



CENTRAL-WEST ORANA RENEWABLE ENERGY ZONE
NOISE AND VIBRATION
MANAGEMENT PLAN
CWO-PRO-050-ENV-PLN-000002 REV 02



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Terms and Definitions

Abbreviations	Expanded text
ACERENZ Network Operator	ACERENZ Network Operator has been selected by EnergyCo as the Network Operator for the Central-West Orana Renewable Energy Zone
ACJV D&C	A design and construct unincorporated Joint Venture of ACCIONA and COBRA
AIMS	ACCIONA Integrated Management System
AR	The Central-West Orana Renewable Energy Zone Transmission Project Amendment Report, dated March 2024
AVTG	<i>Assessing Vibration: A Technical Guideline</i> (DEC, 2006)
CCS	Community Consultation Strategy
CNVG	<i>Construction Noise and Vibration Guideline</i> (Transport for NSW, 2022)
CNVIS	Construction Noise and Vibration Impact Statements
CoA (Commonwealth)	Department of Climate Change, Energy, the Environment and Water's Conditions of Approval
Compliance audit	Verification of how implementation is proceeding with respect to an Environmental Management Strategy (EMS) (which incorporates the relevant approval conditions)
CSSI	The Critical State Significant Infrastructure, as described in Schedule 1, the carrying out of which is approved under the terms of the SSI-48323210 approval
CWO	Central-West Orana
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DPHI	Department of Planning, Housing and Infrastructure (NSW)
DPI (Fisheries)	Department of Primary Industries (Fisheries) (NSW)
EIS	The Environmental Impact Statement titled Environmental Impact Statement – Central-West Orana REZ Transmission Project, dated September 2023, including the Proponent's: - Amendment Report, dated March 2024 - Submissions Report, dated March 2024 - Biodiversity Development Assessment Report, dated March 2024 - Central-West Orana REZ Transmission Project Modification 1 – Request for minor modifications to the condition of approvals, dated September 2024 and additional information dated 11 October 2024 - Central-West Orana REZ Transmission Project Modification 2 – Request for modification to allow establishment of an additional operations facility, dated 22 October 2025 - Central-West Orana REZ Transmission Project Modification 3 – Request for minor administrative changes to reflect Strategic Offset delivery Agreement, dated 15 August 2025
EMS	Environmental Management Strategy
EnergyCo	The Energy Corporation of New South Wales constituted by Section 6 of the <i>Energy and Utilities Administration Act 1987</i> as the NSW Government statutory authority responsible for the delivery of NSW's Renewable Energy Zones

Abbreviations	Expanded text
Environmental Representative (ER)	A suitably qualified and experienced person independent of Project design and construction personnel employed for the duration of construction. The principal point of advice in relation to environmental performance of the Project and has the responsibility listed in the NSW Minister for Planning and Public Spaces' Conditions of Approval A12
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
EPL	Environment Protection Licence issued under the <i>Protection of the Environment Operations Act 1997</i>
EWMS	Environmental work method statement
ICNG	<i>Interim Construction Noise Guideline</i> (NSW Department of Environment & Climate Change, 2009)
L _{A90}	The noise level exceeded for 90% of the measurement period, typically considered the average minimum noise level and used to establish background noise levels
L _{Aeq} (15min)	The A-weighted equivalent continuous (energy average) A-weighted sound pressure level over a 15-minute period
L _A (max)	The A-weighted maximum noise level, measured using the fast time weighting on a sound level meter
LCVIMP	Landscape Character and Visual Impact Management Plan
MCoA (NSW)	NSW Minister for Planning and Public Spaces' Conditions of Approval
Minister, the	Minister for Planning and Public Spaces
NCA	Noise Catchment Area
NML	Noise Management Level
Non-conformance	Failure to conform to the requirements of Project system documentation including this Plan, EMS or supporting documentation
NPfI	<i>Noise Policy for Industry</i> (NSW Environment Protection Authority, 2017)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OOHW	Out-of-Hours Works
POEO Act	<i>Protection of the Environment Operations Act 1997</i> (NSW)
Project, the	The construction and operation of new electricity transmission infrastructure, new energy hubs and switching stations and ancillary works required to connect new renewable energy generation and storage projects within the Central-West Orana REZ to the NSW transmission network (referred to herein as 'the Project' or 'Central-West Orana Renewable Energy Zone Transmission project')
Reasonable and feasible	Available and capable of being implemented after consideration of cost, existing technology, logistics in light of the overall Project purpose, environmental impact, and ability to obtain all necessary approvals for implementation
RBL	Rating Background Level. The Rating Background Level for each period is the median value of the L _{A90} values for the period over all of the days measured. There is an RBL value for each period (day, evening and night)

Abbreviations	Expanded text
REMM	Revised Environmental Mitigation Measures, as listed in Appendix E of the Amendment Report
REZ	Renewable Energy Zone
RNP	<i>NSW Road Noise Policy</i> (NSW Department of Environment, Climate Change and Water, 2011)
RtS	Response to Submissions Report
SAP	Sensitive Area Plan
Secretary	Secretary of the NSW Department of Planning, Housing and Infrastructure or nominee, whether nominated before or after the date on which this approval was granted
Sensitive receiver	Defined as with the potential to be affected by noise from construction, including residences, classrooms, hospitals, places of worship, passive recreation areas such as outdoor grounds used for teaching, active recreation areas such as parks and sports grounds, commercial premises and industrial premises
SWL	Sound Power Level – the acoustic power output of a source expressed in decibels. Sound power level is calculated from measured sound pressure levels
SSI	State Significant Infrastructure
VDV	Vibration Dose Value



Document Control

This Noise and Vibration Management Plan is a controlled document, approved by the ACJV D&C Project Director. The Project Wide Lead is responsible for ensuring this plan is kept up to date for the Project, Project risks, activities and legislative requirements.

PROJECT AUTHORISATION

Authorisation				
Document Title	CENTRAL-WEST ORANA RENEWABLE ENERGY ZONE – NOISE AND VIBRATION MANAGEMENT PLAN			
Revision Number	REV 02			
Document Number	CWO-PRO-050-ENV-PLN-000002			
Discipline/Department	Project Wide Construction			
Originator	Acciona Construction Australia			
Review	Name	Position	Date	Signature
	Anthony Lusher	Environmental Approvals and Compliance Lead	11/12/2025	<i>Anthony Lusher</i>
Approval	Lorryn Williamson	Environment and Sustainability Manager	18/12/2025	Signed by: <i>Lorryn Williamson</i> 12B46C439F5743E...
Principal Endorsement	Grant Andersen	Project Director	18/12/2025	Signed by: <i>G. Andersen</i> 76C0982E0FB74E2...

DOCUMENT STATUS

Revision	Date	Pages	Revised by	Description
Rev A	03/06/2024	All	Oliver Gilroy-Sarkies	For NO and EnergyCo review
Rev B	17/09/2024	All	Mark Russell Erran Woodward	Updated to address final CoA For EnergyCo review
Rev C	04/11/2024	All	Erran Woodward Saad Khan	Updated for ER Review
Rev 00	16/01/2025	All	Erran Woodward	Updated following ER comments / incorporate OOHW Protocol
Rev 01	08/05/2025	All	Catherine Curlewis	Formatted from ACEREZ D&C to ACJV D&C in alignment with brand guidelines; respond to DPHI comments
Rev 02	10/12/2025	Multiple	Lauren Tompkins	Updated following Modification 2 and 3 determination



CONTROL AND RECORDS

The approved CWO-PRO-050-ENV-PLN-000002 Noise and Vibration Management Plan (NVMP) will be signed, and a pdf version will be uploaded and stored on the Project’s document management system in accordance with CWO-PRO-050-DOC-PLN-000001 the CWO Document and Records Management Plan.

UNCONTROLLED COPIES

Any uncontrolled hard copy documents are up to date at issue and are only issued to outside organisations, customers, etc., upon request and approval by a Workplace Manager. Such uncontrolled documents will be clearly marked “Uncontrolled Copy When Printed or Downloaded” and will not be subject to an update.

DISTRIBUTION

The Integrated Management System – Systems Representative on the Project is responsible for the controlled internal distribution of this document and changes. Personnel have access to the latest revision of the Plan through RIBCX.

GOVERNANCE AND AUTHORISATION

The NVMP intends to provide the framework and guidelines, to operate within the Central-West Orana REZ, to ensure integrity, coherence, and effective stakeholder interface management and required reporting as defined in the ACJV D&C Policies and Code of Conduct.

The Construction Director together with Senior Manager Environment and Sustainability are responsible for implementing this NVMP and ensure that the processes and associated documentation is applicable to the Project works undertaken and that it complies with the D&C Deed, Policies, code of conduct and legislative requirements. The NVMP is approved by the Project Director, who has overall accountability for the project control function.

RELATED DOCUMENTS

The key documents interfacing with this Plan that fall outside of the area of the NVMP are outlined in TABLE 0-1 belowTable 1-1.

TABLE 0-1 KEY INTERFACES WITH THIS PLAN

Plan	Interface
Environmental Management Strategy (MCoA (NSW) C1)	- Provides the strategic framework for environmental management of the Project - Identifies all statutory approvals that apply to the Project - Describe key roles, responsibilities authority and accountability



Plan	Interface
	• Sets out procedures to inform the community, local agencies of the environmental performance of the development, manage complaints, resolve disputes, response to any non-compliance or emergencies • Details the links to any strategies, plans and programmes • Details monitoring and reporting required under the approval
Community Communications Strategy (MCoA (NSW) A22)	• Describes how community and stakeholder engagement will be managed and facilitates communication about construction of the project with the community as well as relevant councils and agencies • Specifies the process for receiving, addressing, resolving and recording complaints



1 Introduction

1.1 CONTEXT

This Noise and Vibration Management Plan (NVMP or plan) has been prepared for the Central-West Orana Renewable Energy Zone (REZ) Transmission project (the Project).

This NVMP has been prepared to address the requirements of the:

- NSW Minister for Planning's Conditions of Approval (MCoA (NSW)) for the Project (SSI-48323210)
- The Project environmental impact statement (dated September 2023) (EIS)
- The Project Response to Submission report (dated March 2024) (RtS)
- The Project Amendment Report (dated March 2024) (AR), including Revised Environmental Mitigation Measures (REMMs)

In totality, the MCoA (NSW), CoA (Commonwealth) and REMMs are referred to as the 'Project requirements'.

This plan describes how ACJV D&C proposes to manage potential impacts on noise and vibration during the construction of the Project.

1.2 BACKGROUND AND PROJECT DESCRIPTION

The Project comprises the construction and operation of new electricity transmission infrastructure, new energy hubs and switching stations and ancillary works required to connect new renewable energy generation and storage projects within the Central-West Orana REZ to the NSW transmission network.

The EIS was prepared to assess the impacts of construction and operation of the Project. As part of the EIS development, a noise and vibration assessment (Technical Paper 9 – Noise and Vibration) was prepared to assess and address noise and vibration impacts relating to the Project. The findings of the noise and vibration impact assessment were summarised in Chapter 15 (Noise and Vibration) of the EIS.

A RtS was prepared in response to submissions received on the EIS. The RtS includes clarifications as well as further detail relating to noise and vibration management issues of the Project.

An AR was subsequently prepared to address Project changes resulting from submissions and design progress. The application of the AR was accepted on 11 March 2024.

The Project was declared Critical State Significant Infrastructure (CSSI) by the NSW Minister for Planning and Public Spaces (the Minister) on 23 November 2020 (amended in February 2023) in



accordance with Section 5.13 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and Section 23 in Schedule 5 of the *State Environmental Planning Policy (Planning Systems) 2021*.

The Project is also a controlled action and requires a separate approval from the Commonwealth Minister (or its delegate) for the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Project was approved by the Minister on 26 June 2024. This approval was updated to accommodate Modification 1 on 14 October 2024, Modification 2 on 22 October 2025 and Modification 3 on 15 August 2025.. Approval for the Project under the EPBC Act was granted by the Branch Head, Environment Assessments NSW and Act, of the DCCEEW on 8 August 2024 (EPBC 2022/09353).

ACJV engaged an acoustic specialist to conduct a review of the background noise monitoring conducted as part of the EIS, following project approval being granted. This review resulted in a recommendation of supplementary long-term (unattended) noise monitoring being conducted, which was subsequently undertaken to validate the noise monitoring from the EIS assessment and amend the EIS noise catchment areas to better represent the study area of interest.

The documents listed in the planning approval concluded that while efforts have been made to avoid impacts to noise and vibration, some impacts could not be avoided due to competing environmental and technical constraints. These impacts would be managed through the implementation of mitigation and management measures as described in this NVMP.

1.3 SCOPE

All ACJV D&C staff and subcontractors are required to comply with the requirements of this plan and related plans, over the full duration of the construction program.

This plan addresses the construction stage of works. Remaining stages, including operation, upgrading and decommissioning, will be addressed in a separate document, following approval from the Planning Secretary, in accordance with MCoA (NSW) C3.

1.4 INTERFACE WITH OTHER PLANNING DOCUMENTS

The key documents that interface with the NVMP are outlined in Table 1-1.

Table 1-1 Key interfaces with this plan

Plan	Interface
Environmental Management Strategy (MCoA (NSW) C1)	- Provides the strategic framework for environmental management of the development - Identifies all statutory approvals that apply to the development - Describes key roles, responsibilities authority and accountability

Plan	Interface
	- Sets out procedures to inform the community, local agencies of the environmental performance of the development, manage complaints, resolve disputes, response to any non-compliance or emergencies - Details the links to any strategies, plans and programmes - Details monitoring and reporting requirements under the approval
Community Communications Strategy (MCoA (NSW) A22)	- Describes how community and stakeholder engagement will be managed - Facilitates communication about construction of the Project with the community - Specifies the process for receiving, addressing, resolving and recording complaints
Blast Management Strategy (REMM NV2)	Details the manner in which any blasting required will be undertaken so that it will not generate unacceptable noise and vibration impacts or pose a significant risk to nearby structures and sensitive receivers
Accommodation Camp Management Plan (MCoA (NSW) B53)	- Provides detail of the proposed activities to be undertaken as part of the operation of the workforce accommodation camps - Provides detail on the hours of operation of the workforce accommodation camps
Traffic and Transport Management Plan (MCoA (NSW) B35)	- Provides details of transport routes, road upgrade works and associated management measures - Considers minimising traffic noise impacts
Heritage Management Plan (MCoA (NSW) B28)	- Details the measures to be implemented to avoid harm to known heritage items outside the approved construction area - Provides details on the measures to be implemented to protect known heritage sites within the construction area, in accordance with management activities identified in Table 3-2 of Appendix 3 of the MCoA (NSW), including management of potential impacts from blasting on heritage items - A program to monitor and report on the effectiveness of measures and any heritage impacts that may arise

1.5 PURPOSE

The purpose of this NVMP is to describe how the Project will manage potential impacts to noise and vibration during construction of the Project. The requirements of the MCoA (NSW) specifically relevant to the preparation of the NVMP are provided in Table 1-2.

This NVMP has been prepared to address applicable statutory requirements and aims to ensure that the commitments in the planning approval are met with regard to construction impacts to noise and vibration.

TABLE 1-2 MCOA (NSW) RELEVANT TO THE NVMP

MCoA (NSW)	Requirements	Document Reference	How addressed
B13	Prior to the commencement of construction, the Proponent must prepare a Noise and Vibration Management Plan to the satisfaction of the Planning Secretary. This plan must:	NVMP	This document, in its entirety, meets the requirement of this condition.

MCoA (NSW)	Requirements	Document Reference	How addressed
a)	Ensure the requirements in conditions B1 to B12 are complied with	Appendix A	Appendix A details how each condition (MCoA (NSW) B1 – B12) is addressed within this plan.
b)	Include a description of the reasonable and feasible measures that would be implemented to minimise noise and vibration impacts of the development	Table 10-1	Table 10-1 details the reasonable and feasible mitigation measures to minimise noise and vibration impacts relating to the Project.
c)	Include a detailed description of the noise and vibration management system for the development	Section 8.2	Section 8.2 details the noise and vibration management system
d)	Include a protocol for the identification, notification and management of works that exceed the noise management levels	Section 8.1 Table 10-1	Section 8.1 identifies the notification and management of works that exceed noise management levels.
e)	Include a monitoring program that evaluates and reports on the effectiveness of the noise and vibration management systems; and	Section 9	Section 9 details how works would be managed where predicted noise management levels (NMLs) are exceeded.
f)	Include an Out-of-Hours Work Protocol to identify a process for the consideration, management and approval of works outside the hours defined in conditions B1 and B9, which must: (i) Be prepared in consultation with the relevant Council (ii) Identify low risk activities that can be undertaken without the approval of the Planning Secretary and with the approval of the ER (iii) Identify high risk activities that must be approved by the Planning Secretary; and (iv) Identify Department, Council and community notification arrangements for approved out of hours work	Appendix C	An Out-of-Hours Works Protocol is included in Appendix C.
	Following the Planning Secretary's approval, the Proponent must implement the Noise and Vibration Management Plan	Section 1.3	This plan.

2 Environmental Requirements

2.1 LEGISLATION AND REGULATORY REQUIREMENTS

Legislation relevant to noise and vibration management for the Project includes:

- EP&A Act
- POEO Act
- EPBC Act

All other legislation relevant to this plan is included in Appendix A1 of the EMS.

2.2 GUIDELINES AND STANDARDS

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

TABLE 2-1 RELEVANT GUIDELINES TO THIS PLAN

Guideline	Reference
Interim Construction Noise Guideline (ICNG) (DECCW, 2009)	EIS Technical Paper 9 – Noise and vibration Table 4-1
NSW Road Noise Policy (RNP) (DECCW, 2011)	EIS Technical Paper 9 – Noise and vibration Table 4-1
Noise Policy for Industry (NPfI) (EPA 2017)	EIS Technical Paper 9 – Noise and vibration Table 4-1
Assessing Vibration: A Technical Guideline (AVTG) (DEC, 2006).	EIS Technical Paper 9 – Noise and vibration Table 4-1
Australian Standard AS 1055: Description and measurement of environmental noise	EIS Technical Paper 9 – Noise and vibration Table 4-1
ISO 8297 – Determination of Sound Power Levels of Multisource Industrial Plants for Evaluation of Sound Pressure Levels in the Environment (Engineering Method)	EIS Technical Paper 9 – Noise and vibration Table 4-1
German Standard DIN 4150-3: Structural Vibration – effects of vibration on structures	EIS Technical Paper 9 – Noise and vibration Table 4-1
British Standard BS 7385-2:1993 – Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (1993).	EIS Technical Paper 9 – Noise and vibration Section 2.5.2.2
Construction Noise and Vibration Guideline (CNVG) (Transport for NSW, 2022)	EIS Technical Paper 9 – Noise and vibration Section 2.5.2.2
Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)	EIS Technical Paper 9 – Noise and vibration Table 4-1
AS 2187.2 Explosives – Storage, Transport and use Part 2: Use of Explosives (AS2187.2).	EIS Technical Paper 9 – Noise and vibration Table 4-1



2.3 MINISTER'S CONDITIONS OF APPROVAL (NSW)

The MCoA (NSW) relevant to this plan are listed in Appendix A. A cross reference is also included to indicate where the MCoA (NSW) are addressed in this plan or other project management documents.

2.4 CONDITIONS OF APPROVAL (COMMONWEALTH)

No CoA (Commonwealth) are applicable to noise and vibration management.

2.5 REVISED ENVIRONMENTAL MITIGATION MEASURES

Relevant revised environmental mitigation measures (REMMs) are listed in Appendix B. A cross reference is also included to indicate where the REMM is addressed in this plan or other project management documents.



3 Consultation

3.1 CONSULTATION FOR NVMP PREPARATION

In accordance with MCoA (NSW) B13 (f)(i), the OOHW Protocol (Appendix C), which is required to form part of this NVMP, has been prepared in consultation with following councils:

- Dubbo Regional Council
- Mid-Western Regional Council
- Upper Hunter Shire Council
- Warrumbungle Shire Council

Consultation with each stakeholder, including responses received and how any issues raised were addressed in the development of this plan has been provided to the Planning Secretary along with the relevant document for submission.

3.2 ONGOING COMMUNITY CONSULTATION

ACJV D&C will use a range of tools as noted in the Community Communication Strategy (CCS) which was prepared in accordance with MCoA (NSW) A21, to facilitate ongoing consultation and communication with the community and stakeholders (including government agencies where necessary).

Communication tools include, but are not limited to, stakeholder briefings, project website, door knocks and project factsheets. Notifications will be issued for, but not limited to, the commencement of construction, significant milestones and major changes to the scope of work.

In accordance with MCoA (NSW) C17, project documents, including the EIS, approved strategies, plans, audits or programs required under the conditions of approval will be publicly available on the Project website. Where revision occurs to any of the publicly available documents, the document published on the Project website will be replaced with the most up to date revision.

3.3 NEGOTIATED AGREEMENTS

In accordance with MCoA (NSW) B2(c), an agreement with sensitive receivers (owners and occupiers) may be negotiated. Where multiple receivers are affected by the proposed works, a majority of the affected receivers must agree. Further details are provided in the OOHW Protocol in Appendix C.



4 Existing Environment

4.1 NOISE CATCHMENT AREAS

Long term (unattended) noise monitoring was undertaken in November 2022 as part of the Project’s Environmental Impact Statement (dated July 2023) at 10 locations to establish background noise levels within representative noise catchment areas adjacent to the Project. Noise Catchment Areas (NCAs) were established as part of the EIS (outlined in Section 2.2.2 of Technical Paper 9), in consideration of the existing ambient noise levels in the area, along with the type and uses of surrounding receptors.

ACJV D&C conducted a review of this monitoring data in June 2024 to ensure that the suggested locations are representative of the local environment, including potential noise from mines or roads. The review recommended supplementary monitoring at certain locations and amendments to the EIS noise catchment areas to better represent the study area of interest. In implementing these recommendations, unattended background noise monitoring was undertaken by Hutchison Weller from Tuesday 30th July 2024 to Wednesday 14th August 2024. Monitoring data was used to establish the Rating Background Level (RBL), which represents the average minimum background noise level for each measurement period, averaged over the measurement days, as well as to redefine the NCAs. These revised NCAs were table with DPHI and the Environmental Representative and will be utilised moving forward.

The revised NCAs are summarised in Table 4-1 and illustrated in Figure 4-1, the ARs amended noise and vibration study area at the Botobolar Microwave Repeater Station is shown in Figure 4-2.

Opportunities to further refine these areas may be investigated during construction of the Project. In the case of any further refinements, the revised NCAs will be validated by a qualified acoustician and finalised in consultation with the ER, and implemented as part of the Construction Noise and Vibration Impact Statement (CNVIS) process as described in Section 8.2.

TABLE 4-1 REVISED NOISE CATCHMENT AREAS (2004)

NCA	Region/description of environment
NCA 1	Goolma region, sparsely populated farmland
NCA 2	Elong Elong region, open farmland and bushland of Tuckland State Forest. Road noise from Spring Ridge Road
NCA 3	Orana region, sparsely populated farmland dominated by Castlereagh Highway or state conservation areas (EIS NCA3 with portion of EIS NCA 4 included)
NCA 4	Very low-density rural areas throughout project, consisting of either farmland or state conservation areas (truncated EIS NCA4)
NCA 5	Merotherie region, very low-density rural area/farmland or state conservation areas (boundary extended to include EIS NCA5 or portion of EIS NCA4)
NCA 6	Very low-density rural areas throughout project, consisting of either farmland or state conservation areas (new NCA created from portion of EIS NCA4)



NCA	Region/description of environment
NCA 7	Township and surrounding area of Ulan, dominated by mining and rail operations (truncated EIS NCA7 with addition of portion of EIS NCA4)
NCA 8	Township and surrounding area of Wollar, dominated by mining and rail operations (truncated EIS NCA8 with addition of portion of EIS NCA7)
NCA 9	Cassilis region, sparsely populated farmland dominated by Golden Highway (east). (truncated EIS NCA8)
NCA 10	Very low-density rural area north of Golden Highway, with Coolah township on northern border (former EIS NCA11)
NCA 11	Uarbry region, sparsely populated farmland dominated by Golden Highway (west) (formerly EIS NCA6)
NCA 12	Very low-density rural areas throughout project, consisting of either farmland or state conservation areas (new NCA created from former part of EIS NCA4)
NCA 13	Cassilis region, sparsely populated farmland dominated by Golden Highway (east). (new NCA created from former EIS NCA9)
NCA 14	Very low-density rural area north of Golden Highway, with Coolah township on northern border (New NCA created from portion of EIS NCA10)
NCA 15	Very low-density rural area north of Golden Highway, with Coolah township on northern border (New NCA created from portion of EIS NCA10)
N/A	Botobolar microwave repeater station

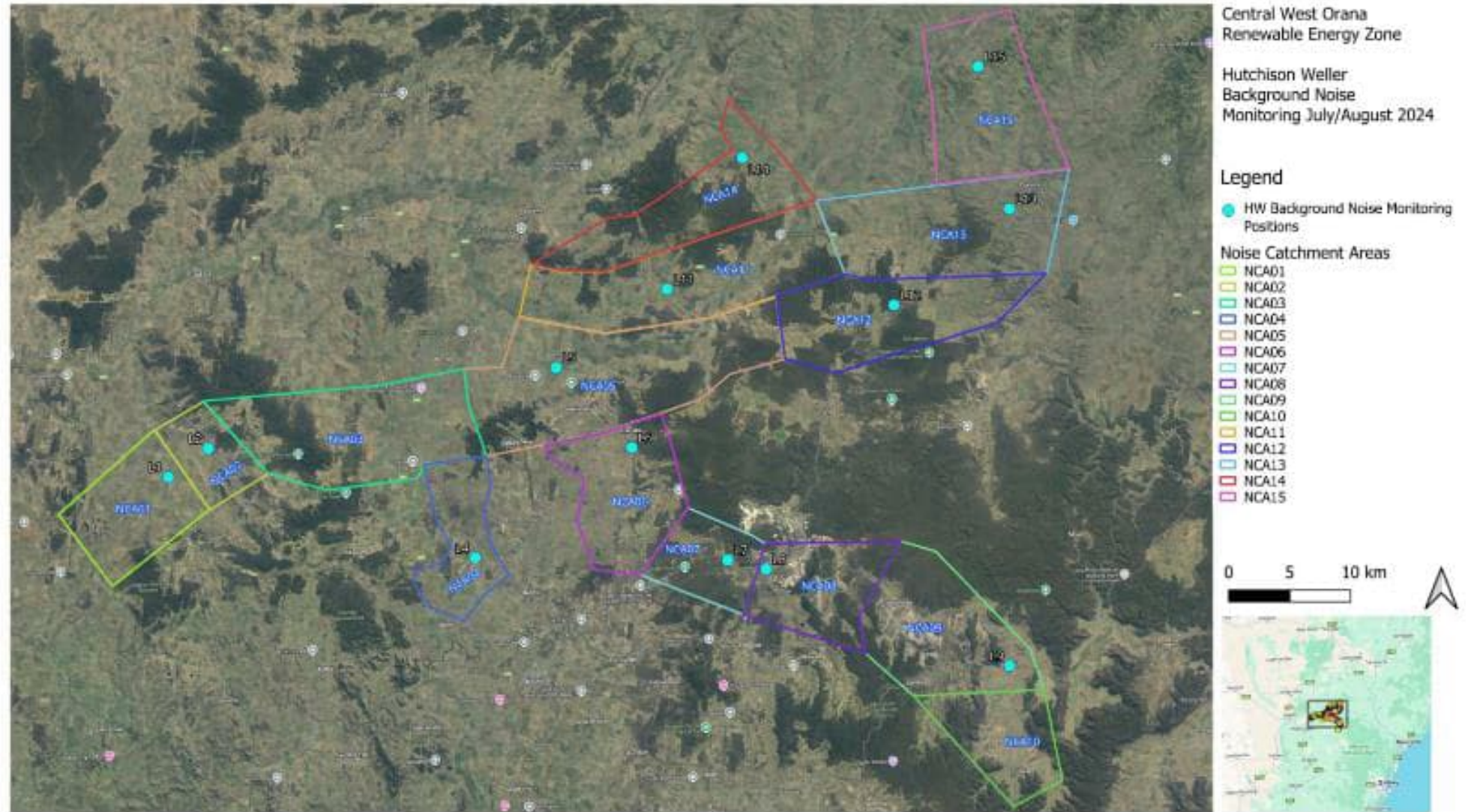


FIGURE 4-1:EIS NOISE CATCHMENT AREAS

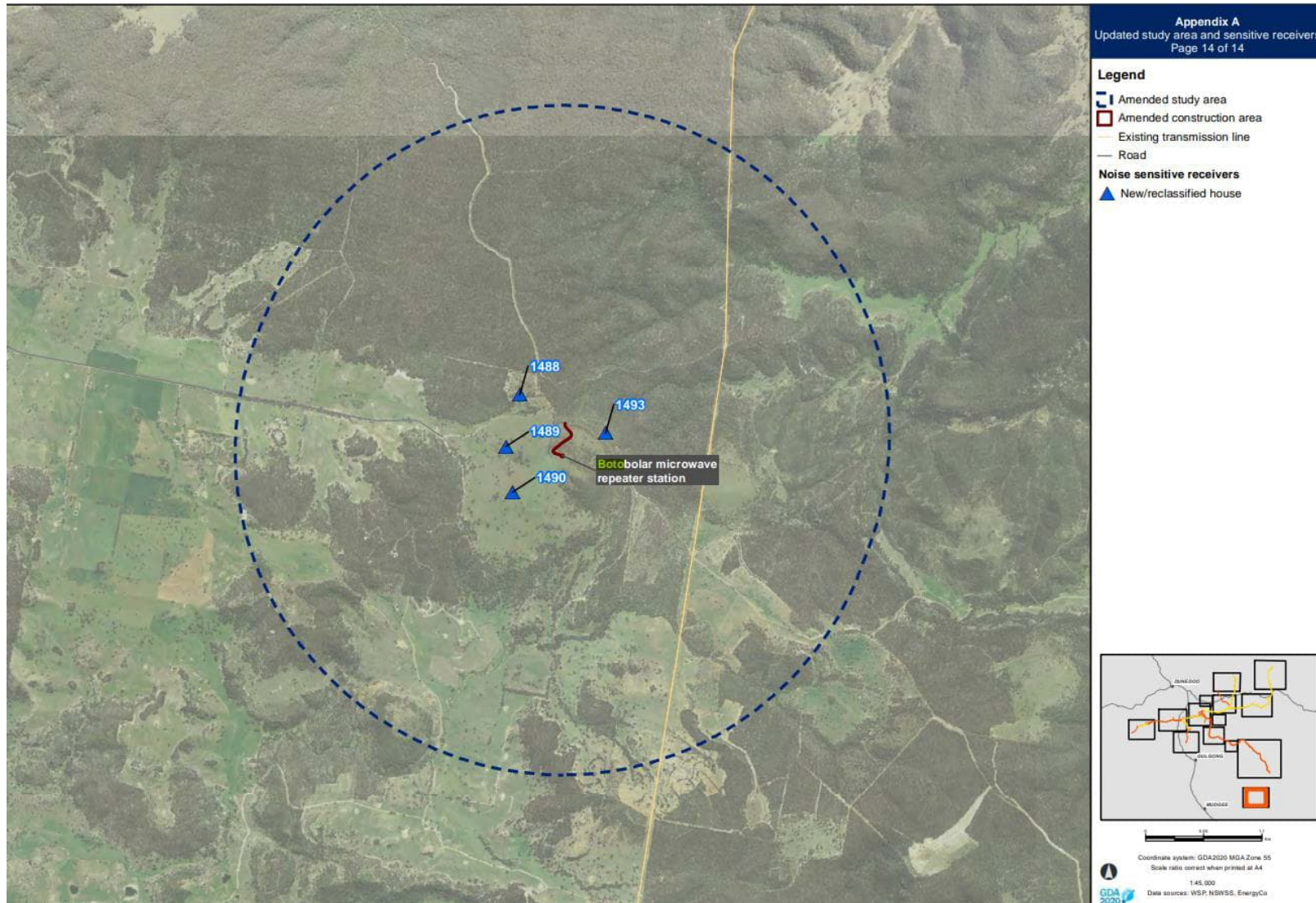


FIGURE 4-2: BOTOBOLAR MICROWAVE REPEATER STATION

4.2 AMBIENT NOISE ENVIRONMENT (RBL)

Baseline noise levels were established as part of the Project EIS (Section 15.3.2, EIS) through unattended background noise monitoring at representative locations. The primary activities which dominate the existing noise levels include a combination of natural noises (for example cicadas and other insects) and local traffic influences, main arterial roads in the construction area include the Golden Highway and the Castlereagh Highway.

The baseline information was used to establish the Rating Background Level (RBL), which represents the average minimum background sound level for each measurement period, averaged over the measurement days.

As discussed in Section 4.1, supplementary monitoring was undertaken in July/August 2024. Monitoring data was used to establish the Rating Background Level (RBL), which represents the average minimum background noise level for each measurement period, averaged over the measurement days.

The results demonstrate the majority of the background noise monitoring results did not change with the exception of monitoring positions: L01, L04 and L07.

- At L01, the evening period measured 3dB higher than the EIS noise measurement. The daytime and night period noise measurements were consistent.
- At L04, the evening and night period measurements were 4dB and 1dB higher than the EIS evening and night measurements respectively. The daytime measurements were consistent.
- At L07, all periods (day, evening, and night) recorded during supplementary noise monitoring measured lower than the EIS noise measurements.

The increase in measured noise levels at L01 and L04 may be attributed to an increase in ambient activity such as fauna, traffic. No unusual or temporary activities such as events, construction work, new roads or new developments were reported.

Similarly, the reduced measured noise levels at L07 may be attributed to a decrease in ambient activity. Nonetheless the most recent measured noise levels are representative of the current ambient conditions at these locations and should be used for assessment purposes.

Based on the outcome of this supplementary monitoring, noise catchment areas were adjusted as discussed in Section 4.1, and revised RBLs tabled with DPHI and the Environmental Representative. These revised RBLs are provided in Table 4-2 and will be adopted for the Project moving forward.

In the case of any further refinements, the revised RBLs will be validated by qualified acoustician and finalised in consultation with the ER, and implemented as part of the CNVIS process described in Section 8.2. Additional mitigation may be required during shoulder periods, as identified in the OOHV Protocol process described in Appendix C.

TABLE 4-2 REVISED BACKGROUND NOISE MONITORING RESULTS (2024)

NCA	RBL (dBA) ^{1,4}			Shoulder Period ³	
	Day ²	Evening ³	Night ³	Morning	Evening
NCA 1	35	33	30	N/A	35
NCA 2	35	30	30	-	-
NCA 3	35	30	30	-	-
NCA 4	35	34	31	N/A	35
NCA 5	35	30	30	N/A	N/A
NCA 6	35	33	30	N/A	35
NCA 7	35	30	30	33	33
NCA 8	35	34	34	N/A	35
NCA 9	35	34	30	35	35
NCA 10	35	34	30	35	35
NCA 11	35	30	30	30	31
NCA 12	35	30	30	30	30
NCA 13	35	30	30	30	32
NCA 14	35	30	30	30	30
NCA 15	35	30	30	30	N/A

1. RBLs for NCAs have been extracted from Technical Note (Hutchison Weller, 2024), except NCA 2. The RBL value for NCA 2 has been extracted from the EIS, refer to Table 15-1 of the EIS and Table 4-11 Technical paper 9 of the EIS due to damage to the noise meter during additional assessment
2. Time periods defined as – Day: 7 am to 6 pm Monday to Saturday, 8 am to 6 pm Sunday; Evening: 6 pm to 10 pm; Night: 10 pm to 7 am Monday to Saturday, 10 pm to 8 am Sunday
3. Shoulder periods defined as – Morning: 5am to 7am; Evening: 6pm-8pm
4. Where monitored background levels were below the minimum assumed RBLs outlined in the NPfI, these have been adjusted to 35 dBA during the day period, and 30 dBA during the evening and night periods

It is noted that the NPfI (EPA, 2017) states that where the rating background noise level is found to be less than 30 dB(A) for the evening and night periods, then it is set to 30 dB(A); where it is found to be less than 35 dB(A) for the daytime period, then it is set to 35 dB(A). This methodology has been reflected in the Table above.



4.3 SENSITIVE RECEIVERS & HIGHLY AFFECTED NOISE RECEIVERS

A definition of sensitive receiver is not provided in the EIS or Project Approval, however is defined in the ICNG as including:

- Residences
- Classrooms
- Hospitals
- Places of worship
- Passive recreation areas such as outdoor grounds used for teaching
- Active recreation areas such as parks and sports grounds

Other land uses that may at times be sensitive to noise from construction include:

- Commercial premises, such as film and television studios, research facilities, entertainment spaces, temporary accommodation (such as caravan parks and camping grounds), child care centres, restaurants, office premises and retail spaces
- Industrial premises

Sensitive receivers with the potential to be impacted by noise and vibration during construction of the Project were identified within the EIS (Technical paper 9), with the AR identifying an additional 16 new or reclassified sensitive receivers.

The number of highly noise affected (>75 dBA) was unchanged from the EIS (one) to the AR, however the individual receiver has changed; receiver 531 is now highly noise affected and sensitive receiver 539 is now in exceedance of standard hours NML by 8 dBA during standard hours.

The location of sensitive receivers as identified in the EIS and AR are provided in Appendix B.

5 Construction Hours

5.1 STANDARD CONSTRUCTION HOURS

In accordance with the ICNG and MCoA (NSW) B1, pre-construction minor works, road upgrades, construction, demolition, upgrading or decommissioning activities (excluding blasting) may only be undertaken as follows (unless approved in accordance with MCoA (NSW) B1 or permitted under MCoA B2 (refer to Section 5.2):

- a) 7am to 6pm – Monday to Friday;
- b) 8am to 1pm – Saturdays; and
- c) At no time on Sundays and NSW public holidays;

unless the Planning Secretary agrees otherwise.

In accordance with MCoA (NSW) B9:

Unless approved in accordance with condition B1, blasting may only be carried out on the site:

- a) between 9am and 5pm, Monday to Friday;
- b) between 9am to 1pm on Saturday; and
- c) no blasting is allowed on Sundays or NSW public holidays.

5.2 VARIATION TO STANDARD CONSTRUCTION HOURS

In accordance with MCoA (NSW) B2, the following construction, upgrading and decommissioning activities may be carried out outside the hours specified above:

- The delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- Emergency work to avoid the loss of life, property or prevent material harm to the environment
- Works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works
- Activities that do not result in noise affected sensitive receivers, as defined in Interim Construction Noise Guidelines (DECC, 2009)(or its latest version)
- Road upgrades required by the relevant road authority to be undertaken outside the standard construction hours
- Activities that require a network outage on another distribution or transmission network, and the operator of the network requires the outage and associated works outside standard construction hours



- Where different hours are permitted or required under an EPL in force in respect of the CSSI
- Works carried out in accordance with an Out-of-Hours Work Protocol in accordance with CoA B13 (f)(i)

Construction work is proposed to occur during standard construction hours, with potential extension to these hours (refer to Section 3.5.5 of the EIS). Any works proposed to be undertaken outside of the standard construction hours, except those otherwise allowed under MCoA (NSW) B2, will be undertaken subject to the requirements of the OOHW Protocol MCoA (NSW) B13(f) (refer to Appendix C).

Operation of the main construction compounds and accommodation camps will be required 24 hours, 7 days a week (as assessed in the EIS). Noise impacts associated with the construction and or operation of the accommodation camps and compounds is subject to MCoA (NSW) B7. As such, mitigation measures may be required either at the site or, in agreement with the receiver/s, via at-receiver property modifications. This will be documented as part of the CNVIS for those locations.

6 Noise and Vibration Criteria

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

- The ICNG (DECC, 2009)
- *Assessing Vibration: a technical guideline* (DEC, 2006)

Relevant elements of these documents are summarised in the sections below.

6.1 ICNG NOISE ASSESSMENT OBJECTIVES

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

6.2 ICNG NOISE MANAGEMENT LEVELS

6.2.1 Residential Premises

In accordance with the ICNG, reasonable and feasible work practices to minimise noise emissions are to be investigated where construction noise levels are predicted or measured to be above the relevant Noise Management Levels (NMLs) (the noise levels above which management measures are required to be considered).

The NML are set with reference to the time of day and RBLs (discussed in Section 4.2). The ICNG NMLs for residential sensitive receivers are provided in Table 6-1.

TABLE 6-1 NMLS FOR RESIDENTIAL RECEIVERS (ICNG)

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

Note 1: Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5m above ground level. If the property boundary is more than 30m from the residence, the location for measuring or predicting noise levels is at the most noise affected point within 30m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

6.2.2 Other Land Uses

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, such as hotels, are derived from AS/NZS 2107:2016 *Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors*.

Table 6-2 presents noise management levels for other non-residential land uses that have been identified within the Project area. The NMLs apply when the premises are in use during any assessment period.



Internal noise levels are assessed at the centre of the occupied room. External noise levels are assessed at the most affected point within 50m of the area boundary. Where internal noise levels cannot be measured, external noise levels may be used. A conservative estimate of the difference between internal and external noise levels is 10dB for buildings other than residences. Some buildings may achieve greater performance, such as where windows are fixed (i.e., cannot be opened).

TABLE 6-2 NOISE MANAGEMENT LEVELS FOR OTHER NON-RESIDENTIAL LAND USES

Sensitive receiver type	NML applicable when in use, LAeq, 15 min
Classrooms at schools and other educational institutions	Internal noise level 45 dB(A)
Commercial / industrial	External noise level 75 dB(A)

6.3 SLEEP DISTURBANCE CRITERIA

Where construction works are planned to extend over more than two consecutive nights, the potential for works to disturb sleep should be considered. Factors that may be important in assessing the extent of impact on sleep include how often high noise events occur at night, the predicted maximum noise levels, whether there are times when there is a clear change in the noise environment (such as during early morning shoulder periods), and the degree of maximum noise levels above the background noise level.

A night-time sleep disturbance ‘screening criterion’ noise goal of RBL + 15dB or 52dBA (whichever is higher) is used to identify the receivers where there is potential for sleep disturbance.

Where the sleep disturbance screening criterion is exceeded, further assessment is conducted to determine whether the ‘awakening reaction’ level of LAmax 55dBA internal (i.e. 65dBA external assuming an open window or 75dBA external assuming a closed window) would be exceeded and the likely number of these events. The awakening reaction level is the level above which sleep disturbance is considered likely.

The assessment of sleep disturbance during construction has applied the maximum noise level event criteria established by the NPfI being:

- *Leq(15min) 40 dBA or the RBL plus 5 dB, whichever is the greater*
- *L_{Fmax} 52 dBA or the RBL plus 15 dB, whichever is the greater*

Maximum noise impacts may cause awakening events (LAFmax criteria), while maintained elevated noise levels may reduce the quality of sleep (Leq(15min) criteria). The sleep disturbance criteria for the Project are shown in Table 6-3 and are based on the revised RBLs identified for each revised NCA.

TABLE 6-3 SLEEP DISTURBANCE CRITERIA, BASED ON REVISED RBLs.

Location	Night-time RBL dBA	L _{Aeq} (15min) criteria dB (sleep disturbance)	L _{AFmax} criteria dB (awakening)
NCA 1, 2, 3, 5, 6, 7, 9, 10, 11, 12, 13, 14 and 15	30	40	52
NCA 4	31	40	52
NCA 8	34	40	52

6.4 PROJECT SPECIFIC NOISE MANAGEMENT LEVELS

The Project-specific NMLs for residential receivers are outlined in Table 6-4 and are based on the revised RBLs identified for each revised NCA in Table 4-2.

TABLE 6-4 PROJECT SPECIFIC NOISE MANAGEMENT LEVELS FOR RESIDENTIAL RECEIVERS, BASED ON REVISED RBLs.

NCA	NMLs, L _{eq} (15min) dBA			
	Standard construction hours	OOH periods		
	Day	Day (OOH)	Evening (OOH)	Night (OOH)
NCA 1	45	40	38	35
NCA 2	45	40	35	35
NCA 3	45	40	35	35
NCA 4	45	40	39	36
NCA 5	45	40	35	35
NCA 6	45	40	38	35
NCA 7	45	40	35	35
NCA 8	45	40	39	39
NCA 9	45	40	39	35
NCA 10	45	40	39	35
NCA 11	45	40	35	35
NCA 12	45	40	35	35
NCA 13	45	40	35	35
NCA 14	45	40	35	35
NCA 15	45	40	35	35
Ulan Public School	Internal noise level 45 dB(A) when in use			
Dapper Fire Station	External noise level 75 dB(A) when in use			

6.5 VIBRATION CRITERIA

Vibration criteria relate to:

- Cosmetic building damage (and structural damage in extreme cases)
- Loss of amenity due to perceptible vibration, termed human comfort
- Impacts on the condition and structural integrity of sensitive structures

Cosmetic damage is considered minor in nature as it is readily repairable and does not affect a building's structural integrity. It is described as hairline cracks on drywall surfaces, hairline cracks in mortar joints and cement render, enlargement of existing cracks, and separation of partitions or intermediate walls from load bearing walls. If there is no significant risk of cosmetic building damage, then structural damage is not considered a significant risk and is not assessed.

In accordance with MCoA (NSW) B6, mitigation measures will be implemented with the aim of achieving the vibration limits as per:

- *Vibration criteria established using the Assessing vibration: a technical guideline (DEC, 2006) (for human exposure)*
- *BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings Part 2 as they are "applicable to Australian conditions"*
- *Vibration limits set out in the German Standard DIN 4150-3: Structural Vibration – Effects of Vibration on Structures (for Structural Damage)*

6.5.1 Cosmetic Damage

Australian Standard AS2187.2-2006 *Explosives – Storage, Transport and Use* provides guidance for the assessment of cosmetic damage to buildings caused by vibration. This section of the standard is based on the British Standard BS 7385-2:1993 – *Evaluation and Measurement for Vibration in Buildings* and is used as a guide to assess the likelihood of building damage from ground vibration including piling, compaction, construction equipment and road and rail traffic.

Table 6-5 presents the guideline limits for cosmetic damage for short term vibration.

TABLE 6-5 TRANSIENT VIBRATION GUIDE VALUES FOR COSMETIC DAMAGE (BS 7385)

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

Note: values referred to are at the base of the building

The guidance values in Table 6-5 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 that it gives rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table 6-5 may need to be reduced by up to 50 percent.

6.5.2 Heritage Receivers

Guidance for more sensitive structures or vibration sensitive activities is outlined in the German Guideline, DIN 4150-3. For the assessment purposes at this stage, DIN 4150-3 will be considered. With regard to heritage structures, BS 7385 states that 'a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive' and therefore items should not be assumed to be sensitive to vibration on the basis of being classified a heritage site alone. Item specific vibration criteria would be developed following conditions inspection of each identified heritage site.

Structural damage within such structures may reasonably be expected to be avoided where vibration velocities within the structure do not exceed three millimetres per second (mm/s) for vibration frequencies between 1 to 10 Hz.

Item-specific criteria may be determined and used in lieu of the generic criteria above, on a case-by-case basis in consultation with structural engineer and/or heritage specialist.

6.5.3 Human Comfort

Potential human comfort impacts from vibration are considered using a vibration dose value (VDVs) above which it is considered there is a risk that the amenity and comfort of people occupying buildings would be affected by vibration from construction works.

Acceptable vibration dose values for intermittent vibration taken from AVTG are presented in Table 6-6. Preferred and maximum values for continuous and impulsive vibration are presented in Table 6-7.

TABLE 6-6 VIBRATION LIMITS (HUMAN EXPOSURE) FOR INTERMITTENT VIBRATION (M/S^{1.75})

Location	VDV day (7 am – 10 pm)		VDV night (10 pm – 7 am)	
	Preferred	Maximum	Preferred	Maximum
Residences	0.20	0.40	0.13	0.26
Schools, educational institution	0.40	0.80	0.40	0.80

TABLE 6-7 PREFERRED AND MAXIMUM VALUES FOR CONTINUOUS AND IMPULSIVE VIBRATION

Location	Assessment period	RMS acceleration m/s ²				Peak particle velocity (mm/s)	
		Preferred values		Maximum values		Pref. values	Max. values
		z-axis	x and y axes	z-axis	x and y axes		
Continuous vibration							
Residences	Day 7 am – 10 pm	0.010	0.0071	0.020	0.014	0.28	0.56
	Night 10 pm – 7 am	0.007	0.005	0.014	0.010	0.20	0.40
Schools, educational institution	All	0.020	0.014	0.040	0.028	0.56	1.1
Impulsive vibration							
Residences	Day 7 am – 10 pm	0.3	0.21	0.60	0.42	8.6	17.0
	Night 10 pm – 7 am	0.10	0.071	0.20	0.14	2.8	5.6
Schools, educational institution	All	0.64	0.46	1.28	0.92	18.0	36.0

6.6 MINIMUM WORKING DISTANCES

The CNVG summarises the relevant minimum working distances for certain vibration intensive plant and equipment with regard to cosmetic damage and human comfort impacts. These distances have been calculated according to the BS 7385 for cosmetic damage and AVTG for human comfort impacts. In relation to human comfort, the nominated minimum working distances relate to continuous vibration. For most construction activities, vibration emissions are intermittent and higher vibration levels over shorter periods are acceptable.

Table 6-8 indicates the minimum working distances for typical items of vibration intensive plant and equipment applicable to this project. The minimum working distances presented are indicative and would vary depending on the item of plant and local geotechnical conditions. The cosmetic damage thresholds apply to typical buildings under typical geotechnical conditions.

TABLE 6-8 MINIMUM WORKING DISTANCES FOR VIBRATION INTENSIVE PLANT (ADAPTED FROM CNVG, TFNSW, 2022)

Plant items	Rating/description	Minimum working distance (metres)		
		Cosmetic Damage (BS7385) ¹	Heritage (DIN 4150-3) ¹	Human comfort (AVTG)
Small hydraulic hammer	300 kg – 5 to 12 tonne excavator	2	5	7
Medium hydraulic hammer	900 kg – 12 to 18 tonne excavator	7	15	23
Large hydraulic hammer	1600 kg – 18 to 34 tonne excavator	22	44	73
Pile boring	≤800 mm diameter	2	5	n/a
Vibratory Pile Driver	Sheet piles	2-20	5-40	20
Vibratory roller	<50 kN (typically 1-2t)	5	11	15-20
	< 100 kilonewton (typically 2-4 tonnes)	6	16	20
	<200kN (typically 4-6t)	12	25	40
	<300kN (typically 7-13t)	15	31	100
	> 300 kilonewton (typically 13-18 tonnes)	20	54	100
Jackhammer	Hand held	1	3	2

6.7 CONSTRUCTION ROAD TRAFFIC NOISE

Section 4.2.1.4 of Technical paper 9 – Noise and Vibration of the EIS notes that traffic impacts associated with construction are assessed using guidance from the Road Noise Policy (RNP). The RNP makes a distinction between the assessment of freeway/arterial/sub-arterial roads and local roads. Table 6-9 presents a summary of applicable road traffic criteria for residential receivers identified in Table 3 of the RNP.

In considering feasible and reasonable mitigation measures where the relevant noise increase is greater than 2 dBA, consideration would also be given to the actual noise levels associated with total traffic (i.e. existing traffic + construction traffic) and whether or not these levels comply with the road traffic noise criteria in the RNP, shown overleaf.

TABLE 6-9 ROAD TRAFFIC NOISE CRITERIA FOR RECEIVERS ON EXISTING ROADS AFFECTED BY THE ADDITIONAL TRAFFIC

Road Type	External road traffic noise criteria ¹	
	Day 7 am – 10 pm	Night 10 pm – 7 am
Freeway/arterial/sub-arterial roads	60 dBA L_{Aeq} (15hr) and increase >2 dB	55 dBA L_{Aeq} (9hr) and increase >2 dB
Local roads	55 dB L_{Aeq} 1hr and increase >2 dB	50 dB L_{Aeq} 1hr and increase >2 dB

Note: 1. Values have been extracted from the EIS; refer to Table 4-6 in technical paper 9 of the EIS. 2. Façade corrected noise levels

6.8 BLASTING CRITERIA

Blasting events have the potential to result in brief ground vibration and air overpressure impacts at nearby receivers. The ICNG requires vibration and overpressure from blasting to be assessed against the *ANZECC Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990). The criteria in the ANZECC guideline are applicable to long-term operations, such as those at mining sites and quarries, and are targeted to protect human comfort from vibration. As a result, guideline levels can be considered conservative in the context of construction, which typically occur for much shorter time periods. Consistent with the ANZECC guideline, the MCoA (NSW) B10 details the vibration and overpressure limits which are reproduced below.

- Vibration Peak Particle Velocity (PPV): 5 mm/s - The PPV level of 5 mm/s may be exceeded up to 5 per cent of the total number of blasts over a period of 12 months. The level should not exceed 10 mm/s at any time.
- Airblast overpressure: 115 dBL - The level of 115 dBL may be exceeded on up to 5 percent of the total number of blasts over a period of 12 months. The level should not exceed 120 dBL at any time.

Further detail on the management of blasting activities will be discussed in the Blast Management Strategy (BMS) prepared in accordance with REMM NV2.

7 Environmental Aspects and Impacts

7.1 CONSTRUCTION ACTIVITIES

The general categories of construction activity likely to interact with nearby sensitive receivers are described in Table 7-1.

TABLE 7-1 ASPECTS AND IMPACTS TABLE RELEVANT TO NOISE AND VIBRATION

Aspects	Potential Impacts
Construction of transmission lines and access tracks	Construction of the transmission line tower foundations would involve excavation and piling work. This work stage would occur progressively along the alignment. Activities likely to impact on noise and vibration include: • <i>Vegetation clearing and grubbing activities</i> • <i>Concrete piling</i> • <i>Tower assembly (including the use of rattle guns) and stringing</i> • <i>Movement of vehicles including light and heavy vehicles</i> • <i>Earthworks for track and pad construction</i> • <i>Blasting, at small areas along the transmission line</i>
Construction of energy hubs and New Wollar Switching Station	Bulk earthworks to establish the landform (or pads) for the energy hubs and switching station. Activities likely to impact on noise and vibration include: • <i>Vegetation clearing and grubbing activities</i> • <i>Surface grading and compaction</i> • <i>Blasting</i> • <i>Crushing and grinding</i> • <i>Establishment of access points and water supply points</i> • <i>Topsoil/rock material handling including stockpiling, material and spoil loading and material and spoil haulage</i>
Construction of switching stations	Bulk earthworks to establish the landform (or pads) would be undertaken in the early stages of construction at each site. Activities likely to impact on noise and vibration include: • <i>Vegetation clearing and grubbing activities</i> • <i>Surface grading and compaction</i> • <i>Blasting</i> • <i>Establishment of access points and water supply points</i> • <i>Topsoil/rock material handling including stockpiling, material and spoil loading and material and spoil haulage</i>
Construction and operation of construction compounds	Each construction compound is a base for construction activities, usually for the storage of plant, equipment and materials, and/or construction site offices and worker facilities. It can also comprise concrete batching plant, crushing, grinding and screening plant, testing laboratory and wastewater treatment plant.
Construction and operation of workforce accommodation camps	Establishment of workforce accommodation camps would include surface preparation and installation of buildings, recreation facilities, sewage & wastewater treatment and water treatment facilities.

Aspects	Potential Impacts
Materials Transport	Heavy vehicles will be required to transport materials within, and to/ from the Construction area, potentially resulting in increases in construction and/or traffic noise on existing roads.
Concrete batching	Concrete batching will require heavy infrastructure and consistent movement of heavy vehicles for delivering batch inputs to the site and removing the product to its required location on the Project.
Microwave repeater works	Earthworks to establish the microwave repeater site would be undertaken in the early stages of construction at each site. Activities likely to impact on noise and vibration include: • <i>Vegetation clearing and grubbing activities</i> • <i>Earthworks for track and base construction</i> • <i>Piling</i> • <i>Antenna installation</i> • <i>Movement of vehicles including light and heavy vehicles</i>
Road Upgrades	Road and intersection upgrades are required to ensure safe access to construction sites and the movement of oversize and overmass (OSOM) equipment for the Project. Activities likely to impact on noise and vibration include: • <i>Vegetation clearing and grubbing activities</i> • <i>Surface grading/ rolling and compaction</i> • <i>Earthwork, including excavation, scraping and crushing</i> • <i>Road base installation, including asphalt paving, rolling</i>

7.2 OUT OF HOURS CONSTRUCTION ACTIVITIES

The workforce accommodation camps would be operational 24 hours a day, seven days a week to provide accommodation for the workforce. In addition (but not limited to), the following out of hours work would be required at certain locations within the construction area to satisfy third party or safety requirements or to accommodate specific long lead items:

- Stringing of transmission lines across a main road or railway or other infrastructure
- Transmission line construction within areas currently forming part of mining operations, to coordinate works with 24/7 mining operations
- Where road occupancy licences are required
- Transmission line cutover or commissioning
- The delivery of equipment or materials as requested by police or other authorities for safety reasons (such as the delivery of transformer units)
- Oil filling of the transformers at energy hubs
- Emergency work to avoid the loss of lives and/or property and/or to prevent environmental harm
- Work timed to correlate with system planning outages (likely 24-hour operations when required to minimise impact to electrical supply services)
- Situations where agreement is reached with affected receivers



- Potential utilities adjustment works (in consultation with the requirements of asset operators)
- Large concrete pours (including concrete batching plant operation which may require commencement before 7 am for early pours)
- Any works that do not exceed the applicable noise management levels in accordance with the ICNG

Throughout construction, a program will be used to identify the required night work periods (including dates and durations).

Refer to the Out OOHW Protocol (Appendix C) for detail on the management of OOHW.

7.3 POTENTIAL CONSTRUCTION NOISE IMPACTS

During construction, airborne noise impacts would be minor for most construction activities at energy hubs and switching stations. Noise levels are predicted to comply with NMLs during daytime (standard) hours at the majority of noise sensitive receivers in the study area, however when works are undertaken outside standard working hours, noise levels are predicted to be more noticeable and more likely to exceed NMLs.

Generally, earthworks associated with establishing transmission line tower foundations, energy hubs and switching stations are identified as the noisiest work stage during construction. Use of drones for stringing transmission lines between towers may be required for short periods and would progress along the alignment. Where required, this activity would result in some exceedances of NMLs during the daytime (including OOH daytime). However, these impacts would be short term and this activity would not typically be undertaken during evening or night-time hours unless in accordance with MCoA (NSW) B2.

7.3.1 Accommodation Camps

During the construction of the Neeleys Lane accommodation camp, a minor exceedance of NMLs is predicted at one receiver during standard construction hours. and up to four should OOHW be required.

At Merotherie accommodation camp, impacts are generally expected to be minor with one exceedance (0-10dB) predicted during standard working hours. If OOHW are conducted, exceedances (0-15dB) may be experienced at up to four properties located within NCA 5.

7.3.2 Local Road Upgrades

Due to the large separation distances between the local road upgrades and the nearest noise sensitive receivers, construction noise impacts are generally expected to be minor with exceedances at up to four receivers predicted during standard working hours across multiple NCAs. If OOHW is conducted, exceedances may be experienced at nearby sensitive receivers.



7.4 POTENTIAL CONSTRUCTION VIBRATION IMPACTS

For the transmission line works, it was found that human comfort impacts may potentially be experienced at one residential building located in proximity to the construction area. These impacts are predicted at the nearest receivers to the transmission line corridor and likely to be highest during earthworks where vibratory rollers are proposed (namely site access works and transmission line tower foundations).

Up to nine structures have been identified within the recommended minimum safe working distances for potential cosmetic damage across multiple work stages. All identified buildings are unoccupied structures such as sheds and unoccupied dwellings, and as such are not expected to generate impacts to human comfort. One of these structures is located in close proximity to a brake and winch site, and six structures are located close to access track works.

Three non-Aboriginal heritage items have been identified within the recommended minimum safe working distances.

One heritage item is expected to be located within the minimum safe working distance for transmission line construction, in NCA 6. The vibration sensitivity of this item is currently unknown and would be assessed as design progresses and in accordance with the relevant project requirements. Further detail can be found in the Project Heritage Management Plan.

7.5 BLASTING

There is the potential for blasting to be required at the Merotherie and Elong Elong energy hubs, switching stations and small areas along the transmission line alignment. This would most likely include the Cassilis, Coolah, Leadville and Merotherie Energy Hub—Elong Elong Energy Hub connections, based on the current understanding of geotechnical conditions.

Areas requiring blasting would be confirmed during detailed construction planning. Controlled blasting typically involves pre-drilling a series of closely spaced holes which are loaded with a small amount of explosives that are then detonated to break the rock into removable pieces. Blasting will be addressed within the Blast Management Plan. The Blast Management Plan will also detail the required consultation and notification requirements for sensitive receivers which may be impacted.

7.6 CONSTRUCTION TRAFFIC NOISE

Technical Report 9 – Noise and Vibration of the EIS noted the following potential worst-case impacts:

Overall, 32 receivers are predicted to exceed criteria, with 1 exceeding day and night local road noise exceedance, two exceeding night-time local road noise exceedance only and 29 exceeding the base main road noise criteria and experiencing an increase of more than 2 dB during night time hours (as outlined in Table 6-9). These numbers may vary slightly as a result of the revised RBLs and revised NCA's.

8 Noise and Vibration Management System

8.1 EXCEEDANCE OF NOISE MANAGEMENT LEVELS

If construction activities are identified that are likely to exceed the relevant ICNG (DECC 2009) construction NMLs or sleep disturbance criteria at any sensitive receivers, additional reasonable and feasible measures, aimed at reducing construction noise below the relevant criteria, would be implemented prior to commencing such works, in accordance with this plan and in particular the measures specified in Table 10-1, unless otherwise agreed with the Planning Secretary.

Works likely to generate noise levels that exceed applicable noise management levels at sensitive receivers would be scheduled during standard construction hours, wherever practicable, or in accordance with the OOHV Protocol (Appendix C).

Where exceedances of noise management or vibration levels are predicted, residents/sensitive receivers will be notified of construction activities that are likely to affect their noise and vibration amenity.

This proactive communication will include:

- The types of activities to be undertaken and equipment used
- The timing of activities including expected start and finish
- The location of activities
- Likely impacts of the activities and applicable mitigation measures
- Details of the community information line and how to make an enquiry and/or a complaint

Notification of OOHV will also be undertaken in accordance with the notification requirements of the OOHV Protocol (Appendix C). A range of tools will be utilised to communicate with the community and stakeholders and will include community and stakeholder notifications, email and door knocks.

Monitoring will be undertaken as described in Section 9.

8.2 NOISE AND VIBRATION MODELLING

A project-specific construction noise and vibration management tool will be developed to calculate the potential noise and vibration impacts for construction activities.

The tool will be responsible for modelling the construction scenarios pertaining to that site/activity, considering plant and equipment and their source noise emission (Sound Power Levels, LW or SWL), and the distance to potentially affected receivers.

The tool will also estimate whether any sensitive receivers are within minimum working distances from the proposed construction activities.

The tool will:

- Consider the location of the proposed activities
- Consider the noise and vibration generating activities that will take place and determine if they are low/moderate or high-risk activities
- Assess the predicted noise and vibration levels against the relevant management levels
- Identify feasible and reasonable mitigation and management measures in accordance with the ICNG
- Be based upon reasonable worst-case scenario

Noise and vibration monitoring results for monitoring undertaken as described in Section 9 will be compared against the predictions, where applicable, to validate and, where required, identify amendments of the predictive modelling tool.

8.3 CONSTRUCTION NOISE AND VIBRATION IMPACT STATEMENTS

CNVIS will be prepared for key construction areas, areas of specific sensitivities or criteria, or where there are major changes in construction method that may need further consideration and assessment. The CNVIS will assess potential noise and vibration impacts by using the outcomes of the noise modelling tool and the safe work distances for vibration intensive plan, and applying relevant mitigations to ensure compliance with noise and vibration criteria discussed in Section 6.

Each CNVIS will generally consider:

- Proposed scope of works for the location, including assessment of realistic and/or worst-case scenario activities generating the highest noise or vibration impacts
- Proximity and type of sensitive receivers/land uses
- The effects of noise shielding provided by noise barriers or natural topographic features
- Predicted levels for construction scenarios at sensitive receiver groups
- Predicted exceedances against the noise and vibration goals
- Mitigation options and preferred management measures, including those measures identified through consultation with affected sensitive land users
- Safe working distances for vibration intensive activities or further investigation, monitoring and mitigation to be applied where these cannot be met
- Activity specific monitoring requirements if required

In accordance with MCoA (NSW) B8, where a CNVIS indicates a sensitive receiver may potentially exceed the 'highly noise affected' noise management level (as per ICNG (DECC, 2009)) mitigation measures must be implemented with the objective of reducing construction noise below this level at



each relevant sensitive receiver. Activities that would exceed this level must not commence until the measures identified have been implemented, unless otherwise agreed with the Planning Secretary.

8.4 CONSTRUCTION BLASTING

Construction blasting has been assessed within the EIS (see EIS Technical Paper 9 – Noise and vibration Section 5.3). Where blasting is required, it will be managed in accordance with the Blast Management Strategy, prepared in accordance with REMM NV2. The Blast Management Strategy will address the blasting criteria defined in MCoA (NSW) B10, and site-specific methodology, and will need to consider local ground conditions, topography and proximity to sensitive receivers.

Blasting hours are described in MCoA (NSW) B9 (as discussed in Section 5).

Blast design will be prepared in consideration of the blast criteria described in Section 6.8. In order to comply with this criteria, the blast design may be modified to reduce the scale of each blast, increase overburden or other design mechanisms that will be determined by an appropriately experienced blast specialist.

8.5 CONSTRUCTION TRAFFIC

In accordance with MCoA (NSW) B5, mitigation measures must be implemented with the aim of achieving the road traffic noise assessment criteria for land uses from NSW RNP (DECCW, 2011).

The RNP provides criteria for noise impact for residential and non-residential land users, for day and night time periods. It also provides a 'relative increase criteria' for residential land uses of 12 dB, and notes that "for road projects where the main subject road is a local road, the relative increase criterion does not apply."

As the assessment carried out in the EIS was for the worst-case scenario, it is likely that there will be times during construction when less vehicle movements are required and/or the construction peak occurs during the day-time period, resulting in reduced road traffic noise impacts. The mitigation measures outlined below will be implemented where reasonable and feasible, with the aim to achieve the road traffic noise assessment criteria for land uses from NSW RNP (DECCW, 2011).

Proposed mitigation measures include:

- Designation of dedicated traffic routes
- Limiting traffic movements to daytime periods as far as reasonable and feasible
- Minimising traffic movements by ensuring full loads
- Use of busses from main sites, offices and accommodation camps, to minimise personal vehicle use to get to work areas
- Use of accommodation camps located centrally to the work areas, rather than in-town or remote accommodation



Noting much of the site access routes will be off-road access tracks (which may be unpaved), vehicle speed reductions will be in place for safety and environmental management (for example, dust generation). This will also result in reduced vehicle noise emissions.

Transmission line construction areas will be transient in impact, as the works are completed and progressed to a new location, however further mitigation measures in areas of long-term impact (such as main sites, offices and accommodation camps) will be considered in response to community feedback.

Further information on traffic reduction measures is available in the Traffic and Transport Management Plan prepared in accordance with MCoA (NSW) B35.

8.6 ACCOMMODATION CAMPS

In accordance with MCoA (NSW) B7, where a sensitive receiver is identified as potentially exceeding the construction 'noise affected' noise management level or sleep disturbance criteria as result of construction and or operation of the accommodation camps, mitigation measures must be implemented. Activities that would exceed the 'noise affected' noise management level or sleep disturbance criteria during construction or operation of these facilities must not commence until the measures identified have been implemented, unless otherwise agreed with the Planning Secretary.

A detailed CNVIS for the construction and operation of the camps will be prepared to address the requirements of MCoA (NSW) B7. The assessment will separately assess noise and or vibration impacts associated with the site establishment, staging and operation of the camp to understand the scale and duration of potential impacts.

Reasonable and feasible mitigation measures that are considerate of the level, duration, time (standard hours or OOHV) and particularly sensitivities of impacted receivers will be detailed and implemented as outlined in CNVIS, such as:

Construction and site establishment

- Consultation with affected receivers to identify:
 - Any specific health conditions that could be exacerbated by adverse noise and vibration impacts
 - Occupants that may have periods of the day that are more sensitive (sleep, studying)
 - Understand times of use / occupancy, i.e. or shift workers
 - Establish preferred communication methods to facilitate ongoing consultation
- Based on the information collected above, the scheduling and staging of works will be reviewed to prioritise noisy works during the least sensitive periods of the day, where possible
- Temporary barriers will be constructed around stationary plant and equipment where the item is predicted to result in an exceedance of the NMLs
- Schedule deliveries to defined hours and ensure these requirements are clearly communicated to impacted receivers



Operation

- Mitigation and management measures as outlined above for the construction / site establishment will be implemented
- The design and arrangement of the accommodation camps will be optimised to maximise shielding of plant and vehicles to nearby receivers where possible
- Reasonable and feasible property treatments to bedrooms will be considered if long term exceedances outside of standard construction cannot be managed at the source. Property treatments will only be considered where the property condition and or option for treatment provides a noticeable benefit.

9 Monitoring of Management Systems

9.1 MONITORING PROGRAM

The impacts and environmental performance of the Project relevant to noise and vibration, including the effectiveness of the management systems, will be monitored through the monitoring program outlined in Table 9-1. It is noted that the undertaking of monitoring activities may be subject to resident and/or property owner access permission.

TABLE 9-1 NOISE AND VIBRATION MONITORING REQUIREMENTS

Item	Scope	Frequency	Responsibility	Records / reporting
Noise compliance monitoring	During the undertaking of an activity, to confirm compliance of specific criteria under MCoA (NSW) B7, B8, B10, or where modelling indicates that a non-compliance could occur at sensitive locations and no existing comparable data is available.	As identified by noise modelling predictions	Environmental Advisor	Noise monitoring records
Vibration monitoring – at structures within minimum vibration working distances of sensitive receivers	To determine actual vibration levels at the structure and/or sensitive receiver.	When works are planned within minimum working distances, as required	Environmental Advisor	Vibration monitoring records
Vibration monitoring for heritage impact considerations	As described in the Heritage Management Plan, and in addition to monitoring of any activities within 'minimum working distances' of sensitive receivers, some heritage items have specific vibration monitoring requirements.	As detailed in the Heritage Management Plan	Environmental Advisor	Vibration monitoring records.
Complaint-based noise and vibration monitoring	Where complaints are received, noise and/or vibration monitoring may be undertaken at sensitive receivers to determine if the actual construction noise generated exceeds the predicted 'worst case' construction noise levels identified in this plan or to confirm predicted vibration levels.	As required	Environmental Advisor	Noise and vibration monitoring records

Item	Scope	Frequency	Responsibility	Records / reporting
OOHW noise and vibration monitoring	As triggered by specific mitigation requirements described in an OOHW Permit (refer to Appendix C)	As described in the OOHW Permit, but typically at the commencement and/or most representative works that trigger the monitoring	Environmental Advisor	Noise and vibration monitoring records
Environmental Site Inspections	Assesses the ongoing effectiveness and suitability of the Project's environmental controls, such as acoustic barriers or offsetting noise and/or vibration emitting plant and equipment. Refer to the Project EMS for further detail.	Typically weekly	Environmental Advisor	Environmental inspection checklists

Outcomes of monitoring will be considered against noise and/or vibration predictions for applicable works to assist in refining the modelling tool(s) and reducing noise impacts. Where specific criteria apply, monitoring outcomes will also be compared against the applicable criteria to ensure compliance.

Monitoring may be attended or unattended, as required, to obtain noise results over longer periods. Consideration will be given to the following aspects when determining if monitoring will be undertaken attended or unattended:

- Duration of activity, impact to residents, and duration of monitoring;
- Location of monitoring; new locations not previously impacted, proximity of sensitive receivers, access to appropriate monitoring location, and security of equipment
- Activity type being undertaken and new activity not previously conducted elsewhere on the project.
- Weather conditions

Longer duration monitoring is typically undertaken unattended with shorter duration attended monitoring undertaken to validate results of unattended monitoring.



9.2 INCIDENT AND NON-COMPLIANCE MANAGEMENT

9.2.1 Incidents

An event will be classified as an incident if the event falls within the definition of ‘incident’ and ‘material harm’ as detailed in the Infrastructure Approval.

Incidents relating to noise and vibration will be managed in accordance with Section 2.11.2 of the Project’s Environmental Management Strategy and in compliance with the requirements of MCoA (NSW) C10.

Further to the above, the POEO Act excludes an incident or set of circumstances involving only the emission of any noise from the definition of a pollution incident. Therefore, in general, noise events will only be classified as an incident in accordance with MCoA (NSW) C10 if it involves actual or potential harm to the health or safety of human beings. Otherwise, a noise event will be managed as a non-compliance as detailed in Section 9.2.2 below.

9.2.2 Non-Compliances

An event will be classified as a Non-Compliance if the event falls within the definition of ‘non-compliance’ as detailed in the Infrastructure Approval.

Non-compliances relating to noise and vibration will be managed in accordance with Section 2.11.1 of the Project’s Environmental Management Strategy and in compliance with the requirements of MCoA (NSW) C11 and C12.

The following steps will also be undertaken for non-compliances relating to noise and vibration monitoring.

Where monitored noise or vibration levels are found to be above the relevant objective and/or predicted levels, the following actions will be undertaken:

- Confirm that predictive modelling reflects the actual activity being undertaken
- Confirm the monitored levels are not being impacted by other noise or vibration sources
- Confirm the mitigation measures implemented are as planned or described in the applicable OOHW Permit/CNVIS/EWMS (whichever is applicable)
- Confirm if the exceedance is due to an uncharacteristically noisy or vibration-intensive piece of equipment that can be removed or eliminated
- Implement other reasonable and feasible measures, which may include reducing plant type or size, modifying time of works, changing operational settings (such as turning off the vibratory function of the machine), utilising alternative construction methodology or adding additional at-source or at-receiver controls

Following the above actions, monitoring will be repeated to re-confirm the noise outcome. Where the above does not result in an improvement in noise scenarios to the point of compliance with



predictions and/or criteria, works must be stopped, the extent of impacts re-assessed based on this new information (e.g. revised equipment sound power level) and implement appropriate mitigation and management measures, which may include renewed consultation or approvals.

In each case, the insights and learnings from the above (whether it be adjustments or cessation of works) would be integrated into the noise modelling assessment process for further refinement and any relevant 'lessons learnt' would be communicated to relevant personnel.

In the event that activities are confirmed as non-compliant with Project approval criteria, they must be stopped immediately. The following actions will generally be undertaken, as required:

- The issue will be recorded within the compliance management database
- An environmental action list will be developed and issued to the relevant project team personnel for implementation and close out. Actions will be assigned a priority based on the environmental risk
- Timeframes will be stipulated for any corrective actions including appropriate preventative measures, if practicable, to be implemented
- Following corrective action, evidence of close out will be recorded and the Environmental and Sustainability Manager will close out the non-compliance

Notification of a non-compliance will occur via the Major Projects website portal within seven days after becoming aware of a non-compliance as per MCoA (NSW) C11. The notification will identify the development, list the MCoA (NSW) to which the non-compliance relates, reasons for the non-compliance, and what actions that have or will be implemented to address the non-compliance.

10 Environmental Mitigation and Management Measures

Management and mitigation measures relevant to the noise and vibration on the Project are outlined in Table 10-1. These will be implemented to minimise noise and vibration impacts and ensure all project requirements are met.

TABLE 10-1 NOISE AND VIBRATION MANAGEMENT AND MITIGATION MEASURES

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
Construction noise (source controls)							
MM1	At all locations where exceedances of applicable construction noise criteria are predicted at sensitive receivers, portable temporary noise screens will be erected adjacent to stationary or long-term static noise sources, or noise generating items, where reasonable and feasible.	CNVIS	Construction	Ancillary facilities	Project Manager	NV1	Site inspection records
MM2	Spotters, “smart” reversing alarms, or broadband reversing alarms will be used in place of traditional tonal beeper reversing alarms, particularly on equipment where reversing alarms are frequently in use such as rollers, loaders or compactors (subject to a safety risk assessment).	Induction, Plant Matrix	Construction	All construction locations	Site Engineer Plant Manger	NV1	Manufacturer's Specification Site inspection records
MM3	Noise source controls, such as the use of residential class mufflers, will be used to reduce noise from all plant including cranes, excavators and trucks.	Plant Matrix	Construction	All construction locations	Plant Manager	NV1	Manufacturer's Specification Site inspection records
MM4	The offset distance between noisy plant items and sensitive receivers will be maximised, where reasonable and feasible	CNVIS	Construction	All construction locations	Site Supervisor Site Engineer	NV1	Site inspection records
MM5	Machinery will be operated in a manner which reduces maximum noise level events such as reduce shaking excavator buckets, dropping materials into trucks from a height or steel on steel contact.	Induction/toolbox	Construction	All construction locations	Site Engineer Site Supervisor	NV1	Induction records
MM6	Construction plant and equipment will be turned off when not in use	Induction/toolbox	Construction	All construction locations	Site Engineer Site Supervisor	NV1	Induction records

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
MM7	- Helicopters will not be operated during evening and night-time periods. - Where the use of drones is proposed during evening and/or night-time periods, an additional assessment(s) will be undertaken to identify appropriate operational limits to ensure that noise impacts to nearby sensitive receivers are acceptable	CNVIS	Construction	Transmission lines and helicopter pads	Site Supervisor Night Works Supervisor	NV1	OOHW Protocol
Construction noise (administrative controls)							
MM8	Environmental awareness training and inductions for site personnel will include noise mitigation techniques/measures to be implemented when on site and accessing the site.	Toolbox/induction	Construction	All construction locations	Environmental Manager	NV2	Induction records
MM9	The avoidance of simultaneous construction activities during transmission line construction in the vicinity of the Energy Hubs will be investigated to minimise potential cumulative noise impacts	CNVIS	Construction	Energy hubs	Construction Manager	NV2	CNVIS Construction Planning
MM10	Plant and equipment will be selected with noise emission levels being a consideration for selection. This will include the consideration of alternative stringing methods, such as the use of drones instead of helicopters..	CNVIS	Construction	All construction locations	Plant Manager Site Engineer	NV2	Manufacturer's Specification
MM11	Noise-intensive works will be limited to less sensitive construction hours (i.e. away from early morning and late afternoon periods) as	CNVIS	Construction	Near sensitive receivers	Site Engineer Construction manager	NV2	CNVIS

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
	far as practicable, when working in the vicinity of sensitive receivers						
MM12	Plant and equipment will be well maintained to ensure that excessive noise is not generated	N/A	Construction	All construction locations	Plant Manager	NV2	Maintenance records
MM13	The provision of respite periods for helicopter take off / landing will be considered at the construction compounds	N/A	Construction	Helicopter pads	Environmental Manager Construction Manager Community Manager	NV2	Community Notification Construction Planning
MM14	A blasting vibration and overpressure assessment will be required as part of any potential blast design. This assessment will determine the Maximum Instantaneous Charge to achieve the ground vibration and overpressure limits set by MCoA (NSW) B10. In addition, a Blast Management Strategy will be prepared in accordance with Section 4 of AS 2187.2-2006.	Blast Management Strategy	Prior to blasting	Blasting locations	Project Manager Site Supervisor Specialized sub-contractor Environmental Manager	NV2	Blast Management Strategy
MM15	Any works undertaken outside standard working hours will be further assessed in accordance with the ICNG and the CNVG during detailed design and an Out of hours works protocol will be developed and implemented to mitigate any identified impacts.	OOHW Protocol CNVIS and/or OOHW Permit	Construction	All construction locations	Environmental Manager Construction manager	NV2	OOHW Protocol CNVIS and/or OOHW Permit
Construction Noise							
MM16	Sensitive receivers potentially affected by the works will be notified of the	Community Communications Strategy	Construction	Near sensitive receivers	Community Manager	NV3	Community notifications

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
	commencement of construction activities at least five days prior to works starting. The notification will inform potentially impacted sensitive receivers of the nature of and duration of works, expected noise levels and contact details for sensitive receivers to contact project representatives.						
MM17	The community will be kept regularly informed of noise intensive activities in the immediate area.	Community Communications Strategy	Construction	Near sensitive receivers	Community Manager	NV3	Community notifications
MM18	If noise complaints are received, the complainant will be offered the opportunity for noise monitoring to be carried out to confirm the noise level at the receiver. Where the noise monitoring confirms that the applicable noise predictions are being exceeded, the construction methodology will be reviewed and changes implemented to reduce construction noise levels to be compliant with noise predictions where reasonable and feasible. Additional mitigation measures such as respite periods have been outlined in Section 7.1.2.4.	Community Communications Strategy	Construction	Near sensitive receivers	Community Manager Environmental Manager	NV3	Noise Monitoring Report
Construction vibration							
MM19	avoid the use of vibration-intensive plant at distances where human discomfort may occur	Construction Planning	Design/pre-construction	Near sensitive receivers	Construction Manager Design Manager	NV4	Design Reports
MM20	substitute to lower vibration-intensive plant and methods (for example use a smaller	Construction Planning	Design/pre-construction	Within safe working distances	Construction Manager Design Manager	NV4	Design Reports

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
	machine, lower power settings or alternative equipment)						
MM21	sequence operations to avoid or minimise concurrent vibration intensive activities	Construction Planning	Construction	Near sensitive receivers	Construction Manager	NV4	CNVIS
MM22	schedule the use of vibration-sensitive equipment during the least sensitive times of the day	Construction Planning	Construction	Near sensitive receivers	Construction Manager	NV4	CNVIS
MM23	confirm any vibration-sensitive heritage structures that could be impacted by the proposal works	Construction Planning	Construction	Within safe working distances of heritage structures	Construction Manager	NV4	Community consultation CNVIS
MM24	inform and consult with potentially affected receivers about upcoming vibration-intensive activities	Construction Planning	Construction	Near sensitive receivers	Construction Manager Community Manager	NV4	Community consultation
MM25	Pre and post condition surveys	Constructing Planning	Pre-construction	Within safe working distances	Construction Manager	NV4	Surveys
Heritage vibration impacts							
MM26	Vibration sensitive Aboriginal and non-Aboriginal heritage items which have potential to be impacted by the project works will be confirmed prior to the commencement of vibration generating works in proximity to relevant structures.	Assessments for heritage items as required	Pre-construction/ Construction	Within safe working distances of heritage items	Project Manager Environmental Manager	NV5	Heritage Management Plan Detailed assessments

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
	Suitable, item specific criteria will be developed for heritage items and vibration impacts at these locations will be managed before commencement of construction. This may include the use of alternative construction methods which generate lower levels of ground vibration and the installation of vibration monitors while vibration intensive activities are conducted						
MM27	A structural assessment of the standing headstones will be undertaken to determine if additional conservation works may be required to mitigate nearby construction works. Prior to and during any activities with the potential to generate vibration levels that exceed tolerance levels identified by the structural assessment, a vibration monitor will be installed within the cemetery at the closest point to construction works to confirm that vibration levels are compliant with applicable criteria. Vibration monitoring would be discontinued if it indicates that the risk exceeding the tolerance levels is negligible.	Structural assessment and mitigations identified dependant on outcome	Pre-construction/ Construction	CWO-22-HH06 (Laheys Creek Cemetery)	Project Manager Environmental Manager	HH9	Heritage Management Plan Detailed assessments Vibration monitoring report
MM28	Prior to construction in the vicinity of CWO-22-HH06 (Laheys Creek Cemetery), an exclusion area of a suitable minimum width, as confirmed by a vibration assessment, will be installed to ensure impacts to the cemetery are avoided.	Structural assessment and mitigations identified dependant on outcome	Pre-construction/ Construction	CWO-22-HH06 (Laheys Creek Cemetery)	Project Manager Environmental Manager	HH10	Heritage Management Plan Detailed assessments

ID	Measure / requirement	Resources needed	Timing	Location	Responsibility	Source	Evidence
	The initial nominated exclusion buffer for CWO-22-HH06 will be determined on the following basis: • A report from a structural engineer assesses the stability of the headstones in the cemetery and identify vibration tolerance levels to avoid damage • The report must certify that the proposed exclusion buffer is sufficient to avoid damage to the items. If a reduction in the initial exclusion area is required: ○ A structural engineer must certify that the proposed revised exclusion buffer is sufficient to avoid damage to the items • If vibration-generating works are unavoidable within the exclusion buffer, headstones identified as being at risk of collapse will be stabilised and conserved • The report can provide and certify vibration criteria, vibration monitoring equipment is installed and vibration criteria are not exceeded • Any damage sustained to the cemetery during construction or in the succeeding 12-month period will be repaired and rectified						



Appendix A Minister's Conditions of Approval (NSW)

TABLE A-1 FURTHER MCOA (NSW) RELEVANT TO THE NVMP

MCoA (NSW)	Condition requirement	Document reference
B1	Pre-construction minor works road upgrades, construction, upgrading and decommissioning activities may only be undertaken between: a) 7 am to 6 pm Monday to Friday; b) 8 am to 1 pm Saturdays; and c) at no time on Sundays and NSW public holidays; unless the Planning Secretary agrees otherwise.	Section 5.1
B2	The following activities may be carried outside the hours specified in condition B1 above: a) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; b) emergency work to avoid the loss of life, property or prevent material harm to the environment; c) works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works; d) activities that do not result in noise affected sensitive receivers, as defined in <i>Interim Construction Noise Guidelines</i> (DECC, 2009) (or its latest version); e) road upgrades required by the relevant road authority to be undertaken outside the standard construction hours; f) activities that require a network outage on another distribution or transmission network, and the operator of the network requires the outage and associated works outside standard construction hours; g) where different hours are permitted or required under an EPL in force in respect of the CSSI; or h) works carried out in accordance with an Out-of-Hours Work Protocol in accordance with condition B13	Section 5.2
B3	The Proponent must take all reasonable and feasible steps to minimise the pre-construction minor works, road upgrades, construction, upgrading or decommissioning noise of the development in the locations where the noise is audible to sensitive receivers, including any associated traffic noise.	Section 10, MM 1 – 15
B4	The Proponent must ensure that the noise generated by any construction, upgrading or decommissioning activities is managed in accordance with the requirements outlined in the <i>Interim Construction Noise Guideline</i> (DECC, 2009) (or its latest version).	Section 6.2
B5	The Proponent must implement mitigation measures with the aim of achieving the road traffic noise assessment criteria for land uses from <i>NSW Road Noise Policy</i> (DECCW, 2011).	Section 8.5 Section 10
B6	The Proponent must implement mitigation measures with the aim of achieving the following vibration limits: a) vibration criteria established using the <i>Assessing vibration: a technical guideline</i> (DEC, 2006) (for human exposure);	Section 6.5

MCoA (NSW)	Condition requirement	Document reference
	b) BS 7385 Part 2-1993 “Evaluation and measurement for vibration in buildings Part 2” as they are “applicable to Australian conditions”; and c) vibration limits set out in the German Standard DIN 4150-3: Structural Vibration – effects of vibration on structures (for structural damage).	
B7	Where a sensitive receiver is identified as potentially exceeding the construction 'noise affected' noise management level or sleep disturbance criteria established using the Interim Construction Noise Guideline (DECC, 2009), or its latest version, as a result of the construction or operation of the accommodation camps or construction compounds, mitigation measures must be implemented with the objective of reducing construction noise below the relevant criteria at each relevant sensitive receiver. Activities that would exceed the 'noise affected' noise management level or sleep disturbance criteria during construction or operation of these facilities must not commence until the measures identified in this condition have been implemented, unless otherwise agreed with the Planning Secretary. <i>Note: Mitigation measures may include path barrier controls, at-property treatment, or a combination of path and at-property treatment.</i>	Section 8.1
B8	Where a sensitive receiver is identified as potentially exceeding the 'highly noise affected' noise management level established using the Interim Construction Noise Guideline (DECC, 2009), or its latest version, during construction, mitigation measures must be implemented with the objective of reducing construction noise below the highly noise affected noise management level at each relevant sensitive receiver. Activities that would exceed the 'highly noise affected' noise management level during construction must not commence until the measures identified in this condition have been implemented, unless otherwise agreed with the Planning Secretary. <i>Note: Mitigation measures may include path barrier controls, at-property treatment, or a combination of path and at-property treatment</i>	Section 8.1
B9	Unless approved in accordance with condition B1, blasting may only be carried out on the site: a) between 9 am to 5 pm Monday to Friday; b) between 9 am to 1 pm on Saturday; and c) no blasting is allowed on Sunday or NSW public holidays	Blasting Management Strategy (REMM NV2) will be developed, addressing blasting hours as detailed in Section 5
B10	<i>The Proponent must ensure that any blasting carried out on site does not exceed the criteria in Table 1.</i>	Blasting Management Strategy (REMM NV2) will be developed, addressing the blasting criteria as detailed in Section 6.8



MCoA (NSW)	Condition requirement	Document reference											
	Table 1: Blasting Criteria <table><tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr><tr><td rowspan="2">Any residential receiver</td><td>120</td><td>10</td><td>0%</td></tr><tr><td>115</td><td>5</td><td>5% of the total number of blasts or events over a rolling period of 12 months</td></tr></table>	Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance	Any residential receiver	120	10	0%	115	5	5% of the total number of blasts or events over a rolling period of 12 months	
Location	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance										
Any residential receiver	120	10	0%										
	115	5	5% of the total number of blasts or events over a rolling period of 12 months										
B11	Except for corona discharge noise, the Proponent must ensure that the noise generated by the operation of the development does not exceed the project trigger noise levels (PTNL) established in the Noise Policy for Industry (NPfI), at the reasonably most affected point of the residence, at any residential receiver.	This requirement will be addressed at a later stage, i.e. prior to the commencement of operation, upgrading or decommissioning, as per Staging Request (SSI-48323210-PA-9) dated 26 September 2024 and approved by the Department on 4 December 2024.											
B12	The Proponent must: (a) take all reasonable and feasible steps to minimise corona discharge noise during operation of the project; (b) identify residences predicted to experience corona discharge noise levels above the PTNL at the reasonably most affected point of the residence, determined in accordance with the NPfI, and how often corona noise is expected to be above this this level per year; (c) identify residences predicted to experience circuit breaker noise levels above the PTNL at the reasonably most affected point of the residence, determined in accordance with the NPfI, and how often this happens during the night-time period; and (d) implement all reasonable and feasible noise mitigation measures, determined in accordance with the NPfI, at receivers predicted to experience corona discharge noise levels or circuit breaker noise levels that exceed the	This requirement will be addressed at a later stage, i.e. prior to the commencement of operation, upgrading or decommissioning, as per Staging Request (SSI-48323210-PA-9) dated 26 September 2024 and approved by the Department on 4 December 2024.											



MCoA (NSW)	Condition requirement	Document reference
	noise levels identified in the PTNL.	



Appendix B Revised Environmental Mitigation Measures

TABLE A-2 REMMS RELEVANT TO THE NVMP

REMM	REMM Requirement	Document reference
NV1	As part of development of the detailed design and construction methodology, all reasonable and feasible mitigation measures will be considered, confirmed and implemented to minimise construction noise impacts and to avoid exceedances of the applicable noise goals at adjacent sensitive receivers where practicable. Measures that may achieve this outcome may include, but not limited to the following: • Portable temporary noise screens will be erected adjacent to stationary or long-term static noise sources, or noise generating items, where reasonable and feasible • Spotters, “smart” reversing alarms, or broadband reversing alarms will be used in place of traditional tonal beeper reversing alarms, particularly on equipment where reversing alarms are frequently in use such as rollers, loaders or compactors • Noise source controls, such as the use of residential class mufflers, will be used reduce noise from all plant including cranes, excavators and trucks • The offset distance between noisy plant items and sensitive receivers will be maximised, where reasonable and feasible • Machinery will be operated in a manner which reduces maximum noise level events such as a reduce shaking excavator buckets, dropping materials into trucks from a, height or steel on steel contact • Construction plant and equipment will be turned off when not in use • Helicopters will not be operated during evening and night-time periods. Where the use of drones is proposed during evening and/or night-time periods, an additional assessment(s) will be undertaken to identify appropriate operational limits to ensure that noise impacts to nearby sensitive receivers are acceptable	Section 10
NV2	Opportunities to reduce exceedances of the applicable construction noise goals through the implementation of administrative controls will be examined, confirmed and implemented where reasonable and feasible. Controls to be considered will include, but not limited to the following: • Environmental awareness training and inductions for site personnel will include noise mitigation techniques/measures to be implemented when on site and accessing the site • The avoidance of simultaneous construction activities during transmission line construction in the vicinity of the Energy Hubs will be investigated to minimise potential cumulative noise impacts • Plant and equipment will be selected based on noise emission levels. This will include the consideration of alternative stringing methods, such as the use of drones instead of helicopters • Noise-intensive works will be limited to less sensitive construction hours (i.e. away from early morning and late afternoon periods) as far as practicable, when working in the vicinity of sensitive receivers. • Plant and equipment will be well maintained to ensure that excessive noise is not generated • The provision of respite periods for helicopter take off / landing will be considered at the construction compounds	Section 10

REMM	REMM Requirement	Document reference
	- A blasting vibration and overpressure assessment will be required as part of any potential blast design. This assessment will determine the Maximum Instantaneous Charge to achieve the recommended ground vibration and overpressure limits. In addition, a Blast Management Strategy will be prepared in accordance with Section 4 of AS 2187.2-2006 for inclusion in the CNVMP. - Any works undertaken outside standard working hours will be further assessed in accordance with the ICNG and the CNVG during detailed design and an Out of hours works protocol will be developed and implemented to mitigate any identified impacts	
NV3	Opportunities to reduce the impacts associated with construction noise levels through the implementation of proactive community consultation will be examined, confirmed and implemented where reasonable and feasible. Controls to be considered will include, but not limited to the following: - Sensitive receivers potentially affected by the works will be notified of the commencement of construction activities at least five days prior to works starting. The notification will inform potentially impacted sensitive receivers of the nature of and duration of works, expected noise levels and contact details of where sensitive receivers can contact can project representatives. - The community will be kept regularly informed of noise intensive activities in the immediate area - If noise complaints are received, the complainant will be offered the opportunity for noise monitoring to be carried out to confirm the noise level at the receiver. Where the noise monitoring confirms that the applicable noise predictions are being exceeded, the construction methodology will be reviewed and changes implemented to reduce construction noise levels to be compliant with noise predictions where reasonable and feasible. Additional mitigation measures such as respite periods have been outlined in Section 7.1.2.4.	Section 10
NV4	Where construction is likely to result in vibration levels that exceed relevant criteria at sensitive receivers, mitigation and management will be implemented where practicable and appropriate. Measures that will be considered and implemented where feasible and reasonable include (but is not limited to) the following measures: - Avoid the use of vibration-intensive plant at distances where human discomfort will result - Substitute lower vibration-intensive plant and methods (for example use a smaller machine, lower power settings or alternative equipment) - Sequence operations to avoid or minimise concurrent vibration intensive activities - Schedule the use of vibration-sensitive equipment during the least sensitive times of the day - Confirm any vibration-sensitive heritage structures that could be impacted by the proposal works - Inform and consult with potentially affected receivers about upcoming vibration-intensive activities - Pre and post condition surveys	Section 10
NV5	Vibration sensitive Aboriginal and non-Aboriginal heritage items which have potential to be impacted by the Project works will be confirmed prior to the commencement of vibration generating works in proximity to relevant structures.	Section 10

REMM	REMM Requirement	Document reference
	Suitable, item specific criteria will be developed for heritage items and vibration impacts at these locations will be managed before commencement of construction. This may include the use of alternative construction methods which generate lower levels of ground vibration and the installation of vibration monitors while vibration intensive activities are conducted.	
NV6	An Operational Noise Review will be prepared to confirm the predicted noise impacts from the project (based on the final infrastructure locations). Where necessary, the operational mitigation measures to be implemented below will be revised so operational noise impacts are compliant with the project noise trigger levels, where feasible and reasonable. Where exceedances of the project specific noise trigger levels are predicted (i.e. transmission lines audible noise), feasible and reasonable operational noise and vibration mitigation measures will be further investigated, in consultation with the affected receivers. This will include: • Transmission lines • Scheduling of maintenance activities during less sensitive times of day. • Noise control at the receiver, such as 'at property' treatment to upgrade aspects of the dwellings including the façade or ventilation systems. • Monitoring after the commissioning of the project to be conducted at each residence where potential operational noise levels are predicted to exceed project trigger levels. • If additional measures are found to be required during the compliance monitoring, these will be implemented as soon as practicable. • Energy hubs and switching stations • Adoption of lower generating noise equipment (where practicable). • Site layout designed to minimise noise impacts. • Restriction of operational parameters such as cooling fans where meteorological conditions are favourable. • Noise control at the receiver, such as 'at property' treatment to upgrade aspects of the dwellings including the façade or ventilation systems. Identified measures will be implemented prior to operation of the relevant infrastructure. In addition, the following will be undertaken: • Monitoring after the commissioning of the project to be conducted at each residence where potential operational noise levels are predicted to exceed project trigger levels to compare operational noise levels to predictions. • If additional measures are found to be required during the compliance monitoring, these will be implemented as soon as practicable.	Operational Noise Review (to be prepared upon design finalisation for relevant locations)
HH9	• A structural assessment of the standing headstones will be undertaken to determine if additional conservation works may be required to mitigate nearby construction works. Prior to and during any activities with the potential to generate vibration levels that exceed tolerance	Heritage Management Plan

REMM	REMM Requirement	Document reference
	levels identified by the structural assessment, a vibration monitor will be installed within the cemetery at the closest point to construction works to confirm that vibration levels are compliant with applicable criteria. • A vibration monitor will be installed within the cemetery at the closest point to construction works to confirm that vibration levels are compliant with applicable criteria	
HH10	Prior to construction in the vicinity of CWO-22-HH06 (Laheys Creek Cemetery), an exclusion area of a suitable minimum width, as confirmed by a vibration assessment will be installed to ensure impacts to the cemetery are avoided. The initial nominated exclusion buffer for CWO-22-HH06 will be determined on the following basis: • A report from a structural engineer assesses the stability of the headstones in the cemetery and identify vibration tolerance levels to avoid damage • The report must certify that the proposed exclusion buffer is sufficient to avoid damage to items • If a reduction in the initial exclusion area is required: ○ A structural engineer must certify that the proposed revised exclusion buffer is sufficient to avoid damage to the items ○ The report can provide and certify vibration criteria; vibration monitoring equipment is installed, and vibration criteria are not exceeded ○ Any damage sustained to the cemetery during construction or in the succeeding 12-month period will be repaired and rectified by the proponent	Heritage Management Plan



Appendix C OOHV Protocol



CENTRAL-WEST ORANA RENEWABLE ENERGY ZONE

OUT-OF-HOURS-WORK PROTOCOL

CWO-PRO-050-ENV-PCD-000012 REV 02



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Document Control

This Out-of-Hours-Works Protocol is a controlled document, approved by the ACJV Project Director. The Project Wide Lead is responsible for ensuring this document is kept up to date for the Project, Project risks, activities and legislative requirements.

PROJECT AUTHORISATION

Authorisation				
Document Title	CENTRAL-WEST ORANA RENEWABLE ENERGY ZONE TRANSMISSION PROJECT OUT-OF-HOURS-WORK PROTOCOL			
Revision Number	REV 02			
Document Number	CWO-PRO-050-ENV-PCD-000012			
Discipline/Department	Project Wide Construction			
Originator	Acciona Construction Australia			
Review	Name	Position	Date	Signature
	Anthony Lusher	Approvals and Compliance Lead	11/12/2025	Anthony Lusher
Approval	Lorryn Williamson	Environment and Sustainability Manager	18/12/2025	Signed by: Lorryn Williamson 12B46C439F5743E...
Principal Endorsement	Grant Andersen	Project Director	18/12/2025	Signed by: G. Andersen 76C0982E0FB74E2...

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Revision	Date	Pages	Revised by	Description
Rev A	15/09/24	All	Mark Russell	For N.O. review and EnergyCo review
Rev B	21/10/24	All	Mark Russell	For EnergyCo review
Rev C	28/10/24	All	Erran Woodward	For External consultation and ER review
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Rev 01	08/05/2025	All	Catherine Curlewis	For DPHI Approval
Rev 02	11/12/2025	Multiple	Lauren Tompkins	Updated following Modification 2 and 3 determination



CONTROL AND RECORDS

The approved CWO-PRO-050-ENV-PCD-000012 Out-of-Hours Works Protocol will be signed, and a pdf version will be uploaded and stored on the Project's document management system in accordance with CWO-PRO-050-DOC-PLN-000001 the CWO Document and Records Management Plan.

UNCONTROLLED COPIES

Any uncontrolled hard copy documents are up to date at issue and are only issued to outside organisations, customers, etc., upon request and approval by a Workplace Manager. Such uncontrolled documents will be clearly marked "Uncontrolled Copy When Printed" and will not be subject to an update.

DISTRIBUTION

The Integrated Management System – Systems Representative on the Project is responsible for the controlled internal distribution of this document and changes. Personnel have access to the latest revision of the document through RIBCX.

Terms and definitions

Abbreviations	Expanded text
ACER EZ Network Operator	ACER EZ Network Operator has been selected by EnergyCo as the Network Operator for the Central-West Orana REZ
ACJV	The Joint Venture of ACCIONA Construction Australia Pty Ltd and Cobra Pty Ltd, engaged by ACER EZ Network Operator to design and construct the Project
AIMS	ACCIONA Integrated Management System
AR	Central-West Orana Renewable Energy Zone Transmission Project Amendment Report
AVTG	Assessing Vibration: A Technical Guideline (DEC, 2006)
CEP	Communication and Engagement Plan
CNVG	Construction Noise and Vibration Guideline (Transport for NSW, 2022)
CNVIS	Construction Noise and Vibration Impact Statements
CoA (Commonwealth)	Commonwealth Conditions of Approval
Compliance audit	Verification of how implementation is proceeding with respect to an Environmental Management Strategy (EMS) (which incorporates the relevant approval conditions)
CSSI	The Critical State Significant Infrastructure, as described in Schedule 1, the carrying out of which is approved under the terms of the SSI-48323210 approval
CWO	Central-West Orana
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DPHI	Department of Planning, Housing and Infrastructure (NSW)
DPI (Fisheries)	Department of Primary Industries (Fisheries) (NSW)
EIS	The Environmental Impact Statement titled <i>Environmental Impact Statement – Central-West Orana REZ Transmission Project</i>, prepared by WSP, dated February 2023, including the Proponent's: • Amendment Report, dated March 2024; • Submissions Report, dated March 2024; • Biodiversity Development Assessment Report, dated March 2024; and • Central-West Orana REZ Transmission Project Modification 1 – Request for minor modifications to the condition of approvals, dated September 2024 and additional information dated 11 October 2024 • Central-West Orana REZ Transmission Project Modification 2 – Request for modification to allow establishment of an additional operations facility, dated 22 October 2025 • Central-West Orana REZ Transmission Project Modification 3 – Request for minor administrative changes to reflect Strategic Offset delivery Agreement, dated 15 August 2025
EMS	Environmental Management Strategy
EnergyCo	The Energy Corporation of New South Wales, constituted by Section 6 of the <i>Energy and Utilities Administration Act 1987</i> , as the NSW Government statutory authority responsible for the delivery of NSW's Renewable Energy Zones

Abbreviations	Expanded text
Environmental Representative (ER)	A suitably qualified and experienced person independent of project design and construction personnel employed for the duration of construction. The principal point of advice in relation to environmental performance of the Project and has the responsibility listed in condition A12 of the MCoA (NSW)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPL	Environment Protection Licence
EWMS	Environmental work method statement
ICNG	Interim Construction Noise Guideline (DECC 2009)
L _{A90}	The noise level exceeded 90% of the measurement period, typically considered the average minimum noise level and used to establish background noise levels
L _{Aeq} (15min)	The A-weighted equivalent continuous (energy average) A-weighted sound pressure level over a 15-minute period
L _A (max)	The A-weighted maximum noise level, measured using the fast time weighting on a sound level meter
LCVIMP	Landscape Character and Visual Impact Management Plan
MCoA (NSW)	NSW Minister for Planning and Public Spaces' Conditions of Approval
Minister, the	Minister for Planning and Public Spaces
NCA	Noise Catchment Area
NML	Noise Management Level
Non-compliance	Failure to comply with the requirements of the Planning Approval or any applicable licence, permit or legal requirements
Non-conformance	Failure to conform to the requirements of Project system documentation, including this Plan, EMS or supporting documentation
NPfI	Noise Policy for Industry (EPA 2017)
NSW	New South Wales
NVMP	Noise and Vibration Management Plan
OOHW	Out-of-hours-work
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Project, the	The construction and operation of new electricity transmission infrastructure, new energy hubs and switching stations and ancillary works required to connect new renewable energy generation and storage projects within the Central-West Orana REZ to the NSW transmission network (referred to herein as 'the Project' or 'Central-West Orana Renewable Energy Zone Transmission project')
Reasonable and feasible	Available and capable of being implemented after consideration of cost, existing technology, logistics in light of the overall Project purpose, environmental impact, and ability to obtain all necessary approvals for implementation
RBL	The Rating Background Level for each period is the median value of the L _{A90} values for the period over all the days measured. There is an RBL value for each period (day, evening and night)
REMM	Revised Environmental Mitigation Measures (as described in Appendix E of the Project Amendment Report)



Abbreviations	Expanded text
REZ	Renewable Energy Zone
RNP	NSW Road Noise Policy (DECCW, 2011)
RtS	Response to Submissions Report
SAM	Sensitive Area Maps
Secretary	Secretary of the NSW Department of Planning, Housing and Infrastructure or nominee, whether nominated before or after the date on which this approval was granted
Sensitive receiver	Defined as with the potential to be affected by noise from construction including residences, classrooms, hospitals, places of worship, passive recreation areas such as outdoor grounds used for teaching, active recreation areas such as parks and sports grounds, commercial premises and industrial premises.
SSI	State Significant Infrastructure



1 Introduction

1.1 CONTEXT

This Out-of-Hours-Work Protocol (OOHW Protocol) forms part of the Noise and Vibration Management Plan (NVMP) for the Central-West Orana Renewable Energy Zone (REZ) Transmission project (the Project).

This OOHW Protocol has been prepared to address the requirements of the:

- NSW Minister for Planning and Public Spaces’ Conditions of Approval (MCoA (NSW)) for the Project (SSI-48323210)
- The Project Environmental Impact Statement (dated September 2023) (EIS), including environmental mitigation measures (EMMs)
- The Project Response to Submission report (dated March 2024) (RtS)
- The Project Amendment Report (AR), including revised environmental mitigation measures (REMMS).
- In totality, the MCoA (NSW), CoA (Commonwealth) and REMMs are referred to as ‘Project requirements’.

1.2 PURPOSE

The purpose of this OOHW Protocol is to describe how ACJV will manage potential impacts of Out-of-Hours-Works during construction of the Project.

This document has been prepared to fulfill the requirements outlined in Table 1-1 below.

Table 1-1 Project requirements specifically relevant to the preparation of the OOHW Protocol

Ref	Requirement	Document reference	How addressed
MCoA (NSW)			
B13	Prior to the commencement of construction, the Proponent must prepare a Noise and Vibration Management Plan to the satisfaction of the Planning Secretary. This plan must:	-	-
(f)	include an Out-of-Hours Work Protocol to identify a process for the consideration, management and approval of works outside the hours defined in conditions B1 and B9,	OOHW Protocol	This document.

Ref	Requirement	Document reference	How addressed
	which must:		
(i)	be prepared in consultation with the relevant Council;	Section 2	Section 2 details the consultation undertaken with the relevant Councils.
(ii)	identify low risk activities that can be undertaken without the approval of the Planning Secretary and with the approval of the ER;	Section 4	Section 4 of this OOHW Protocol classifies any low-risk activities that can be undertaken with approval from ER, but without the approval of the Planning Secretary.
(iii)	identify high risk activities that must be approved by the Planning Secretary; and	Section 4	Section 4 of this OOHW Protocol classifies any high-risk activities that must require approval from Planning Secretary prior to commencement.
(iv)	identify Department, Council and community notification arrangements for approved out of hours work.	Section 7	This section describes how different stakeholders will be notified of OOHW.
REMMs			
NV2	Any works undertaken outside standard working hours will be further assessed in accordance with the ICNG and the CNVG during detailed design and an Out of hours works protocol will be developed and implemented to mitigate any identified impacts.	All	This document.

2 Consultation

2.1 CONSULTATION FOR OOHW PROTOCOL PREPARATION

The following Councils were consulted during the development of this OOHW Protocol:

- Dubbo Regional Council
- Mid-Western Regional Council
- Upper Hunter Shire Council
- Warrumbungle Shire Council.

Consultation with each Council, including responses received and how any issues raised were addressed in the development of this OOHW Protocol have been provided to the Planning Secretary, along with the relevant documentation for submission, in accordance with MCoA (NSW) A7.

2.2 ONGOING CONSULTATION

Any ongoing consultation and notification will be undertaken in accordance with Section 7 of this OOHW Protocol. Community feedback and complaints relating to noise and vibration will be managed in accordance with the Community Communications Strategy.

3 Construction Hours

3.1 STANDARD CONSTRUCTION HOURS

OOHW are any works (excluding blasting) that are undertaken outside of the approved hours as defined in the MCoA (NSW) B1, being (unless the Planning Secretary agrees otherwise, or in accordance with MCoA (NSW) B2, refer to Section 3.2):

- 7 am to 6 pm Monday to Friday;
- 8 am to 1 pm Saturdays; and
- At no time on Sundays and NSW public holidays.

In accordance with MCoA (NSW) B9, unless approved in accordance with MCoA (NSW) B1, blasting may only be carried out on the site:

- between 9 am to 5 pm Monday to Friday;
- between 9 am to 1 pm on Saturday; and
- no blasting is allowed on Sunday or NSW public holidays.

3.2 EXCEPTIONS TO STANDARD CONSTRUCTION HOURS

MCoA (NSW) B2 recognises there are times where works outside the standard construction hours (as described above) will be required, including:

- a) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- b) emergency work to avoid the loss of life, property or prevent material harm to the environment
- c) works carried out in accordance with the hours and noise limits specified in any negotiated agreements with sensitive receivers (owners and occupiers), provided the negotiated agreements are in writing and finalised before the commencement of works
- d) activities that do not result in noise affected sensitive receivers, as defined in Interim Construction Noise Guidelines (DECC, 2009) (or its latest version)
- e) road upgrades required by the relevant road authority to be undertaken outside the standard construction hours
- f) activities that require a network outage on another distribution or transmission network, and the operator of the network requires the outage and associated works outside standard construction hours
- g) where different hours are permitted or required under an EPL



- h) works carried out in accordance with an Out-of-Hours Work Protocol in accordance with condition B13 (this document).

The OOHW activities outlined in MCoA (NSW) B2, except for item h), are permitted under the MCoA (NSW) and do not require external approval from:

- the Environmental Representative (for low risk works); or
- the Planning Secretary (for high risk works).

Instead, these will be internally authorised by the Environment and Sustainability Manager (or delegate).

3.3 ACCOMMODATION CAMP

The establishment and construction of the accommodation camp is subject to the standard hours, and processes described in this OOHW Protocol, as well as the requirements of MCoA (NSW) B7.

The operation of the accommodation camp facilities is 24 hours a day, 7 days a week, as assessed in the Project EIS and is not subject to any additional approval or authorisation requirements in accordance with this OOHW Protocol. Accommodation camp operations are subject to MCoA (NSW) B7.

3.4 NEGOTIATED AGREEMENTS

Variation to working hours may occur following negotiated agreements with affected residents and sensitive land user(s).

Proposed works will be considered as a negotiated agreement once an appropriate level of concurrence has occurred across applicable receivers. This has been structured to accommodate for increased sensitivity of OOHW Period 2, as follows:

- OOHW period 1: negotiated agreement can occur where a majority (50% or greater) of receivers that are affected by noise levels greater than 10 dBA (following the implementation of mitigation measures) above the Noise Management Level (NML) is obtained
- OOHW period 2: negotiated agreement can occur where a majority (50% or greater) of receivers that are affected by noise levels greater than 5 dBA (following the implementation of mitigation measures) above the NML is obtained.

In accordance with MCoA (NSW) B2(c), all negotiated agreements will be in writing and finalised before the commencement of activities to which the agreement addresses.

4 OOHW Assessment

4.1 OOHW PERMIT

For all OOHW, with the exclusion of emergency works and accommodation camp operation, an OOHW Permit will be prepared for the consideration, management and either external approval or internal authorisation of works outside the permissible hours of construction. The pathway of obtaining an OOHW Permit is described below:

- **Prepared**
 - An OOHW Permit will be drafted for review and approval/authorisation
 - Content will include details to describe the activities, equipment, location, duration, and justification for the works.
- **Reviewed and assessed**
 - The Environment Manager (or delegate) will review the OOHW Permit as drafted, to:
 - Confirm valid justification for the proposed works
 - Identify any potentially affected sensitive receivers
 - Undertake a noise and vibration assessment (including cumulative impacts where relevant) and determine the risk level to identified sensitive receivers (refer to Section 4.3) based on predicted noise levels
 - Provide a description of mitigation measures to be implemented based on the risk level and predicted impacts
 - Confirm if the works require external approval or internal authorisation under this OOHW Protocol
 - Confirm that the proposed activity will comply with the relevant conditions of approval and this OOHW Protocol.
- **Approved or Authorised**
 - The OOHW Permit will be submitted to the relevant authority for review and either external approval or internal authorisation. The reviewer will consider if:
 - The justification for the OOHW works is satisfactory
 - The noise and vibration assessment is adequate
 - The proposed mitigation measures are appropriate.

- **Notification**

- As detailed in Section 7, notifications may be carried out through various methods. The specific requirements and mitigation measures outlined in the OOHW Permit, which are based on the predicted noise and vibration levels as well as the ICNG, will dictate which receivers are required to be notified.

4.2 JUSTIFICATION

The ICNG outlines categories of work that may be undertaken out of hours. Generally, the following reasons are considered to justify OOHW:

- To sustain the operational integrity of the wider associated transmission network
- Where disruption to essential services and/or considerations of worker safety do not allow work within standard hours
- Where OOHW shorten the length of construction and are supported by the affected community
- Works where a proponent demonstrates and justifies a need to operate outside the recommended standard hours
- Where works are required to be completed continuously, such as for technical and quality requirements (for example, concrete pour of foundation piles)
- Where works do not result in adverse impacts to noise and vibration affected sensitive receivers.

Review and acceptance of the justification will form part of the external approval or internal authorisation process, as described in Section 4.1 OOHW Permit.

4.3 IMPACT ASSESSMENT

For each OOHW activity, a detailed assessment will be undertaken to identify the potential noise and vibration impacts of the proposed OOHW activity and is described below.

4.3.1 Noise Assessment

A construction noise tool will be developed by an appropriately qualified acoustician to determine the 'Predicted Noise Impacts' of the proposed work, in the following manner:

- The predicted noise at the sensitive receiver will be determined based on the location of sensitive receivers, local topography and types of plant and equipment required, including any mitigation measures, such as noise barriers, where appropriate
- The predicted noise at the sensitive receiver will be assessed to determine the exceedance (if any) against the NML.

- The final outcome, being the 'Predicted Noise Impacts', will then be used to inform risk category (refer to Section 5) and consultation requirements (refer to Section 7) for the purposes of the OOHW Permit.
- Additionally, where OOHW are being proposed for multiple work areas concurrently, consideration will be given to any cumulative impact associated with the proposed OOHW.

Any mitigation measures included into the model as part of the Predicted Noise Impacts calculations, or identified following modelling to reduce noise impacts, will be mandatory for implementation and will be included into the OOHW Permit.

4.3.2 Vibration Assessment

Vibration impacts will initially be assessed based on minimum safe working distances. Where works occur within the minimum working distances, further advice will be sought to develop appropriate mitigation measures, such as to reduce the scope of works or plant size to ensure compliance with safe working distances, and/or monitoring.

4.4 OOHW PERIODS

The OOHW permit will identify the period that the activity is planned to occur which is used to identify the appropriate risk and mitigation measure required.

OOHW Period 1: (evening and extended day):

- Monday to Friday: 6pm to 10pm (i.e., 'evening')
- Saturday: 7am to 8am and 1pm to 10pm (i.e., 'evening' and 'extended day')
- Sunday and Public Holidays: 8am to 6pm (i.e., 'extended day').

OOHW Period 2: (night):

- Monday to Friday: after 10pm and prior to 7am
- Saturday: after 10pm and prior to 7am
- Sunday and Public Holidays: after 6pm and prior to 8am.

4.5 MITIGATION

4.5.1 Activity Specific Mitigations

Works outside standard hours are typically undertaken at a time where most people are more receptive to noise and vibration impacts and when background levels of noise are generally quieter. This increases the potential for adverse noise and vibration impacts on a locality.

To minimise this impact, reasonable and feasible measures for noise and vibration mitigation will be implemented, irrespective of predicted noise levels. These actions may include:

- Management of behaviour, such as avoiding shouting and swearing, turning off idling equipment when not in use, avoiding impulsive noise (metal on metal contact)
- Selection of quieter equipment, such as smaller, lower powered, newer, or better maintained equipment
- Examining alternative technologies and methods to complete activities more quietly
- Programming to avoid noisy activities after midnight as far as practicable (such as hammering, sawing etc.)
- Use of screens and enclosures to reduce noise emissions from equipment
- Adequate consultation and notification (as described below)

4.5.2 Additional Mitigation Measures

In addition to the activity-specific mitigation measures, 'additional mitigation measures' will be determined based on the predicted noise and vibration levels felt by the receiver, as guided by the Construction Noise and Vibration Guideline (CNVG), and implementation where reasonable and feasible in accordance with the ICNG.

An indicative summary of how additional mitigation measures will be adopted is provided in Table 4-1.

Table 4-1 Indicative implementation of additional mitigation measures

Predicted airborne LAeq(15min) noise level at receiver categories		OOHW Period 1 (evening): additional mitigation measures ¹	OOHW Period 2 (night): additional mitigation measures ²
Perception	dB(A) above NML		
Noticeable	< 5	n/a	N
Clearly audible	5 – 15	N	N
Moderately intrusive	15 – 25	N, V, RO	N, V, RO, DR
Highly intrusive	>25	N, V, RO, PC/SN	N, V, RO, DR

Note:

1. OOWH Period 1 - Monday to Friday: 6pm to 10pm (i.e., 'evening'), Saturday: 7am to 8am and 1pm to 10pm (i.e., 'evening' and 'extended day') Sunday and Public Holidays: 8am to 6pm (i.e., 'extended day')
2. OOWH Period 2 Monday to Friday: after 10pm and prior to 7am, Saturday: after 10pm and prior to 7am Sunday and Public Holidays: after 6pm and prior to 8am.

The mitigation categories shown in Table 4-1 are defined below:



Notification (N): The notification may consist of a letterbox drop (or equivalent), detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification will be provided to potentially affected receivers at least five business days prior to the commencement of works.

Phone Calls (PC)/Specific Notification (SN): Notification, as above, but in the form of phone calls.

Respite Offers (RO): Respite offers will be made where OOHW noise is proposed to occur, as follows:

- For OOHW period 1 (evening) where work occurs for four or more consecutive evenings, respite should occur; or
- For OOHW period 2 (night) where work occurs for three or more consecutive nights, respite should occur.

Duration Respite (DR): Respite periods may be counterproductive in reducing the impact on the community for longer duration activities. In these instances, where it can be agreed by affected residents, it may be beneficial to increase the work duration, number of evenings or nights worked through duration respite so that the Project can be completed more quickly. The Project will engage with affected receivers to determine support for duration respite. Where possible, negotiated agreements are the preferred Project approach in lieu of duration respite.

Verification (V): Verification (i.e. monitoring) of construction noise and vibration levels should occur to ensure the actual impacts are consistent with the predicted levels.

5 OOHW Categories

The following section outlines the assessment criteria to allocate the category of the proposed OOHW, and subsequently the external approval or internal authorisation required. The category considers the approval pathway and Predicted Noise Impact relative to the appropriate noise management level and the duration of works.

The OOHW approval process identifies the following categories:

- Permitted
- Negligible Risk
- Low Risk
- High Risk.

The relevant approval authority for each risk category is outlined in Table 6-1.

Once the category has been determined, the OOHW permit and supporting assessment will be issued for either external approval or internal authorisation.



6 Approval and Authorisation

The pathway of either external approval or internal authorisation is determined by the allocated category of the proposed works, as described above in Section 5).

The matrix provided in Table 6-1 demonstrates the relationship between the category and the required approval or authorisation, which is also illustrated in Figure 6-1.

Table 6-1 OOHW approval pathways

ID	Approval Category	Applicable Period
Category 1 – Permitted. Authorised by the Environment Manager		
1a	Any works as permitted under MCoA (NSW) B2. OOHW Permit required, apart from item b and g	Period 1 & Period 2
1b	Camp operation undertaken in accordance with the Planning Approval and MCoA (NSW) B7. No Permit required.	24/7
1c	Negotiated agreements as described in Section 3.4	Period 1 & Period 2
Category 2 – Negligible. Authorised by the Environment Manager		
2a	Activities which result in noise levels which are no more than NML + <5.0 dBA	Period 1
2b	Activities which result in noise levels which are no more than NML + <2.0 dBA	Period 2
Category 3 – Low. Authorised by the Environment Manager and Approved by the Environment Representative		
3a	Activities which exceed Negligible risk but are mandated to be undertaken outside standard construction hours due to being: - Located on or adjacent to a road and the relevant road authority requires the works to be undertaken outside the standard construction hours (i.e. Road Occupancy Licence restrictions). Note: this does not include road upgrade works permitted by MCoA (NSW) B2e. - Utility works required by relevant service providers to occur outside of the standard construction hours. Note: this does not include road upgrade works permitted by MCoA (NSW) B2f. - Works on or adjacent to rail corridors and the asset owner/authority requires works to occur outside standard construction hours to maintain the operational integrity of the associated infrastructure network - Activities (e.g., concrete pours) that must occur continuously for quality reasons / technical requirements	Period 1 & Period 2
3b	Activities which exceed Negligible risk but do not exceed: - NML + <25.0 dBA, and - Human Comfort vibration criteria under the 'Assessing Vibration – A Technical guideline', and - Follows the below pattern:	Period 1 & Period 2



ID	Approval Category	Applicable Period
	- Maximum of two consecutive days/evenings/nights per week - Maximum of three days/evenings/nights per week in total - Max 12 days/evenings/nights per 4 weeks.	
Category 4 – High. Authorised by the Environment Manager and Approved by the Planning Secretary		
4	Any activity which does not fit within Category 1, 2 or 3	Any

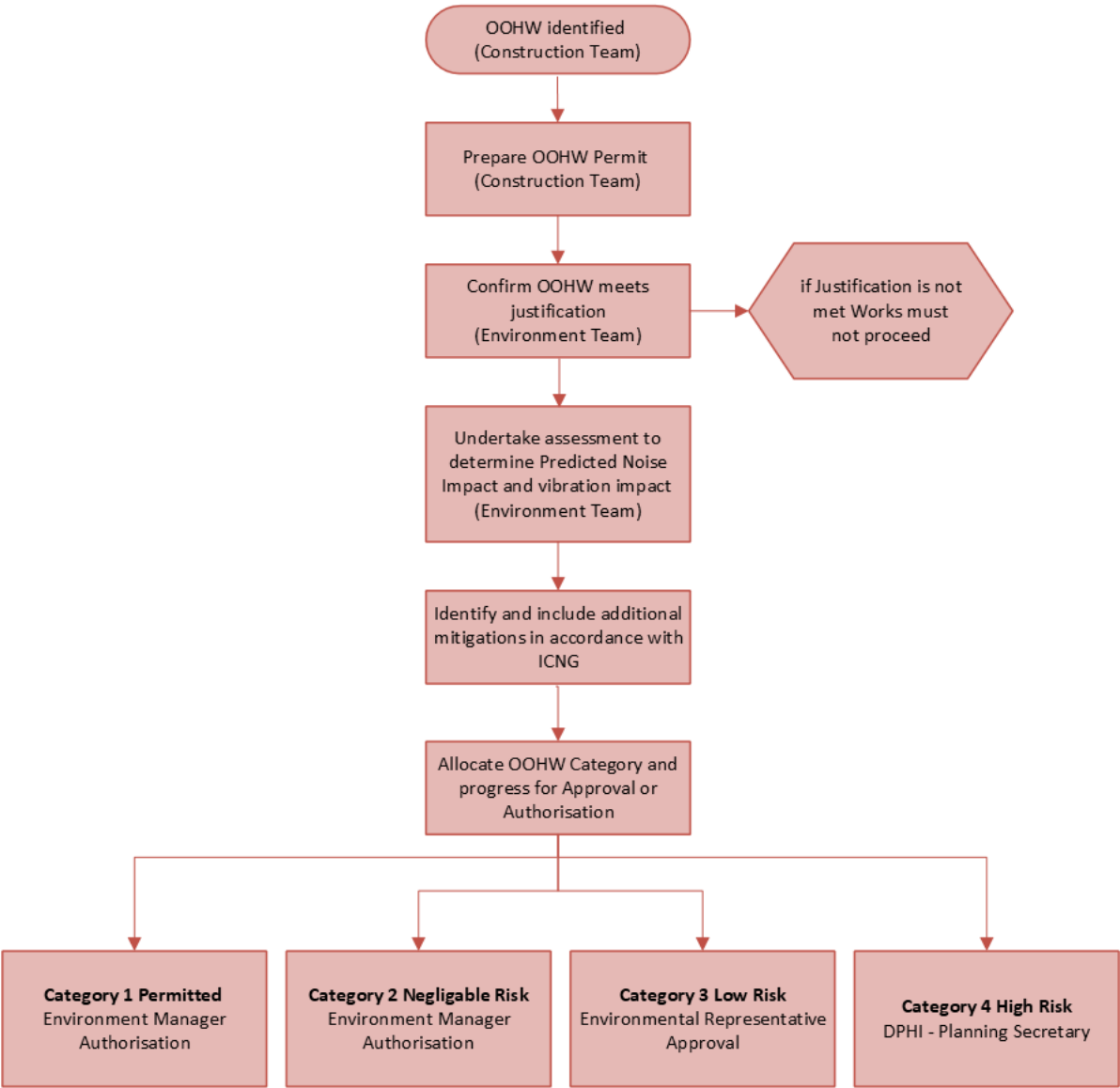


Figure 6-1 OOHW permit process

7 Notification

7.1 COMMUNITY

The Community Engagement and Stakeholder Team will use a range of communication tools to provide clear, effective and timely information to the predicted affected sensitive receivers and stakeholders. The method of communication will be chosen based on the nature of works and the potential impacts, and in consideration of the guidance provided in the ICNG. These mechanisms of outreach may include:

- Direct phone calls
- Letterbox drops
- Electronic mail (email).

Notifications of OOHW events will be issued to potentially affected sensitive receivers.

7.2 COUNCIL

ACJV has a dedicated stakeholder manager who is responsible for coordinating notifications with the applicable Council of any local government area which may be directly impacted by the OOHW, being:

- Dubbo Regional Council
- Mid-Western Regional Council
- Upper Hunter Shire Council
- Warrumbungle Shire Council.

Affected Council/s will be provided notifications concurrently with affected receivers, at least five business days prior to the commencement of works. Note, this does not include emergency works under MCoA (NSW) B2(b) or unplanned activities that are required to continue due to quality or safety reasons. In these cases, affected Council/s will be notified as soon as practicable.

7.3 DPHI

Where the Planning Secretary has the role of OOHW Permit Approval, this Permit will be provided, via the Major Project's website portal, at least 20 days prior to the proposed works commencing, unless otherwise requested by the Planning Secretary. The OOHW Permit will be provided with all details, including a full description of the proposed activity (plant and equipment, duration, timing), outcomes of predicted noise impacts, mitigation measures, and justification. A full description of matters considered in the OOHW Permit is provided in Section 4.1 OOHW Permit.



In all other cases, DPHI will be provided a monthly lookahead of proposed OOHW, unless otherwise requested by DPHI, with any changes to this lookahead notified to DPHI once they are known. Note, this does not include emergency works under MCoA (NSW) B2(b) or unplanned activities that are required to continue due to quality or safety reasons. In these cases, Council will be notified as soon as practicable.

8 Monitoring

8.1 MONITORING APPROACH

Noise monitoring will be conducted as follows:

- At the commencement of a new OOHW activity, where no existing comparable monitoring data is available
- At the commencement of any OOHW activity where exceedance of a NML is predicted to occur as identified on the OOHW Permit
- In response to a complaint (noting that if the complaint is received after the activity has concluded, the monitoring will be undertaken at the next available opportunity of this activity occurring in the vicinity of the complainant).

Vibration monitoring will be undertaken as determined on a case-by-case basis in consideration of safe working distances and receiver sensitivity, and in response to complaints in a similar manner as for noise monitoring.

The requirement for monitoring will be specified on the applicable OOHW Permit.

All monitoring will be undertaken during a representative period of works, and when minimal background interference (i.e. other non-Project related noise and/or vibration inputs) are occurring, to the greatest extent possible.

Noise and vibration monitoring may be undertaken using the following methodologies:

- Attended Monitoring
- Unattended Monitoring.

Further detail of monitoring methodologies is included in the Noise and Vibration Management Plan, to which this OOHW Protocol forms an appendix. It is noted that the undertaking of monitoring activities may be subject to resident and/or property owner access permission.

8.2 MONITORING RESPONSE FRAMEWORK

Where monitored results are found to be above predictions, the following actions will be undertaken in accordance with the following sequence:

1. Confirm monitored levels are not being impacted by other noise or vibration sources that are not associated with construction. If confounding inputs are identified, wait until monitoring can be



undertaken when these inputs will not occur (such as a break in traffic), or exclude confounding data from the monitoring output

2. Confirm all mitigation measures required by the OOHW Permit are being implemented. If not, ensure these are implemented and repeat monitoring. Note – this may trigger a non-compliance
3. Confirm that the works being undertaken are consistent with the works as described in the OOHW Permit. If not, adjust works to reflect the OOHW Permit and repeat monitoring. Note – this may trigger a non-compliance
4. Review whether any additional reasonable and feasible mitigation measures can be applied. Implement these where appropriate and repeat monitoring. Update OOHW Permit as appropriate
5. Determine if alternative equipment, plant, construction methodologies or mitigation measures can be adopted for the activity. Implement this where appropriate and repeat monitoring. Update OOHW Permit as appropriate
6. Stop works where all points and considerations listed above do not result in a compliant monitoring outcome
7. Refine the noise modelling assessment process based on the learnings. For example, if noise or vibration predictions are lower/higher than expected, noise modelling would take this into consideration to more accurately predict impacts for future works
8. Communicate lessons learnt to relevant personnel
9. Should the permit be deemed insufficient by the investigation, a new permit may be required to be produced and approved, and additional mitigation measures may need to be applied.

The Project will review monitoring data and lessons learnt to help inform future OOHW activities and mitigation measures and minimise impacts.

Where monitoring outcomes trigger an incident, the incident management process, as described in the Project Environmental Management Strategy, will be implemented.