ASSESSMENT: MENANGLE LANDSCAPE CONSERVATION AREA

3.1 HISTORICAL BACKGROUND

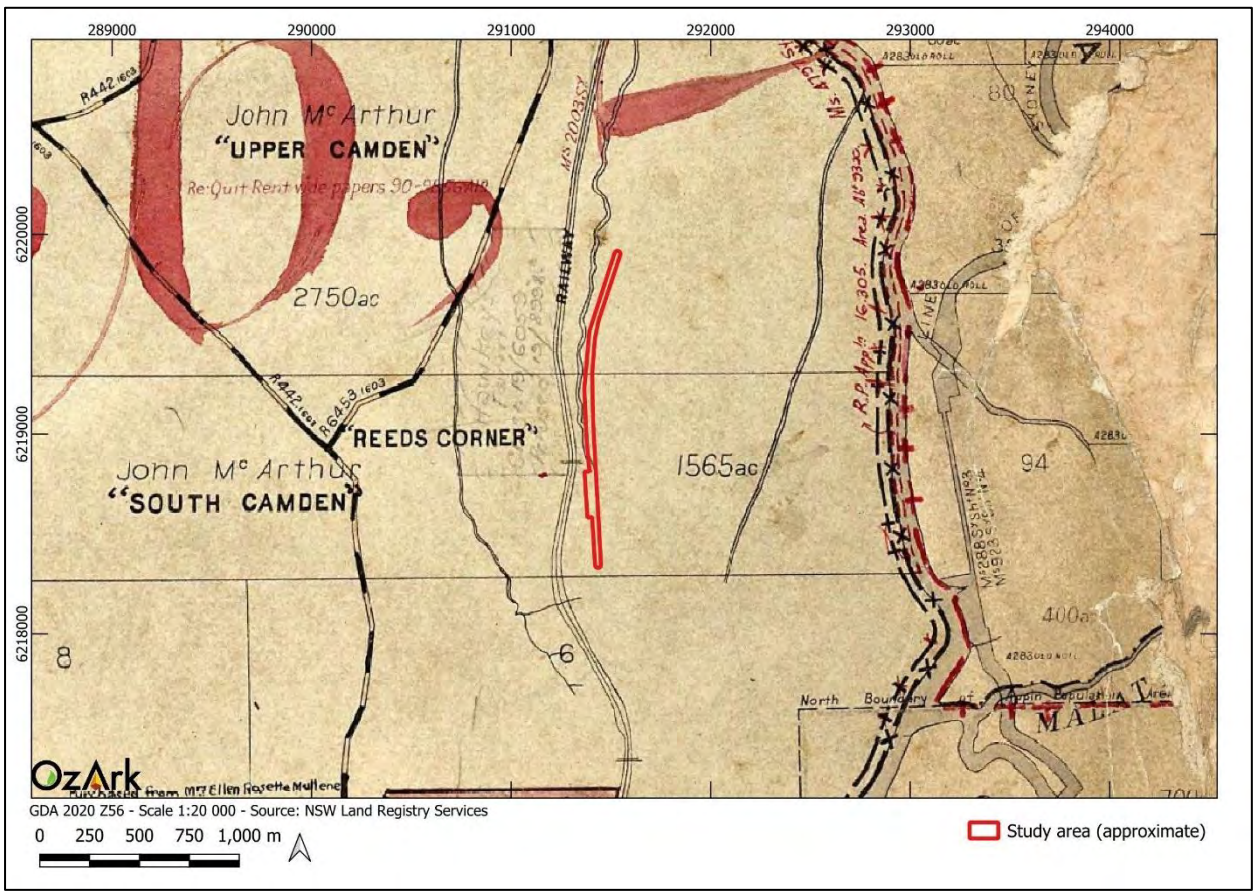
A comprehensive history of Menangle and its rural surrounds was compiled for the listing of the Menangle Landscape Conservation Area (Betteridge 2012). This section provides an overview relevant to the study area, focusing on the Hume Highway.

The study area appears to have been a part of John Macarthur's land holdings surrounding Camden Park, crossing both the *Upper Camden* and *South Camden* parcels on an 1887 Parish map (**Figure 3-1**).

The current alignment of the Hume Highway at Menangle was constructed in 1980 (RMS 2018: 29). One of the early 19th century routes south from Sydney was proposed to follow the approximate alignment of the current Menangle Road southwest towards Picton (850 m to the west of the study area). However, the Macarthur family (owners of Camden Park Estate) refused to allow the transit route to cross their property, leading to the use of multiple routes across the Razorback Range, 3.5 km further to the west.

In the 1970s, the road alignment was shifted east to its current alignment to avoid the Razorback Range.

Figure 3-1: Parish of Camden map 1887.



3.2 STATEMENT OF SIGNIFICANCE

The final excerpt of the draft statement of significance for the Menangle Landscape Conservation Area is presented below (Betteridge 2012: 139–140).

> *The area possesses a rare mix of natural, indigenous and non-indigenous cultural heritage values arising from the local topography, geology, soils, streams and vegetation and the ways in which those environmental attributes influenced the occupation of the land by Aboriginal people, the construction of the Menangle Road and the Main Southern Railway Line, early European settlement and agriculture, decline following development of alternative land uses and transport routes and, more recently, residential subdivisions and rural lifestyle developments. A limited comparative analysis with other similar rural estates in NSW and elsewhere in Australia supports this assessment of rarity.*
>
> *Menangle is representative of villages established along English country estate lines to provide accommodation and services for rural estate workers and a focus for particular agricultural enterprises, in Menangle's case, the estate's dairying operations.*

3.3 ASSESSMENT OF SIGNIFICANCE—GENERAL PRINCIPLES

The heritage significance of the Menangle Landscape Conservation Area has been completed in Betteridge (2012). The assessment of significance is reproduced in **Table 3-1** but the general principles are described below (see also *Assessing heritage significance Guidelines for assessing places and objects against the Heritage Council of NSW criteria* [DPE 2023b]). A historic heritage site must satisfy at minimum one of the following criteria to be assessed as having heritage significance:

Criterion (a): *An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).*

Criterion (b): *An item has a strong or special association with the life or works of a person, or group of persons, of importance in NSW's cultural or natural history (or the cultural or natural history of the local area).*

Criterion (c): *An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area).*

Criterion (d): *An item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.*

Criterion (e): *An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area).*

Criterion (f): *An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area).*

Criterion (g): *An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places; or cultural or natural environments (or a class of the local area's cultural or natural places; or cultural or natural environments).*

Significance assessments are carried out on the basis that decisions about the future of heritage items must be informed by an understanding of these items' heritage values. The *Australia ICOMOS Burra Charter* (Burra Charter 2013) recognises four categories of heritage value: historic, aesthetic, scientific, and social significance.

Items are categorised as having local or state level, or no significance. The level of significance is assessed in accordance with the geographical extent of the item's value. An item of state significance is one that is important to the people of NSW whilst an item of local significance is one that is principally important to the people of a specific LGA.

3.4 ASSESSMENT OF SIGNIFICANCE—MENANGLE LANDSCAPE CONSERVATION AREA

Table 3-1 presents the assessment of heritage significance for the Menangle Landscape Conservation.

Table 3-1: Assessment of heritage significance – Menangle Landscape Conservation Area (Betteridge 2012: 137–9).

Criterion	Comments	Significance
a	*The Menangle cultural landscape is historically significant for its evidence of early 19th century rural settlement and for its location along Menangle Road and the Main Southern Railway Line, a major mid-19th century engineering work in the colony of NSW.* *The historical significance of the landscape derives from the fact that it was part of the Macarthur family's rural enterprise and the routes of major road and rail links south of Sydney. The cultural landscape is considered to be significant for the presence of these transport corridors and development directly associated with them, together with the conspicuous response of the patterns of settlement and agricultural land use to the strong influences of the topography, soils, flooding and the availability of water.*	Local
b	*Menangle Village and its landscape setting have strong associations with the surveying and construction of the main Southern railway Line, a major mid-19th century engineering work in NSW. Also strong associations with many individuals and families influential in the settlement and subsequent development of the area, particularly the extended Macarthur, Onslow and Stanham families and the many convicts, tenant farmers and others employed to develop and run the estate.*	Local
c	*Aesthetically significant are the visual contrasts of surrounding ridges and cultivated river flats. The placement of buildings generally above the flood prone lands reinforces the dual unity between the landscape and its powerful biophysical determinants. The landscape has aesthetic qualities derived from the mix of remnant natural features with active and relict agricultural landscapes that are evolving with new land uses such as residential development and aged care facilities.* *The* [Menangle Landscape Conservation Area] *includes a number of buildings of outstanding architectural quality, designed by prominent architects.*	Local
d	*While this criterion has not been tested quantitatively by this author, submissions by members of the Menangle community in response to development proposals in recent years suggest that they have very strong views about the significance of the place, for a variety of reasons, including its European historic heritage values and its cultural landscape values. It is considered highly likely that the community would feel a great sense of loss if these values were threatened, diminished or destroyed by unsympathetic development. The social significance is also attested by the fact that*	Local

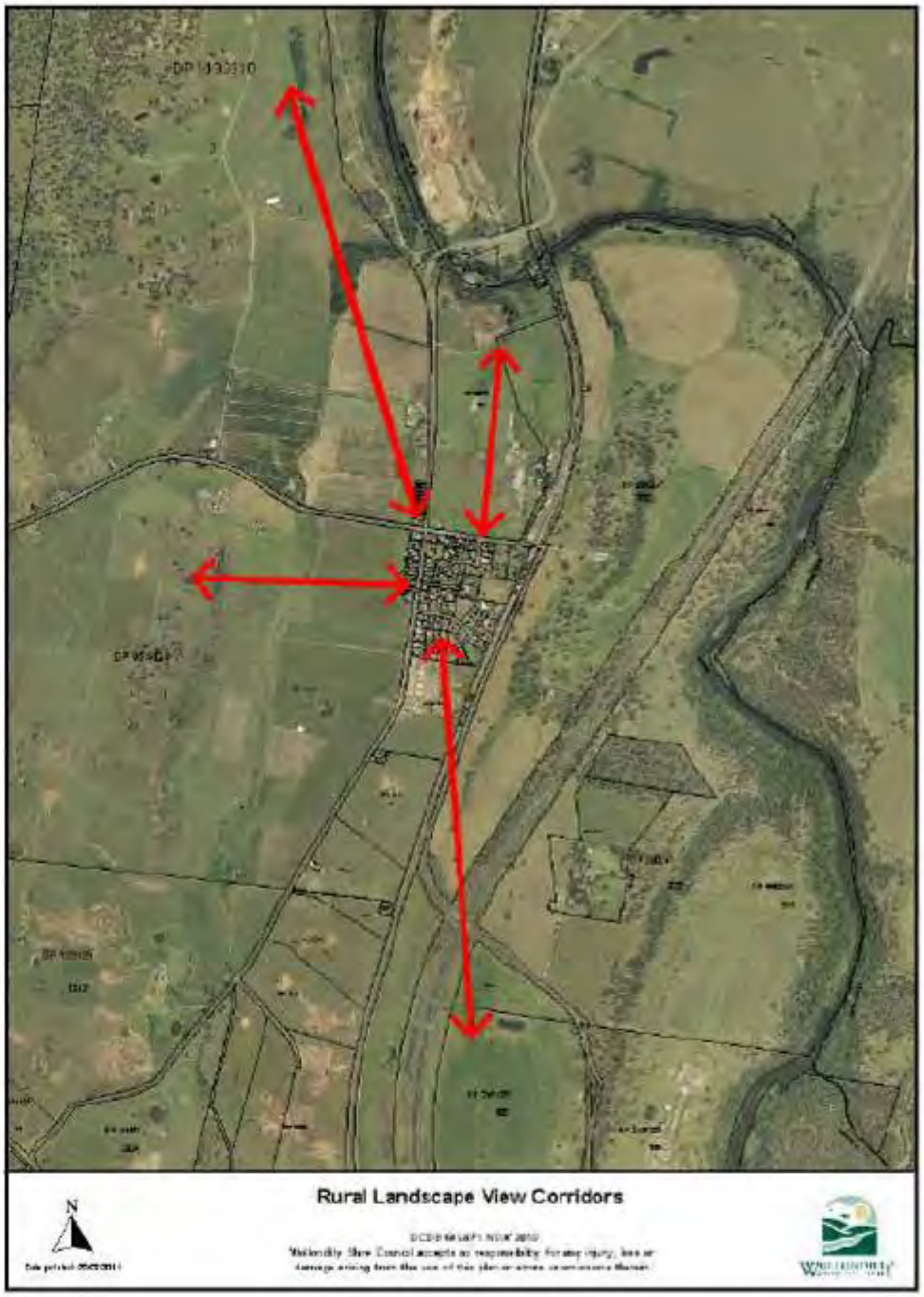
Criterion	Comments	Significance
	the area and / or heritage items within it have been recognised as significant by the local government authority and by the NSW Government.	
e	*Further research of the documentary evidence and existing heritage fabric of the* Menangle Landscape Conservation Area *is considered highly likely to yield more information on the European and Aboriginal cultural history and natural history of the place. Archaeological investigations could reveal information about the fabric and methods of construction of various structures including the road and rail bridges, the Railway Station, the former Menangle Creamery and the former Rotolactor, as well as cottages, dairies and other agricultural structures.*	Local
f	*The Menangle Landscape Conservation Area possess a rare mix of natural, indigenous and non-indigenous cultural heritage values arising from the local topography, geology, soils, streams and vegetation and the ways in which those environmental attributes influenced the occupation of the land by Aboriginal people, the construction of the Menangle Road and the Main Southern Railway Line, early European settlement and agriculture, decline following development of alternative land uses and transport routes and, more recently, rural lifestyle developments and residential subdivision.*	Local
g	*Menangle is representative of villages established along English country estate lines to provide accommodation and services for rural estate workers and a focus for particular agricultural enterprises, in Menangle's case, the estate's dairying operations.*	Local

3.5 DISCUSSION

Although the study area overlaps with a section of the Menangle Landscape Conservation Area, none of the items of heritage significance identified within the conservation area are present within the Hume Highway road corridor. The current alignment of the Hume Highway is a modern development and is not associated with the heritage values of the Old Hume Highway routes further to the west. Similarly, the transport infrastructure items of heritage significance within the Menangle Landscape Conservation Area (i.e. the Great Southern Railway, Menangle Railway Station group) are not associated with the Hume Highway. One of the significant view corridors identified to and from the village of Menangle crosses the study area at the Moreton Park Road overpass ('southern' view corridor on **Figure 3-2**). The section of the Hume Highway to the north of the study area is excluded from the Menangle Landscape Conservation Area (see **Figure 1-4**).

The study area was once part of the large pastoral holdings of the Macarthur family in the Camden and Menangle area. However, there are no remaining elements of the former pastoral landscape remaining within the study area and it does not contribute to the well-conserved heritage values of the Camden Park Estate and its associated heritage listings.

Figure 3-2: Rural landscape view corridors of heritage significance at the Menangle Landscape Conservation Area (Betteridge 2012: 28).



Arrows show the 4 most significant rural landscape view corridors.
From north, running clockwise, these are:
1. North: Railway, Rotolactor, Central Creamery with grazing and cropping land.
2. South: St James Hill to Gilbulla with grazing and cropping land.
3. West: Mt Taurus with grazing and cropping land.
4. North west: Menangle Pond and Barrigal lagoon with grazing and cropping land.

4 IMPACT ASSESSMENT

4.1 PROPOSED WORKS

The proponent is constructing a heavy vehicle rest stop including a deceleration lane and an acceleration lane to rejoin the northbound traffic. The vehicle parking area will be approximately 150 m in length and 29 m in width. The combined length of the deceleration and acceleration lanes will be approximately 1.6 km. It is assumed that the proposal will require bulk earthworks and excavation to establish these elements.

4.2 IMPACT ASSESSMENT

4.2.1 Fabric and spatial arrangements

There is no significant heritage fabric within the study area related to the Menangle Landscape Conservation Area. Signfiicant heritage fabric will not be affected.

4.2.2 Setting, views, and vistas

The 'southern' view corridor to and from Menangle village may be affected by the proposal (see **Figure 3-2**). The proposal will result in an additional slip lane, approximately 500 m of which will be within the Menangle Landscape Conservation Area. The rest stop itself will be approximately 700 m south of the boundary of Menangle Landscape Conservation Area and it will not be visible in the 'southern' view corridor identified on **Figure 3-2**.

4.2.3 Archaeology

There are no known archaeological deposits at the site. Previous pastoral land use suggests that it is unlikely that structures were formerly present and there is a low potential for archaeological items (if once present) to remain due to the complete disturbance of the study area during the construction of the Campbelltown to Yanderra section of the Hume Highway in the 1970s.

4.2.4 Interpretation

The elements of the proposal within the Menangle Landscape Conservation Area will not affect the interpretation of its heritage significance. Although the proposal will be visible from certain locations, its modifications to the visual aesthetics of the existing Hume Highway are minor. Interpretation of the streetscape of the Menangle village, and its setting in its surrounding pasture land, will not be harmed by the proposal.

4.3 CONSIDERATIONS FOR SPECIFIC WORKS – DEVELOPMENT WITHIN A HERITAGE CONSERVATION AREA

Will the proposed works affect the heritage significance of the adjacent heritage item or the heritage conservation area?

No. Although the proposal will involve road construction within the heritage conservation area, the additions to the existing Hume Highway are minor in scale and do not represent a significant change to the current landscape. The proposal will not harm any of the identified items that contribute to the heritage values of the Menangle Landscape Conservation Area.

Will the proposed works affect views to, and from, the heritage item? If yes, how will the impact be mitigated?

Yes, approximately 500 m of a slip lane will be visible in the 'southern' view corridor to and from the Menangle Landscape Conservation Area. The change to this view corridor is unlikely to discernible at the completion of the works and the major component of the proposal (the rest area itself) is situated at a location that will not affect the significant views associated with the Menangle Landscape Conservation Area.

The northern section of the study area is currently screened by vegetation on both the western road edge and along the median divider. The proposal is unlikely to remove a substantial amount of this screening vegetation. However, if clearing is required, replacement of this screening vegetation is appropriate mitigation to soften the inconsequential visual impact of the proposal. The TfNSW *Landscape design guideline* (TfNSW 2023) provides suitable advice regarding the re-instatement of appropriate vegetation. It is also understood that recommendations for specific Cumberland Plain species for revegetation have been provided for the MWREF.

Will the proposed works impact on the integrity or the streetscape of the heritage conservation area?

No, the integrity of the Menangle Landscape Conservation Area will not be compromised by the proposal. Harm to the 'southern' view corridor that is relevant to the study area has been assessed as inconsequential.

5 MANAGEMENT RECOMMENDATIONS

The proposal will result in a minor change to the layout of the Hume Highway at a location that will be visible in the 'southern' view corridor to and from the Menangle Landscape Conservation Area. However, the proposal will have an inconsequential additional impact on the view corridor and its heritage values given its association with the Hume Highway, an existing intrusive element to the view corridor.

The assessment has concluded that the proposal will have an inconsequential impact on the heritage values of an item with identified local heritage values, the Menangle Landscape Conservation Area. The following recommendations concerning the proposal are made:

1. The vegetation along the northern 500 m section of the study area currently softens the visual impact of the Hume Highway on the 'southern' view corridor to and from the Menangle Landscape Conservation Area. Should this vegetation be cleared for the proposal, then it should be appropriately replaced according to TfNSW (2023) guidelines and/or recommendations provided by the specialist biodiversity report(s) for the proposal.
2. Although the risk of the proposal affecting archaeological deposits at the study area has been assessed as low, the TfNSW unexpected finds procedure should be followed if potential significant heritage items are encountered during construction.

REFERENCES

Betteridge 2012 — Betteridge, C. 2012. *Menangle Landscape Conservation Area Assessment of Significance and Proposed Boundaries.* Report to Wollondilly Shire Council.

Burra Charter 2013 — International Council on Monuments and Sites 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*.

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DPE 2023a — Department of Planning and Environment. 2023. *Guidelines for preparing a statement of heritage impact.*

DPE 2023b — Department of Planning and Environment. 2023. *Assessing heritage significance. Guidelines for assessing places and objects against the Heritage Council of NSW criteria*.

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Appendix E: Biodiversity Assessment Report Memo

Jaime Bohm
Associate - Environment
BD Infrastructure

24th October 2024

Biodiversity Assessment Report Memo for the Hume Motorway Ultimate Truck Rest Area

Dear Jaime,

It is understood that Transport for NSW (Transport) propose to construct an oversize and/or overmass vehicle stop in the northbound carriageway of Hume Motorway (the Project). The Project replaces an existing informal heavy vehicle rest area, which is colloquially knows as the 'Dustbowl'. This Project is integral to the delivery of the adjacent Spring Farm Parkway Stage 1 project which is a new four lane divided carriageway to link the new Menangle Park development with the Hume Highway and Menangle Road. Spring Farm Parkway Stage 1 includes a northbound on-ramp to the Hume Motorway that extends past the existing 'Dustbowl' heavy vehicle rest area. The new truck rest area will improve the overall safety for both truck drivers using the facility and for general traffic on the Hume Highway as it will be a formalised facility with a deceleration lane, an acceleration lane, sign posting and appropriate pavement marking which are all absent from the current site.

The scope of this assessment was to identify and assess impacts to species and ecological communities listed as threatened under the *Biodiversity Conservation Act 2016* (NSW) (BC Act), *Fisheries Management Act 1994* (FM Act) and Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and where relevant, the requirements of the *Biosecurity Act 2015* (NSW), and relevant State Environmental Planning Policies (SEPPs). This report has been prepared to accompany a Minor Works Review of Environmental Factors (MWREF) prepared by bd Infrastructure.

The BC Act requires that the significance of the impact on threatened species, populations and threatened ecological communities is assessed using the test listed in Section 7.3 of the BC Act. Similarly, Part 7A of the FM Act requires that significance assessments are undertaken in accordance with Division 12 of the FM Act. Where a significant impact is likely to occur, a species impact statement (SIS) must be prepared in accordance with the Environment Agency Head's requirements, or a Biodiversity Development Assessment Report (BDAR) must be prepared by an accredited assessor in accordance with the Biodiversity Assessment Method (BAM) (DPIE, 2020a).

In September 2015, a 'strategic assessment' approval was granted by the Federal Minister in accordance with the EPBC Act. The approval applies to Transport road activities being assessed under Division 5.1 (formerly Part 5) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) with respect to potential impacts on nationally listed threatened species, ecological communities and migratory species.

As a result, Transport road proposals assessed via an REF:

- Must address and consider potential impacts on EPBC Act listed threatened species, populations, ecological communities and migratory species, including application of the "avoid, minimise, mitigate and offset" hierarchy
- Do not require referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for these matters, even if the activity is likely to have a significant impact

- Must use the BAM to calculate credits that would offset significant impacts on EPBC Act listed threatened species, populations, ecological communities and migratory species.

Assessments of impact significance are required for all relevant biodiversity values in accordance with the Matters of National Environmental Significance: Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999 (DoE, 2013).

The area that has been assessed as part of this Biodiversity Assessment Report (BAR) memo is referred to as the Subject Land (**Figure 1**) and has been defined using the detailed design (Transport, 2024). The Subject Land covers an area of approximately 4.04ha.

This BAR memo, including BC Act 5-Part Tests and EPBC Act Assessment of Significance, was prepared to evaluate the ecological values that occur within the Subject Land and identify how the proposed activity satisfies the relevant planning framework.

1. METHODS

A thorough literature review of local information relevant to the Subject Land was undertaken. Searches using NSW Wildlife Atlas (BioNet) (NSW DCCEEW, 2024b) and the Commonwealth Protected Matters Search Tool (PMST) (DCCEEW, 2024) were conducted to identify all current threatened flora and fauna, as well as migratory fauna records, within a 5km radius of the Subject Land.

1.1 Native Vegetation

A review of the State Vegetation Type Map (NSW DCCEEW, 2024b) was used to assist in the identification of Plant Community Types (PCTs) within and surrounding the Subject Land. The PCT of 'best-fit' was determined based on the floristic descriptions within the BioNet Vegetation Classification System database (NSW DCCEEW, 2023). ECE undertook vegetation mapping in April and September 2024. Vegetation mapping involved recording dominant species, particularly canopy species, at regular intervals and then assigning PCTs to like sections of vegetation. PCTs were further stratified into condition classes based on the diversity and cover of exotic species and assemblage of native species. This mapping was used as the basis of the vegetation mapping included in this BAR memo and to determine the location of BAM plots to be collected. One, 20m x 50m, BAM plot was undertaken in each vegetation zone (n = 2) as evidence for the condition of the vegetation within the Subject Land. The sampling plot locations were chosen as they were representative of the type and condition of vegetation that is proposed to be impacted for the Project.

1.2 Threatened Flora Survey Methods

Threatened flora that are known or likely to occur within the Subject Land and immediate surrounds (i.e. within 5km) were identified following review of BioNet and the PMST. Soil mapping (NSW DCCEEW, 2024a) and topography (Google Earth) were also used to provide further context on habitat constraints for threatened flora. Twelve threatened flora have been recorded (BioNet), with a further seven known or likely to occur (PMST), within 5km of the Subject Land.

The desktop assessment resulted in three species (out of the 19) having a moderate likelihood of occurrence based on nearby records and known habitat/ geographic constraints, and were the focus of the targeted surveys during the site assessment. Targeted surveys were undertaken by ecologists Jack Tatler and Jade Minto on the 9th April 2024 and Jade Minto and Ethan Dean on 11th September 2024, using parallel field traverses in accordance with the 'Surveying threatened plants and their habitats - NSW survey guide for the Biodiversity Assessment

Method' (DPIE, 2020b). For the remaining species, searches concentrated on habitat constraints and vegetation associations. All vegetated areas of the Subject Land were surveyed.

The three species targeted during the field survey, as well as their survey dates, are presented below in **Table 1**. It was noted that *Pterostylis saxicola* is deciduous and die back to fleshy, rounded underground tuberoids after flowering (October-December) and therefore, were unlikely to be detected during the targeted surveys.

Table 1. Threatened flora with a moderate or high likelihood of occurrence (based on the desktop assessment) within the Subject Land.

Candidate Fauna Species	Survey Period											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Pterostylis saxicola				✓					✓			
Pultenaea pedunculata				✓					✓			
Pimelea spicata				✓					✓			
Key	✓ = Surveyed						= DCCEEW endorsed survey period					

A habitat suitability assessment for potentially occurring threatened flora is presented in **Appendix A** and was assessed based on recent and proximal records, as well as habitat constraints recorded during the site assessments.

1.3 Threatened Fauna Survey Methods

No targeted surveys for fauna were undertaken. However, a field survey was undertaken by ecologists Jack Tatler and Jade Minto on the 9th April 2024 and Jade Minto and Ethan Dean on 11th September 2024, to identify any habitat constraints (e.g. waterbodies, rocky areas, tree hollows), including microhabitat, present within the Subject Land and immediate surrounds. Potential habitat constraints within the broader area (500m buffer) were assessed using Google Earth, soil landscape mapping (NSW DCCEEW, 2024a) and recent vegetation mapping (NSW DCCEEW, 2024b).

Threatened fauna that are known or likely to occur within the Subject Land and immediate surrounds (i.e. within 5km) were identified following review of BioNet and the PMST. A habitat suitability assessment for potentially occurring threatened fauna is presented in **Appendix A** and was assessed based on recent and proximal records, as well as habitat constraints recorded during the site assessments.

1.4 Aquatic Surveys

The only aquatic habitat recorded during the site assessment were two small ephemeral pools in a stormwater channel that do not provide habitat for aquatic species.

Figure 1. The Subject Land and mapped watercourses.

2. EXISTING ENVIRONMENT

2.1 Location

The Subject Land is located in the Cumberland Interim Biogeographic Regionalisation for Australia (IBRA) Subregion, within the Sydney Basin IBRA Bioregion. The Subject Land is situated within the Wollondilly Local Government Area (LGA) and is approximately 7km east of the Dharawal National Park.

2.2 Rivers, streams, estuaries and wetlands

Two mapped watercourses bifurcate the Subject Land, draining east to west (**Figure 1**), with the southern most holding a small pool of water at the time of the site assessment (**Figure 3**). A second stormwater channel (unmapped watercourse) was observed holding a small pool of water at the time of the site assessment (**Figure 3**). Several dams occur west of the Subject Land. The Nepean River lies approximately 1.1km east of the Subject Land.

2.3 Habitat Connectivity

The surrounding areas consist of agricultural land and support little, if any, habitat connectivity with the Subject Land.

2.4 Karst, Caves, Crevices, Cliffs, Rocks or Other of Geological Features of Significance

The Subject Land did not contain any areas of geological significance (karsts, caves, cliffs and crevices). The Subject Land, or surrounding area, was not mapped as occurring on acid sulfate soils nor mapped as having risk/ probability of exhibiting occurrence of acid sulfate soils.

2.5 Areas of Outstanding Biodiversity Value

No Areas of Outstanding Biodiversity Value occur on the Subject Land or surrounding area.

2.6 Topography, Geology and Soils

The Subject Land occurs on a gentle slope, starting at approximately 145m above sea level (asl) in the south and dropping to approximately 110m asl in the north. The southern half of the Subject Land is mapped as occurring on the Blacktown soil landscape, which is characterised by gently undulating rises on Wianamatta Group shale. The northern half is mapped as occurring on the Theresa Park soil landscape, which is characterised by Quaternary alluvium—quartz and lithic 'fluvial' sand, silt and clay.

2.7 Mapped Native Vegetation Communities – NSW State Vegetation Type Map

The NSW State Vegetation Type Map (NSW DCCEEW, 2024b) indicated the presence of two Plant Community Types (PCT) within, or adjoining, the Subject Land (**Figure 2**):

- PCT 3319: Cumberland Shale Hills Woodland, and
- PCT 3320: Cumberland Shale Plains Woodland.

Part of the Subject Land has also been mapped as 'Not classified'.

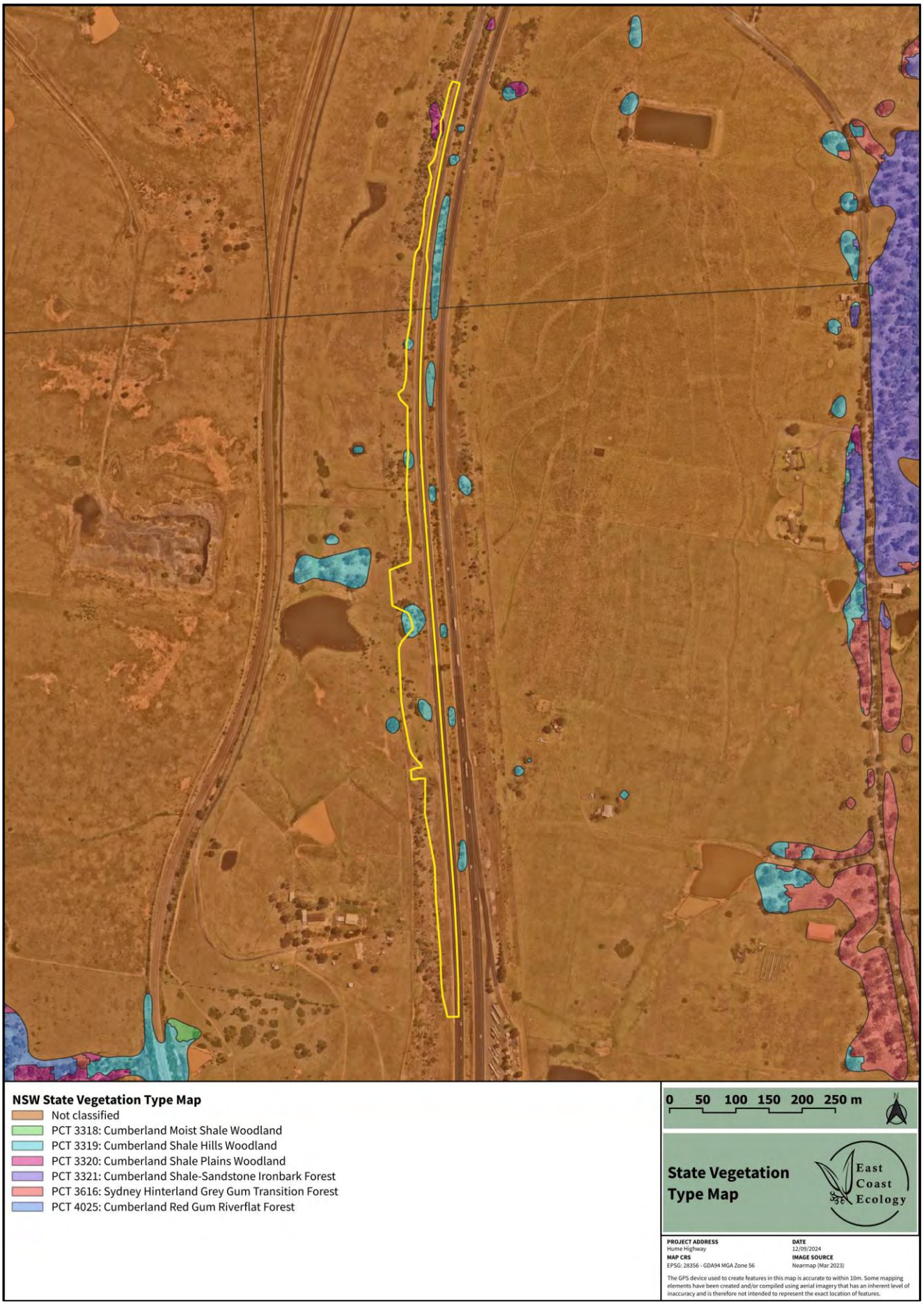

Figure 2. NSW State Vegetation Type Map (recent vegetation mapping).

3. RESULTS: FIELD-VALIDATED NATIVE VEGETATION

The entire Subject Land was infested with environmental and priority weeds. Dominant weed species included *Chloris gayana, Eragrostis curvula, Cenchrus clandestinus, Olea europaea* subsp. *cuspidata, Cirsium vulgare* and *Ligustrum lucidum*. Although most of the Subject Land was exotic grassland with scattered native/ exotic shrubs, a small section contained native canopy species including *Eucalyptus tereticornis, E. moluccana* and *E. crebra*. In addition, there was a small occurrence of *Typha orientalis* in a stormwater depression.

Owing to the soil mapping (i.e. Wianamatta shale), location in the landscape (undulating terrain between Douglas Park and Campbelltown) and presence of characteristic eucalypts, the following PCT was assigned to the areas of native vegetation within the Subject Land:

- PCT 3320: Cumberland Shale Plains Woodland (Vegetation Zone 1) (**Photo 1**).

PCT 3320 is associated with Cumberland Plain Woodland (CPW), a Critically Endangered Ecological Community (CEEC) under the BC Act. The vegetation within the Subject Land represents a severely degraded form of the BC Act CEEC. Although PCT 3320 is also associated with the EPBC Act listed CEEC - Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, the vegetation within Vegetation Zone 1 consists of an exotic dominated understorey and does not meet the eligibility criteria for listing as the EPBC Act CEEC.

Areas of vegetation that were dominated by environmental and priority weeds could not be assigned to a PCT and were classified as 'Exotic' (Vegetation Zone 2) (**Photo 2**, **Figure 3**).

The proposed activity is likely to impact 0.17ha of moderate condition PCT 3320. A 5-part test was prepared to assess whether the impacts to the BC Act threatened Ecological Community (TEC) could constitute a significant impact. The result of the 5-part test was that a significant impact is not likely (**Appendix B**).

Vegetation Integrity (VI) scores for Vegetation Zones 1 is shown in **Table 2**.

Table 2. Vegetation zones and vegetation integrity scores.

Veg zone	PCT	Condition class	TEC?	Area within Subject Land (ha)	VI score
Zone 1	PCT 3320: Cumberland Shale Plains Woodland	Moderate	Cumberland Plain Woodland (CEEC)	0.17	27.4
Zone 2	Exotic	N/A	Not a TEC	2.98	N/A

Photo 1. Representative photo of PCT 3320: Vegetation Zone 1 (plot 1).

Photo 2. Representative photo of Exotic: Vegetation Zone 2.

Figure 3. Field-validated vegetation communities and threatened species.

4. RESULTS: THREATENED FLORA

Database searches revealed 19 threatened flora occur, or have potential to occur, within a ~5km radius of the Subject Land. The results from the site assessment, including targeted flora surveys and habitat assessment, were used to assess each species' likelihood of occurrence within the Subject Land (**Appendix A**). No flora species were determined to have a moderate or higher likelihood of occurrence within the Subject Land and no further assessment is required.

5. RESULTS: THREATENED FAUNA

Database searches revealed 53 threatened fauna occur, or have potential to occur, within a ~5km radius of the Subject Land. The results from the site assessment, including targeted habitat surveys, were used to assess each species' likelihood of occurrence within the Subject Land (**Appendix A**). Evidence of one threatened species was detected during the site assessment:

- *Meridolum corneovirens* (Cumberland Plain Land Snail).

Several empty shells likely belonging to this species was detected in leaf litter within the southern extent of the Subject Land boundary (**Plate 1**, **Figure 3**). No live specimens were found.

Unlike more mobile species, there is the potential that the proposed activity could impact the Cumberland Plain Land Snail (CPLS). An assessment as to whether CPLS is likely to experience a significant impact as a result of the proposed activity has been undertaken (**Appendix B**). The proposed activity is not likely to cause a significant impact to CPLS if the mitigation measures described in the MWREF are adhered to.

The degraded vegetation, lack of breeding habitat and location adjacent to the Hume Highway indicates that although threatened birds and mammals could potentially be occasional visitors to the Subject Land (e.g. flying over), it is unlikely to be used regularly or for any important life cycle events (e.g. breeding, roosting). As a result, any potential impacts to threatened birds and mammals are likely to be minor.

Plate 1. Empty shells likely belonging to the Cumberland Plain Land Snail.

5.1 Threatened Fauna Habitat Constraints

The degraded vegetation within the Subject Land is unlikely to provide habitat for threatened species. There was no breeding habitat identified (in the form of hollow-bearing trees, rocky outcrops/ caves, human-made structures) although the small pools identified within drainage channels could potentially support non-threatened amphibians. Leaf litter identified within PCT 3320 could provide foraging and breeding habitat for CPLS.

5.2 Migratory Species

Database searches revealed six (6) migratory terrestrial species, or their habitat, are known to occur within the Subject Land (**Table 3**). These species do not breed in Australia.

Table 3. Migratory terrestrial species with potential to occur in the Subject Land.

Species	EPBC Act Status
Cuculus optatus (Oriental Cuckoo)	Migratory, CAMBA, JAMBA, ROKAMBA
Hirundapus caudacutus (White-throated Needletail)	Vulnerable, Migratory, CAMBA, JAMBA, ROKAMBA
Monarcha melanopsis (Black-faced Monarch)	Migratory, Bonn
Motacilla flava (Yellow Wagtail)	Migratory, CAMBA, JAMBA, ROKAMBA
Myiagra cyanoleuca (Satin Flycatcher)	Migratory, Bonn
Rhipidura rufifrons (Rufous Fantail)	Migratory, Bonn

6. LEGISLATION

6.1 State Environmental Planning Policies

6.1.1 State Environmental Planning Policy (Resilience and Hazards) 2021

The State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) commenced on the 1st of March 2022 and replaces the following former SEPPs:

- State Environmental Planning Policy (Coastal Management) 2018
- State Environmental Planning Policy 33 – Hazardous and Offensive Development, and
- State Environmental Planning Policy 55 – Remediation of Land.

The Subject Land is not situated within the 'Coastal Zone' therefore this SEPP does not apply.

6.1.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

Section 2.7(1) of this SEPP states that an authority to clear vegetation under this policy is not required if it is a clearing authorised under s60(O) of the Local Land Services Act 2013. Section 60(O) provides an exemption for clearing under Part 5 of the EP&A Act and therefore consent is not required under the SEPP (Biodiversity and Conservation).

6.2 *Fisheries Management Act 1994*

The FM Act aims to conserve, develop, and share the fishery resources of NSW for the benefit of present and future generations including conserving fish stocks and key fish habitats and promoting ecologically sustainable development.

The closest Key Fish Habitat (KFH) occurs approximately 1.1km east of the Subject Land, within the Nepean River. The proposed activity does not require works within mapped KFH, nor did marine vegetation protected under the FM Act occur within the Subject Land. As such, the activity would not impact upon KFH, nor are there any legislative requirements or notifications required under this Act.

6.3 *Biosecurity Act 2015*

The *Biosecurity Act 2015* (NSW) provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by an activity as a matter of biosecurity. As defined in Part 3, section 23 of this Act, any non-conformance by an individual is defined as guilty of an offence.

Three priority weeds, *Senecio madagascariensis* (Fireweed), *Olea europaea* subsp. *cuspidata* (African Olive) and *Opuntia* species were identified within the Subject Land and are to be appropriately managed in accordance with the *Biosecurity Act 2015*.

6.4 *Water Management Act 2000*

The main objective of the *Water Management Act 2000* (NSW) (WM Act) is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. Section 91E of the Act establishes an approval regime for controlled activities within waterfront land. However, clause 41 of the Water Management (General) Regulation 2018 provides an exemption for public authorities in relation to all controlled activities on waterfront land. Therefore, approval under the WM Act is not required.

6.5 Matters of National Environmental Significance

Under the EPBC Act, a proponent must not take an action if that action will have, or is likely to have, a significant impact on matters protected under the EPBC Act, referred to as MNES. The EPBC Act identifies eight MNES:

- World Heritage properties
- National Heritage places
- Wetlands of international importance (those listed under the Ramsar Convention)
- Listed threatened species and communities
- Migratory species listed under international agreements
- Great Barrier Reef Marine Park
- Commonwealth marine areas
- Nuclear actions

The PMST identified the following as potentially occurring within the Subject Land (or within 5km):

- 9 Threatened Ecological Communities
- 68 threatened species
- 14 Migratory species

No MNES were identified within or adjoining the Subject Land, or are likely to be significantly impacted by the proposed activity.

7. AVOID AND MINIMISE IMPACTS

A key component of Transport's Biodiversity Policy commitment to no net loss of biodiversity requires the application of the 'avoid, minimise, mitigate and offset' hierarchy as follows:

- Avoid and minimise impacts.
- Mitigate unavoidable impacts.
- Offset residual impacts in accordance with Transport guidelines.

This chapter demonstrates the efforts taken to avoid and minimise impacts on biodiversity values.

Table 4 outlines how the Project will avoid and minimise direct impacts to native vegetation and habitat in accordance with Transport for NSW policies.

Table 4. Design considerations that have avoided and/ or minimised impacts.

Avoidance and/or Minimisation Measure	Project
Location of the proposal	
Locating the proposal in areas where there are no biodiversity values. Locating the proposal in areas where the native vegetation or threatened species habitat is in the lowest condition.	Efforts have been made to position the alignment in disturbed areas (i.e. exotic vegetation) and avoid specialist breeding habitat (e.g. hollow-bearing trees), where possible. A small area (0.17ha) of land with biodiversity value (Vegetation Zone 1) will be impacted.
Locating the proposal in areas that avoid habitat for threatened species that may be at risk of a significant impact or native vegetation that is part of a critically endangered ecological community (CEEC) or an endangered ecological community (EEC).	PCT 3320 within the Subject Land is consistent with CPW - BC Act listed CEEC. This area was also found to be habitat for CPLS – listed as Endangered under the BC Act. Measures to minimise direct impacts to this community/ fauna habitat will be implemented, however cannot be totally avoided as part of the Project. A significant impact is not likely to occur to either CPW or CPLS as a result of the Project.
Design refinement of the proposal	
Reducing the clearing footprint of the proposal.	The clearing footprint has been reduced as far as practicable and the majority of impacts are to vegetation with a high level of disturbance.
Locating ancillary facilities in areas where there are no biodiversity values.	Ancillary facilities for the Project will be located in exotic vegetation with no biodiversity values. No specialist threatened species habitat (e.g. hollow-bearing trees) will be removed for the ancillary facilities.
Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the lowest condition.	
Locating ancillary facilities in areas that avoid habitat for threatened species and vegetation in high threat status categories (e.g. endangered or critically endangered)	

8. MITIGATION MEASURES

Mitigation measures recommended for the Project are detailed in **Table 5**. Note that the residual impacts column refers to impacts assessed under the BC Act.

Table 5. Mitigation measures.

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B01	All project impacts	Retained vegetation in close proximity to construction activities will not be damaged or removed.	Construction	Effective	None	Contractor
B02		A Biodiversity Offset Strategy in accordance with Transport 'No Net Loss Guideline' (Transport, 2022a) would be developed to outline the offsetting strategies for biodiversity impacts that exceed Transport offset thresholds.	Prior to construction	Effective	Biodiversity impacts would be offset as outlined in the report.	Transport
B03	Removal of native vegetation	Native vegetation removal will be minimised through detailed design and installation. The clearing would be limited as far as practicable. An onsite ecologist is recommended during clearing to assist in minimizing potential impacts to native vegetation.	Detailed design During construction	Effective	0.17ha of native vegetation and habitat	Transport/Contractor
B04		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	Prior to construction	Effective	0.17ha of native vegetation and habitat	Transport/Contractor
B05		Vegetation removal will be undertaken in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	0.17ha of native vegetation and habitat	Transport/Contractor

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B06		An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a). The procedure is to be followed if threatened ecological communities, either new TECs or new occurrences of known TECs, not assessed in the biodiversity assessment, are identified in the Project site.	During construction	Proven	0.17ha of native vegetation and habitat	Transport/Contractor
B07		Flora and Fauna Management Plan will be prepared in accordance with *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a) and implemented as part of the CEMP. It will include, but not be limited to: ▪ Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas ▪ Pre-clearing survey requirements ▪ Procedures for unexpected threatened species finds and fauna handling. ▪ Procedures addressing relevant matters specified in the DPI Policy and guidelines for fish habitat conservation and management (2013). ▪ Protocols to manage weeds, pathogens and pest species	During construction	Proven	0.17ha of native vegetation and habitat	Transport/Contractor
B08	Direct impacts to threatened species	Threatened fauna habitat removal will be minimised through detailed design.	Detailed design	Effective	0.17ha of native vegetation and habitat	Transport/Contractor
B09		Fauna encountered on-site during construction will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity*	During construction	Effective	0.17ha of native	Transport/Contractor

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
		Management Guideline: Protecting and managing biodiversity on Transport for NSW projects (Transport 2024a). Any live CPLS will be relocated to areas of retained habitat.			vegetation and habitat	
B10		Habitat removal will be undertaken by staged clearing in accordance with *Guide 4: Clearing of vegetation and removal of bushrock* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	0.17ha of native vegetation and habitat	Transport/Contractor
B11		Habitat will be replaced or re-instated in accordance with *Guide 5: Re-use of woody debris and bushrock* and *Guide 8: Artificial hollows* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Proven	0.17ha of native vegetation and habitat	Transport/Contractor
B12		An unexpected threatened species finds procedure is to be developed as part of the CEMP using the template in *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a). The procedure is to be followed if threatened fauna, either new species or new occurrences of known species, not assessed in the biodiversity assessment, are identified in the proposal site.	During construction	Proven	0.17ha of native vegetation and habitat	Transport/Contractor
B13		Pre-clearing surveys and final pre-clearing checks will be undertaken in accordance with *Guide 1: Pre-clearing process* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Proven	0.17ha of native vegetation and habitat	Transport/Contractor
B14	Aquatic impacts	Impacts to aquatic habitat will be minimised through detailed design.	Detailed design	Effective	Removal of riparian vegetation	Transport/Contractor

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B15		Aquatic habitat will be protected in accordance with *Guide 10: Aquatic habitats and riparian zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a) and Section 3.3.2 *Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013* (DPI (Fisheries NSW) 2013).	During construction	Effective	Removal of riparian vegetation	Transport/Contractor
B16	Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective	Minimal, if any	Transport/Contractor
B17	Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design.	Detailed design	Effective	Minimal, if any	Transport/Contractor
B18	Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with *Guide 2: Exclusion zones* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	None	Transport/Contractor
B19	Injury and mortality of fauna	Fauna will be managed in accordance with *Guide 9: Fauna handling* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	Unknown	Transport/Contractor
B20	Invasion and spread of weeds	Weed species will be managed in accordance with *Guide 6: Weed management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	Unknown	Transport/Contractor
B21	Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with *Guide 7: Pathogen management* of the *Biodiversity Management Guideline: Protecting and managing biodiversity on Transport for NSW projects* (Transport 2024a).	During construction	Effective	Unknown	Transport/Contractor

ID	Impact	Mitigation measure	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated?	Responsibility
B22	Light spill and shading impacts	Shading and artificial light impacts will be minimised through detailed design.	Detailed design	Effective	Unknown	Transport/Contractor

9. TRANSPORT BIODIVERSITY OFFSETS

Offset thresholds are presented in **Table 6**. This assessment has described the biodiversity values present in the Subject Land and the impact of the project on these values. Further to this, the assessment has identified all reasonable measures and strategies proposed to avoid and minimise impacts to biodiversity associated with the project. Any residual impacts would need to be offset.

Table 6. Offset thresholds (Transport, 2023a).

Impact	Threshold	Applicable to the Proposal?
A. Threatened ecological communities		
Works involving clearing of an EPBC Act or BC Act listed critically endangered ecological communities (CEEC).	Where there is any clearing of an CEEC in 'moderate to good' condition	Yes, 0.17ha of moderate condition CEEC will be impacted.
Works involving clearing of an EPBC Act or BC Act listed endangered ecological community (EEC).	Where clearing of a EEC ≥ 2 ha in 'moderate to good' condition	No. No EECs will be cleared.
Works involving clearing of a BC Act listed vulnerable ecological community (VEC).	Where clearing of VEC ≥ 5 ha in 'moderate to good' condition	No. No VEC will be cleared.
B. Threatened fauna habitat		
Works involving clearing of threatened fauna habitat for ecosystem-credit species that is also a TEC identified in Category A.	No – covered by Category A TEC thresholds.	Yes, 0.17ha of habitat for Cumberland Plain Land Snail will be impacted.
Works involving clearing of any habitat (that is not a TEC) for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type).	Where clearing ≥ 1 hectare in moderate to good condition.	No. Impacts will be to <1ha of moderate condition CEEC, or exotic vegetation (excluded).
C. Threatened flora and habitat		
Works involving removal of known threatened flora species and their habitat.	Where loss of individuals is ≥ 10 (species that have a 'count of individuals' as the unit of measure) or where clearing of habitat (calculated by a species polygon in accordance with the BAM) is ≥ 1 hectare.	No. No threatened flora species will be removed.
D. Key fish habitat		
Type 1 or Type 2 key fish habitats (KFH)	Where there is a net loss of habitat	No. No Type 1 or 2 KFH will be impacted.

Impact	Threshold	Applicable to the Proposal?
Additional requirements exist in relation to the replacement of trees and hollows, for any impacts that do not trigger these area thresholds.		No trees are proposed to be removed in Vegetation Zone 2.

The required ecosystem credits and species credits are presented in **Table 7** and **Table 8**. A biodiversity offset strategy may need to be provided to outline how Transport intends to offset the impacts of the proposal.

Table 7. Ecosystem credits summary.

Vegetation Zone	PCT	Loss in VI Score	Area	Ecosystem Credits
Vegetation Zone 1	PCT 3320: Cumberland Shale Plains Woodland	-27.4	0.17ha	3

Table 8. Species credits summary.

Species	BC Act	EPBC Act	Extent of Impacts	Species Credits
Meridolum corneovirens (Cumberland Plain Land Snail)	E	-	0.17ha	2

10. CONCLUSION

The proposed activity will impact a small area (0.17ha) of moderate condition PCT 3320: Cumberland Shale Plains Woodland. PCT 3320 is associated with CPW, a CEEC under the BC Act. The conclusion of the BC Act assessment as to whether CPW is likely to experience a significant impact as a result of the proposed activity found that a significant impact was not likely to occur. The vegetation within the Subject Land does not meet the eligibility criteria for the EPBC Act listed community.

One threatened fauna species was recorded within the Subject Land:

- *Meridolum corneovirens* (Cumberland Plain Land Snail) – Endangered (BC Act).

The nature and extent of the proposed works is limited to disturbed areas adjoining or in proximity to the Hume Highway. The conclusion of the BC Act assessment as to whether CPLS is likely to experience a significant impact as a result of the proposed activity found that a significant impact was not likely to occur.

If you have any queries, please feel free to contact me.

Sincerely,

Dr Jack Tatler
Director/ Principal Ecologist - Accredited Biodiversity Assessor
(BAAS21006)

REFERENCES

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Department of Planning, Industry and Environment (DPIE) (2020a) Biodiversity Assessment Method

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NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2023). BioNet Vegetation Classification

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024a). eSPADE

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024b). NSW State Vegetation Type Map

NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) (2024c). NSW BioNet Atlas

Office of Environment and Heritage (OEH) (2018). Threatened Species Test of Significance Guidelines

Appendix A. Habitat suitability assessment.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Plants							
Acacia bynoeana	E	V	Species	-	Bynoe's wattle is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. The species is currently known from about 30 locations, with the size of the populations at most locations being very small (1-5 plants). It has recently been found in the Colymea and Parma Creek areas west of Nowra.	Modelled only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. In addition, the vegetation within the Subject Land was severely degraded and not suitable for this species.
Cynanchum elegans	E	E	Species	-	Recorded from rainforest gullies scrub and scree slopes from the Gloucester district to the Wollongong area and inland to Mt Dangar.	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. The only record is from 1987 and is >4km from the Subject Land. There is no suitable habitat for this species within the Subject Land.
Eucalyptus benthamii	CE	V	Species	-	Occurs on the alluvial flats of the Nepean River and its tributaries. Requires a combination of deep alluvial sands and a flooding regime that permits seedling establishment. Recruitment of	Modelled only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					juveniles appears to be most successful on bare silt deposits in rivers and streams.		habitat for this species within the Subject Land.
Eucalyptus nicholii	V	V	Species	-	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. Seedling recruitment is common, even in disturbed soils, if protected from grazing and fire.	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. The only record is from 2005 and is >4km from the Subject Land. There is no suitable habitat for this species within the Subject Land.
Genoplesium baueri	E	E	Species	-	Grows in dry sclerophyll forest and moss gardens over sandstone.	Modelled only	Low. There are no recent or nearby records of this species. The vegetation within the Subject Land was degraded and not suitable for this species.
Grevillea parviflora subsp. parviflora	V	V	Species	-	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Often occurs in open, slightly disturbed sites such as along tracks.	BioNet - 5	Low. There are no recent or nearby (within 5km) records of this species. No grevilleas were detected during the survey.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Gyrostemon thesioides	E	-	Species	Sandy, alluvial or colluvial soil within 50 m of a water course	Grows on hillsides and riverbanks and may be restricted to fine sandy soils Within NSW, has only ever been recorded at three sites, to the west of Sydney, near the Colo, Georges and Nepean Rivers. The most recent sighting was of a single male plant near the Colo River within Wollemi National Park. The species has not been recorded from the Nepean and Georges Rivers for 90 and 30 years respectively, despite searches. Also occurs in Western Australia, South Australia, Victoria and Tasmania.	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. The only record is from 1910. The vegetation within the Subject Land was degraded and not suitable for this species.
Leucopogon exolasius	V	V	Species	-	Grows in woodland on sandstone. Restricted to the Woronora and Grose Rivers and Stokes Creek, Royal National Park.	BioNet - 1	Low. There are no recent or nearby (within 5km) records of this species. There is no suitable habitat for this species within the Subject Land.
Melaleuca deanei	V	V	Species	-	Grows in wet heath on sandstone in coastal districts from Berowra to Nowra.	Modelled only	Low. There are no recent or nearby (within 5km) records of this species. There is no suitable habitat for this species within the Subject Land.
Persicaria elatior	V	V	Species	Within 50m of waterbodies	This species normally grows in damp places, especially beside streams and lakes.	Modelled only	Low. There are no recent or nearby records of this species. In addition, the vegetation within the Subject

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					Occasionally in swamp forest or associated with disturbance.		Land was severely weed infested and not suitable for this species.
Persoonia bargoensis	E	V	Species	-	The Bargo Geebung occurs in woodland or dry sclerophyll forest on sandstone and on heavier, well drained, loamy, gravely soils.	BioNet - 7	Low. The vegetation within the Subject Land was degraded and not suitable for this species.
Persoonia hirsuta	E	E	Species	-	The Hairy Geebung is found in clayey and sandy soils in dry sclerophyll open forest, woodland and heath, primarily on the Mittagong Formation and on the upper Hawkesbury Sandstone.	Modelled only	Low. The vegetation within the Subject Land was degraded and not suitable for this species.
Persoonia nutans	E	E	Species	-	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south. Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition	Modelled only	Low. The vegetation within the Subject Land was degraded and not suitable for this species.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					communities and into Cooks River / Castlereagh Ironbark Forest.		
Pimelea spicata	E	E	Species	-	Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in two disjunct areas; the Cumberland Plain (Narellan, Marayong, Prospect Reservoir areas) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the inland Cumberland Plain sites it is associated with grey box and Ironbark. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey.	BioNet - 24	Low. Although there are recent (2021) and nearby (~2km) records of this species on BioNet, the habitat was weed infested and not suitable.
Pomaderris brunnea	E	V	Species	-	The species is expected to live for 10 - 20 years, while the minimum time to produce seed is estimated to be 4 - 6 years. Found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area. It also occurs at Walcha on the New England Tableland and in far eastern Gippsland in Victoria. Brown Pomaderris grows in moist	BioNet - 9	Low. There is one recent (2022) and nearby (<4km) record of this species on BioNet. In addition, the vegetation within the Subject Land was severely weed infested and not suitable for this species.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					woodland or forest on clay and alluvial soils of flood plains and creek lines.		
Pultenaea pedunculata	E	-	Species	-	*Pultenaea pedunculata* occurs in a range of habitats. NSW populations are generally among woodland vegetation but plants have also been found on road batters and coastal cliffs. It is largely confined to loamy soils in dry gullies in populations in the Windellama area.	BioNet - 9	Low. This species has not been recorded in the locality in the last 10 years on BioNet. In addition, the vegetation within the Subject Land was severely weed infested and not suitable for this species. Targeted survey during the NSW DCCEEW endorsed survey period did not detect this species.
Pterostylis saxicola	E	E	Species	-	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. The vegetation communities above the shelves where *Pterostylis saxicola* occurs are sclerophyll forest or woodland on shale-sandstone transition soils or shale soils.	BioNet - 35	Low. Although there are recent (2018) and nearby (~1.2km) records of this species, the habitat was weed infested and not suitable.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Rhodamnia rubescens	CE	CE	Species	-	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Modelled only	Low. There are no recent or nearby records of this species. In addition, this species grows in rainforest and wet sclerophyll vegetation formations, which were not present within the Subject Land.
Syzygium paniculatum	E	V	Species	-	Found only in NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State forest. On the south coast the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral rainforest. On the central coast it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. This species is not associated with vegetation within the Subject Land (PCT 3319).
Birds							
Anthochaera phrygia (Regent Honeyeater)	CE	CE	Species/ Ecosystem	As per Important Habitat Map.	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The distribution of the species has contracted dramatically in the last 30 years to between north-eastern Victoria and	BioNet - 1	Low. The Subject Land is not on the important habitat map. This species has not been recorded in the locality in the last 10 years on BioNet. The only record is from 1954.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.		
Aphelocephala leucopsis (Southern Whiteface)	V	V	-	-	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps.	Modelled Only	Low. There are no recent or nearby records of this species. There is no suitable habitat within the Subject Land.
Botaurus poiciloptilus (Australasian Bittern)	E	E	Ecosystem	Brackish or freshwater wetlands	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west.	Modelled Only	Low. There are no recent or nearby records of this species. There is no suitable habitat within the Subject Land.
Calidris acuminata	-	V	-	-	They are widespread in most regions of New South Wales (NSW) and Victoria, especially in coastal areas, but they are sparse in the south-central Western Plain and east Lower Western	Modelled Only	Low. There are no recent or nearby records of this species. There is no

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
(Sharp-tailed Sandpiper)					Regions of NSW, and north-east and north-central Victoria.		suitable habitat within the Subject Land.
Calidris ferruginea (Curlew Sandpiper)	E	CE	Species/ Ecosystem	As per Important Habitat Map	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration.	Modelled Only	Low. There are no recent or nearby records of this species. There is no suitable habitat within the Subject Land.
Calyptorhynchus lathami lathami (South-eastern Glossy Black-Cockatoo)	V	V	Species/ Ecosystem	Living or dead tree with hollows greater than 15cm diameter and higher than 8m above ground. Presence of Allocasuarina and casuarina species	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.	BioNet - 7	Low. This species is highly mobile and has not been recorded in the locality in the last 10 years on BioNet. There is no suitable breeding or foraging habitat within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	V	-	Ecosystem	-	In New South Wales it is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. The Dusky Woodswallow is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests. At sites where Dusky Woodswallows are recorded the understorey is typically open with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris (Higgins and Peter 2002). Birds are also often observed in farm land, usually at the edges of forest or woodland or in roadside remnants or wind breaks with dead timber.	BioNet - 48	Low. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the Subject Land given its poor condition and location adjacent to a highway. The species may fly over the Subject Land.
Callocephalon fimbriatum (Gang-gang Cockatoo)	V	E	Species/ Ecosystem	Hollow bearing trees. Eucalypt tree species with hollows at least 3 m above	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine snow gum woodland and occasionally in temperate or regenerating forest. In winter,	BioNet - 4	Low. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. There is

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				the ground and with hollow diameter of 7 cm or larger.	occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.		no suitable breeding habitat within the Subject Land.
Chthonicola sagittata (Speckled Warbler)	V	-	Ecosystem	-	The Speckled Warbler lives in a wide range of eucalypt dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	BioNet - 2	Low. This species is highly mobile and has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Climacteris picumnus victoriae (Brown Treecreeper)	V	-	Ecosystem	-	Found in eucalypt woodlands (including box-gum woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and river red gum forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen	BioNet - 4	Low. This species is highly mobile and has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.		
Daphoenositta chrysoptera (Varied Sittella)	V	-	Ecosystem	-	Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby under storey or grassy ground cover or both, in all climatic zones of Australia. Usually in areas with rough-barked trees, such as stringybarks or ironbarks, but also in paperbarks or mature Eucalypts with hollows.	BioNet - 43	Low. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Falco hypoleucos (Grey Falcon)	V	V	Ecosystem	-	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Modelled Only	Low. There are no recent or nearby records of this species. There is no suitable habitat present within the Subject Land.
Falco subniger (Black Falcon)	V	-	Ecosystem			BioNet - 1	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Gallinago hardwickii (Latham's Snipe)	-	V	-	-	Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration.	Modelled Only	Low. There are no recent or nearby records of this species. There is no suitable habitat present within the Subject Land.
Glossopsitta pusilla (Little Lorikeet)	V	-	Ecosystem	-	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.	BioNet - 32	Low-Moderate. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat present within the Subject Land.
Grantiella picta (Painted Honeyeater)	V	V	Ecosystem	Mistletoes present at a density of	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost	Modelled Only	Low. There are no recent or nearby records of this species. There is no

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				greater than five mistletoes per hectare	all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits boree, brigalow and box-gum woodlands and box-ironbark forests.		suitable habitat within the Subject Land.
Haliaeetus leucogaster (White-bellied Sea-Eagle)	V	-	Species/ Ecosystem	Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines.	Inhabits coastal and near coastal areas, building large stick nests, and feeding mostly on marine and estuarine fish and aquatic fauna.	BioNet - 3	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable breeding or foraging habitat within the Subject Land.
Hieraaetus morphnoides (Little Eagle)	V	-	Species/ Ecosystem	Nest trees - live (occasionally dead) large old trees within vegetation.	Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. May nest in farmland, woodland and forest in tall trees.	BioNet - 5	Low. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the Subject Land given the location adjacent to a highway.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
							There was no breeding habitat for this species within the Subject Land.
Hirundapus caudacutus (White-throated Needletail)	-	V, M, MAR	Ecosystem	-	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges.	BioNet - 2	Low. This species is highly mobile and has been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the Subject Land given the location adjacent to a highway.
Lathamus discolor (Swift Parrot)	E	CE, MAR	Species/ Ecosystem	As per Important Habitat Map.	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW . This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	BioNet - 3	Low. The Subject Land is not on the important habitat map. This species is highly mobile and has been recorded >3km from the Subject Land. There was no suitable habitat for this species within the Subject Land.
Lophoictinia isura (Square-tailed Kite)	V	-	Species/ Ecosystem	Nest trees	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by *Eucalyptus longifolia, Corymbia maculata, E. elata* or *E. smithii*.	BioNet - 2	Low. This species is highly mobile and has not been recorded in the locality in the last 10 years on BioNet. This species may fly over the Subject Land but is unlikely to use habitat within it.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					Individuals appear to occupy large hunting ranges of more than 100km2. They require large living trees for breeding, particularly near water with surrounding woodland -forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.		No breeding habitat occurred within the Subject Land.
Melanodryas cucullata cucullata (South-eastern Hooded Robin)	E	E	Ecosystem	-	Occupy a wide range of eucalypt woodlands, Acacia shrublands and open forests.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the Subject Land given the location adjacent to a highway.
Melithreptus gularis gularis (Black-chinned Honeyeater (eastern subspecies))	V	-	Ecosystem	-	Eucalypt woodlands within an approximate annual rainfall range of 400-700mm	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.
Ninox strenua (Powerful Owl)	V	-	Species	A living or dead tree with a hollow >20 cm	Occupies wet and dry eucalypt forests and rainforests. Can occupy both un-logged and lightly logged forests as well as undisturbed	BioNet - 15	Low. There is no suitable habitat present within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				diameter that occurs >4 metres above the ground.	forests where it usually roosts on the limbs of dense trees in gully areas. It is most commonly recorded within red turpentine in tall open forests and black she-oak within open forests. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm.		
Petroica boodang (Scarlet Robin)	V	-	Ecosystem	-	The Scarlet Robin is found from SE Queensland to SE South Australia and also in Tasmania and SW Western Australia. In NSW, it occurs from the coast to the inland slopes. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	BioNet - 4	Low. There are no recent and nearby record of this species on BioNet. This species may be an occasional visitor, but it is unlikely that this species would regularly use habitat within the Subject Land given the location adjacent to a highway.
Petroica phoenicea (Flame Robin)	V	MAR	Ecosystem	-	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The species is also found in Tasmania. The preferred habitat in	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					summer includes eucalyptus forests and woodland, whilst in winter prefers open woodlands and farmlands. It is considered migratory. The Flame Robin breeds from about August to January.		Subject Land given the location adjacent to a highway.
Pycnoptilus floccosus (Pilot Bird)	-	V	-	-	Pilotbirds are endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in New South Wales and north-east Victoria (Higgins & Peter 2002; Loyn et al. 2021). Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne (Higgins & Peter 2002; Loyn et al. 2021). Pilotbirds are strictly terrestrial, living on the ground in dense forests with heavy undergrowth (Higgins & Peter 2002).	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.
Rostratula australis (Australian Painted Snipe)	E	E	Ecosystem	-	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Tringa nebularia (Common Greenshank)	-	M, MAR	-	-	Habitat is diverse, both inland and coastal. Found inland on both permanent and temporary wetland- billabongs, swamps, lakes, floodplains, sewage, farms and saltwater ponds. On the coast, it uses sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons and occasionally rocky tidal edges.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Stagonopleura guttata (Diamond Firetail)	V	-	Ecosystem	-	Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Found in grassy eucalypt woodlands, including box-gum woodlands and snow gum woodlands. Also occurs in open forest, mallee, natural temperate grassland, and in secondary grassland derived from other communities.	BioNet - 1	Low. This species has not been recorded in the locality in the last 10 years on BioNet. It is unlikely that this species would use habitat within the Subject Land given its poor condition and location adjacent to a highway.
Amphibians							
Heleioporus australiacus	V	V	Species	-	The Giant Burrowing Frog has been recorded breeding in a range of water bodies associated with more sandy environments of the coast and adjacent ranges from the Sydney Basin south	Modelled Only	Low. This species has not been recorded in the locality in the last 10

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
(Giant Burrowing Frog)					the eastern Victoria. It breeds in hanging swamps, perennial non-flooding creeks and occasionally permanent pools, but permanent water must be present to allow its large tadpoles time to reach metamorphosis.		years on BioNet. There is no suitable habitat within the Subject Land.
Litoria aurea (Green and Golden Bell Frog)	E	V	Species	Within 1km of wet areas, swamps or waterbodies	Inhabits a very wide range of water bodies including marshes, dams and streams, particularly those containing emergent vegetation such as bullrushes or spikerushes. It also inhabits numerous types of man-made water bodies including quarries and sand extraction sites. Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow, have a grassy area nearby and diurnal sheltering sites available.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet and no known population occurs nearby. There is a small area of potential habitat (spikerushes) for this species but is of low suitability owing to its location along a highway.
Litoria littlejohni (Northern Heath Frog)	E	E	Species	-	Occurs in wet and dry sclerophyll forests and heathland associated with sandstone outcrops between 280 and 1000 m on the eastern slopes of the Great Dividing Range from the Central Coast down into Victoria. Individuals have been collected from a wide range of water bodies that includes semi-permanent dams, permanent	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					ponds, temporary pools and permanent streams, with calling occurring from fringing vegetation or on the banks. Individuals have been observed sheltering under rocks on high exposed ridges during summer and within deep leaf litter adjacent to the breeding site. Calling occurs in all months of the year, often in association with heavy rains. The tadpoles are distinctive, being large and very dark in colouration.		
Mammals							
Chalinolobus dwyeri (Large-eared Pied Bat)	V	V	Species	Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of	Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests. This species roosts in caves and mines in groups of between 3 and 37 individuals.	BioNet - 3	Low. There are recent (2014) and nearby records of this species. There is no suitable roosting habitat within the Subject Land and it would provide poor quality foraging habitat given its location adjacent to a highway.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				old mines or tunnels.			
Falsistrellus tasmaniensis (Eastern False Pipistrelle)	V		Ecosystem	Prefers moist habitats, with trees taller than 20 m.	Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high. Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor . This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites .	BioNet - 5	Low. There are recent (2019) and nearby records of this species. However, there is no suitable habitat (moist habitat) within the Subject Land.
Micronomus norfolkensis (Eastern Coastal Free-tailed Bat)	V	-	Ecosystem	-	Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits.	BioNet - 7	Low. There are recent (2014) and nearby records of this species. However, there is no breeding habitat within the Subject Land and it would provide poor quality foraging habitat given its location adjacent to a highway.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Miniopterus australis (Little Bent-winged Bat)	V	-	Species/ Ecosystem	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave'; observation type code 'E nest-roost'; with numbers of individuals >500; or from the scientific literature.	Coastal north-eastern NSW and eastern Queensland. Little Bent-wing Bat is an insectivorous bat that roost in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites. Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.	BioNet - 2	Low. There are recent (2014) and nearby records of this species. However, there is no breeding habitat within the Subject Land and it would provide poor quality foraging habitat given its location adjacent to a highway.
Miniopterus orianae	V	-	Species/ Ecosystem	Cave, tunnel, mine, culvert or other	Eastern Bent-wing Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict	BioNet - 10	Low. There are no recent and nearby records. There is no breeding habitat within the Subject Land and it would

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
oceanensis (Large Bent-winged Bat)				structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500	mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.		provide poor quality foraging habitat given its location adjacent to a highway.
Myotis Macropus (Southern Myotis)	V	-	Species	Waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks,	The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	BioNet - 168	Low. There is no suitable habitat (e.g. permanent waterbodies or hollow-bearing trees) within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site.			
Dasyurus maculatus maculatus (Spotted-tail Quoll)	V	E	Ecosystem	-	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	Modelled Only	Low. There is no suitable habitat for this species within the Subject Land.
Petauroides Volans (Southern Greater Glider)	-	V	Species	-	The Greater Glider occurs in eucalypt forests and woodlands. Utilises tree hollows.	BioNet - 1	Low. There is no suitable habitat for this species within the Subject Land.
Petaurus australis australis (Yellow-bellied Glider (south-eastern))	V	-	Ecosystem	-	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					gullies and creek flats to tall montane forests in the south. Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.		habitat for this species within the Subject Land.
Petaurus norfolcensis (Squirrel Glider)	V	-	Species	-	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias. There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.
Phascolarctos cinereus (Koala)	V	E	Species	Presence of koala use trees	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall.	BioNet - 237	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Pseudomys novaehollandiae (New Holland Mouse)		V	Ecosystem	-	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.
Pteropus poliocephalus (Grey-headed Flying-fox)	V	V	Species/ Ecosystem	Breeding camps	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.	BioNet - 31	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat for this species within the Subject Land.
Saccolaimus flaviventris (Yellow-bellied Sheathtail-bat)	V	-	Ecosystem	-	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	BioNet - 1	Low. There is no suitable habitat for this species within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
Scoteanax rueppellii (Greater Broad-nosed Bat)	V	-	Ecosystem	-	Prefer moist gullies in mature coastal forests and rainforests, between the Great Dividing Range and the coast. They are only found at low altitudes below 500 m. In dense environments they utilise natural and human-made opening in the forest for flight paths. Creeks and small rivers are favoured foraging habitat. This species roosts in hollow tree trunks and branches.	BioNet - 8	Low. There is no suitable habitat for this species within the Subject Land.
Invertebrates							
Austrocordulia leonardi (Sydney Hawk Dragonfly)	-	E	-	-	The Sydney Hawk Dragonfly has specific habitat requirements, and has only ever been collected from deep river pools with cooler water and permanent flow. It is strictly a diurnal dragonfly that requires open, sunlit space. Larvae are found under rocks where they coexist with the Eastern Hawk Dragonfly.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Meridolum corneovirens (Cumberland Plain Land Snail)	E	-	Species	-	Primarily inhabits Cumberland Plain woodland (an EEC). This community is a grassy, open woodland with occasional dense patches of shrubs. Lives under litter of bark, leaves and	BioNet - 28	Recorded. Several empty shells of this species were identified within Vegetation Zone 1.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
					logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish.		
Reptiles							
Aprasia parapulchella (Pink-tailed Worm-lizard)	V	V	Species	Rocky Area or within 50m of rocky areas.	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by kangaroo grass. Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Delma impar (Striped Legless Lizard)	V	V	Species	-	Found mainly in natural temperate grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near natural temperate grassland and occasionally in open box-gum woodland. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.
Hoplocephalus bungaroides (Broad-headed Snake)	E	V	Species/ Ecosystem	Rocky areas including escapments, outcrops and pogodas within	Occurs almost exclusively in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within	Modelled Only	Low. This species has not been recorded in the locality in the last 10 years on BioNet. There is no suitable habitat within the Subject Land.

Scientific name	Status		BAM credit type	Habitat constraints and/or geographic limitations	Distribution and habitat	Number of records (source)	Likelihood of occurrence
	BC Act	EPBC Act					
				the Sydney Sandstone geologies.	these habitats they spend most of the year sheltering in and under rock crevices and exfoliating rock. However, some individuals will migrate to tree hollows to find shelter during hotter parts of summer.		

Appendix B. BC Act 5-part tests.

Biodiversity Conservation Act 2016 (NSW)– Test of Significance (5-part Test) for *Meridolum corneovirens* (Cumberland Plain Land Snail) – Vulnerable

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

The proposed activity is not likely to have an adverse effect on the life cycle of the species such that a viable local population is likely to be placed at risk of extinction.

The potential habitat for this species that is proposed to be impacted is of poor quality and is currently subject to considerable edge effects (e.g. weed incursion, pollution, littering) from the adjacent Hume Highway. Empty shells (evidence of presence) were recorded from leaf litter that is outside of the Subject Land and will not be directly impacted. It is possible that edge effects following construction of the heavy vehicle stop could reduce the quality of fringing habitat. Should this species occur within the proposed works area it is not expected that a viable local population would be likely to be placed at risk of extinction given the small scale of the proposed works and habitat of better quality remaining in adjacent areas that are connected to the Subject Land.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

> **(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

Not Applicable.

> **(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,**

Not Applicable.

(c) in relation to the habitat of a threatened species or ecological community:

> **(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and**

The proposed works entail the widening of an existing highway to facilitate truck deceleration and stopping, and will be confined to disturbed areas immediately adjacent to the highway. The potential habitat for this species to be impacted is of poor quality, consisting of a groundlayer dominated by environmental weeds. Areas of higher quality potentially containing this species, that immediately adjoin the proposed works area, will be retained.

> **(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and**

If present, an increase in fragmentation is not likely to occur for this species given the proposed works are an along existing highway (which already fragments potential habitat). Higher quality habitat will remain immediately adjacent to the proposed works area and in the broader locality.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The habitat to be impacted is unlikely to be of high importance to this species. It is degraded and subject to considerable edge effects from the Hume Highway. Any potentially occurring individuals of this species would be at the edge of their dispersal limits given the current barrier of the highway, with better quality habitat continuing to persist immediately adjacent to the proposed works area and in the broader locality, that will support the long-term survival of this species should it occur.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed activity is not likely to have an adverse effect on any declared area of critical habitat, directly or indirectly.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The following Key Threatening Processes (KTPs) are documented to impact upon the survival of the ecological community:

- Clearing of native vegetation

The majority of impacts will be to exotic weeds although some native species will also be impacted. Much higher quality habitat will remain adjacent to the proposed works area and in the broader locality.

Conclusion

There will be no significant impact on the threatened species and therefore, the proposed activity should not warrant the preparation of a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR).

Biodiversity Conservation Act 2016 (NSW)– Test of Significance (5-part Test) for Cumberland Plain Woodland – Critically Endangered

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

N/A

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The proposed activity is not likely to have an adverse effect on the extent of CPW such that its local occurrence is at risk of extinction. Approximately 0.17ha of this community will be impacted. The extent of CPW to be impacted by the Project is degraded (which is typical of the location) and subject to considerable edge effects from the Hume Highway. Occurrences of CPW in equal, or higher, quality will continue to exist adjacent to the proposed works area and in the wider locality.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The proposed activity is not likely to substantially and adversely modify the composition of CPW such that its local occurrence is a risk of extinction. Approximately 0.17ha of this community will be impacted. The extent of CPW to be impacted by the Project is degraded (which is typical of the location) and subject to considerable edge effects from the Hume Highway. Moreover, it occurs on the edge of a larger patch and therefore does not cause fragmentation. Occurrences of CPW in equal, or higher, quality will continue to exist adjacent to the proposed works area and in the wider locality.

(c) in relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

While all habitat is important, the extent of CPW within the proposed works area (0.17ha) is degraded and subject to considerable edge effects from the Hume Highway.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The local occurrence of CPW is already heavily fragmented by roads and residential development. No increased fragmentation will occur as a result of the proposed activity. Occurrences of CPW in equal, or higher, quality will continue to exist adjacent to the proposed works area and in the wider locality.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The habitat to be impacted is unlikely to be of high importance to this community given its level of degradation and location along a major road. Occurrences of CPW in equal, or higher, quality will continue to exist adjacent to the proposed works area and in the wider locality.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The activity proposed is not likely to have an adverse effect on any declared area of critical habitat, directly or indirectly.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The following Key Threatening Processes (KTPs) are documented to impact upon the survival of the ecological community:

- Clearing of native vegetation

The area of CPW to be impacted by the Project is degraded and located on the edge of a larger patch. Equally suitable habitat will remain adjacent to the proposed works area and in the broader locality.

Conclusion

There will be no significant impact on the ecological community and therefore, the proposed activity should not warrant the preparation of a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR).

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Appendix F: PACHCI advice

14 October 2024

Amanda Berger
Senior Environment and Sustainability Officer

Dear Amanda,

Preliminary assessment results for Hume Motorway Alternative Heavy Vehicle Rest Area, additional compound site, based on Stage 1 of the *Procedure for Aboriginal cultural heritage consultation and investigation* (the procedure).

The project, as described in the Stage 1 assessment, was assessed as being unlikely to have an impact on Aboriginal cultural heritage.

The assessment is based on the following due diligence considerations:

- The project is unlikely to harm known Aboriginal objects or places.
- The AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area.
- The study area does not contain landscape features that indicate the presence of Aboriginal objects, based on the Heritage NSW's *Due diligence Code of Practice for the Protection of Aboriginal objects in NSW* and the Transport for NSW's procedure.
- The cultural heritage potential of the study area appears to be reduced due to past disturbance.
- There is an absence of sandstone rock outcrops likely to contain Aboriginal art.

Your project may proceed in accordance with the environmental impact assessment process, as relevant, and all other relevant approvals.

If the scope of your project changes, you must contact me and your regional environmental staff to reassess any potential impacts on Aboriginal cultural heritage.

If any potential Aboriginal objects (including skeletal remains) are discovered during the course of the project, all works in the vicinity of the find must cease. Follow the steps outlined in the Transport for NSW's *Unexpected Archaeological Finds Procedure*.

For further assistance in this matter do not hesitate to contact me.

Yours sincerely

Cheyenne Noble Tovehi
Aboriginal Cultural Heritage Officer – Southern

NSW GOVERNMENT