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CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN – STAGE C

A2I | Albury to Illabo

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DOCUMENT OWNER:	Simon Fisher - Environmental Lead			
PREPARED BY:	Karen McCann	**TITLE:**	Environmental Approvals Advisor	
SIGNATURE:			**DATE:**	15/06/2026
REVIEWED BY:	Simon Fisher	**TITLE:**	Environmental Lead	
SIGNATURE:			**DATE:**	15/06/2026

Approved by

NAME	TITLE	SIGNATURE	DATE
Andy Williams	Project Director		15/06/2026

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GLOSSARY

TERM	DEFINITION
Acoustics Advisor (AA)	The Acoustics Advisor for the CSSI approved by the Planning Secretary
A2I	Albury to Illabo section of the Inland Rail project
ARTC	Australian Rail Track Corporation
CCS	Community Communications Strategy
CCHMP	Construction Cultural Heritage Management Plan
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CIZ	Construction impact zone
CMP	Construction monitoring plan
CNVIS	Construction Noise and Vibration Impact Statement
CNVF	Construction Noise and Vibration Framework
CNVMP	Construction Noise and Vibration Management Plan (this Plan)
CoA	Conditions of Approval
Construction	Includes work required to construct the CSSI as defined in the Project Description described in the documents listed in Condition A1 including commissioning trials of equipment and temporary use of any part of the CSSI but excluding Low Impact Work which is carried out or completed prior to approval of the CEMP.
CSSI	Critical State Significant Infrastructure
CTTAMP	Construction Traffic, Transport and Access Management Plan
dB	Decibel (referenced 20 µPa)
dB(A)	A-weighted decibel (referenced 20 µPa)
DPHI	Department of Planning, Housing and Infrastructure
EAD	Environmental Assessment Documentation that includes: • Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022); • Albury to Illabo Response to Submissions (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024); • Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024); • Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Albury to Illabo Kemp Street Bridge Enhancement Site Modification (June 2025); • Albury to Illabo Kemp Street Bridge Enhancement Site Modification Clarification (July 2025); • Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment (August 2025).
EIS	Environmental Impact Statement

TERM	DEFINITION
EIS RtS	Environmental Impact Statement Response to Submissions
EMS	Environmental Management System
EPA	Environment Protection Authority (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPL	Environment Protection Licence
Environmental Representative (ER)	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
ICNG	Interim Construction Noise Guideline
IRPL	Inland Rail Pty Ltd
IRPL CNVF	Inland Rail NSW Construction Noise and Vibration Management Framework
IRPL NVMS	Inland Rail NSW Noise and Vibration Management Strategy
ISC	Infrastructure Sustainability Council
ISO	International Standards Organisation
km	kilometre
LA10	The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
LA90	The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
LAeq	A-weighted equivalent continuous noise level, providing a representation of the cumulative level of noise exposure over a defined period.
LAeq(15 minute)	The A-weighted equivalent continuous noise level for a 15-minute period, typically the worst-case 15-minute period.
LAmax	The A-weighted maximum sound pressure level of an event measured with a sound level meter.
LGA	Local government area
m	Metre
MR	Martinus Rail
NCA	Noise Catchment Area
NML	Noise Management Level
NSW	New South Wales
NPfI	Noise Policy for Industry
ONVR	Operational Noise and Vibration Review required by CoA E89
OOH	Out of hours

TERM	DEFINITION
OOHW	Out of hours work
Planning Secretary	Secretary of the NSW Department of Infrastructure, Housing and Infrastructure, or delegate
PIR	Preferred Infrastructure Report
PIR RtS	The PIR Response to Submissions Report
POEO Act	Protection of the Environment Operations Act 1997
PPV	Peak particle velocity
Primary CoA/UMM	CoA and/or UMMs that are specific to the development of this Plan
Project, the	Albury to Illabo section of the Inland Rail project
Project website	https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/
PSR	Project Scope and Requirements
RBL	Rating Background Level
RNP	Road Noise Policy
RtS	Response to Submissions Report
SAPs	Sensitive Area Plans
SEARs	Secretary's Environmental Assessment Requirements
SIMP	Social Impact Management Plan
SLR Predict	A2I noise and vibration management tool
SMART	Specific, Measurable, Achievable, Realistic and Timely
SSI	State Significant Infrastructure
SuMP	Sustainability Management Plan
TfNSW	Transport for New South Wales
TOA	Track occupancy authorisation
UMM	Updated Mitigation Measures (PIR RtS Appendix B)
VC	Vibration criteria
VDV	Vibration dose value ($m/s^{1.75}$)

1 INTRODUCTION

1.1 Project overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC) and Inland Rail Pty Ltd (IRPL).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine and Narrabri to North Star Phase 1 sections are complete.

The Inland Rail project will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section of the Inland Rail program (the project). Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

A detailed project description is provided in Section 4 of the Construction Environmental Management Plan (CEMP).

1.2 Planning context

The Inland Rail – Albury to Illabo project (the project) is declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

An environmental impact statement (EIS) was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of the EP&A Act and the environmental assessment requirements of the Secretary of the (then) NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning, Housing and Infrastructure (DPHI)).

The EIS was placed on public exhibition from 17 August 2022 to 28 September 2022. During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by ARTC, and make a written submission to the DPE for consideration in its assessment of the proposal.

In accordance with section 5.17(6)(b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report (PIR) that provides further assessment of traffic and transport, noise and vibration, and air quality impacts. The PIR was also prepared to consider changes to the exhibited proposal that have arisen as a consequence of these further assessments and related submissions.

A modification report (Kemp Street Bridge Enhancement Site Modification, Inland Rail June 2025) was prepared to revise the replacement road and pedestrian, two bridge separated arrangement over the railway line at the Kemp Street bridge enhancement site in Junee to now provide a single structure.

1.3 Statutory context and approval

The Inland Rail – Albury to Illabo project was assessed as part of the following documents:

- Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022);
- Albury to Illabo Response to Submissions (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024);

- Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024);
- Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Albury to Illabo Kemp Street Bridge Enhancement Site Modification (June 2025);
- Albury to Illabo Kemp Street Bridge Enhancement Site Modification Clarification (July 2025);

Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment (August 2025). Together these documents are referred to as the Environmental Assessment Documentation (EAD).

Approval for the project under the EP&A Act was granted by the Minister for Planning on 8 October 2024. The Modification was approved by the delegate of the NSW Minister for Planning and Public Spaces on 13 August 2025.

1.4 Scope of this Stage C Plan

The scope of this Plan is to describe how potential noise and vibration impacts will be managed during Stage C construction of the project.

This Plan addresses the requirements of the EAD including incorporating the relevant updated mitigation measures (UMMs), and CoAs. SMART (Specific, Measurable, Achievable, Realistic and Timely) principles have been considered and applied during the preparation of this Plan which will be implemented for the duration of Stage C construction.

This Plan is applicable to all activities during Stage C construction of the project, including all areas where physical works will occur or areas that may otherwise be impacted by the construction works, and under the control of Martinus Rail. All Martinus Rail staff and sub-contractors are required to comply with and operate fully under the requirements of this Plan and related environmental management plans, over the full duration of the Stage C construction program.

Operational noise and vibration impacts, and operation measures do not fall within the scope of this CNVMP and therefore are not included within the processes contained within this CNVMP.

1.4.1 Staging

The Staging Report describes how the construction and operation of the project will be staged in accordance with CoA A9, A10 and A11. A staged approach has been primarily adopted for the project to prioritise critical activities that are reliant upon infrequent and fixed rail possessions. It overall de-risks the construction program for the project, enabling the project to be operational within the timeframe committed to by the NSW Government.

As required by CoA A14 and C16, a Construction Environmental Management Framework (CEMF) has been prepared to be consistent with the Staging Report. The CEMF has been prepared to facilitate the preparation and approval of CEMPs, Sub-plans, and construction monitoring plans (CMPs) during the construction phase of the project. It includes a guide to the general environmental, stakeholder and community management requirements which will be implemented during construction and provides a road map for environmental management documentation.

In accordance with CoA C16, the CEMF must be endorsed by the Environmental Representative (ER) and then submitted to the Planning Secretary (for approval) no later than one (1) month before the lodgement of any CEMP, CEMP Sub-plan, or Construction Monitoring Program.

This CNVMP has been prepared to be consistent with the Staging Report and the CEMF, as required by CoA A11 and A12, as well as C16.

Stage A

The Stage A CNVMP was approved by the Planning Secretary on 24 January 2025. The Stage A CNVMP was prepared to address management of potential noise and vibration impacts during construction of the first stage of the project, Stage A, as described in Section 2.1.2 of the Staging Report. This includes preparation activities for the March 2025 rail possession (Substage A1), the rail possession activities themselves (Substage A2), and post-possession activities (Substage A3). Stage A works were undertaken only at a select number of enhancement sites.

Stage B

The Stage B CNVMP was approved by the Planning Secretary on 24 June 2025. The Stage B CNVMP was prepared to address management of potential noise and vibration impacts during construction of the second stage of the project, Stage B.

Stage B, as described in Section 2.1.3 of the Staging Report included new locations and new construction activities such as culvert work, level crossing work and finishing work will also occur. Stage B construction included works at the following locations:

- Murray River bridge;
- Albury Station pedestrian bridge;
- Albury Yard clearances;
- Riverina Highway bridge;
- Billy Hughes bridge;
- Table Top Yard clearances;
- Culcairn pedestrian bridge;
- Culcairn Yard clearances;
- Henty Yard clearances;
- Yerong Creek Yard clearances;
- The Rock Yard clearances;
- Uranquinty Yard clearances;
- Pearson Street bridge;
- Cassidy Parade pedestrian bridge;
- Edmondson Street bridge – excluding the demolition of Edmondson Street bridge and implementation of associated traffic mitigation measures outlined in the Wagga Wagga Construction Traffic, Transport and Access Mitigation Report (CoA E136 and E137);
- Wagga Wagga Station pedestrian bridge;
- Wagga Wagga Yard clearances;
- Bomen Yard clearances;
- Harefield Yard clearances;
- Kemp Street bridge;
- Junee pedestrian bridge;
- Junee Yard clearances;
- Olympic Highway underbridge;
- Junee to Illabo clearances.

The Stage B CNVMP will be superseded by this Stage C CNVMP, once approved by the Planning Secretary and Stage C of construction commences. Any works that were commenced and not completed, or not yet commenced during Stage B of construction, will be undertaken during Stage C of construction.

Stage C

Staging is described further in Section 4.2 of the CEMP and in the CEMF and Staging Report. Stage C, as described in Section 2.1.4 of the Staging Report, will include traffic mitigation measures identified in the Wagga Wagga Construction Traffic, Transport and Access Mitigation Report and demolition of the existing Edmondson Street bridge and construction of the new Edmondson Street bridge.

Construction work during Stage C will generally include:

- Pre-construction activities that have not commenced before the approval of the CEMP;
- Utility and drainage works;
- Site establishment and operation;
- Traffic management and access, including material haulage;

- Clearing, grubbing and topsoil strip;
- Earthworks including preparation of pads and stockpiling;
- Track work including realignment and lowering;
- Rail bridge works;
- Road and pedestrian bridge works, including demolition;
- Pedestrian bridge works;
- Level crossing works;
- Gantry and signalling works;
- Finishing works.

This plan applies to the entirety of Stage C.

1.5 Interactions with other managements plans and strategies

This Plan has the following interrelationships with other management plans and documents:

- Community Communication Strategy (CCS) which details procedures and processes for community notification, consultation and complaints management;
- Construction Cultural Heritage Management Plan (CCHMP) provides details of heritage structures and items which are to be protected from vibration generated during the construction works;
- Example Sensitive Area Plans (SAPs) detailed in Appendix A8 of the CEMP which highlight sensitive environmental areas to be managed during construction;
- The Social Impact Management Plan (SIMP) which addresses the socio-economic impacts associated with all stages of the project;
- The Sustainability Management Plan (SuMP) which outlines the required sustainability goals and deliverables of the project, and how the Contractor intends to achieve these outputs during design, delivery and operation of the project under the Infrastructure Sustainability Council (ISC) rating system.

Where a reference to another document is made, this is assumed to be the most recent version, unless otherwise stated.

1.6 Consultation

1.6.1 Consultation for this Plan

In accordance with CoA C6(c), this CNVMP was prepared in consultation with the following councils:

- Albury City Council;
- Greater Hume Council;
- Wagga Wagga City Council;
- Lockhart Shire Council;
- Junee Shire Council.

Consultation with councils was undertaken during the development of the Stage A CNVMP. Greater Hume Shire, Wagga Wagga City Council and Lockhart Shire Council had no comments on the Stage A CNVMP. Junee Shire Council had various comments including on consultation, noise monitoring locations, clarity regarding hours of work and noise and vibration impacts.

Consultation was also undertaken during the development of the Stage B CNVMP. The CNVMP was provided to councils on 10/03/25 and the consultation period closed on 07/04/25. Reminders have been provided through emails and regular meetings. No feedback was provided by Wagga Wagga City Council on the Stage B CNVMP. Any comments received at a later date will be considered in subsequent revisions of the plan.

No further consultation was undertaken during the development of the Stage C CNVMP as the demolition of the Edmondson Street bridge was originally included in the scope of the Stage B CNVMP when the plan was provided to stakeholders.

The consultation report prepared for the Stage B CNVMP in accordance with CoA A8 outlines the location in which council's responses, where provided, have been addressed. A summary of consultation has been provided in Table 1.

TABLE 1: CONSULTATION SUMMARY – STAGE B

STAKEHOLDER	DATES	FEEDBACK PROVIDED	HOW ADDRESSED
Albury City Council	20/05/2025	Various comments were received from Albury City Council. No comments were relevant to the CNVMP.	N/A
Greater Hume Shire Council	23/04/2025	Confirmation that Council has no comments	N/A
Wagga Wagga City Council	N/A	Not received	N/A
Junee Shire Council	20/05/2025 29/05/2025	▪ Comments received 20/05/2025. ▪ Follow up meeting held on 29/05/2025. A summary of feedback received: ▪ No program of works has been provided for Stage B. ▪ Provide greater detail on the anticipated impacts of noise and noise treatments to be provided in Junee. Does Stage B include permanent noise management? There is community concern that there will be no permanent noise treatment. There is also concern as to whether a noise wall will be constructed. Could permanent noise treatments be implemented prior to construction? ▪ Only one noise monitoring location is identified in Junee in Appendix D. It does not seem logical that all noise assessments could be monitored from this point. Given the number of sensitive receivers in Junee, and the distance of rail works in Junee another noise monitoring point is essential. ▪ Clarify that out of hours works are proposed, as Section 5.3.1 states that works will be undertaken during approved standard hours. Confirm if works are planned for Sundays and public holidays and if so, for example during possessions, state when this will occur in the CNVMP. ▪ Clarify working hours with respect to noise versus vibration criteria which is states that daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am. This does not align with the standard construction hours of 7.00 am to 6.00 pm. ▪ Clarify timing, duration and extent of anticipated noise impacts for Junee and mitigations proposed. Clearly identify which sensitive receivers in Junee will be impacted and level of impact. ▪ Provide reasoning behind why at-property treatments are not being	▪ Stage B is expected to commence in the first quarter of FY2526. An indicative program has subsequently been provided to Council on 23/05/2025. ▪ The CNVMP provides a framework for the management of noise and vibration impacts during the construction of the project. It does not identify operational noise mitigation measures, which would be further detailed in the Operational Noise and Vibration Review (ONVR) Potential operational noise mitigation options are described in the PIR Appendix D Revised Technical Report 7 - Operational Noise and Vibration (Rail). Once design is sufficiently developed, the operational noise model will be re-run to determine which properties would require mitigation (as part of the ONVR). Any permanent noise treatments (including noise walls) that are identified as being required along the extent of the project, would be constructed during the Stage B works. ▪ Noise monitoring locations presented in Appendix D of the CNVMP are the background noise monitoring locations from the EAD. As described in Section 4.2, the background noise levels from the EIS were used to establish the construction noise management levels for the project. Noise monitoring regarding upcoming construction work associated with the project will be based on the predicted construction noise impacts as presented in the Construction Noise and Vibration Impact Statements (CNVIS). Section 7.1 has been updated to reflect this. ▪ Section 5.3.1 of the plan has been updated to refer to Section 5.3.3 which details the circumstances under which the project would work outside the approved standard working hours.

STAKEHOLDER	DATES	FEEDBACK PROVIDED	HOW ADDRESSED
		considered for properties at high risk of vibration impacts. Monitoring and waiting until the structures fail or complaints arise is a poor management approach. ▪ Explain why there are two periods defined for Out of Work Hours. How are impacts during these periods being minimised?	The exact proposed dates and time for works to be undertaken outside of standard construction hours will be subject to ongoing construction planning. ▪ Identification of daytime and night-time in Section 5.4.1 is relevant only to the vibration criteria. The notes for Table 15 and Table 16 have been updated to state that the hours are as per Table 2.2 of Assessing Vibration: A Technical Guideline. ▪ The anticipated extent of noise impact and any mitigation measures are provided as part of the CNVIS, which will be published on the project website prior to commencement of the subject works as discussed in Section 7.1. The latest endorsed CNVIS are available on the project website. [Mapping previously provided within the CNVMP has been removed, as the most relevant mapping is included in the CNVIS available on the project website, https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/] ▪ No modifications to buildings in advance of vibration inducing works are proposed. The CNVIS developed for each enhancement site identify where buildings are at risk for exceeding the vibration criteria. Where exceedances are possible, condition survey reports are required and vibration monitoring is undertaken during works. Monitoring will be undertaken during vibration inducing works and works will be modified if monitoring indicates the vibration levels are likely to, or do exceed the relevant cosmetic damage criteria. Potential vibration impacts and suitable mitigation measures are considered as part of the relevant CNVIS. Mitigation measures relevant to vibration are identified in Table 29, CNV-13 to CNV-17b. Refer particularly to CNV-17. ▪ Two out of hours periods are described in Section 1.6 of the Out of Hours Work Protocol (Appendix F of the CNVMP); period 1 being generally evenings and Sunday and public holiday day time periods; and period 2 being generally night time, including evenings on Sundays and public holidays. These out of hours periods help define the additional mitigation measures identified in Section 3.1

STAKEHOLDER	DATES	FEEDBACK PROVIDED	HOW ADDRESSED
			and Attachment 1 of the Out of Hours Work Protocol.
Lockhart Shire Council	04/04/25	General comment regarding provision of notifications to Lockhart Shire Council	Updates/notifications to be shared with Council. No updates required for this CNVMP.

In addition to consultation with key stakeholders, consultation has occurred in accordance with CoA C9(c) in order to highlight noise sensitive periods identified by the community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas and measures to ensure noise levels above the NMLs do not occur during sensitive periods for those identified receivers. A summary of the consultation outcomes is provided in Section 5.3.4.

1.6.2 Ongoing consultation during construction

Ongoing consultation between Martinus Rail, IRPL, other construction projects, stakeholders, the community and relevant agencies regarding the management of noise and vibration impacts on the environment will be undertaken during the construction of the project as required.

In accordance with CoA E76, noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs will not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution. The process for consultation is described the CCS.

Noise and vibration management information will be communicated to the community and stakeholders in accordance with the principles and procedures outlined in the CCS. The project will provide timely, accurate, relevant and accessible information about construction activities that may cause noise and vibration impacts, with provision for feedback through a complaints line during construction.

1.7 Endorsement and approval

In accordance with CoA A22(d) and CoA A27(e), this Plan will be submitted to the ER and the AA for endorsement prior to submission to the Planning Secretary for approval.

Construction will not commence until the relevant CEMP(s) and Sub-plans have been endorsed by the ER and approved by the Planning Secretary (as applicable and as identified in the CEMF approved under CoA C16), in accordance with CoA C15. The ER will consider the review comments and observations of the AA.

Additionally, the CEMP and CEMP Sub-plans, as endorsed by the ER and/or approved by the Planning Secretary as relevant, including any minor amendments approved by the ER, must be implemented for the duration of Stage C of construction.

2 PURPOSE

2.1 Purpose

The purpose of this CNVMP is to describe how potential noise and vibration impacts will be managed during construction of Stage C of the project.

2.2 Objectives

The key objective of this CNVMP is to ensure that impacts to the local community and the built environment from noise and vibration associated with the project are minimised. To aid in achieving this objective, this CNVMP incorporates the relevant noise and vibration management measures from the following sources:

- The project EAD;
- Inland Rail – Albury to Illabo Infrastructure Approval CoA (SSI-10055);
- All relevant legislation and other requirements described in Section 3 of this Plan.

As discussed further in Section 2.6, sustainability is integral to the project. The SuMP includes environment and heritage theme objectives and targets.

In addition to the above, a Social Impact Management Plan (SIMP) has been developed for the project. The SIMP identifies desired outcomes for the project, including that 'amenity impacts are minimised through monitoring, engagement and continuous improvement initiatives'. The implementation of this CNVMP supports the desired outcome through the implementation of the identified management measures and monitoring activities.

2.3 Targets

Targets for the management of noise and vibration impacts during the project include:

- Compliance with the relevant legislative requirements (CoAs);
- Compliance with the Environment Protection Licence (EPL) which applies to construction of the project;
- Be generally in accordance with the UMMs;
- Implementation of feasible and reasonable noise mitigation measures with the aim of achieving the construction noise affected NMLs detailed in the Interim Construction Noise Guideline (ICNG) (DECC, 2009);
- Implementation of feasible and reasonable vibration mitigation measures with the aim of achieving the vibration criteria outlined in Section 5.4;
- Minimising impacts on, and complaints from, the community and stakeholders.
- Sustainability target in relation to construction noise and vibration – No major exceedances of relevant noise guidelines during construction.

2.4 Performance outcomes

Performance outcomes identified in Chapter 27 of the EIS (Approach to mitigation and management) that are relevant to the management of noise and vibration during construction of the project are identified in Table 2.

TABLE 2: PERFORMANCE OUTCOMES (CONSTRUCTION NOISE AND VIBRATION)

PERFORMANCE OUTCOMES	HOW PERFORMANCE OUTCOME WILL BE ACHIEVED
Substantial construction noise impacts are predicted due to the extended hours proposed. Mitigation measures have been proposed to minimise the noise and vibration exceedance predicted at receivers, considering respites and alternative accommodation offers.	Implement this CNVMP, particularly the OOHW Protocol (Appendix F) as well as the management measures in Section 7 which have been developed to consider the requirements in Section 3.
Procedures for monitoring noise and vibration levels during construction would be developed and implemented during construction.	Undertake training, monitoring and inspections as summarised in Section 8.4.

2.5 SMART principles

This Plan has been developed with the consideration of SMART principles. This was achieved as follows:

- **Specific**: The measures listed this Plan are specific to noise and vibration management during construction. They include the development and implementation of plans and procedures tailored to address noise and vibration impacts, identification, and management of specific issues;
- **Measurable**: The document provides specific measures, requirements, and references that enable the evaluation and measurement of the effectiveness of each control measure. Monitoring program and reporting requirements are outlined, allowing for the assessment of noise and vibration impacts;
- **Achievable**: The control measures outlined in the document are practical and achievable within the construction context. They involve the implementation of plans, investigations, and management strategies that can be feasibly executed during the construction phase;
- **Relevant**: The measures are directly relevant to noise and vibration management during construction. They address potential impacts, such as those associated with out of hours work, work above the noise management level, and complaints management. These measures are designed to mitigate or prevent noise and vibration impacts;
- **Time-bound**: The document specifies when each measure should be implemented, such as prior to and during construction. It also assigns responsibilities to specific roles, indicating the timeline and accountability associated with each measure.

2.6 Infrastructure Sustainability Council requirements

Both Martinus Rail and IRPL are committed to ensuring the Project is designed and constructed with high levels of sustainability integrated throughout the project. Martinus Rail has developed and will implement a Sustainability Management Plan (SuMP) that is compliant with:

- Project Approvals
- Inland Rail Sustainability Strategy (0-0000-900-ESS-00-RP-0003);
- Specification - Inland Rail Sustainability Requirements – Albury to Parkes (3-0000-210-ESS-00-SP-0001);
- A2P Enhancement Projects Incentivised Target Cost Deed (ARTC Contract No. 2140-0001).

Martinus Rail will aim to achieve a certified minimum rating of ‘Excellent’ under the Infrastructure Sustainability Council (ISC) IS Technical Manual version 1.2. Further details are provided in the SuMP.

Targets for the management of noise and vibration impacts can be found in Section 2.3. Table 3 and Table 4 outline the relevant IS credits and where they are addressed in this plan or references external documents that fulfill the ISC credit criteria. See Appendix G for a detailed compliance table.

TABLE 3. ISC NOISE COMMITTMENTS

ISC NOISE COMMITMENT	WHERE ADDRESSED
Measures to mitigate noise during construction and operation have been identified and implemented	Section 7.11 Appendix B, Section 1.6.3
Monitoring of noise is undertaken at appropriate intervals and in response to complaints during construction	Section 8.2 Section 8.4.1 Appendix B, Section 4.1 CEMP Section 6.4.4
For construction, modelling and monitoring demonstrates no divergence from the noise management process in ISC approved noise guidelines	Section 3.2 Section 5.1 Section 7.2 Section 8.4 Appendix B, Section 1.6

ISC NOISE COMMITMENT	WHERE ADDRESSED
For operation, modelling demonstrates no exceedances of noise goals.	An ONVR will be prepared as required by CoA E89

TABLE 4. ISC VIBRATION COMMITTMENTS

ISC VIBRATION COMMITTMENT	WHERE ADDRESSED
Measures to mitigate vibration during construction and operation have been identified and implemented.	Section 7.3 Section 7.11 Appendix B, Section 1.6.3
Monitoring of vibration is undertaken at appropriate intervals and in response to complaints during construction.	Section 8.2 Section 8.4 Appendix B, Section 4.2
For construction, modelling and monitoring demonstrates no exceedances of vibration goals for structural damage to buildings and structures.	Section 7.1 Section 7.2 Section 7.5 Appendix B, Section 4.2
No physical damage has been caused to any buildings or structures by vibration caused by construction.	Section 7.5
For operation, modelling demonstrates no exceedances of vibration goals for human comfort criteria	An ONVR will be prepared as required by CoA E89

3 ENVIRONMENTAL REQUIREMENTS

3.1 Legislation

Legislation and regulations relevant to noise and vibration management includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Protection of the Environment Operations Act 1997* (POEO Act);
- Protection of the Environment Operations (Noise Control) Regulation 2017.

A register of legal requirements for the project is contained in Appendix A1 of the CEMP.

3.2 Guidelines and standards

The main guidelines, specifications, and policy documents relevant to this Plan include:

- Environmental Management Plan Guideline – Guideline for Infrastructure Projects (DPIE, April 2020);
- Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment (Version 3) (2020);
- Australian Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors;
- Department of Infrastructure, Planning and Natural Resources Guideline for the Preparation of Environmental Management Plans (DIPNR, 2004);
- Inland Rail NSW Noise and Vibration Management Strategy (IRPL NVMS) (01-9000-PE-P11-ST-0003-V3.3) (ARTC, 2016);
- Inland Rail NSW Construction Noise and Vibration Framework (IRPL CNVF) (0-0000-902-EMN-00-SP-0001_2) (ARTC, 2023);
- Environmental Management Plan Guideline – Guideline for Infrastructure Projects (DPHI, April 2020);
- Interim Construction Noise Guideline (ICNG), Department of Environment and Climate Change 2009;
- Inland Rail Sustainability Strategy (0-0000-900-ESS-00-RP-0003);
- Inland Rail Sustainability Requirements – Albury to Parkes, sustainability requirements specified in 3-0000-210-ESS-00-SP-0001.

3.3 Minister's Conditions of Approval

The requirements of the CoA relevant to the development of this Plan are shown in Table 5. These are defined as primary CoA and are specifically related to the development of this Plan. Secondary CoA relevant to, but not specific to the development of this Plan, have been listed in Appendix A.

A cross reference is also included to indicate where the CoA is addressed in this Plan or other project management document.

TABLE 5: PRIMARY COA RELEVANT TO THIS PLAN

NO.	REQUIREMENT	WHERE ADDRESSED
C4	Where a CEMP (and relevant CEMP Sub-plans) requires Planning Secretary's approval, the CEMP (and relevant CEMP Sub-plans) must be endorsed by the ER and then submitted to the Planning Secretary for approval no later than one (1) month before the commencement of construction, or where construction is staged, no later than one (1) month before the commencement of each stage.	This CNVMP Section 1.7
C6	Except as provided by Condition C16 the following CEMP Sub-plans must be prepared and implemented in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any	This CNVMP Section 1.6.1

NO.	REQUIREMENT	WHERE ADDRESSED
	submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition A8. **Required CEMP Sub-plan** / **Relevant government agencies to be consulted for each CEMP Sub-plan** (c) Noise and vibration — Relevant councils	Consultation Report
C7	The CEMP Sub-plans must state how:	-
	a) the environmental performance outcomes identified in the documents listed in Condition A1 will be achieved;	Section 2.4 Section 1.3
	b) the mitigation measures identified in the documents listed in Condition A1 will be monitored and implemented;	Section 3 Section 7 Appendix A
	c) the relevant terms of this approval will be complied with; and	Section 3 Section 7 Appendix A
	d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 1.5 Section 2.5 Section 7 Section 9 Table 29Appendix B
C8	The Construction Traffic, Transport and Access Management (CTTAMP) Sub-plan must be consistent with any agreements with the relevant roads authority about the use and management of roads and include measures to: d) minimise noise and amenity impacts of heavy vehicles entering and exiting construction compounds, borrow sites and other ancillary sites, and driving through populated areas, including school zones at speed limited times;	Construction Traffic, Transport and Access Management Plan Section 6.2 and 6.9
C9	The Construction Noise and Vibration Sub-plan must include, but not limited to: a) measures to reduce construction to standard ICNG hours where sensitive land uses are likely to be noise affected for more than 3 months;	Section 5.3.4 Section 7.10 Table 29
	b) an approach to assess and manage construction fatigue from noise impacts on sensitive receivers on an ongoing basis;	Section 7 Section 8.2 Table 29
	c) noise sensitive periods identified by the community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas and measures to ensure noise levels above the NMLs do not occur during sensitive periods in accordance with Condition E76;	Section 1.6 Section 8.2 Table 29

NO.	REQUIREMENT	WHERE ADDRESSED
	d) mitigation for construction traffic noise impacts from additional construction traffic and road diversions;	Table 29
	e) the location of all heritage items, non-heritage structures and infrastructure likely to be impacted by vibration and measures to manage vibration impacts at those items and structures; and	Appendix E
	f) vibration levels at a range of distances from vibration intensive equipment such as excavators and vibratory rollers before undertaking works with the specific type and size of equipment.	Section 7
C15	Construction must not commence until the relevant CEMP(s) and CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER, (as applicable and as identified in the CEMF approved under Condition C16). The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where the CSSI is being staged, construction of that stage is not to commence until the relevant CEMP and Sub-plans have been endorsed by the ER and approved by the Planning Secretary or ER.	Section 1.4 Section 1.7
E68	A detailed land use survey must be undertaken to confirm sensitive land use(s) (including critical working areas such as operating theatres and precision laboratories) potentially exposed to construction noise and vibration, construction ground-borne noise and operational noise. The survey may be undertaken on a progressive basis but must be undertaken in any one area before the commencement of work which generates construction or operational noise, vibration or ground-borne noise in that area. The results of the survey must be included in the Noise and Vibration CEMP Sub-plan required by Condition C8.	Appendix D
E72	An Out-of-Hours Work Protocol must be prepared to identify a process for the consideration, management and approval of work which is outside the hours defined in Conditions E69, and that are not subject to an EPL. The Protocol must be approved by the Planning Secretary before commencement of the Out-of-Hours Work. The Protocol must be prepared in consultation with the ER, AA and EPA. The Protocol must include: a) identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where: i. the ER and AA review all proposed out-of-hours activities and confirm their risk levels, ii. low risk activities can be approved by the ER in consultation with the AA, and iii. high risk activities that are approved by the Planning Secretary; b) a process for the consideration of out-of-hours work against the relevant NML and vibration criteria; c) a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods. The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive land use(s) would be exposed to, including the number of noise awakening events;	Appendix F

NO.	REQUIREMENT	WHERE ADDRESSED
	d) procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and e) notification arrangements for affected receivers for approved out-of-hours work and notification to the Planning Secretary of approved low risk out-of-hours works. This condition does not apply if the requirements of Condition E71 are met.	
E73	Except as permitted by an EPL, out-of-hours work that may be regulated through the Out-of-Hours Work Protocol as per Condition E72, but is not limited to: a) Carrying out work that if carried out during standard hours would result in a high risk to construction personnel or public safety based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2009: "Risk management; or b) where the relevant roads authority has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to road network performance and a road occupancy licence will not be issued; or c) where the relevant utility service operator has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to the operation and integrity of the utility network; or d) work undertaken in a rail possession for operational or safety reasons. Note: Other out-of-hours works can be undertaken with the approval of an EPL, or through the project's Out-of-Hours Work Protocol for works not subject to an EPL.	Appendix F
E74	Mitigation measures must be implemented with the aim of achieving the following construction noise management levels and vibration objectives: a) construction 'Noise affected' NMLs established using the Interim Construction Noise Guideline (DECC, 2009); b) vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure); c) Australian Standard AS 2187.2 - 2006 "Explosives - Storage and Use - Use of Explosives"; d) BS 7385 Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2" as they are "applicable to Australian conditions"; and e) the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration- effects of vibration on structures (for structural damage). Work that exceeds the noise management levels and/or vibration criteria must be managed in accordance with the Noise and Vibration CEMP Sub-plan. *Note: The ICNG identifies 'particularly annoying' activities that require the addition of 5 dB(A) to the predicted level before comparing to the construction NML.*	Section 5
E75	Mitigation measures must be applied when the following residential ground-borne noise levels are exceeded: a) evening (6:00 pm to 10:00 pm) — internal LAeq(15 minute): 40 dB(A); and b) night (10:00 pm to 7:00 am) — internal LAeq(15 minute): 35 dB(A). The mitigation measures must be outlined in the Noise and Vibration CEMP Sub-plan, including in any Out-of-Hours Work Protocol, required by Condition E72.	Section 5.2.6 Section 7 Table 29Appendix F

NO.	REQUIREMENT	WHERE ADDRESSED
E119	The Proponent must coordinate work with adjoining Inland Rail Projects, including any work to relocate or connect utilities, to minimise cumulative and consecutive noise and vibration impacts and maximise respite for affected sensitive land uses. Coordination and mitigation measures must be detailed in the Construction Noise and Vibration management Sub-plan required by Condition C9.	Section 7.9
E120	Before commencement of any work, a structural engineer must undertake condition surveys of all buildings, structures, utilities and the like identified in the documents listed in Condition A1 as being at risk of damage. The results of the surveys must be documented in a Condition Survey Report for each item surveyed. Copies of Condition Survey Reports must be provided to the owners of the items surveyed, and no later than one (1) month before the commencement of construction.	Section 7.5
E121	After completion of construction, condition surveys of all items for which condition surveys were undertaken in accordance with Condition of this approval must be undertaken by a structural engineer. The results of the surveys must be documented in a Condition Survey Report for each item surveyed. Copies of Condition Survey Reports must be provided to the landowners of the items surveyed, and no later than three (3) months following the completion of construction.	Section 7.5
E122	Property damage caused directly or indirectly (for example from vibration or from groundwater change) by the construction or operation must be rectified at no cost to the owner. Alternatively, compensation may be provided for the property damage as agreed with the property owner.	Section 7.5

Acoustic Advisor (AA)

In accordance with CoA A24, a suitably qualified and experienced Acoustics Advisor(s) (AA) in noise and vibration management, who is independent of the design and construction personnel, must be nominated by the Proponent and engaged for the duration of construction of the project. Construction must not commence until an AA has been approved by the Planning Secretary no later than one (1) month before commencement of construction.

The AA was approved by the Planning Secretary on 25 October 2024.

In accordance with CoA A27, the approved AA must:

a) Receive and respond to communication from the Planning Secretary in relation to the performance of the CSSI in relation to noise and vibration;
b) Consider and inform the Planning Secretary on matters specified in the terms of this approval relating to noise and vibration;
c) Consider and recommend to the Martinus Rail and IRPL, improvements that may be made to avoid or minimise adverse noise and vibration impacts;
d) Review proposed night-time works to determine if sleep disturbance would occur and recommend measures to avoid sleep disturbance or appropriate additional alternative mitigation measures;
e) Review noise and vibration documents required to be prepared under the terms of this approval, and should they be consistent with the terms of this approval, endorse them before submission to the Planning Secretary (if required to be submitted to the Planning Secretary) or before implementation (if not required to be submitted to the Planning Secretary);
f) Regularly monitor the implementation of all noise and vibration documents required to be prepared under the terms of this approval to ensure implementation is in accordance with what is stated in the document(s) and the terms of this approval;
g) Reporting of noise and vibration incidents notified by the Martinus Rail and IRPL in accordance with CoA A36 and A38 of this approval;
h) In conjunction with the ER, the AA must:
i. As may be requested by the Planning Secretary or Community Complaints Mediator (required by CoA B14), help plan, attend or undertake audits of noise and vibration management of the CSSI including briefings, and site visits,

ii. In the event that conflict arises between Martinus Rail and IRPL and the community in relation to the noise and vibration performance of the CSSI, follow the procedure in the CCS approved under CoA B2 to attempt to resolve the conflict, and if it cannot be resolved, notify the Planning Secretary,

iii. Consider relevant minor amendments made to the Ancillary Site Establishment Management Plan, CEMP, relevant sub-plans and noise and vibration monitoring programs that require updating or are of an administrative nature, and are consistent with the terms of this approval and the management plans and monitoring programs approved by the Planning Secretary and, if satisfied such amendment is necessary, endorse the amendment, (this does not include any modifications to the terms of this approval),

iv. Prepare and submit to the Planning Secretary and other relevant regulatory agencies, for information, a Monthly Noise and Vibration Report detailing the AA's actions and decisions on matters for which the AA was responsible in the preceding month. The Monthly Noise and Vibration Report must be submitted within seven (7) days following the end of each month for the duration of the AA's engagement for the CSSI, or as otherwise agreed by the Planning Secretary.

In accordance with CoA A26, Martinus Rail and IRPL will cooperate with the AA by:

a) Allowing for attendance at noise and vibration monitoring activities;
b) Providing for review of noise and vibration plans, assessments, monitoring reports, data and analyses required to be prepared under the conditions of this approval;
c) Providing the complaints register on a weekly basis where complaints have been received, or as otherwise requested; and
d) Considering any recommendations to improve practices and demonstrating, to the satisfaction of the AA, why any recommendation is not adopted.

3.4 Updated Mitigation Measures

The primary and secondary requirements of the UMMs presented in the EAD relevant to the development of this Plan are shown in Table 6. Secondary UMMs not specifically related, but relevant to this Plan and have been listed in Appendix A. A cross reference is also included to indicate where the UMMs is addressed in this Plan for other project management documents.

TABLE 6: PRIMARY UMMS RELEVANT TO THE DEVELOPMENT OF THIS PLAN

NO.	REQUIREMENT	TIMING	WHERE ADDRESSED
NV5	A construction noise and vibration management plan (CNVMP) will be prepared and implemented as part of the CEMP, in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework. The plan will outline measures, processes and responsibilities to manage and monitor noise and vibration, and minimise the potential for impacts during construction. This plan will include all feasible and reasonable mitigation measures: - construction noise and vibration criteria for the proposal - the location of sensitive receivers - specific management measures for activities that could exceed the construction noise and vibration criteria - OOH protocol - procedures for monitoring noise and vibration levels during construction - community and stakeholder engagement measures in accordance with the communication management plan.	Pre-construction / construction	This Plan Appendix B Appendix F
NV8	An OOH work protocol will be developed as part of the CNVMP to define the process for considering, approving and managing OOH work, including implementation of feasible and reasonable measures and communication requirements. Measures will be aimed at proactive communication and engagement with potentially affected receivers, provision of respite periods and/or alternative accommodation for defined exceedance levels.	Construction	Appendix F

NO.	REQUIREMENT	TIMING	WHERE ADDRESSED
	All work outside the primary proposal construction hours will be undertaken in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework and in accordance with the OOH work protocol. The protocol will provide guidance for the preparation of OOH work plans for each construction work location and for key works. OOH work plans will be prepared in consultation with key stakeholders (including the NSW Environment Protection Authority (EPA)) and the community, and incorporated into the CNVMP. Respite will be considered in accordance with section 3.2.2 of the Inland Rail NSW Construction Noise and Vibration Management Framework.		

3.5 EPL No. 21984

The A2I project is subject to EPL 21984 as a Scheduled Activity for 'railway activities - railway infrastructure construction'. The EPL includes clauses requiring the licensee to minimise noise and vibration impacts at residences and other sensitive land uses. The EPL sets out various conditions relating to noise and vibration, which are presented in Table 7.

TABLE 7: EPL CONDITIONS

CONDITION	REQUIREMENT	WHERE ADDRESSED
L2 Noise limits		
L2.1	The licensee must minimise noise and vibration impacts at residences and other sensitive land uses. To meet the requirements of this condition the licensee must:	This Plan, particularly Section 7
	a) implement the guidance in the Interim Construction Noise Guideline (DEC, 2009) and the Assessing Vibration: a technical guideline (DEC, 2006);	Section 3.2 Section 5.1 Section 5.4
	b) implement all reasonable and feasible measures to minimise noise impacts in accordance with the Interim Construction Noise Guideline (DEC, 2009); and	Section 7
	c) implement vibration mitigation in accordance with the Assessing Vibration: a Technical Guideline (DEC, 2006).	Section 7
	In this condition, 'reasonable' and 'feasible', in relation to noise management, have the same meaning as defined in the Interim Construction Noise Guideline (DEC, 2009).	Noted
L2.2	When construction activities include 'High Noise Impact Activities and Works' as defined in the special dictionary in this licence, quantitative construction noise assessments must apply a +5dB correction to the measured or predicted level of construction noise at the nearest Noise Sensitive Receiver location before assessment against the Interim Construction Noise Guideline (DECC, 2009) noise management levels.	CNVIS (available on the project website: https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/)

CONDITION	REQUIREMENT	WHERE ADDRESSED
L3 Blasting		
L3.1	All blasting activities are prohibited on the licensed premises.	No blasting is proposed.
L4 Hours of operation		
L4.1	Standard construction hours Unless permitted by another condition of this licence, works and activities must: a) only be undertaken between the hours of 7:00 am and 6:00 pm Monday to Friday; b) only be undertaken between the hours of 7:00 am and 6:00 pm Saturday; and c) not be undertaken on Sundays or Public Holidays.	Section 5.3.1 Note: An EPL s.58 variation to align with the standard construction hours (Saturday start time) was issued 20 May 2025 as reflected in the standard construction hours.
L4.2	High Noise Impact Works Unless permitted by another condition of this licence, any high noise impact works and activities must only be undertaken: a) between 8:00 am and 6:00 pm Monday to Friday; b) between 8:00 am and 1:00 pm Saturday; and c) if high noise impact works are to be conducted continuously and the location of the works means that it is likely to impact the same receivers, then the works must be conducted in continuous blocks of no more than 3 hours, with at least a 1-hour respite between each block of continuous high noise impact work; except as expressly permitted by another condition of this licence. Note: For the purposes of this condition 'continuous' includes any period where there is a less than 1-hour respite between ceasing and recommencing of any work that is subject to this condition.	Section 5.3
L4.3	Exemptions to standard construction hours for low noise impact works Works and activities may be carried on outside of standard construction hours specified in condition L4.1 if the works and activities do not cause, when assessed at the boundary of the most affected Noise Sensitive Receiver: a) LAeq (15 minute) noise levels greater than 5dB above the day, evening and night Rating Background Level (RBL) as applicable; b) LAmax noise levels greater than 15dB above the night RBL for night works; c) the preferred continuous or impulsive vibration values greater than those for human exposure to vibration, set out for residences in Table 2.2 in Assessing Vibration: a technical guideline (DEC, 2006); and	Section 5.3.3

CONDITION	REQUIREMENT	WHERE ADDRESSED
	d) the preferred intermittent vibration values greater than those for human exposure to vibration, set out for residences in Table 2.4 in Assessing Vibration: a technical guideline (DEC, 2006). For the purposes of this condition, the RBLs are those contained in an environmental assessment for the activities subject to this licence prepared under the Environmental Planning and Assessment Act 1979. Alternatively, the licensee may use another RBL determined in accordance with the Noise Policy for Industry (EPA, 2017) and provided to the EPA prior to carrying out any works or activities under this condition. Note: The notification requirements under condition L4.5 do not apply to this condition.	
L4.4	Exemptions to standard construction hours in exceptional circumstances a) The licensee may undertake works and activities outside of standard construction hours specified in condition L4.1 for: i. emergency works required to avoid the loss of life or property, or to prevent material harm to the environment; and ii. the delivery of oversized plant, structures or materials determined by the police or other authorised authorities to require special arrangements to transport along public roads. b) The licensee must, on becoming aware of the need to undertake emergency works under this condition notify the EPA's Environment Line as soon as practicable and submit a report to the EPA by 4:00 pm on the next business day after the emergency works commenced that describes: i. the cause, time and duration of the emergency; ii. action taken by or on behalf of the licensee in relation to the emergency; and iii. details of any measures taken or proposed to be taken by the licensee to prevent or mitigate against a recurrence of the emergency. For the purposes of this condition, 'material harm to the environment' has the same meaning as in section 147 of the POEO Act. Note: Emergency works do not require a notification under condition L4.5.	Section 5.3.3
L4.5	Works outside of standard construction hours - Notification The licensee must notify potentially affected Noise Sensitive Receivers of works outside of standard construction hours unless notification under this condition is not required as specified in another condition of this licence. a) The notification must: i. be given not less than 5 calendar days and not more than 14 calendar days before those works are to be undertaken, unless otherwise agreed with the affected community and notified to the EPA;	Section 8.1

CONDITION	REQUIREMENT	WHERE ADDRESSED
	ii. be undertaken by letterbox drop, email, text message or other targeted and equivalent method; and iii. be detailed on the project website or other relevant website notified to the EPA. b) The notification required by this Condition must: i. clearly outline the reason that the work is required to be undertaken outside the hours specified in condition L4.1; ii. include a diagram that clearly identifies the location of the proposed works in relation to nearby cross streets and local landmarks; iii. include details of the date, timing and relevant time restrictions that apply to the proposed works; iv. clearly outline in plain English, the location, nature, scope and duration of the proposed works; v. detail the expected noise impact of the works on Noise Sensitive Receivers; vi. clearly state how complaints may be made and additional information obtained; vii. include the number of the telephone complaints line required by condition M5.1, an after hours contact phone number specific to the works undertaken outside the hours specified in condition L4.1, and the project website address; and viii. include consideration of culturally and linguistically diverse Noise Sensitive Receivers where required.	
L4.6	Works outside of standard construction hours Under this condition, works and activities may be undertaken outside of standard construction hours specified in condition L4.1 and L4.2, but only if they are required in relation to one or more of the following: a) carrying on those works and activities during standard construction hours would result in a high risk to construction personnel or public safety, based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2018 "Risk Management"; b) the Relevant Road Network Operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to road network operational performance; c) a relevant utility service operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to the operation and integrity of the utility network; d) the TfNSW Transport Management Centre (or other road authority) have refused to issue a road occupancy licence during standard construction hours; or e) ARTC (or other rail authority) requires a rail possession for the activities to be performed outside of standard construction hours.	Section 5.3.3

CONDITION	REQUIREMENT	WHERE ADDRESSED
M2 Environmental monitoring		
M2.1	All noise and vibration monitoring for the purposes of determining compliance with the conditions of this licence must be undertaken by a suitably qualified Person.	Section 4.1 of Appendix B – Construction Noise and Vibration Monitoring Program
M2.2	All vibration monitoring must be: a) undertaken in accordance with the technical guidance provided in the Assessing Vibration: a technical guideline (DEC, 2006); and b) assessed and reported against the acceptable and maximum values of human exposure to vibration set out in Tables 2.2 and 2.4 of this guideline.	Section 1.1.6 and Section 3 of Appendix B – Construction Noise and Vibration Monitoring Program
M2.3	The licensee must undertake noise and vibration monitoring as directed by an authorised officer of the EPA. Where the monitoring is requested to take place on private land (for example a residential property) the licensee must request permission to access the premises in advance and keep a record of permission requests and responses. If a licensee is unable to obtain permission, the licensee must undertake the monitoring at an indicative location where possible and they must provide the response (including any nil response) to the EPA.	Section 4.1 and Section 4.2 of Appendix B – Construction Noise and Vibration Monitoring Program
M2.4	All noise monitoring for the purposes of determining compliance with the conditions of this licence must consider and be generally undertaken in accordance with; (a) Australian Standard AS 1055: 2018 Acoustics - Description and measurement of environmental noise; and (b) the compliance monitoring guidance provided in the chapter 7 'Monitoring Performance' of the Noise Policy for Industry (EPA, 2017).	Section 4.1 of Appendix B – Construction Noise and Vibration Monitoring Program
M5 Telephone complaints line		
M5.7	Noise and Vibration Complaints a) the licensee must commence investigation of noise and vibration complaints: i. within two hours of the complaint being made; or ii. in accordance with any documented complaint management agreement between the licensee and the complainant. b) the licensee must offer to the complainant to undertake attended noise or vibration monitoring at their premises if: i. any investigation referred to in this condition identifies works or activities being undertaken on the licensed premises as the likely source of the complaint; and ii. the licensee is not in possession of noise monitoring data representative of the complainants location and of the subject works and activities being undertaken on the licensed premises. c) if the occupant of the dwelling or management personnel of a Noise Sensitive Receiver (other than a dwelling) accepts the	Section 8.2

CONDITION	REQUIREMENT	WHERE ADDRESSED
	offer of attended noise or vibration monitoring the licensee must undertake that attended monitoring: i. as soon as practicable; or ii. at a time agreed with the complainant. d) The licensee must, in respect of each complaint made, advise each complainant of the results of its investigation of their complaint and any proposed remedial action within a reasonable period of time.	
G3 Other general conditions		
G3.1	The licensee must ensure all personnel and contractors involved in undertaking any activity subject to this licence that has the potential to impact Noise Sensitive Receivers has received environmental induction training relevant to their role prior to undertaking that activity.	Section 8.3
G3.2	The induction training must: a) clearly identify the location of all noise sensitive receivers likely to be affected by noise or vibration generated during the course of the work undertaken by those personnel; and b) highlight the licence requirements to minimise noise and vibration impacts on Noise Sensitive Receivers.	Section 8.3
E1 Community Agreements		
E1.1	The licensee may work outside standard construction hours (as defined in L4.1) in circumstances other than those permitted under conditions L4.3, L4.4, or any other condition of this licence if the Licensee: a) undertakes community consultation and agreement as described in E1.2; b) submits to the EPA a written request to work outside the standard construction hours attaching information set out in E1.3; and c) obtains approval by the EPA to work outside standard construction hours. The EPA may, in exercising its discretion to approve the works outside standard construction hours, review whether the licensee has obtained community agreement. Specifically, whether a substantial majority of the individual Noise Sensitive Receivers who together comprise the Community Affected Catchments and were contacted has consented to the planned works out of standard hours	Section 5.3.3
E1.2	Any community consultation and agreement undertaken with respect to the proposed out of hours works (OOHW) must: a) be prepared and implemented in accordance with the Interim Construction Noise Guidelines (DEC 2009), the Noise Policy for Industry (EPA, 2017) and AS2436-2010: Guide to noise and	Section 5.3.3

CONDITION	REQUIREMENT	WHERE ADDRESSED
	vibration control on construction, demolition and maintenance sites; b) include consultation of all noise sensitive receivers within the Community Affected Catchments. This includes Noise Sensitive Receivers that have declined to participate in previous agreements unless a community member has explicitly requested not to be involved in any future consultation about future OOHW; c) ensure that the noise sensitive receivers understand the nature of the works and any predicted impacts, including that consideration is made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers, and include details for interpreting services for languages other than English where required; d) include in the community consultations with Noise Sensitive Receivers the following information: i. the actual works proposed; ii. any expected impacts in clear, plain English based on noise modelling; iii. the expected duration of the works; iv. any expected benefits for receivers; v. any other known concurrent OOHW that will be occurring; and vi. any other OOHW that will be occurring on the nights preceding and following the proposed works or, if the proposed work precedes or follows a weekend period, any other OOHW that will be occurring on the weekend; e) request consent from the Noise Sensitive Receiver for their responses to be provided to the EPA; f) ensure that a record is kept when a licensee is unable to contact a noise sensitive receiver after three attempts, including leaving "sorry I missed you" cards explaining the reason for the visit and requesting a return phone call; and g) demonstrate, where the OOHW is predicted to go on longer than 28 calendar days, that the licensee has consulted the community in relation to re-engagement periods for the purpose of determining agreement from the community is maintained and continuing. Detailed records are to be maintained by the licensee of all community consultations, including attempts to contact Noise Sensitive Receivers, and must be maintained for the duration of the licence. Any Noise Sensitive Receiver who requests a copy of the record of conversations must be supplied with one.	
E1.3	The licensee must report to the EPA the community consultation and agreement process that was undertaken with the Community Affected Catchments. This report to the EPA must be:	Section 5.3.3

CONDITION	REQUIREMENT	WHERE ADDRESSED
	a) prepared in writing; b) detail the steps taken to fulfil the requirements of condition E1.2; c) demonstrate that the Noise Sensitive Receivers understood the nature of the works and any predicted impacts, including that consideration was made of additional requirements relevant to the needs of culturally and linguistically diverse Noise Sensitive Receivers; d) provide the script used during the community consultation with Noise Sensitive Receivers; e) report community response and consent rates (including where no contact could be made) against the total community affected catchments, and must be broken down into response and consent rates based on sub-catchments that are delineated by affectation levels; f) include a noise validation monitoring plan as required by E2.1; and g) be submitted to the EPA at least 15 business days prior to any works that are the subject of the agreement being undertaken unless prior arrangements have been made with the EPA. A copy of the report must be: a) kept by the licensee for the duration of this licence including on the premises, and made available to an EPA authorised officer on request; and b) be made available on the licensee's project website or another website approved in writing by the EPA for the duration of the OOHWs permitted under condition E1.1. (Personal details of Noise Sensitive Receivers must be omitted).	
E2 Noise validation monitoring		
E2.1	A noise validation monitoring plan must be submitted to the EPA for approval as part of the community agreement documentation prior to any OOHW occurring.	Section 5.3.3
E2.2	Validation monitoring must be undertaken for any OOHW that are the approved under condition E1.1 and must: a) be undertaken in accordance with the monitoring plan prepared under condition E2.1; b) be performed by a Competent Person; c) be performed on at least the first 2 occasions (day, evening, nights) where OOHW will be undertaken and are likely to impact Noise Sensitive Receivers; d) be performed on any other occasion (day, evening, night) where the nature of the works is likely to cause greater noise impacts than the first 2 occasions; e) be representative of the impacts in terms of monitoring locations, time and duration of measurements; and	Section 5.3.3

CONDITION	REQUIREMENT	WHERE ADDRESSED
	f) be recorded and provided to an EPA officer upon request	
E2.3	If validation monitoring undertaken under Condition E2.2 shows that noise levels are higher than those predicted by any noise modelling undertaken as part of the community agreement, work practices must be modified immediately so that measured noise levels do not exceed predicted levels. Where it has been determined that works cannot be modified to achieve the predicted noise levels: a) the licensee must report immediately to the EPA; and b) after considering the circumstances EPA may withdraw its permission under E1.1	Section 5.3.3
E3 Ongoing community engagement and agreement		
E3.1	a) For any approval of OOHW under E1.1 predicted to take longer than 28 calendar days to remain valid, the licensee must be able to demonstrate agreement from the community is maintained and continuing. b) To demonstrate agreement from the community is maintained and continuing the licensee must: i. engage the community to determine if a substantial majority of Noise Sensitive Receivers continue to consent to the OOHW pursuant to the re-engagement period determined under condition E1.2(d); ii. provide the EPA with a report within 7 calendar days of the end of each re-engagement period summarising the community response including ongoing consent rates of the Noise Sensitive Receiver; and c) Where the licensee is unable to demonstrate a substantial majority of agreement from Community Affected Catchment is maintained and continuing: i. the licensee must report immediately to the EPA; and ii. after considering the circumstances EPA may withdraw its permission under E1.1.	Section 5.3.3

4 EXISTING ENVIRONMENT

This section summarises the existing noise and vibration environment within and adjacent to the project. The key reference documents include:

- Chapter 15 of the EIS (Noise and Vibration);
- EIS Technical Paper 6 (Noise and Vibration (Non-Rail));
- EIS RtS Appendix G (Noise and Vibration (Non-Rail));
- PIR Appendix G (Noise and Vibration (Non-Rail));
- Section 6.4 and Appendix F of the Kemp Street Bridge Enhancement Site Modification Report (Construction Noise and Vibration)
- Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment (August 2025).

As above, the information described in the subsequent sections is primarily based on the EAD. Project changes, considered and assessed through consistency assessments, and construction noise and vibration impact statements ((CNVIS), refer to Section 7.1) are available on the project website and describe the most up-to-date, endorsed / approved impacts.

4.1 Sensitive receivers and noise catchment areas

Noise catchment areas (NCAs) have been defined as part of the EIS to classify groups of sensitive receivers that are likely to have a similar existing noise environment and experience similar impacts from the proposal. The NCAs are delineated by landmark features, such as roads, to encompass groupings of sensitive receivers with similar background noise environments. This was determined through reference to aerial imagery and land-use maps and verified during the noise monitoring program that was undertaken for the EAD. NCAs are shown in Appendix D.

A total of 24,936 noise sensitive receivers considered relevant to A2I were identified within the EAD. A breakdown of the number of sensitive receivers by precinct and NCA is provided in Table 8.

TABLE 8: SUMMARY OF NOISE SENSITIVE RECEIVERS IDENTIFIED IN THE EAD

NCA / PRECINCT	RESIDENTIAL	EDUCATION	MEDICAL	COMMERCIAL	INDUSTRIAL	ACTIVE RECREATION	PASSIVE RECREATION	PLACE OF WORSHIP	TOTAL
Albury Precinct	**7,045**	**89**	**9**	**575**	**481**	**73**	**32**	**13**	**8,306**
NCA01	622	2	0	103	172	25	22	3	946
NCA02	6,267	82	9	471	249	48	10	10	7,138
NCA03	13	0	0	0	57	0	0	0	70
NCA04	143	5	0	1	3	0	0	0	152
Greater Hume – Lockhart Precinct	**1,601**	**40**	**5**	**73**	**56**	**29**	**7**	**16**	**1,827**
NCA05	571	21	4	22	23	4	1	3	649
NCA06	511	9	1	31	14	10	5	7	588

NCA / PRECINCT	RESIDENTIAL	EDUCATION	MEDICAL	COMMERCIAL	INDUSTRIAL	ACTIVE RECREATION	PASSIVE RECREATION	PLACE OF WORSHIP	TOTAL
NCA07	78	1	0	2	6	12	0	3	102
NCA08	441	9	0	18	13	3	1	3	488
Wagga Wagga Precinct	**11,062**	**116**	**21**	**750**	**631**	**79**	**16**	**27**	**12,702**
NCA09	326	8	0	5	8	2	0	6	355
NCA10	5,675	45	9	161	205	40	0	6	6,141
NCA11	4,950	63	12	584	245	37	16	15	5,922
NCA12	111	0	0	0	173	0	0	0	284
Junee Precinct	**1,871**	**27**	**1**	**70**	**113**	**17**	**0**	**4**	**2,103**
NCA13	9	0	0	0	5	0	0	0	14
NCA14	1,741	17	1	69	88	15	0	4	1,935
NCA15	121	10	0	1	20	2	0	0	154
Total receivers	**21,579**	**272**	**36**	**1,468**	**1,281**	**198**	**55**	**60**	**24,936**

In addition to these sensitive receivers (also known as sensitive land uses), the EAD identified streets and geographical areas containing noise sensitive receivers at each enhancement site. These receivers are summarised in Table 9.

TABLE 9: EAD – IDENTIFIED NOISE SENSITIVE AREAS BY PRECINCT AND ENHANCEMENT SITE

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
ALBURY PRECINCT			
Murray River bridge			
Abercorn Street, Kiewa Street, Plummer Street and Olive Street	Residential	North	24
S&K Francis Engineering	Industrial	North	240
Albury Station pedestrian bridge			
Kenilworth Street and Hanel Street	Residential	East	80
Centenary Street and Schubach Street	Residential	East	110

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
Officeworks Albury	Commercial	West	130
Windsor Park Motor Inn	Residential	West	100
Albury Yard clearances			
Schubach Street, Rau Street, Wilson Street, Kenilworth Street, Centenary Street, Aurora Way and Woodstock Circuit	Residential	East	110
Hume Street, Macauley Street, Fleming Street, Hovell Street, Thomas Street and Charles Street	Residential	South-west	120
Porters' Cottages	Residential	West	85
Riverina Highway bridge			
Albury Manor House	Residential	West	125
Broad Street and Wilson Street	Residential	East	130
The Scots School, Albury	Educational	North	50
Billy Hughes bridge			
Sanctuary Lane	Residential	South-west	290
Table Top Yard clearances			
Hume Highway	Residential	East	240
Perryman Lane	Residential	West	285
Table Top Public School	Educational	South	870
GREATER HUME–LOCKHART PRECINCT			
Culcairn pedestrian bridge			
Station House	Passive Recreation	East	30
Culcairn Uniting Church	Place of worship	East	100
Railway Parade	Residential	South-west	90
Melville Street	Residential	East	80
Henty Street	Residential	North-east	160

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
Culcairn Yard clearances			
Melrose Street, Princes Street, Queen Street, Victoria Street, Henty Street and Olympic Highway	Residential	East	45
Railway Parade	Residential	West	35
Culcairn Motor Inn	Residential	North-east	90
Billabong High School	Educational	East	360
Henty Yard clearances			
Riverlife Church	Place of worship	West	30
Henty Uniting Church	Place of worship	West	45
Ivor Street, Keightley Street, Hayes Street, Day Street, Lyne Street and Allan Street	Residential	West	15
Headlie Taylor Header Museum	Passive recreation	East	20
Rosler Parade, South Street and Ivor Street	Residential	West	30
97 Railway Parade	Residential	East	40
Yerong Creek Yard clearances			
Yerong Creek Public School	Educational	East	70
Olympic Highway	Residential	East	60
Waratah Street and Plunkett Street	Residential	West	25
Hay Street and Cole Street	Residential	East	85
The Rock Yard clearances			
Draper Smissen Street, Urana Street, Davidson Street and Railway Street	Residential	North	40
Scott Street, Railway Street and Olympic Highway	Residential	South	110

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
WAGGA WAGGA PRECINCT			
Uranquinty Yard clearances			
Seventh Day Adventist Reform Church	Place of worship	North	80
Pearson Street, Best Street, Ryan Street and Yarragundry Street	Residential	North	75
Uranquinty Public School	Educational	North	70
Olympic Highway, Miosge Lane, Morgan Street, Ben Street, Ryan Street and Yarragundry Street	Residential	South	75
Uranquinty Street and Guttler Street	Residential	East	60
Pearson Street bridge			
Peacock Drive, Gallop Avenue and Wade Street	Residential	South-east	60
Wagga Show Campground and Wagga & District Greyhound Club	Active recreation	East	10
Bulolo Street	Residential	West	55
Cassidy Parade pedestrian bridge			
Kildare Catholic College	Educational	South	35
Kildare Street, Norman Street and Cassidy Parade	Residential	South	5
Brookong Avenue	Residential	North-west	10
Edmondson Street bridge			
Kildare Catholic College	Educational	South-west	30
Edmondson Street, Erin Street, Railway Street and MacLeay Street	Residential	South-east	10
South Wagga Public School	Educational	North-east	5
Little Best Street and Donnelly Avenue	Residential	North-west	10
Wagga Wagga Station pedestrian bridge			
Railway Street, MacLeay Street and Collins Street	Residential	South	20

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
South Wagga Public School	Educational	North-west	70
Wagga Wagga Yard clearances			
The Penthouse	Residential	North	95
Railway Street, MacLeay Street, Collins Street, Flinders Street, Richard Street and Young Street	Residential	South	35
Bomen Yard clearances			
Bavin Road	Residential	South	800
JUNEE PRECINCT			
Harefield Yard clearances			
Byrnes Road	Residential	South-east	40
Kemp Street bridge			
Olympic Highway, Railway Lane, Railway Parade and Thomas Street	Residential	South-west	10
Good Start Early Learning Junee	Educational	South-east	50
Olympic Highway, Seignior Street and Pretoria Avenue	Residential	North-west	15
Edgar Street, George Street, Ducker Street, Kemp Street and Hill Street	Residential	East	10
Junee Public School	Educational	North-east	130
Junee Yard clearances			
Olympic Highway	Residential	West	30
Lorne Street	Residential	East	40
Edgar Street	Residential	East	60
Junee Station pedestrian bridge			
Olympic Highway	Residential	West	30
The Crossing	Residential	West	45
Lorne Street	Residential	South	50
Olympic Highway and Anzac Avenue	Residential	South-west	130

LOCATION	RECEIVER TYPE	DIRECTION FROM ENHANCEMENT SITE	DISTANCE FROM ENHANCEMENT SITE (M)
Olympic Highway underbridge			
Junee North Public School	Educational	North-west	135
Olympic Highway, Ridge Street, Main Street, Lillian Street, Cedric Street, Cross Street, Florence Street, Elizabeth Street, Pitt Street and Orr Street	Residential	East	35
Olympic Highway, Illabo Road, Knight Street, Prince Street, Marquis Street, Regent Street, Gloucester Street, Lord Street and Castle Street	Residential	West	20
Junee to Illabo clearances			
Olympic Highway	Residential	North	30
Illabo Public School	Educational	North	50

4.2 Ambient noise monitoring

A baseline noise monitoring survey was undertaken to inform the EAD between March and May 2021. The purpose of the survey was to quantify and characterise the existing noise environment in the areas surrounding each enhancement site and nearby sensitive receivers. Noise levels were continuously monitored for a minimum period of seven days within the NCAs, as shown in Appendix D. The rating background level (RBL) is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the Noise Policy for Industry (NPfI) (EPA, 2017).

A summary of the monitoring results is provided in Table 10.

TABLE 10: SUMMARY OF THE EAD MONITORED DAILY NOISE LEVELS

NCA	LOCATION	AMBIENT NOISE LEVEL dBA $L_{EQ(15\ MIN)}$			RATING BACKGROUND LEVEL (RBL) dBA		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
Albury Precinct							
NCA01	1	53	53	50	45	45(47[2])	41
NCA02(a)	2(a)	39	46	47	35 (27[2])	33	33 (36[4])
NCA02(b)	2(b)	43	47	47	35 (34[2])	35	34
NCA03	3	52	49	49	37	37 (41[2])	37 (38[4])
NCA04	4	54	57	57	42	42 (51[2])	42(46[4])
Greater Hume–Lockhart Precinct							
NCA05	5	59	58	55	36	35	30
NCA06	6	51	48	40	37	36	30

NCA	LOCATION	AMBIENT NOISE LEVEL dBA $L_{EQ(15\ MIN)}$			RATING BACKGROUND LEVEL (RBL) dBA		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
NCA07/08	7	49	59	46	39	39 (41[2])	30
Wagga Wagga Precinct							
NCA09	7	49	59	46	39	39 (41[2])	30
NCA10	10	52	51	45	46	45	38
NCA11	11	52	54	46	48	47	37
Junee Precinct							
NCA13	13	60	56	53	41	39	37
NCA14	14	52	53	47	42	42 (45[2])	35
NCA15	15	53	53	47	41	41 (46[2])	33

(1) The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays.
(2) The evening RBL data has been reduced to the daytime period RBL in this case (bracketed figures indicates the measured value)
(3) The NPfI minimum RBL value has been used due to the measured RBL being lower than the minimum value.
(4) The night-time RBL data has been reduced to the evening period RBL in this case (bracketed figures indicates the measured value).

5 CONSTRUCTION NOISE AND VIBRATION OBJECTIVES

The EPA recommends management levels and goals when assessing construction noise and vibration. These are outlined in:

- Interim Construction Noise Guideline (ICNG) (DECC, 2009);
- Assessing Vibration: A Technical Guideline (DEC, 2006);
- Inland Rail NSW Construction Noise and Vibration Management Framework (IRPL CNVF) (0-0000-902-EMN-00-SP-0001_2) (ARTC, 2023).

Relevant elements of these documents are summarised and discussed below.

5.1 Interim Construction Noise Guideline

The ICNG provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels.

The main objectives of the ICNG are to:

- Identify and minimise noise from construction works;
- Focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts;
- Encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours;
- Reduce time spent dealing with complaints at the project implementation stage;
- Provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

5.2 Construction noise and vibration objectives

Construction noise assessment goals presented in the ICNG are referenced to NML for residential, sensitive land uses and commercial/industrial premises.

5.2.1 Residential receivers

The adopted construction NMLs for each NCA have been determined based on the RBLs measured during the preparation of the EIS.

For work during standard construction hours:

- The 'noise affected level' represents the point above which there may be some community reaction to noise. The noise affected level is calculated by adding 10 dB to the RBL;
- The 'highly noise affected level' represents the point above which there may be strong community reaction to noise. The ICNG specifies that the highly noise affected level is 75 dB(A).

Considering the possibility of work outside standard construction hours, additional project construction NMLs for these times have also been determined. For work outside standard construction hours, the construction NML is calculated by adding 5 dB to the RBL. For assessing the potential for sleep disturbance, the NSW Road Noise Policy (DECCW 2011) outlines a screening level of the prevailing RBL plus 15 dB. The maximum sleep disturbance level is calculated as 65 dBA, based on an internal level of 55 dBA and a façade insertion loss of 10 dB.

The adopted construction NMLs and sleep disturbance screening criterion for residential receivers are provided in Table 11. As required by the NPfI when setting project construction NMLs, the evening NML should be no greater than the daytime NML. Likewise, the night-time NML should be no greater than the day or evening NML. A number of RBLs in Table 11 have been amended from those included in the EAD to align with the NPfI.

In consultation with the Acoustic Advisor and the project's noise and vibration consultants, noise monitoring data presented in the EAD for NCA 2 was deemed to be unrepresentative of the receivers in the area, with ambient noise levels more consistent with those presented for NCA 1. As a result, measured background noise levels for NCA 1 were used to determine the NMLs for NCA 2 (refer Table 11).

5.2.2 Sleep disturbance screening and awakening criteria

Where construction works are planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts be completed. The ICNG refers to the Environmental Criteria for Road Traffic

Noise (EPA 1999) for assessing the potential impacts, which notes that to limit the level of sleep disturbance, the LAmax should not exceed the existing RBL noise level by more than 15 dB.

The Noise Policy for Industry (NPfI, 2017) provides minimum thresholds for assessing sleep disturbance impacts where noise levels exceed 52 dB(A) LAmax or the prevailing RBL plus 15 dB, whichever is the greater. Although the NPfI sleep disturbance criteria relates to industrial noise, it is also considered relevant for reviewing potential impacts from construction noise as a screening criterion.

As a result, the sleep disturbance screening level is RBL+15 dB or 52 dB(A), whichever is higher.

Where there are noise events found to be above the initial screening level, further analysis is required to identify:

- The likely number of events that might occur during the night assessment period, and
- Whether events exceed an 'awakening reaction' level of 55 dB(A) L_{AFmax} (internal) that equates to NML of 65 dB(A) externally (assuming open windows).

Sleep disturbance screening and awakening criteria are provided in Table 11.

TABLE 11: EAD CONSTRUCTION NMLS AND SLEEP DISTURBANCE SCREENING CRITERIA AT RESIDENCES

NCA	Monitoring ID for RBL	RBL dB(A)			NML dB(A)[1]				Sleep disturbance LAmax dB	
		Day	Evening	Night	Std. Hours	OOH Day	OOH Eve	OOH Night	Screening	Max
1	1	45	45(47[2])	41	55	50	50	46	56	65
2(a)[5]	~~2~~	~~35(27[2])~~	~~33~~	~~33 (36[4])~~	~~45~~	~~40~~	~~38~~	~~48~~	~~52~~	~~65~~
2(b)[5]	~~2~~	~~35(34[2])~~	~~35~~	~~34~~	~~45~~	~~40~~	~~40~~	~~39~~	~~52~~	~~65~~
3	3	37	37(41[2])	37(38[4])	47	42	42	42	52	65
4	4	42	42 (51[2])	42 (46[2])	52	47	47	47	61	65
5	5	36	35	30	46	41	40	35	52	65
6	6	37	36	30	47	42	41	35	52	65
7/8	7	39	39 (41[2])	30	49	44	44	35	52	65
9	9	39	39 (41[2])	30	49	44	44	35	52	65
10	10	46	45	38	56	51	50	43	53	65
11	11	48	47	37	58	53	52	42	52	65
12	12	48	47	37	58	53	52	42	52	65
13	13	41	39	37	51	46	44	42	52	65
14	14	42	42 (45[2])	35	52	47	47	40	52	65

NCA	Monitoring ID for RBL	RBL dB(A)			NML dB(A)[1]				Sleep disturbance LAmax dB	
		Day	Evening	Night	Std. Hours	OOH Day	OOH Eve	OOH Night	Screening	Max
15	15	41	41 (46[2])	33	51	46	46	38	56	65

(1) The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays. See the NSW EPA Noise Policy for Industry (NPfI)
(2) The evening RBL data has been reduced to the daytime period RBL in this case (bracketed figures indicates the measured value)
(3) The NPfI minimum RBL value has been used due to the[1] measured RBL being lower than the minimum value.
(4) The night-time RBL data has been reduced to the evening period RBL in this case (bracketed figures indicates the measured value).
(5) The RBL and NML for NCA 2 have been replaced with those identified for NCA 1 (refer Section 5.2.1).

5.2.3 Non-residential sensitive receivers

Other sensitive land uses, such as schools and offices, typically find noise from construction to be disruptive when the properties are being used (such as during work and school times). Table 12 presents NMLs for sensitive land uses based on the principle that the characteristic activities for each of these land uses should not be unduly disturbed. Martinus Rail will undertake consultation with potentially affected community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas to schedule construction activities and work hours to achieve a reasonable noise outcome.

The ICNG provides noise management levels for commercial and industrial premises and 'other sensitive' land uses (ICNG, Table 3). The management levels for other noise sensitive receivers not listed in the ICNG that are applicable to the project, such as hotels and libraries, are derived from AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors and the Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment (2020). The management levels from AS2107 are the upper range levels to account for the variable and short-term nature of construction noise.

TABLE 12: NON-RESIDENTIAL SENSITIVE LAND USES NOISE MANAGEMENT LEVELS

Land use	NML LAeq(15min)	Where NML applies	Referenced from:	Assumed façade loss[1] (conservative)	External equivalent NML[2] - LAeq(15min)
Studio building (music recording studio)	25 dB	Internal noise level	AS2107 'maximum'	20 dB	45 dB
Studio building (film or television studio)	30 dB	Internal noise level	AS2107 'maximum'	20 dB	50 dB
Cinema space, theatre, auditorium	35 dB	Internal noise level	AS2107 'maximum'	20 dB	55 dB
Classrooms at schools and other educational institutions	45 dB	Internal noise level	ICNG	10 dB	55 dB
Childcare centre (sleeping areas)	35 dB	Internal noise level	AAAC - guideline for Child Care Centre Acoustic Assessment	10 dB	45 dB
Childcare centre (activity areas)	40dB	Internal noise level	AAAC – guideline for Child Care Centre Acoustic Assessment	10 dB	50 dB
Hospital wards and operating theatres	45 dB	Internal noise level	ICNG	20 dB	65 dB
Places of worship	45 dB	Internal noise level	ICNG	10 dB	55 dB
Library (reading areas)	45 dB	Internal noise level	AS2107 'maximum'	20 dB	65 dB

Land use	NML LAeq(15min)	Where NML applies	Referenced from:	Assumed façade loss[1] (conservative)	External equivalent NML[2] - LAeq(15min)
Hotel (daytime and evening)	50 dB	Internal noise level	AS2107 'maximum'	20 dB	70 dB
Hotel (night-time)	35 dB	Internal noise level	AS2107 'maximum'	10 dB	45 dB
Community centres – Municipal Buildings	50 dB	Internal noise level	AS2107 'maximum'	10 dB	60 dB
Restaurant, bar (Bars and lounges/ Restaurant)	50 dB	Internal noise level	AS2107 'maximum'	20 dB	70 dB
Passive recreation[3] (e.g. area used for reading, meditation)	60 dB	External noise level	ICNG	-	60 dB
Active recreation[4] (e.g. sports fields)	65 dB	External noise level	ICNG	-	65 dB
Commercial premises (including offices and retail outlets)	70 dB	External noise level	ICNG	-	70 dB
Industrial premises	75 dB	External noise level	ICNG	-	75 dB

(1) Assumed facade loss of 10 dB is considered representative for windows that can be opened to sufficiently to provide adequate ventilation. Assumed facade loss of 20 dB representative of facades with closed windows and mechanical ventilation.
(2) Applies only when properties are being used
(3) Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion.
(4) Active recreation areas are characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.

5.2.4 National Standard for exposure to noise

In accordance with CoA E77, worksites will be managed to ensure that noise generated by construction will not exceed the National Standard for exposure to noise in the occupational environment of an eight-hour equivalent continuous A-weighted sound pressure level of LAeq,8h, of 85dB(A) for any employee working at a location near the project.

It is not anticipated that an exceedance will occur at any point during the project. This notwithstanding, where a detailed noise and vibration assessment or Construction Noise and Vibration Impact Statement (CNVIS) (refer Section 7.1) highlights the potential for an exceedance of this National Standard, noise monitoring will be undertaken during the activity.

It is noted that occupational exposure to noise will primarily be managed under the Work Health and Safety Management Plan.

5.2.5 Construction road traffic noise

The potential impacts from construction traffic associated with the project when travelling on public roads are assessed under the NSW EPA Road Noise Policy (RNP).

An initial screening test is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2.0 dB as a result of construction traffic. Where this is considered likely, further assessment is required using the RNP base criteria shown in Table 13.

TABLE 13: RNP CRITERIA FOR ASSESSING CONSTRUCTION TRAFFIC ON PUBLIC ROADS

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	LAeq(15hour) 60 (external)	LAeq(9hour) 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	LAeq(1hour) 55 (external)	LAeq(1hour) 50 (external)

5.2.6 Ground-borne noise

Construction work can cause ground-borne (structure-borne or regenerated) noise impacts in nearby buildings when vibration intensive equipment is in use, such as during excavation work using rockbreakers. Vibration can be transmitted through the ground and into nearby buildings, which can then create audible noise impacts inside the building.

Ground-borne noise NMLs are applicable where ground-borne noise levels are likely to be higher than airborne noise levels, which can occur where work is underground or where surface work is shielded by noise barriers or other structures. Ground-borne noise is generally found to generate impacts during the evening and night-time periods when ambient noise levels are often much lower, and ground-borne noise is more prominent.

The internal ground-borne noise NMLs for residential receivers, in accordance with CoA E75, are shown in Table 14.

TABLE 14: INTERNAL RESIDENTIAL GROUND-BORNE NMLS

Receiver Type	Noise Management Level, $L_{Aeq(15minute)}$ – dB(A)		
	Day[1]	Evening[2]	Night[2]
Residential	N/A	40	35

(1) Daytime ground-borne noise NMLs are not specified in the ICNG.
(2) Specified in the ICNG.

For other sensitive receivers, including commercial receivers such as offices and retail areas, the ICNG does not provide guidance in relation to acceptable ground-borne noise levels. For the purpose of this CNVMP, the internal airborne NMLs presented in Table 12 will also be adopted for ground-borne noise within non-residential sensitive receivers.

5.3 Working hours

5.3.1 Hours of work

The approved standard construction hours for the project outlined in CoA E69 are:

- 7:00am to 6:00pm Mondays to Fridays, inclusive;
- 7:00am to 6:00pm Saturdays; and
- At no time on Sundays or public holidays.

Notwithstanding the above, certain activities may need to be carried out outside of standard construction hours as described in Section 5.3.3.

5.3.2 Highly noise intensive works

The Infrastructure Approval defines 'highly noise intensive works' as those identified as annoying under the ICNG and include:

- Use of power saws, such as used for cutting timber, rail lines, masonry, road pavement or steel work;
- Grinding metal, concrete or masonry;
- Rock drilling;
- Line drilling;
- Vibratory rolling;
- Rail tamping and regulating;
- Bitumen milling or profiling;
- Jackhammering, rock hammering or rock breaking;
- Impact piling.

Infrastructure approval

In accordance with CoA E70, except as permitted by EPL No. 21984, highly noise intensive activities that result in the exceedance of an applicable NML at the same receiver must only be undertaken:

- Monday to Friday: 8am to 6pm;
- Saturday: 8am to 1pm;
- If continuously, then not exceeding three hours, with a minimum cessation of work of not less than one hour.

During standard construction hours, highly noise intensive works will be carried out in continuous blocks not exceeding three hours each, with a minimum respite of at least one hour between ceasing and recommencing each block of highly noise intensive work. 'Continuous' includes any period during which there is less than a one-hour respite between ceasing and recommencing the highly noise intensive work.

Environment Protection Licence

Unless permitted by another condition of EPL 21984, any high noise impact works and activities must only be undertaken:

(a) Between 8:00 am and 6:00 pm Monday to Friday;
(b) Between 8:00 am and 1:00 pm Saturday; and
(c) If high noise impact works are to be conducted continuously and the location of the works means that it is likely to impact the same receivers, then the works must be conducted in continuous blocks of no more than 3 hours, with at least a 1-hour respite between each block of high noise impact work; except as expressly permitted by another condition of this licence.

Note: For the purposes of this condition 'continuous' includes any period where there is less than 1-hour respite between ceasing and recommencing of any work that is subject to this condition.

5.3.3 Variation to hours of work

Infrastructure approval

Certain activities may need to be carried out outside of standard construction hours. There are two periods of OOHW:

1. OOHW Period 1 -
    a. Monday to Friday: 6pm to 10pm;
    b. Saturday: 6pm to 10pm;
    c. Sunday and Public Holidays: 8am to 6pm.
2. OOHW Period 2 –
    a. Monday to Friday: 10pm to 7am;
    b. Saturday: 10pm to 8am;
    c. Sunday and Public Holidays: 6pm to 7am the following day (unless that day is a Sunday or Public Holiday, then to 8am).

Works outside of the standard construction hours may be undertaken in the following circumstances as permitted by CoA E71:

a) Safety and Emergencies, including:

i. For the delivery of materials required by the NSW Police Force or other authority for safety reasons; or

ii. Where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm.

On becoming aware of the need for emergency work in accordance with (a), the AA, the ER, the Planning Secretary and the EPA must be notified of the reasons for such work. Best endeavours must be used to notify all noise and/or vibration affected residents and owners/occupiers of properties identified sensitive land use(s) of the likely impact and duration of those work.

b) Work, that meets the following criteria:

i. Construction that causes LAeq(15 minute) noise levels:

• No more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG, and

• No more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); and

ii. Construction that causes LAFmax noise levels no more than 15 dB above the rating background level at any residence during the night period as defined in the ICNG. and

iii. Construction that causes:

• Continuous or impulsive vibration values, measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or

• Intermittent vibration values measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006).

c) By Approval, including:

i. Where different construction hours, such as those for a rail possession, are permitted under an EPL in force in respect of the CSSI; or

ii. Works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition ; or

iii. Negotiated agreements with directly affected residents and sensitive land use(s).

Environment Protection Licence

Works outside of standard construction hours, undertaken in accordance with EPL condition L4.6, but only if they are required in relation to one or more of the following:

a) carrying on those works and activities during standard construction hours would result in a high risk to construction personnel or public safety, based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2018 "Risk Management";
b) the Relevant Road Network Operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to road network operational performance;
c) a relevant utility service operator has advised the licensee in writing that carrying out the works and activities during standard construction hours would result in a high risk to the operation and integrity of the utility network;
d) the TfNSW Transport Management Centre (or other road authority) have refused to issue a road occupancy licence during standard construction hours; or
e) ARTC (or other rail authority) requires a rail possession for the activities to be performed outside of standard construction hours.

Emergency work is defined as work that is required to:

- Avoid injury or the loss of life;
- To avoid damage or loss of property; or
- To prevent environmental harm.

On becoming aware of the need to undertake emergency works the EPA's Environmental Line must be notified as soon as practicable, and a report must be submitted to the EPA by 4:00pm on the next business day after the emergency works commenced that describes:

- The cause, time and duration of the emergency;
- Action taken by or on behalf of the project in relation to the emergency; and
- Details of any measures taken or proposed to be taken by the licensee to prevent or mitigate against a recurrence of the emergency.

Justification of the need for OOHW will be provided in accordance with CoA E73, where OOHW is required:

- For carrying out work that if carried out during standard hours would result in a high risk to construction personnel or public safety based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2009: "Risk management; or
- Where the relevant roads authority has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to road network performance and a road occupancy licence will not be issued; or
- Where the relevant utility service operator has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to the operation and integrity of the utility network; or
- Work undertaken in a rail possession for operational or safety reasons.

Activities that may require scheduled OOHW include, but are not limited to:

- Vegetation clearing and grubbing;
- Utility works including outages/cutovers, service identification, protection and relocation;
- Concrete pours;
- Ancillary facility establishment and operation;
- Earthworks;
- Bridge works;
- Track work;
- Gantry and signal work;
- Drainage and culvert work;
- Noise wall work;
- Road works including changes to level crossings, traffic management, milling, re-sheeting and line marking;
- Finishing works, including landscaping and remediation.

Work activities that may be required or proposed to be undertaken outside of standard working hours will be managed in accordance with the OOHW Protocol, unless the work is regulated by an EPL.

Negotiated agreements

Work may be undertaken outside of standard construction hours in accordance with negotiated agreements (including for duration reduction) as identified in CoA E71(c)(iii). The requirements for a negotiated agreement, including approval by the EPA and reporting requirements are defined in conditions E1.1, E1.2 and E1.3 of the EPL. Validation monitoring for works undertaken in accordance with negotiated agreements is described in conditions E2.1, E2.2 and E2.3 of the EPL. For works to be undertaken by negotiated agreement for longer than 28 calendar days, condition E3.1 of the EPL must be satisfied.

5.3.4 Timetabling of work activities

Work activities will be timetabled to be carried out during the standard construction hours, where possible. This applies in particular to high noise activities and for activities concentrated in a single area (i.e. activities that do not move along the alignment, and/or do not require OOHW activities for safety reasons or to minimise disruption to road or rail networks).

Timetabling of construction activities will also take into account required respite periods. Currently, the program of works for the project indicates that ongoing construction activities may occur for more than three (3) months at all enhancement sites except Table Top Yard, Culcairn Station Yard and The Rock Yard. In accordance with CoA C9(a), where the same sensitive receivers (also referred to as sensitive land uses) are likely to be noise affected for more than three (3) months, Martinus Rail will consider measures to reduce works to within standard construction hours.

Consultation has occurred in accordance with CoA C9(c) in order to highlight noise sensitive periods identified by the community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas and measures to ensure noise levels above the NMLs do not occur during sensitive periods. The project contacted all receivers noted in the EAD as being potentially impacted by noise above the NML and asked for feedback on what their sensitive periods are via an online survey. Respondents could also submit their feedback over the phone, via email or via post.

The following sensitive periods were identified by the community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas during this consultation:

- Avoid noise generating work during specific church services on Sundays (typically 10am to 11.30am);
- Avoid vibration generating work during operating times at nearby veterinary clinics, noting that although operating times are mostly during the week, they are not consistent and are subject to constant and last minute change.

In addition to the above the following sentiments were also noted from respondents:

- Limit noise generating work outside of standard construction hours as much as possible;
- Limit noise generating work on the weekends as much as possible;
- Construction works should be completed as soon as possible.

Noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs must not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution, in accordance with CoA E76.

Further detail on specific timetabling and justification for undertaking works outside of the standard construction hours above the NML will be included in the noise and vibration assessment for proposed work activities.

5.3.5 Out of hours work

This CNVMP includes an OOHW Protocol (Appendix F) which outlines how assessment, approval and management of OOHW not subject to an EPL will occur on the project. The OOHW Protocol has been prepared to address the relevant planning approval conditions and has been written in accordance with the Construction Noise and Vibration Guidelines (Transport for NSW, 2023).

All OOHW subject to an EPL will be assessed to determine the potential noise and/or vibration impacts and an OOHW Permit will be completed for the works and approved in accordance with the conditions of the EPL.

5.4 Construction vibration objectives

Effects of ground vibration on buildings and sensitive structures (such as heritage structures) resulting from construction can be classified as follows:

- Human exposure – disturbance to building occupants: vibration in which the occupants or users of the building are inconvenienced or possibly disturbed;

- Effects on building contents – vibration where the building contents may be affected;
- Effects on building structures – vibration in which the integrity of the building or structure itself may be compromised;
- Effects on buried pipework – vibration where underground utilities may be affected.

The following construction vibration goals apply:

- For structural damage to heritage structures (deemed structurally unsound), the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures;
- For damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-2:1993 - Evaluation and measurement for vibration in buildings - Part 2;
- For human exposure, the acceptable vibration values set out in Assessing Vibration: A Technical Guideline (DEC, 2006).

5.4.1 Human comfort level

Assessment of potential disturbance from tactile vibration on human occupants of buildings is made in accordance with Assessing Vibration: A Technical Guideline (DEC, 2006). The guideline provides criteria which are based on the British Standard BS 6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz). Sources of vibration are defined as either 'continuous', 'impulsive' or 'intermittent':

- Continuous vibration – from uninterrupted sources, e.g. machinery, steady road traffic, continuous construction activity;
- Impulsive vibration – up to three instances of sudden impact per monitoring period e.g. occasional dropping of heavy equipment, occasional loading and unloading;
- Intermittent vibration – such as from drilling, compacting or activities that will result in continuous vibration if operated continuously.

Maximum and preferred values for continuous and impulsive vibration are defined in Table 15.

TABLE 15: CONTINUOUS AND IMPULSIVE VIBRATION ACCELERATION (M/S^2) 1-80 HZ

Location	Assessment period[1]	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Critical areas[2]	Day or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions, and placed of worship	Day or night-time	0.020	0.014	0.040	0.028
Workshops	Day or night-time	0.04	0.029	0.080	0.058
Impulsive vibration					
Critical areas[2]	Day or night-time	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14

Location	Assessment period[1]	Preferred values		Maximum values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Offices, schools, educational institutions, and placed of worship	Day or night-time	0.64	0.46	1.28	0.92

(1) Daytime is 7.00 am to 10.00 pm and night-time is 10.00 pm to 7.00 am (as per Table 2.2 of Assessing Vibration: A Technical Guideline).
(2) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

Intermittent vibration impact is assessed using vibration dose values (VDVs). The VDV method is more sensitive to peaks in the acceleration waveform and makes corrections to the criteria based on the exposure duration. The acceptable VDVs for intermittent vibration are defined in Table 16.

TABLE 16: ACCEPTABLE VIBRATION DOSE VALUES (M/S$^{1.75}$) FOR INTERMITTENT VIBRATION

Location	Daytime[1]		Night-time[2]	
	Preferred values	Maximum values	Preferred values	Maximum values
Critical areas[3]	0.10	0.20	0.10	0.02
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions, and placed of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

(1) Daytime is 7.00 am to 10.00 pm (as per Table 2.2 of Assessing Vibration: A Technical Guideline).
(2) Night-time is 10.00 pm to 7.00 am (as per Table 2.2 of Assessing Vibration: A Technical Guideline).
(3) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

5.4.2 Vibration sensitive equipment

Some scientific equipment, such as electron microscopes and microelectronics manufacturing equipment, can require more stringent vibration objectives. Other sensitive equipment used for various business requirements, such as medical equipment, may also have specific vibration goals. Vibration sensitive equipment is, however, often housed in buildings/rooms specifically designed and constructed for that purpose, which can help mitigate any potential impacts.

Vibration limits for the operation of sensitive scientific and medical equipment should be taken from manufacturer's data, where this is not available the Vibration Criteria (VC) curves can be used. VC curves are widely used to classify laboratory equipment into categories according to their vibration sensitivity. VC criteria provide lower bounds of vibration criteria for groups or broadly defined classes of equipment. The VC curves are intended to apply for the most sensitive equipment within each category that is defined and as such are inherently conservative.

The VC criteria presented in Table 17 are sets of root-mean-square, one-third octave vibration velocity spectra labelled VC-A (least stringent) through to VC-G (most stringent). The VC-curves apply for vibration in the vertical and horizontal directions and cover the frequency bandwidth from 1 Hz to 80 Hz.

Where the criteria are exceeded all appropriate feasible and reasonable mitigation and management measures would be considered to minimise the impacts.

TABLE 17: VC CURVES FOR VIBRATION SENSITIVE EQUIPMENT

Criterion Curve	Max Level (µm/s, RMS)[1]	Detail Size (microns)[2]	Description of Use
VC-A	50	8	Adequate in most instances for optical microscopes to 400X, microbalances, optical balances, proximity and projection aligners, etc.
VC-B	25	3	An appropriate standard for optical microscopes to 1000X, inspection and lithography equipment (including steppers) to 3 micron line widths.
VC-C	12.5	1	A good standard for most lithography and inspection equipment to 1 micron detail size.
VC-D	6	0.3	Suitable in most instances for the most demanding equipment including electron microscopes (TEMs and SEMs) and E-Beam systems, operating to the limits of their capability.
VC-E	3	0.1	A difficult criterion to achieve in most instances. Assumed to be adequate for the most demanding of sensitive systems including long path, laser-based, small target systems and other systems requiring extraordinary dynamic stability.

(1) As measured in one-third octave bands of frequency over the frequency range 8 to 100 Hz.
(2) The detail size refers to the line widths for microelectronics fabrication, the particle (cell) size for medical and pharmaceutical research, etc. The values given take into account the observation requirements of many items depend upon the detail size of the process.

5.4.3 Structural damage level – BS7385

BS 7385 is used as a guide to assess the likelihood of building damage from ground vibration. BS 7385 suggests levels at which 'cosmetic', 'minor' and 'major' categories of damage might occur, where the categories of structural damage are defined as:

- Cosmetic - the formation of hairline cracks on drywall surfaces, or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick/concrete block construction;
- Minor - the formation of large cracks or loosening of plaster or drywall surfaces, or cracks through bricks/concrete blocks;
- Major - damage to structural elements of the building, cracks in supporting columns, loosening of joints, splaying of masonry cracks, etc.

The levels for structural damage outlined in the standard refer to non-continuous vibration sources and are considered 'safe limits' up to which no damage due to vibration effects are expected to occur for the various building types. Where vibration is continuous these levels may be reduced by up to 50 per cent and additional assessment against the standard will be necessary.

BS 7385 is based on peak particle velocity and specifies damage criteria for frequencies within the range 4 to 250 Hz, being the range usually encountered in buildings. Table 18 sets out the BS 7385 criteria for cosmetic, minor, and major damage. The cosmetic damage criteria will be used as the management level.

TABLE 18: BS 7385 STRUCTURAL DAMAGE CRITERIA

Group	Type of structure	Damage level	Peak component particle velocity PPV (mm/s)		
			4 – 15 Hz	15 – 40 Hz	>40 Hz
1	Reinforced or framed structures	Cosmetic	50	50	50
		Minor	100	100	100

Group	Type of structure	Damage level	Peak component particle velocity PPV (mm/s)		
			4 – 15 Hz	15 – 40 Hz	>40 Hz
	Industrial and heavy commercial buildings	Major	200	200	200
2	Unreinforced or light framed structures Residential or light commercial type buildings	Cosmetic	15 - 20	20 - 50	50
		Minor	30 - 40	40 - 100	100
		Major	60 - 80	80 - 200	200

5.4.4 Cosmetic damage

The limits presented in Table 18 relate predominantly to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, then the guide values in Table 18 may need to be reduced by up to 50 per cent. This is especially applicable at the lower frequencies where lower guide values apply.

On this basis, a conservative vibration screening criteria per receiver type is given below:

- Reinforced or framed structures (Line 1): 25.0 mm/s;
- Unreinforced or light framed structures (Line 2): 7.5 mm/s.

At locations where the predicted and/or measured vibration levels are greater than shown above (peak component particle velocity), a more detailed analysis of the building structure, vibration source, dominant frequencies and dynamic characteristics of the structure would be required to determine the applicable safe vibration level. The analysis would take into consideration the transient vibration guide values for minimal risk of cosmetic damage set out in Table 18.

5.4.5 Heritage items – DIN4150

The German standard provides a conservative criterion for vibration limits for different buildings and has been used to identify the vibration criteria for the project where the British Standard does not apply. The German standard values for peak particle velocity (PPV) (mm/s) measured at the foundation of the building are summarised in Table 19.

TABLE 19: DIN 4150-3 GUIDELINE VALUES FOR SHORT-TERM VIBRATION ON STRUCTURES

Group	Type of structure	Guideline values vibration velocity (mm/s)				
		Foundations, all directions at a frequency of:			Topmost floor, horizontal	Floor slabs, vertical
		1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 - 30	40 - 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 - 15	15 - 20	15	20
3	Structures that because of their	3	3 - 8	3 - 8	8	20

Group	Type of structure	Guideline values vibration velocity (mm/s)				
		Foundations, all directions at a frequency of:			Topmost floor, horizontal	Floor slabs, vertical
		1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	All frequencies
	particular sensitivity to vibration, cannot be classified into Group 1 or 2 and are of great intrinsic value e.g. heritage listed buildings					

As noted in BS 7385, heritage buildings and structures should not be assumed to be more sensitive to vibration, unless structurally unsound. Where heritage structures are impacted, a conservative vibration damage screening level based on the DIN 4150-3 Group 3 can be applied. If further investigation determines that structure is structurally sound, structural damage vibration limits based on BS 7385 will be applied. If the structure is found to be structurally unsound, further analysis will be undertaken in accordance with the DIN4150-3 (considering short-term or long-term criteria as applicable).

5.4.6 Buried structures and pipework

Table 20 presents guideline values to evaluate the effects of vibration on buried pipework, such as, gas or other pipelines which may be considered to be sensitive to construction vibration. Guidance is taken from the DIN 4150-3:2016, which sets vibration velocity values for evaluating effects of vibration on buried pipework based on material makeup of the pipework.

TABLE 20: VIBRATION SCREENING LEVELS FOR UNDERGROUND UTILITIES (DIN 4150-3:2016)

Pipe materials	Guideline values for maximum peak component particle velocity measured on the pipe (mm/s)
Steel (including welded pipelines)	50
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	40
Masonry or plastic pipe	25

For buried structures for evaluating the effects of vibration of the lining of underground cavities, such as tunnels, galleries and cavities in rocks, guidance from DIN 4150-3:2016 may be used. The guide values from DIN 4150-3 are replicated in Table 21 and these guide values apply for short-term vibration, only and does not apply to any associated in-cavity installations. The definition of short-term vibration is defined in the standard.

TABLE 21: VIBRATION SCREENING LEVELS FOR UNDERGROUND UTILITIES (DIN 4150-3)

Lining material	Guideline values for maximum peak component particle velocity measured perpendicular to lining surface (mm/s)
Steel (including welded pipelines)	80
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	60
Masonry or plastic pipe	40

In accordance with CoA E118, the services potentially affected by construction must be identified to determine requirements for diversion, protection and / or support. In all cases, protection requirements or alterations to services will be determined by negotiation with the service providers. Disruption to services resulting from construction will be avoided, wherever possible, and advised to customers where it is not possible.

6 CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

6.1 Construction activities

Key activities associated with Stage C of the project that could result in noise and vibration impacts are summarised in Table 22.

TABLE 22: KEY CONSTRUCTION ACTIVITIES - STAGE C

CONSTRUCTION COMPONENT	CONSTRUCTION ACTIVITIES
Site establishment / demobilisation	▪ Site Compound delivery and set up ▪ Haul road construction ▪ Laydown construction ▪ Vegetation clearing ▪ Demobilisation of site compound ▪ Restoration and revegetation
Compound operation	▪ Operation of the site compound ▪ Delivery of materials / equipment
Geotechnical investigation	▪ Geotechnical Investigation
Utility work	▪ Services protection ▪ Services relocation
Drainage work	▪ Drainage work ▪ Install culverts
Earthwork	▪ Earthwork
Signalling	▪ Crane operations ▪ Cut gantry bolts ▪ Removal of gantry and footings ▪ Installation of signalling infrastructure ▪ Install footings, cabling, conduits ▪ Backfill footings
Gantry modification	▪ Gantry modification
Removal of gantry and footings	▪ Removal of gantry and footings
Track work (peak, typical and tamping)	▪ Track widening ▪ Track realignment ▪ Track rebuilding ▪ Tamping following track work
Bridge works	▪ Bridge alterations ▪ Demolition of existing structures ▪ Construction and installation of new structures
Culvert works	▪ Removal of existing culverts

CONSTRUCTION COMPONENT	CONSTRUCTION ACTIVITIES
	▪ Installation of replacement culverts ▪ Extensions of existing culverts
Level crossing works	▪ Removal of existing level crossings surface panels ▪ Install new level crossing surface panels ▪ Replace/modify level crossing controls

Construction activities and the resultant potential noise and vibration impacts for the project were assessed as part of the EAD. Further assessment of construction scenarios has been developed by an appropriately qualified acoustic consultant on behalf of Martinus Rail. Site-specific scenarios are assessed within each relevant CNVIS (refer Section 7.1) and available on the project website.

6.2 Construction noise impacts

The EAD assessment included predictions of noise impacts for the worst-case construction stage at each enhancement site. The predicted impacts shown in the EAD at each enhancement site are summarised in Table 23. These scenarios would be subject to further construction planning and duration would be reduced where practicable. Further detail would be provided for each enhancement site as part of a CNVIS (where required by CoA E78), as discussed in Section 7.1 and available on the project website.

TABLE 23: PREDICTED CONSTRUCTION NOISE IMPACTS AT EACH ENHANCEMENT SITE (EAD)

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
Albury Precinct			
Murray River bridge	NCA01	Over 12 months. Bridge works planned to be undertaken during Track Occupancy Authorisations (TOAs).	▪ NML exceedances predicted during site establishment, bridge works, site compound operation and demobilisation. ▪ Site establishment would be the loudest activity, occurring over 26 days during the primary (standard approved) construction hours unless work is required under a TOA. ▪ Four residential receivers would be highly noise affected during site establishment. ▪ Sleep disturbance impacts are predicted at 288 receivers during bridge works.
Albury Station pedestrian bridge (within Albury Yard)	NCA01/ NCA02	Over six months. Some works required under TOA or rail possessions.	▪ NML exceedances predicted during site establishment, bridge demolition and lifting of the truss structure and demobilisation/rehabilitation. ▪ Bridge demolition within Albury Yard would be the loudest activity, occurring over five days. ▪ No sensitive receivers would be highly noise affected other than during bridge demolition. ▪ Exceedances of the sleep disturbance criterion would vary according to the activity, with exceedances up to 1,317 during bridge demolition.
Albury Station pedestrian bridge – eastern ramps	NCA01/ NCA02	Over six months. Some works required under TOA or rail possessions.	▪ Site establishment, demolition works and site rehabilitation are the loudest activities. ▪ 10 residential receivers would be highly noise affected during daytime (standard approved) hours, no receivers would be highly noise affected during OOH periods.
Albury Yard clearances	NCA01/ NCA02	Over three months. Under major works occurring under TOA or rail possessions.	▪ Construction work within the yard would be predominately need to occur during rail possessions or under TOAs. ▪ No receivers would be highly noise affected.

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
			▪ Sleep disturbance impacts are predicted at 848 receivers during track realignment works.
Riverina Highway bridge	NCA01/ NCA02	Over 16 months. Major work occurring under TOA or rail possessions.	▪ Construction work within the Yard would predominately need to occur during rail possessions or under TOAs. ▪ Site establishment, earthworks and drainage, and demobilisation/rehabilitation would be the loudest activities ▪ No receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at 319 receivers during piling works.
Billy Hughes bridge	NCA03	Over 16 months. Major work occurring under TOA or rail possessions.	▪ Construction work would require works to be carried out under rail possessions or TOAs in addition to the primary (standard approved) construction hours. ▪ Site establishment is the loudest activity. ▪ No receivers are predicted to be highly noise affected. ▪ Sleep disturbance impacts are predicted at two receivers during earthworks and drainage works.
Table Top Yard clearances	NCA04	Over two weeks.	▪ Site establishment and footing works would be the loudest activities. ▪ Sleep disturbance impacts are predicted at one receiver, if footing work is required.
Greater Hume-Lockhart Precinct			
Culcairn Yard clearances/Culcairn pedestrian bridge	NCA01	Over three months. Major works occurring under TOA or rail possessions.	▪ Track works, gantry, drainage or utility adjustments would be the loudest activities. ▪ Operation of the compound would result in low-to-high impacts when in use. ▪ Three receivers are predicted to be highly noise affected. ▪ Sleep disturbance impacts are predicted at 531 receivers.

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
Henty Yard clearances	NCA05	Over three months. Major works occurring under TOA or rail possessions.	▪ Track works, gantry, drainage or utility adjustments would be the loudest activities. ▪ Nine receivers are predicted to be highly noise affected. ▪ Sleep disturbance impacts are predicted at 494 receivers.
Yerong Creek Yard clearances	NCA06	Over three months. Major works occurring under TOA or rail possessions.	▪ Track works, gantry, drainage or utility adjustments and demobilisation would be the loudest activities. ▪ Four receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at 126 receivers during site establishment but would reduce to 74 receivers during other activities.
The Rock Yard clearances	NCA07	Over one month.	▪ Site establishment, installation of new caballing/conduits, gantry modifications and demobilisation would be the loudest activities. ▪ No receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at 258 receivers.
Wagga Wagga Precinct			
Uranquinty Yard clearances	NCA09	Over two months. Majority of track works, level crossing and bridge works to occur under a 60-hour rail possession.	▪ One 60-hour rail possession is proposed to undertake the majority of track works, level crossing and bridge works. ▪ Seven residential receivers would be highly noise affected during site establishment and track widening in daytime (standard approved) periods. ▪ Sleep disturbance impacts are predicted at 312 receivers.
Pearson Street bridge	NCA10/ NCA11/ NCA12	Over 16 months. Works focused around three 60-hour possessions.	▪ Site establishment and earthworks would be the loudest activities. ▪ 10 residential receivers would be highly noise affected during site establishment and earthworks.

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
		Piling completed under nine-hour TOAs. A break of three to four months is planned between rail possessions.	▪ Sleep disturbance impacts are predicted at 2,072 receivers during earthworks. During other activities this would reduce to 813 or less receivers.
Cassidy Parade pedestrian bridge	NCA10/ NCA11/ NCA12	Over six months. Demolition and placement of the bridge truss structure and deck would occur under a TOA	▪ Site establishment, demolition and demobilisation/rehabilitation would be the loudest activities. ▪ 16 residential receivers would be highly noise affected during daytime (standard approved) hours. ▪ No receivers would be highly noise affected during OOH periods. ▪ Sleep disturbance impacts are predicted at 1,408 receivers during demolition works. During other activities this would reduce to 820 or less receivers.
Edmondson Street bridge	NCA10/ NCA11/ NCA12	Over 11 months. Demolition, piling and installing the bridge deck would each require nine-hour TOAs.	▪ 34 residential receivers would be highly noise affected during daytime (standard approved) hours. ▪ No receivers would be highly noise affected during OOH periods. ▪ Sleep disturbance impacts are predicted at 1,301 receivers during deck and road furniture installation. During other activities this would reduce to 868 or less receivers.
Wagga Wagga Station pedestrian bridge	NCA10/ NCA11/ NCA12	Over six months. Demolition and placement of the bridge truss structure and deck would occur under a TOA.	▪ Site establishment, demolition and demobilisation/rehabilitation are the loudest activities. ▪ 14 residential receivers would be highly noise affected during daytime (standard approved) hours. ▪ No receivers would be highly noise affected during OOH periods. ▪ Sleep disturbance impacts are predicted at 876 receivers during site establishment. During other activities this would reduce to 618 or less receivers.

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
Wagga Wagga Yard clearances	NCA10/ NCA11/ NCA12	Over three months. One 60-hour rail possession is proposed to undertaken majority of the track works.	▪ During track works, high levels of noise impacts have been predicted during night-time hours. One 60-hour rail possession is proposed to undertake majority of the track works. ▪ Site establishment, track widening and demobilisation/rehabilitation are the loudest activities. ▪ 31 residential receivers would be highly noise affected during daytime (standard approved) hours. ▪ No receivers would be highly noise affected during OOH periods. ▪ Sleep disturbance impacts are predicted at 791 receivers during offline track widening. During other activities this would reduce.
Bomen Yard clearances	NCA10/ NCA11/ NCA12	Over two months.	▪ Sleep disturbance impacts are predicted at three residential receivers during track realignment works. ▪ Exceedances are predicted at nearby industrial receiver facilities during site establishment, track work and demobilisation.
Junee Precinct			
Harefield Yard clearances	NCA13	Over three months. One 60-hour rail possession is proposed to undertake majority of track works and bridge works	▪ No receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at five residential receivers.
Kemp Street bridge (as modified by the Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment, August 2025)	NCA14	Over 18 months. Demolition, piling and installing the bridge deck would each require nine-hour TOAs.	▪ The greatest noise impacts during construction work are predicted to occur during bridge demolition works, and highly noise intensive works associated with roadworks and bridge construction. ▪ Up to 46 residential receivers would be highly noise affected during peak road work activities.

ENHANCEMENT SITE	NCA	DURATION	SUMMARY OF NOISE IMPACTS FROM EAD
			▪ Sleep disturbance impacts are predicted at 904 receivers during peak bridge work activities. ▪ Noise levels are predicted to exceed the sleep disturbance screening level and sleep awakening criteria for all work scenarios with the potential to occur during the nighttime period. Sleep disturbance impacts would generally be caused by heavy vehicle movements and more noise intensive equipment.
Junee Station pedestrian bridge/Junee Yard clearances	NCA14	Over three months. Majority of track works occurring during one 60-hour rail possession. Removal of the pedestrian bridge would take less than one month.	▪ The Junee Yard clearances works would be the loudest activities of the two works within the Junee Yard. ▪ Track works would result in the greatest number of residential receivers experiencing NML exceedances. ▪ One residential receivers would be highly noise affected during track works. ▪ Sleep disturbance impacts are predicted at 613 receivers.
Olympic Highway underbridge	NCA14	Over three months. Majority of track and bridge works occurring during one 60-hour rail possession.	▪ 68 residential receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at 1,075 receivers.
Junee to Illabo clearances	NCA15	Over 10 months, progressively along the alignment with works focused around two 60-hour rail possessions.	▪ Site establishment would be the loudest activity which would occur over 15 days. ▪ Five residential receivers would be highly noise affected. ▪ Sleep disturbance impacts are predicted at 54 receivers.

The noise impact predictions in the EAD provided modelled sound power levels (SWLs) for construction equipment in relation to anticipated construction activities at each enhancement site. Further assessment of potential noise impacts was undertaken by an appropriately qualified acoustic consultant on behalf of Martinus Rail. Assessments are captured within CNVIS (refer Section 7.1). Refer to the project website (https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/) for endorsed CNVIS (Section 7.1) prepared for each enhancement site.

The EAD identified that during the construction phase of the project, heavy vehicles would be required for materials and equipment delivery, while light vehicles will transport workers to and from the site. This additional road traffic may impact receivers along the proposed transport routes. Table 24 summarises the construction vehicle traffic assessment that was undertaken for the EAD (Technical Paper 6 – Noise and vibration (Non-Rail) of the EIS). It is noted that the EAD identified that an increase in road traffic noise during construction of less than 2dB would generally be considered acceptable. This corresponds to an approximate increase in traffic of 60 per cent.

Table 24 identifies that all sites would comply with the road traffic noise goals, except for construction traffic associated with the Greater Hume–Lockhart and the Wagga Wagga Precinct. Predicted construction traffic noise on public roads is likely to comply with the road traffic noise goals at most sites, with potential minor exceedances of ~1dB on Railway Parade (Olympic Highway), Olympic Highway/Melville Street, Erin Street, Edward Street (Sturt Highway), Docker Street/Bourke Street, Macleay Street, Railway Street and Lake Albert Street.

The EAD considered peak 1 hour traffic during the daytime. The EAD does not appear to assess construction traffic noise, including potential impacts from diversions, outside of peak traffic periods. The CNVIS documents will therefore conservatively assume that where night-time construction traffic is required, impacts would be experienced by residences along construction routes on sub-arterial and local roads within close proximity to the work sites. Night-time noise impacts are not anticipated on arterial roads.

TABLE 24: EAD PREDICTED CONSTRUCTION TRAFFIC ROUTES AND NUMBERS (CONSTRUCTION TRAFFIC)

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
ALBURY PRECINCT						
Murray River bridge						
East Street	Sub-arterial	58.9	59.2	No	No	No
Atkins Street	Sub-arterial	56.1	57.0	No	No	No
Hume Highway	Arterial	65.2	65.4	Yes	No	No
Macauley Street	Local	46.2	48.9	No	Yes	No
Panmure Street	Local	46.2	48.9	No	Yes	No
Abercorn Street	Local	46.1	48.9	No	Yes	No
Kiewa Street	Local	56.2	57.3	Yes	No	No
Townsend Street	Local	46.2	48.9	No	Yes	No
Olive Street	Local	56.2	57.3	Yes	No	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Albury Station, Albury Yard and Riverina Highway bridge						
Young Street	Arterial	56.7	57.4	No	No	No
Smollet Street (Railway Place)	Local	46.8	50.1	No	Yes	No
Borella Road	Arterial	63.6	64.2	Yes	No	No
Hume Highway Northbound Off Ramps	Arterial	58.5	60.2	Yes	No	No
Schubach Street	Sub-arterial	56.1	57.6	No	No	No
Billy Hughes bridge						
Wagga Road	Sub-arterial	59.6	60.7	Yes	No	No
Hume Highway	Arterial	66.5	67.1	Yes	No	No
Table Top Yard						
Perryman Lane	Local	51.8	52.8	No	No	No
Tynan Road	Local	51.0	51.9	No	No	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Hume Highway	Arterial	66.5	66.6	Yes	No	No
GREATER HUME–LOCKHART PRECINCT						
Culcairn Yard Clearance and pedestrian bridge						
Olympic Highway/Melville Street	Sub-arterial	58.8	61.0	Yes	Yes	Yes
Balfour Street	Sub-arterial	55.1	56.0	No	No	No
Railway Parade South	Arterial	53.4	54.7	No	No	No
Railway Parade North	Local	52.0	54.0	No	No	No
Henty Yard clearances						
Railway Parade (Olympic Highway)	Arterial	58.8	61.0	Yes	Yes	Yes
Sladen Street	Sub-arterial	42.1	46.4	No	Yes	No
Rosler Parade/Yankee Crossing Road	Local	39.0	46.2	No	Yes	No
Allan Street	Local	50.1	53.6	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Ivor Street	Local	50.1	53.6	No	Yes	No
Yerong Creek clearances						
Olympic Highway/Cox Street	Arterial	59.5	61.3	Yes	No	No
Plunkett Street	Sub-arterial	42.1	46.4	No	Yes	No
Finlayson Lane	Local	40.1	46.5	No	Yes	No
The Rock Yard clearances						
Olympic Highway/Melville Street	Arterial	59.5	59.8	No	No	No
Urana Street	Sub-arterial	45.6	46.7	No	No	No
Henty diversion						
Rosler Parade/Yankee Crossing Road	Sub-arterial	27.3	34.7	No	Yes	No
Allan Street	Local	50.1	53.7	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
WAGGA WAGGA PRECINCT						
Uranquinty Yard clearances						
Olympic Highway	Arterial	60.2	61.4	Yes	No	No
Uranquinty Street	Sub-arterial	39.2	44.2	No	Yes	No
Yarragundry Street	Sub-arterial	39.6	44.1	No	Yes	No
Hanging Rock Road	Local	37.1	46.4	No	Yes	No
Pearson Street bridge						
Edward Street (Sturt Highway)	Arterial	58.9	59.4	No	No	No
Moorong Street (Olympic Highway)	Arterial	63.6	64.0	Yes	No	No
Pearson Street	Sub-arterial	58.5	58.9	No	No	No
Urana Street	Sub-arterial	54.5	55.4	No	No	No
Cheshire Street	Local	49.2	51.5	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Alan Turner Depot Access Road	Local	53.4	54.6	No	No	No
Fernleigh Road	Local	61.0	61.3	Yes	No	No
Wagga Wagga Station, Yard, Edmondson Street bridge and Cassidy Parade pedestrian bridge						
Edward Street (Sturt Highway)	Arterial	60.2	61.1	Yes	No	No
Fox Street	Local	62.6	63.1	Yes	No	No
Mitchelmore Street	Sub-arterial	56.2	57.4	No	No	No
Edmondson Street	Sub-arterial	57.7	58.8	No	No	No
Norman Street	Local	62.2	62.6	Yes	No	No
Coleman Street	Sub-arterial	53.3	55.9	No	Yes	No
Cassidy Parade	Local	59.1	60.1	Yes	No	No
Erin Street	Local	51.9	55.4	Yes	Yes	Yes
Station Place	Local	49.3	53.7	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Brookong Avenue	Local	57.6	59.4	Yes	No	No
Bomen Yard clearances						
Olympic Highway	Arterial	60.2	61.4	Yes	No	No
Byrnes Road	Arterial	56.6	58.0	No	No	No
Merino Drive – between Olympic and Dorsett	Sub-arterial	45.9	49.0	No	Yes	No
Merino Drive – between Byrnes and Dorsett	Sub-arterial	55.7	57.3	No	No	No
East Bomen Road	Local	43.0	46.1	No	Yes	No
Edmondson Street diversion						
Edward Street (Sturt Highway)	Arterial	60.2	63.6	Yes	Yes	Yes
Docker Street/Bourke Street	Sub-arterial	57.1	61.2	Yes	Yes	Yes
Urana Street	Sub-arterial	54.1	60.0	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Macleay Street	Local	57.9	63.6	Yes	Yes	Yes
Railway Street	Local	57.9	63.6	Yes	Yes	Yes
Lake Albert Road	Sub-arterial	60.1	63.2	Yes	Yes	Yes
JUNEE PRECINCT						
Harefield Yard clearances						
Harefield Road	Local	44.7	50.4	No	Yes	No
Byrnes Road	Arterial	59.7	60.9	Yes	No	No
Harefield Railway Access Road	Sub-arterial	35.6	44.8	No	Yes	No
Kemp Street bridge						
Seignior Street	Arterial	52.7	57.3	No	Yes	No
Olympic Highway Level Crossing	Arterial	50.9	56.2	No	Yes	No
Humphrys Street	Sub-arterial	43.1	50.5	No	Yes	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Lorne Street	Sub-arterial	36.9	37.7	No	No	No
Joffre Street	Local	41.7	50.8	No	Yes	No
Harold Street	Local	53.0	55.0	No	No	No
Thomas Street	Local	40.5	45.3	No	Yes	No
William Street	Sub-arterial	39.6	47.7	No	Yes	No
Pretoria Avenue	Local	40.5	50.7	No	Yes	No
Junee Station, Junee Yard and Kemp Street bridge						
Olympic Highway (west of Seignior Street)	Arterial	57.6	59.0	No	No	No
Seignior Street	Sub-arterial	52.7	54.0	No	No	No
Broadway Street	Arterial	53.0	54.1	No	No	No
Olympic Highway Level Crossing	Sub-arterial	50.9	52.5	No	No	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Humphrys Street	Sub-arterial	43.1	45.8	No	Yes	No
Main Street (Olympic Highway)	Sub-arterial	42.8	45.5	No	Yes	No
Lorne Street	Local	56.4	57.5	Yes	No	No
Hill Street	Local	51.1	53.3	No	Yes	No
Joffre Street	Local	41.7	45.4	No	Yes	No
Harold Street	Local	53.0	54.8	No	No	No
Thomas Street	Local	40.5	45.0	No	Yes	No
Railway Lane	Local	40.2	43.9	No	Yes	No
Railway Parade	Local	40.2	43.9	No	Yes	No
William Street	Sub-arterial	39.6	44.2	No	Yes	No
Edgar Street	Arterial	47.3	49.5	No	Yes	No
Byrnes Road	Local	56.6	57.5	Yes	No	No

TRAFFIC ROUTE	ROAD TYPE	PREDICTED CONSTRUCTION TRAFFIC NOISE (BOTH DIRECTIONS) LAeq (PERIOD)		Exceed base criterion? ARTERIAL/SUBARTERIAL Day: 60dB LAeq(15 HOUR) - LOCAL Day: 55dB LAeq(1 HOUR)	POTENTIAL INCREASE > 2dB	POTENTIAL NOISE IMPACT
		Existing	Existing and proposed			
Pretoria Avenue	Local	40.6	45.0	No	Yes	No
Olympic Highway underbridge						
Main Street (Olympic Highway)	Arterial	54.3	57.6	No	Yes	No
Illabo Road	Local	46.0	50.0	No	Yes	No
Junee to Illabo clearances						
Olympic Highway	Arterial	54.3	58.1	No	Yes	No
Brabins Road	Local	34.2	49.7	No	Yes	No
Waterworks Road	Local	42.5	50.2	No	Yes	No
Marinna Station Cross Road	Local	34.2	49.7	No	Yes	No

6.3 Construction vibration impacts

The EAD assessed vibration based on minimum working distances for human comfort and cosmetic damage at non-heritage sites. The predicted receivers within the safe working distances for ground vibration (excluding start up and shut down) are outlined in Table 25. Enhancement sites with no vibration-generating works or no impacted receivers are not included. For each precinct, the highest impact activity (identified in the EAD) for construction vibration was vibratory compaction (start-up / shut down).

Refer to the project website (https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/) for endorsed construction noise and vibration impact statements (Section 7.1) prepared for each enhancement site.

TABLE 25: EAD ASSESSMENT OF MINIMUM WORKING DISTANCES FOR VIBRATION IMPACTS

ENHANCEMENT SITE	NO. OF RECEIVERS WITHIN THE MINIMUM WORKING DISTANCES		APPROX. DURATION (DAYS)	
	HUMAN COMFORT	COSMETIC DAMAGE: NON-HERITAGE SITES	DAY	NIGHT
Albury Precinct				
Murray River bridge	28	0	5	0
Albury Station pedestrian bridge	37	3	5	0
Albury Yard clearances	6	0	17	2
Riverina Highway bridge	6	0	20	1
Greater Hume-Lockhart Precinct				
Culcairn Yard clearances	37	0	20	1
Henty Yard clearances	47	0	15	1
Yerong Creek Yard clearances	15	0	15	1
Wagga Wagga Precinct				
Uranquinty Yard clearances	48	0	15	1
Pearson Street bridge	53	0	12	12
Cassidy Parade pedestrian bridge	58	1	5	0
Edmonson Street bridge	93	9	25	1
Wagga Wagga Station pedestrian bridge	46	0	5	0
Wagga Wagga Yard clearances	113	0	15	1
Junee Precinct				
Harefield Yard clearances	2	0	5	1

ENHANCEMENT SITE	NO. OF RECEIVERS WITHIN THE MINIMUM WORKING DISTANCES		APPROX. DURATION (DAYS)	
	HUMAN COMFORT	COSMETIC DAMAGE: NON-HERITAGE SITES	DAY	NIGHT
Kemp Street bridge (as modified by the Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment, August 2025)	132	24	20	5
Junee Station pedestrian bridge	15	0	5	0
Junee Yard clearances	26	0	3	2
Olympic Highway underbridge	125	0	10	0
Junee to Illabo clearances	12	0	23	2

The EAD predicted that there would be vibration impacts to structures. The predicted vibration impacts were expected:

Albury Precinct -

- Up to 16 structures that could be exposed to vibration levels higher than 3 mm/s PPV;
- The highest number of potentially affected structures is due to vibratory piling and vibratory compaction at the Albury Station pedestrian bridge and Albury Yard clearances enhancement sites.
- Many of these structures are light industrial or rail buildings, and would therefore be resilient to higher vibration levels.

Greater Hume-Lockhart Precinct -

- Up to 12 structures that could be exposed to vibration levels higher than 3 mm/s PPV.
- The highest number of potentially affected structures is due to vibratory compaction at the Culcairn Yard clearances
- Many of these structures are subject to regular vibration from passing trains and are likely to be insensitive to vibration.

Wagga Wagga Precinct -

- Up to 32 structures that could be exposed to vibration levels higher than 3 mm/s PPV;
- The highest number of potentially affected structures is at the Edmondson Street bridge enhancement site, where residences and the South Wagga Public School may be impacted;
- Properties near the Cassidy Parade pedestrian bridge and Wagga Wagga Yard clearances enhancement sites may also exceed the vibration criteria due to vibratory compaction works;
- The Wagga Wagga conservation area does not necessarily imply that items in this area are susceptible to vibration;

Junee precinct -

- Up to five structures that could be exposed to vibration levels higher than 3 mm/s PPV;
- The highest number of potentially affected structures is due to vibratory compaction at the Junee Yard clearances and Junee Station pedestrian bridge enhancement sites.

The above statements and predicted impacts are based on the assessments described in the EAD. Updated assessments of construction vibration impacts, based on current design and construction planning, will be conducted during the preparation of Construction Noise and Vibration Impact Statements (CNVIS) for relevant works (refer Section 7.1).

6.4 Kemp Street bridge enhancement site modification

Section 6 of the Albury to Illabo Kemp Street Bridge Modification Noise and Vibration Impact Assessment (August 2025) includes a comparison of the predicted construction noise and vibration impacts between the EIS and the Kemp Street bridge enhancement site modification and concludes the following:

- Predicted construction noise impacts as a result of the modification are generally consistent with the impacts presented in the EIS.
- Extensions to the CIZ has increased impacts to receivers near those work areas, particularly during the night-time period. iA summary of the impacts is contained in Table 23.
- Vibration impacts have increased slightly compared to those identified in the EIS. Several additional sensitive receivers have been identified as potentially falling within the minimum working distances for cosmetic damage. Updated summaries of the predicted vibration impacts are shown in Table 25.

7 MANAGEMENT AND MITIGATION

7.1 Construction Noise and Vibration Impact Statements

As required by CoA E78, Construction Noise and Vibration Impact Statements (CNVIS) will be prepared and implemented for construction activities that may exceed the noise management levels and vibration criteria at any residence outside standard construction hours or where receivers will be highly noise affected.

The CNVIS will include specific noise and vibration mitigation measures identified through consultation with affected sensitive land user(s) and the mitigation measures are to be implemented for the duration of the assessed activity.

Construction activities that are likely to need a CNVIS will be screened using the project noise and vibration management tool to determine whether activities are predicted to exceed the noise management levels or occur within the minimum working distances (for vibration intensive activities) at any residence outside standard construction hours (refer Section 5.3.1), or where receivers will be highly noise affected.

A CNVIS may include but not be limited to:

- A description of the proposed activities (construction scenarios), duration and associated plant proposed to be used;
- Prediction of noise (including ground-borne) and vibration levels and comparison against noise, ground-borne noise, and vibration objectives, including the 'Best Achievable Noise Performance Objective', which constitutes the construction noise level predicted at a receiver location after all feasible and reasonable noise mitigation measures have been incorporated into the project noise and vibration management tool;
- Sleep disturbance assessment considering maximum noise levels (L_{Amax}) from the proposed activities during night-time period;
- Examination of alternative methods of construction or innovative technologies that would potentially reduce noise and vibration if the potential noise (including ground-borne noise) and vibration exceeds the relevant criteria;
- Description and commitment to work practices which limit noise (including ground-borne noise) and vibration;
- Description of site-specific noise (including ground-borne noise) and vibration mitigation treatments, indicative construction monitoring locations, and time restrictions, including respite periods, duration, and frequency;
- Internal noise audit systems including recording of daily hours of construction, progressive impact assessments as work proceeds, conducting informal checks, providing active and communication links to councils and surrounding residents and sensitive receivers;
- Assessment of potential noise from the proposed construction methods including noise from construction vehicles and noise impacts from required traffic diversions;
- Measures to coordinate works with other construction and infrastructure projects;
- Community consultation and notification;
- Examination of all reasonable and feasible measures including any suggested by the AA;
- Additional noise (including ground-borne noise) and vibration mitigation measures as negotiated with affected residents and other sensitive receivers.

Consultation will be undertaken with affected sensitive land use(s) in accordance with CoA E78 to determine specific mitigation measures. These mitigation measures will be implemented for the duration of the works subject to that CNVIS. Consultation will be undertaken in accordance with the CCS.

A copy of each CNVIS will be provided to the AA to be reviewed and endorsed prior to the commencement of the associated activity. Copies of the CNVIS will be provided to the Planning Secretary and the ER upon request. A copy of each current AA endorsed CNVIS will be published on the project website (https://inlandrail.com.au/where-we-go/projects/albury-to-illabo/) prior to the subject works in accordance with CoA B18(e).

As construction planning and construction activities progress, the location of works and/or the required plant and equipment may evolve beyond that which was assessed in the endorsed CNVIS. The project noise and vibration management tool (SLR Predict, refer Section 7.2) will be used to screen the new scope / plant and equipment. Where impacts are equal to, or no greater than those identified in the endorsed CNVIS, the assessment will be provided to the AA for information prior to the works. Where increased impacts are identified, the output of the project noise and vibration tool will utilised to prepare an addendum CNVIS, which will be provided to the AA for review and endorsement.

7.2 Project noise and vibration management tool

A project noise and vibration management tool has been developed by an appropriately qualified acoustic consultant on behalf of Martinus Rail, to predict construction noise and vibration impacts from proposed construction activities and screen for potential vibration impacts based on the minimum working distances for vibration intensive activities. The project noise and vibration management tool, SLR Predict, will enable the project to predict construction noise impacts by specifying work areas and activities, as construction progresses.

The noise and vibration management tool will be designed to allow:

- Flexibility in assessing specific scenarios of local area works,
- Assessment where works are undertaken at multiple locations, and
- Multiple combinations of equipment that may be used during each stage of works.

The project noise and vibration management tool output will include sensitive receivers where predicted noise levels are above the NMLs. Additional mitigation measures can then be applied in accordance with Section 7.10 of this CNVMP and the OOHW Protocol (Appendix F).

Verification and adjustment of the prediction tool will occur throughout construction via monitoring. Noise and vibration monitoring data will be collected in accordance with the Monitoring Program (Appendix B). This feedback loop will ensure the prediction tool is verified and adjusted as required to ensure accuracy across the various sections of the Project alignment.

The noise and vibration management tool will assist in managing respite in accordance with CoA E72 and E83 and/or any EPL requirements.

Note: The noise and vibration management tool does not replace the CNVIS. CNVIS documents (and CNVIS addendums) will be stand-alone and definitive documents that guide the deployment of specific mitigation measures and practices at each site.

7.3 Minimising vibration impacts

The pattern of vibration radiation is very different to the pattern of airborne noise radiation and is very site specific. Final vibration levels are dependent on many factors including the actual plant used, its operation and the intervening geology between the activity and the receiver.

Recommended minimum working distances, derived from the Construction Noise and Vibration Guideline – Public Transport Infrastructure (CNVG-PTI) (TfNSW, 2023), presented in the following sections provide a conservative screening method for indicating buildings and structures where there is a risk of vibration impact. Vibration monitoring would be carried out to confirm the minimum working distances at specific sites, where vibration significant plant is required to operate within the recommended minimum working distances.

7.4 Human exposure

Many building occupants assume that building damage is occurring when they feel vibration or observe rattling of loose objects, however the level of vibration at which people perceive vibration or at which loose objects may rattle is far lower than vibration levels that can cause damage to structures. At properties near the construction works, nearby receivers may be able to feel vibration when vibration-generating equipment is being utilised. For this reason, it is appropriate to identify properties where there is a probability of adverse comment so that impacts can be managed.

Recommended minimum working distances for typical vibration intensive construction equipment for human comfort (response) are shown in Table 26. These recommended distances relate to the screening vibration criteria for human comfort and are presented as a guide only.

TABLE 26: RECOMMENDED MINIMUM WORKING DISTANCES (M) – HUMAN COMFORT

VIBRATION SIGNIFICANT PLANT ITEM	RATING/DESCRIPTION	CRITICAL AREA[1]	RESIDENCE (DAY)	RESIDENCE (NIGHT)	OFFICE	WORKSHOP
Vibratory Roller	<50 kN (1–2 tonne)	25 m	17 m	20 m	11 m	7 m
	<100 kN (2–4 tonne)	25 m	17 m	20 m	11 m	7 m

VIBRATION SIGNIFICANT PLANT ITEM	RATING/DESCRIPTION	CRITICAL AREA[1]	RESIDENCE (DAY)	RESIDENCE (NIGHT)	OFFICE	WORKSHOP
	<200 kN (4–6 tonne)	50 m	33 m	40 m	21 m	14 m
	<300 kN (7–13 tonne)	124 m	81 m	100 m	52 m	34 m
	>300 kN (13–18 tonne)	124 m	81 m	100 m	52 m	34 m
	>300 kN (>18 tonne)	124 m	81 m	100 m	52 m	34 m
Small hydraulic hammer	300 kg (5 to 12 t excavator)	9 m	6 m	7 m	4 m	3 m
Medium hydraulic hammer	900 kg (12 to 18 t excavator)	29 m	19 m	23 m	12 m	8 m
Large hydraulic hammer	1,600 kg (18 to 34 t excavator)	91 m	59 m	73 m	38 m	25 m
Vibratory pile driver	sheet piles	25 m	17 m	20 m	11 m	7 m
Piling rig – bored	≤ 800 mm	5 m	4 m	4 m	3 m	2 m
Jackhammer	Handheld	3 m	2 m	2 m	2 m	1 m

1) Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

7.5 Buildings and structures

Pre- and post-condition surveys of buildings, structures, utilities, and the like, where they have been identified as being at risk of damage in the documents listed in CoA A1, will be undertaken in accordance with CoA E120 and E121.The inspections will be comprehensively written, and a photographic condition report produced by an appropriate professional prior to relevant works commencing will be included. The inspection reports will document the existing condition of the property and typically note the location of all visible cracks and/or defects observed by the inspector. The post-construction survey report will record any changes to the property at construction completion.

Property damage caused directly or indirectly (for example from vibration or from groundwater change) by the construction or operation must be rectified at no cost to the owner, in accordance with CoA E122. Alternatively, compensation may be provided for the property damage as agreed with the property owner.

Recommended minimum working distances to reduce the risk of cosmetic damage to buildings or structures from typical vibration intensive construction equipment are presented in Table 27. These are aimed at reducing the risk of cosmetic damage (as per BS 7385:1993 and DIN 4150-3:2016) and are based on the vibration screening criteria in Section 5.4. The minimum working distances below are indicative and will vary depending on the plant item, building types and foundations and local geotechnical conditions. Vibration monitoring would be carried out to confirm the site-specific minimum working distances for the project.

TABLE 27: MINIMUM WORKING DISTANCES (M) - COSMETIC DAMAGE

VIBRATION SIGNIFICANT PLANT ITEM	RATING/DESCRIPTION	RESIDENTIAL AND LIGHT COMMERCIAL (BS 7385)	HERITAGE ITEMS (DIN 4150, GROUP 3)	INDUSTRIAL AND HEAVY COMMERCIAL (BS 7385)
	<50 kN (1–2 tonne)	5 m	11 m	3 m

VIBRATION SIGNIFICANT PLANT ITEM	RATING/DESCRIPTION	RESIDENTIAL AND LIGHT COMMERCIAL (BS 7385)	HERITAGE ITEMS (DIN 4150, GROUP 3)	INDUSTRIAL AND HEAVY COMMERCIAL (BS 7385)
Vibratory Roller	<100 kN (2–4 tonne)	6 m	13 m	3 m
	<200 kN (4–6 tonne)	12 m	25 m	6 m
	<300 kN (7–13 tonne)	15 m	31 m	8 m
	>300 kN (13–18 tonne)	20 m	40 m	10 m
	>300 kN (>18 tonne)	25 m	50 m	12 m
Small hydraulic hammer	300 kg (5 to 12 t excavator)	2 m	5 m	1 m
Medium hydraulic hammer	900 kg (12 to 18 t excavator)	7 m	15 m	4 m
Large hydraulic hammer	1,600 kg (18 to 34 t excavator)	22 m	44 m	11 m
Vibratory pile driver	sheet piles	2 m – 20 m	5 m to 40 m	1 m to 10 m
Piling rig – bored	≤ 800 mm	2 m	5 m	1 m
Jackhammer	Handheld	1 m	3 m	1 m
Track tamping	Ballast tamping	5 m	10 m	3 m

In accordance with CoA E79, owners of properties at risk of exceeding the screening criteria for cosmetic damage will be notified before the commencement of vibration-generating works. Properties at risk of cosmetic damage are identified in Appendix E. The figures identified in Appendix E present the worst-case scenario, showing the most vibration-intensive equipment at all locations within the construction impact zone (CIZ). Updated assessments of construction vibration impacts will be conducted during the preparation of CNVIS for relevant works (refer Section 7.1) and will present the anticipated impacts with appropriate equipment and work areas.

Where properties are identified as within the recommended minimum working distances, vibration monitoring is recommended to determine site specific minimum working distances that will prevent cosmetic and structural damage. If the monitoring above identifies that vibration is likely to exceed the screening criteria for cosmetic damage, further analysis would be undertaken, including consideration of a different construction method with lower source vibration levels and/or implement additional mitigation measures to prevent damage. Furthermore, if the potential exceedance is likely to occur more than once or extend over a period of 24 hours, owners and occupiers would be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the owner and occupier.

A heritage specialist will be engaged throughout the project to provide Martinus Rail with advice on methods and locations for installing equipment used for vibration, movement, and noise monitoring of heritage-listed structures. Additionally, in accordance with CoA E82, before conducting at-property treatment at any heritage item identified in the documents listed in Condition A1, the advice of a suitably qualified and experienced built heritage expert will be obtained and implemented to ensure any such work does not have an adverse impact on the heritage significance of the item.

7.6 Management of out of hours work

Where OOHW for the purposes of the project are undertaken by Martinus Rail, whether undertaken consistent with the requirements of the OOHW Protocol (Appendix F) or an EPL, works will be assessed through a construction noise and vibration assessment. This assessment will take into consideration any works undertaken during the subject shifts by Martinus Rail, to ensure that appropriate respite and other mitigation measures are applied.

7.7 Emergency work

Where OOHW is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm, the Environmental Site Representative (ESR) will notify the AA, the ER, the Planning Secretary and the EPA of the need for the emergency works. In addition, the construction team will use best endeavours to notify all affected sensitive receivers of the likely impact and duration of the emergency work.

7.8 Out of Hours Work Protocol

The OOHW Protocol (Appendix F) will assist with any work associated with the project that will be carried out outside standard construction hours and that are not regulated by an EPL. The OOHW Protocol also satisfies CoA E72 where works can be approved outside the standard hours through an approval of an OOHW Protocol.

The OOHW Protocol will be implemented by Martinus Rail for any OOHW not subject to an EPL, which are expected to be minimal.

The OOHW Protocol will be approved by the Planning Secretary before commencement of the OOHW.

7.9 Construction traffic noise

Where temporary diversions (e.g. during possessions or temporary road closures, etc.) are required outside of standard construction hours, impacts will be assumed, and mitigation will be implemented in accordance with CNV-11 and CNV-12.

Where diversions are required for three months or more, unattended monitoring is proposed at key diversion locations. Monitoring results will be used to determine if the Road Noise Policy criteria is exceeded and will help inform any potential mitigation.

Potential mitigation may include respite offers (e.g. movie tickets, etc.), respite items (e.g. ear plugs, noise cancelling headphones, etc.), temporary at-property treatments (e.g. temporary noise blankets, etc.) and/or alternative accommodation.

7.10 Cumulative impacts, respite and construction fatigue

Cumulative impacts may occur because of the project being delivered concurrently, or consecutively, with other approved projects in the area. Chapter 26 (Cumulative impacts) of the EIS identified the following possible projects that could overlap with construction of the project:

- T2A (Victoria);
- Thurgoona Link Road;
- Nexus Industrial Precinct;
- Jindera Solar Farm;
- Glenellen Solar Farm;
- Walla Walla Solar Farm;
- Culcairn Solar Farm;
- Uranquinty Solar Farm;
- Sandy Creek Solar Farm;
- Gregadoo Solar Farm;
- Solar Farm (Five MW) – Uranquinty;
- Olympic Highway intersection upgrades;
- Solar Farm (Five MW) – Bomen;

- Wagga Wagga Special Activation Precinct (SAP);
- Riverina Intermodal Freight and Logistics Hub;
- Project EnergyConnect (NSW— Eastern Section);
- HumeLink (Western Section);
- Junee Station upgrade;
- Junee to Griffith Line upgrade;
- Illabo Solar Farm;
- Inland Rail – Illabo to Stockinbingal (I2S) (NSW);
- Grade separating road interfaces.

It is noted that the scale of cumulative impacts is dependent upon timing, location and type of construction activities. Regular interface meetings will be undertaken with government authorities, neighbouring projects, and stakeholders.

In accordance with CoA C7(d) and E83, to manage cumulative impacts, detailed design and construction works will consider with the aim of minimising concurrent works near sensitive receivers, including:

- Coordination between project teams and other CSSI, SSI and SSD projects that are being constructed nearby;
- Rescheduling of work to provide respite to impacted noise sensitive land user(s) so that respite is achieved in accordance with CoA E83(a);
- Consideration to the provision of alternative respite or mitigation to impacted noise sensitive land users.

The consideration of respite must also include all other projects which may cause cumulative and/or consecutive impacts at receivers affected by the delivery of the project. The AA and the ER will be informed of decisions made in relation to respite or mitigation and documentary evidence will be provided to support the decisions.

It is also noted that in some instances where impacts are already high, it may be in the interests of the affected receivers and nearby projects to have works occur at the same time to minimise the number of occurrences and overall duration of OOHW for instance.

The implementation of respite where it relates to OOHW will be managed in accordance with the OOHW Protocol (Appendix F).

Martinus Rail will work with third parties (such as utility relocations) to reschedule any work to provide respite to noise impacted sensitive land users so that the respite is achieved in accordance with CoA E83. Documentary evidence will be provided to the AA in support of any decision made in relation to respite or mitigation. The consideration of respite will also include all other CSSI, SSI and SSD projects which may cause cumulative and/or consecutive impacts at receivers affected by the delivery of the project.

In accordance with CoA C9(a), where sensitive receivers (also referred to as sensitive land uses) are likely to be highly noise affected for more than three (3) months, Martinus Rail will consider measures to reduce works to within standard ICNG construction hours.

In accordance with CoA C9(b), feasible and reasonable mitigation measures to manage potential ongoing construction fatigue from noise impacts on sensitive receivers could include (but not be limited to) undertaking regular consultation with affected land use(s) (quarterly) to determine appropriate offers of respite (e.g. vouchers to spend time away from home at a quieter location or breaks from certain construction activities) or temporary relocation, as well as considering changes to construction methodology and/or plant and equipment to minimise impacts. Complaints will also be actively monitored for trends that would indicate that sensitive receivers are fatigued by construction.

7.11 Management and mitigation measures

7.11.1 IRPL CNVF requirements

The Inland Rail NSW Construction Noise and Vibration Framework (IRPL CNVF) outlines a hierarchy of work practices and mitigation measures to minimise the impact of construction noise and vibration on the community.

Universal work practices (UWP) have been developed by IRPL to minimise potential noise and vibration impacts at surrounding receivers. Table 28 outlines these measures.

TABLE 28: UNIVERSAL WORK PRACTICES

ACTION REQUIRED	DETAILS
Site inductions	Site inductions for all employees and contractors will address: ▪ Environmental aspects and impacts; ▪ Proposal specific and standard noise management measures; ▪ Licence and approval conditions; ▪ Hours of work; ▪ Environmental incident reporting and management procedures; and ▪ Complaints management.
Daily toolbox talks	Daily site-specific briefings for all employees and contractors will include: ▪ Site specific noise management measures; ▪ Location of nearest noise sensitive receivers; ▪ Construction employee parking areas; ▪ Behavioural practices (e.g. avoid swearing, shouting, dropping materials from heights); and ▪ Designated loading/unloading areas and procedures.
Location of construction compounds and worksite planning	▪ Work compounds, storage areas, parking areas, unloading/loading areas and other semi-permanent construction sites should be located away from noise sensitive receivers. Where this is not possible, the orientation and layout of the work site shall consider noise impacts, and opportunities to shield receivers from noise through the use of site buildings and stockpiles should be considered; ▪ The number of vehicle trips to and from site will be optimised.
Construction hours and scheduling	When working adjacent to schools, medical centres, childcare centres or places of worship, particularly noisy activities will be scheduled outside of operating or service hours where possible.
Use of plant and equipment	▪ Equipment that is used intermittently is to be shut down when not in use; ▪ The offset distance between noisy plant and noise sensitive receivers will be maximised where reasonable and feasible; ▪ Use of non-tonal reversing alarms for all permanent mobile plant (excludes light vehicles); ▪ Regularly inspect and maintain equipment to ensure it is operating correctly.
Behavioural practices	▪ Avoid the use of radios or stereos outdoors where neighbours can be affected; ▪ Avoid dropping materials from a height.

7.11.2 Management and mitigation measures

A range of environmental requirements and management measures are identified in the EAD and CoA. Specific measures and requirements to address noise and vibration impacts are outlined in Table 29. The following mitigation measures have been developed with consideration of SMART (specific, measurable, achievable, relevant and time-based) principles.

TABLE 29: NOISE AND VIBRATION MANAGEMENT AND MITIGATION MEASURES

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
General						
CNV-01	Training and awareness programs will be delivered to project personnel, including relevant sub-contractors on noise and vibration requirements (including operating hours) through inductions, toolboxes and targeted training	All	Pre-construction and construction	MR ESM	Good Practice	Training records
Construction noise						
CNV-02	Construction Noise and Vibration Impact Statements (CNVIS) must be prepared for work that may exceed the noise management levels, vibration criteria and/or ground-borne noise levels specified in Section 5.2.6 at any residence outside construction hours identified in Section 5.3, or where receivers will be highly noise affected. The statements will confirm predicted impacts at relevant receivers to assist with the selection of feasible and reasonable management measures, and the requirements for respite. A copy of the CNVIS must be provided to the AA and ER to be reviewed and endorsed prior to the commencement of the associated works. The Planning Secretary may request a copy/ies of CNVIS. The statements will also confirm noise and vibration auditing and monitoring requirements.	All	Pre-construction	MR ESM	CoA E78 UMM NV1	CNVIS
CNV-03	Using portable temporary acoustic screens where effective to screen the noise emissions.	All	Construction	MR ESM	IRPL CNVF	Inspection records
CNV-04	Avoid the simultaneous operation of noisy plant within discernible range of noise sensitive receivers where possible Where practical optimise vehicle routes to avoid or minimise the need for reversing of construction vehicles.	All	Construction	MR ESM	IRPL CNVF	Inspection Records

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
CNV-05	Using at-source noise controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	All	Construction	MR ESM	IRPL CNVF	Inspection Records
CNV-06	Static plant should be located as far as possible from sensitive receivers, be located to take advantage of natural acoustic screening such as terrain, site buildings, etc and where necessary for reduction of noise impacts, provided with an acoustic enclosure. Consideration of battery and/or electrical mains powered items of plant and equipment instead of diesel or petrol powered engines.	All	Construction	MR ESM	IRPL CNVF	Inspection Records
CNV-07	In consultation with contractors and suppliers, aim to source plant and equipment with the lowest available noise and vibration emissions that can practically complete the works. This will include consideration of minimising the use of equipment that generates impulsive, tonal or irregular noise and the consideration of battery and/or electrical powered items of plant and equipment. Non-tonal movement alarms will be considered where relevant for all plant and equipment.	All	Pre-construction/ Construction	MR ESM	UMM NV7 IRPL CNVF	Inspection Records
CNV-08	Where reasonable and feasible, deliveries should be undertaken only during standard daytime construction hours. Where feasible enable forward movements only to restrict or minimise requirement for reversing of vehicles or plant. Construction specific light vehicles should be fitted with broad band level varying reversing alarms where practical.	All	Construction	MR ESM	UMM NV9	Inspection Records
CNV-09	Noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs will not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions can be made at no cost to the affected institution.	All	Pre-construction/ Construction	MR ESM	CoA C9(c) CoA E76	Consultation records Inspection Records Complaints Records

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
CNV-10	All work undertaken for the delivery of the project including those undertaken by third parties (such as utility relocations), must be coordinated to ensure respite periods are provided.	All	Construction	MR ESM	CoA E83	Consultation records Inspection Records
Traffic noise						
CNV-11	Where an exceedance of the NSW RNP road noise criteria is predicted to occur as a result of construction heavy vehicle movements outside of standard construction hours, the following measures would be considered, where reasonable and feasible: ▪ Respite in the form of restricting construction vehicle movements to evening periods only; ▪ Another form of respite to be agreed with the sensitive receiver (where exceedance is greater than three consecutive nights); ▪ Notifications.	All	Construction	MR ESM	CoA C9(d)	OOHW permits
CNV-11b	Where extended (greater than one week) road diversions are required, the diverted route would be selected in consultation with the road authority, but would consider potential noise impacts to sensitive receivers, where practicable. Respite would be considered, where reasonable and feasible.	All	Construction	MR ESM Traffic Manager	CoA C9(d)	TMPs
CNV-12	Where reasonable and feasible, deliveries should be undertaken only during standard daytime construction hours.	All	Construction	MR ESM	UMM NV9	Inspection Records Monitoring records

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
Construction vibration						
CNV-13	Condition surveys will be completed before and after construction works where buildings or structures, utilities or road infrastructure are within the minimum vibration working distances.	All	Pre-construction	MR ESM	UMM NV2	Condition survey
CNV-14	Owners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage must be notified before work that generates vibration commences in the vicinity of those properties.	All	Pre-construction/ Construction	MR ESM	CoA E79	Consultation records
CNV-15	Where vibration levels are predicted to approach the criteria for cosmetic building damage or limits for critical or sensitive areas, attended vibration measurements shall be undertaken at the commencement of vibration generating activities to confirm that vibration limits are within the acceptable range.	All	Pre-construction/ Construction	MR ESM	IRPL CNVF	Vibration monitoring records
CNV-16	Where vibration and overpressure from construction activities are predicted to approach the relevant limits, condition surveys on potentially affected buildings shall be undertaken.	All	Pre-construction/ Construction	MR ESM	IRPL CNVF	Condition surveys
CNV-17	Where vibration levels are predicted to exceed the screening criteria, and following the condition survey, the potential for damage to the item will be assessed. Where there is potential for damage, alternative methods that generate less vibration will be investigated and substituted, where practicable. Where residual damage risks remain, attended vibration measurements will be undertaken at the commencement of vibration-generating activities to confirm that structural vibration limits are within the acceptable range.	All	Pre-construction/ Construction	MR ESM	UMM NV10	Condition survey

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
	Site activities will be modified where practicable to avoid exceeding the applicable criteria. Any identified vibration-related damage to the items will be rectified.					
CNV-17b	Where vibration from construction activities scheduled outside of the hours defined in condition E69 and/or E70, or under the circumstances described in condition E71 is predicted to exceed the preferred continuous and impulsive or intermittent values for human exposure for residents, occupiers of properties at risk of exceeding the criteria must be notified before the work that is predicted to exceed the relevant criteria commences in the vicinity of those properties.	All	Pre-construction/ Construction	MR ESM	IRPL CNVF EPL 21984	Consultation records
Heritage items						
CNV-18	Vibration testing must be undertaken before and during vibration generating activities that have the potential to impact on heritage items to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and attended monitoring shows that the preferred values for vibration are likely to be exceeded, the construction methodology must be reviewed and, if necessary, additional mitigation measures implemented.	All	Pre-construction/ Construction	MR ESM	CoA E80	Vibration monitoring and testing records
CNV-19	Advice from a heritage specialist must be sought on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures.	All	Pre-construction/ Construction	MR ESM	CoA E81	Consultation records
CNV-20	Before conducting at-property treatment at any heritage item identified in the documents listed in Condition A1, the advice of a suitably qualified and experienced built heritage expert must be obtained and implemented to ensure any such work does not have an adverse impact on the heritage significance of the item.	All	Pre-construction/ Construction	MR ESM	CoA E82	Consultation records Advice from heritage expert

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
Land use survey						
CNV-21	A detailed land use survey must be undertaken to confirm sensitive land use(s) (including critical working areas such as operating theatres and precision laboratories) potentially exposed to construction noise and vibration, construction ground-borne noise and operational noise. The survey may be undertaken on a progressive basis but must be undertaken in any one area before the commencement of work which generates construction or operational noise, vibration or ground-borne noise in that area. The results of the survey must be included in the Noise and Vibration CEMP sub-plan required by Condition C8.	All	Pre-construction/ Construction	MR ESM	CoA E68	Land Use Survey (Appendix D)
Construction hours						
CNV-22	Work must be undertaken during the following hours: a) 7:00am to 6:00pm Mondays to Fridays, inclusive; b) 7:00am to 6:00pm Saturdays; and c) at no time on Sundays or public holidays.	All	Construction	MR ESM	CoA E69 EPL 21984	Inspection records Complaints records
CNV-23	Any works outside of the hours defined in condition E69 and/or E70, or under the circumstances described in condition E71 will be undertaken in accordance with the Out of Hours Work Protocol in Appendix F, or EPL 21984	All	Construction	MR ESM	CoA E71 CoA E72 UMM NV8 EPL 21984	Inspection records OOHW Permits
CNV-24	Works may be undertaken in accordance with the hours and noise limits specified in negotiated agreements with affected sensitive receivers. Where multiple receivers are affected by works, a majority of the receivers must agree to the specified hours and noise limits proposed by the project.	All	Construction	MR ESM	CoA E71 EPL 21984	Inspection records OOHW Permits Negotiated agreements

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
	Negotiated agreements must be in writing and finalised prior to the relevant works. Planning Secretary, the ER and the AA may request a copy/ies of the negotiated agreement.					
Consultation and complaints management						
CNV-25	Owners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage must be notified before work that generates vibration commences in the vicinity of those properties. If the potential exceedance is to occur more than once or extend over a period of 24 hours, owners and occupiers are to be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the owner and occupier.	All	Pre-construction/ Construction	MR ESM	CoA E79	Consultation records
CNV-26	A telephone, email and web-based community information service shall be established to allow the community to obtain additional information on construction activities, provide feedback or make a complaint	All	Pre-construction/ Construction	MR ESM	IRPL CNVF	Consultation records Community information services
CNV-27	Regular communications on the activities and progress of the proposal shall be provided to the community (e.g. via newsletter, email and/or website).	All	Pre-construction/ Construction	MR ESM	IRPL CNVF	Consultation records Community information services
Ground borne Noise						
CNV-28	Where exceedances of ground borne noise management levels are predicted additional management measures would be implemented. These include but are not limited to:	All	Pre-construction/ Construction	MR ESM	CoA E75	Consultation records for management measures

ID	MANAGEMENT MEASURE	LOCATION	WHEN TO IMPLEMENT	RESPONSIBILITY FOR IMPLEMENTATION	REFERENCE OR SOURCE	EVIDENCE OF IMPLEMENTATION
	• Respite in the form of only allowing work to be completed during the day time period; • Respite in the form of allowing at least a one-hour respite period between blocks of work; • Alternate accommodation options (i.e. accommodation in motels away from the worksite) may be provided for residents.					
Monitoring						
CNV-29	Noise and vibration monitoring will be undertaken in accordance with Section 8.4 and Appendix B.	All	Pre-construction/ Construction	MR ESM	CoA C25 EPL 21984	Noise and Vibration Monitoring Program (Appendix B)
Project change						
CNV-30	Where significant new/additional activities and/or significant changes to site layouts are proposed (proposed changes), the potential noise and vibration impacts will be considered: ▪ Initial changes will be assessed using the project noise and vibration management tool; ▪ If required, a new/revised Construction Noise and Vibration Impact Statement will be prepared. Potential changes to be implemented would be assessed as required through the appropriate approval avenue (e.g. consistency assessment, modification, minor ancillary facilities assessments, etc.).	All	Pre-construction/ Construction	MR ESM	Best practice	Assessment records

7.11.3 Additional mitigation measures (AMM)

When construction noise and vibration levels are predicted to exceed NMLs during OOHW with UWP and standard mitigation measures (SMM) applied, the project shall implement additional measures commensurate with the impacts. The definitions of AMM from Section 3.3 of the IRPL CNVF and guidance on their implementation are provided in the Out of Hours Works Protocol (Appendix F).

8 COMPLIANCE MANAGEMENT

8.1 Communication

The CCS has been prepared to document the approach to stakeholder and community communications for the project. The CCS identifies opportunities and tools for providing information and consulting with the community and stakeholders during the construction of the project.

Noise and vibration management information will be communicated to the community and stakeholders in accordance with the principles and procedures outlined in the CCS. Martinus Rail will adhere as a minimum to the following principles and procedures relevant to noise and vibration management:

- Good engagement with the community will be maintained to facilitate effective project delivery with consideration of community impact, including procedures for notifying residents, business owners and other sensitive receivers, of any noise- or vibration-intensive construction activities likely to affect their amenity;
- The community will be informed of the dates for the intended works, sequencing, timing and levels of noise if above the NML or vibration intensive events at least seven calendar days in advance of the activity being undertaken;
- Minimising construction noise and vibration will be viewed as a continuous improvement exercise that is inclusive of stakeholders;
- Site personnel and the community will be informed of the effort and methods undertaken to reduce noise and vibration impacts for the project;
- Owners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage will be notified before work that generates vibration commences in the vicinity of those properties in accordance with CoA E79. If the potential exceedance is to occur more than once or extend over a period of 24 hours, owners and occupiers are to be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the owner and occupier.

For further detail on the measures implemented for advising the community in advance of upcoming work, including upcoming out-of-hours work, refer to the CCS.

Community consultation methods relating to OOHW not regulated by an EPL are contained in the OOHW Protocol (Appendix F). Should works outside of standard construction hours be required that are subject to an EPL, a notification must be provided to potentially noise affected sensitive receivers in accordance with the EPL No 21984 condition L4.5. Condition L4.5 of the EPL specifies the requirements of the notification including the content and timing.

8.2 Complaints management

In accordance with CoA B7, IRPL has developed a Complaints Management System to document the overall approach to complaints management for the project. The Complaints Management System will be implemented for the duration of construction and for 12 months following completion of construction.

The project has the following information available to facilitate complaints and will be accessible to the community:

- 24-hour telephone number for the registration of complaints and enquiries;
- Postal address to which written complaints and enquires may be sent;
- Email address to which electronic complaints and enquiries may be transmitted;
- Mediation system for complaints unable to be resolved.

The information will be made accessible to all members of the community regardless of age, ethnicity, disability or literacy level. For further detail refer to the CCS.

The Complaints Management System includes a Complaints Register which will record the details of all complaints relating to the Project. The Complaints Management System includes a Complaints Register, which will record the details of all complaints relating to the Project including the following as a minimum:

- Date and time of the complaint;
- Method by which the complaint was made;
- Any personal details of the stakeholder;
- Number of people affected in relation to a complaint;

- Nature of the complaint;
- Action taken in relation to the complaint, means by which the complaint was addressed and any follow up;
- Whether resolution was reached, with or without mediation;
- If no action taken, reasons why;
- The status of resolution of the complaint.

All complaints will be recorded in the Complaints Register (by the Communications Manager). The Complaints Register will be provided to the ER and AA on a weekly basis where complaints have been received, or as otherwise requested. The Complaints Register will be provided to the Planning Secretary on request. Martinus Rail is not required to submit a report for any reporting period during which no complaints have been received.

Condition M5.7 of the EPL identifies specific requirements in the event of a noise and vibration complaint:

a) the licensee must commence investigation of noise and vibration complaints:
   i. within two hours of the complaint being made; or
   ii. in accordance with any documented complaint management agreement between the licensee and the complainant.
b) the licensee must offer to the complainant to undertake attended noise or vibration monitoring at their premises if:
   i. any investigation referred to in this condition identifies works or activities being undertaken on the licensed premises as the likely source of the complaint; and
   ii. the licensee is not in possession of noise monitoring data representative of the complainants location and of the subject works and activities being undertaken on the licensed premises.
c) if the occupant of the dwelling or management personnel of a Noise Sensitive Receiver (other than a dwelling) accepts the offer of attended noise or vibration monitoring the licensee must undertake that attended monitoring:
   i. as soon as practicable; or
   ii. at a time agreed with the complainant.
d) The licensee must, in respect of each complaint made, advise each complainant of the results of its investigation of their complaint and any proposed remedial action within a reasonable period of time.

Timeframes for complaint responses are described in the complaints management process in the CCS.

Complaints will also be actively monitored for trends that would indicate that sensitive receivers are fatigued by construction.

8.3 Training

To ensure that this Plan is effectively implemented, all site personnel (including sub-contractors) will undergo site induction training that includes construction noise and vibration management issues prior to construction commencing. The induction training will address element related to noise and vibration management including:

- Existence and requirements of this CNVMP;
- Relevant legislation, regulations and EPL conditions (where applicable), including to satisfy EPL conditions G3.1 and G3.2:
- clearly identify the location of all noise sensitive receivers likely to be affected by noise or vibration generated during the course of the work undertaken by those personnel; and
- highlight the licence requirements to minimise noise and vibration impacts on Noise Sensitive Receivers;
- Incident response, management and reporting;
- Standard construction hours;
- The process for seeking approval for out of hours works, including consultation;
- Noise management measures during night works;
- Location of noise sensitive areas;
- Complaints response and reporting;
- General noise and vibration management measures;
- Specific responsibilities to minimise impacts on the community and built environment from noise and vibration associated with the works.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in noise and vibration management (including those undertaking noise or vibration monitoring).

Daily pre-start meetings conducted by the Martinus Rail Foreman/Site Supervisor will inform the site workforce of any environmental issues relevant to noise and vibration that could potentially be impacted by, or impact on, the day's activities.

Further details regarding staff induction and training are outlined in Section 6 of the CEMP.

8.4 Inspection and monitoring

8.4.1 Monitoring

The Construction Monitoring Programs have been prepared in consultation with the relevant identified government agencies in order to compare actual performance of construction against the predicted performance. This process informs management measures. This includes the development of a Construction Noise and Vibration Monitoring Program. The Construction Noise and Vibration Monitoring Program is provided in Appendix B.

8.4.2 Inspections

Regular inspections of sensitive areas and activities will occur for the duration of the project. Martinus Rail will carry out weekly site inspections.

Site inspections by the AA and ER will occur throughout construction. Detail on the nature and frequency of these inspections are documented in Section 7.1 of the CEMP.

8.4.3 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of noise and vibration management measures, compliance with this Plan, conditions of approval and other relevant approvals, licenses and guidelines. Audit requirements are detailed in Section 9.1 and 9.2 of the CEMP.

8.4.4 Reporting and identified records

Reporting requirements and responsibilities are documented in Section 10.2 of the CEMP and Section 5 of Appendix B of this CNVMP.

Martinus Rail will maintain accurate records substantiating all construction activities associated with the project or relevant to the conditions of approval, including measures taken to implement this Plan.

Records will be made available to the Planning Secretary upon request, within the timeframe nominated in the request.

9 REVIEW AND IMPROVEMENT

9.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement.

Issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance;
- Identify environmental risks not already included in the risk register;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement;
- Make comparisons with objectives and targets.

Martinus Rail will be responsible for ensuring that project environmental risks are identified and included in the risk register and appropriate mitigation measures implemented throughout the construction of the project, as part of the continuous improvement process.

The process for continuous identification and analysis of new risks associated with noise and vibration that may arise during construction will be facilitated by:

- Construction noise and vibration monitoring program (as outlined in Appendix B);
- Use of the project noise management tool to regularly assess future work;
- Regular inspections of sensitive areas and activities and observations by site personnel;
- Revision of this Plan and/or noise and vibration management measures as required in response to community complaints or requests from regulatory agencies, the AA, the ER or the Planning Secretary.

This continuous risk analysis approach will ensure prompt identification of new risks and ensure efficient mitigation through implementation of appropriate management measures.

9.2 Update and amendment

The processes described in Section 10.4 of the CEMP may result in the need to update or revise this Plan.

Any revisions to this Plan will be in accordance with the process outlined in Section 10.4 of the CEMP and reviewed and approved as described in Section 3.3.1 of the CEMP. A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure.

This Plan, including any amendments, will be implemented for the duration of construction.

APPENDICES

APPENDIX A

Secondary CoAs and UMMs

TABLE A1-A: SECONDARY COA RELEVANT TO THIS PLAN

COA	REQUIREMENT	WHERE ADDRESSED
E69	Work must be undertaken during the following hours: a) 7:00am to 6:00pm Mondays to Fridays, inclusive; b) 7:00am to 6:00pm Saturdays; and c) at no time on Sundays or public holidays.	Section 5.3
E70	Except as permitted by an EPL, highly noise intensive works that result in an exceedance of the applicable NML at the same receiver must only be undertaken: a) between the hours of 8:00 am to 6:00 pm Monday to Friday; b) between the hours of 8:00 am to 1:00 pm Saturday; and c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one hour between ceasing and recommencing any of the work.	Section 5.3.2
E71	Notwithstanding Conditions E69 and E70, work may be undertaken outside the hours specified in the following circumstances (a, b, or c): a) Safety and Emergencies, including: i. for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or ii. where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm. On becoming aware of the need for emergency work in accordance with Condition (a), the AA, the ER, the Planning Secretary and the EPA must be notified of the reasons for such work. Best endeavours must be used to notify all noise and/or vibration affected residents and owners/occupiers of properties identified sensitive land use(s) of the likely impact and duration of those work. b) Work, that meets the following criteria: i. construction that causes LAeq(15 minute) noise levels: • no more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG, and • no more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); and	Section 5.3.3 Table 27 - CNV-23, CNV-24 Section 5.2 of Appendix F

COA	REQUIREMENT	WHERE ADDRESSED
	ii. construction that causes LAFmax noise levels no more than 15 dB above the rating background level at any residence during the night period as defined in the ICNG. and iii. construction that causes: • continuous or impulsive vibration values, measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or • intermittent vibration values measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006). c) By Approval, including: i. where different construction hours, such as those for a rail possession, are permitted under an EPL in force in respect of the CSSI; or ii. works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition; or iii. negotiated agreements with directly affected residents and sensitive land use(s).	
E75	Mitigation measures must be applied when the following residential ground-borne noise levels are exceeded: a) evening (6:00 pm to 10:00 pm) — internal LAeq(15 minute): 40 dB(A); and b) night (10:00 pm to 7:00 am) — internal LAeq(15 minute): 35 dB(A). The mitigation measures must be outlined in the Noise and Vibration CEMP sub-plan, including in any Out-of-Hours Work Protocol, required by Condition E72.	Section 5.2.6 Section 7.1 Table 27 -CNV-28 OOHW Protocol (Appendix F)
E76	Noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs must not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution.	Section 1.6.1 Section 5.3.4 Table 27 - CNV-09 OOHW Protocol (Appendix F)

COA	REQUIREMENT	WHERE ADDRESSED
E77	At no time can noise generated by construction exceed the National Standard for exposure to noise in the occupational environment of an eight-hour (8hr) equivalent continuous A-weighted sound pressure level of LAeq,8h of 85 dB(A) for any employee working at a location near the CSSI.	Section 5.2.4
E78	Construction Noise and Vibration Impact Statements (CNVIS) must be prepared for work that may exceed the noise management levels, vibration criteria and/or ground-borne noise levels specified in Condition E74 and Condition E75 at any residence outside construction hours identified in Condition E69, or where receivers will be highly noise affected. The CNVIS must include specific mitigation measures identified through consultation with affected sensitive land use(s) and the mitigation measures must be implemented for the duration of the works. A copy of the CNVIS must be provided to the AA and ER prior to the commencement of the associated works. The Planning Secretary may request a copy/ies of CNVIS.	Section 7.1 Table 27 - CNV-02
E79	Owners and occupiers of properties at risk of exceeding the screening criteria for cosmetic damage must be notified before work that generates vibration commences in the vicinity of those properties. If the potential exceedance is to occur more than once or extend over a period of 24 hours, owners and occupiers are to be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances, unless otherwise agreed by the owner and occupier. These properties must be identified and considered in the Noise and Vibration CEMP Sub-plan required by Condition C8 and the Community Communication Strategy required by Condition B1.	Section 7.5 Section 8.1 Table 27 - CNV-14 Table 27 - CNV-25 Appendix E
E80	Vibration testing must be undertaken before and during vibration generating activities that have the potential to impact on heritage items to identify minimum working distances to prevent cosmetic damage. In the event that the vibration testing and attended monitoring shows that the preferred values for vibration are likely to be exceeded, the construction methodology must be reviewed and, if necessary, additional mitigation measures implemented.	Appendix B- Noise and Vibration Monitoring Program Table 27 - CNV-18
E81	Advice from a heritage specialist must be sought on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures. ***Note**: The heritage specialist is to provide advice prior to installing equipment that may impact the heritage significance or structural integrity of the heritage listed structures.*	Appendix B- Noise and Vibration Monitoring Program Table 27 - CNV-19
E82	Before conducting at-property treatment at any heritage item identified in the documents listed in Condition A1, the advice of a suitably qualified and experienced built heritage expert must be obtained and implemented to ensure any such work does not have an adverse impact on the heritage significance of the item.	Section 7.5 Table 27 - CNV-20

COA	REQUIREMENT	WHERE ADDRESSED
E83	All work undertaken for the delivery of the CSSI, including those undertaken by third parties (such as utility relocations), must be coordinated to ensure respite periods are provided. This must include: a) rescheduling work to provide respite to impacted noise sensitive land use(s) so that the respite is achieved; or b) the provision of alternative respite or mitigation to impacted noise sensitive land use(s); and c) the provision of documentary evidence to the AA in support of any decision made in relation to respite or mitigation. The consideration of respite must also include all other CSSI, SSI and SSD projects which may cause cumulative and/or consecutive impacts at receivers affected by the delivery of the CSSI.	Section 7.10 Table 29 – CNV-10 Appendix F: Out of Hours Works Protocol (Section 2.5)
E120	Before commencement of any work, a structural engineer must undertake condition surveys of all buildings, structures, utilities and the like identified in the documents listed in Condition A1 as being at risk of damage. The results of the surveys must be documented in a Condition Survey Report for each item surveyed. Copies of Condition Survey Reports must be provided to the owners of the items surveyed, and no later than one (1) month before the commencement of construction.	Section 7.5
E121	After completion of construction, condition surveys of all items for which condition surveys were undertaken in accordance with Condition 120 of this approval must be undertaken by a structural engineer. The results of the surveys must be documented in a Condition Survey Report for each item surveyed. Copies of Condition Survey Reports must be provided to the landowners of the items surveyed, and no later than three (3) months following the completion of construction.	Section 7.5
E122	Property damage caused directly or indirectly (for example from vibration or from groundwater change) by the construction or operation must be rectified at no cost to the owner. Alternatively, compensation may be provided for the property damage as agreed with the property owner.	Section 7.5

TABLE A1-B: SECONDARY UMMS RELEVANT TO THIS PLAN

NO.	REQUIREMENT	WHERE ADDRESSED
NV1	Location and activity-specific construction noise and vibration statements will be prepared based on a more detailed understanding of the construction methods and construction schedule, including the size and type of construction equipment, construction traffic, duration and timing of works, and detailed reviews of local receivers as required.	Section 7.1 Table 27 - CNV-02

NO.	REQUIREMENT	WHERE ADDRESSED
	The statements will confirm predicted impacts at relevant receivers to assist with the selection of feasible and reasonable management measures, and the requirements for respite. The statements will also confirm noise and vibration auditing and monitoring requirements.	
NV2	Condition surveys will be completed before and after construction works where buildings or structures, utilities or road infrastructure are within the minimum vibration working distances.	Section 7.5 Table 27 - CNV-13
NV6	The proposal will be constructed, with the aim of achieving the applicable construction noise management levels and vibration criteria. All feasible and reasonable noise and vibration measures will be implemented. Any activities that could exceed the construction noise management levels and vibration criteria will be identified and managed in accordance with the framework, the CNVMP, and the construction noise and vibration impact statements. Notification of impacts will be undertaken in accordance with the communication management plan for the proposal.	Section 5 Section 6 Section 7
NV7	In consultation with contractors and suppliers, aim to source plant and equipment with the lowest available noise and vibration emissions that can practically complete the works. This will include consideration of minimising the use of equipment that generates impulsive, tonal or irregular noise.	Section 7.10 Table 27 - CNV-07
NV9	Where reasonable and feasible, deliveries should be undertaken only during standard daytime construction hours.	Section 7.10 Table 27 - CNV-08 & CNV-12
NV10	Where vibration levels are predicted to exceed the screening criteria, and following the condition survey, the potential for damage to the item will be assessed. Where there is potential for damage, alternative methods that generate less vibration will be investigated and substituted, where practicable. Where residual damage risks remain, attended vibration measurements will be undertaken at the commencement of vibration-generating activities to confirm that structural vibration limits are within the acceptable range. Site activities will be modified where practicable to avoid exceeding the applicable criteria. Any identified vibration-related damage to the items will be rectified.	Section 7.5 Table 27 - CNV-17

PSR and CEMF requirements are internal requirements beyond the Infrastructure Approval. These have been included for internal quality control purposes and do not form part of the management plan.

TABLE A1-C: INTERNAL PSRS AND CEMF REQUIREMENTS APPLICABLE TO THIS PLAN

NO.	REQUIREMENT	WHERE ADDRESSED
PSR Appendix C Section 1.5.1	Without limiting any requirements of the Deed, the Contractor shall implement noise and vibration mitigation measures in compliance with the environmental management requirements in PSR Annexure F, section [6.1], including increased restriction of hours of work for particular construction activities, where necessary.	Section 5.3 Section 7.10
PSR Appendix C Section 1.5.2	Without limiting any requirements of the Deed, the Contractor shall use appropriate mitigation measures to ensure that actual noise and vibration levels associated with the Contractor's Activities comply with the environmental management requirements in Annexure F, section [6.1].	Section 7
PSR Appendix C Section 1.5.3	Without limiting any requirements of the Deed or the environmental management requirements in PSR Annexure F, section 6.1, the Contractor shall comply with construction noise requirements in the *Interim Construction Noise Guideline (NSW EPA 2009)* and the *Draft Construction Noise Guideline (NSW EPA 2020).*	Section 5.1 Section 5.2 Section 7.10 Only the *Interim Construction Noise Guideline* is identified as being relevant in the Infrastructure Approval and EPL 21984.
PSR Appendix C Section 1.5.4	Without limiting any requirements of the Deed or the environmental management requirements in Annexure F, section 6.1, the Contractor shall ensure perceptible vibrations for human comfort comply with the preferred values in Table 2.2 and Table 2.4 of the NSW EPA *Assessing Vibration: a technical guideline.*	Section 5
PSR Appendix C Section 1.5.5	Management of construction noise and vibration shall comply with *0-0000-902-EMN-00-SP-0001 NSW Construction Noise and Vibration Management Framework.*	Section 5.1 Section 5.2 Section 7.10.1 Section 7.10.2

NO.	REQUIREMENT	WHERE ADDRESSED
PSR Appendix C Section 6.1.3 (f)	The key environmental risk areas which the Contractor shall consider in development of the Construction Environmental Management Plan include, but are not limited to: (f) noise and vibration	This Plan
Table 3, ARTC CEMF Specification	Hold Point: Out of Hours work permit system shall be developed that requires prior consultation with impacted sensitive receptors, monitoring, modelling of noise/vibration impacts on sensitive receptors and ARTC acknowledgement and engagement interface.	Appendix F – OOHW Protocol
Table 3, ARTC CEMF Specification	Hold Point: Any relaxation of impact to sensitive receivers will be provided to ARTC for information before works commence.	Community agreements are addressed in Section 5.2. Any community agreements will be provided to IRPL prior to commencement of relevant works.
Table 3, ARTC CEMF Specification	Hold Point: All out of hours work permits to be provided to ARTC 5 days before activities commence. Works cannot commence until the hold point is released.	Hold points will be managed separately to the CEMP/Sub-plans through an agreed process (e.g. Procore/Aconex)
Table 3, ARTC CEMF Specification	Noise/vibration complaints shall be responded to and assessed for further mitigation and monitoring and details provided to ARTC.	Section 8.2
Table 3, ARTC CEMF Specification	Must have an approved Noise and Vibration Management Plan.	This Plan

NO.	REQUIREMENT	WHERE ADDRESSED
Table 3, ARTC CEMF Specification	Proactive vibration monitoring undertaken during high-risk activities.	Appendix B – Construction Noise and Vibration Monitoring Program
Table 3, ARTC CEMF Specification	Dilapidation surveys undertaken and sensitive receptors identified in the potential impact zone.	Section 4.2 Table 14
Table 3, ARTC CEMF Specification	Proactive noise monitoring undertaken during high-risk activities.	Appendix B – Construction Noise and Vibration Monitoring Program
Table 3, ARTC CEMF Specification	Proactive noise modelling undertaken of high-risk activities prior to activities being carried out.	Appendix B – Construction Noise and Vibration Monitoring Program
Table 3, ARTC CEMF Specification	Communication to neighbouring sensitive receptors on upcoming high-risk activities.	Section 8.1
Table 3, ARTC CEMF Specification	All personnel must undergo a site induction of relevant environmental requirements, including but not limited to biodiversity, heritage and contamination unexpected find protocol	Section 8.3 Table 27 Table 28 CNV-01
Table 3, ARTC CEMF Specification	An environmental toolbox will be held once a month on a key environmental requirement. (Record keeping, review, register and copy provided upon request).	Section 8.3 Table 27 Table 28 CNV-01

NO.	REQUIREMENT	WHERE ADDRESSED
Table 3, ARTC CEMF Specification	All key staff are to have completed basic ESC training (e.g. site superintendent, leading hands, those managing high environmental risk areas).	Section 8.3 Table 28 CNV-01
Table 3, ARTC CEMF Specification	All site offices and crib huts/site supervisor folder to include Site Environmental Plans and relevant environmental documentation	Section 8.4.4
Table 2, IR NSW Construction Noise and Vibration Management Framework	Description of works, duration and working hours and noise management levels.	Section 6
Table 2, IR NSW Construction Noise and Vibration Management Framework	Identification of noise sensitive receivers including impacted commercial receivers.	Section 4.1
Table 2, IR NSW Construction Noise and Vibration Management Framework	Identification of vibration sensitive structures and receivers, and requirements for dilapidation surveys and/ or monitoring during construction.	Section 4.2 Table 14
Table 2, IR NSW Construction Noise and Vibration Management Framework	Details of construction including and indicative schedule for key construction scenarios.	Section 6
Table 2, IR NSW Construction Noise and Vibration Management Framework	Feasible and reasonable work practices to minimise noise and vibration impacts.	Table 26
Table 2, IR NSW Construction Noise and	Monitoring and auditing procedures.	Section 8.4

NO.	REQUIREMENT	WHERE ADDRESSED
Vibration Management Framework		Appendix B – Construction Noise and Vibration Management Plan
Table 5, IR NSW Construction Noise and Vibration Management Framework	Standard mitigation measures	Section 7.10.2
Table 6, Table 7 and Table 8, IR NSW Construction Noise and Vibration Management Framework	Additional management measures – Airborne noise Additional management measures – Ground-borne noise Additional management measures – Vibration	Section 7.10.3
Section 4, IR NSW Construction Noise and Vibration Management Framework	Complaint handling and community engagement: Complaints will be handled in accordance with Inland Rail's complaints management system.	Section 8
Section 5, IR NSW Construction Noise and Vibration Management Framework (Monitoring and auditing)	Noise and vibration monitoring: Compliance noise and vibration monitoring will be undertaken as specified in this Framework, with the methodology and results documented. Noise measurements shall be undertaken consistent AS1055.1-1997 Acoustics – Description and Measurement of Environmental Noise – General Procedures. Vibration measurements shall be undertaken in accordance with Assessing Vibration: a technical guideline and BS7385 Part 2-1993 Evaluation and measurement of vibration in buildings, as recommended in AS 2187: Part 2-2006 'Explosives - Storage and Use - Part 2: Use of Explosives'.	Appendix B – Construction Noise and Vibration Monitoring Program
Section 5, IR NSW Construction Noise and	Track Possession Monitoring:	Appendix B – Construction Noise and

NO.	REQUIREMENT	WHERE ADDRESSED
Vibration Management Framework (Monitoring and auditing)	If there is the potential to impact sensitive receivers, during a track possession, a monitoring program should be initiated to confirm predicted noise and vibration levels and identify any additional feasible and reasonable measures to reduce impact on receivers. The monitoring program (for either noise, vibration or both) should be risk based, and would not need to occur if there are no impacted receivers within the vicinity of the work. Design of the monitoring program will be included in the proposal CNVMP.	Vibration Monitoring Program
Section 5, IR NSW Construction Noise and Vibration Management Framework (Monitoring and auditing)	Dilapidation surveys: If construction activities have potential to cause cosmetic or structural damage through vibration or overpressure to public utilities, structures, buildings or their contents an existing condition report of buildings and structures will be undertaken in accordance with AS 4349.0 Inspection of buildings – General requirements. Where a heritage structure is assessed as potentially susceptible to vibration damage, a more conservative cosmetic damage criterion should be adopted.	Table 14 of the Construction Noise and Vibration Monitoring Program
Section 5, IR NSW Construction Noise and Vibration Management Framework (Monitoring and auditing)	Audits Periodic audits will be undertaken of proposal construction activities and the implementation of the CNVMP to ensure that noise and vibration predictions are accurate and the required management measures are in place. The Proposal Environmental Management Plan and CNVMP will prescribe the auditing regime for each proposal.	Section 8.4.3

APPENDIX B

Construction Noise and Vibration Monitoring Program

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CONSTRUCTION NOISE AND VIBRATION MONITORING PROGRAM – STAGE C

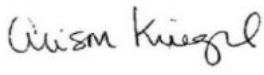
A2I | Albury to Illabo

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PREPARED BY:	Alison Kriegel	**TITLE:**	Environmental Approvals Lead
SIGNATURE:		**DATE:**	23/09/2025
REVIEWED BY:	Chris Standing	**TITLE:**	Environment, Approvals and Sustainability Manager
SIGNATURE:		**DATE:**	23/09/2025

Approved by

NAME	TITLE	SIGNATURE	DATE
Andy Williams	Project Director		23/09/2025

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GLOSSARY

TERM	DEFINITION
AA	The Acoustics Advisor for the CSSI approved by the Planning Secretary.
A2I	Albury to Illabo section of the Inland Rail project
ARTC	Australian Rail Track Corporation
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CNVF	Inland Rail NSW Construction Noise and Vibration Management Framework
CNVIS	Construction Noise and Vibration Impact Statement
CNVMP	Construction Noise and Vibration Management Plan
CoA	Conditions of Approval
Construction	Includes work required to construct the CSSI as defined in the Project Description described in the documents listed in CoA A1 including commissioning trials of equipment and temporary use of any part of the CSSI but excluding Low Impact Work which is carried out or completed prior to approval of the CEMP.
CSSI	Critical State Significant Infrastructure
dB	Decibel (referenced 20 µPa)
dB(A)	A-weighted decibel (referenced 20 µPa)
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DIPNR	Department of Infrastructure, Planning and Natural Resources
Division 5.2 Approval	Approval issued by the NSW Minister for Planning for the Albury to Illabo project
DPE	NSW Department of Planning and Environment
DPI	Department of Primary Industries
DPHI	Department of Planning, Housing and Infrastructure
EAD	Environmental Assessment Documentation that includes: • Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022); • Albury to Illabo Response to Submissions (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024); • Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024); • Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Kemp Street Bridge Enhancement Site Modification Report (Inland Rail, June 2025)

TERM	DEFINITION
EHG	Environment and Heritage Group (a part of NSW DPE)
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority (NSW)
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (Federal)
EPL	Environment Protection Licence
Environmental Representative (ER)	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
ISO	International Standards Organisation
LA10	The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
LA90	The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
LAeq	A-weighted equivalent continuous noise level, providing a representation of the cumulative level of noise exposure over a defined period.
LAeq(15 minute)	The A-weighted equivalent continuous noise level for a 15-minute period, typically the worst-case 15-minute period.
LAmax	The A-weighted maximum sound pressure level of an event measured with a sound level meter.
km	Kilometre
mm	Millimetre
NSW	New South Wales
Planning Secretary	Secretary of the NSW Department of Infrastructure, Housing and Infrastructure, or delegate
PIR	Preferred Infrastructure Report
Primary CoA/UMM	CoA and/or UMMs that are specific to the development of this Monitoring Program
POEO Act	*NSW Protection of Environment Operations Act 1997*
PPV	Peak particle velocity (mm/s)
RBL	Rating background level
UMM	Updated Mitigation Measure (per the PIR RtS)
VDV	Vibration dose values ($m/s^{1.75}$)

1 INTRODUCTION

1.1 Project overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine and Narrabri to North Star Phase 1 sections are complete.

The Inland Rail project will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section of the Inland Rail program (the project). Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

A detailed project description is provided in Section 4 of the Construction Environmental Management Plan (CEMP).

1.1.1 Planning context

The Inland Rail – Albury to Illabo project (the project) is declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

An environmental impact statement (EIS) was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of the EP&A Act and the environmental assessment requirements of the Secretary of the (then) NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning, Housing and Infrastructure (DPHI)).

The EIS was placed on public exhibition from 17 August 2022 to 28 September 2022. During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by ARTC, and make a written submission to the DPE for consideration in its assessment of the proposal.

In accordance with section 5.17(6)(b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report (PIR) that provides further assessment of traffic and transport, noise and vibration, and air quality impacts. The PIR was also prepared to consider changes to the exhibited proposal that have arisen as a consequence of these further assessments and related submissions.

A modification report (Kemp Street Bridge Enhancement Site Modification, Inland Rail June 2025) was prepared to revise the replacement road and pedestrian bridge arrangement over the railway line at the Kemp Street bridge enhancement site in Junee to now provide a single structure. The Modification was approved by the NSW Minister for Planning and Public Spaces.

1.1.2 Statutory context and approval

The Inland Rail – Albury to Illabo project was assessed as part of the following documents:

- Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022);
- Albury to Illabo Response to Submissions (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024);

- Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024);
- Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Kemp Street Bridge Enhancement Site Modification Report (Inland Rail, June 2025)

Together these documents are referred to as the Environmental Assessment Documentation (EAD).

Approval for the project under the EP&A Act was granted by the Minister for Planning on 08 October 2024.

1.2 Scope of this Monitoring Program

The scope of this Construction Noise and Vibration Monitoring Program (this Monitoring Program) is to describe how Martinus Rail will monitor potential noise and vibration impacts during construction of the project. This Program is an appendix of the Construction Noise and Vibration Management Plan (CNVMP).

SMART (Specific, Measurable, Achievable, Realistic and Timely) principles will be considered and applied during the preparation and ongoing implementation of this Monitoring Program.

This Monitoring Program Plan is applicable to all activities during construction of the project, including all areas where physical works will occur or areas that may otherwise be impacted by the construction works. All Martinus Rail staff and sub-contractors are required to comply with the requirements of this Monitoring Program and related environmental management plans, over the full duration of the construction program.

Operational noise and vibration impacts and operational monitoring requirements do not fall within the scope of this Monitoring Program and therefore are not included within the processes contained herein.

1.3 Endorsement and approval

In accordance with CoA A22(d) and CoA A27(e), this Monitoring Program will be submitted to the ER and the AA for endorsement prior to submission to the Planning Secretary for approval.

Construction will not commence until the relevant CEMP(s) and Sub-plans have been endorsed by the ER and/or approved by the Planning Secretary (as applicable and as identified in the CEMF approved under CoA C16), in accordance with CoA C15.

This Monitoring Program, including any amendments, will be implemented throughout construction.

1.4 Consultation

In accordance with CoA C26, this Monitoring Program was prepared in consultation with the following relevant councils:

- Albury City Council;
- Great Hume Shire Council;
- Lockhart Shire Council;
- Wagga Wagga City Council;
- Junee Shire Council.

The consultation report prepared for the CNVMP outlined the location in which stakeholders' responses have been addressed.

1.5 Responsibilities

In accordance with Section 2.2 of EPA Approved Methods for the measurement and analysis of environmental noise in NSW, and requirement M2.1 of EPL 21984, any person measuring and analysing environmental noise must be appropriately qualified and experienced in acoustics to a standard sufficient to enable that person to accurately interpret and apply the advice set out in acoustics standards, guidelines and policies (competent person).

Martinus Rail's Construction Manager/Area Manager and the Environmental Site Representative (ESR) are responsible for ensuring that all legal and other requirements described in this Monitoring Program are met.

1.6 Environmental requirements

1.6.1 Guidelines and standards

The main guidelines, specifications, and policy documents relevant to this Monitoring Program include:

- NSW EPA, Approved methods for the measurement and analysis of environmental noise in NSW (January 2022)

- NSW Interim Construction Noise Guideline (ICNG) (Department of Environment and Climate Change (DECC), 2009)
- NSW Assessing Vibration – a technical guideline (AVTG) (DEC, 2006)
- Australian Standard IEC 61672.1: 2019 Electroacoustic – Sound Level Meters – Specifications
- Australian Standard AS/NZS 2107:2016 Acoustics - Recommended design sound levels and reverberation times for building interiors
- Australian Standard AS 1055: 2018 Acoustics – Description and Measurement of Environmental Noise
- Australian Standard AS2436-2010 Guide to Noise Control on Construction, Maintenance and Demolition Sites
- Rail Infrastructure Noise Guideline (RING), State of NSW and Environment Protection Authority (2013).

In accordance with CoA C28, this Monitoring Program has been prepared in accordance with the requirements of Approved Methods for the Measurement and Analysis of Environmental Noise (EPA).

1.6.2 Minister's Conditions of Approval

The requirements of the CoA relevant to the development of this Monitoring Program are shown in Table 1. A cross reference is also included to indicate where the CoA is addressed in this Monitoring Program or other project management document, as relevant.

TABLE 1: CONDITIONS OF APPROVAL RELEVANT TO THIS MONITORING PROGRAM

NO.	REQUIREMENT	WHERE ADDRESSED
C26	Except as provided by Condition C16 the following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP: b) Noise and vibration – Relevant councils	Section 1.3
C27	Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide: a) details of baseline data available;	Section 2
	b) details of baseline data to be obtained and when;	Section 2
	c) details of all monitoring of the project to be undertaken;	Section 4
	d) the parameters of the project to be monitored;	Section 3
	e) the frequency of monitoring to be undertaken;	Section 4
	f) the location and justification of monitoring locations;	Section 4.4
	g) the reporting of monitoring results and analysis results against relevant criteria;	Section 5
	h) details of the methods that will be used to analyse the monitoring data;	Section 4.1 Section 4.2
	i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and	Section 4.5
	j) any consultation to be undertaken in relation to the monitoring programs.	Section 1.4

NO.	REQUIREMENT	WHERE ADDRESSED
C28	The Noise and Vibration Monitoring Program must be prepared in accordance with the requirements of Approved Methods for the Measurement and Analysis of Environmental Noise (EPA).	Section 1.6.1
C29	CMP(s) must be submitted to the Planning Secretary for approval except those permitted to be endorsed by others pursuant to a CEMF approved by the Planning Secretary under Condition C16.	Section 1.3
C30	Where a CMP requires Planning Secretary's approval, the CMP must be endorsed by the ER and then submitted to the Planning Secretary for approval no later than one (1) month before the commencement of construction, or where construction is staged, no later than one (1) month before the commencement of each stage.	Section 1.3
C31	CMP(s) not requiring the Planning Secretary's approval, but requiring ER endorsement, must be submitted to the ER no later than one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage. The CMP(s) must be endorsed by the ER as being consistent with the conditions of this approval and all undertakings made in the documents listed in Condition A1.	Section 1.3
C32	Construction must not commence until the relevant CMP(s) have been approved by the Planning Secretary or endorsed by the ER, (as applicable and as identified in the CEMF approved under Condition C16), and all relevant baseline data for the specific construction activity has been collected.	Section 1.3
C33	The CMP(s), as approved or endorsed (as relevant), including any minor amendments approved by the ER, must be implemented for the duration of construction and for any longer period set out in the monitoring program or specified by the Planning Secretary, whichever is the greater.	Section 1.3
C34	The results of the CMP(s) must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant CMP. Note: Where a relevant CEMP Sub-plan exists, the relevant Construction Monitoring Program may be incorporated into that CEMP Sub-plan.	Section 5

1.6.3 Updated Mitigation Measures

The primary and secondary requirements of the Updated Mitigation Measures (UMMs) presented in the EAD relevant to the development of this Monitoring Program are shown in Table 2. A cross reference is also included to indicate where the UMM is addressed in this Monitoring Program for other project management documents, as relevant.

TABLE 2: UMMS RELEVANT TO THE DEVELOPMENT OF THIS MONITORING PROGRAM

NO.	REQUIREMENT	TIMING	WHERE ADDRESSED
NV5	A construction noise and vibration management plan (CNVMP) will be prepared and implemented as part of the CEMP, in accordance with the Inland Rail NSW Construction Noise and Vibration Management Framework. The plan will outline measures, processes and responsibilities to manage and monitor noise and vibration and minimise the potential for impacts during construction. This plan will include all feasible and reasonable mitigation measures:	Pre-construction/ construction	The CNVMP

NO.	REQUIREMENT	TIMING	WHERE ADDRESSED
	▪ construction noise and vibration criteria for the proposal		Section 3.2
	▪ the location of sensitive receivers		Section 4 of the CNVMP
	▪ specific management measures for activities that could exceed the construction noise and vibration criteria		Section 7 of the CNVMP
	▪ OOH protocol		CNVMP Appendix F - Out of Hours Work Protocol
	▪ procedures for monitoring noise and vibration levels during construction		This Monitoring Program
	▪ community and stakeholder engagement measures in accordance with the communication management plan.		Section 8.1 and 8.2 of the CNVMP
NV10	Where vibration levels are predicted to exceed the screening criteria, and following the condition survey, the potential for damage to the item will be assessed. Where there is potential for damage, alternative methods that generate less vibration will be investigated and substituted, where practicable. Where residual damage risks remain, attended vibration measurements will be undertaken at the commencement of vibration-generating activities to confirm that structural vibration limits are within the acceptable range. Site activities will be modified where practicable to avoid exceeding the applicable criteria. Any identified vibration-related damage to the items will be rectified.		Section 4.2

1.6.4 EPL No.21984

The A2I project is subject to EPL 21984 as a Scheduled Activity for 'railway activities – railway infrastructure construction'. The EPL includes clauses requiring the licensee to minimise noise and vibration impacts at residences and other sensitive land uses. The EPL sets out various conditions in relation to noise and vibration monitoring, which are presented in Table 3.

TABLE 3: EPL CONDITIONS

Condition	Requirement	Where addressed
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition	Section 5.1
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can be readily reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Section 5.1

Condition	Requirement	Where addressed
M1.1	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Section 5.1
M2.1	All noise and vibration monitoring for the purposes of determining compliance with the conditions of this licence must be undertaken by a suitably qualified Person.	Section 4.1 Section 4.2
M2.2	All vibration monitoring must be: a) undertaken in accordance with the technical guidance provided in the Assessing Vibration: a technical guideline (DEC, 2006); and b) assessed and reported against the acceptable and maximum values of human exposure to vibration set out in Tables 2.2 and 2.4 of this guideline.	Section 1.1.6 Section 3 Section 4.2
M2.3	The licensee must undertake noise and vibration monitoring as directed by an authorised officer of the EPA. Where the monitoring is requested to take place on private land (for example a residential property) the licensee must request permission to access the premises in advance and keep a record of permission requests and responses. If a licensee if unable to obtain permission, the licensee must undertake the monitoring at an indicative location where possible and they must provide the response (including any nil response) to the EPA	Section 4.1 Section 4.2
M2.4	All noise monitoring for the purposes of determining compliance with the conditions of this licence must consider and be generally undertaken in accordance with: a) Australian Standard AS 1055: 2018 Acoustics – Description and measurement of environmental noise; and b) the compliance monitoring guidance provided in the Chapter 7 ‘Monitoring Performance’ of the Noise Policy for Industry (EPA, 2017)	Section 4.1

2 BASELINE DATA

2.1 Noise and vibration sensitive receivers

The noise and vibration assessments in the EAD identified and considered potential construction noise and vibration impacts for sensitive receivers, including residences, surrounding the project corridor.

The location of noise and vibration sensitive receivers are described in the Section 4.1 and Appendix D (Land use mapping and NCAs) of the CNVMP.

2.2 Noise catchment areas

Noise catchment areas (NCAs) have been defined as part of the EIS to classify groups of sensitive receivers that are likely to have a similar existing noise environment and experience similar impacts from the proposal. The NCAs are delineated by landmark features, such as roads, to encompass groupings of sensitive receivers with similar background noise environments. This was determined through reference to aerial imagery and land-use maps and verified during the noise monitoring program that was undertaken for the EAD.

The location of the project's NCAs are shown in Appendix D (Land use mapping and NCAs) of the CNVMP.

2.3 Existing environment

A baseline noise monitoring survey was undertaken to inform the EAD between March and May 2021. The purpose of the survey was to quantify and characterise the existing noise environment in the areas surrounding each proposal site and nearby sensitive receivers. Noise levels were continuously monitored for a minimum period of seven days at the nine locations detailed in Figure 1 to Figure 12.

A summary of the monitoring results is provided in Table 4.

TABLE 4: SUMMARY OF THE EAD MONITORED DAILY NOISE LEVELS

NCA	LOCATION	AMBIENT NOISE LEVEL dBA $L_{EQ(15\ MIN)}$			RATING BACKGROUND LEVEL (RBL) dBA		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
Albury precinct							
NCA01	1	53	53	50	45	45(47[2])	41
NCA02(a)	2(a)	39	46	47	35 (27[2])	33	33 (36[4])
NCA02(b)	2(b)	43	47	47	35 (34[2])	35	34
NCA03	3	52	49	49	37	37 (41[2])	37 (38[4])
NCA04	4	54	57	57	42	42 (51[2])	42 (46[4])
Greater Hume–Lockhart Precinct							
NCA05	5	59	58	55	36	35	30
NCA06	6	51	48	40	37	36	30
NCA07/08	7	49	59	46	39	39 (41[2])	30
Wagga Wagga Precinct							
NCA09	7	49	59	46	39	39 (41[2])	30
NCA10	10	52	51	45	46	45	38

NCA	LOCATION	AMBIENT NOISE LEVEL dBA $L_{EQ(15\ MIN)}$			RATING BACKGROUND LEVEL (RBL) dBA		
		Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
NCA11	11	52	54	46	48	47	37
Junee Precinct							
NCA13	13	60	56	53	41	39	37
NCA14	14	52	53	47	42	42 (45[2])	35
NCA15	15	53	53	47	41	41 (46[2])	33

(1) The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays. See the NSW EPA Noise Policy for Industry (NPfI)
(2) The evening RBL data has been reduced to the daytime period RBL in this case (bracketed figures indicates the measured value)
(3) The NPfI minimum RBL value has been used due to the measured RBL being lower than the minimum value.
(4) The night-time RBL data has been reduced to the evening period RBL in this case (bracketed figures indicates the measured value).

2.4 Additional baseline data to be obtained

No additional baseline data is proposed to be obtained. The baseline data obtained to inform the EAD will be used to fulfil the monitoring requirements for the project.

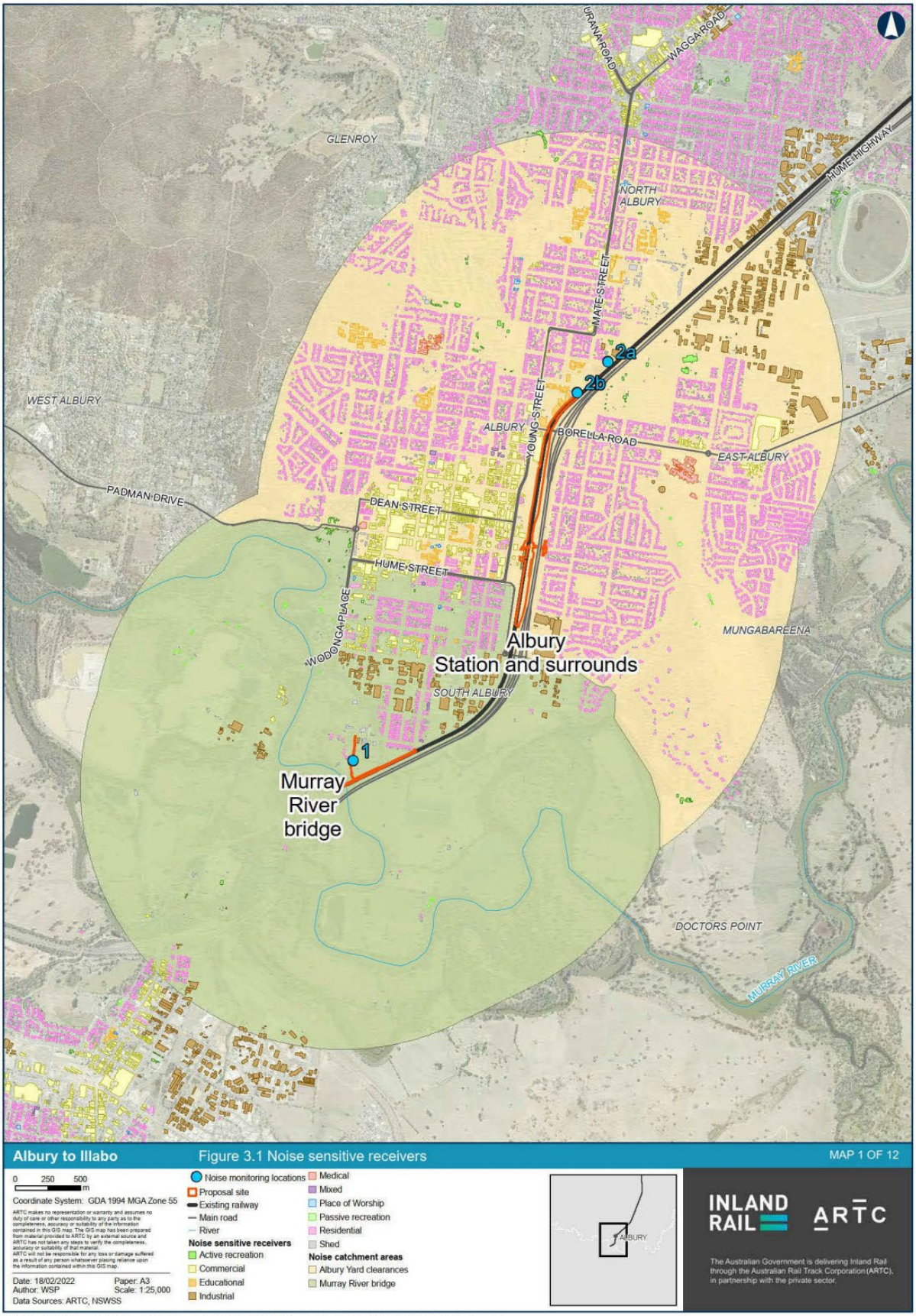


FIGURE 1: EAD NCA01 AND NCA02 NOISE MONITORING LOCATIONS

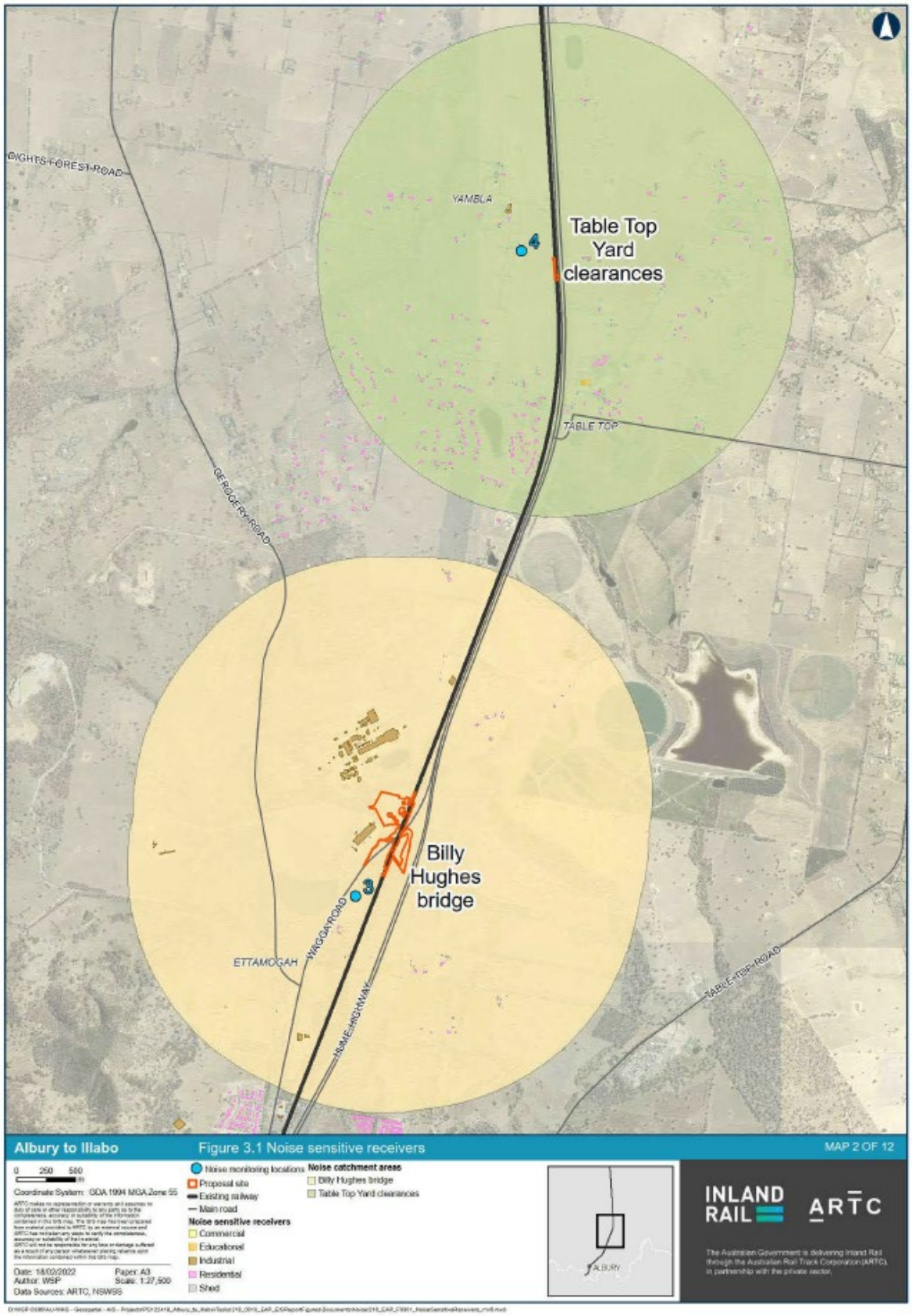


FIGURE 2: EAD NCA03 AND NCA04 NOISE MONITORING LOCATIONS

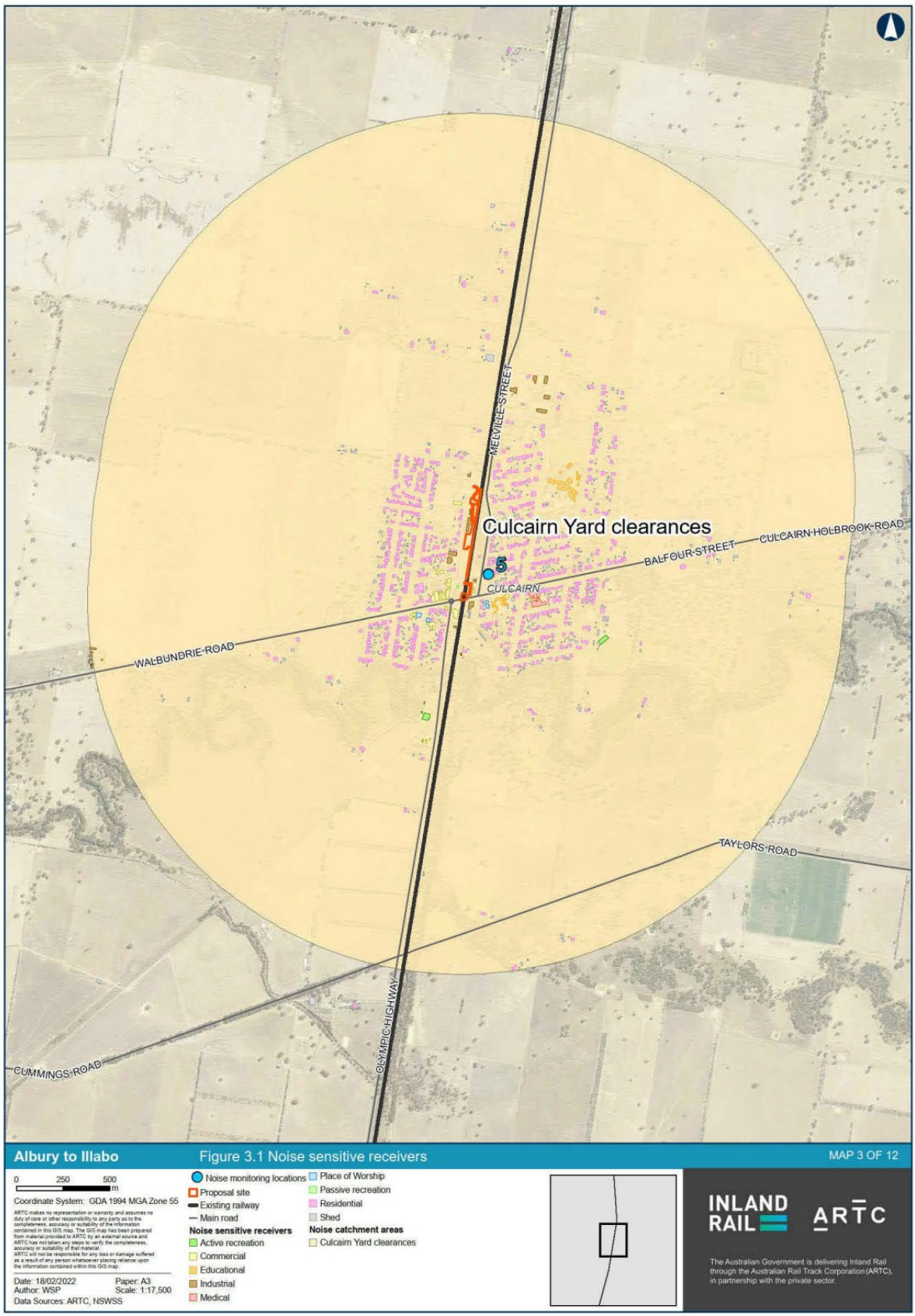


FIGURE 3: EAD NCA05 NOISE MONITORING LOCATION

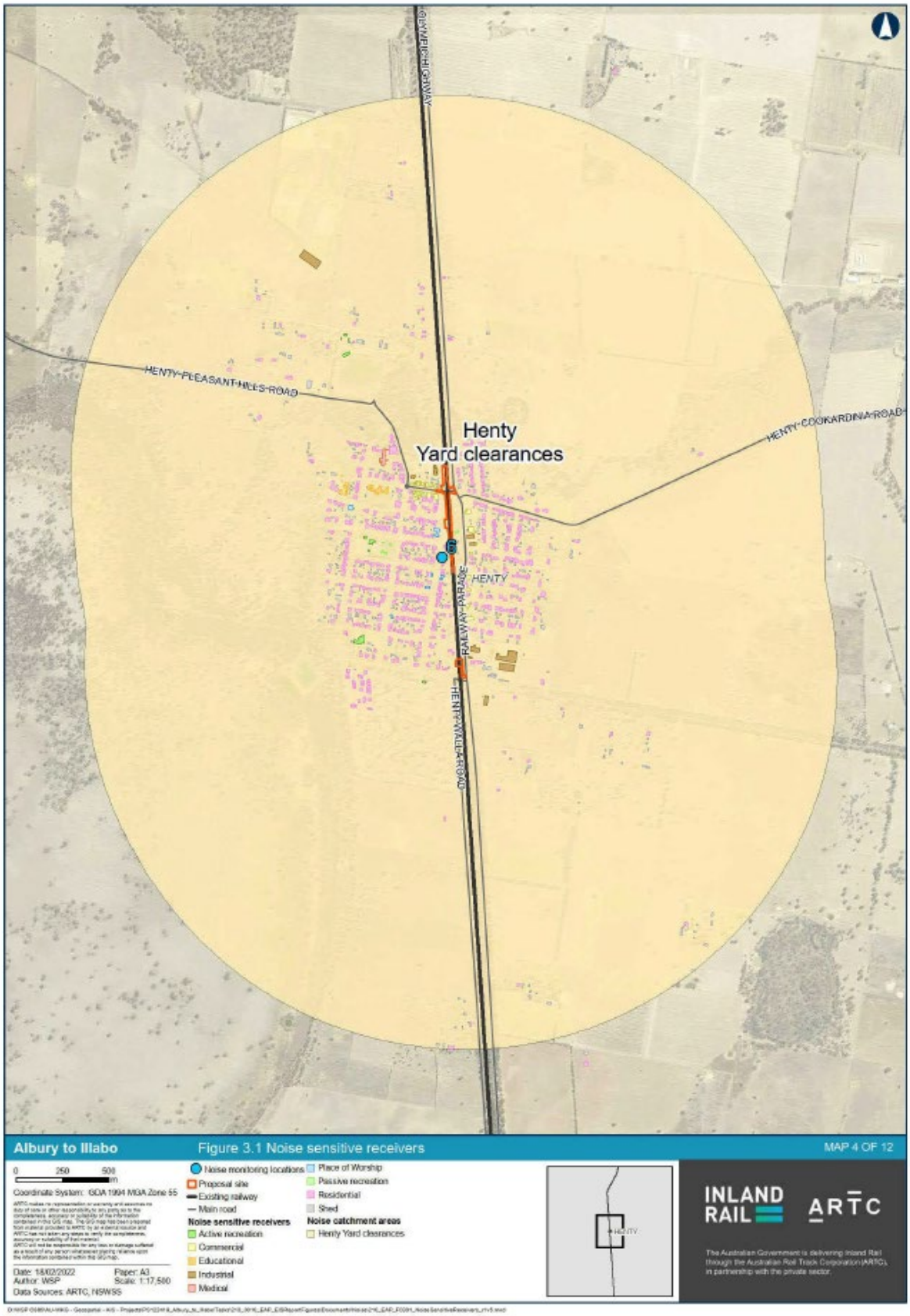


FIGURE 4: EAD NCA06 NOISE MONITORING LOCATION

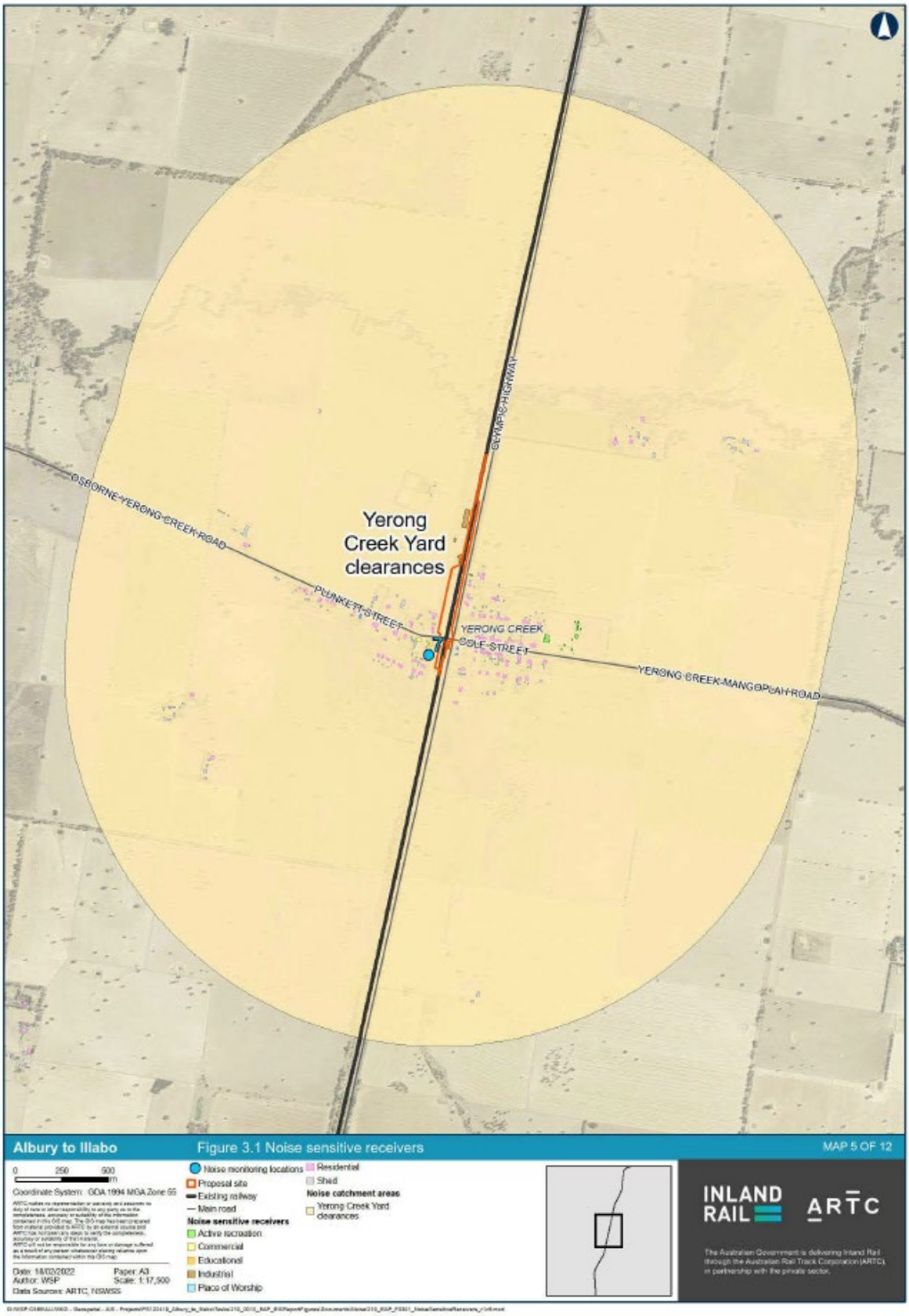


FIGURE 5: EAD NCA07 NOISE MONITORING LOCATION

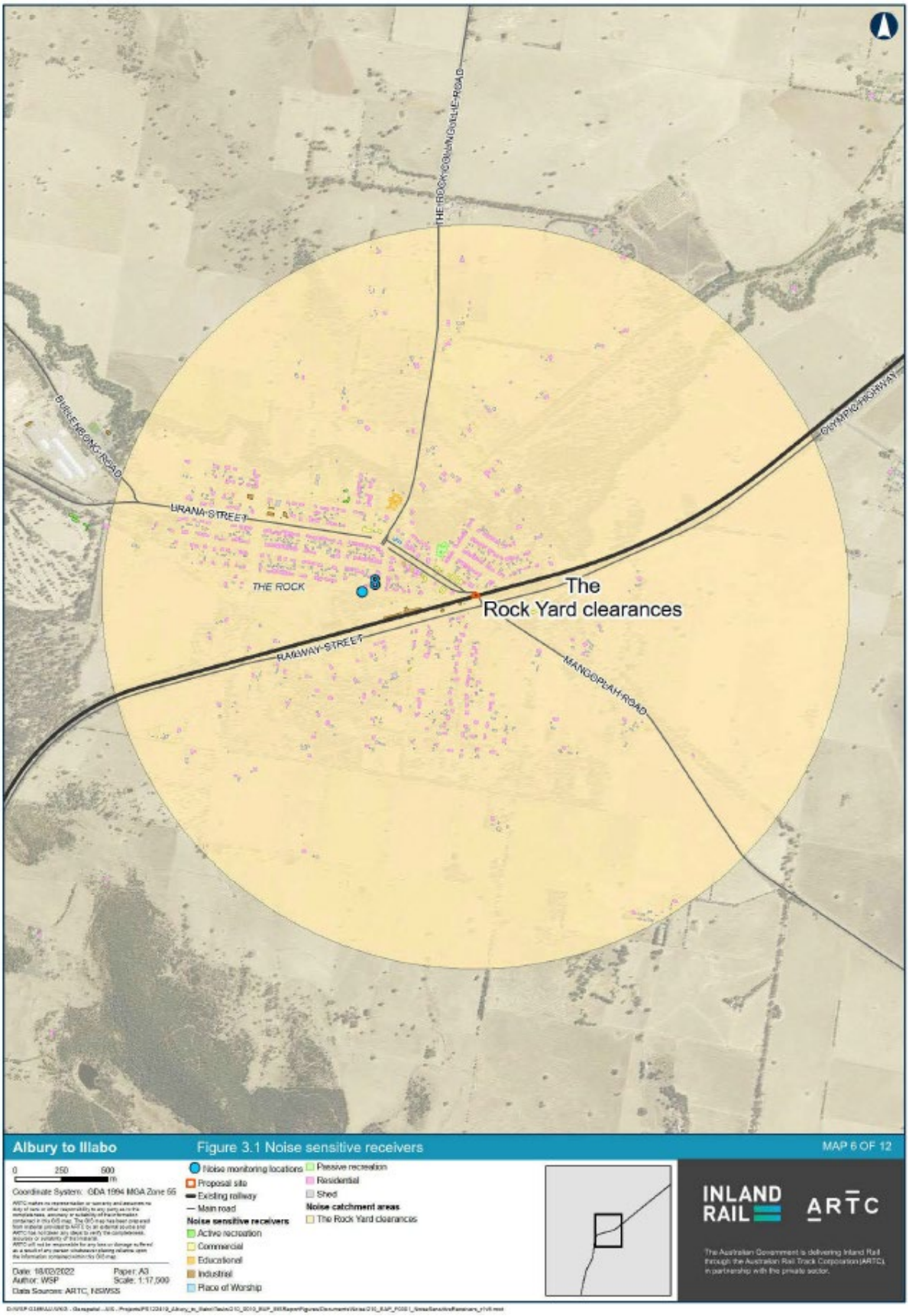


FIGURE 6: EAD NCA08 NOISE MONITORING LOCATION

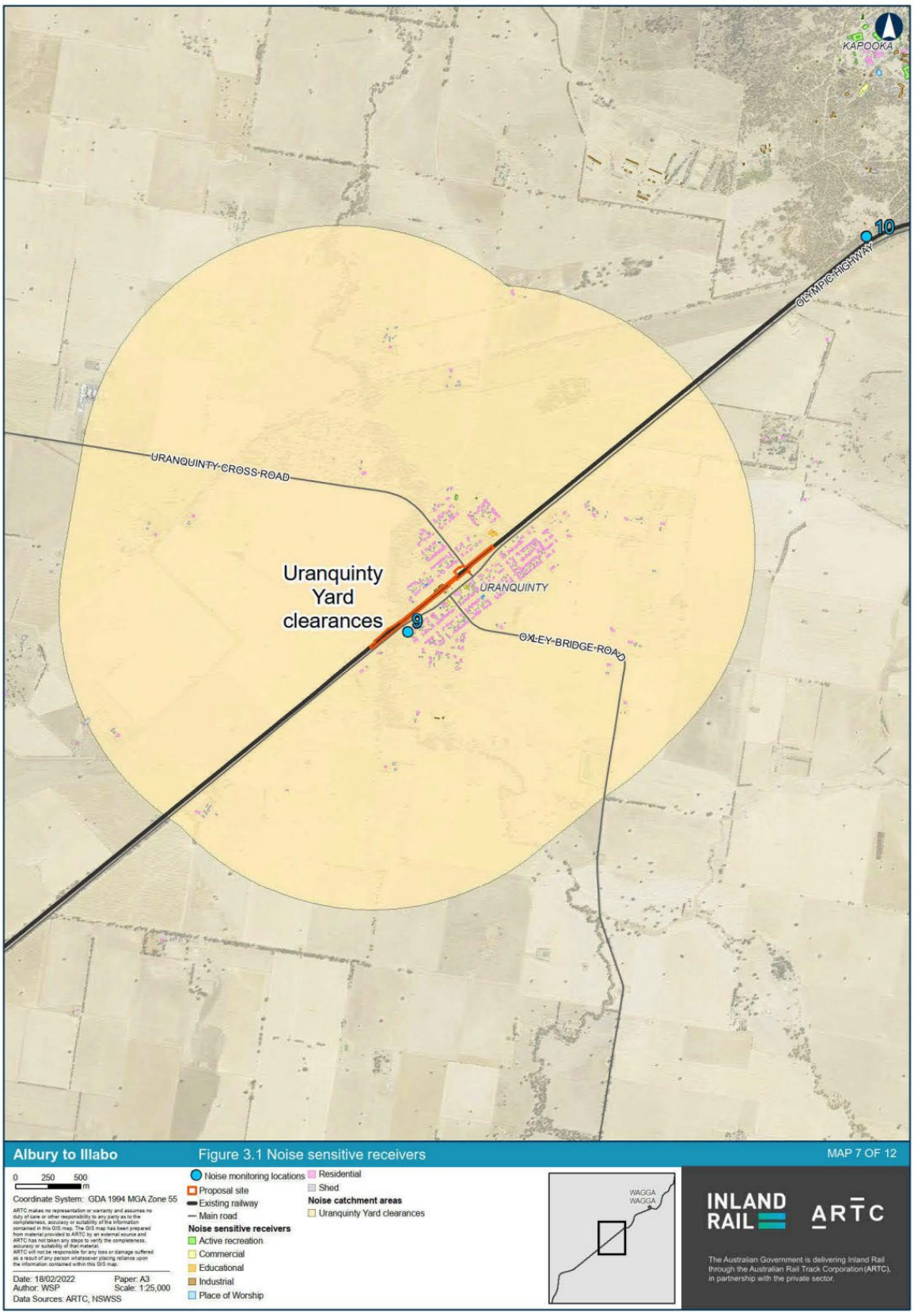


FIGURE 7: EAD NCA09 NOISE MONITORING LOCATION

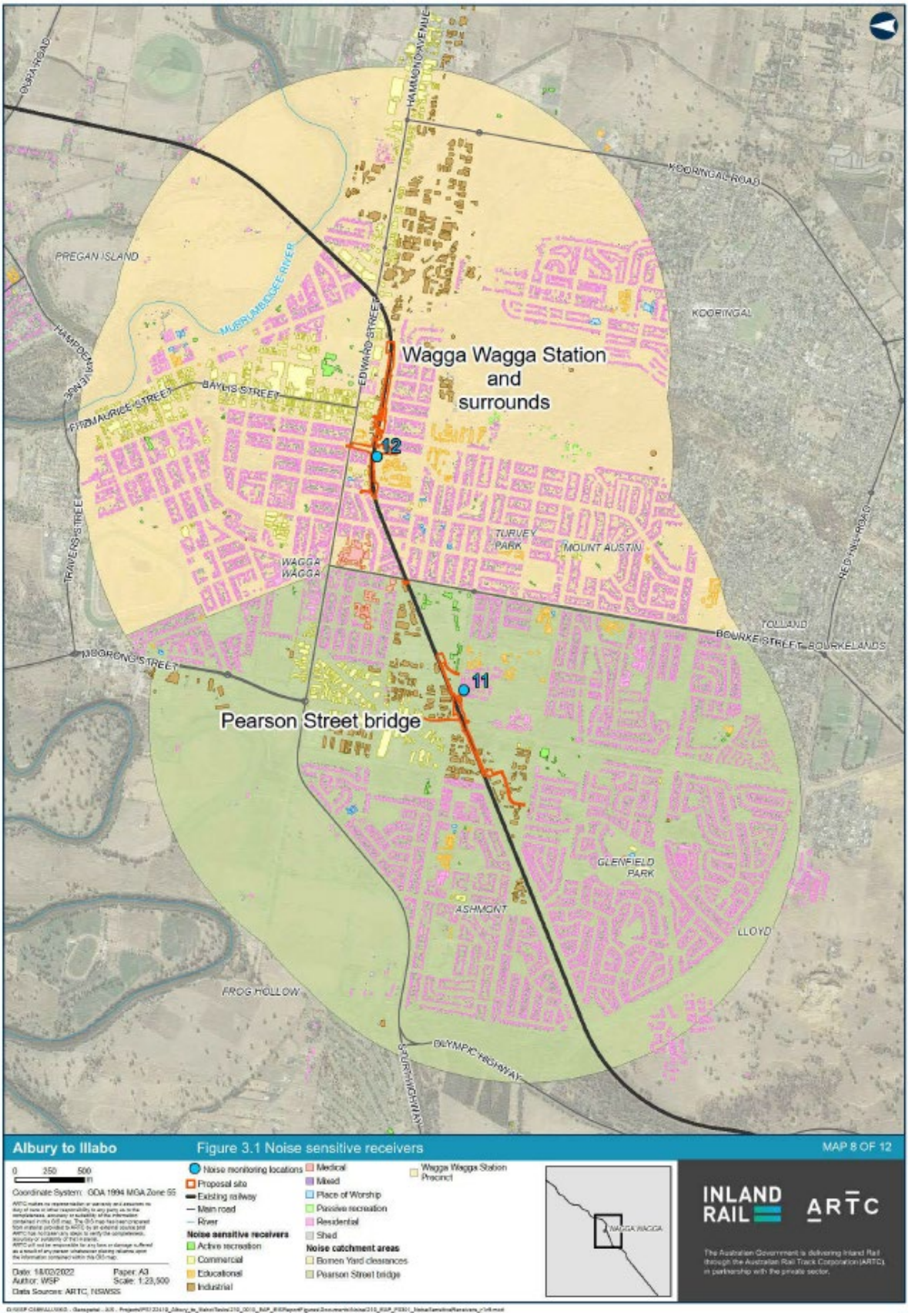


FIGURE 8: EAD NCA10 AND NCA11 NOISE MONITORING LOCATIONS

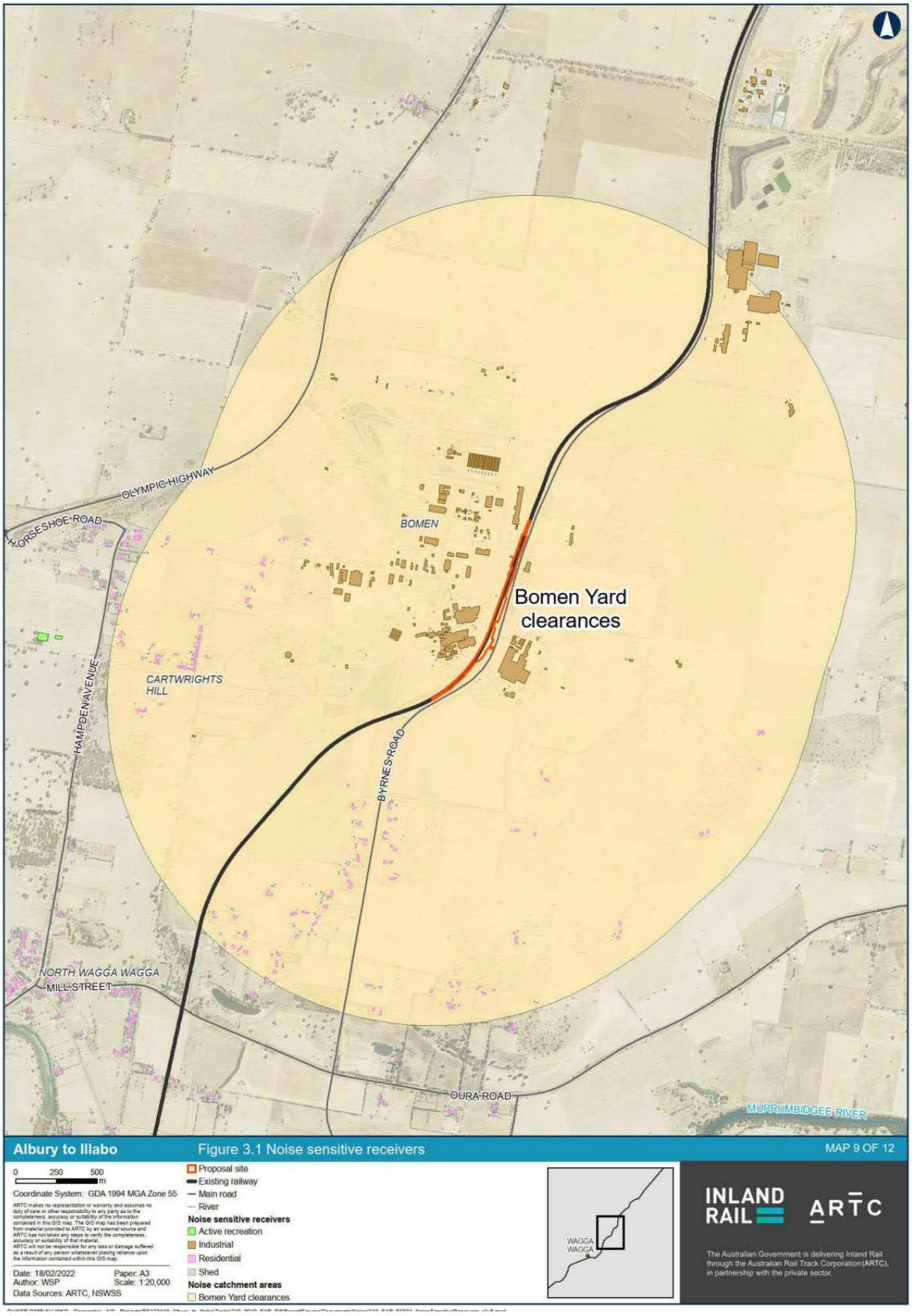


FIGURE 9: EAD NCA12 NOISE MONITORING LOCATION

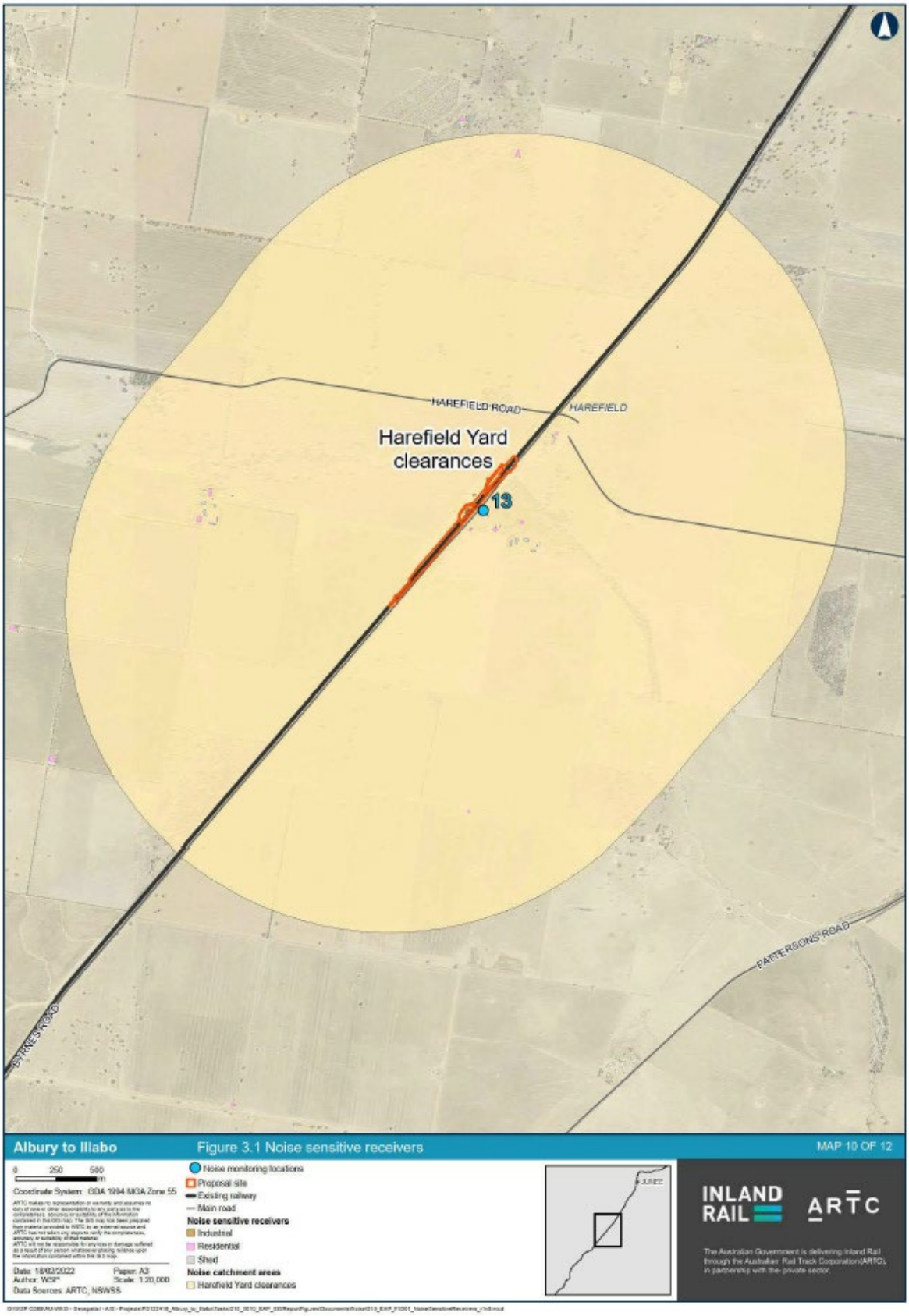


FIGURE 10: EAD NCA13 NOISE MONITORING LOCATION

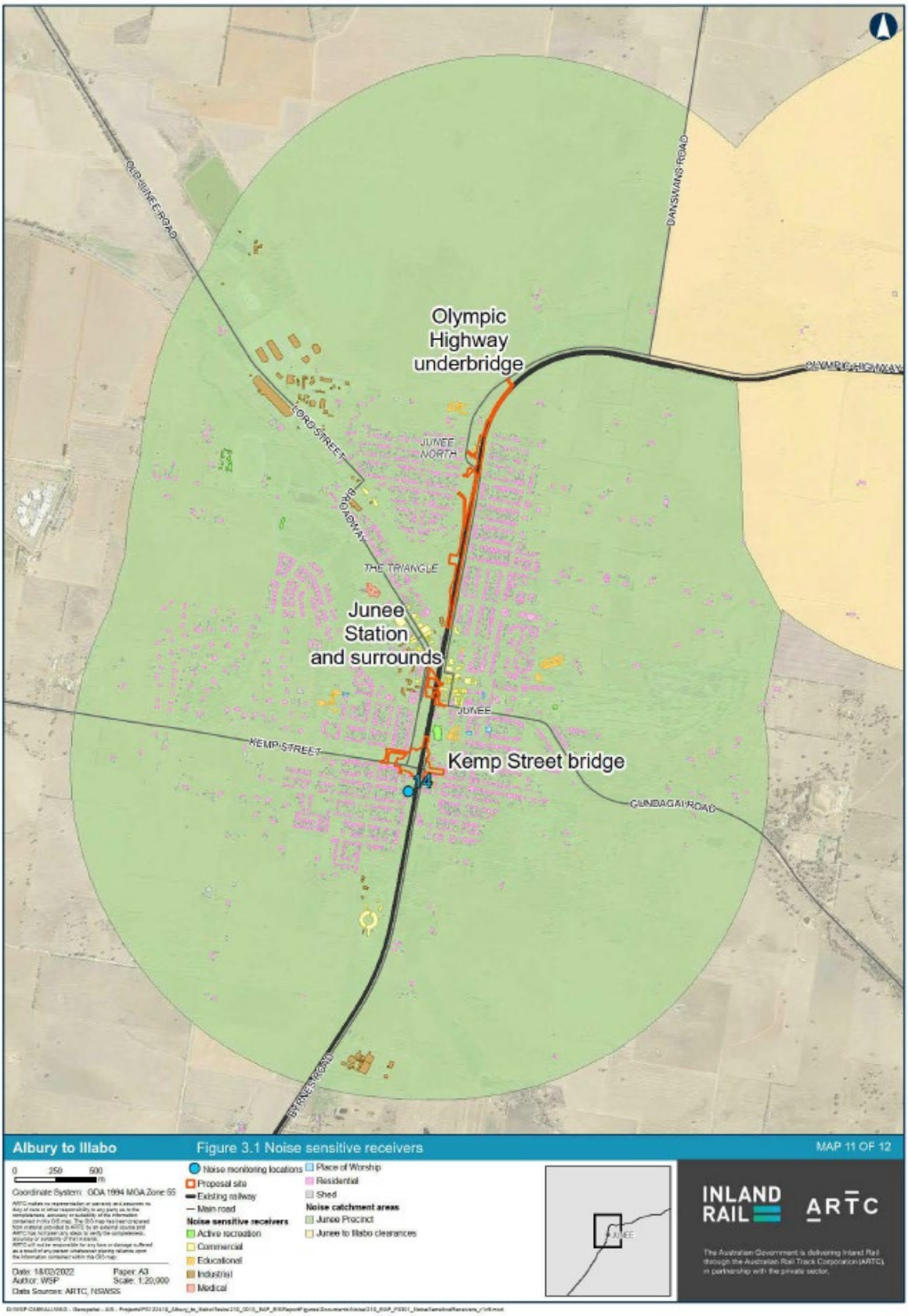


FIGURE 11: EAD NCA14 NOISE MONITORING LOCATION

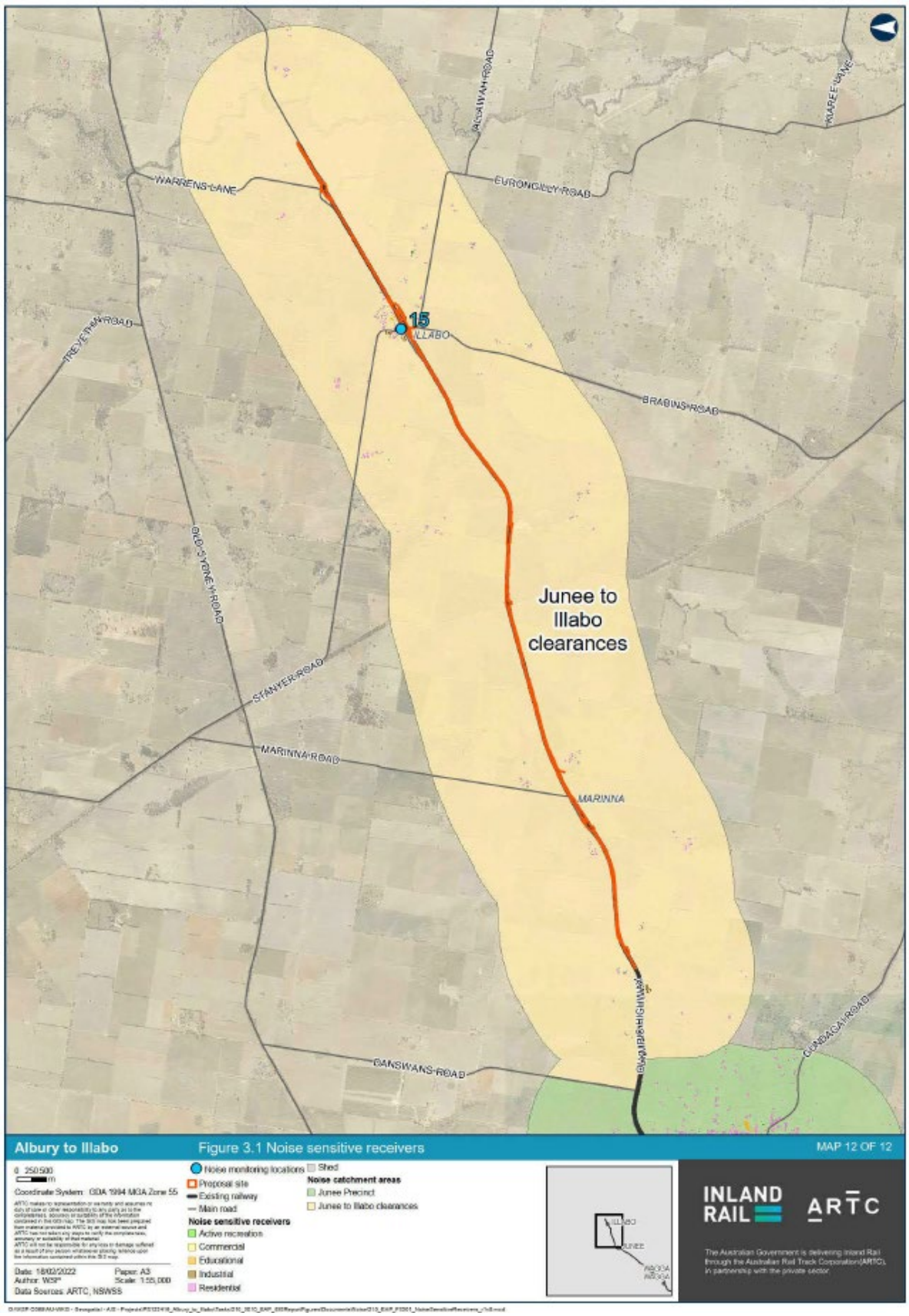


FIGURE 12: EAD NCA15 NOISE MONITORING LOCATION

3 CONSTRUCTION NOISE AND VIBRATION OBJECTIVES

The EPA recommends management levels and goals when assessing construction noise and vibration. These are outlined in:

- Interim Construction Noise Guideline (ICNG) (DECC, 2009);
- Assessing Vibration: A Technical Guideline (DEC, 2006).

Relevant elements of these documents are summarised and discussed below.

EPL 21984 also sets out noise limit requirements that must be implemented when assessing construction noise and vibration. These are as follows:

- L2.1: The licensee must minimise noise and vibration impacts at residences and other sensitive land uses. To meet the requirements of this condition the licensee must:
  a) Implement the guidance in the Interim Construction Noise Guideline (DEC, 2009) and the Assessing Vibration: a technical guideline (DEC, 2006);
  b) Implement all reasonable and feasible measures to minimise noise impacts in accordance with the Interim Construction Noise Guideline (DEC, 2009); and
  c) Implement vibration mitigation in accordance with the Assessing Vibration: a Technical Guideline (DEC, 2006).

  In this condition, 'reasonable' and 'feasible', in relation to noise management, have the same meaning as defined in the Interim Construction Noise Guideline (DEC, 2009)
- L2.2: When construction activities include 'High Noise Impact Activities and Works' as defined in the special dictionary in this licence, quantitative construction noise assessments must apply a +5dB correction to the measured or predicted level of construction noise at the nearest Noise Sensitive Receiver location before assessment against the Interim Construction Noise Guideline (DECC, 2009) noise management levels.

3.1 Interim Construction Noise Guideline

The ICNG provides guidelines for the assessment and management of construction noise. The ICNG focuses on applying a range of work practices to minimise construction noise impacts rather than focusing on achieving numeric noise levels. The main objectives of the ICNG are to:

- Identify and minimise noise from construction works;
- Focus on applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts;
- Encourage construction during the recommended standard hours only, unless approval is given for works that cannot be undertaken during these hours;
- Reduce time spent dealing with complaints at the project implementation stage;
- Provide flexibility in selecting site-specific feasible and reasonable work practices to minimise noise impacts.

3.2 Construction noise and vibration objectives

Construction noise assessment goals presented in the ICNG are referenced to NML for residential, sensitive land uses and commercial/industrial premises.

3.2.1 Residential receivers

The adopted construction NMLs for each NCA have been determined based on the Rating Background Levels (RBLs) measured during the preparation of the EIS. The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the Noise Policy for Industry (NPfI) (EPA, 2017).

For work during standard construction hours:

- The 'noise affected level' represents the point above which there may be some community reaction to noise. The noise affected level is calculated by adding 10 dB to the RBL;
- The 'highly noise affected level' represents the point above which there may be strong community reaction to noise. The ICNG specifies that the highly noise affected level is 75 dB(A).

Considering the possibility of work outside standard construction hours, additional project construction NMLs for these times have also been determined. For work outside standard construction hours, the construction NML is calculated by adding 5 dB to the RBL. For assessing the potential for sleep disturbance, the NSW Road Noise Policy (DECCW 2011) outlines a screening level of the prevailing RBL plus 15 dB. The maximum sleep disturbance level is calculated as 65 dBA, based on an internal level of 55 dBA and a façade insertion loss of 10 dB.

The adopted construction NMLs and sleep disturbance screening criterion for residential receivers are provided in Table 5. As required by the Noise Policy for Industry (NPfI) when setting project construction NMLs, the evening NML should be no greater than the daytime NML. Likewise, the night-time NML should be no greater than the day or evening NML.

In consultation with the Acoustic Advisor and the project's noise and vibration consultants, noise monitoring data presented in the EAD for NCA 2 was deemed to be unrepresentative of the receivers in the area, with ambient noise levels more consistent with those presented for NCA 1. As a result, measured background noise levels for NCA 1 were used to determine the NMLs for NCA 2 (refer to Table 5).

3.2.2 Sleep disturbance screening and awakening criteria

Where construction works are planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts be completed. The ICNG refers to the Environmental Criteria for Road Traffic Noise (EPA 1999) for assessing the potential impacts, which notes that to limit the level of sleep disturbance, the L_{Amax} should not exceed the existing RBL noise level by more than 15 dB.

The Noise Policy for Industry (NPfI, 2017) provides minimum thresholds for assessing sleep disturbance impacts where noise levels exceed 52 dB L_{Amax} or the prevailing RBL plus 15 dB, whichever is the greater. Although the NPfI sleep disturbance criteria relates to industrial noise, it is also considered relevant for reviewing potential impacts from construction noise as a screening criterion. As a result, the sleep disturbance screening level is RBL plus 15 dB or 52 dB(A), whichever is higher.

Where there are noise events found to be above the initial screening level, further analysis is required to identify:

- The likely number of events that might occur during the night assessment period, and;
- Whether events exceed an 'awakening reaction' level of 55 dB L_{AFmax} (internal) that equates to NML of 65 dB(A) externally (assuming open windows).

Sleep disturbance screening and awakening criteria are provided in Table 5.

TABLE 5: EAD CONSTRUCTION NMLS AND SLEEP DISTURBANCE SCREENING CRITERIA AT RESIDENCES

NCA	Monitoring ID for RBL	RBL dB(A)			NML dB(A)[1]				Sleep disturbance Lamax dB	
		Day	Evening	Night	Std. Hours	OOH Day	OOH Eve	OOH Night	Screening	Max
1	1	45	45(47[2])	41	55	50	50	46	56	65
2[5]	~~2~~	~~35(27[2])~~	~~33~~	~~33 (36[4])~~	~~45~~	~~40~~	~~38~~	~~48~~	~~52~~	~~65~~
3	3	37	37(41[2])	37(38[4])	47	42	42	42	52	65
4	4	42	42 (51[2])	42 (46[2])	52	47	47	47	61	65
5	5	36	35	30	46	41	40	35	52	65
6	6	37	36	30	47	42	41	35	52	65
7/8	7	39	39 (41[2])	30	49	44	44	35	52	65
9	9	39	39 (41[2])	30	49	44	44	35	52	65

(1) The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays. See the NSW EPA Noise Policy for Industry (NPfI)

(2) The evening RBL data has been reduced to the daytime period RBL in this case (bracketed figures indicates the measured value)

(3) The NPfI minimum RBL value has been used due to the measured RBL being lower than the minimum value.

(4) The night-time RBL data has been reduced to the evening period RBL in this case (bracketed figures indicates the measured value).

(5) The RBL and NML for NCA 2 have been replaced with those identified for NCA 1 (refer to Section 3.2.1)

NCA	Monitoring ID for RBL	RBL dB(A)			NML dB(A)[1]				Sleep disturbance Lamax dB	
		Day	Evening	Night	Std. Hours	OOH Day	OOH Eve	OOH Night	Screening	Max
10	10	46	45	38	56	51	50	43	53	65
11	11	48	47	37	58	53	52	42	52	65
12	12	48	47	37	58	53	52	42	52	65
13	13	41	39	37	51	46	44	42	52	65
14	14	42	42 (45[2])	35	52	47	47	40	52	65
15	15	41	41 (46[2])	33	51	46	46	38	56	65

3.2.3 Non-residential sensitive receivers

Other sensitive land uses, such as schools and offices, typically find noise from construction to be disruptive when the properties are being used (such as during work and school times). Table 6 presents NMLs for sensitive land uses based on the principle that the characteristic activities for each of these land uses should not be unduly disturbed. Martinus Rail will undertake consultation with potentially affected community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas to schedule construction activities and work hours to achieve a reasonable noise outcome.

The ICNG provides noise management levels for commercial and industrial premises and 'other sensitive' land uses (ICNG, Table 3). The management levels for other noise sensitive receivers not listed in the ICNG that are applicable to the project, such as hotels and libraries, are derived from AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors and the Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment (2020). The management levels from AS2107 are the upper range levels to account for the variable and short-term nature of construction noise.

TABLE 6: NON-RESIDENTIAL SENSITIVE LAND USES NOISE MANAGEMENT LEVELS

LAND USE	NML $LA_{EQ(15MIN)}$	WHERE NML APPLIES	REFERENCED FROM:	ASSUMED FAÇADE LOSS (CONSERVATIVE)	EXTERNAL EQUIVALENT NML [2] - $LA_{EQ(15MIN)}$
Studio building (music recording studio)	25 dB	Internal noise level	AS2107 'maximum'	20 dB	45 dB
Studio building (film or television studio)	30 dB	Internal noise level	AS2107 'maximum'	20 dB	50 dB
Cinema space, theatre, auditorium	35 dB	Internal noise level	AS2107 'maximum'	20 dB	55 dB
Classrooms at schools and other educational institutions	45 dB	Internal noise level	ICNG	10 dB	55 dB
Childcare centre (sleeping areas)	35 dB	Internal noise level	AAAC - guideline for Child Care Centre Acoustic Assessment	10 dB	45 dB
Childcare centre (activity areas)	40dB	Internal noise level	AAAC – guideline for Child Care Centre Acoustic Assessment	10 dB	50 dB
Hospital wards and operating theatres	45 dB	Internal noise level	ICNG	20 dB	65 dB
Places of worship	45 dB	Internal noise level	ICNG	10 dB	55 dB
Library (reading areas)	45 dB	Internal noise level	AS2107 'maximum'	10 dB	55 dB

[2] Applies only when properties are being used

LAND USE	NML $LA_{EQ(15MIN)}$	WHERE NML APPLIES	REFERENCED FROM:	ASSUMED FAÇADE LOSS (CONSERVATIVE)	EXTERNAL EQUIVALENT NML[2] - $LA_{EQ(15MIN)}$
Hotel (daytime and evening)	50 dB	Internal noise level	AS2107 'maximum'	10 dB	60 dB
Hotel (night-time)	35 dB	Internal noise level	AS2107 'maximum'	10 dB	45 dB
Community centres – Municipal Buildings	50 dB	Internal noise level	AS2107 'maximum'	10 dB(A)	60 dB
Restaurant, bar (Bars and lounges/ Restaurant)	50 dB	Internal noise level	AS2107 'maximum'	20 dB(A)	70 dB
Passive recreation[3] (e.g. area used for reading, meditation)	60 dB	External noise level	ICNG	-	60 dB
Active recreation[4] (e.g. sports fields)	65 dB	External noise level	ICNG	-	65 dB
Commercial premises (including offices and retail outlets)	70 dB	External noise level	ICNG	-	70 dB
Industrial premises	75 dB	External noise level	ICNG	-	75 dB

(1) Assumed facade loss of 10 dB is considered representative for windows that can be opened to sufficiently to provide adequate ventilation. Assumed facade loss of 20 dB representative of facades with fixed windows and mechanical ventilation.

3.2.4 National Standard for exposure to noise

In accordance with CoA E77, worksites will be managed to ensure that noise generated by construction will not exceed the National Standard for exposure to noise in the occupational environment of an eight-hour equivalent continuous A-weighted sound pressure level of LAeq,8h, of 85 dB(A) for any employee working at a location near the project.

It is not anticipated that an exceedance will occur at any point during the project. This notwithstanding, where detailed noise and vibration assessments or Construction Noise and Vibration Impact Statements (CNVIS) highlight the potential for an exceedance of this National Standard, noise monitoring will be undertaken during the activity.

It is noted that occupational exposure to noise will primarily be managed under the Work Health and Safety Management Plan.

3.2.5 Ground-borne noise

Construction work can cause ground-borne (structure-borne or regenerated) noise impacts in nearby buildings when vibration intensive equipment is in use, such as during excavation work using rockbreakers. Vibration can be transmitted through the ground and into nearby buildings, which can then create audible noise impacts inside the building.

Ground-borne noise NMLs are applicable where ground-borne noise levels are likely to be higher than airborne noise levels, which can occur where work is underground or where surface work is shielded by noise barriers or other structures.

[3] Passive recreation areas characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion.
[4] Active recreation areas are characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion.

Ground-borne noise is generally found to generate impacts during the evening and night-time periods when ambient noise levels are often much lower, and ground-borne noise is more prominent.

The internal ground-borne noise NMLs for residential receivers, in accordance with CoA E75, are shown in Table 7

TABLE 7: INTERNAL RESIDENTIAL GROUND-BORNE NMLS

Receiver Type	Noise Management Level, LAeq(15minute) – dB		
	Day[1]	Evening[2]	Night[2]
Residential	N/A	40	35

Note 1: Daytime ground-borne noise NMLs are not specified in the ICNG.
Note 2: Specified in the ICNG.

For other sensitive receivers, including commercial receivers such as offices and retail areas, the ICNG does not provide guidance in relation to acceptable ground-borne noise levels. For the purpose of this CNVMP, the internal airborne NMLs presented in Table 10 will also be adopted for ground-borne noise within non-residential sensitive receivers

3.3 Construction vibration objectives

Effects of ground vibration on buildings and sensitive structures (such as heritage structures) resulting from construction can be classified as follows:

- Human exposure – disturbance to building occupants: vibration in which the occupants or users of the building are inconvenienced or possibly disturbed;
- Effects on building contents – vibration where the building contents may be affected;
- Effects on building structures – vibration in which the integrity of the building or structure itself may be prejudiced.

In accordance with CoA E74, the following construction vibration goals apply:

- For structural damage, the vibration limits set out in the German Standard DIN 4150-3: Structural Vibration - effects of vibration on structures;
- For damage to other buildings and/or structures, the vibration limits set out in the British Standard BS 7385-2:1993 - Evaluation and measurement for vibration in buildings - Part 2;
- For human exposure, the acceptable vibration values set out in Assessing Vibration: A Technical Guideline (DEC, 2006).

3.3.1 Human comfort level

Assessment of potential disturbance from tactile vibration on human occupants of buildings is made in accordance with Assessing Vibration: A Technical Guideline (DEC, 2006). The guideline provides criteria which are based on the British Standard BS 6472-1992 Evaluation of human exposure to vibration in buildings (1-80Hz). Sources of vibration are defined as either ‘continuous’, ‘impulsive’ or ‘intermittent’:

- Continuous vibration – from uninterrupted sources, e.g. machinery, steady road traffic, continuous construction activity;
- Impulsive vibration – up to three instances of sudden impact per monitoring period e.g. occasional dropping of heavy equipment, occasional loading and unloading;
- Intermittent vibration – such as from drilling, compacting or activities that will result in continuous vibration if operated continuously.

Maximum and preferred values for continuous and impulsive vibration are defined in Table 8. Day time is considered to be 7.00 am to 10.00 pm and nighttime is considered to be 10.00 pm to 7.00 am.

TABLE 8: CONTINUOUS AND IMPULSIVE VIBRATION ACCELERATION (M/S2) 1-80 HZ

LOCATION	ASSESSMENT PERIOD	PREFERRED VALUES		MAXIMUM VALUES	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Continuous vibration					
Critical areas[5]	Day or nighttime	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.010	0.0071	0.020	0.014
	Nighttime	0.007	0.005	0.014	0.010
Offices, schools, educational institutions, and places of worship	Day or nighttime	0.020	0.014	0.040	0.028
Workshops	Day or nighttime	0.04	0.029	0.080	0.058
Impulsive vibration					
Critical areas	Day or nighttime	0.0050	0.0036	0.010	0.0072
Residences	Daytime	0.30	0.21	0.60	0.42
	Nighttime	0.10	0.071	0.20	0.14
Offices, schools, educational institutions, and places of worship	Day or nighttime	0.64	0.46	1.28	0.92
Workshops	Day or nighttime	0.64	0.46	1.28	0.92

Intermittent vibration impact is assessed using vibration dose values (VDVs). The VDV method is more sensitive to peaks in the acceleration waveform and makes corrections to the criteria based on the exposure duration. The acceptable VDVs for intermittent vibration are defined in Table 9.

TABLE 9: ACCEPTABLE VIBRATION DOSE VALUES (M/S1.75) FOR INTERMITTENT VIBRATION

LOCATION	DAY TIME		NIGHTTIME	
	Preferred values	Maximum values	Preferred values	Maximum values
Critical areas[6]	0.10	0.20	0.10	0.02
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

[5] Such as hospital operating theatres or precision laboratories.
[6] Such as hospital operating theatres or precision laboratories.

3.3.2 Structural damage level – BS7385

BS 7385 is used as a guide to assess the likelihood of building damage from ground vibration. BS 7385 suggests levels at which 'cosmetic', 'minor' and 'major' categories of damage might occur, where the categories of structural damage are defined as:

- Cosmetic - the formation of hairline cracks on drywall surfaces, or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick/concrete block construction;
- Minor - the formation of large cracks or loosening of plaster or drywall surfaces, or cracks through bricks/concrete blocks;
- Major - damage to structural elements of the building, cracks in supporting columns, loosening of joints, splaying of masonry cracks, etc.

The levels for structural damage outlined in the standard refer to non-continuous vibration sources and are considered 'safe limits' up to which no damage due to vibration effects are expected to occur for the various building types. Where vibration is continuous these levels may be reduced by up to 50 per cent and additional assessment against the standard will be necessary.

BS 7385 is based on peak particle velocity and specifies damage criteria for frequencies within the range 4 to 250 Hz, being the range usually encountered in buildings. Table 10 sets out the BS 7385 criteria for cosmetic, minor, and major damage. The cosmetic damage criteria will be used as the management level.

TABLE 10: BS 7385 STRUCTURAL DAMAGE CRITERIA

GROUP	TYPE OF STRUCTURE	DAMAGE LEVEL	PEAK COMPONENT PARTICLE VELOCITY[7] PPV (MM/S)		
			4 – 15 Hz	15 – 40 Hz	>40 Hz
1	Reinforced or framed structures Industrial and heavy commercial buildings	Cosmetic	50	50	50
		Minor[8]	100	100	100
		Major	200	200	200
2	Unreinforced or light framed structures Residential or light commercial type buildings	Cosmetic	15 - 20	20 - 50	50
		Minor	30 - 40	40 - 100	100
		Major	60 - 80	80 - 200	200

3.3.3 Vibration screening criteria

Human comfort

To assess the potential for vibration impact on human comfort, an initial screening test will be done based on peak velocity units, as this metric is also used for the cosmetic building damage vibration assessment. This screening test is a conservative approach since it is based on the continuous vibration velocity criteria (i.e. vibration that continues uninterrupted for a defined assessment period) whilst construction works are mostly intermittent. The initial screening test for vibration disturbance to building occupants, based on the peak particle velocity (PPV, mm/s) are presented in Table 11.

If the predicted vibration exceeds the initial screening test, the total estimated VDVs will be determined based on the level and duration of the vibration event causing exceedance in accordance with the Assessing Vibration – a technical guideline (Department of Environment and Conservation, 2006).

[7] Peak Component Particle Velocity is the maximum peak particle velocity in any one direction (x, y, z) as measured by a tri-axial vibration transducer.

[8] Minor and major damage criteria established based on BS 7385 Part 2 (1993) Section 7.4.2.

TABLE 11: CONSTRUCTION VIBRATION DISTURBANCE TO BUILDING OCCUPANTS – INITIAL SCREENING

PLACE AND TIME	MAXIMUM PEAK VELOCITY, MM/S (>8HZ)
Critical areas (day time or nighttime)	0.28
Residential buildings 16 hour day	0.56
Residential buildings 8 hour night	0.40
Offices, schools, educational institutions and places of worship (day or night)	1.10

Cosmetic damage

The limits presented in Table 10 relate predominantly to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, then the guide values in Table 10 may need to be reduced by up to 50 per cent. This is especially applicable at the lower frequencies where lower guide values apply.

On this basis, consistent a conservative vibration screening criteria per receiver type is given below:

- Reinforced or framed structures (Line 1): 25.0 mm/s;
- Unreinforced or light framed structures (Line 2): 7.5 mm/s.

At locations where the predicted and/or measured vibration levels are greater than shown above (peak component particle velocity), a more detailed analysis of the building structure, vibration source, dominant frequencies and dynamic characteristics of the structure would be required to determine the applicable safe vibration level. The analysis would take into consideration the transient vibration guide values for minimal risk of cosmetic damage set out in Table 10.

3.3.4 Heritage items – DIN4150

The German standard provides a conservative criterion for vibration limits for different buildings and buried pipework and has been used to identify the vibration criteria for the project where the British Standard does not apply. The German standard values for peak particle velocity (PPV) (mm/s) measured at the foundation of the building are summarised in Table 12.

TABLE 12: DIN 4150-3 GUIDELINE VALUES FOR SHORT-TERM VIBRATION ON STRUCTURES

GROUP	TYPE OF STRUCTURE	GUIDELINE VALUES VIBRATION VELOCITY (MM/S)				
		Foundations, all directions at a frequency of:			Topmost floor, horizontal	Floor slabs, vertical
		1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	All frequencies
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 - 30	40 - 50	40	20
2	Residential buildings and buildings of similar design and/or occupancy	5	5 - 15	15 - 20	15	20
3	Structures that because of their particular sensitivity to vibration, cannot be	3	3 - 8	3 - 8	8	20

GROUP	TYPE OF STRUCTURE	GUIDELINE VALUES VIBRATION VELOCITY (MM/S)				
		Foundations, all directions at a frequency of:			Topmost floor, horizontal	Floor slabs, vertical
		1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	All frequencies
	classified into Group 1 or 2 and are of great intrinsic value e.g. heritage listed buildings					

As noted in BS 7385, heritage buildings and structures should not be assumed to be more sensitive to vibration, unless structurally unsound. Where heritage structures are impacted, a conservative vibration damage screening level based on the DIN 4150-3 Group 3 can be applied. If further investigation determines that structure is structurally sound, based on advice from both a heritage consultant and a structural engineer, structural damage vibration limits based on BS 7385 will be applied. If the structure is found to be structurally unsound, further analysis will be undertaken in accordance with the DIN4150-3 (considering short-term or long-term criteria as applicable).

A heritage specialist will be engaged throughout the project to provide Martinus Rail with advice on methods and locations for installing equipment used for vibration, movement, and noise monitoring of heritage-listed structures.

4 MONITORING PROCEDURES

4.1 Noise monitoring

The noise monitoring procedure to implemented on the project is outlined in Table 13.

All noise monitoring will be undertaken in accordance with the ICNG and, where additional guidance is required, the NSW Environment Protection Authority Approved methods for the measurement and analysis of environment noise in NSW (EPA, 2022).

Noise monitoring for the purpose of the EPL will be undertaken in accordance with conditions M2.1, M2.3 and M2.4. All noise monitoring for the purposes of determining compliance with the conditions of the EPL must consider and generally be undertaken in accordance with:

- Australian Standard AS 1055: 2018 Acoustics – Description and measurement of environmental noise; and
- the compliance monitoring guidance provided in the Chapter 7 'Monitoring Performance' of the Noise Policy for Industry (EPA, 2017).

All noise monitoring instrumentation would be compliant with the requirements set out in Section 2.1 of the EPA Approved methods for the measurement and analysis of environmental noise in NSW (2022).

Any person monitoring or analysing environmental noise must be appropriately qualified and experienced in acoustics to a sufficient standard to enable that person to accurately interpret and apply the advice set out in acoustics standards, guidelines and policies (competent person).

All Martinus Rail staff measuring and analysing environmental noise have experience in noise and vibration monitoring and will have received the relevant training from an acoustic consultant on noise and vibration monitoring if required.

Subject to property owner approval, noise monitoring will be conducted at representative properties to confirm construction noise levels. The ICNG states that noise levels are to be assessed at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. The monitoring location(s) will be selected with regard to this, as well as factors including:

- Safety of the person undertaking the measurement;
- Security of the noise monitoring equipment;
- The purposes of the noise monitoring such as investigating a noise complaint at a particular property façade;
- Other specific constraints as they arise.

Noise monitoring must be undertaken as directed by an authorised officer of the EPA. Where monitoring is requested to take place on private land (for example a residential property) permission must be requested to access the premises in advance and a record of permission requests and responses must be kept. If access is unable to be obtained, monitoring must be undertaken at an indicative location where possible and the response to the request of access (including any nil response) must be provided to the EPA.

TABLE 13: NOISE MONITORING PROCEDURE

MONITORING DETAILS	FREQUENCY	TEST PROCEDURE
Attended monitoring will be carried out at the commencement of construction activities for which a CNVIS has been prepared to confirm actual noise levels.	On the first occasion of activities for which a CNVIS has been prepared	Noise measurements for the purposes of determining compliance with a licence or consent must be based on the use of a Class 1 sound level meter (or equivalent) as specified in AS/NZS IEC 61672.1:2019 Electroacoustics: sound level meter specifications. Sound level meter configured for "fast" time weighting and "A" frequency weighting. Outdoor measurements should be undertaken at least 3.5 metres from any reflecting structure (other than the ground) and at a height of 1.2 to 1.5 metres above ground level or the floor of
Attended monitoring where a complaint is received.	Relevant to a received noise complaint where it is determined that the results of the process will assist in resolving or understanding the receiver's issue, or where this is identified as necessary to confirm mitigation measures are suitable, or where required in accordance with condition M5.7 of the EPL	

MONITORING DETAILS	FREQUENCY	TEST PROCEDURE
Attended monitoring will be carried out at the request of AA or where predicted levels exceed the NML by: • >15dB for OOHWP1, • >5dB OOHWP2	At the request of AA, or on the first occasion of activities for which a CNVIS has identified exceedances of the NML as listed	interest if pertinent to a building, unless good acoustic practice means that a different position is more appropriate. Tests will not be carried out during rain or when the wind speed at the test site exceeds 5 m/s. Conditions such as wind velocity and direction, temperature, relative humidity and cloud cover will be recorded. Site activity during noise monitoring should be representative of a typical 15-minute period. The following noise parameters will be recorded as a minimum: • Equivalent A-weighted sound level ($L_{Aeq(15minute)}$); • Maximum A-weighted sound pressure level (L_{AFmax}); • A-weighted sound pressure level is exceeded for 90% of the measurement time ($L_{AF90(15minute)}$); • A-weighted sound pressure level that is exceeded for 10% of the measurement time ($L_{AF10(15minute)}$). The L_{Aeq} and L_{Amax} contribution from the project will be quantified and compared to the project's NMLs and predicted noise levels. Field calibration checks of the instrumentation must be carried out before and after measurements are made.
Attended Validation monitoring	At least the first 2 occasions (day, evening, nights) where OOHW will be undertaken and are likely to impact noise sensitive receivers, where work is being undertaken in accordance with a community/negotiated agreement (in accordance with condition E2.2 of the EPL)	
Spot checks of noise intensive plant	In conjunction with attended monitoring at commencement of activities	Sound level meter configured for "fast" time weighting and "A" frequency weighting. Test environment to be free from reflecting objects. Tests will not be carried out during rain or when the wind speed at the test site exceeds 5 m/s. If verifiable data confirming the sound power level of the item is not available, attended measurements shall be conducted to verify the sound power level for modelling purposes.
Where required for the purposes of refining construction methods or techniques to reduce noise levels	When trialling/refining construction methodologies or mitigation measures targeted at the reduction in sound power level of a specific noise source	

4.2 Vibration monitoring

Vibration monitoring will be undertaken before and during vibration generating activities associated with the project's works that are within the minimum working distances outlined in the CNVMP which includes the potential to impact on heritage items as required by CoA E80.

The vibration monitoring procedure to be implemented on the project is outlined in Table 14.

Vibration monitoring for the purpose of the EPL will be undertaken in accordance with conditions M2.1, M2.2 and M2.3.

Any person monitoring or analysing environmental vibration will be appropriately qualified and experienced in acoustics to a sufficient standard to enable that person to accurately interpret and apply the advice set out in acoustics standards, guidelines and policies (competent person). All Martinus Rail staff measuring and analysing environmental vibration have experience in noise and vibration monitoring and will have received the relevant training from an acoustic consultant on noise and vibration monitoring if required.

Subject to property owner approval, vibration monitoring will be conducted at representative properties to confirm construction vibration levels.

Where vibration is found to exceed the relevant criteria, impacts will be reduced by changing work methods and/or plant, or through the provision of building protection measures where possible.

Vibration monitoring must be undertaken as directed by an authorised officer of the EPA. Where monitoring is requested to take place on private land (for example a residential property) permission must be requested to access the premises in advance and a record of permission requests and responses must be kept. If access is unable to be obtained, monitoring must be undertaken at an indicative location where possible and the response to the request of access (including any nil response) must be provided to the EPA.

TABLE 14: VIBRATION MONITORING PROCEDURE

MONITORING DETAILS	FREQUENCY	TEST PROCEDURE
At the commencement of vibratory work within minimum working distances for sensitive receivers.	As required	Transducer to be affixed to the ground or building in accordance with ISO5348:2021. **Cosmetic damage** PPV with sufficient temporal resolution to determine vibration impacts and the dominant frequency of vibration will be recorded for assessment against the cosmetic damage criteria. To determine site specific minimum working distances, monitoring will be conducted for at least three (3) distances from the vibration source, including a representative distance for the nearest receiver. The plant will be tested in setting in which it is expected to operate. For example, vibrator rollers may include both 'high' and 'low' settings. **Human comfort** In situations where human comfort is the main concern, VDV should be measured with sufficient temporal resolution to determine vibration impacts.
When a complaint is received in relation to human exposure to vibration levels and/or suspected property damage due to vibration impacts and monitoring is considered an appropriate response	As required	
For the purposes of refining construction methodology to reduce vibration levels	As required	
Where an activity may occur within minimum working distances for cosmetic damage	As required	Transducer to be affixed to the ground or building in accordance with ISO5348:2021. Vibration logger to continuously measure vibration levels while the relevant works are occurring within the minimum distance for cosmetic damage. Measurement to be conducted as close as possible to the sensitive structure. PPV with sufficient temporal resolution to determine vibration impacts and the dominant frequency of vibration will be recorded for assessment against the cosmetic damage criteria and against human comfort (screening criteria). In

MONITORING DETAILS	FREQUENCY	TEST PROCEDURE
		situations where human comfort is the main concern, a metric which is appropriate for estimating the vibration dose values should be considered.
Pre- and post-construction property condition surveys of buildings, structures and utilities and the like identified in the documents listed in Condition A1 of the Infrastructure Approval as being at risk of damage (undertaken by a structural engineer) in accordance with CoA E120 and E121	Before the commencement of any work (in the relevant area) and post-construction	A visual inspection of the structure. Full written building condition survey report outlining the condition of the internal and external components of each property. A series of photographs of each identified defect/crack. Identification of any condition changes relative to pre-construction.
Vibration generating activities that have the potential to impact on heritage items in accordance with CoA E80	As required	Identify minimum working distances to prevent cosmetic damage. When conducting vibration testing at a heritage item, advice from a heritage specialist must be sought on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures (in accordance with CoA E80).

4.2.1 Monitoring for cosmetic damage

To control cosmetic damage, vibration sensors will be installed by a suitable vibration expert in accordance with the procedures outlined in British Standard 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2 (BS 7385-2). The following summary may form the basis of a measurement program, as guided by BS 7385-2:

- The vibration sensor should be able to record peak component particle velocity (PPV) in three orthogonal directions;
- Measurements should be undertaken at the base of the nearest receivers' building on the side of the building facing the source of vibration. If doing so is not feasible, measuring vibration on the ground outside of the building is possible, although may require additional engineering analysis;
- The vibration sensor should be mounted to the base of the building or on the ground outside such that there is good coupling between the sensor and base;
- The vibration sensor should be capable to "faithfully reproduce the vibration in the frequency and magnitude ranges in which vibration response may be expected";
- Should the works location change, the geophones will be relocated to remain at the closest point of the structure to the works.

For vibration monitoring of structurally unsound buildings, guidance from German Standard DIN 4150-3 will be used. Advice from a heritage specialist must be sought on methods and locations for installing equipment used for vibration, movement and noise monitoring at heritage-listed structures (in accordance with CoA E80).

4.2.2 Monitoring for human comfort

Monitoring the effects of construction vibration on human comfort is to be achieved through installation of an accelerometer or velocity-based sensor and set to appropriately calculate cumulative VDVs during the periods when construction work is undertaken. Measurement details for human comfort, as guided by British Standard 6472 Part 1-1992 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting (BS 6472-1), is as follows:

- Unless the dominant axis of vibration is known, the vibration sensor should record vibration in three orthogonal directions;
- Measurements should be undertaken within a complainant's offending space or within spaces which receivers frequently use when construction work is on-going. The measurement location is preferably at a point on a structure (typically the floor) where vibration is typically experienced by a complainant.

Details regarding the determination of cumulative VDVs are outlined in BS 6472-1.

4.2.3 Measurements for other vibration sensitive structures

Specialised vibration monitoring advice from an acoustic consultant should be sought after for assessing sensitive structures, such as buried structures and pipework, where required. The advice provided should be determined on a case-by-case basis for each vibration sensitive structure.

4.3 Minimum working distances

The minimum working distances for cosmetic damage and human comfort (human exposure) are presented in Section 7.4 and Section 7.5 of the CNVMP, respectively. These minimum working distances are indicative and will vary depending on the item of plant (particularly its power rating), local geotechnical conditions and the frequency content of the construction vibration levels.

Attended vibration monitoring will be undertaken to determine site-specific minimum working distances for structural damage and human response, where vibration intensive plant/equipment may be used within the indicative minimum working distances identified in Section 7.4 and Section 7.5 of the CNVMP. Additionally, further detailed analysis based on the frequency dependent guideline vibration levels in BS7385-2:1993 and DIN4150-3:2016 may be utilised in conjunction with site specific measurements to derive alternative cosmetic damage objectives and minimum working distances. For heritage listed/fragile structures, specialist advice from an appropriately qualified structural engineer who is familiar with heritage structures is required to support any proposed relaxation of the initial cosmetic damage screening criterion.

Properties identified within the site-specific minimum working distances for cosmetic damage will be notified before vibration works. If the potential exceedance is to occur more than once or extend over a period of 24 hours, owners and occupiers will be provided a schedule of potential exceedances on a monthly basis for the duration of the potential exceedances.

4.3.1 Human exposure

Recommended minimum working distances for typical vibration intensive construction equipment for human comfort (response) are shown in Table 15. These recommended distances are presented as a guide only.

TABLE 15: RECOMMENDE MINIMUM WORKING DISTANCES – HUMAN COMFORT

Vibration significant plant item	Rating/Description	Critical area[9]	Residence (Day)	Residence (Night)	Office	Workshop
Vibratory Roller	<50 kN (1–2 tonne)	25 m	17 m	20 m	11 m	7 m
	<100 kN (2–4 tonne)	25 m	17 m	20 m	11 m	7 m
	<200 kN (4–6 tonne)	50 m	33 m	40 m	21 m	14 m
	<300 kN (7–13 tonne)	124 m	81 m	100 m	52 m	34 m
	>300 kN (13–18 tonne)	124 m	81 m	100 m	52 m	34 m
	>300 kN (>18 tonne)	124 m	81 m	100 m	52 m	34 m
Small hydraulic hammer	300 kg (5 to 12 t excavator)	9 m	6 m	7 m	4 m	3 m
Medium hydraulic hammer	900 kg (12 to 18 t excavator)	29 m	19 m	23 m	12 m	8 m
Large hydraulic hammer	1,600 kg (18 to 34 t excavator)	91 m	59 m	73 m	38 m	25 m

Vibration significant plant item	Rating/Description	Critical area[9]	Residence (Day)	Residence (Night)	Office	Workshop
Vibratory pile driver	sheet piles	25 m	17 m	20 m	11 m	7 m
Piling rig – bored	≤ 800 mm	5 m	4 m	4 m	3 m	2 m
Jackhammer	Handheld	3 m	2 m	2 m	2 m	1 m

[9] Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring.

4.3.2 Cosmetic damage

Recommended minimum working distances to reduce the risk of cosmetic damage to buildings or structures from typical vibration intensive construction equipment are presented in the CNVMP and are replicated in Table 16. These minimum working distances assume that construction vibration could include low frequency content with associated increased risk of cosmetic damage.

TABLE 16: MINIMUM WORKING DISTANCES - COSMETIC DAMAGE

Vibration significant plant item	Rating/Description	Reinforced or frame structures (BS7385)	Unreinforced or light framed structures (BS7385)	Structurally unsound heritage structures (DIN 4150-3)
Vibratory Roller	<50 kN (1–2 tonne)	3 m	5 m	11 m
	<100 kN (2–4 tonne)	3 m	6 m	13 m
	<200 kN (4–6 tonne)	6 m	12 m	25 m
	<300 kN (7–13 tonne)	8 m	15 m	31 m
	>300 kN (13–18 tonne)	10 m	20 m	40 m
	>300 kN (>18 tonne)	12 m	25 m	50 m
Small hydraulic hammer	300 kg (5 to 12 t excavator)	1 m	2 m	5 m
Medium hydraulic hammer	900 kg (12 to 18 t excavator)	4 m	7 m	15 m
Large hydraulic hammer	1,600 kg (18 to 34 t excavator)	11 m	22 m	44 m
Vibratory pile driver	sheet piles	10 m	2 m to 20 m	5 m to 40 m
Piling rig – bored	≤ 800 mm	1 m	2 m (nominal)	5 m
Jackhammer	Handheld	1 m	1 m (nominal)	3 m

4.4 Indicative noise and vibration monitoring locations

Noise and vibration monitoring locations may vary throughout construction of the project. Final monitoring locations will be determined on a case-by-case basis in a CNVIS or via the project construction noise and vibration management tool (refer Section 7.1 and 7.2 of the CNVMP).

Noise monitoring locations will be undertaken at affected sensitive receivers relevant to the project and will also be undertaken for non-sensitive receivers predicted to be impacted by significant exceedances of the NML from work in standard hours.

Vibration monitoring will be undertaken at vibration sensitive locations within the 'minimum working distances' established for each item of plant during the commencement of use of each plant on site.

Attended noise and vibration monitoring locations will include construction sites where the commencement of operation for each new plant or activity on site has the potential to generate significant noise or vibration levels. This may also include specific attended noise and/or vibration monitoring of significant plant items, such as tamping plant.

4.5 Adaptive management

Noise and vibration monitoring results obtained during the implementation of this Monitoring Program will be compared against the objectives identified in Section 3 and predicted levels within a CNVIS, as relevant.

Should an exceedance of the objective or predicted levels be identified that is directly attributable to the project, the ESR (or delegate) will undertake a site inspection and a review that will consider:

- Detailed analysis of the results by Martinus Rail personnel (including site inspection, as required) to determine possible causes for the exceedance. Construction activities occurring and/or specific equipment in use at the time of the exceedance may be considered;
- Advising relevant personnel of the exceedance;
- Identifying and agreeing on actions and/or additional mitigation measures to resolve or mitigate the exceedance;
- Implementing actions to rectify or mitigate the exceedance;
- Identifying and implementing additional mitigation measures.

Where actual noise levels are found to exceed the predicted worst-case levels, the source of excessive noise generations will be identified, and any additional feasible and reasonable measures available will be implemented to either reduce noise emissions or reduce the impacts on receivers.

Where necessary, monitoring will be implemented to follow-up on any noise and vibration issues that arise during construction.

Where vibration is found to exceed relevant vibration criteria, impacts will be reduced by changing work methods and/or equipment, or through the provision of building protection measures where possible. In the event a complaint relating to property damage is received, an inspection of the property will be undertaken, and an interim building condition survey prepared.

Mitigation measures and preventative/corrective actions will be developed in accordance with the procedure for dealing with non-compliance with environmental management measures outlined in Section 8 of the CEMP. Martinus Rail will verify and document the effectiveness of any management measures or preventative/corrective actions implemented to avoid further exceedances.

5 REPORTING

5.1 Quarterly Construction Noise and Vibration Monitoring Report

A quarterly Construction Monitoring Report will be prepared detailing the results of the monitoring undertaken in accordance with this Monitoring Program.

The Construction Monitoring Reports will be prepared once noise and vibration monitoring commences during construction.

The Construction Monitoring Reports will be submitted to the Planning Secretary and to relevant regulatory agencies (i.e. the EPA) for information 60 days after the reporting period ends.

All reports will be kept in a legible form (or a form that can be readily reduced to a legible form) for at least 4 years after the monitoring or event to which they relate took place. The reports will be submitted to any authorised officer of the EPA by request.

Reports will include, but not be limited to, the following information:

- The date(s) and time at which the monitoring was undertaken;
- The locations and description of monitoring undertaken;
- The name of the person who collected the sample
- A summary of monitoring data;
- Comparison of monitoring results with the relevant objectives identified in Section 3 of this Monitoring Program and whether they have been met;
- Details of any alteration to the Monitoring Program;
- Summary of any complaints received regarding construction noise and vibration.

Separate from the Construction Monitoring Report, additional records relating to noise and vibration training, toolbox talks, monitoring results and audit results will be prepared, maintained, and stored in line with the CEMP. The complaints management and reporting procedure is described in the CEMP.



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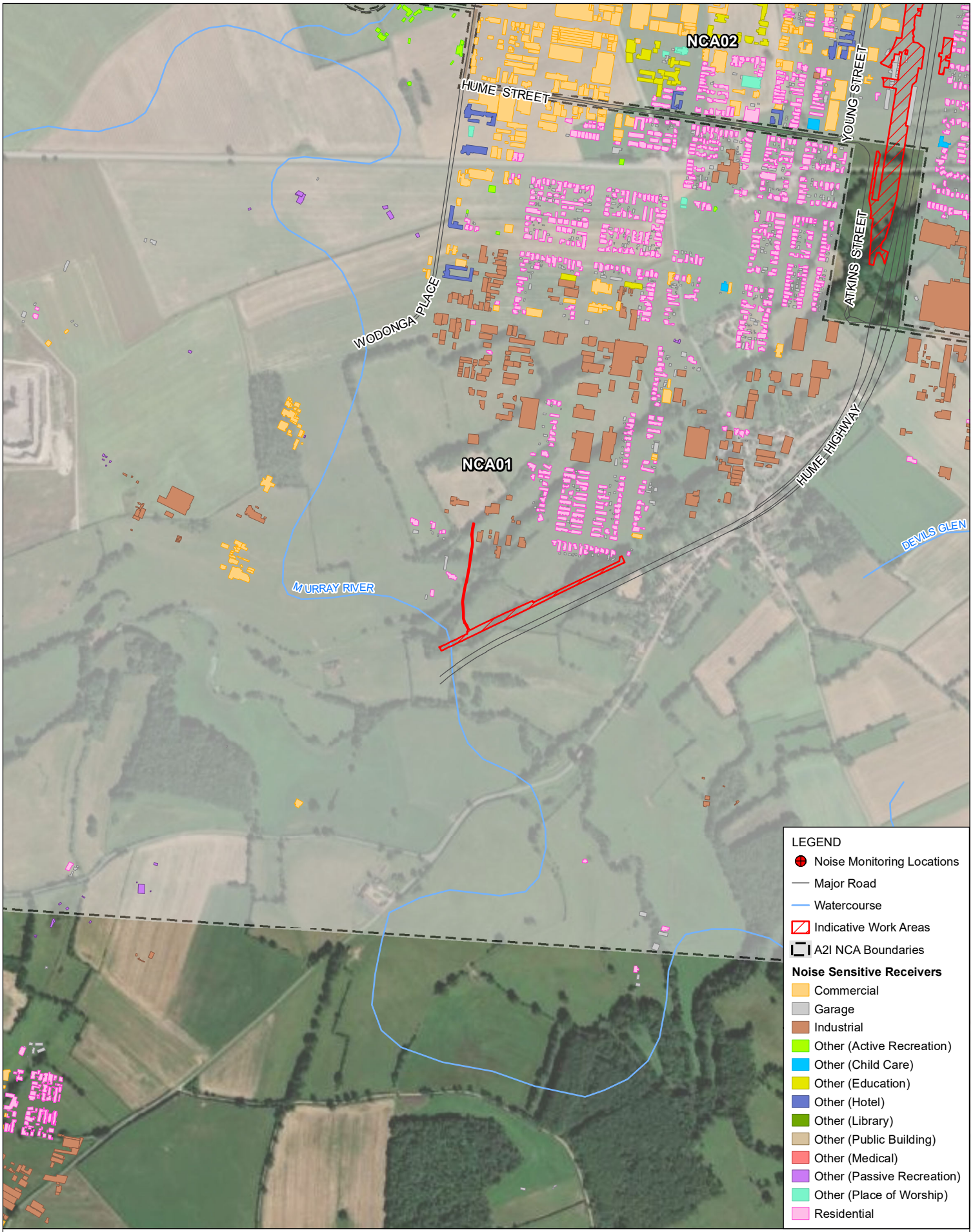
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APPENDIX C

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APPENDIX D

Land use and NCAs mapping

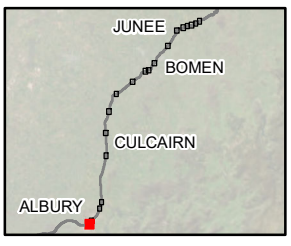


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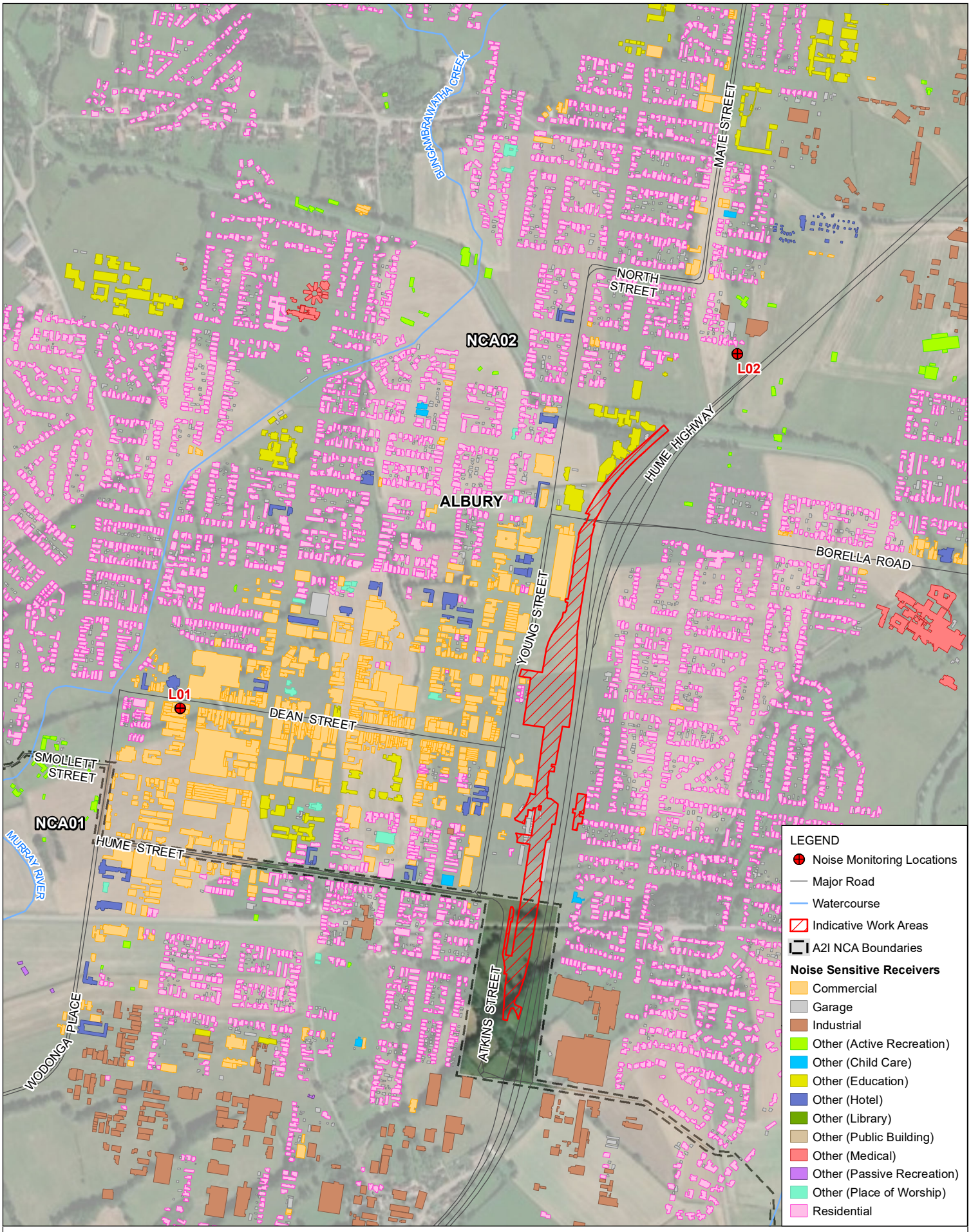


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 1 of 19

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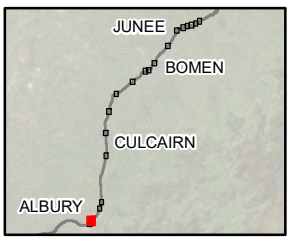


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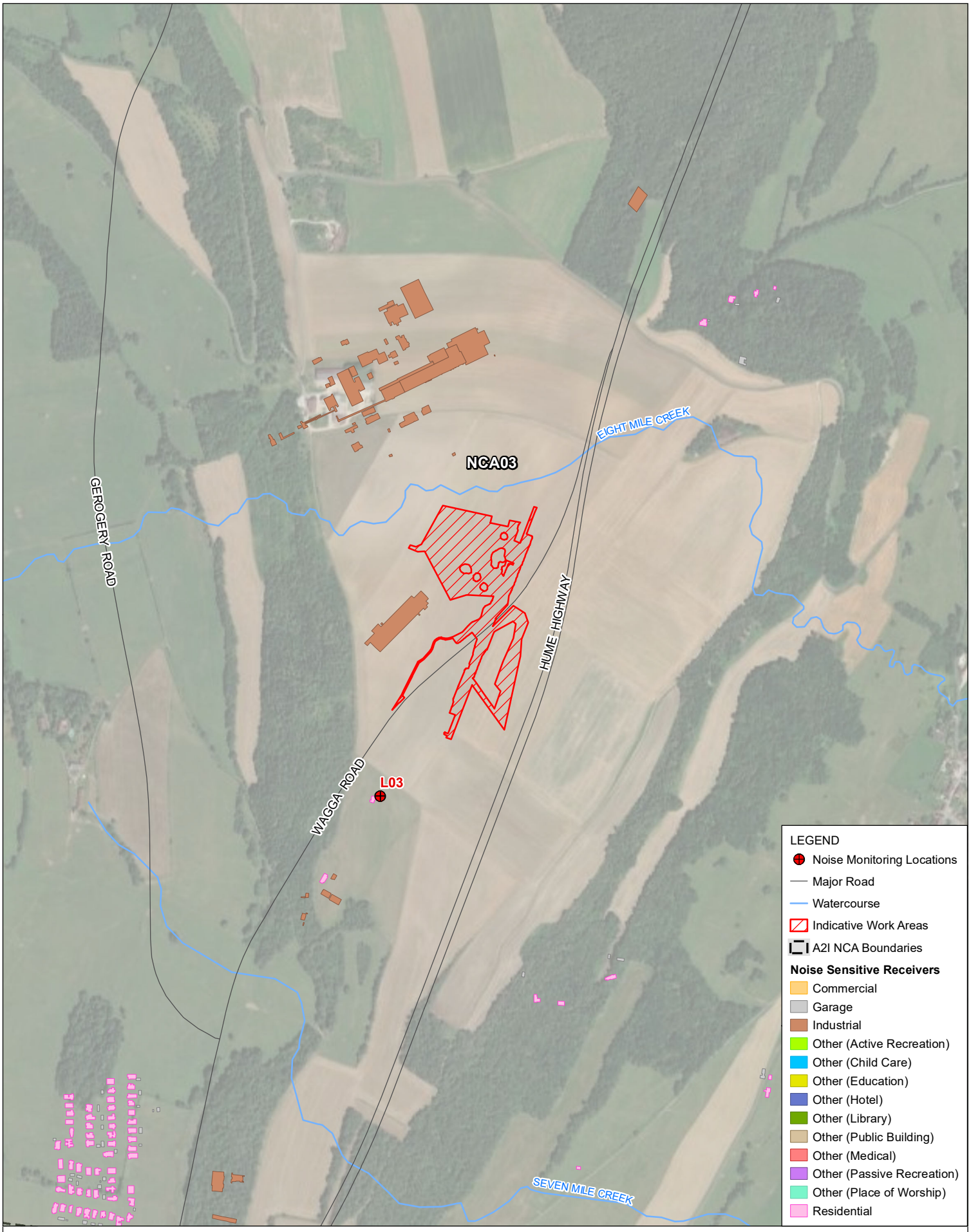


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 2 of 19

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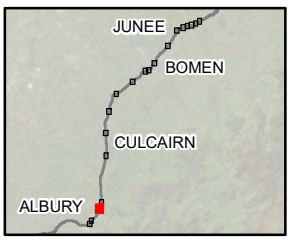


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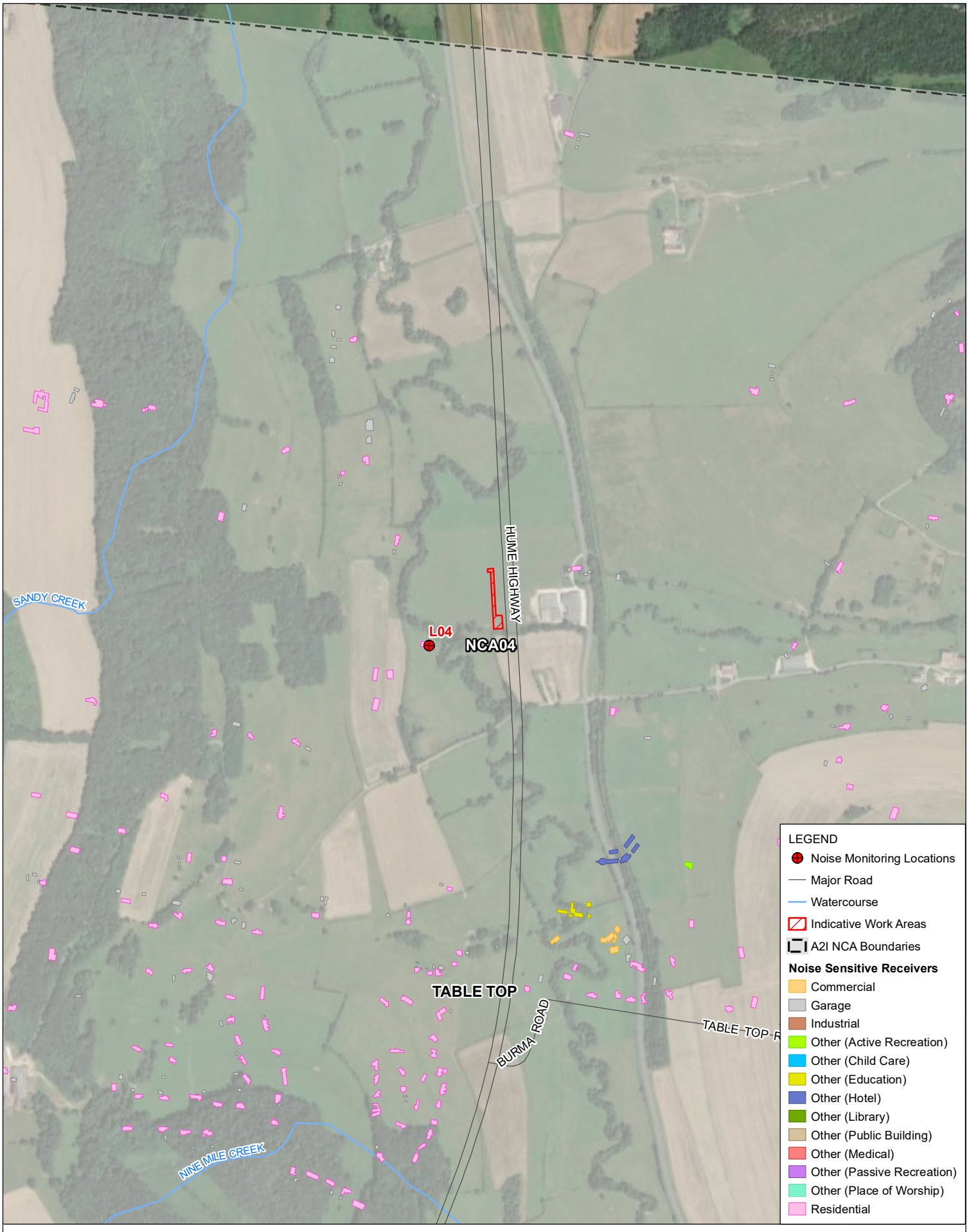


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 3 of 19

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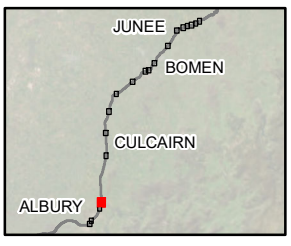


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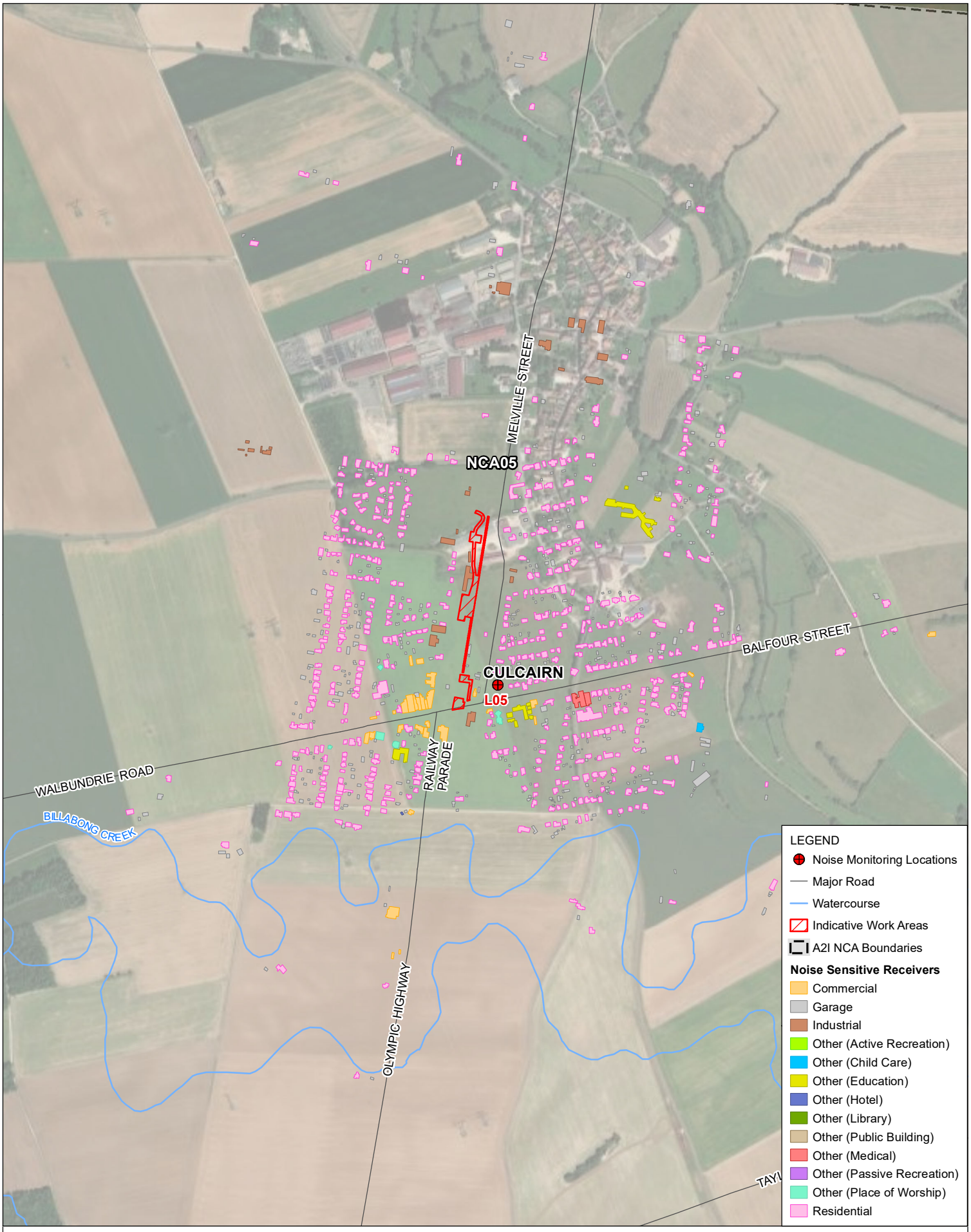


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 4 of 19

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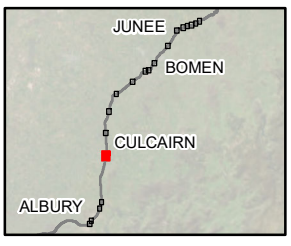


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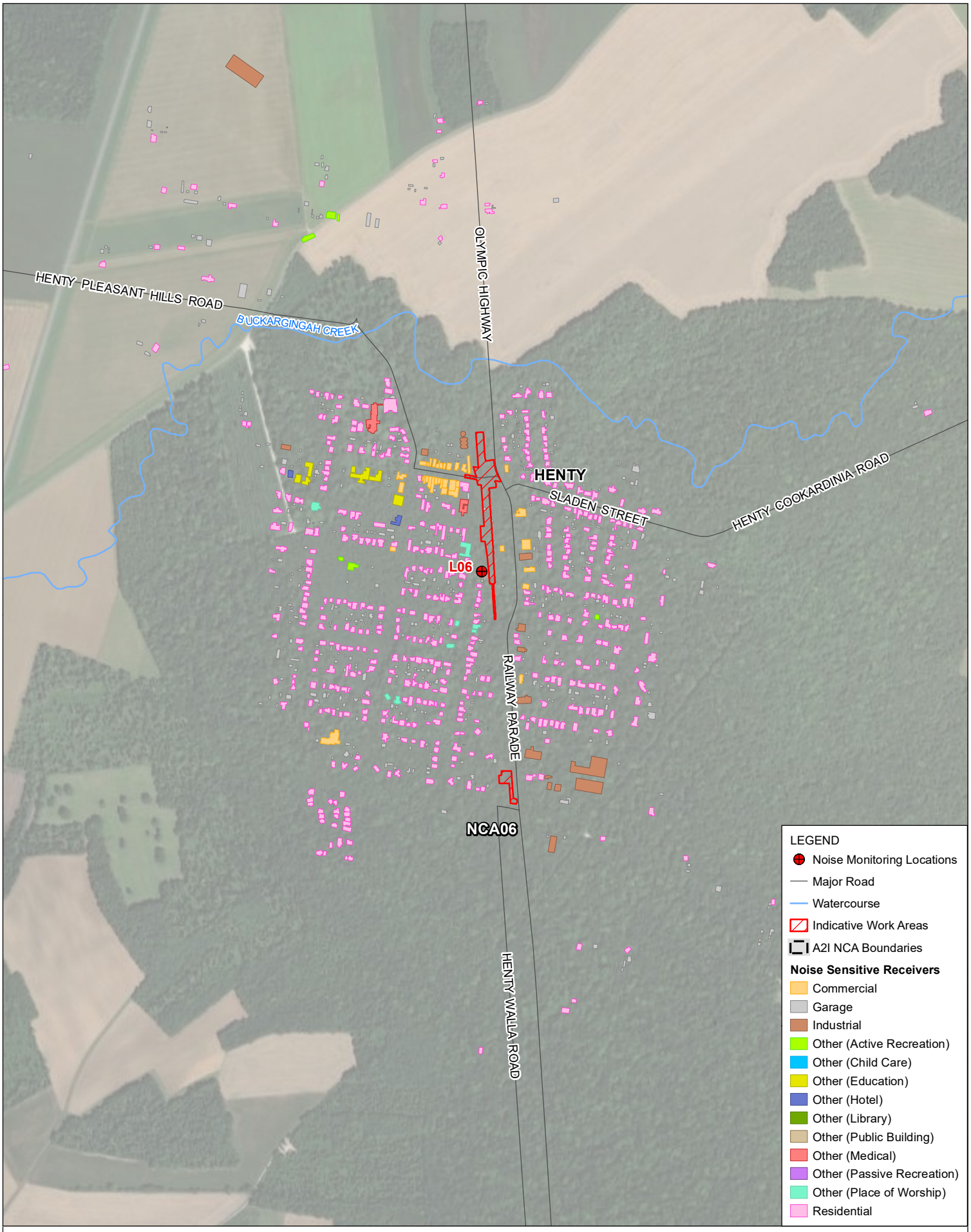


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 5 of 19

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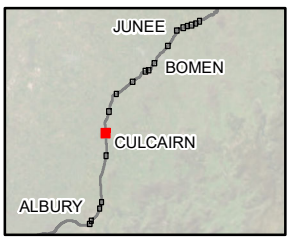


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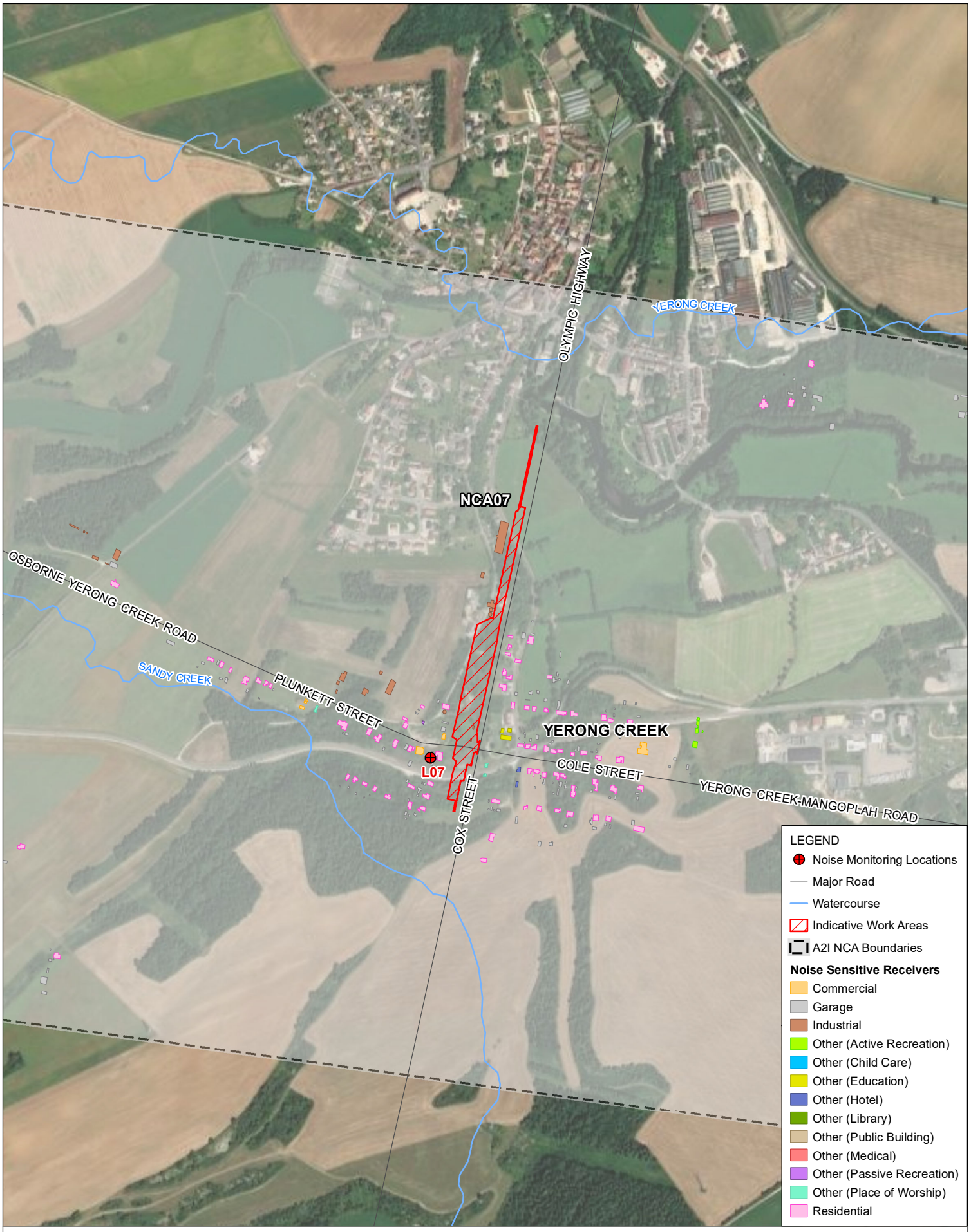


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 6 of 19

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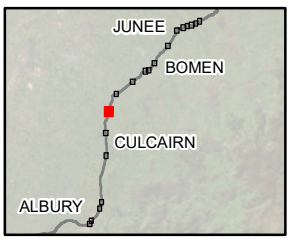


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Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:15,000 at A4
Project Number:	610.031317
Date:	19-Sep-2025
Drawn by:	JG
Reviewed by:	AS/SL

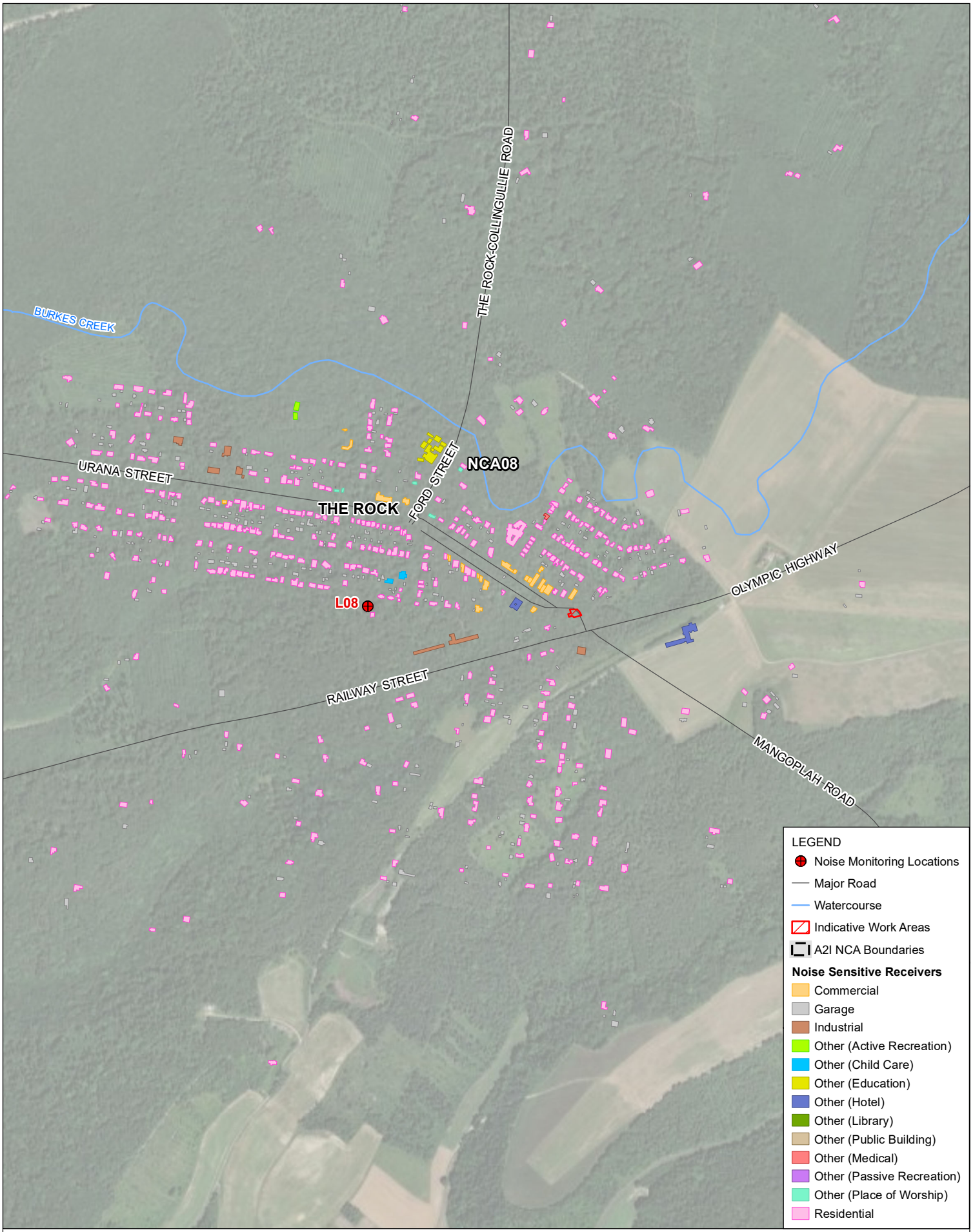


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 7 of 19

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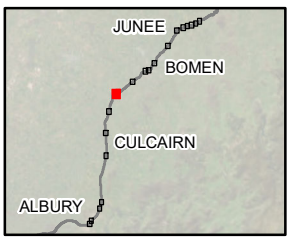


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Reviewed by:	AS/SL

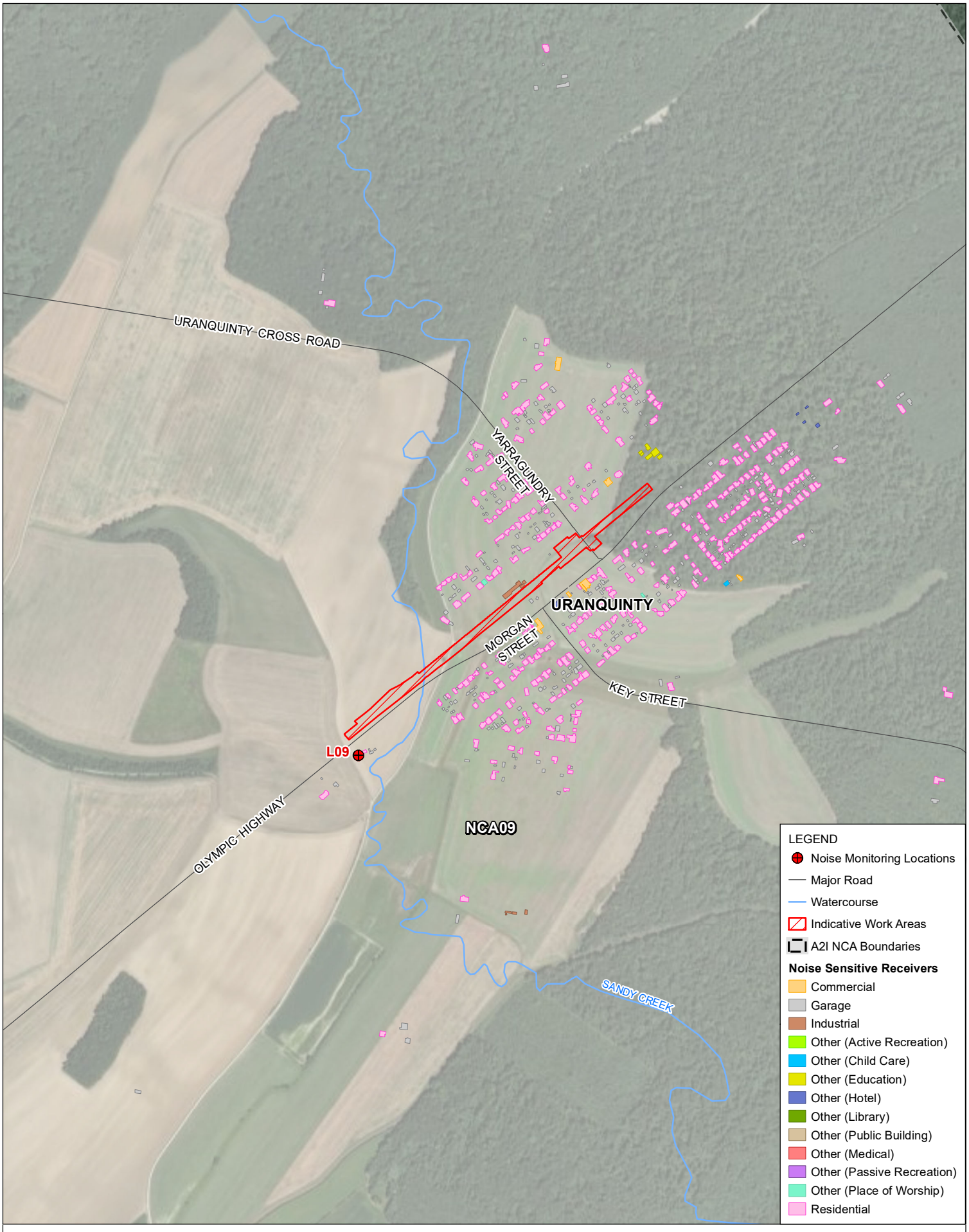


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 8 of 19

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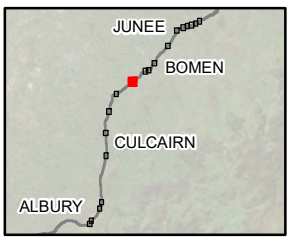


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Coordinate System:	GDA2020 MGA Zone 55
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Reviewed by:	AS/SL

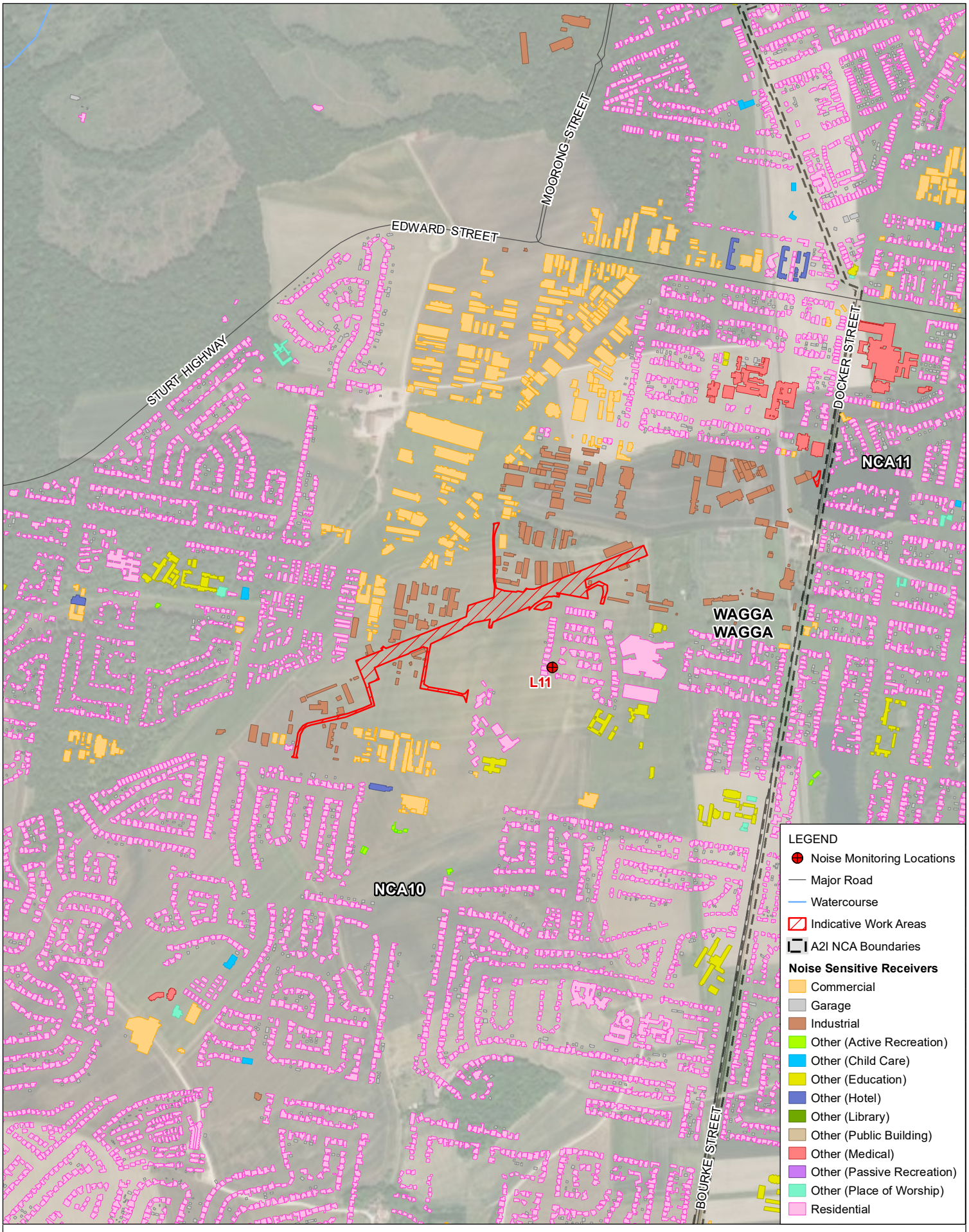


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 9 of 19

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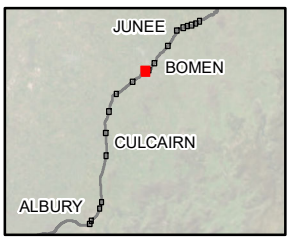


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Coordinate System:	GDA2020 MGA Zone 55
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Reviewed by:	AS/SL

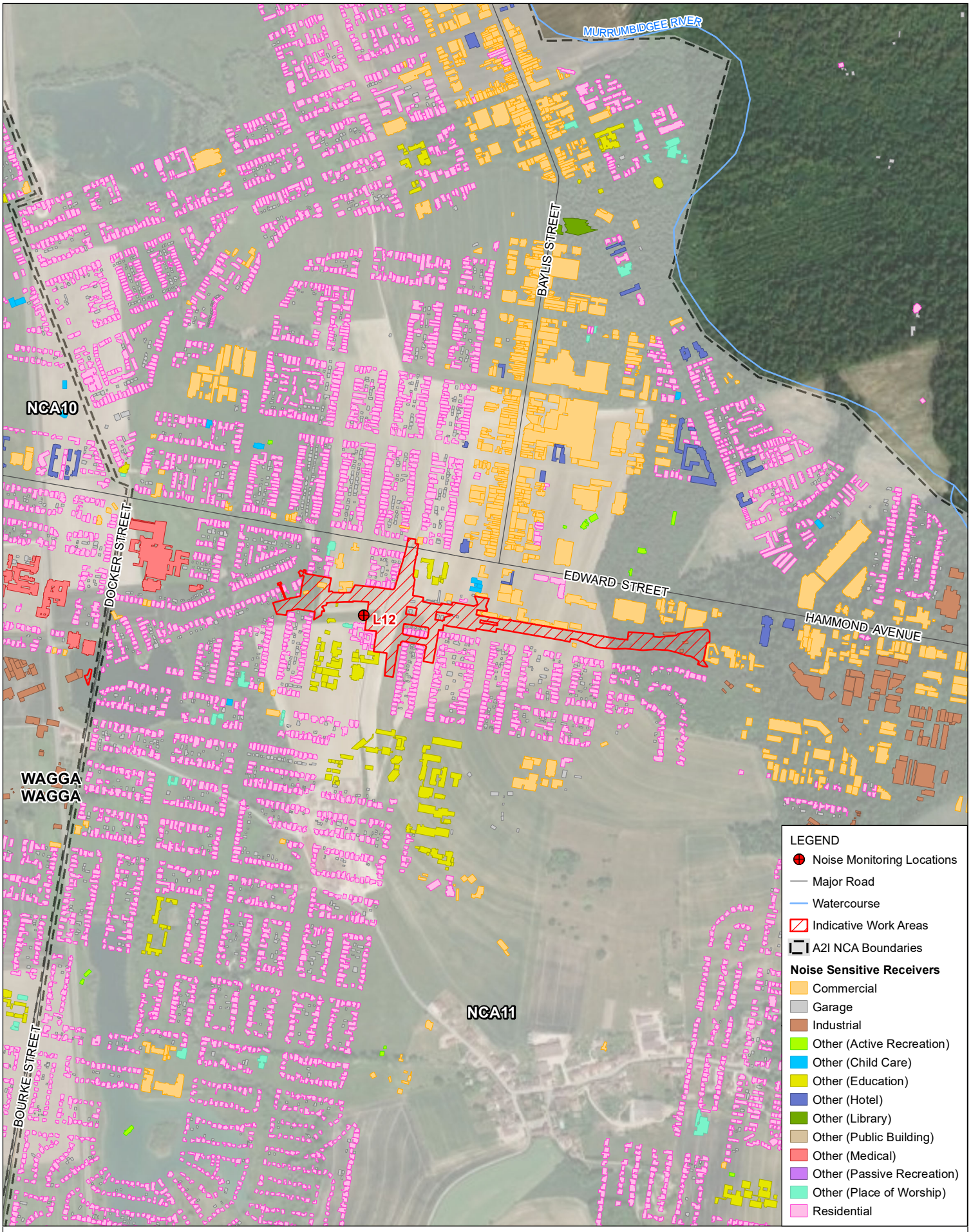


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 10 of 19

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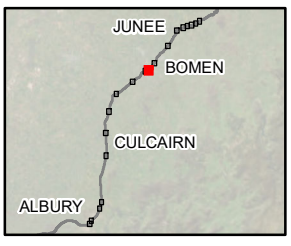


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Coordinate System:	GDA2020 MGA Zone 55
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Reviewed by:	AS/SL

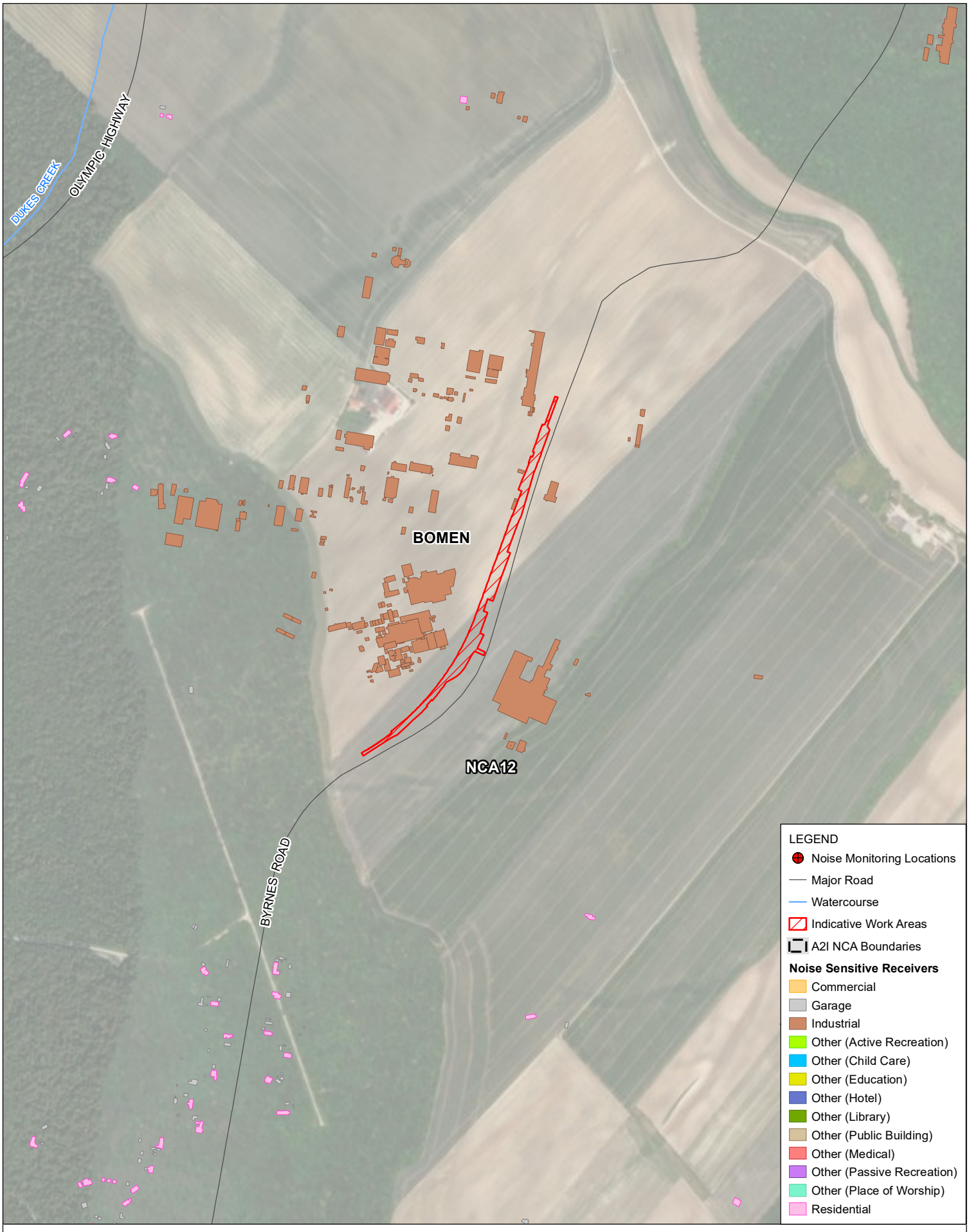


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 11 of 19

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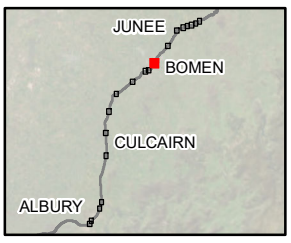


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Coordinate System:	GDA2020 MGA Zone 55
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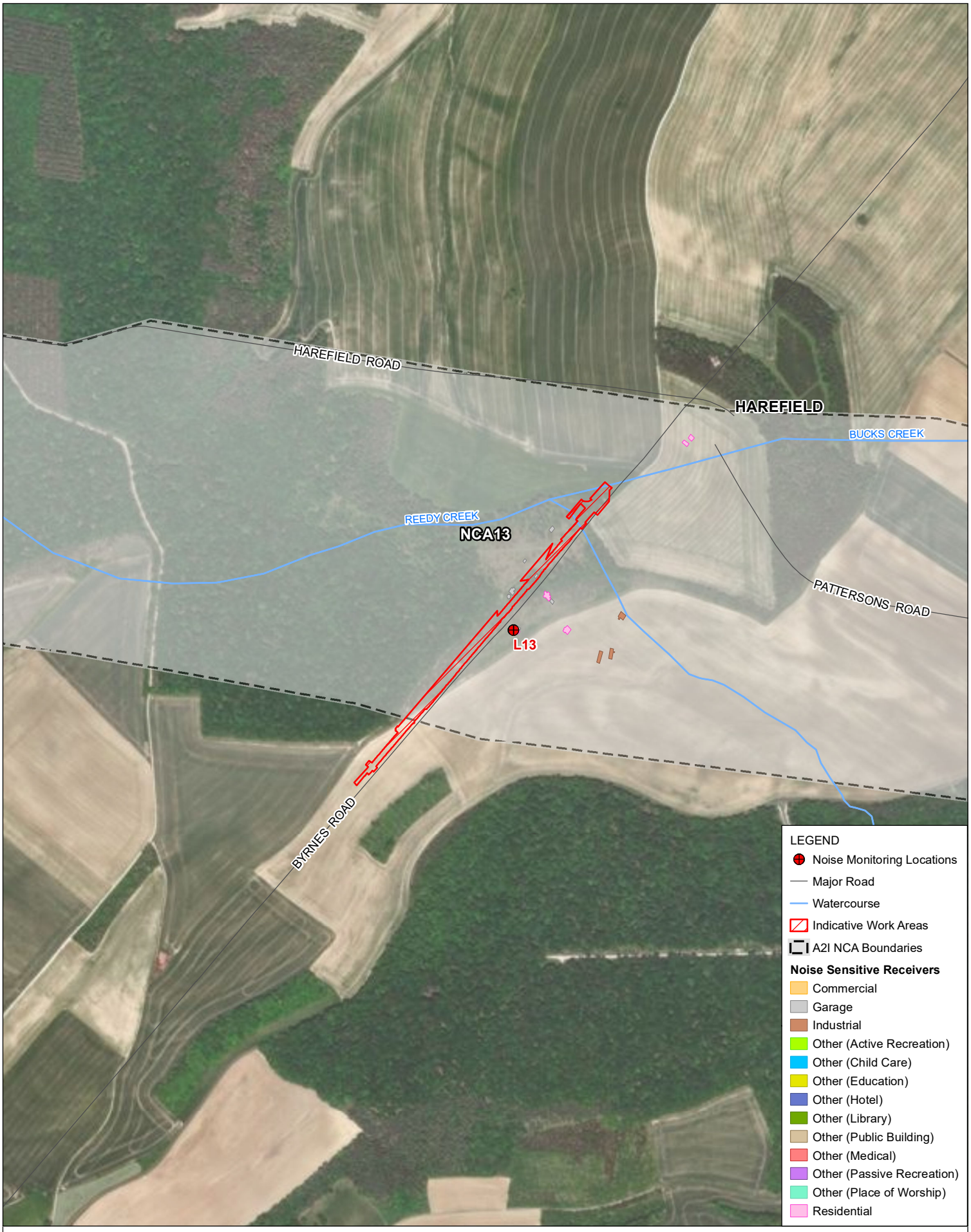


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 12 of 19

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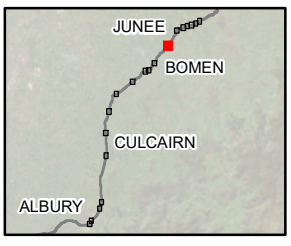


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Coordinate System:	GDA2020 MGA Zone 55
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Reviewed by:	AS/SL

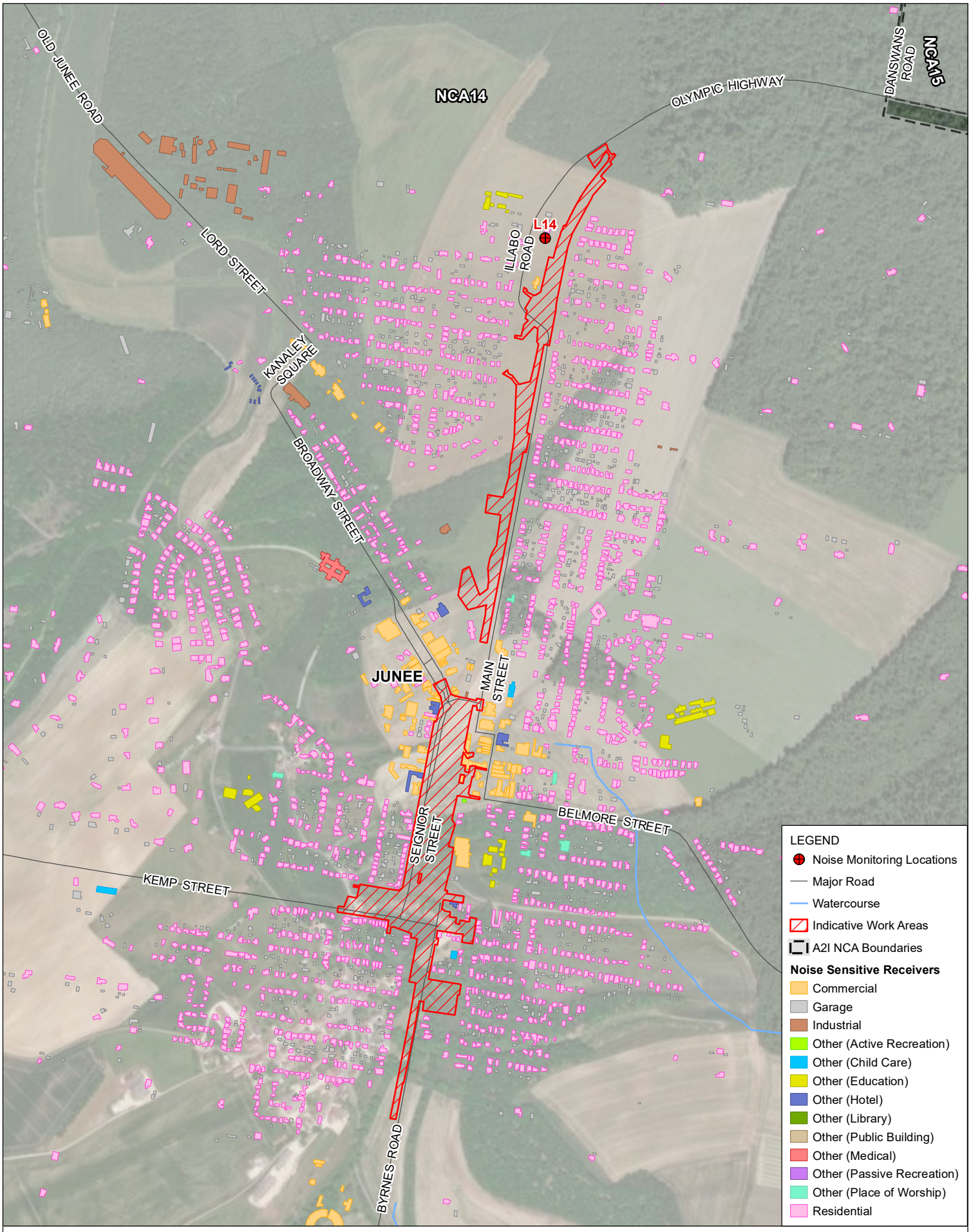


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 13 of 19

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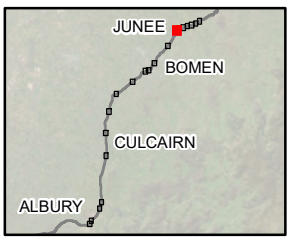


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0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
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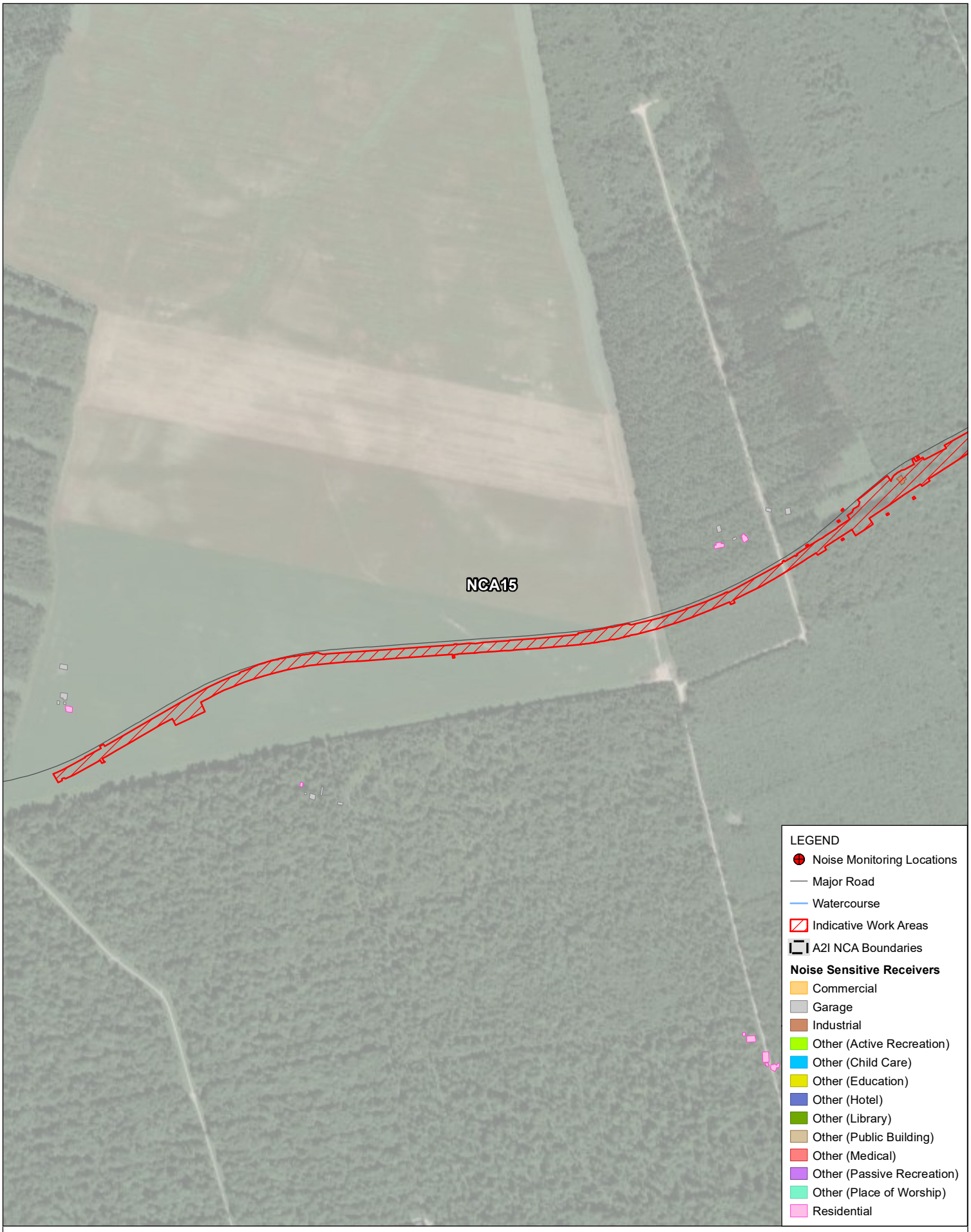


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 14 of 19

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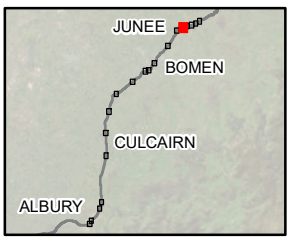


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0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
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Date:	19-Sep-2025
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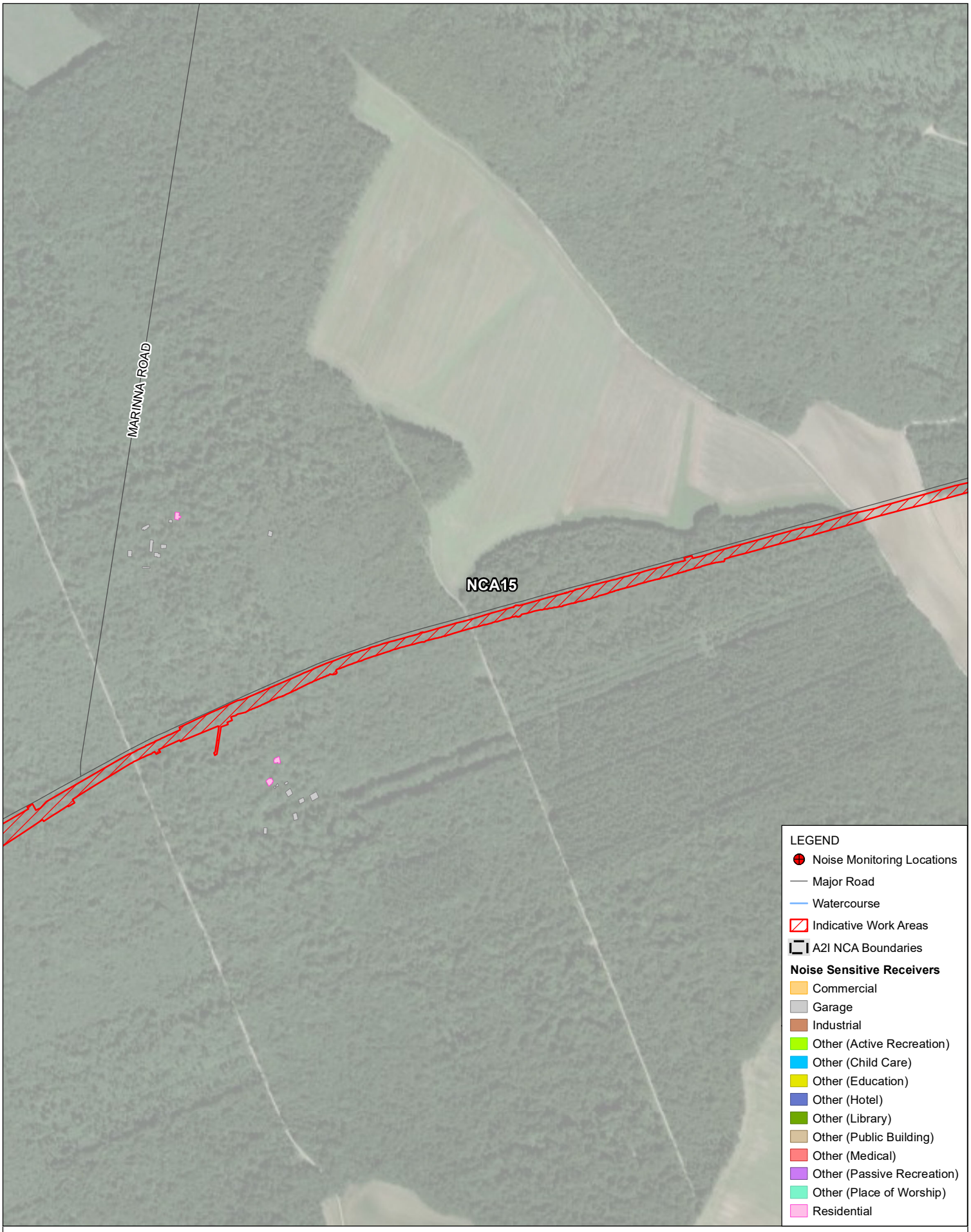


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 15 of 19

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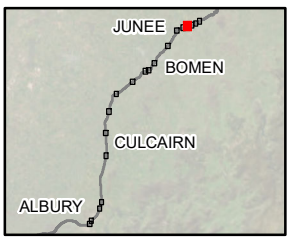


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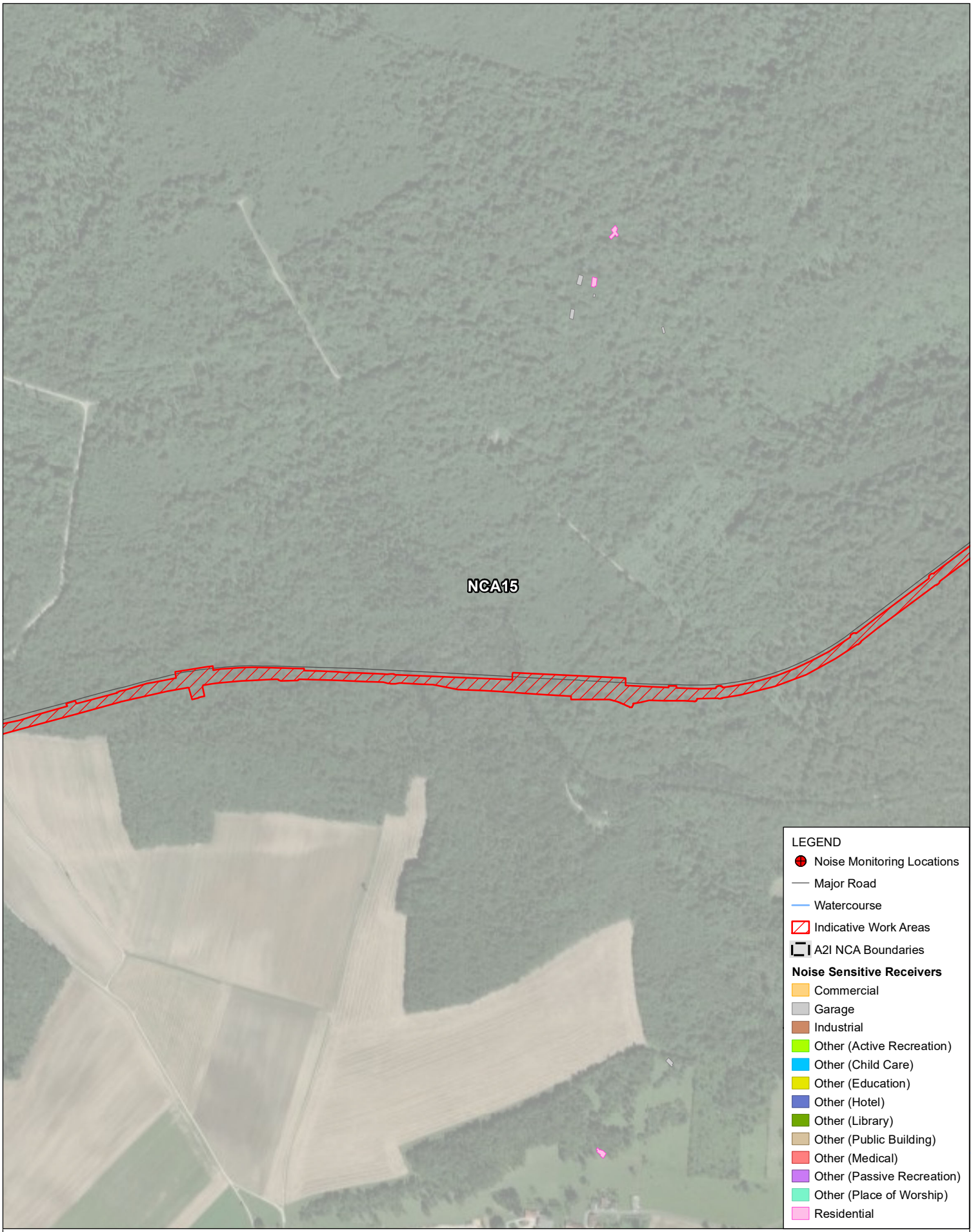


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 16 of 19

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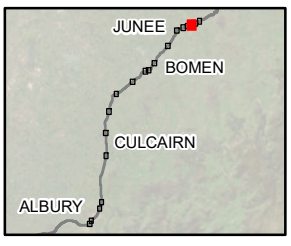


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Reviewed by:	AS/SL

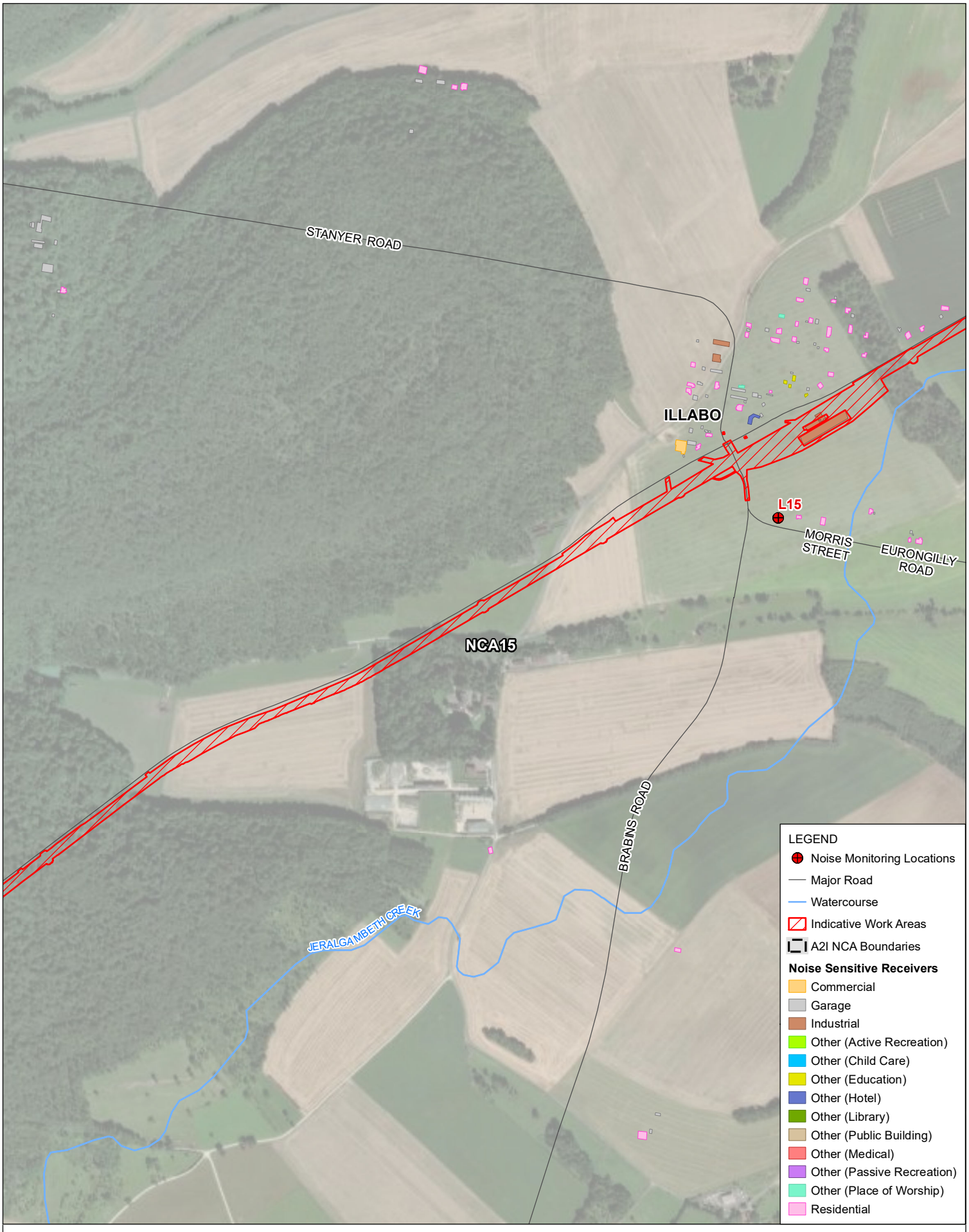


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 17 of 19

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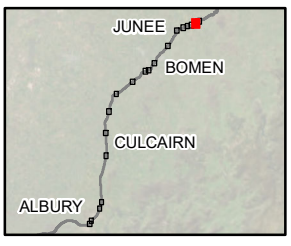


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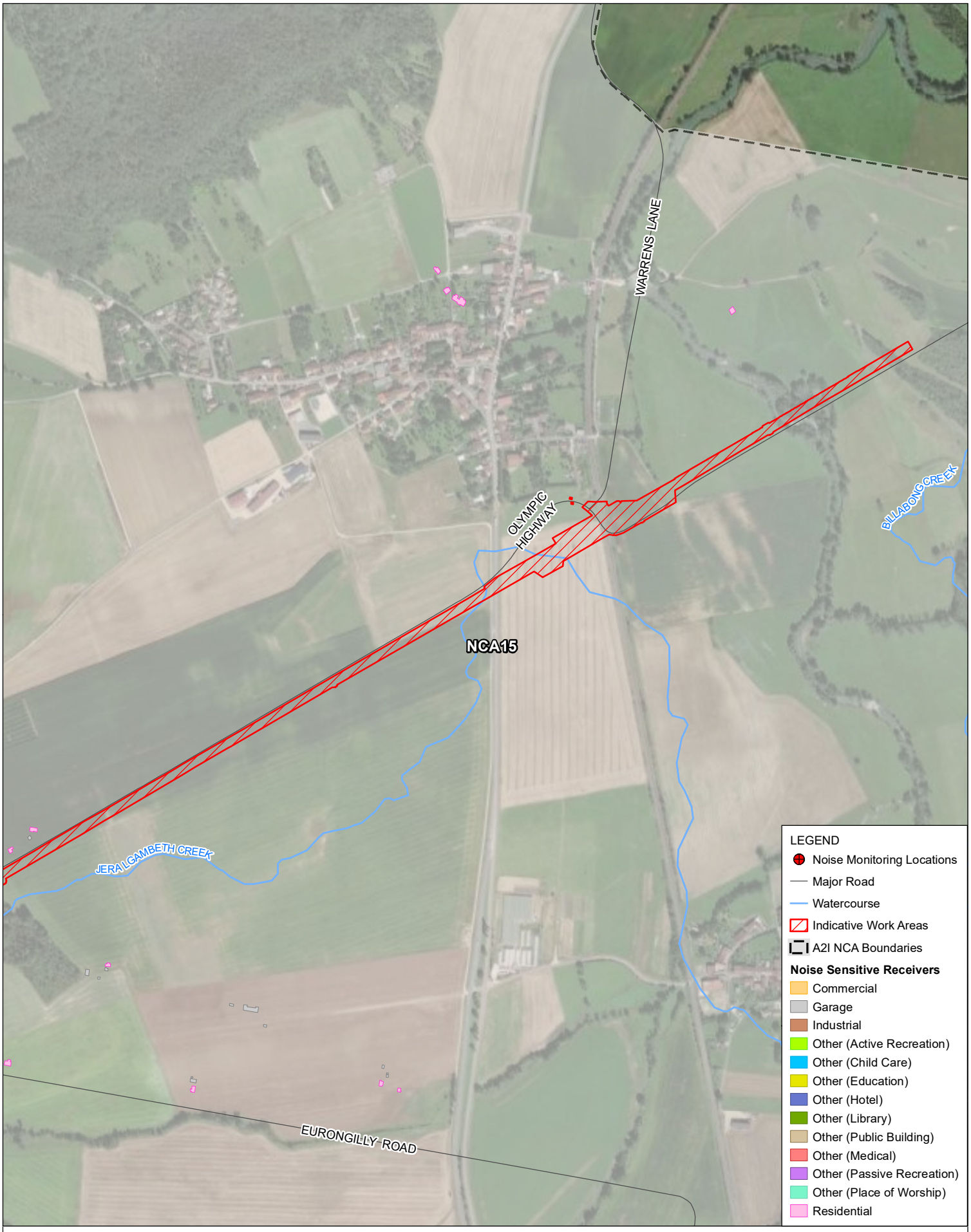


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

CNVMP

APPENDIX D - Map 18 of 19

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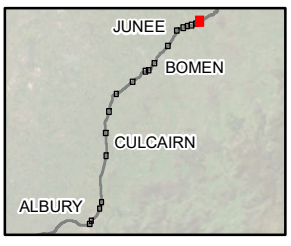


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Drawn by:	JG
Reviewed by:	AS/SL



INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

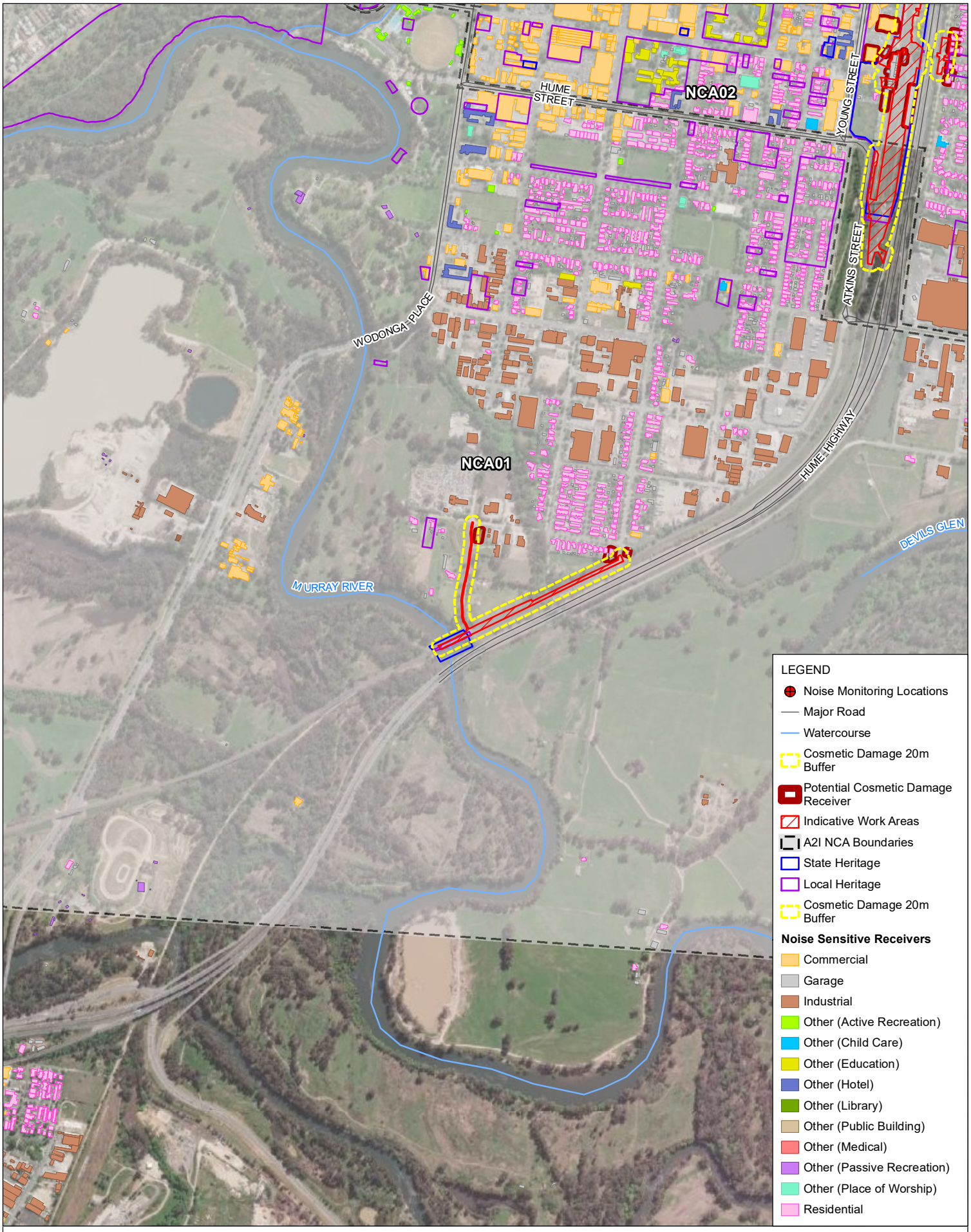
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APPENDIX D - Map 19 of 19

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APPENDIX E

Properties at risk of triggering cosmetic damage

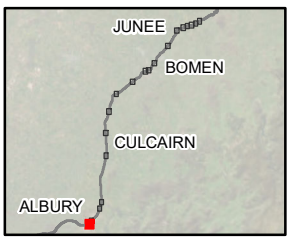


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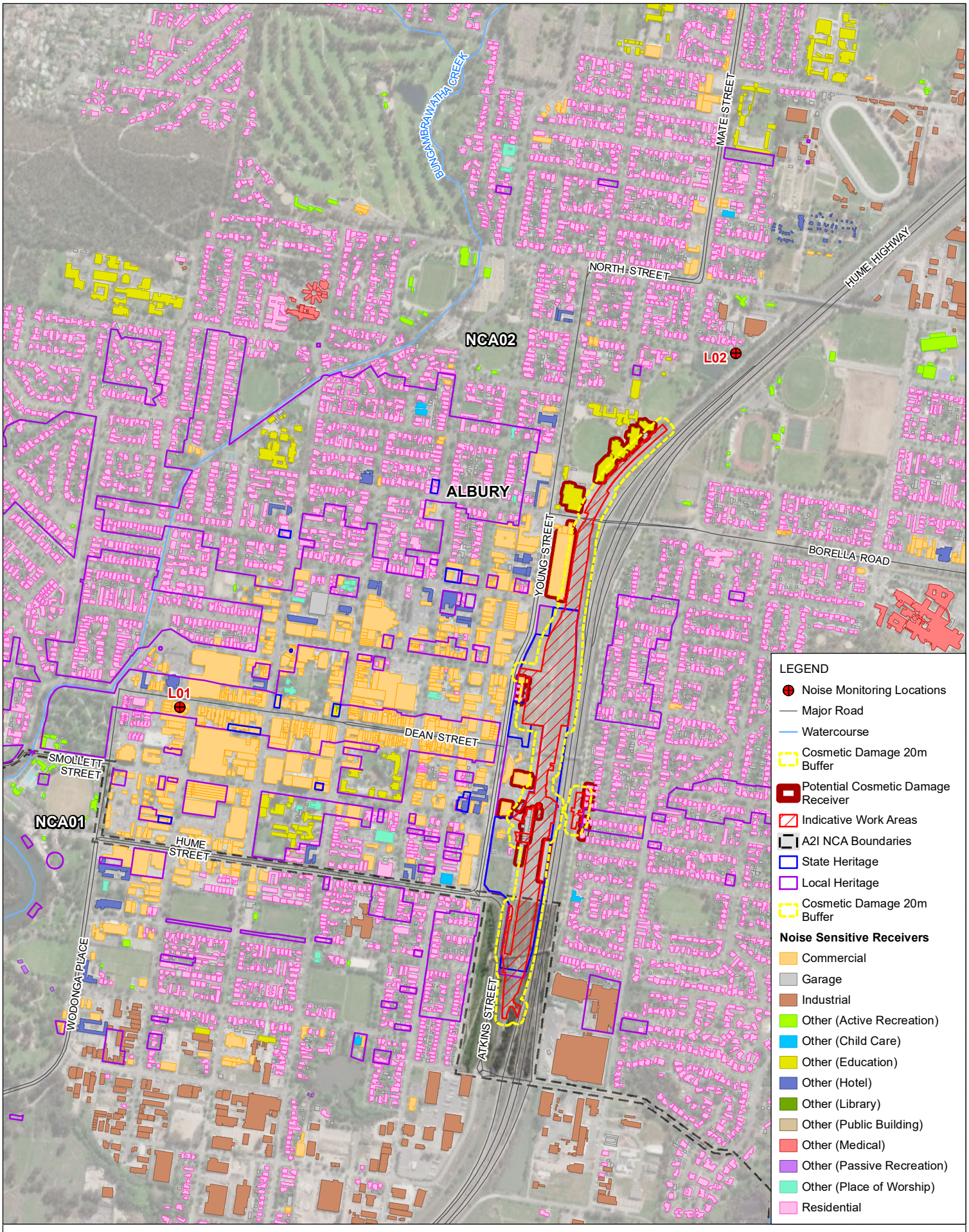


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 1 of 19

H:\Projects\SLR\610-SrvSYD\610.031317.00001 Inland Rail A2P Enhancement\06 SLR Data\01 CAD\GIS\GIS\610031317_A2I_CNVMP_Construction Vibration.mxd

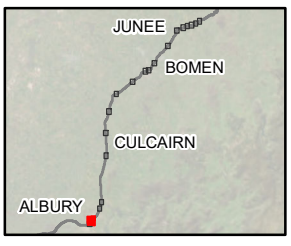


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0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
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Reviewed by:	AS/SL

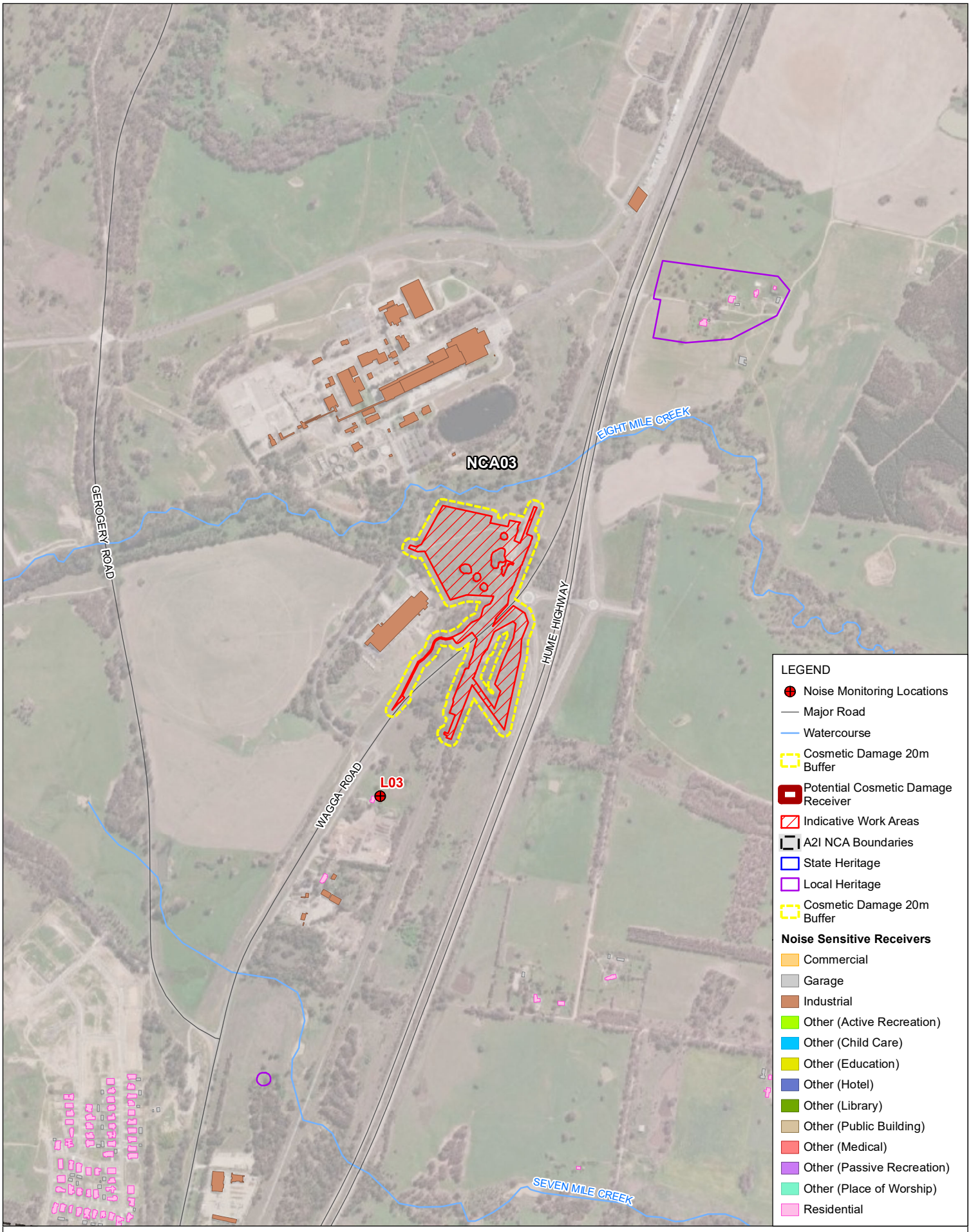


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 2 of 19

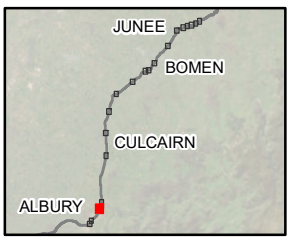
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0 250 500 m

Coordinate System:	GDA2020 MGA Zone 55
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Date:	19-Sep-2025
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Reviewed by:	AS/SL

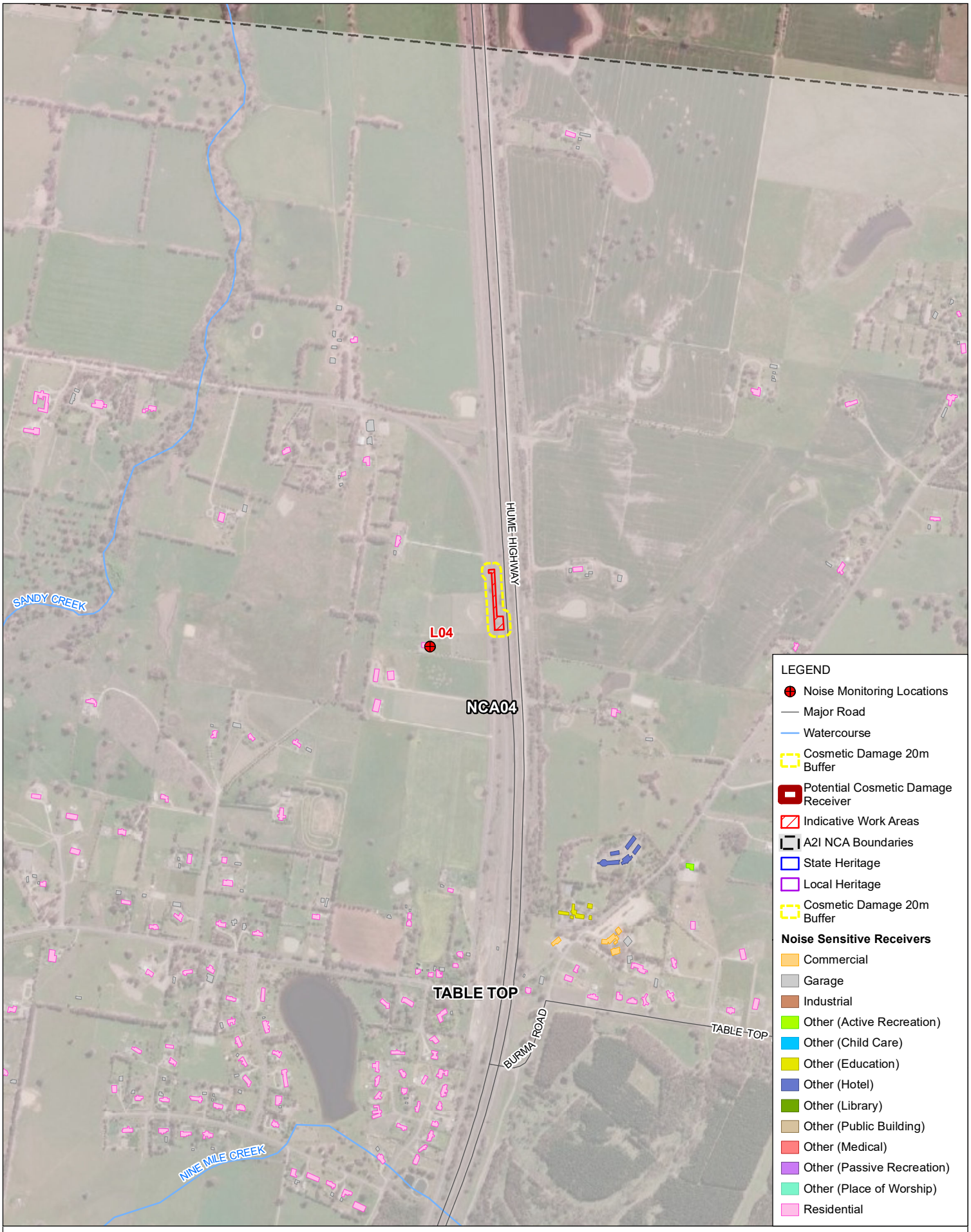


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 3 of 19

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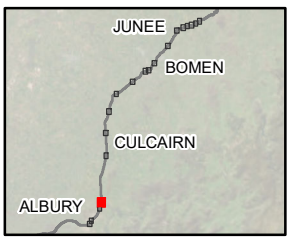


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0 250 500 m

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Project Number:	610.031317
Date:	19-Sep-2025
Drawn by:	JG
Reviewed by:	AS/SL

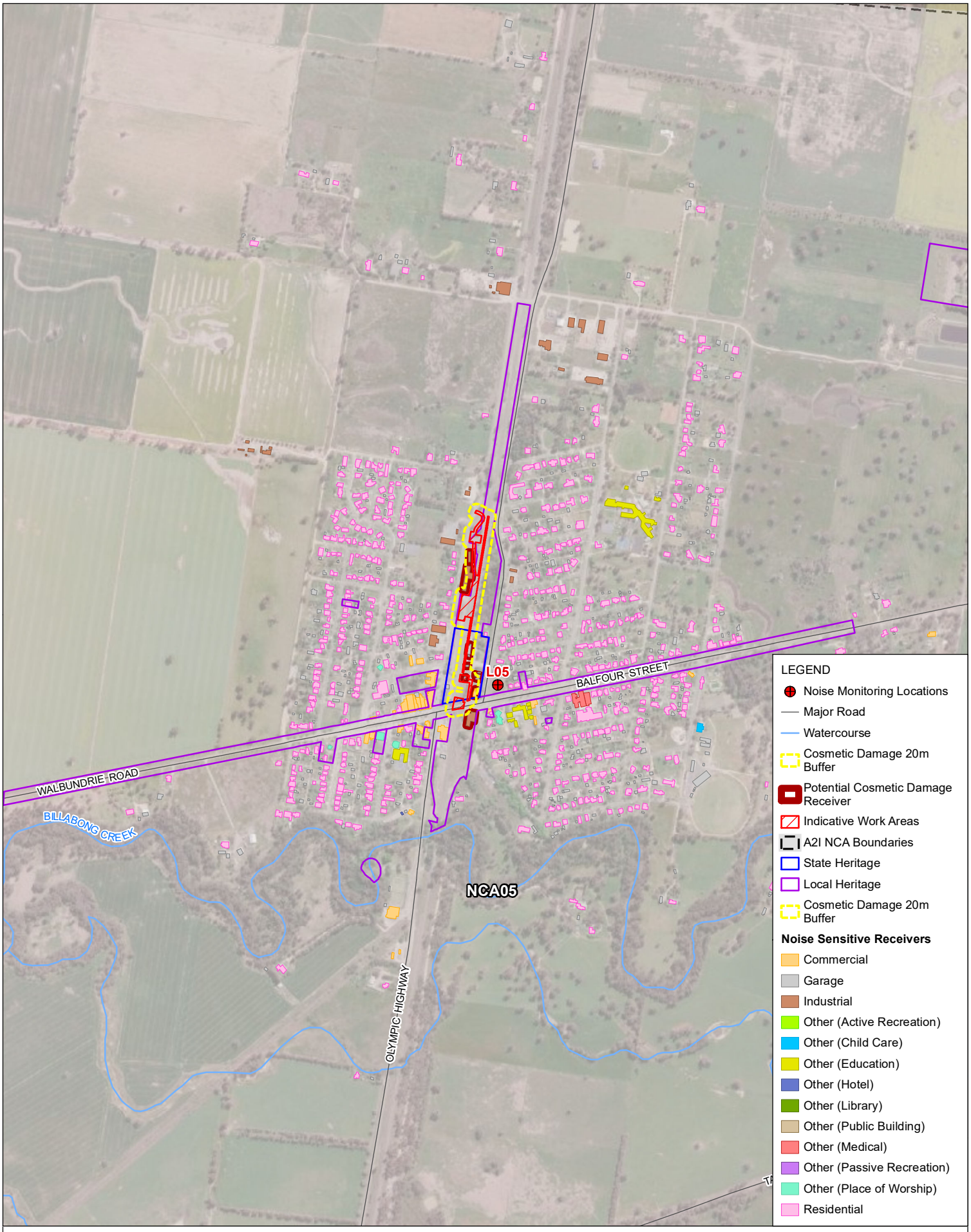


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 4 of 19

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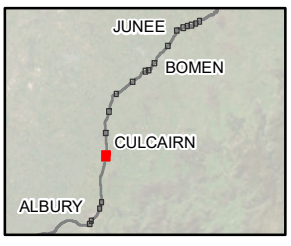


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Date:	19-Sep-2025
Drawn by:	JG
Reviewed by:	AS/SL

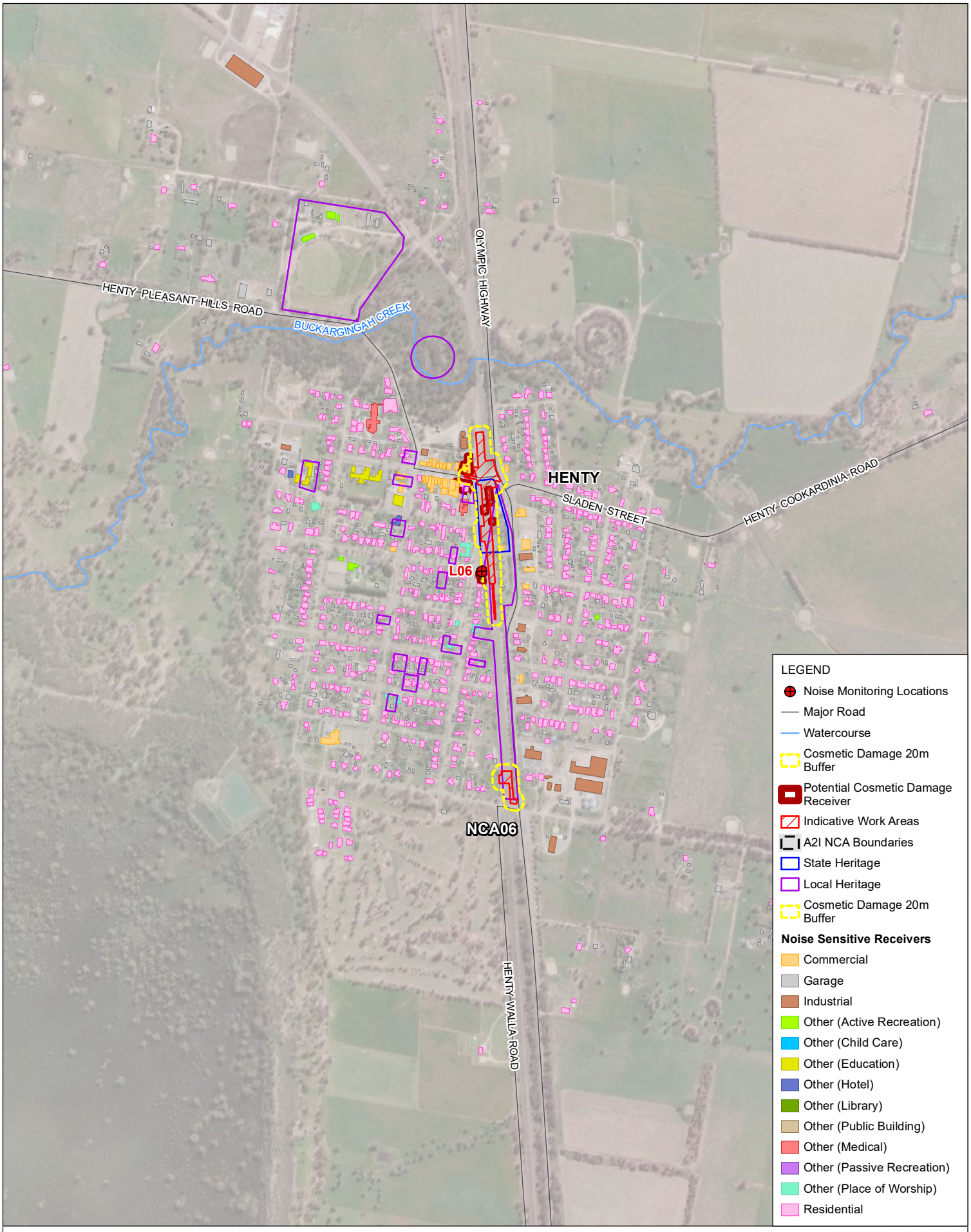


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 5 of 19

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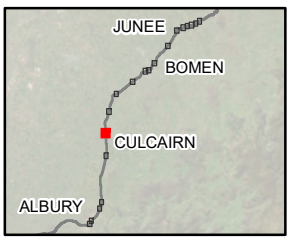


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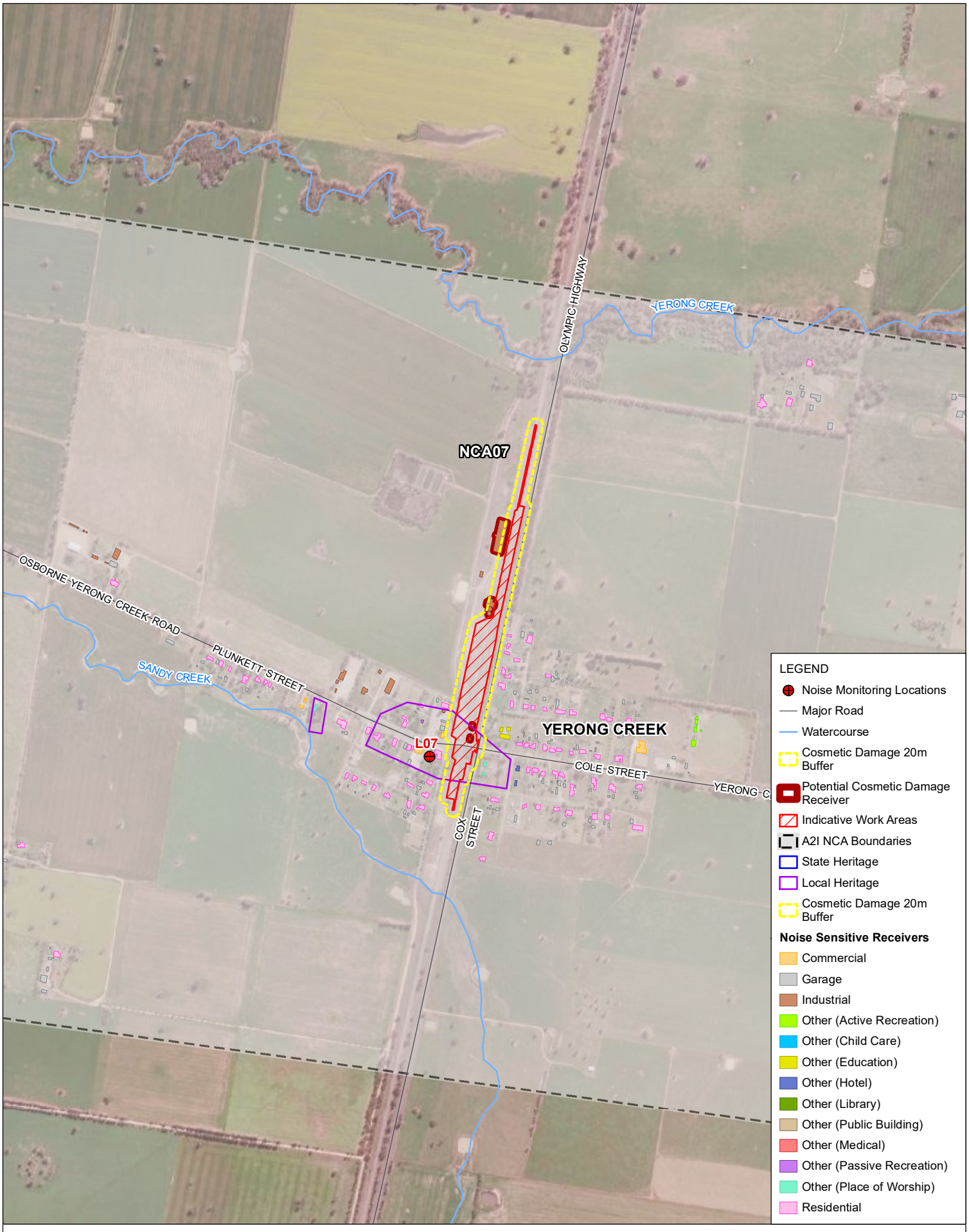


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 6 of 19

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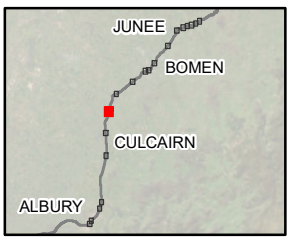


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INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 7 of 19

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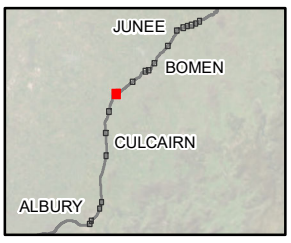


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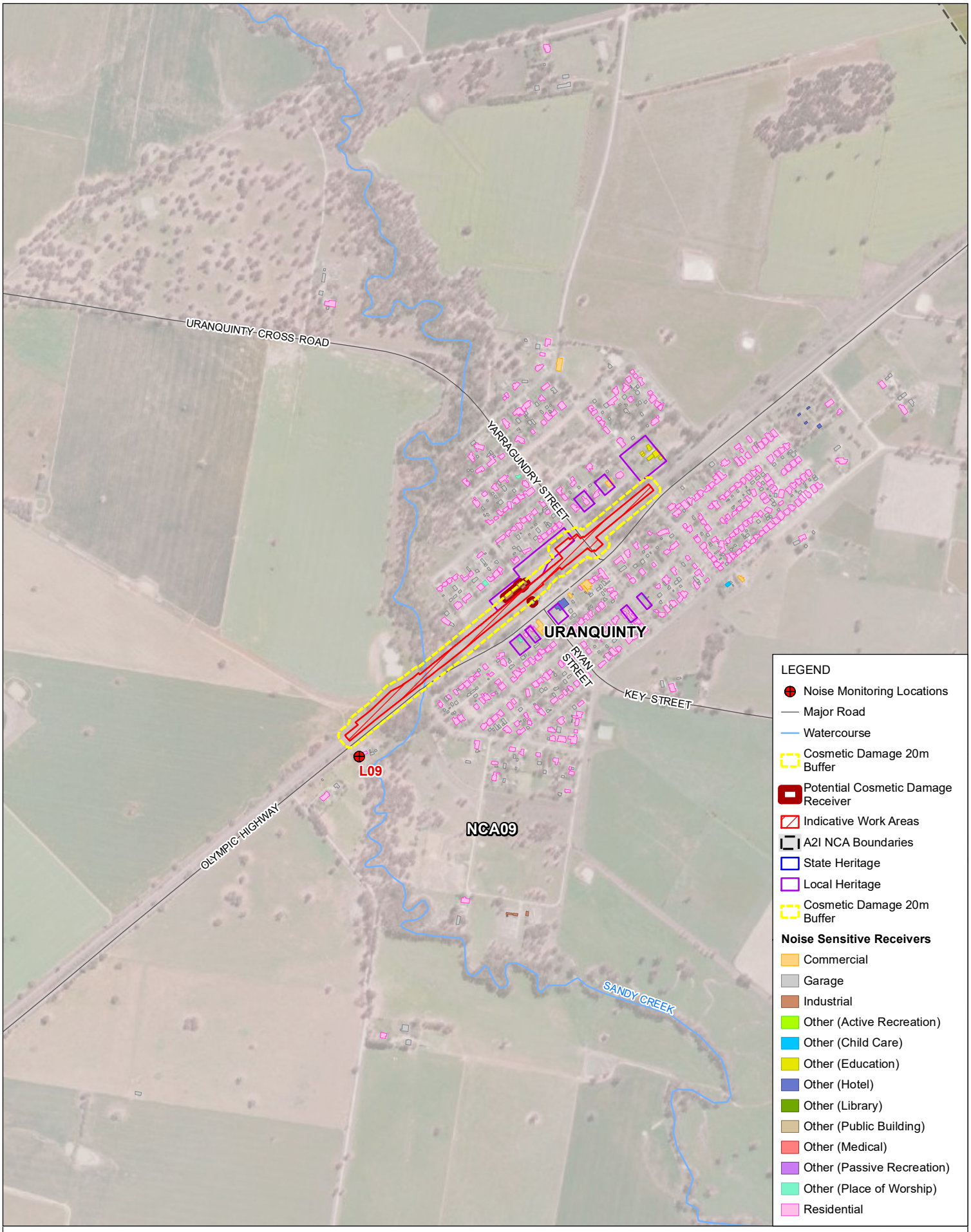


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 8 of 19

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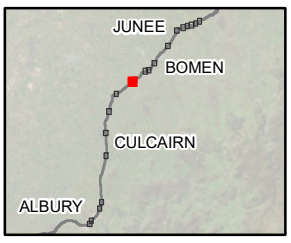


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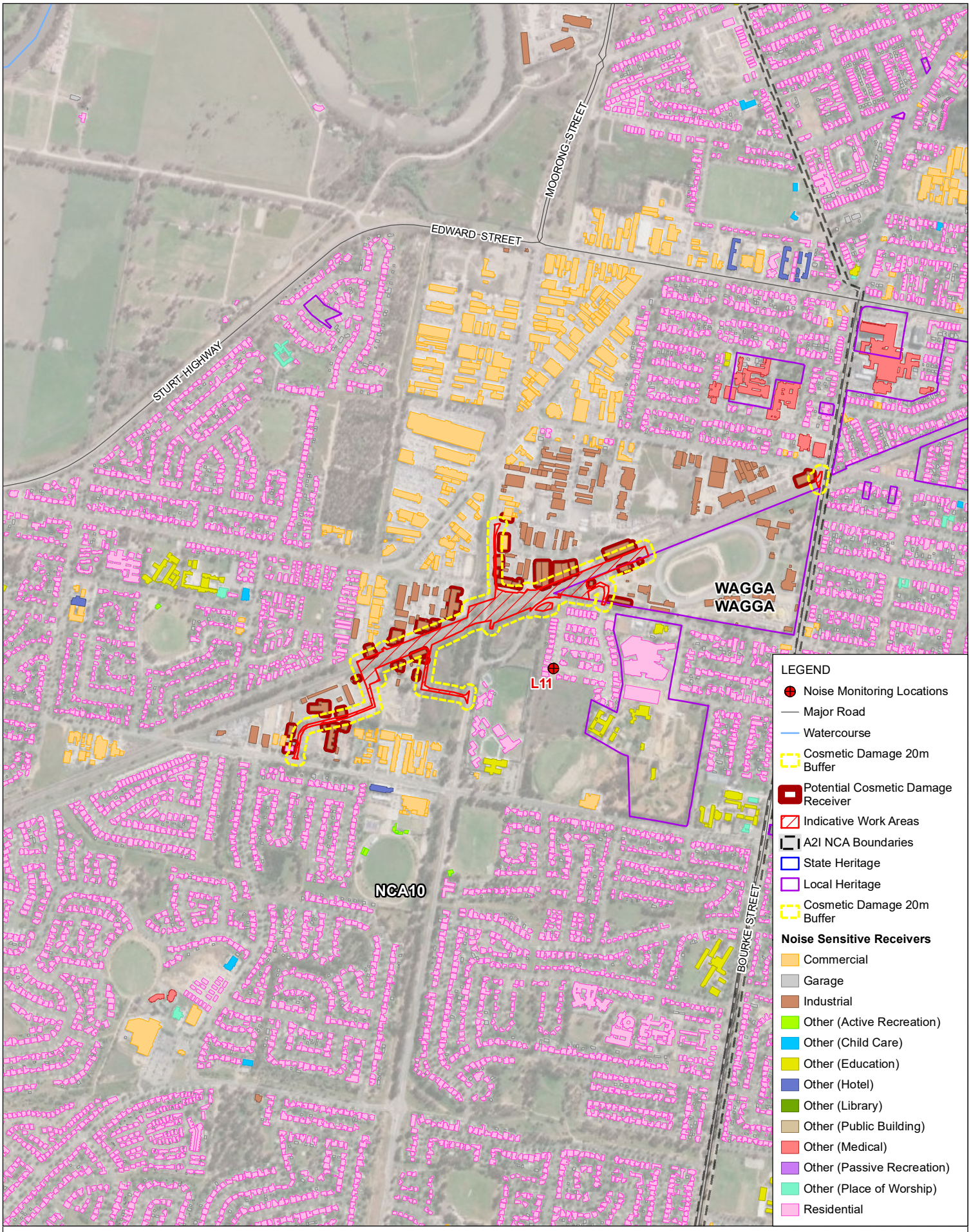


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 9 of 19

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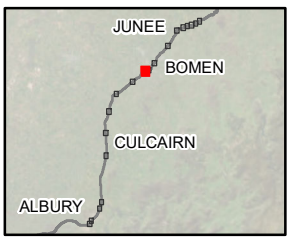


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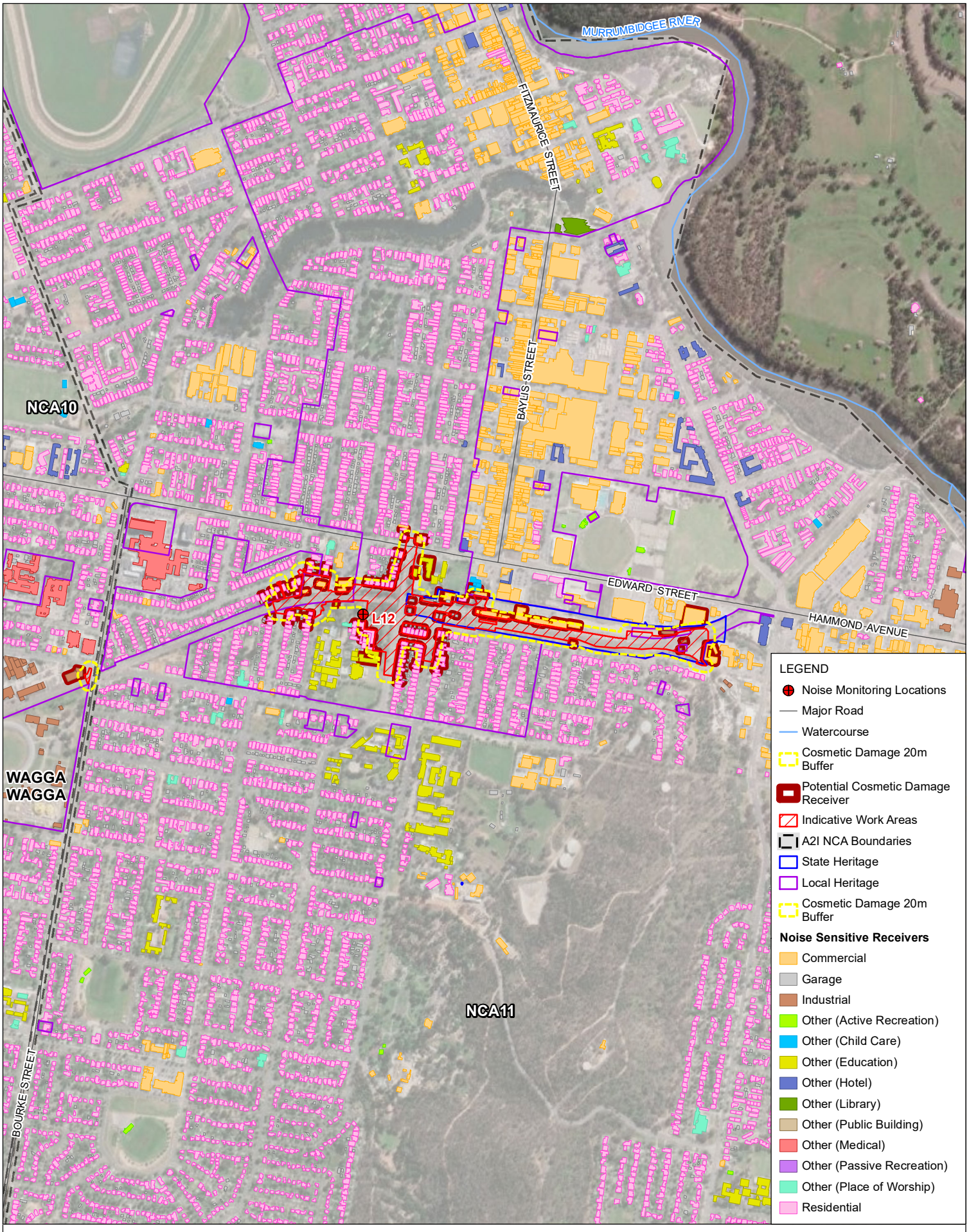


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 10 of 19

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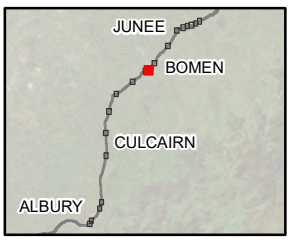


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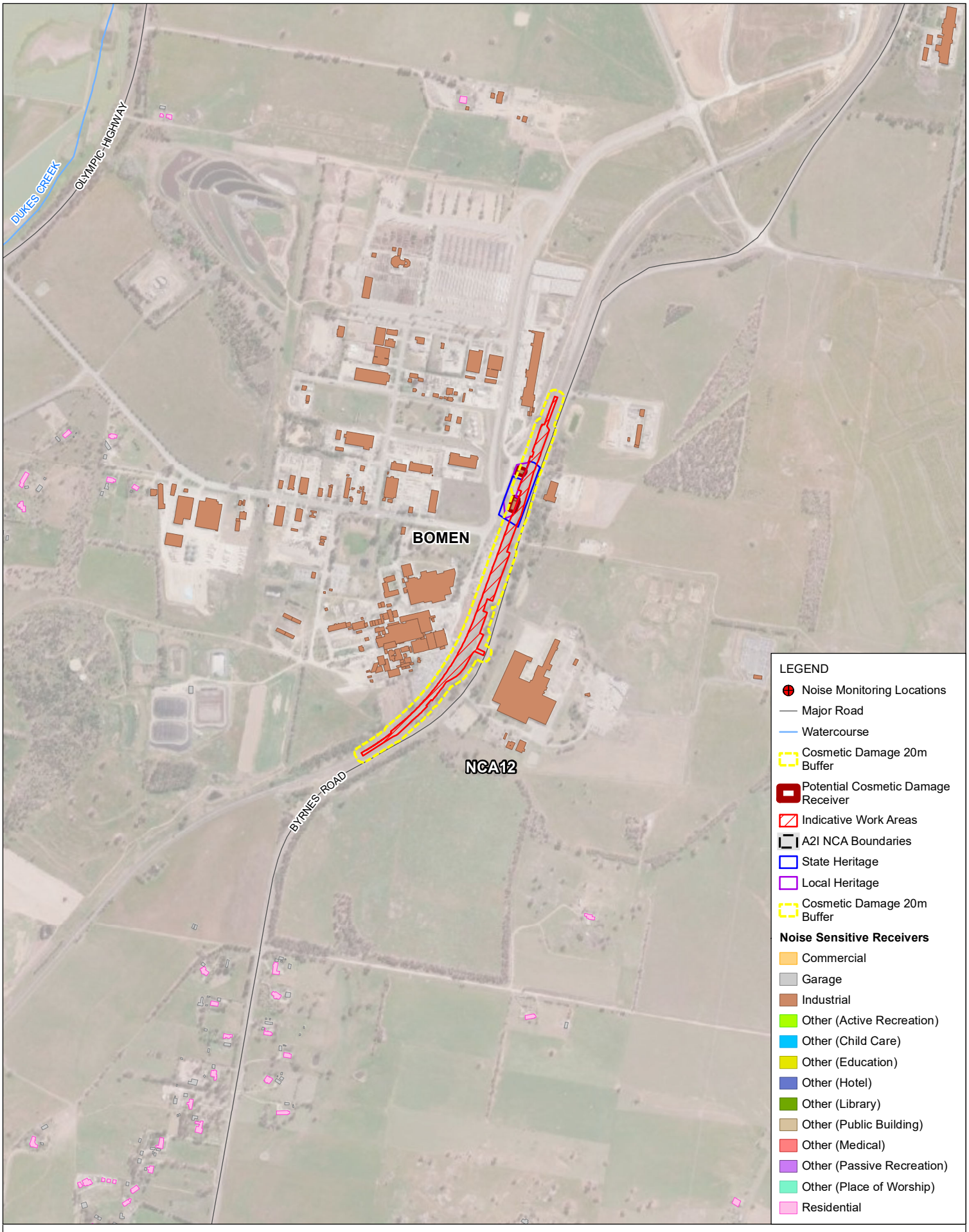


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 11 of 19

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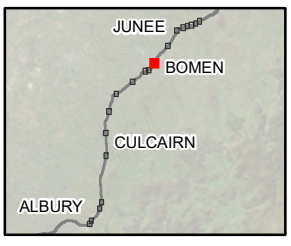


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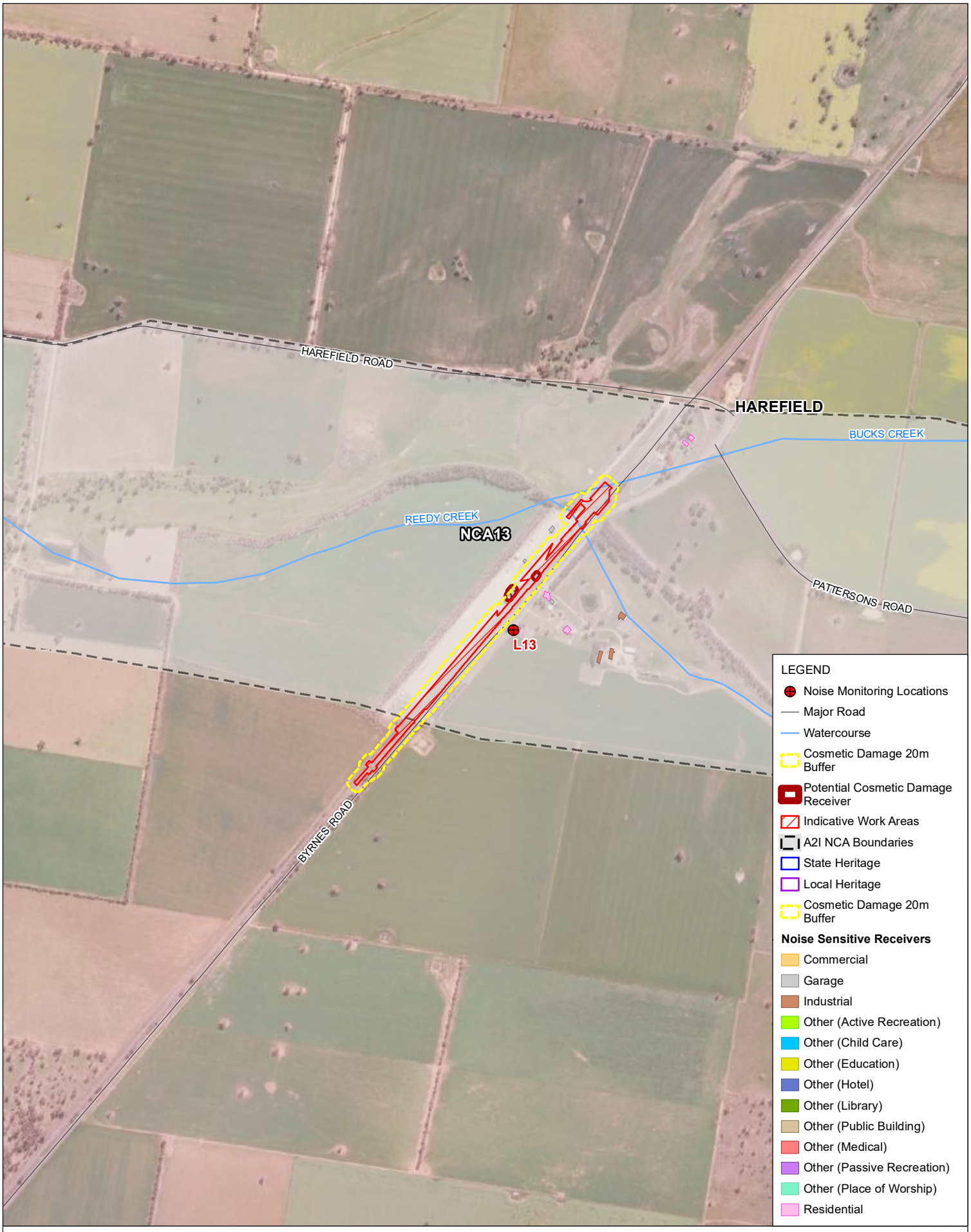


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 12 of 19

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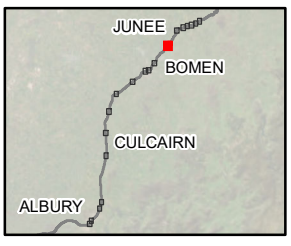


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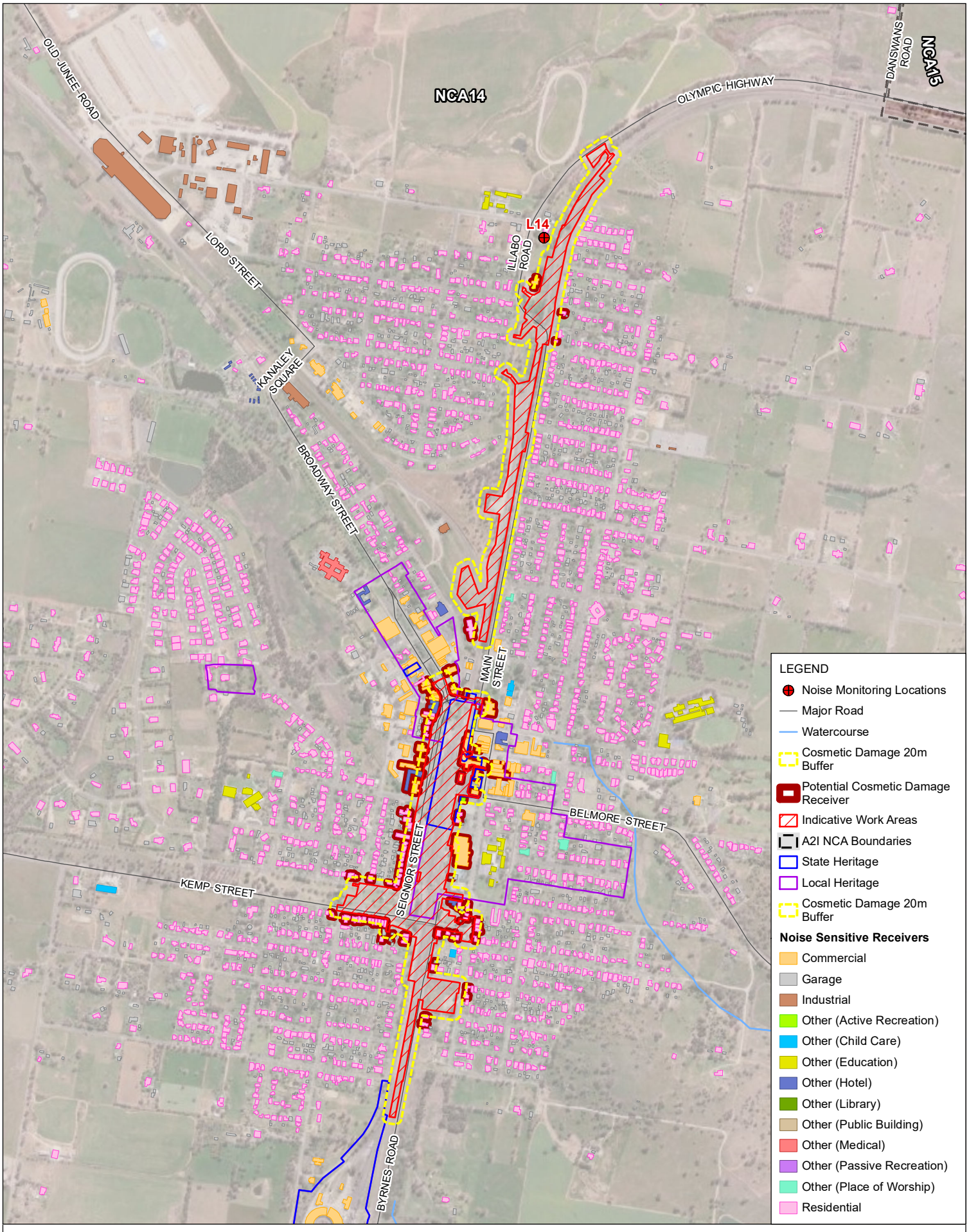


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 13 of 19

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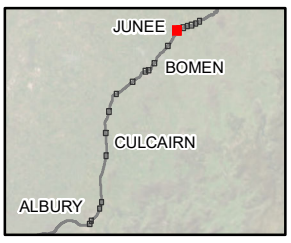
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INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 14 of 19

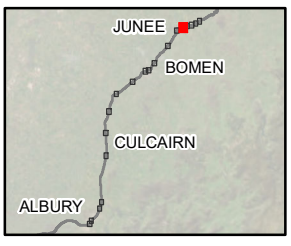


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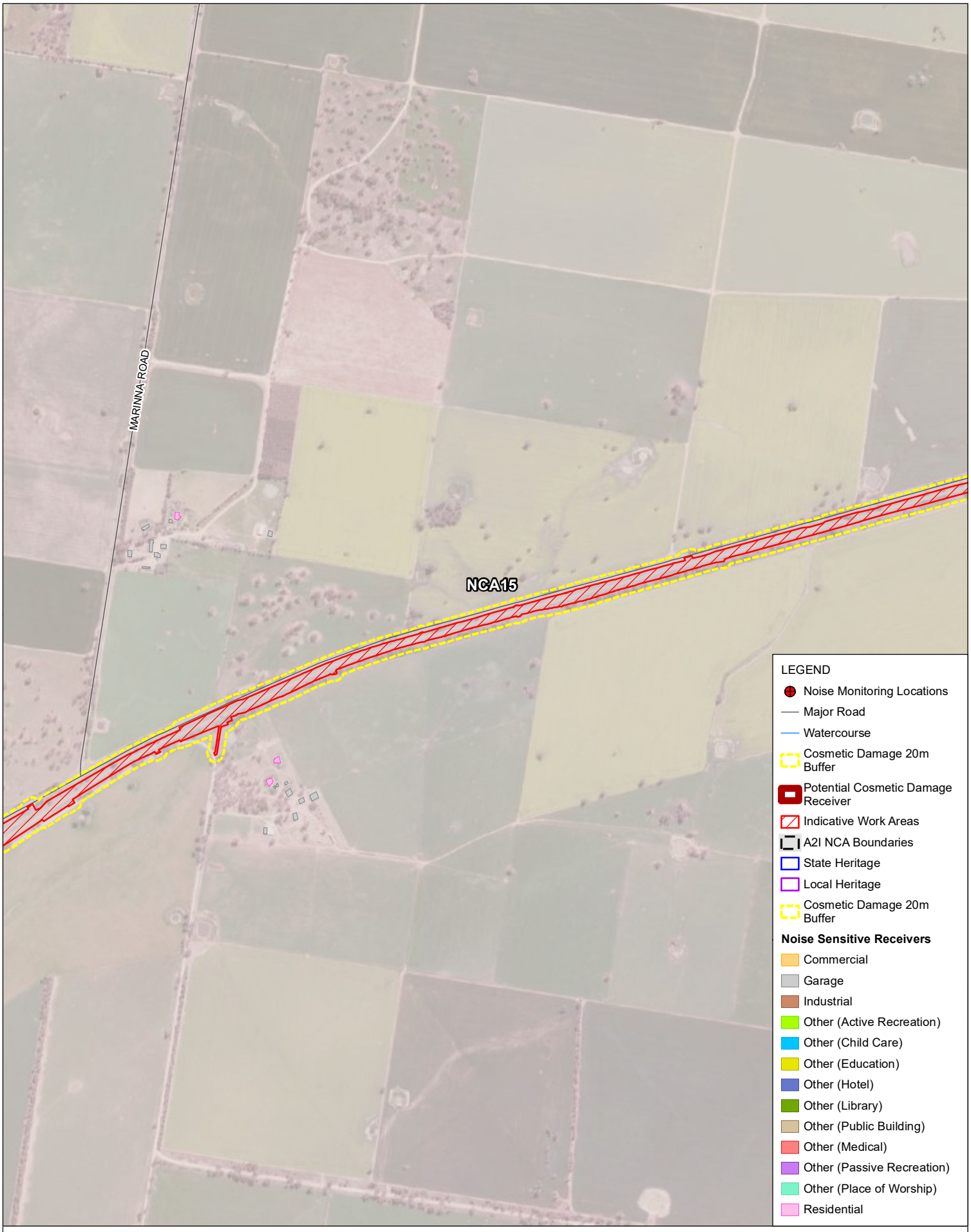


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 15 of 19

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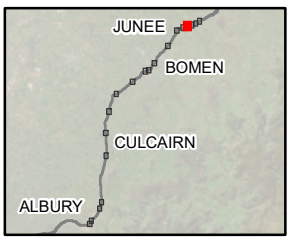


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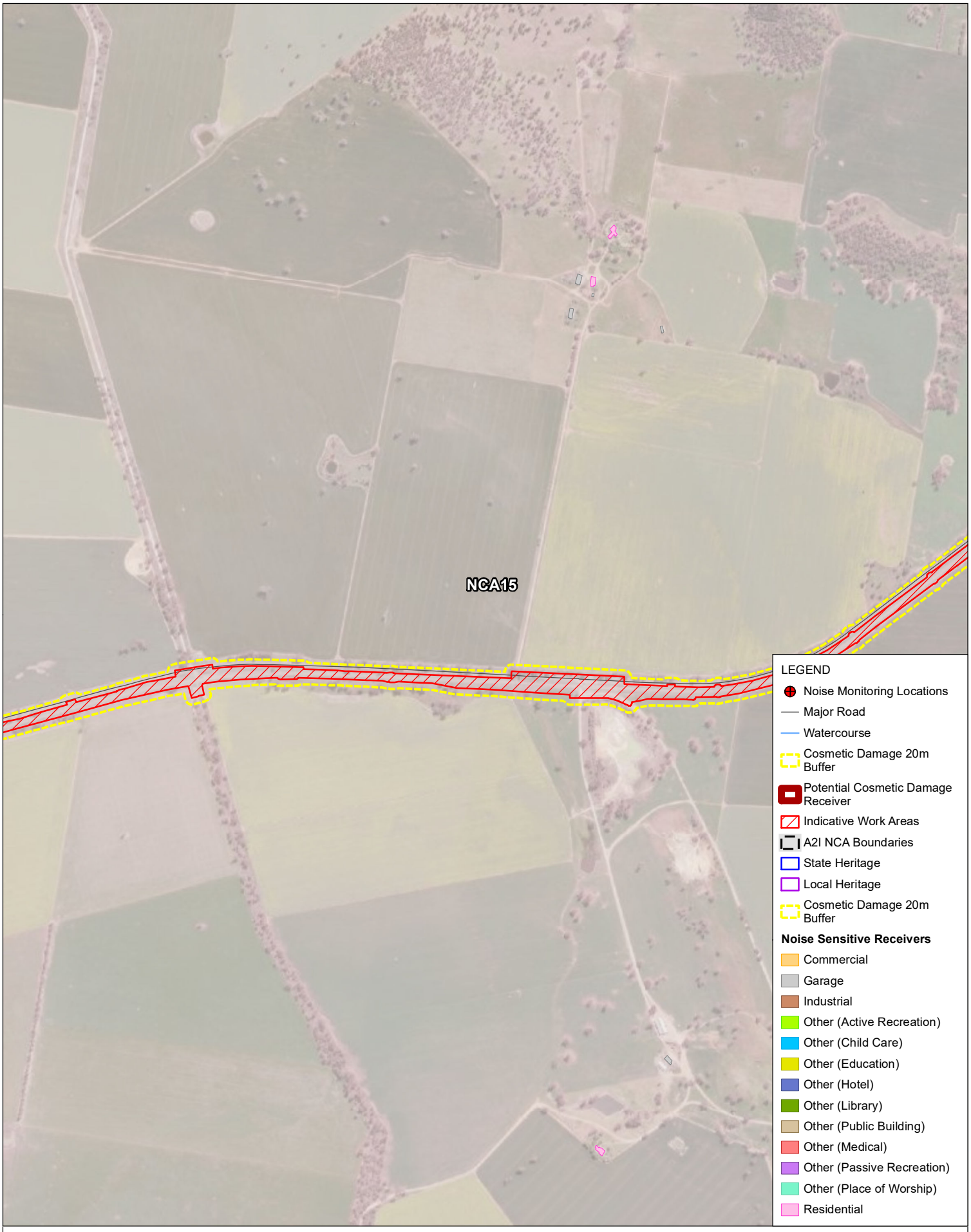


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 16 of 19

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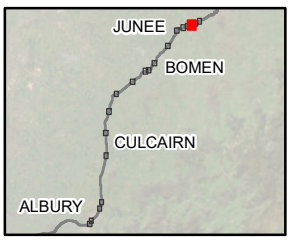


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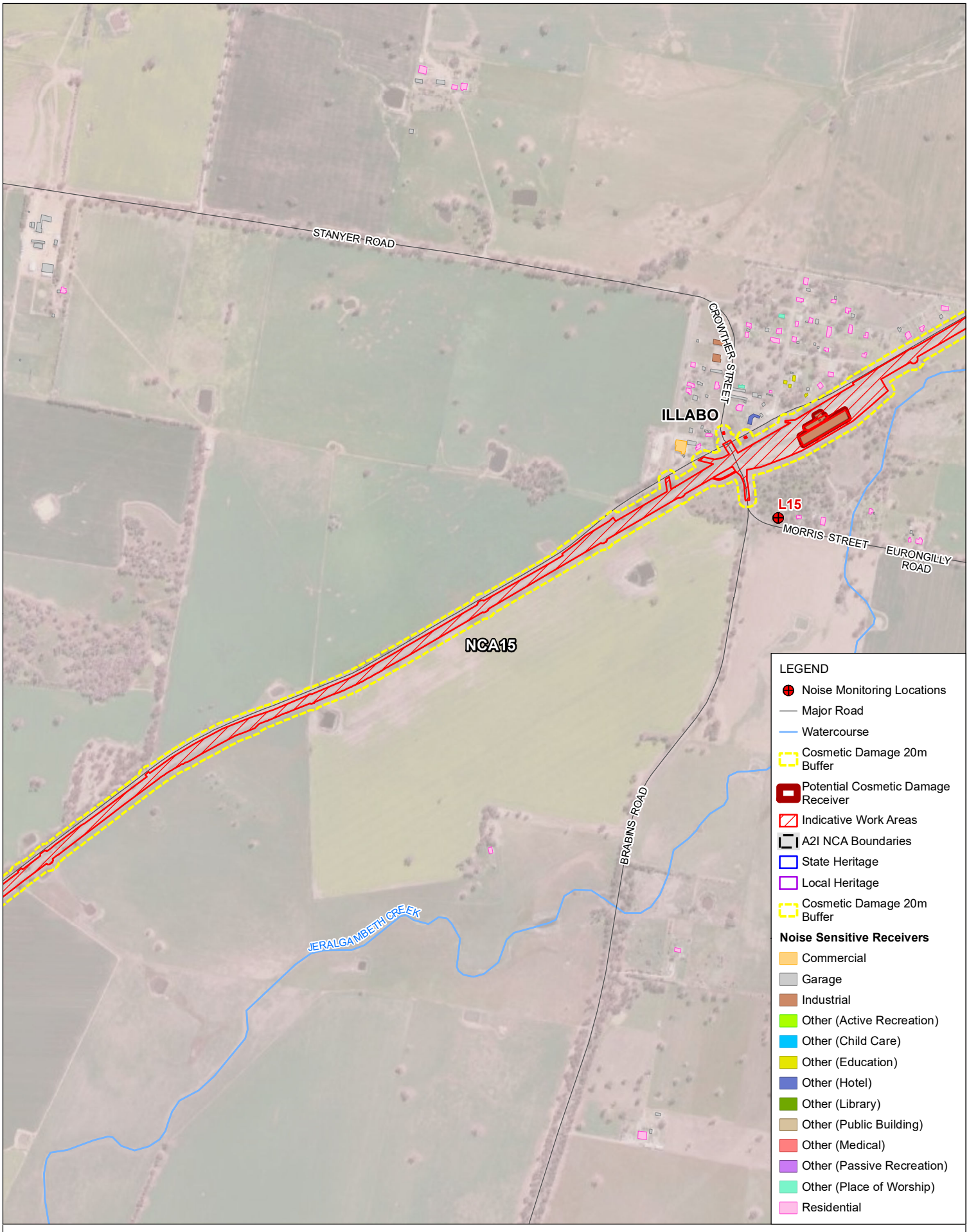


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 17 of 19

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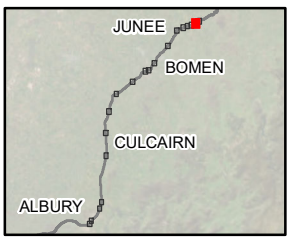


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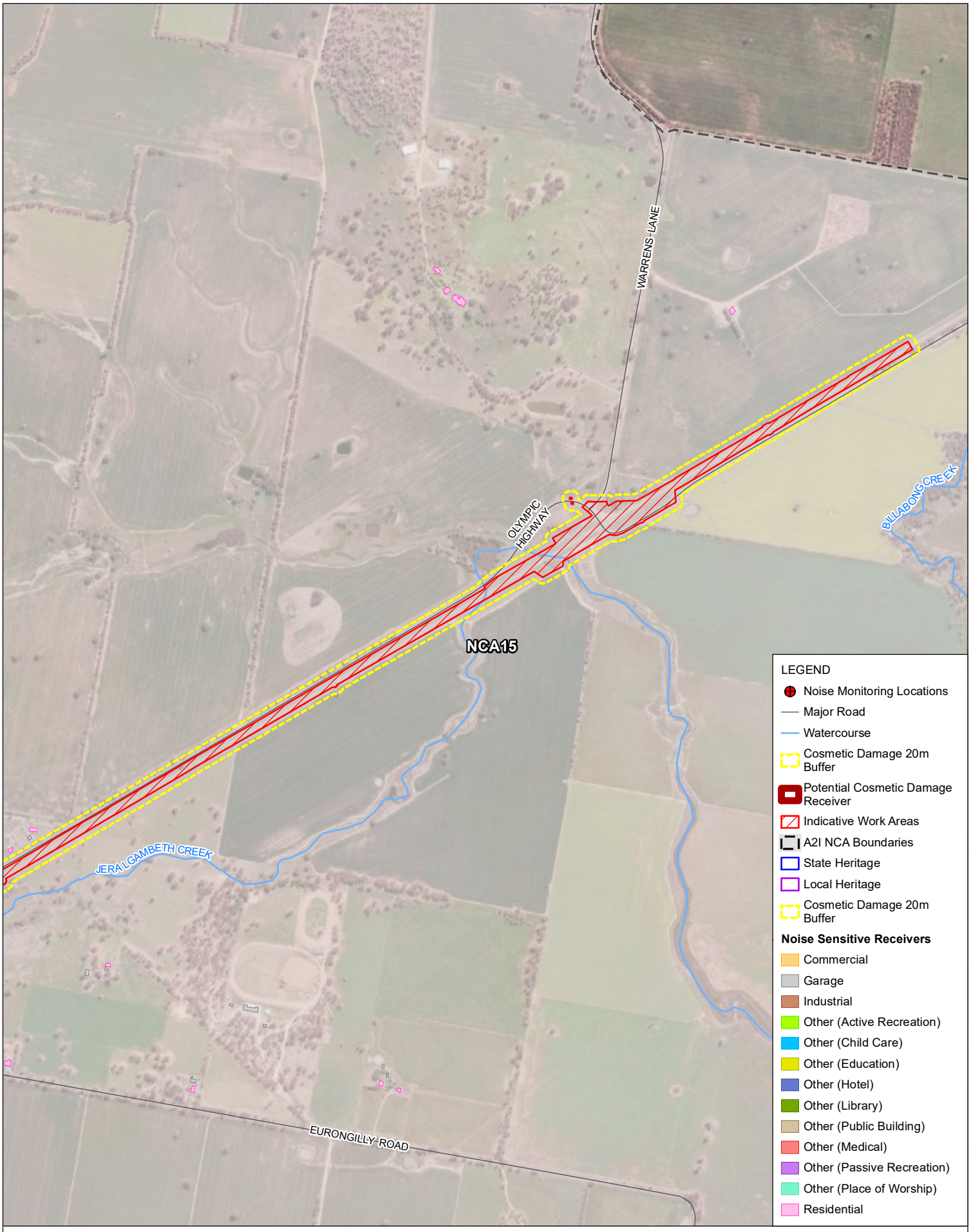


INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 18 of 19

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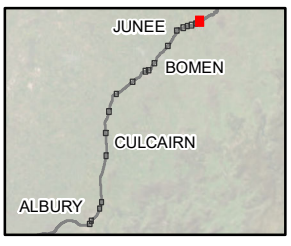


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INLAND RAIL: ALBURY TO ILLABO (A2I) PROJECT

WORST CASE CONSTRUCTION VIBRATION COSMETIC DAMAGE SCREENING ASSESSMENT

APPENDIX E - Map 19 of 19

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APPENDIX F

Out of Hours Work Protocol

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MARTINUS INLAND RAIL



OUT OF HOURS WORK PROTOCOL

Albury to Illabo | A2I

CONTRACT NUMBER: 0052

PROJECT DOCUMENT NUMBER:

6-0052-210-PES-00-PR-0007

Document Control

DOCUMENT TITLE:	Out of Hours Work Protocol			
DOCUMENT OWNER:	Chris Standing – Environment, Approvals and Sustainability Manager			
PREPARED BY:	Adrian Broger	**TITLE:**	Environmental Approvals Advisor	
SIGNATURE:	ABroger		**DATE:**	25/08/2025
REVIEWED BY:	Alison Kriegel	**TITLE:**	Environmental Approvals Lead	
SIGNATURE:	Alison Kriegel		**DATE:**	25/08/2025

Approved by

NAME	TITLE	SIGNATURE	DATE
Andy Williams	Project Director		25/08/2025

Revision History

REVISION	REVISION DATE	AMENDMENT	DATE TO CLIENT
1	19/12/2024	Stage A OOHWP for DPHI approval	19/12/2024
2	17/01/2025	Approved by DPHI as part of Stage A CNVMP	17/01/2025
3	02/06/2025	Reviewed by DPHI	02/06/2025
3.1	31/07/2025	Updated to include Kemp Street Bridge Enhancement Site Modification	31/07/2025
4	25/08/2025	For approval	25/08/2025
5	23/09/2025	For inclusion in Stage C CNVMP	23/09/2025

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GLOSSARY

TERM	DEFINITION
AA	The Acoustics Advisor for the CSSI approved by the Planning Secretary
AA	Alternative accommodation. Refer to additional mitigation measures
A2I	Albury to Illabo section of the Inland Rail project
AO	Agreement with owners. Refer to additional mitigation measures
ARTC	Australian Rail Track Corporation
AMM	Additional management measures
CCS	Community Communication Strategy
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan
CNVF	Inland Rail NSW Construction Noise and Vibration Framework
CNVG	Transport for NSW Construction Noise and Vibration Guideline for Public Transport Infrastructure (EMF-NV-GD-0060) (July, 2023)
CNVMP	Construction Noise and Vibration Management Plan
CO	Communication. Refer to additional mitigation measures
CO1	Category 1: Communication to inform. Refer to additional mitigation measures
CO2	Category 2: Personalised communication. Refer to additional mitigation measures
CoA	Conditions of Approval
Construction	Includes work required to construct the CSSI as defined in the Project Description described in the documents listed in CoA A1 including commissioning trials of equipment and temporary use of any part of the CSSI but excluding Low Impact Work which is carried out or completed prior to approval of the CEMP.
CSSI	Critical State Significant Infrastructure
dB	Decibel (referenced 20 µPa)
dB(A)	A-weighted decibel (referenced 20 µPa)
DPE	NSW Department of Planning and Environment
DPI	Department of Primary Industries
DPHI	Department of Planning, Housing and Infrastructure
EAD	Environmental Assessment Documentation that includes: • Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022); • Albury to Illabo Response to Submissions (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023); • Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024);

TERM	DEFINITION
	• Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024); • Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); • Kemp Street Bridge Enhancement Site Modification Report (Inland Rail, June 2025)
EIS	Environmental Impact Statement
EPA	Environment Protection Authority (NSW)
EPBC Act	*Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (Federal)
EPL	Environment Protection Licence
Environmental Representative (ER)	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
ISO	International Standards Organisation
IRPL	Inland Rail Pty Ltd
km	Kilometre
L_{A10}	The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
L_{A90}	The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
L_{Aeq}	A-weighted equivalent continuous noise level, providing a representation of the cumulative level of noise exposure over a defined period.
$L_{Aeq(15\ minute)}$	The A-weighted equivalent continuous noise level for a 15-minute period, typically the worst-case 15-minute period.
L_{Amax}	The A-weighted maximum sound pressure level of an event measured with a sound level meter.
mm	Millimetre
NSW	New South Wales
NML	Noise management level
OOH	Out of Hours (i.e. outside of standard construction hours)
OOHW	Out of Hours Work
Planning Secretary	Secretary of the NSW Department of Infrastructure, Housing and Infrastructure, or delegate
PIR	Preferred Infrastructure Report
PPV	Peak particle velocity (mm/s)
RBL	Rating background level
RO	Respite offer. Refer to additional mitigation measures

TERM	DEFINITION
SMM	Standard mitigation measures
UMM	Updated Mitigation Measure (PIR RtS)
UWP	Universal Work Practices

1 INTRODUCTION

1.1 Project overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australian's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC) and Inland Rail Pty Ltd (IRPL).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine (P2N) and Narrabri to North Star Phase 1 (N2NS P1) sections are complete.

The project will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section of the Inland Rail program. Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

A detailed project description is provided in Section 4 of the Construction Environmental Management Plan (CEMP).

1.1.1 Planning context

The Inland Rail – Albury to Illabo project (the project) is declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The project is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

An environmental impact statement (EIS) was prepared to support ARTC's application for approval of the proposal in accordance with the requirements of the EP&A Act and the environmental assessment requirements of the Secretary of the (then) NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning, Housing and Infrastructure (DPHI)).

The EIS was placed on public exhibition from 17 August 2022 to 28 September 2022. During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by ARTC, and make a written submission to the DPE for consideration in its assessment of the proposal.

In accordance with section 5.17(6)(b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report (PIR) that provides further assessment of traffic and transport, noise and vibration, and air quality impacts. The PIR was also prepared to consider changes to the exhibited proposal that have arisen as a consequence of these further assessments and related submissions.

A modification report (Kemp Street Bridge Enhancement Site Modification, Inland Rail June 2025) was prepared to revise the replacement road and pedestrian bridge arrangement over the railway line at the Kemp Street bridge enhancement site in Junee to now provide a single structure. The Modification was approved by the NSW Minister for Planning and Public Spaces.

1.1.2 Statutory context and approval

The Inland Rail – Albury to Illabo project was assessed as part of the following documents:

- Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022);
- Albury to Illabo Response to Submissions (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024);

- Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024);
- Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Kemp Street Bridge Enhancement Site Modification Report (Inland Rail, June 2025)

Together these documents are referred to as the Environmental Assessment Documentation (EAD).

Approval for the Inland Rail – Albury to Illabo project under the EP&A Act was granted by the Minister for Planning on 8 October 2024.

1.2 Scope of this Protocol

This Out-Of-Hours Work (OOHW) Protocol (this Protocol) is an appendix to the Construction Noise and Vibration Management Plan (CNVMP).

This Protocol will assist with any work associated with the project that will be carried out outside standard construction hours and that are not regulated by an Environment Protection Licence (EPL). This Protocol also satisfies CoA E72 where works can be approved outside the standard hours through an approval of an OOHW Protocol.

This OOHW Protocol will be implemented by Martinus Rail for any OOHW not subject to an EPL, which are expected to be minimal.

This Protocol will be approved by the Planning Secretary before commencement of the OOHW.

1.3 Approval, review and modification

As outlined in the Staging Report, the project is being staged and a Construction Environmental Management Framework (CEMF) applies. In accordance with CoA E72, this Protocol has been prepared in consultation with the Environment Protection Authority (EPA), the Environmental Representative (ER) and the Acoustics Advisor (AA) and must be approved by the Planning Secretary before the commencement of OOHW not subject to an EPL.

The AA must review and endorse this Protocol in accordance with CoA A27(e) prior to submission to the Planning Secretary.

Where an amendment to this Protocol is required, the update will be prepared in consultation with the EPA, the ER and the AA. The updated Protocol will be endorsed by the AA before being submitted to the Planning Secretary for approval.

Minor amendments will be prepared in consultation with the ER and AA, before being approved by the Planning Secretary (refer Section 1.2).

The Protocol, including any amendments, will be implemented throughout construction.

1.4 Consultation

In accordance with CoA E72, this Protocol has been prepared in consultation with the following:

- The ER;
- The AA;
- The EPA.

A consultation report has been prepared for the CNVMP, including this OOHW Protocol which outlines how responses from the EPA have been addressed. The consultation report will be submitted to the Planning Secretary as part of the submission of this Protocol in accordance with CoA C8. Consultation with the ER and AA is considered to have occurred through the review process of this Protocol.

1.5 Environmental requirements

1.5.1 Minister's Conditions of Approval

The requirements of the CoA relevant to the development of this Protocol are shown in Table 1. A cross reference is also included to indicate where the CoA is addressed in this Protocol or other project management document, as relevant.

TABLE 1: CONDITIONS OF APPROVAL RELEVANT TO THIS PROTOCOL

NO.	REQUIREMENT	WHERE ADDRESSED
E69	Work must be undertaken during the following hours: a) 7:00am to 6:00pm Mondays to Fridays, inclusive; b) 7:00am to 6:00pm Saturdays; and c) at no time on Sundays or public holidays.	Section 1.6
E70	Except as permitted by an EPL, highly noise intensive works that result in an exceedance of the applicable NML at the same receiver must only be undertaken:	Section 1.6

NO.	REQUIREMENT	WHERE ADDRESSED
	a) between the hours of 8:00 am to 6:00 pm Monday to Friday; b) between the hours of 8:00 am to 1:00 pm Saturday; and c) if continuously, then not exceeding three (3) hours, with a minimum cessation of work of not less than one hour. For the purposes of this condition, 'continuously' includes any period during which there is less than one hour between ceasing and recommencing any of the work.	
E71	Notwithstanding Conditions E69 and E70, work may be undertaken outside the hours specified in the following circumstances (a, b, or c): a) Safety and Emergencies, including: i. for the delivery of materials required by the NSW Police Force or other authority for safety reasons; or ii. where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm. On becoming aware of the need for emergency work in accordance with Condition (a), the AA, the ER, the Planning Secretary and the EPA must be notified of the reasons for such work. Best endeavours must be used to notify all noise and/or vibration affected residents and owners/occupiers of properties identified sensitive land use(s) of the likely impact and duration of those work. b) Work, that meets the following criteria; i. construction that causes $L_{Aeq(15\ minute)}$ noise levels: • no more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG, and • no more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); and ii. construction that causes L_{AFmax} noise levels no more than 15 dB above the rating background level at any residence during the night period as defined in the ICNG. and iii. construction that causes: • continuous or impulsive vibration values, measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or • intermittent vibration values measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006). c) By Approval, including: i. where different construction hours, such as those for a rail possession, are permitted under an EPL in force in respect of the CSSI; or ii. works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition ; or iii. negotiated agreements with directly affected residents and sensitive land use(s).	Section 1.7 Section 5.2
E72	An Out-of-Hours Work Protocol must be prepared to identify a process for the consideration, management and approval of work which is outside the hours defined in Conditions E69, and that are not subject to an EPL. The Protocol must	This Protocol Section 1.2

NO.	REQUIREMENT	WHERE ADDRESSED
	be approved by the Planning Secretary before commencement of the Out-of-Hours Work. The Protocol must be prepared in consultation with the ER, AA and EPA.	Section 1.4 Attachment 1
	The Protocol must include: a) identification of low and high-risk activities and an approval process that considers the risk of activities, proposed mitigation, management, and coordination, including where: i. the ER and AA review all proposed out-of-hours activities and confirm their risk levels, ii. low risk activities can be approved by the ER in consultation with the AA, and iii. high risk activities that are approved by the Planning Secretary;	Section 2
	b) a process for the consideration of out-of-hours work against the relevant NML and vibration criteria;	Section 3
	c) a process for selecting and implementing mitigation measures for residual impacts in consultation with the community at each affected location, including respite periods. The measures must take into account the predicted noise levels and the likely frequency and duration of the out-of-hours works that sensitive land use(s) would be exposed to, including the number of noise awakening events;	Section 3 Section 5 Attachment 1
	d) procedures to facilitate the coordination of out-of-hours work including those approved by an EPL or undertaken by a third party, to ensure appropriate respite is provided; and	Section 2.4
	e) notification arrangements for affected receivers for approved out-of-hours work and notification to the Planning Secretary of approved low risk out-of-hours works.	Section 5 Section 4.3
	This condition does not apply if the requirements of Condition E71 are met.	Noted.
E73	Except as permitted by an EPL, out-of-hours work that may be regulated through the Out-of-Hours Work Protocol as per Condition E72, but is not limited to: a) Carrying out work that if carried out during standard hours would result in a high risk to construction personnel or public safety based on a risk assessment carried out in accordance with *AS/NZS ISO 31000:2009: "Risk management*; or	Section 1.6
	b) where the relevant roads authority has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to road network performance and a road occupancy licence will not be issued; or	
	c) where the relevant utility service operator has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to the operation and integrity of the utility network; or	
	d) work undertaken in a rail possession for operational or safety reasons.	
	Note: Other out-of-hours works can be undertaken with the approval of an EPL, or through the project's Out-of-Hours Work Protocol for works not subject to an EPL.	

NO.	REQUIREMENT	WHERE ADDRESSED
E75	Mitigation measures must be applied when the following residential ground-borne noise levels are exceeded: a) evening (6:00 pm to 10:00 pm) — internal $L_{Aeq(15\ minute)}$: 40 dB(A); and b) night (10:00 pm to 7:00 am) — internal $L_{Aeq(15\ minute)}$: 35 dB(A). The mitigation measures must be outlined in the Noise and Vibration CEMP sub-plan, including in any Out-of-Hours Work Protocol, required by Condition E72.	Section 2.4 Attachment 1
E76	Noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs must not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution.	Section 2.5 Section 5.2

1.5.2 Updated Mitigation Measures

The primary and secondary requirements of the Updated Mitigation Measures (UMMs) presented in the EAD relevant to the development of this Protocol are shown in Table 2. A cross reference is also included to indicate where the UMM is addressed in this Protocol for other project management documents, as relevant.

TABLE 2: UMMS RELEVANT TO THE DEVELOPMENT OF THIS PROTOCOL

NO.	REQUIREMENT	TIMING	WHERE ADDRESSED
NV5	A construction noise and vibration management plan (CNVMP) will be prepared and implemented as part of the CEMP, in accordance with the Inland Rail NSW Construction Noise and Vibration Framework. The plan will outline measures, processes and responsibilities to manage and monitor noise and vibration and minimise the potential for impacts during construction. This plan will include all feasible and reasonable mitigation measures:	Pre-construction/ construction	The CNVMP
	▪ construction noise and vibration criteria for the proposal		Section 3 of the Construction Noise and Vibration Monitoring Program (Appendix B of the CNVMP)
	▪ the location of sensitive receivers		Section 4.1 of the CNVMP
	▪ specific management measures for activities that could exceed the construction noise and vibration criteria		Section 7 of the CNVMP, particularly Section 7.10 of the CNVMP
	▪ OOH protocol		This Out of Hours Work Protocol
	▪ procedures for monitoring noise and vibration levels during construction		Section 4 of the Construction Noise and Vibration Monitoring Program (Appendix B of the CNVMP)
	▪ community and stakeholder engagement measures in accordance with the communication management plan.		Section 8.1 of the CNVMP

1.6 Justification for OOHW

Martinus Rail will conduct activities as much as possible within the approved standard construction hours outlined in CoA E69:

- 7:00am to 6:00pm Mondays to Fridays, inclusive;
- 7:00am to 6:00pm Saturdays; and
- At no time on Sundays or public holidays.

In accordance with CoA E70, except as permitted by an Environment Protection Licence (EPL), highly noise intensive activities that result in the exceedance of an applicable noise management level (NML) at the same receiver must only be undertaken:

- Monday to Friday: 8am to 6pm;
- Saturday: 8am to 1pm;
- If continuously, the not exceeding three hours, with a minimum cessation of work of not less than one hour.

Certain activities may need to be carried out outside of standard construction hours. There are two periods of OOHW:

1. OOHW Period 1 -
    a. Monday to Friday: 6pm to 10pm;
    b. Saturday: 6pm to 10pm;
    c. Sunday and Public Holidays: 8am to 6pm.
2. OOHW Period 2 –
    a. Monday to Friday: 10pm to 7am;
    b. Saturday: 10pm to 8am;
    c. Sunday and Public Holidays: 6pm to 7am the following day (unless that day is a Sunday or Public holiday, then to 8am).

Justification of the need for OOHW will be provided in accordance with CoA E73, where OOHW is required:

- For carrying out work that if carried out during standard hours would result in a high risk to construction personnel or public safety based on a risk assessment carried out in accordance with AS/NZS ISO 31000:2009: “Risk management”; or
- Where the relevant roads authority has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to road network performance and a road occupancy licence will not be issued; or
- Where the relevant utility service operator has advised the Proponent in writing that carrying out the work during standard hours would result in a high risk to the operation and integrity of the utility network; or
- Work undertaken in a rail possession for operational or safety reasons.

Activities that may require scheduled OOHW include, but are not limited to:

- Vegetation clearing and grubbing;
- Utility works including outages/cutovers, service identification, protection and relocation;
- Concrete pours;
- Ancillary facility establishment and operation;
- Earthworks;
- Bridge works;
- Track work;
- Gantry and signal work;
- Drainage and culvert work;
- Noise wall work;
- Road works including changes to level crossings, traffic management, milling, re-sheeting and line marking;
- Finishing works, including landscaping and remediation.

Work activities that may be required or proposed to be undertaken outside of standard working hours will be assessed in accordance with the process outlined in this OOHW Protocol.

1.7 Exclusions

Works outside of the standard construction hours may be undertaken in the following circumstances as permitted by CoA E71:

a) Safety and Emergencies, including:

i. For the delivery of materials required by the NSW Police Force or other authority for safety reasons; or

ii. Where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm.

On becoming aware of the need for emergency work in accordance with (a), the AA, the ER, the Planning Secretary and the EPA must be notified of the reasons for such work. Best endeavours must be used to notify all noise and/or vibration affected residents and owners/occupiers of properties identified sensitive land use(s) of the likely impact and duration of those works.

b) Work, that meets the following criteria:

i. Construction that causes $L_{Aeq(15\ minute)}$ noise levels:

• No more than 5 dB(A) above the rating background level at any residence in accordance with the ICNG, and

• No more than the 'Noise affected' NMLs specified in Table 3 of the ICNG at other sensitive land use(s); and

ii. Construction that causes L_{AFmax} noise levels no more than 15 dB above the rating background level at any residence during the night period as defined in the ICNG. and

iii. Construction that causes:

• Continuous or impulsive vibration values, measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.2 of Assessing Vibration: a technical guideline (DEC, 2006), or

• Intermittent vibration values measured at the most affected residence no more than the preferred values for human exposure to vibration, specified in Table 2.4 of Assessing Vibration: a technical guideline (DEC, 2006).

c) By Approval, including:

i. Where different construction hours, such as those for a rail possession, are permitted under an EPL in force in respect of the CSSI; or

ii. Works which are not subject to an EPL that are approved under an Out-of-Hours Work Protocol as required by Condition ; or

iii. Negotiated agreements with directly affected residents and sensitive land use(s).

Emergency work is defined as work that is required to:

- Avoid injury or the loss of life;
- To avoid damage or loss of property; or
- To prevent environmental harm.

2 OOHW NOISE AND VIBRATION ASSESSMENT

2.1 Risk level (low and high)

Prior to undertaking any OOHW, Martinus Rail will undertake a construction noise and vibration assessment to consider the noise and vibration impacts for any activities proposed outside standard construction hours.

Assessments will be prepared using the project noise and vibration management tool. The assessment will include details of the work to be undertaken, plant and equipment required, scheduling and duration of the work, as well as predicted impacts on sensitive receivers, their location and proposed mitigation measures. The inputs into the noise and vibration assessment are to be as accurate as possible and checked by relevant construction personnel. Where uncertainty exists about specific details, a worst-case scenario must be assessed.

Where changes to the scope of the OOHW occur following approval of the OOHW Approval Request Form, the change management process outlined in Section 6.5 will be followed.

The proposed OOHW is classified low risk (in accordance with CoA E72) where it does not trigger the high risk criteria identified below. To be classified as low risk, works would have to be below the relevant cosmetic vibration criteria at the most impacted vibration sensitive structure. Other low risk OOHW may also be identified in consultation with the AA and ER.

The proposed OOHW is classified high risk (in accordance with CoA E72) where it exceeds all of the following criteria, or as otherwise determined by the ER in consultation with the AA:

- Works affect particularly sensitive receivers (e.g. residential home for the elderly, hospitals);
- Works that generate $L_{Aeq(15minute)}$ noise more than 15 dB above RBL; and
- Works that generate a type or intensity of high impact noise (e.g. prolonged periods of high noise or vibration intensive activities).

Notwithstanding the criteria for high risk works outlined above, High Risk OOHW is any OOHW deemed to be high risk by the ER and AA.

In accordance with CoA E72(a)(ii), the ER has the authority to approve low risk OOHW activities, in consultation with the AA. For works that are less than the NML, the works can be self-approved by the MR ESM.

The types of activities proposed to take place outside of standard construction hours include utilities works, drainage and earthworks, signalling and gantry upgrades, demolition and track construction. Any of these types of work may be undertaken as low risk where they do not exceed the nominated criteria. Construction scenarios, including typical plant and equipment are identified in Appendix C of the CNVMP.

In instances where all three criteria above are exceeded, the proposed OOHW is classified as high risk. In this instance, the assessment of the proposed OOHW and the OOHW Approval Request Form will be issued to the Planning Secretary for review and approval in accordance with CoA E72(a)(iii).

OOHW that are classified as high risk, would consist of the same categories of work (utilities works, drainage and earthworks, signalling and gantry upgrades, demolition and track construction) and will likely include higher impact work including demolition and tamping associated with track construction, but only in those instances where the proposed activity exceeds the nominated criteria. As above, typical construction scenarios with relevant plant and equipment are identified in Appendix C of the CNVMP.

2.2 Noise

A quantitative assessment will be developed in accordance with CoA, the ICNG, the Inland Rail NSW Construction Noise and Vibration Framework (IRPL CNVF) (0-0000-902-EMN-00-SP-0001), and this Protocol and will:

- Determine the extent of noise impact and identify the exceedances of activity scenarios against the NMLs adopted for each Noise Catchment Area (NCA) or other sensitive land uses;
- Predict noise levels, frequency and duration of OOHW, sleep disturbance and determine the appropriate standard mitigation measures;
- Identify feasible and reasonable work practices to minimise noise;
- Determine the appropriate additional mitigation measures.

2.3 Vibration

An assessment will be undertaken for vibration intensive OOHW within the vibration minimum working distances for human comfort for nominated plant and equipment. Prior to undertaking an assessment, all other feasible and reasonable options to use less vibration intensive equipment will be investigated and exhausted.

The assessment will:

- Determine the extent of vibration impacts and identify the exceedances of activity scenarios against the vibration objectives;
- Identify feasible and reasonable work practices;
- Determine the appropriate standard and additional mitigation measures.

2.4 Ground-borne noise

Construction works can cause ground-borne noise impacts in nearby buildings when vibration generating equipment is in use. The majority of receivers are sufficiently distant from the works for ground-borne noise impacts on be minimal.

In general, ground-borne noise level values are relevant only where they are higher than the airborne noise, with ground-borne noise from construction typically masked by airborne noise associated with surface construction activities and/or traffic.

The ground-borne noise management levels for the project are provided in CoA E75.

2.5 Coordination of OOHW with third parties

All OOHW, including works undertaken by a third party, will be co-ordinated with projects to implement the appropriate management measures and respite periods as specified in CoA E72(d).

Works will be scheduled with the aim of minimising concurrent works near sensitive receives in consultation with managers of other nearby projects that are likely to result in a cumulative impact.

This will include:

- Coordination between project teams;
- Rescheduling of work to provide respite to impacted noise sensitive land user(s) so that respite is achieved during OOHW;
- Consideration to the provision of alternative respite or mitigation to impacted noise sensitive land users where OOHW respite as per CoA E72(d) cannot be provided.

An anticipated list of third parties is provided in the Community Communication Strategy (CCS). Consultation will be undertaken in accordance with the CCS to ensure works can be coordinated with third parties.

3 OOHW NOISE AND VIBRATION MANAGEMENT

The CNVF outlines a hierarchy of work practices and mitigation measures to minimise the impact of construction noise and vibration on the community. This hierarchy from the CNVF is shown in Figure 1.

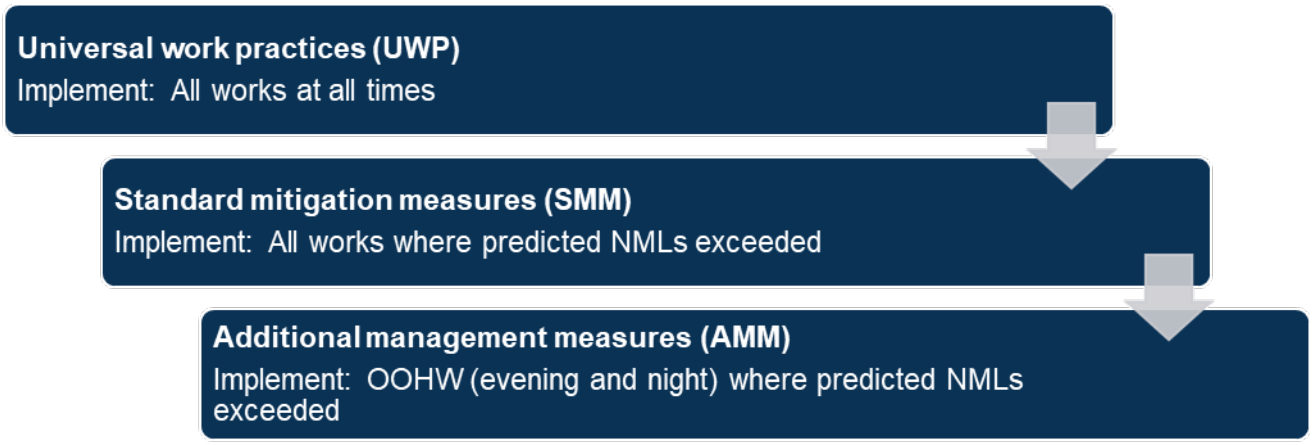


FIGURE 1: HIERARCHY OF WORK PRACTICES AND MITIGATION MEASURES

UWP and SMM have been developed for the project and are outlined in Section 7.10 of the CNVMP to minimise potential noise and vibration impacts at surrounding receivers. AMM are defined below in Section 3.1.

Martinus Rail will identify the OOHW period, the predicted airborne $L_{Aeq(15minute)}$ and L_{Amax} noise level at the receiver, and dB above the NML (including the ground-borne noise NML). Martinus Rail will take into consideration the frequency and duration of OOHW periods proposed, sensitive land users will be exposed to, including an assessment of sleep disturbance. Martinus Rail will also identify if OOH vibration intensive activities have the potential to impact on sensitive receivers or structures, by assessing the works for compliance with minimum working distances. This will determine the appropriate management measures to mitigate the noise (including ground-borne) and vibration impacts.

Attachment 1 outlines the approach for the application of additional mitigation measures to minimise impacts from OOHW in accordance with the CNVF. Appropriate measures will be identified prior to seeking approval of an OOHW Approval Request Form.

3.1 Additional management measures

When construction noise and vibration levels are predicted to exceed NMLs during OOHW with UWP and SMM applied, the contractor shall implement additional management measures (AMM) commensurate with the impacts (refer Figure 1). The definitions of AMM from Section 3.3 of the CNVF are replicated in the sections below and guidance on applying AMM for noise levels above the NMLs are provided in Attachment 1.

3.1.1 Communication (CO)

The level of noise and vibration impact and duration shall guide communication with receivers by the project. Accurate and timely communication is essential to manage and understand community expectations for OOHW.

Two categories of communication have been developed commensurate with the scale of the impact. The purpose of the communication is described below, but the method of communication will be at the discretion of the contractor and detailed in the Contractor's Communications and Stakeholder Management Plan. It is intended that this Framework will compliment, and be referred to, in all relevant Communications and Stakeholder Management Plans to achieve the engagement outcomes described below.

- **Category 1 - CO1**: Communication to provide information on the OOHW via methods such as letter box drop, email, newsletter, media advertisements and/ or website prior to the works commencing;
- **Category 2 - CO2**: Communication should be personalised (e.g. door knock, meeting, telephone call). Contact with these residents should commence early to enable feedback to be considered by the project.

At minimum the information provided to stakeholders (CO1 or CO2) will include:

- The reason the works are required to be undertaken outside of the approved standard construction hours;
- A diagram that identifies the location of the proposed works in relation to nearby cross streets and local landmarks;
- The nature, scope and duration of the works, including start and finish times;

- The expected noise impacts on receivers; and
- Information on how to obtain further information or make a complaint, including an after-hours number and Inland Rail Program website.

Information provided as part of CO1 will be issued to stakeholders five (5) to 14 days prior to works commencing as per the MR Communication and Stakeholder Engagement Management Plan.

3.1.2 Respite offer (RO)

Residential receivers subject to lengthy periods of noise or vibration may be eligible for respite offers. The purpose of such an offer is to provide residents with respite from an ongoing impact and may comprise of pre-purchased movie tickets, dinner vouchers or similar.

Respite offers are not applicable to non-residential receivers.

Respite can also be provided by limiting high noise generating works and allowing at least a one-hour respite period between blocks of work. Where possible, the timing of this respite should be discussed with the impacted community.

The works scenarios in which this AMM will be implemented are detailed in Attachment 1. Where a works scenario is to extend over two (2) consecutive rest periods, this AMM is to be implemented for the entire respite period (as opposed to only the portion that extends beyond the two (2) consecutive rest periods).

3.1.3 Alternate accommodation (AA)

Alternate accommodation options (i.e. accommodation in motels away from the worksite) may be provided for residents living in close proximity to construction sites.

Acceptable accommodation measures shall be developed by the contractor for the affected community and be approved by an IRPL representative prior to discussion with the resident.

The works scenarios in which this AMM will be implemented are detailed in Attachment 1. Where a works scenario is to extend over two (2) consecutive rest periods, this AMM is to be implemented for the entire respite period (as opposed to only the portion that extends beyond the two (2) consecutive rest periods).

3.1.4 Agreements with owners (AO)

The project may negotiate agreements with residents impacted during the construction period. All negotiated agreements with owners and occupiers of sensitive land uses must be in writing, and include the hours, duration and likely noise levels compared to the ICNG NMLs. The negotiated agreement must be agreed and finalised before the commencement of work affecting the sensitive land uses.

4 COMPLIANCE MANAGEMENT

4.1 Roles and responsibilities

For works not subject to an EPL, an OOHW approval request will be developed by completing an OOHW Approval Request Form.

The MR Public Liaison Officer will be responsible for ensuring that notification and consultation has occurred with community stakeholders, in accordance with the conditions of approval, the Community Communications Strategy (as relevant), on the likely impacts of OOHW activities.

Martinus Rail's Environment, Approvals and Sustainability Manager (MR ESM) (or delegate) will implement and oversee the noise monitoring program for OOHW to assess compliance with the CoA, the EPL and the OOHW Protocol. The MR ESM is also responsible for notifying the ER and Planning Secretary of any noise exceedances or complaints during OOHW.

Prior to the start of OOHW, the works supervisor will be responsible for completing a pre-start checklist to ensure compliance with the OOHW Approval Request Form.

4.2 Induction and training

All site personnel (including sub-contractors) will be inducted on the control measures to be implemented to minimise impacts of OOHW on the community and environment and this OOHW Protocol. Training will include inductions, toolbox talks, pre-starts and targeted training as required.

4.3 OOHW process and approval

For proposed OOHW, the following process will be followed:

1. The OOHW Approval Request Form will be prepared and include information on:
    a. Activities;
    b. Required plant and equipment;
    c. Works location;
    d. Duration;
    e. Justification for the work;
    f. Details of the completed quantitative noise assessment including predicted impacts and appropriate management measures as per Attachment 1 of this Protocol;
    g. Details of consultation with the community regarding respite periods and scheduling
2. The OOHW request will be submitted to IRPL for review. IRPL will determine if the justification for the OOHW is satisfactory;
3. IRPL will provide the OOHW request to the ER for review in consultation with the AA and confirmation of the risk level;
4. The identification of the OOHW as a low or high-risk activity will determine who can then approve the OOHW:
    a. Low risk activities: considering the risk of activities, proposed mitigation, management and coordination, to be approved by the ER in consultation with the AA. The ER and the AA will consider the criteria as well as ongoing and cumulative impacts, construction fatigue and complaints in reviewing the determined risk level. If required, the ER and the AA may consult with the Planning Secretary at times to discuss the assessed risk level. The ER and the AA will have up to 15 business days (total) to review the OOHW Approval Request Form. The Planning Secretary will also be notified of all approved low risk OOHW;
    b. High risk activities: must be approved by the Planning Secretary. Works will be planned to provide the Planning Secretary with at least one month to review the OOHW Approval Request Form
5. Following approval of each OOHW request, Martinus Rail in conjunction with IRPL will undertake community consultation and notification in accordance with Section 5 of this Protocol.

Noise and vibration monitoring and reporting will be carried out in accordance with Section 6.1 of this Protocol.

5 COMMUNICATION AND NOTIFICATION

Prior to undertaking approved OOHW, Martinus Rail will consult with the potentially affected sensitive receivers, where applicable. The MR Public Liaison Officer (or delegate) will notify the potentially affected receivers of upcoming OOHW before commencing the work in accordance with the CCS, as relevant. Where requested, Councils will also be notified of upcoming OOHW.

OOHW notifications will be developed in accordance with the MR Communication and Stakeholder Engagement Management Plan. Copies of any OOHW notifications will be submitted to the ER and the AA as part of the OOHW Approval Request Form.

5.1 Respite consultation

In accordance with CoA E72(c), Martinus Rail will identify measures to manage residual OOHW impacts in consultation with the affected community at each affected location. The outcomes of the community consultation, including any identified respite periods and the scheduling of the likely OOHW, will be included in OOHW Approval Request Form.

The consultation will include (but not be limited to) providing the community with:

- Progressive schedule of likely OOHW;
- Description of the potential work, location and duration of the OOHW;
- Noise characteristics and likely noise levels of the work;
- Mitigation and management measures which aim to achieve the relevant noise management levels and vibration criteria under CoA E74.

5.2 Negotiated agreements

Works outside of standard hours that do not meet the circumstances listed in CoA E71(a) and E71 (b) may be undertaken if agreement between Martinus Rail and the directly affected noise sensitive receivers has been reached in accordance with CoA E71(c) (refer to Table 26 of the CNVMP). The community agreements between the project and the directly affected residents and sensitive land users will be:

- Prepared in writing and a copy of the agreement(s) kept on the premises for the duration of the OOHW;
- Made available for the duration of the agreement (personal details of noise sensitive receivers will be omitted).

As part of the agreement process, the community would be made aware of the benefits and disbenefits of the works subject to the community agreement. This would include whether the work would result in a decrease in program, what respite provisions will be made available, and what impacts affected receivers could reasonably expect during the subject period. This will allow for an informed decision-making process.

Where a community agreement has been attained by phone, the following may apply:

- Phone script used to describe the proposed agreement is to be provided to IRPL with the community agreement for approval;
- Phone script to include a description of the proposed works, the likely benefits and disbenefits for the community and a clear question requesting receiver agreement to the proposal;
- Detailed records are to be maintained for the duration of the community agreement;
- Any noise sensitive receiver, who requests a copy of the phone agreement will be supplied with one.

It is noted that where negotiated agreements are used to undertake OOHW for the project and are not subject to an EPL, then agreements must be reached with a majority of affected receivers. All negotiated agreements will be made available to ER, AA and Secretary for information.

In accordance with CoA E76, noise generating work in the vicinity of community, religious, educational institutions, noise and vibration-sensitive businesses and critical working areas (such as exam halls, theatres, laboratories and operating theatres) resulting in noise levels above the NMLs must not be timetabled during sensitive periods, unless other reasonable arrangements with the affected institutions are made at no cost to the affected institution.

6 MONITORING AND REPORTING

6.1 Monitoring for OOHW

All OOHW monitoring will be carried out by an appropriately trained person in the measurement and assessment of construction noise and vibration.

Verification monitoring of noise and/or vibration during construction may be conducted at the affected receiver(s) or a nominated representative location. Monitoring can be in the form of either unattended logging (i.e. for vibration provided there is an immediate feedback mechanism such as SMS capabilities) or operator attended surveys (i.e. for specific periods of construction noise and vibration).

Validation monitoring will be undertaken for any works that are the subject of a community agreement and will be performed by a suitably qualified and experienced person on at least the first night where OOHW will be undertaken. If validation monitoring shows that noise levels are higher than those predicted by any noise modelling undertaken as part of the community agreement, work practices will be modified so that measured noise levels do not exceed predicted levels.

Subject to property owner approval, noise monitoring will be conducted at representative properties to confirm construction noise levels. The ICNG states that noise levels are to be assessed at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 metres of the residence. Further details on the requirements for noise and vibration monitoring are outlined in the Construction Noise and Vibration Monitoring Program.

The monitoring location(s) will be selected with regard to this, as well as factors including:

- Safety of the person undertaking the measurement;
- Security of the noise and vibration monitoring equipment;
- The purposes of the noise and vibration monitoring such as investigating a noise or vibration complaint at a particular property façade;
- Other specific constraints as they arise.

6.2 Complaints reporting

Complaints received as a result of the OOHW will be managed in accordance with the CCS and the Complaints Management Strategy, as relevant.

6.3 Reporting on exceedances

Where monitoring identifies any exceedances of the levels predicted in the OOHW assessments, a review of OOHW activities will be carried out to determine where noise or vibration levels can be further reduced. Where monitored noise or vibration levels are found to exceed the relevant criteria, the exceedance will be managed in accordance with the procedures outlined in the CEMP.

6.4 Records

Martinus Rail will maintain accurate records of all OOHW applications, as well as all noise and vibration monitoring undertaken during OOHW for the duration of the project.

6.5 Change management

Where changes to the scope of the OOHW (including to plant and equipment) occur following approval of the OOHW request, the MR ESM must complete a consistency review of the noise and vibration assessment to assess the impacts of the changes.

A project noise and vibration management tool will be used. The use of the recognised plant and equipment noise values in the tool, noise calculation assumptions and established guidance on the effect of barriers to noise must be used appropriately and the results of the assessment will be documented in the Noise Assessment Consistency Review.

No further approval or change to community notifications are required where the impacts are the same or less than the impacts predicted in the original noise and vibration assessment. This includes where no additional impacted sensitive receivers have been identified and cumulative impacts have been considered.

Where the impact is greater than the impacts predicted in the original noise and vibration assessment, Martinus Rail will re-submit the OOHW request for approval to the ER, in consultation with the AA. The ER and the AA will have up to 15 business days (total) to review the OOHW Approval Request Form. Additional management measures will need to be considered and implemented where relevant. Martinus Rail's Project Manager (or delegate) is responsible for approving commencement of the updated scope of work.

Community notifications will be reviewed for relevance to the adjusted scope of work.

ATTACHMENT 1 – APPLICATION OF OOHW MITIGATION MEASURES

PREDICTED AIRBORNE $L_{AEQ(15\ MINS)}$ NOISE LEVEL AT RECEIVER			MITIGATION MEASURES		
				Additional mitigation measures	
Timing	Perception	dB(A) above Noise Management Level (NML)	Mitigation measures	Duration	Communication Category/Management Measure
OOHW Period 1					
Monday – Saturday: 6pm to 10pm Sunday and public holidays: 8am to 6pm	Noticeable	<5	refer to Section 7.10 of CNVMP	Any	CO1
	Clearly audible	5-15		Any	CO1
	Moderately intrusive	16-25		Any	CO1, CO2
	Highly intrusive	>25		Any	CO1, CO2
				>2 consecutive rest periods[1]	CO1, CO2, RO
OOHW Period 2					
Monday – Saturday: 10pm to 7am Sunday and public holidays: 6pm to 7am the following day (unless that day is a Sunday or Public Holiday, then to 8am)	Noticeable	<5	refer to Section 7.10 of CNVMP	Any	CO1
	Clearly audible	5-15		Any	CO1
	Moderately intrusive	16-25		Any	CO1, CO2
				>2 consecutive rest periods[1]	CO1, CO2, RO, AO
	Highly intrusive	>25		Any	CO1, CO2, RO
				>2 consecutive rest periods[1]	CO1, CO2, RO, AA

(1) Additional mitigation measure to be applied for the duration of the relevant out of hours works period.

PREDICTED GROUND-BORNE $L_{AEQ(15\ MINS)}$ NOISE LEVEL AT RECEIVER				MITIGATION MEASURES	
				Additional mitigation measures	
Timing	Perception	dB(A) above Noise Management Level (NML)	Mitigation measures	Duration	Communication Category/Management Measure
OOHW Period 1					
Monday – Saturday: 6pm to 10pm Sunday and public holidays: 8am to 6pm	Noticeable	<5	refer to Section 7.10 of CNVMP	Any	CO1
	Clearly audible	5-15		Any	CO1
	Moderately intrusive	16-25		Any	CO1, CO2
	Highly intrusive	>25		Any	CO1, CO2
				>2 consecutive rest periods[1]	CO1, CO2, RO
OOHW Period 2					
Monday – Saturday: 10pm to 7am Sunday and public holidays: 6pm to 7am the following day (unless that day is a Sunday or Public Holiday, then to 8am)	Noticeable	<5	refer to Section 7.10 of CNVMP	Any	CO1
	Clearly audible	5-15		Any	CO1
	Moderately intrusive	16-25		Any	CO1, CO2
				>2 consecutive rest periods[1]	CO1, CO2, RO, AA
	Highly intrusive	>25		Any	CO1, CO2, RO
				>2 consecutive rest periods[1]	CO1, CO2, RO, AA

(1) Additional mitigation measure to be applied for the duration of the relevant out of hours works period.

PREDICTED VIBRATION			
Timing	**Duration**	**Exceedance of 'preferred' value**	**Exceedance of 'maximum value'**
OOHW Period 1:			
Monday – Saturday: 6pm to 10pm Sunday and public holidays: 8am to 6pm	Any	CO1, CO2	CO1, CO2, RO
OOHW Period 2			
Monday – Saturday: 10pm to 7am Sunday and public holidays: 6pm to 7am the following day (unless that day is a Sunday or Public Holiday, then to 8am)	Any	CO1, CO2, RO	CO1, CO2, RO, AA



MARTINUS

Head Office | 1/23-27 Waratah Street | KIRRAWEE NSW 2232

APPENDIX G

ISC Requirements

ISC CREDIT		WHERE ADDRESSED
NOISE (DIS-2)		
Level 1		
Benchmark	Measures to mitigate noise during construction and operation have been identified and implemented	- Section 7.10 - Appendix B, Section 1.6.3
Benchmark	Monitoring of noise is undertaken at appropriate intervals and in response to complaints during construction	- Section 8.2 - Section 8.4.1 - Appendix B, Section 4.1 - CEMP Section 6.4.4
Must Statement	The assessor must provide evidence to show that the requirements of the guideline have been met.	- Section 7.10
Must Statement	Noise goals are limits that must not be exceeded or noise levels that projects aim to keep within.	- Section 5 - Appendix B, Section 3.2
Level 2		
Benchmark	For construction, modelling and monitoring demonstrates no recurring or major divergences from the noise management process in ISC approved noise guidelines	- Section 3.2 - Section 7.2 - Section 5.1 - Appendix B, Section 4
Benchmark	For operation, modelling demonstrates no recurring or major exceedances of noise goals	An Operational Noise and Vibration Review (ONVR) will be prepared as required by condition of approval E89
Must Statement	A divergence from the noise management process is defined as a goal being predicted to be exceeded and one or more of the relevant mitigation measures not being implemented.	- Section 7 - Appendix B, Section 1.6.3
Must Statement	Implemented means implemented as part of the relevant construction activity, rather than in response to monitoring 'discovering' an exceedance.	- Section 7
Must Statement	A recurring divergence is defined as more than two divergences of a similar nature within a 12 month period. A major divergence is defined as a noise goal being predicted to be exceeded by more than 10 dBA and one or more of the additional mitigation measures not being implemented.	- Appendix B, Section 4.5
Must Statement	Exceedances are measured noise levels greater than 2 dBA above the noise goals. Recurring exceedances are defined as more than two exceedances of a similar nature within a 12 month period. Major exceedances are defined as exceeding noise goals or objectives by more than 10 dBA	- Section 2.2 (objectives) - Section 2.3 (targets) - Section 5.2 (objectives)
Must Statement	The following is applicable for projects that intend to apply guidelines supplementary to those currently approved by the ISC. An alternatives guideline analysis must be undertaken or reviewed by a SQP - considering that any approved guideline is used to set the benchmark and performance measures for the project's noise goals.	- Benchmark is based on the ICNG. Two additional guidelines are also considered - Section 3.2 - Inland Rail NSW Noise and Vibration Management Strategy (IRPL NVMS) (01-9000-PE-P11-ST-0003-V3.3) (ARTC, 2016); - Inland Rail NSW Construction Noise and Vibration Management Framework

ISC CREDIT		WHERE ADDRESSED
		(IRPL CNVF) (0-0000-902-EMN-00-SP-0001) (ARTC, 2023); - Section 5.1
Level 3		
Benchmark	For construction, modelling and monitoring demonstrates no divergence from the noise management process in ISC approved noise guidelines	- Section 3.2 - Section 5.1 - Section 7.2 - Appendix B, Section 1.6
Benchmark	For operation, modelling demonstrates no exceedances of noise goals.	- An Operational Noise and Vibration Review (ONVR) will be prepared as required by condition of approval E89
VIBRATION (DIS-3)		
Level 1		
Benchmark	Measures to mitigate vibration during construction and operation have been identified and implemented.	- Section 7.3 - Section 7.10 - Appendix B, Section 1.6.3
Benchmark	Monitoring of vibration is undertaken at appropriate intervals and in response to complaints during construction.	- Section 8.2 - Section 8.4 - Appendix B, Section 4.2
Must Statement	Vibration goals are limits that must not be exceeded or vibration levels which the project aims to keep within.	- Section 5.4 - Appendix B, Section 3
Level 2		
Benchmark	For construction, modelling and monitoring demonstrates no exceedances of vibration goals for structural damage to buildings and structures.	- Section 7 - Section 7.2
Benchmark	No physical damage has been caused to any buildings or structures by vibration caused by construction.	- Section 7.5
Must Statement	Exceedances are measured vibration levels above the vibration goals. Recurring exceedances are defined as more than two of a similar type within a 12 month period. Major exceedances are defined as more than doubling the vibration goals.	- Appendix B, Section 3.3 - Appendix B, Section 4.5
Must Statement	For Design and As Built, where the risk of vibration impacts from operations is insignificant, modelling of operational vibration impacts is not required. Suitable evidence to demonstrate that the risk vibration is insignificant must be provided for verification. Evidence could include an impact assessment, expert advice or a vibration management plan. Other types of evidence would also be appropriate. Modelling and monitoring of construction impacts would still be required unless vibration impacts generally can be shown to be low or nil materiality.	- Section 7.2 - An Operational Noise and Vibration Review (ONVR) will be prepared as required by condition of approval E89
Level 3		
Benchmark	For operation, modelling demonstrates no exceedances of vibration goals for human comfort criteria	An Operational Noise and Vibration Review (ONVR) will be prepared as required by condition of approval E89



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Head Office | 3B, 33-35 Belmont Street, Sutherland NSW 2232