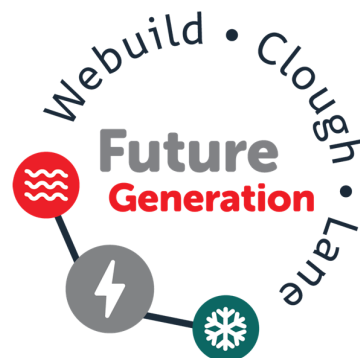




MANAGEMENT PLAN

SNOWY 2.0 MAIN WORKS – CONSTRUCTION NOISE MANAGEMENT PLAN – ROCK FOREST

S2-FGJV-ENV-PLN-0089

DECEMBER 2022

Schedule 3, Condition 57 of the Infrastructure Approval requires a Construction Noise Management Plan for Rock Forest be prepared to address measures to minimise and monitor noise impacts to residents. This plan has been prepared to satisfy Schedule 3, Condition 57 of the Infrastructure Approval.

Revision Record

Rev.	Date	Reason for Issue	Responsible	Accountable	Endorsed
I	02.12.2022	Issue to DPE	N. Jones	E. Porter	M. Franceschi

Document Verification

RACIE Record

R esponsible:	Name: Nathan Jones Job Title: Environmental Coordinator Signed:  Date: 02.12.2022
A ccountable:	Name: Ellen Porter Job Title: Environmental Manager Signed:  Date: 02.12.2022
C onsulted:	See distribution list on Page 3.
I nformed:	See distribution list on Page 3.
E ndorsed:	Name: Massimo Franceschi Job Title: Project Director Signed:  Date: 05/12/2022

RACIE Terms

R	Responsible The person who actually produces the document.
A	Accountable The person who has the answer for success or failure of the quality and timeliness of the document.
C	Consulted Those who must be consulted before the document is published.
I	Informed Those who must be informed after the document is published.
E	Endorsed Those who must approve the document before publication.

Document Distribution

Consulted Distribution List

Date	Format ⁽¹⁾	Addressee / Job Title	Company	Location ⁽²⁾

Informed Distribution List

Date	Format ⁽¹⁾	Addressee / Job Title	Company	Location ⁽²⁾

NOTE: (1) *OHC* – Original Hard Copy / *EC*–Electronic Copy / *HC* – Hard Copy / *Aconex* –Electronic Document Management System

Revision Tracking

Rev.	Date	Description of Revision
A	05.06.2020	Initial draft for Snowy Hydro review
B	17.06.2020	Updated to reflect Snowy Hydro comments
C	26.06.2020	Revised for submission to DPIE
D	27.07.2020	Revised to reflect landholder consultation and DPIE comments
E	02.12.2020	Revised to reflect updated site layout and associated noise assessment
F	28.01.2022	Revised to reflect updated noise assessment and review by SHL
G	20.05.2022	Revised to include public reporting and for issue to DPE
H	11.10.2022	Revised to include additional information requested by DPE
I	02.12.2022	Revised to include additional information requested by DPE

CONTENTS

ABBREVIATIONS AND DEFINITIONS	6
1. INTRODUCTION	9
1.1. Background	9
1.2. Rock Forest Logistics Laydown and Emplacement Area	9
1.2.1. Rock Forest – Construction Activities and Program	9
1.3. Project Approval	13
1.4. Disturbance area	13
1.5. Environmental Management System	15
1.6. Purpose and objectives of this plan	18
1.7. Consultation Summary	18
1.8. Plan Preparation	20
2. ENVIRONMENTAL REQUIREMENTS	21
2.1. Legislation	21
2.2. Conditions of Approval	21
2.3. Revised Environmental Management Measures	22
2.4. Licences and Permits	22
2.5. Guidelines and Standards	23
3. EXISTING ENVIRONMENT	24
3.1. Noise Assessments	24
3.2. Sensitive Receivers	24
3.3. Ambient noise monitoring levels	25
4. NOISE CRITERIA	27
4.1. Noise Criteria	27
4.1.1. Interim Construction Noise Guidelines	27
4.1.2. Noise Management Levels	27
4.2. Sleep Disturbance	28
5. ENVIRONMENTAL ASPECTS, IMPACTS AND RISKS	30
5.1. Environmental Aspects and Impacts	30
5.2. Assessment of Impact	30
5.2.1. EIS Noise and Vibration Assessment	30
5.2.2. Updated Noise Assessment (November 2020)	30
5.2.3. Updated Noise Assessment (January 2022)	30
5.3. Environmental Risk Assessment	32
6. ENVIRONMENTAL MANAGEMENT MEASURES	33
6.1. Management Measures	33
7. COMPLIANCE MANAGEMENT	37
7.1. Monitoring and Inspection	37
7.1.1. Monitoring standards	37
7.1.2. Instrumentation	38
7.1.3. Noise monitoring locations	38
7.1.4. Snowy Hydro Noise Monitoring	38
7.2. Complaints	38
7.3. Training	40
7.4. Auditing	40
7.5. Reporting	40

APPENDIX A – PLANT AND EQUIPMENT SOUND LEVELS and SCHEDULE - Rock Forest.....	41
APPENDIX B – OUT OF HOURS WORKS PROCEDURE	42
APPENDIX C – UPDATED NOISE ASSESSMENT (RWDI, 2022)	49

TABLE OF TABLES

Table 1-1: Disturbance area terminology	13
Table 1-2: Consultation undertaken for this plan.....	19
Table 2-1: Conditions of approval relevant to construction noise management	21
Table 2-2: Revised management measures relevant to this plan	22
Table 3-1: Noise sensitive receivers – Rock Forest	25
Table 3-2: RBLs – Rock Forest residential receivers	25
Table 4-1: Noise at residents using quantitative assessment	27
Table 4-2: Construction NMLs – Rock Forest residential receivers	28
Table 4-3: Sleep disturbance screening criteria - Rock Forest residential receivers	29
Table 5-1: Project aspects and impacts relevant to noise	30
Table 5-2: Predicted construction noise - Rock Forest residential receivers	32
Table 6-1: Noise management measures	34
Table 7-1: Noise monitoring program	37
Table A-1: Plant and equipment sound power levels (Main Works EIS).....	41
Table A-2: Plant and equipment schedule (RWDI, 2022)	41

TABLE OF FIGURES

Figure 1-1: Rock Forest site layout.....	11
Figure 1-2: Original Rock Forest site layout	12
Figure 1-3: Disturbance area and construction envelope.....	15
Figure 1-4: Management plans and post-approval documents with the CNMP indicated	17
Figure 3-1: Snowy 2.0 Main Works noise monitoring and assessment locations	26
Figure 7-1: Snowy Hydro Rock Forest noise monitoring locations.	39

ABBREVIATIONS AND DEFINITIONS

Acronym	Definition
AFL	Agreement for Lease
ANZEC	Australia and New Zealand Environment Council
CSEMP	Community and Stakeholder Engagement Plan
CNMP – Rock Forest	Construction Noise Management Plan – Rock Forest (This plan)
Construction envelope	The envelope within which the disturbance area of the development may be located
CSSI	Critical State significant infrastructure
Day period	Monday-Saturday: 7.00 am to 6.00 pm, on Sundays and public holidays: 8.00 am to 6.00 pm.
DAWE	Department of Agriculture, Water and Environment
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempt to closely approximate the frequency response of the human ear.
DECC	NSW Department of Environment Climate Change
DECCW	NSW Department of Environment Climate Change and Water
Disturbance area	The area within the construction envelope where development may be carried out; the precise location of the disturbance area will be fixed within the construction envelope following final design
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Statement
Main Works EIS	<i>Snowy 2.0 Main Works - Environmental Impact Statement</i>
EMS	Environmental Management Strategy
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
EPA	NSW Environment Protection Authority
EPL	Environment Protection Licence
Future Generation	Future Generation Joint Venture
Future Generation-PMS	Project Management System
Hydro-electric	Generation of electricity using flowing water (typically from a reservoir held behind a dam or barrage) to drive a turbine which powers a generator
HVNL	Heavy Vehicle National Law
ICNG	Interim Construction Noise Guidelines
ISO	International Standards Organisation
Kosciuszko National Park	A National Park protected under the <i>National Parks and Wildlife Act 1974</i> (NSW) and managed by NSW National Parks and Wildlife Service. It covers an area of 673,543 hectares and forms part of Australia's only Alpine area
KNP	Kosciuszko National Park
LGA	Local Government Area
L ₁	The noise level exceeded for 1% of the time.
L ₁₀	The noise level which is exceeded 10% of the time. It is roughly equivalent to the average of maximum noise level.

Acronym	Definition
L ₉₀	The noise level that is exceeded 90% of the time. Commonly referred to as the background noise level.
L _{Aeq}	The energy average noise from a source. This is the equivalent continuous sound pressure level over a given period. The Leq(15min) descriptor refers to a Leq noise level measured over a 15minute period.
L _{Amax}	The maximum sound pressure level received during a measuring interval.
MICharge	Maximum instantaneous charge
NEM	National Electricity Market
Night period	Monday-Saturday: 10.00 pm to 7.00 am, on Sundays and public holidays: 10.00 pm to 8.00 am.
NML	Noise Management Level
NPW Act	NSW <i>National Parks and Wildlife Act 1995</i>
NPW Regulation	NSW <i>National Parks and Wildlife Regulation 2009</i>
NPWS	NSW National Parks and Wildlife Service
NPW Act	<i>National Parks and Wildlife Act 1974</i>
Main Works	The development of an underground power station and associated infrastructure described in the Environmental Impact Statement for the <i>Snowy 2.0 Main Works</i> (CSSI 9687) dated September 2019, and modified by the: • <i>Preferred Infrastructure Report and Response to Submissions – Snowy 2.0 Main Works</i>, dated February 2020; and • Additional information provided to the Department by EMM on 24 March 2020 and 7 April 2020
MIC	Maximum instantaneous change
OEH	NSW Office of Environment and Heritage
OOH	Out of hours
OOHW	Out of hours works
OSOM	Over-sized Over-mass
PEP	Project Execution Plan
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
POEO Noise Control Regulation	<i>Protection of the Environment Operations (Noise Control) Regulation 2008</i>
Project, the	Snowy 2.0 Main Works
Project area	The project area is the broader region within which Snowy 2.0 will be built and operated, and the extent within which direct impacts from Snowy 2.0 Main Works are anticipated. The project area does not represent a footprint for the construction works, but rather indicates an area that was investigated during environmental assessments.
PSE	Permanent spoil emplacement
QMP	Quality Management Plan
RBL	The rating background level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the average background levels.
REMM	Revised environmental management measures
RMS	Roads and Maritime Services (now Transport for NSW)
RNP	Road Noise Policy

Acronym	Definition
Rock Forest	The development on the Rock Forest property, including the Rock Forest emplacement area, logistics laydown area and ancillary infrastructure including access roads
RTS or Submissions Report	<i>Snowy 2.0 Main Works – Preferred Infrastructure Report and Response to Submissions</i>
SEP	Site Environmental Plan
SMRC	Snowy Monaro Regional Council
Snowy Hydro	Snowy Hydro Limited
Sound power level (LW)	A measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.
SSI	State significant infrastructure
SVC	Snowy Valleys Council
TfNSW	Transport for New South Wales
VMP	Vehicle Movement Plans
WMS	Work Method Statement

1. INTRODUCTION

1.1. Background

Snowy Hydro Limited (Snowy Hydro) is constructing a pumped hydro-electric expansion of the Snowy Mountains Hydro-electric Scheme (Snowy Scheme), called Snowy 2.0. Snowy 2.0 is being built by the delivery of two projects: Exploratory Works and Main Works.

Snowy 2.0 is a pumped hydro-electric project that will link the existing Tantangara and Talbingo reservoirs through a series of new underground tunnels and a hydro-electric power station. Most of the project's facilities will be built underground, with approximately 27 kilometres of concrete-lined tunnels constructed to link the two reservoirs and a further 20 kilometres of tunnels required to support the facility. Intake and outlet structures will be built at both Tantangara and Talbingo Reservoirs.

Snowy 2.0 will increase the generation capacity of the Snowy Scheme by an additional 2,000 megawatts and provide up to 350,000 MWh of large-scale energy storage to the National Electricity Market (NEM). This will be enough to ensure the stability and reliability of the NEM, even during prolonged periods of adverse weather conditions.

Webuild (formerly Salini Impregilo), Clough and Lane have formed the Future Generation Joint Venture (Future Generation) and have been engaged to deliver both Stage 2 of Exploratory Works and Snowy 2.0 Main Works.

1.2. Rock Forest Logistics Laydown and Emplacement Area

The Rock Forest site, located outside Kosciuszko National Park (KNP), is used as a storage and logistics area for the delivery of materials to the main project sites, and will be used as an emplacement area for excavated rock materials generated from the Marica area.

1.2.1. Rock Forest – Construction Activities and Program

The works associated with Rock Forest site include the following:

- road upgrades to allow ingress and egress from the Rock Forest property to the Snowy Mountains Highway for light and heavy vehicles;
- pre-construction preparatory activities including dilapidation studies, minor clearing and erosion and sediment control works;
- internal road construction;
- site construction works associated with the logistics laydown and emplacement areas, including:
 - installation of services and drainage;
 - installation of temporary buildings and amenities;
 - laying of concrete and gravel surfaces;
- haulage, emplacement and land forming of spoil within the emplacement area;
- movement of trucks and plant onsite including within the emplacement area
- movement and staging of personnel on site;
- ongoing site maintenance; and
- post-construction revegetation and rehabilitation:
 - demolition of structures and permanent infrastructure;

- final earthworks;
- revegetation.

Following approval of the project, the layout of the Rock Forest site was changed to enable beneficial outcomes for the environment, community and the project. As shown in Figure 1-1 in grey below, the site entrance and logistics yard have been moved to the south-east. The emplacement area has remained in its original position, shown in green. The original site layout is provided in Figure 1-2.

Following revision of the site layout, noise assessments were undertaken to assess the change in impact to adjacent sensitive receivers and have been incorporated into this plan.

As the spoil emplacement area was subject to detailed design, its associated noise impacts were not included in previous revisions. However, in January 2022, upon finalisation of detailed design, predicted noise impacts associated with spoil emplacement at the Rock Forest permanent spoil emplacement (PSE) were assessed and have been included in this plan. Predicted impacts have resulted in the Project limiting Rock Forest spoil emplacement works to standard daytime construction hours, where spoil emplacement works include haulage, emplacement and land forming of spoil within the emplacement area.

Ongoing use of the logistics area will be undertaken 24 hours 7 days per week throughout the life of the Project.

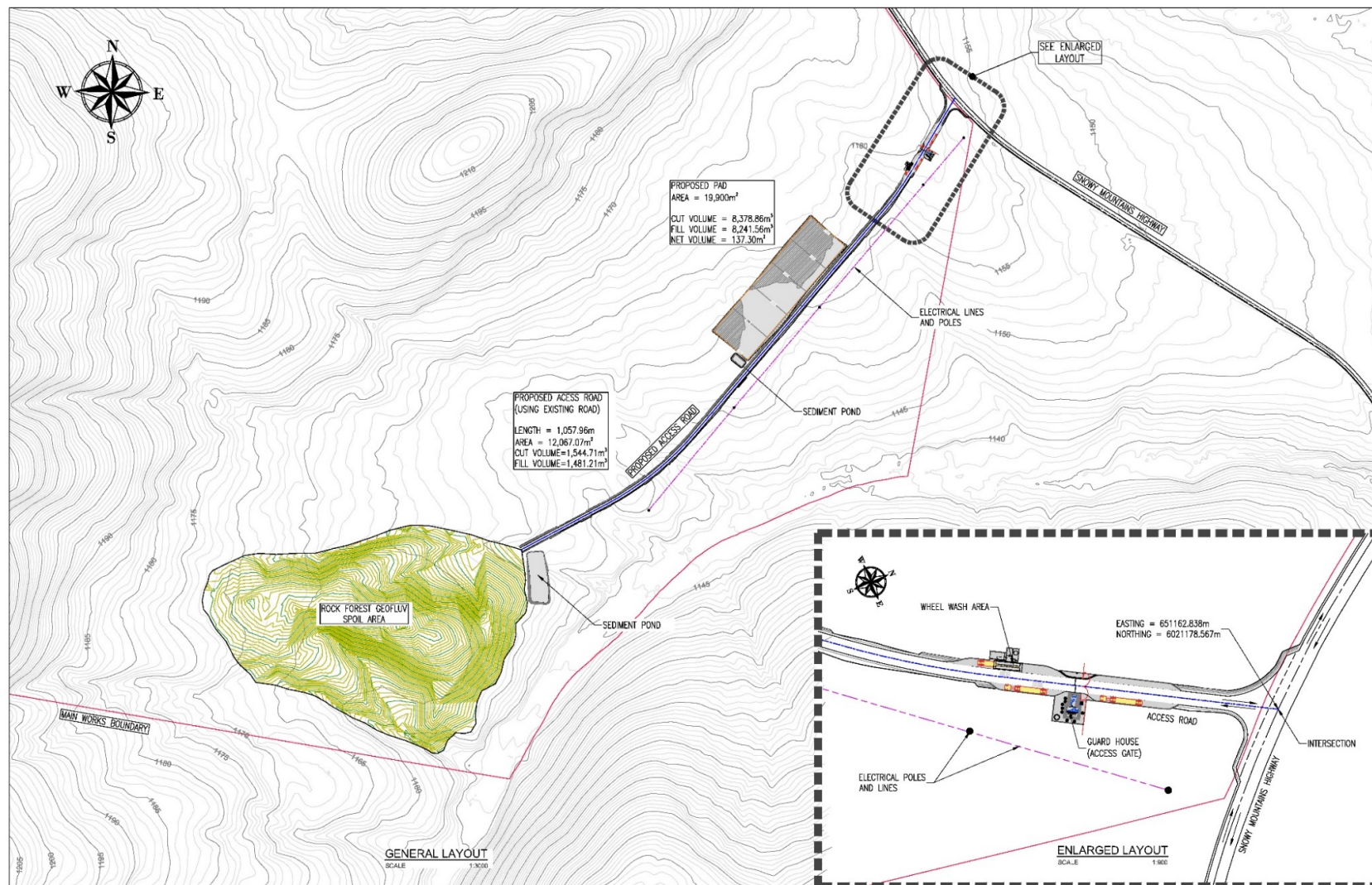


Figure 1-1: Rock Forest site layout – laydown shown in grey, spoil emplacement area shown in green

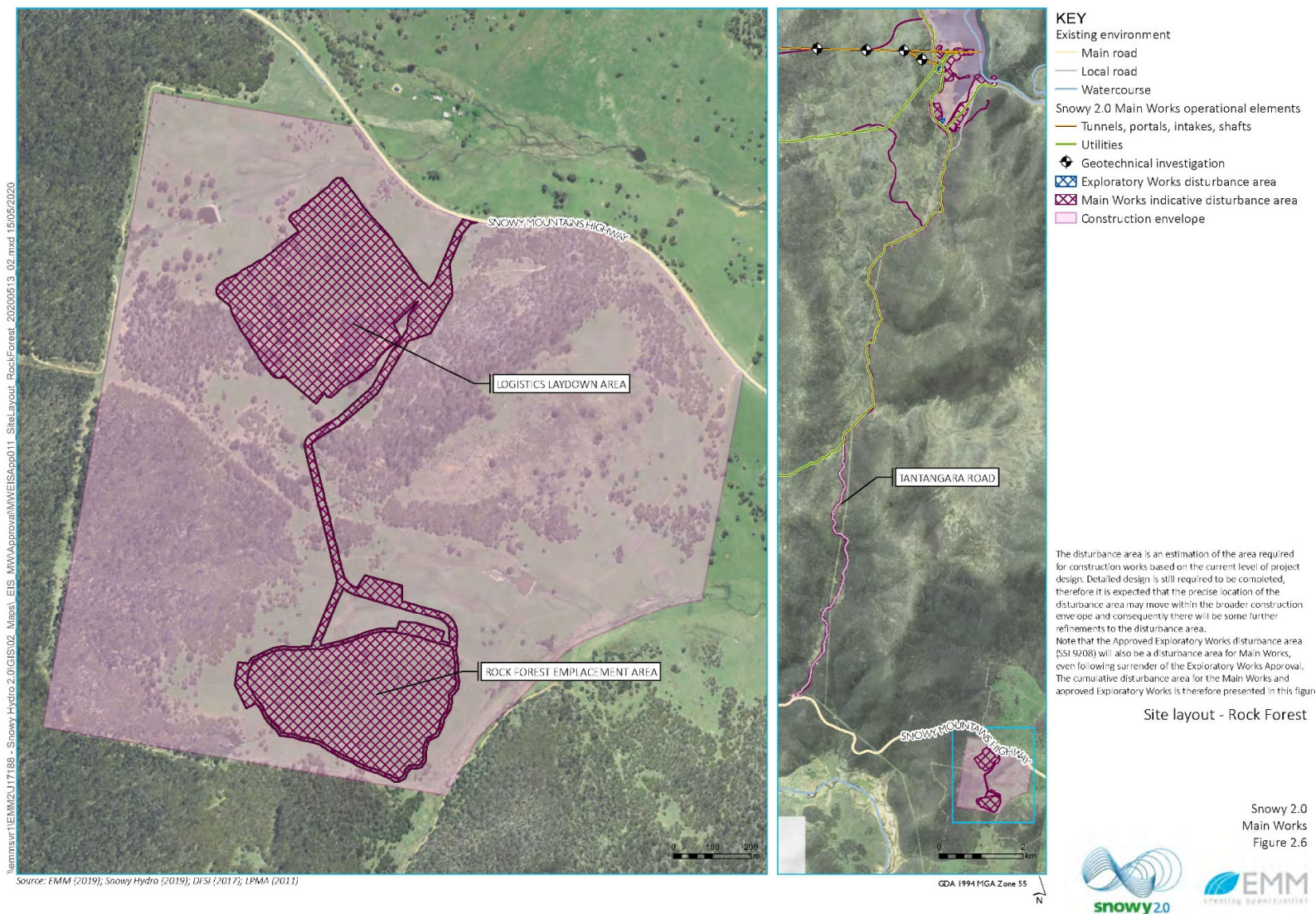


Figure 1-2: Original Rock Forest site layout

1.3. Project Approval

On 7 March 2018 the NSW Minister for Planning declared Snowy 2.0 to be State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) on the basis that it is critical to the State for environmental, economic or social reasons.

In July 2019, the *Environmental Impact Statement Exploratory Works for Snowy 2.0* (Exploratory Work EIS) was submitted to the then Department of Planning and Environment. Following public exhibition, the response to submissions was prepared (*Response to Submissions Exploratory Works for Snowy 2.0*), and on 7 February 2019, approval of Snowy 2.0 Exploratory Works (Exploratory Works) was granted by the Minister for Planning.

The purpose of Exploratory Works is primarily to gain a greater understanding of the underground geological conditions at the new power station. In accordance with section 5.25 of the EP&A Act, the Infrastructure Approval for Exploratory Works was modified on 2 December 2019 and on 27 March 2020.

The *Snowy 2.0 Main Works Environmental Impact Statement* (Main Work EIS) was submitted to Department of Planning, Industry and Environment (DPIE) in September 2019 and was publicly exhibited between 26 September 2019 and 6 November 2019. A total of 222 submissions were received during the public exhibition period, including 10 from government agencies, 30 from special interest groups and 182 from the general public. In February 2020, the response to submissions (RTS) was issued to DPIE to address the public and agency submissions (*Snowy 2.0 Main Works - Preferred Infrastructure Report and Response to Submissions, February 2020*).

Following consideration of the Main Works EIS and RTS, approval was granted by the Minister for Planning and Public Spaces on 20 May 2020, through issue of Infrastructure Approval SSI 9687.

The Infrastructure Approval contains 86 conditions of Approval. The Snowy 2.0 project will be carried out in accordance with these conditions of Approval. Further to the Infrastructure Approval, the Main Works RTS includes revised environmental management measures (REMMs) within Appendix C which will also be implemented for the project. Schedule 3, condition 57 of the Infrastructure Approval requires the development of this CNMP to manage noise impacts associated with the construction and operation of the Rock Forest site.

In addition to the State approval, a referral (EPBC 2018/8322) was prepared and lodged with the Commonwealth Department of Agriculture, Water and the Environment (DAWE) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Commonwealth Minister's delegate determined on 5 December 2018 that Snowy 2.0 Main Works is a "controlled action" under the EPBC Act. The EPBC Act referral decision determined that the project will be assessed by accredited assessment under Part 5, Division 5.2 of the NSW *Environmental Planning and Assessment Act 1979*.

1.4. Disturbance area

A key refinement following public exhibition of the Main Works EIS was a change to and clarification of disturbance area terminology. The revised disturbance area terminology as per the SSI-9687 Approval, RTS and this plan, is outlined in Table 1-1. An example of the terminology is shown in Figure 1-3 at Ravine Road.

Table 1-1: Disturbance area terminology

Term	Definition	Reasoning
Project area	The project area is the broader region within which Snowy 2.0 will be built and operated,	The project area does not represent a footprint for the construction works, but rather indicates an area that was

Term	Definition	Reasoning
	and the extent within which direct impacts from Snowy 2.0 Main Works are anticipated.	investigated during environmental assessments.
Construction envelope	The envelope within which the disturbance area of the development may be located	As detailed design continues, final siting of the infrastructure (i.e. the disturbance area) can move within the assessed construction envelope subject to recommended environmental management measures and provided it does not exceed the limits defined by the construction envelope.
Disturbance area	The area within the construction envelope where development may be carried out; the precise location of the disturbance area will be fixed within the construction envelope following final design.	



Figure 1-3: Disturbance area and construction envelope

1.5. Environmental Management System

The overall environmental management system for the project is described in the Environmental Management Strategy (EMS). The EMS forms part of the Project Management System (Future Generation PMS) and will include any requirements specified in the contract documents, where appropriate. All Future Generation PMS procedures will support, interface or directly relate to the development and execution of the plan.

A number of environmental management plans are required to support the EMS. They document the aspects, impacts, management measures and monitoring requirements for each key

environmental aspect. The conditions of Approval and REMMs define the content and issues to be addressed in most of the management plans.

This Construction Noise Management Plan – Rock Forest (CNMP or plan) forms part of Future Generation's environmental management framework as described in the EMS. This plan aims to transfer the relevant requirements of the Approval documents into a management plan which can be practically applied on the project site.

The timing and relation of the Main Works management plans is displayed in Figure 1-4 below. This CNMP is a new document and is prepared specifically for the Snowy 2.0 Main Works project, and in particular the works at Rock Forest. As this plan has been prepared for the Snowy 2.0 Main Works project, there are no applicable requirements from the Snowy 2.0 Exploratory Works Infrastructure Approval nor from the *Environmental Impact Statement for the Exploratory Works for Snowy 2.0*.

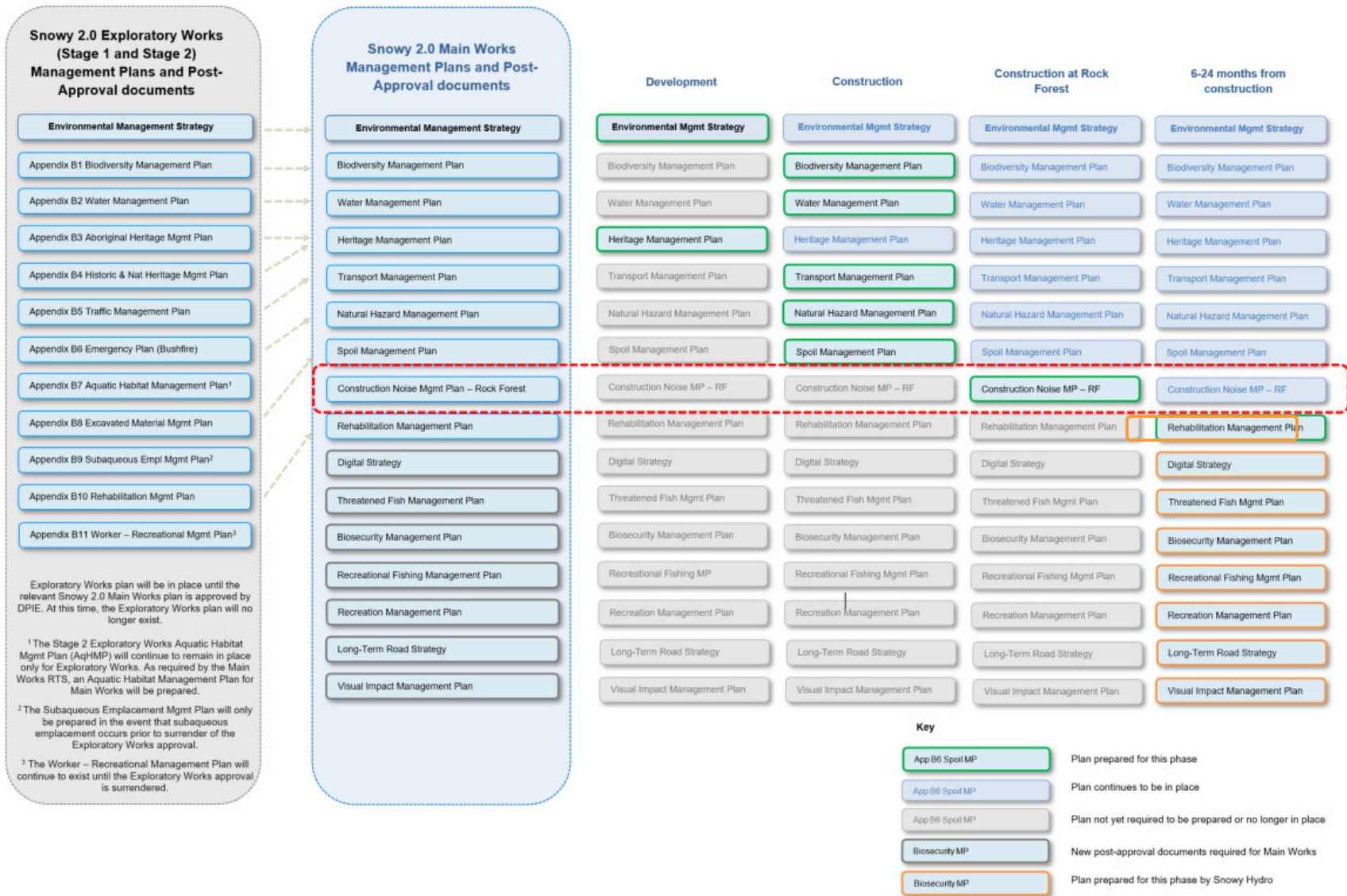


Figure 1-4: Management plans and post-approval documents with the CNMP indicated

1.6. Purpose and objectives of this plan

The purpose of this plan is to address the construction environmental management requirements relevant to construction noise at the Rock Forest site, detailed in:

- the Infrastructure Approval (SSI 9687) (the Approval) issued for Snowy 2.0 Main Works on 20 May 2020;
- the *Main Works Snowy 2.0 - Environmental Impact Statement*; and
- the revised environmental management measures (REMMs) within the Main Works RTS.

The approved CNMP will be implemented in accordance with the requirements of schedule 3, condition 57 of the Infrastructure Approval. This plan will be updated following completion of detailed design of the spoil emplacement area.

The key objective of this plan is to detail management measures and inform site procedures for implementation so that construction noise related impacts on residential receivers in proximity to the Rock Forest site are minimised and within the scope permitted by the Approval. To achieve this objective, Snowy Hydro and Future Generation will:

- ensure appropriate measures are implemented to address the relevant conditions of Approval and the REMMs listed within the Submissions Report, as detailed within Table 2-1 and Table 2-2;
- ensure appropriate measures are implemented during construction to avoid or minimise noise related impacts; and
- ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 2 of this plan.

1.7. Consultation Summary

In accordance with schedule 3, condition 57(a) of the Approval, the Rock Forest CNMP is to be prepared in consultation with impacted landowners adjacent to the site, including:

- 6560 Snowy Mountains Highway, Adaminaby; and
- 10/DP48756 Snowy Mountains Highway, Adaminaby.

Discussions with impacted residents will include:

- the types of activities to be undertaken;
- the timing of activities including expected start and finish;
- the location of activities;
- details of the community information line and how to make an enquiry and / or complaint; and
- proposed mitigation measures and monitoring.

Between 19 and 26 June 2020, initial consultation in the form of phone calls, letter box drops, and door knocks was undertaken.

On 25 June members of the Future Generation environmental and community teams doorknocked receivers provided in Table 3-1. Two (2) residents were encountered and were provided information on the proposed works and contact details for any further enquiries. Where property owners were not contactable, were not home or did not permanently reside at the property, messages and contact details were left.

From 26 June 2020, Future Generation will continue to attempt to contact impacted residents (R6 and R19). When contact is made, formal consultation will be undertaken and outcomes will be incorporated into this plan.

On 07 July 2020, Snowy Hydro and Future Generation staff met with resident R6 to discuss the project, the predicted impacts and proposed mitigation measures to be implemented on-site. Snowy Hydro and Future Generation agreed to alter the site layout and design in order to significantly reduce the noise and amenity impacts to the receiver. The revised site layout is described in Section 1.2 and an updated noise assessment is provided in Section 3.1.

On 16 November 2020, Future Generation staff met with resident R19 to discuss the project, predicted impacts and proposed mitigation measures to be implemented on-site in the revised location. Resident was satisfied impacts were not directly opposite their property.

On 25 November 2020, Future Generation staff met with resident R19 to discuss the project, predicted impacts and proposed mitigation measures to be implemented on-site. It was discussed that the location and design of the spoil emplacement area (the impacting activity or R19) is subject to detailed design. It was also discussed that further consultation would be undertaken following detailed design and assessment of the potential noise impacts of the spoil emplacement area.

Throughout 2021, significant consultation has been undertaken by both Future Generation and Snowy Hydro with adjacent landholders. Consultation has included extensive correspondence via email and phone and face to face meetings. All project material provided contains contact details for complaints and enquiries to enable ongoing dialogue.

The result of the consultation process have been incorporated into this plan where appropriate and are summarised in Table 1-2.

Table 1-2: Consultation undertaken for this plan

Date	Consultation	Outcomes
June – November 2020	R6 – 6560 Snowy Mountains Highway, Adaminaby	24 June – telephone call and message. 25 June – telephone call and message. 25 June – letterbox drop. 07 July – in person meeting. 16 November – in person meeting
June – November 2020	R19 – 10/DP48756 Snowy Mountains Highway, Adaminaby	24 June – telephone call and message. 25 June – telephone call and message. 25 June – letterbox drop. 25 November – in person meeting.
April 2021	R19 – 10/DP48756 Snowy Mountains Highway, Adaminaby	- In-person meetings and telephone calls. 23 April – telephone call to discuss concerns regarding works during construction and operation regarding noise. Measures were discussed to monitor impacts with agreement for on property noise monitoring.
August 2021	6560 Snowy Mountains Highway 6193 Snowy Mountains Highway 6225 Snowy Mountains Highway, Adaminaby 10/DP48756 Snowy Mountains Highway, Adaminaby	11 August – residents were offered a site visit to all surrounding residents of Rock Forest. - Residents stated they had no issues at that stage requested that they be informed before any spoil placement in future.

Date	Consultation	Outcomes
September 2021	6560 Snowy Mountains Highway 6065 Snowy Mountains Highway 6067 Snowy Mountains Highway 6069 Snowy Mountains Highway 6074 Snowy Mountains Highway 6076 Snowy Mountains Highway 6078 Snowy Mountains Highway 6193 Snowy Mountains Highway 4/DP1002302 Snowy Mountains Highway, Adaminaby Lot 3 Snowy Mountains Highway, Adaminaby Lot 2 Snowy Mountains Highway, Adaminaby 1/DP100230 Snowy Mountains Highway, Adaminaby 6225 Snowy Mountains Highway, Adaminaby 10/DP48756 Snowy Mountains Highway, Adaminaby	September - all surrounding residents were notified of the opening of Rock Forest community consultation night, telephone calls, and messages.
	10/DP48756 Snowy Mountains Highway, Adaminaby	21 July - telephone call. - Operational noise and commencement of spoil emplacement were discussed with no issues at this stage.
	6560 Snowy Mountains Highway 6193 Snowy Mountains Highway 6225 Snowy Mountains Highway, Adaminaby	Residents had spoken on multiple occasions to other surrounding residents with no concerns raised at this stage.
July 2022	6560 Snowy Mountains Highway Lot 2 Snowy Mountains Highway, Adaminaby Lot 3 Snowy Mountains Highway, Adaminaby	21 July - telephone calls. 22 July - In-person meetings on site - Some minor concerns regarding noise and water management pertaining to spoil emplacement were discussed. The management and mitigative measures were discussed with residents and residents were informed how they would be able to find the publicly available reports required for Project compliance. Residence satisfied with the approach.

Where unforeseen excessive noise or out of hours works (OOHW) are predicted to occur, further consultation will be undertaken with the residents and negotiated noise mitigation agreements may be used for works to occur.

1.8. Plan Preparation

In accordance with schedule 3, condition 57 (a) of the Approval, this CNMP has been prepared by Remi Larmandieu, suitably qualified and experienced noise consultants from RWDI (formerly Wilkinson Murray).

2. ENVIRONMENTAL REQUIREMENTS

2.1. Legislation

Legislation relevant to noise management includes:

- *Protection of the Environment Operations Act 1997* (POEO Act); and
- *Protection of the Environment Operations (Noise Control) Regulation 2008* (POEO Noise Control Regulation).

Relevant provisions of the above legislation are explained in the register of legal and other requirements included in Appendix A1 of the EMS.

2.2. Conditions of Approval

The following noise management conditions specified under schedule 3 of the Infrastructure Approval are presented in Table 2-1 below.

Table 2-1: Conditions of approval relevant to construction noise management

Condition	Environmental management measure	Where addressed
Schedule 3, condition 53	Visual Impact Management Requirements The Proponent must: (a) minimise the visual impacts of the long-term temporary and permanent infrastructure of the development on the Kosciuszko National Park, including: • installing landscaping and/or suitable screening as soon as practicable along the Snowy Mountains Highway boundary of the Rock Forest site to screen the development on site from road users and nearby residences; (b) minimising the visual impacts of the development on the Rock Forest site on nearby residences during construction;	Table 6-1 NV07 Visual Impact Management Plan Visual Impact Management Plan
Schedule 3, condition 56	Minimise Noise The Proponent must minimise the noise generated by the construction, operation, and decommissioning of the development.	Section 6 Table 6-1
Schedule 3, condition 57	Construction Noise Management Plan – Rock Forest Prior to the commencement of construction on the Rock Forest site, the Proponent must prepare a Construction Noise Management Plan for the development on site to the satisfaction of the Planning Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person in consultation with the landowners of the nearby properties; (b) describe the measures that would be implemented to minimise the construction noise impacts of the development on the Rock Forest site, including: • minimising the use of the site during the evening and night-time periods; • implementing the best practice noise mitigation measures outlined in the Interim Construction Noise Guideline (DECC, 2009), or its latest version; and,	This plan Section 1.8 Section 1.7 Table 6-1 NV09 Table 6-1

Condition	Environmental management measure	Where addressed
	potentially, the use of voluntary noise mitigation agreements with landowners to allow higher construction noise levels or longer construction hours (c) include a program to monitor and publicly report on the effectiveness of these measures.	Table 6-1 NV1 and NV12 Section 7.1
Schedule 3, condition 58	The Proponent must implement the approved Construction Noise Management Plan for the Rock Forest site.	Section 1.6

2.3. Revised Environmental Management Measures

Environmental safeguards and management measures are included in the Main Works EIS in Appendix G. During preparation of the Submissions Report, REMMs were developed and are included in Appendix C of the Main Works Submissions Report.

The REMMs from Appendix C of the Main Work Submissions Report, relevant to this plan are listed in Table 2-2 below.

Table 2-2: Revised management measures relevant to this plan

Impact	Reference	Revised environmental management measures	Where addressed
Construction impacts amenity	NV01	Prepare a construction noise and vibration management plan (CNMP) that will address noise and vibration management and mitigation options (where required). The CNMP will include as a minimum: - identification of nearby residences and sensitive land uses; - a description of approved hours of work and what work will be undertaken; - a description of what work practices will be applied to minimise construction noise, in particular how construction noise levels will be managed where predicted noise levels above the NMLs have been identified; - a description of what work practices will be applied to minimise vibration; - a description of the complaints handling process; and - a description of monitoring that is required.	This plan Section 3.2 Table 6-1 NV09 Section 6.1 Table 6-1 Section 3.1 Section 7.2 Section 7.1
Exceedance of day and night-time criteria at assessment location	NV02	Affected landholders should be consulted prior to and during construction and should be notified of proposed mitigation measures that will be used to manage construction noise levels to below Interim Construction Noise Guideline (EPA 2009) NMLs where practicable.	Section 1.7 Table 6-1 NV12 – NV14

2.4. Licences and Permits

Environment Protection Licence (EPL) (No 21266) was issued as part of the Exploratory Works phase for extractive activities. The premises boundary for the Exploratory Works EPL has been expanded to encompasses both Exploratory Works and Main Works activities and the governing schedule activity for Main Works will be Electricity Generation.

EPL 21266 has been varied on a number of occasions since being issued by the EPA. No aspects of EPL variations have been relevant to the Rock Forest site or this Plan.

2.5. Guidelines and Standards

The guidelines considered in the completion of this assessment include those from NSW Environment Protection Agency (EPA) and Transport for NSW (TfNSW):

- NSW Department of Environment Climate Change (DECC) 2009, *Interim Construction Noise Guideline* (ICNG);
- NSW Environment Protection Authority (EPA) 2017, *NSW Noise Policy for Industry* (NPfI);
- NSW Department of Environment Climate Change and Water (DECCW) 2011, *Road Noise Policy* (RNP); and
- TfNSW – *Construction Noise and Vibration Strategy* – April 2019 (CNVS v4.1); and
- NSW EPA, (ECRTN) 1999, *Environmental Criteria for Road Traffic Noise*.

3. EXISTING ENVIRONMENT

The Rock Forest site is located outside of KNP, approximately 14km north-west of Adaminaby. Rock Forest will be used for the length of the project, as a storage and logistics area for the delivery of materials to the main project sites.

During adverse weather or unsafe conditions, the site will be used to stage deliveries and staff. Facilities likely to be established at the site include storage yards (for segments and other goods), turn around and parking areas and amenities.

Spoil generated from the Marica area will temporarily stockpiled within the construction footprint then loaded onto trucks and transported to Rock Forest via the Snowy Mountains Highway.

Works required to construct the Rock Forest site also include upgrade of the Snowy Mountains Highway / Rock Forest intersection, including Basic Right Turn (BAR), Auxiliary Left Turn (AUL) and pavement widening to allow ingress and egress for light and heavy vehicles. These works will be undertaken by Transport for NSW (TfNSW).

3.1. Noise Assessments

The Noise and Vibration Assessment (NVA), included within Appendix R of the Main Works EIS, concluded that for the Rock Forest site:

1. on-site construction related airborne noise including sleep disturbance exceeded the recommended criteria;
2. construction related traffic noise along the road network is predicted to comply with the recommended criteria;
3. vibration intensive construction activities are not proposed; and
4. blasting is not proposed at this site.

As a result, this CNMP will focus on airborne noise emissions from on-site related activities only, however, will include the criteria regarding construction traffic given the anticipated high number of truck movements along Snowy Mountains Highway to and from Rock Forest.

Following revision of the site layout, noise assessments were undertaken to assess the change in impact to adjacent sensitive receivers. Outcomes of the updated Noise Assessment are provided in Section 5 and as Appendix C.

As the spoil emplacement area is subject to detailed design, its associated noise impacts have not been included within this assessment. Upon finalisation of detailed design, noise impacts for the preparation and emplacement of spoil will be evaluated and this plan will be updated accordingly.

3.2. Sensitive Receivers

The NVA and the Main Works Submissions Report, provide details of the receivers assessed for the Rock Forest site. Sensitive receivers most relevant to Rock Forest are listed in Table 3-1 and their locations are shown in Figure 3-1.

The nearest and most impacted sensitive receivers are considered to be R6, located approximately 200m to the north of the site and R19, located approximately 500m to the south of the site. Both receivers are rural, residential properties.

Table 3-1: Noise sensitive receivers – Rock Forest

ID	Description	Classification	Easting	Northing
R6	6560 Snowy Mountains Highway	Residential	650414	6021793
R7	6065 Snowy Mountains Highway	Residential	653068	6017700
R8	6067 Snowy Mountains Highway	Residential	652785	6018304
R9	6069 Snowy Mountains Highway	Residential	652758	6018605
R10	6074 Snowy Mountains Highway	Residential	653301	6018452
R11	6076 Snowy Mountains Highway	Residential	653413	6018914
R12	6078 Snowy Mountains Highway	Residential	652937	6018962
R13	Rock Forest, 6193 Snowy Mountains Highway	Residential	652289	6019054
R14	4/DP1002302 Snowy Mountains Highway, Adaminaby	Residential	651167	6018200
R15	Lot 3 Snowy Mountains Highway, Adaminaby	Residential	651093	6018384
R16	Lot 2 Snowy Mountains Highway, Adaminaby	Residential	650893	6018404
R17	1/DP100230 Snowy Mountains Highway, Adaminaby	Residential	650879	6018592
R18	6225 Snowy Mountains Highway, Adaminaby	Residential	649917	6018153
R19	10/DP48756 Snowy Mountains Highway, Adaminaby	Residential	650325	6019535

3.3. Ambient noise monitoring levels

As part of the NVA, unattended noise monitoring was undertaken using a noise logger at six (6) locations to establish the existing level of ambient noise across the project. Location L5 – ‘Rock Forest’ Snowy Mountains Highway, Adaminaby, was undertaken to establish the ambient noise environment of the Rock Forest site. Noise monitoring and assessment locations are provided in Figure 3-1 below (the Rock Forest assessment location is provided in the figure insert).

The NVA confirmed in Section 3.3, that the background monitoring levels for L5 were 34dBA for the day period and <30dBA for the evening and night periods. In accordance with the Noise Policy for Industry (Npfi), where measured background levels are <35dbA for the day and <30dBA for evening / night, then the background noise levels are to be set at 35dBA for the day and 30dBA for evening / night respectively.

Table 3-2 summarises the rating background levels (RBLs) for the residential receivers at Rock Forest.

Table 3-2: RBLs – Rock Forest residential receivers

Time of day	Rating Background Level (dB(A))
Day (7am – 6pm Monday to Saturday and 8am-6pm on Sunday & Public Holidays)	35
Evening (6pm – 10pm)	30
Night (10pm – 7am Monday to Saturday, on Sunday & Public Holidays, night ends at 8am)	30

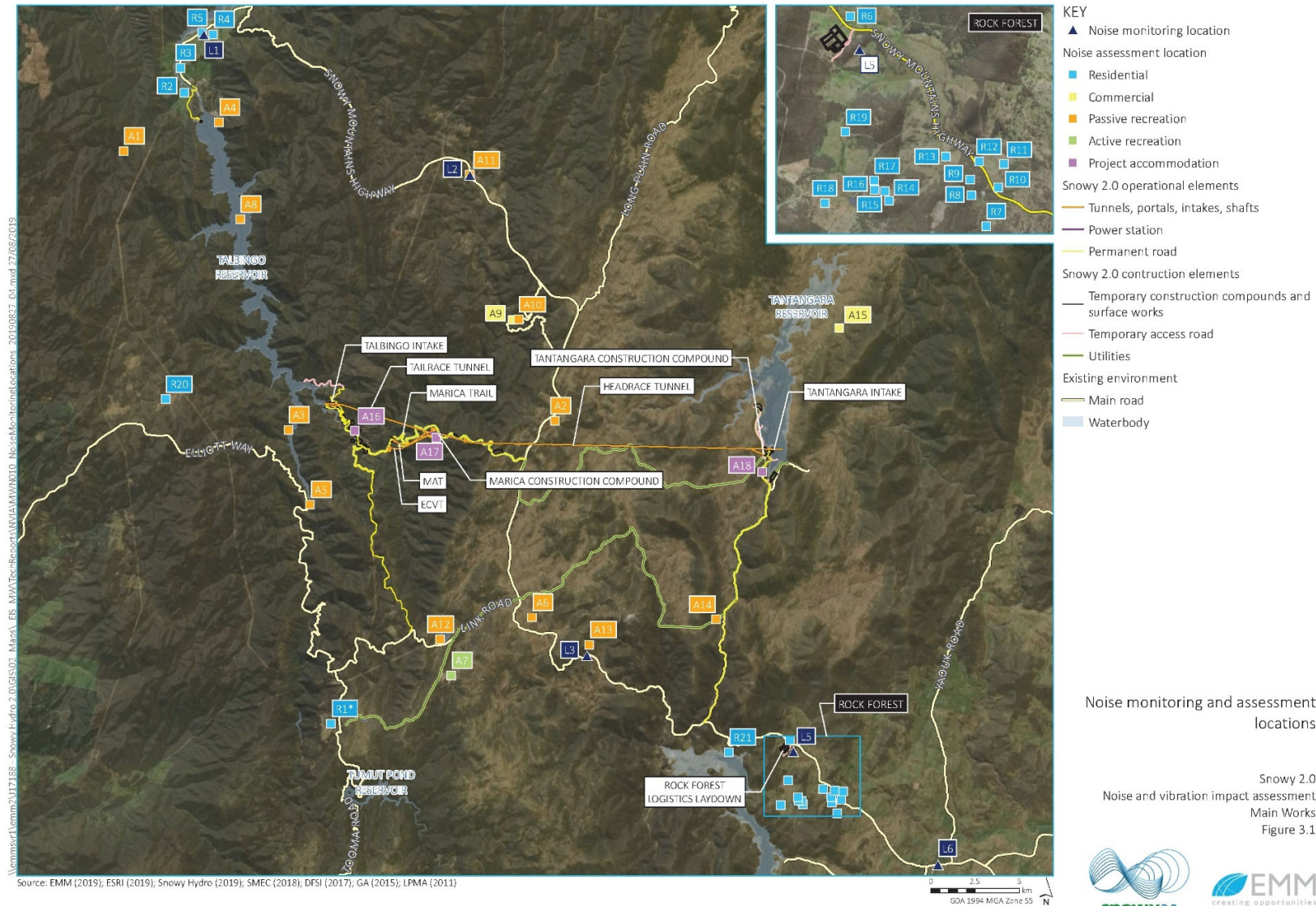


Figure 3-1: Snowy 2.0 Main Works noise monitoring and assessment locations

4. NOISE CRITERIA

4.1. Noise Criteria

4.1.1. Interim Construction Noise Guidelines

The objectives of the ICNG are to promote a clear understanding of ways to identify and minimise noise from construction and to identify ‘feasible’ and ‘reasonable’ work practices. The ICNG acknowledges that works outside standard construction hours (out-of-hours) may be necessary, however justification should be provided to the relevant authorities.

The ICNG provides quantitative and qualitative methodologies to assess construction noise. The quantitative approach was adopted for the NVA and updated Noise Assessment and included the prediction of noise emissions from construction activities and assessment against ICNG recommended noise management levels (NMLs) at the nearest sensitive receivers.

4.1.2. Noise Management Levels

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

As sensitive receivers adjacent to the Rock Forest site are residential only, this CNMP will focus only on residential receivers. For residential properties, the RBL (Table 3-2) is used to determine the management level. Table 4-1 is derived from the ICNG and details how the NMLs are determined for each period.

Table 4-1: Noise at residents using quantitative assessment

Time of day	Management Level Laeq (15 min) *	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected 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 Laeq (15 min) 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 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences) - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Time of day	Management Level L _{Aeq} (15 min) *	How to apply
Outside recommended standard hours	Noise affected RBL + 5 dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

* 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 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Construction NMLs relevant to the Rock Forest site for recommended standard hours and out-of-hours (OOH) periods, are presented in Table 4-2. Adopted criteria consider the noise impacts from all activities over a typical worst case 15 minute period.

Table 4-2: Construction NMLs – Rock Forest residential receivers

Receivers	Period	RBL ¹ (dB(A))	NML L _{Aeq,15min} (dB(A))
Residential assessment locations: R6, R19	Day (standard ICNG hours)	35	45 (RBL + 10)
	Evening (OOH)	30	35 (RBL + 5)
	Night including 'shoulder' ² (OOH)	30	35 (RBL + 5)

Notes: 1. The RBLs represent the Npfl minimum thresholds given measured values were lower, as adopted in the NVA.
 2. EPA defines the morning shoulder as 5 am to 7 am.

4.2. Sleep Disturbance

The NPfl assesses the risk of sleep disturbance against the following screening:

- L_{Aeq,15 minute} of 40 dB or the prevailing RBL plus 5 dB (whichever is the greater); and/or
- L_{Amax} of 52 dB or the prevailing RBL plus 15 dB (whichever is the greater).

Further guidance on potential sleep disturbance impacts is also provided in the RNP. The RNP calls upon a number of studies into the effects of maximum noise levels on sleep. The RNP provides the following conclusions on sleep disturbance:

- maximum internal noise levels (L_{max}) below 50 to 55 dB are unlikely to awaken people from sleep; and
- one or two noise events per night, with maximum internal noise levels (L_{Amax}) of 65 to 70 dB, are not likely to affect health and wellbeing significantly.

It is commonly accepted by acoustic practitioners and regulatory bodies that a façade including a window partially open to provide ventilation will result in an external to internal noise reduction of 10 dB. Therefore, external maximum noise levels in the order of 60 to 65 dB calculated at a façade of a residence (bedroom window) are unlikely to awaken people according to the RNP.

Table 4-3 provides the noise level event screening criteria for the residential receivers identified at Rock Forest.

Table 4-3: Sleep disturbance screening criteria - Rock Forest residential receivers

Receiver	RBL	Night-time maximum noise level event screening criteria, dB	
		L _{Aeq,15min}	L _{Amax}
Residences	30	40	52

5. ENVIRONMENTAL ASPECTS, IMPACTS AND RISKS

5.1. Environmental Aspects and Impacts

An environmental aspect is an element of an organisation's activities, products, or services that has or may have an impact on the environment (ISO 14001 Environmental management systems). The relationship of aspects and impacts is one of cause and effect.

Key aspects of the project that could result in noise impacts are identified in Table 5-1. The extent of these impacts will depend on the nature, extent and magnitude of construction activities and their interaction with the natural environment (Column 2). This is further exacerbated by environmental factors (Column 3).

Table 5-1: Project aspects and impacts relevant to noise

Environmental Aspects (Construction activities likely to cause noise impacts)	Environmental Impacts	Environmental Factors (Conditions)
- Earthworks - Drainage works - Stockpiling of materials - Transport of materials - Loading and unloading of material particularly oversize loads	Increased noise levels at sensitive receivers	- Wind direction – will sometime affected the distance noise will travel. - Natural shielding – natural terrain can shield or exasperate noise thereby increasing or decreasing the effects on sensitive receivers. - Proximity – reduced impacts are experienced further from the source.

5.2. Assessment of Impact

5.2.1. EIS Noise and Vibration Assessment

The NVA and Submissions Report predicted exceedances of the ICNG NMLs at R6 only. The NVA undertook detailed point to point calculations that included conservative noise enhancing weather conditions (determined by EMM to be a feature of the area). Noise contours based on grid calculations were also presented.

5.2.2. Updated Noise Assessment (November 2020)

Following revision of the site layout, the Rock Forest Noise Assessment (Wilkinson Murray, 2020) was updated to assess the change in impact to adjacent sensitive receivers. The updated Noise Assessment found that noise impacts from Rock Forest construction activities will comply with NMLs. Additionally, no exceedances of the sleep disturbance criteria were predicted.

Revision of the site layout resulted in predicted noise levels at receiver R6, initially the most affected receiver, to reduce significantly. R19 became the most affected property, while still predicted to comply with NMLs. The November 2020 Noise Assessment did not model works associated with the Rock Forest spoil emplacement area, as at the time this was subject to detailed design.

5.2.3. Updated Noise Assessment (January 2022)

In January 2022, the Rock Forest Noise Assessment (RWDI, 2022) was updated to include the design of the Rock Forest spoil emplacement area (Figure 1-1). The updated Noise Assessment found that the majority of activities were predicted to comply with NMLs.

The only exceedances that were predicted to be generated at the spoil emplacement area were during out-of-hours haulage, emplacement and land forming works. Here, exceedances at

Receiver R19 were predicted be up to 3 dB during daytime out-of-hours periods, and up to 9 dB during out-of-hours night-time periods.

Due to the predicted exceedances at R19 during out-of-hours periods, the project will only undertake works within the emplacement area during standard day-time construction hours where noise levels at R19 are compliant. Works within the Rock Forest logistics and laydown area, adjacent to the Snowy Mountains Highway, may be undertaken during out-of-hours periods.

The following three construction phases were considered in the NVA and updated Noise Assessment:

Phase 1: Bulk earthworks and site establishment:

- road upgrades to allow ingress and egress from the Rock Forest property to the Snowy Mountains Highway for light and heavy vehicles;
- pre-construction preparatory activities including dilapidation studies, minor clearing and erosion and sediment control works;
- internal road construction;
- site construction works associated with the logistics laydown and emplacement areas, including:
 - installation of services and drainage;
 - installation of temporary buildings and amenities; and
 - laying of concrete and gravel surfaces.

Phase 2: Construction activities:

- haulage, emplacement and land forming of spoil within the emplacement area;
- movement of trucks and plant onsite including within the emplacement area;
- movement and staging of personnel on site; and
- ongoing site maintenance.

Phase 3: Rehabilitation and decommissioning:

- post-construction revegetation and rehabilitation:
 - demolition of structures and permanent infrastructure;
 - final earthworks;
 - revegetation.

It is noted that site setup (Phase 1), decommissioning (Phase 3) and spoil emplacement (part of Phase 2) works at the Rock Forest site will be undertaken during standard daytime construction hours:

- 7:00am to 6:00pm Monday to Saturday; and
- 8:00am to 6:00pm Sundays and NSW Public Holidays.

Ongoing use of the logistics area during Phase 2 will be undertaken 24 hours 7 days per week throughout the life of the Project.

Table 5-2 provides summaries of the noise levels (PNLs) impacting residential receivers R6 and R19 for Phase 1, 2 and 3 as predicted by the updated Noise Assessment undertaken by RWDI.

Table 5-2: Predicted construction noise - Rock Forest residential receivers

Location ID	Predicted construction noise level, dB $L_{Aeq,15min}$	
	Day	Evening / Night
Phase 1		
R6	28	-
R19	33	-
Phase 2		
R6	29	29
R19	43	44*
Phase 3		
R6	29	-
R19	31	-

*Note: Due to the predicted exceedances at R19 during out-of-hours periods, the project will only undertake works within the emplacement area during standard day-time hours where noise levels at R19 are compliant.

5.3. Environmental Risk Assessment

The environmental aspects and impacts for noise are further considered within Appendix A4 of the EMS. This includes a risk assessment process. The risk assessment is based on (1) the likelihood of an impact occurring as a result of the aspect; and (2) the consequences of the impact if the event occurred.

6. ENVIRONMENTAL MANAGEMENT MEASURES

6.1. Management Measures

A range of environmental requirements and control measures are identified in the Main Works EIS, Submissions Report and conditions of Approval. Safeguards and management measures will be implemented to avoid, minimise or manage noise impacts to sensitive receivers.

The ICNG recommends the following where NMLs are predicted to be exceeded:

- application of feasible and reasonable work practices to minimise noise;
- inform potentially impacted residents of the nature of the works to be carried out, expected noise levels and duration and relevant contact details; and
- negotiation with the community where noise from work outside standard hours is predicted to exceed the relevant NML by more than 5 dB.

Given the predicted exceedances of the NMLs and in line with schedule 3, condition 57(b) of the Approval, a reduction of the noise impacts, where possible is to be considered.

Where practicable other best practice mitigation measures recommended by the ICNG, which will be implemented on-site include:

- the provision of contact details on a site board at the front of the site and the maintenance of a complaints register;
- community and neighbour notifications;
- where practical, undertaking, the noisiest works during the recommended standard hours;
- turning off plant that is not in use;
- avoid dropping materials from a height, dropping or dragging road plates;
- avoiding the use of radios or stereos outdoors where neighbours can be affected;
- keeping drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes, and no extended periods of engine idling); and
- periodic checks on nearby residences and other sensitive land users for noise issues so that mitigation measures can be quickly applied.

Specific safeguards and management measures to address the impacts to the surrounding environment from noise are outlined in Table 6-1.

Regardless of the allocation of responsibilities within this plan, the responsible party is to be assigned in accordance with the project contract

Table 6-1: Noise management measures

ID	Mitigation Measure / Requirement	Applicable Phase	Responsibility	Source
General				
NV01	Training will be provided to all project personnel, including relevant sub-contractors on noise management practices including the out of hours work procedure and the requirements of this plan through inductions, toolboxes and targeted training.	All	Contractor	Good practice
NV02	Noise management measures from this plan will be included in site environmental documents including for example Work Packs and/or Site Environmental Plans (SEPs).	All	Contractor	Good practice
NV03	Noise mitigation measures will be implemented as per the best practice noise mitigation measures as outlined in the Interim Construction Noise Guideline (DECC, 2009), or its latest version.	All	Contractor	Schedule 3, condition 57 Good practice
Plant and equipment				
NV04	Where feasible and reasonable noisy equipment and/or construction processes will be substituted by alternative low noise emitting equipment and/or construction process. ¹	All	Contractor	REMM NV01 Schedule 3, condition 56 and 57
NV05	Plant and machinery based at Rock Forest will be fitted with non-tonal reversing alarms (this does not include site light vehicles). Where possible this will include site heavy vehicles.	All	Contractor	
NV06	All construction plant and equipment used on the site will be, in addition to other relevant requirements be: - maintained in an efficient condition; - operated in a proper and efficient manner; and - fitted with properly maintained noise suppression devices (i.e. mufflers, silencers) where manufacturer's specifications require.	All	Contractor	
Design				
NV07	The Rock Forest site will be designed and configured so that the internal road network limits reversing of plant and heavy vehicles.	All	Contractor	REMM NV01
Working hours				
NV08	Site setup (Phase 1), decommissioning (Phase 3) and spoil emplacement (part Phase 2) works at the Rock Forest site will be undertaken during standard daytime construction hours:	Phase 1	Contractor	Schedule 3, condition 57 (b)

ID	Mitigation Measure / Requirement	Applicable Phase	Responsibility	Source
	7:00am to 6:00pm Monday to Saturday; and 8:00am to 6:00pm Sundays and NSW Public Holidays.	Phase 2 (spoil emplacement) Phase 3		
NV09	Works outside of the hours described in NV08, will only be undertaken in the following circumstances: - for delivery of materials required outside these hours by the Police or other authorities for safety reasons; or - where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; and - works approved under an Out-of-Hours Work Procedure (refer to Appendix B).	Phase 1 Phase 2 (spoil emplacement) Phase 3	Contractor	Good practice
NV10	Ongoing use of the logistics area during Phase 2 will be undertaken 24 hours 7 days per week throughout the life of the Project. Spoil emplacement works at the Rock Forest site will be undertaken during standard daytime construction hours (NV08). Where possible, Phase 2 logistic area works will be undertaken in standard day-time hours. During evening and night-time, high noise works will be minimised including but not limited to: - loading and unloading of deliveries; and - dropping materials from a height.	Phase 2	Contractor	Good practice
Consultation and complaints management				
NV11	Sensitive receivers will be notified of construction activities that are likely to affect their noise amenity. Information provided will include: - the types of activities to be undertaken; - the timing of activities including expected start and finish; - the location of activities; and - details of the community information line and how to make an enquiry and / or complaint.	All	Contractor	REMM NV02 Schedule 3, condition 56 (a)
NV12	Specific consultation to be undertaken with the owner/occupier of residences R6 and R19 for works at the Rock Forest site.	All	Contractor	
NV13	Should monitoring or assessment identify noise levels above NMLs or predicted noise levels, and ongoing noise complaints are received the source of the noise will be investigated and best practice mitigation implemented. If exceedances cannot be avoided or complaints are not resolved, the use of voluntary noise mitigation agreements will be considered.	All	Contractor	REMM NV01 Schedule 3, condition 56 (c)
Monitoring and reporting				

ID	Mitigation Measure / Requirement	Applicable Phase	Responsibility	Source
NV14	At the Rock Forest site attended noise monitoring will be carried out during the initial stages of construction to inform site management.	All	Contractor	REMM NV01
NV15	If noise complaints are received during construction, a review of noise management measures will be undertaken to determine if additional noise management controls are required.	All	Contractor	REMM NV01

1. Feasible meaning what is both possible and practical in the circumstances. Reasonable meaning applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements.

7. COMPLIANCE MANAGEMENT

7.1. Monitoring and Inspection

Attended noise monitoring during the initial stages of construction and monitoring in response to complaints, will be undertaken in accordance with this plan. All acoustic instrumentation used for monitoring under the noise monitoring program will have current NATA or manufacturer calibration certificates.

7.1.1. Monitoring standards

Operator-attended noise monitoring will be undertaken in accordance with the relevant Australian Standards and EPA guidelines including:

- AS 1055.1 – 1997 Acoustics – *Description and measurement of environmental noise – General procedures*;
- AS IEC 61672.1 – 2004 Electroacoustics – *Sound level meters – Specifications*;
- NSW *Noise Policy for Industry* (NPfI) (EPA 2017); and
- Appendix A of this CNMP.

All acoustic instrumentation used for monitoring under this plan will have current NATA or manufacturer calibration certificates.

Noise monitoring program

Proposed noise monitoring is summarised in Table 7-1. The monitoring results will be compared to relevant NMLs in order to assess potential impact.

Table 7-1: Noise monitoring program

Activity	Frequency	Responsibility	Record	Noise criteria table (to determine applicable criteria)
Validation noise monitoring for construction noise levels at early stages and intensive works	Ongoing unattended noise monitoring during construction and operational works	Snowy Hydro Environment Team	Noise monitoring sheet	Table 4-2 and Table 5-2
Attended noise monitoring at nearest sensitive receivers	Where and when complaints are received	Site Supervisor / Future Generation Environment Team	Noise monitoring sheet	Table 4-2

The Future Generation's Environmental Site Representative or a suitably trained person will undertake the attended noise monitoring. Operator-attended (15-minute) noise measurements will be completed during standard hours and the most critical OOH period.

In accordance with the NPfI, noise monitoring should not be conducted during rain events or when average wind speed is greater than of 5 m/s at microphone height. The exception is where it can be shown that wind-induced noise on the microphone and/or sound levels due to rainfall, are at least 10 dB below the noise levels under investigation. In any case, details of the meteorology are to be measured during the noise monitoring, particularly during the evening and night campaigns.

7.1.2. Instrumentation

All acoustic monitoring equipment shall meet the requirements of AS IEC 61672.1 – 2004 'Electroacoustics – Sound level meters – Specifications' and carry current NATA or manufacturer calibration certificates. A minimum Class 2 instrument is required. Instrument calibration shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dB.

7.1.3. Noise monitoring locations

Validation noise monitoring will be undertaken at the nearest potentially affected residential receivers (R6 and R19).

7.1.4. Snowy Hydro Noise Monitoring

Throughout the construction and operation of the Rock Forest site, Snowy Hydro will be undertaking unattended noise and dust monitoring at a number of locations surrounding the site. These locations are marked in yellow and pink (proposed locations) in Figure 7-1 below.

Unattended noise and dust monitoring would usually be observed as live data. However, due to limited reception, the units are required to be collected and downloaded.

Monitoring commenced in May 2021 and the data download of units have been collected on average every 4 weeks since then.

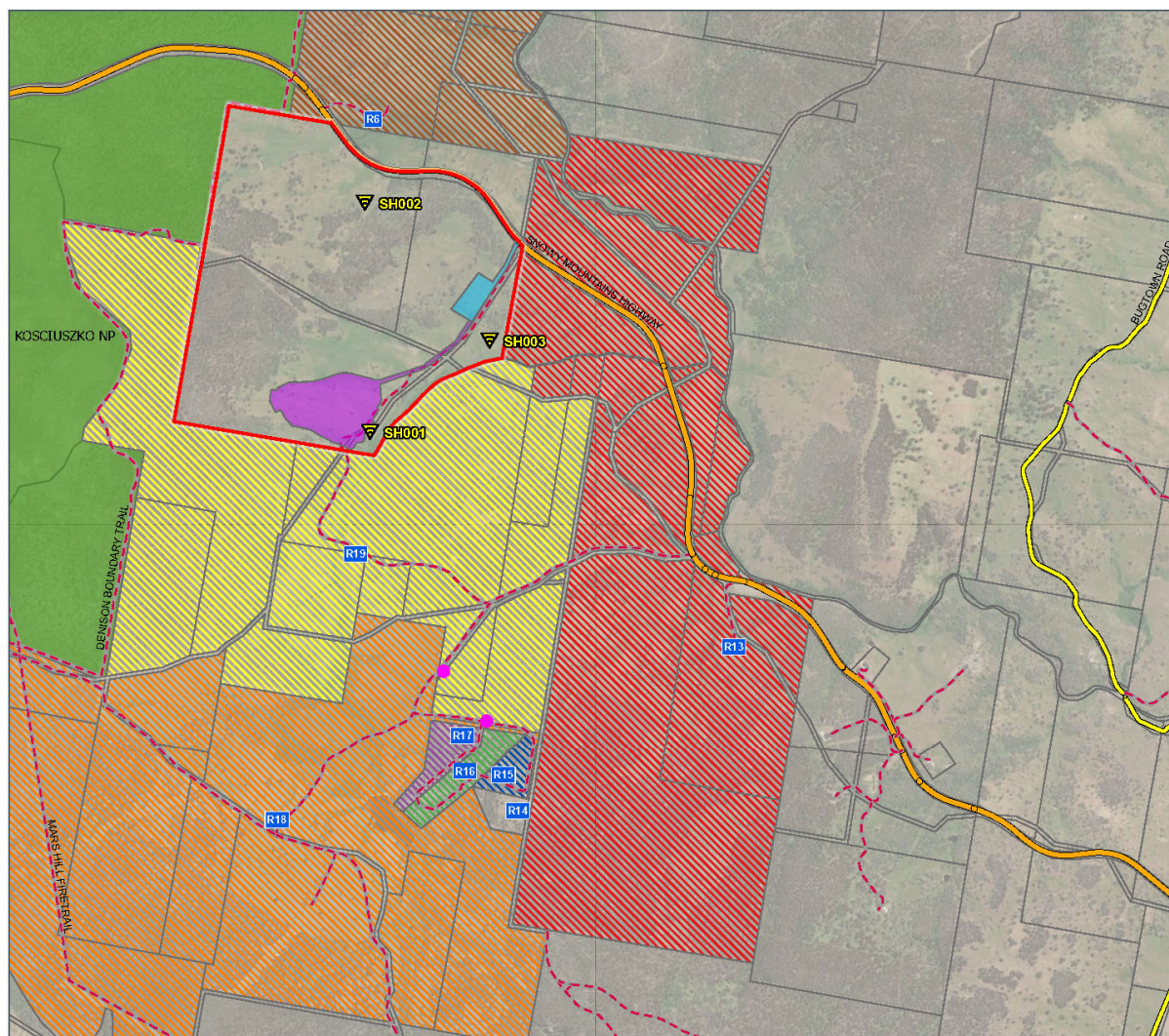
7.2. Complaints

In line with the project EMS, a complaints management system including a complaints register will be maintained by Snowy Hydro and Future Generation. Where a noise complaint is received, the following actions will be implemented:

- details of the complaint will be recorded to investigate the likely noise emission source. Details captured in the complaints register will include date, time, person receiving complaint, complainant's contact number, description of the complaint, time of verbal response and timeframe for written response where appropriate;
- complainants will be responded to verbally within two (2) hours from the time contact is received or at least by the end of the working day;
- where noise emissions are identified to be due to the Rock Forest activities, attended noise monitoring will be undertaken;
- the complainant will be advised of the action taken in response to the complaint;
- all enquiries / complaints will be recorded in a complaints register;
- details of complaints and actions taken will be supplied to Snowy Hydro by Future Generation via Aconex for reporting as required; and
- enquiries received for the duration of the project will be responded to verbally within 24 hours from the time contact is received. An enquiry received OOH will be responded to on the next working day.

The community and stakeholder engagement staff will attend to enquiries and complaints received through the enquiries and complaints information line, project email address, from letters mailed to the project team, during community meetings or through construction / site staff.

All reasonable efforts will be made by Future Generation to resolve an issue with the complainant. In the event a complaint is unable to be resolved, Future Generation will raise the issue with Snowy Hydro or delegate to review and facilitate an outcome.



Rock Forest Sensitive Receptors

ID	CONTACT NAME	MOBILE NUMBER
R6		
R13		
R14		
R15		
R16		
R17		
R18		
R19		
Unknown		

FROM SPOIL			FROM LAYDOWN		
ID	DISTANCE	BEARING	DISTANCE	BEARING	
R6	1506	8 (N)	1064	330 (NW)	
R13	2435	121 (ESE)	2260	143 (SE)	
R14	2315	155 (SE)	2678	175 (SSE)	
R15	2117	155 (SE)	2489	177 (SSE)	
R16	2022	160 (SSE)	2465	181 (S)	
R17	1841	158 (SSE)	2277	182 (S)	
R18	2168	187 (S)	2902	201 (S)	
R19	778	171 (SSE)	1469	205 (SSW)	

- Noise Receptor
- Site Hive
- Construction Envelope
- LaydownPad and Access
- Future Spoil and Access
- NPWS Reserve
- Major Road
- Local Road
- Vehicular Track

Credits: Data used is owned by Snowy Hydro Limited except as follows:
Mapbox

Prepared by: griffiths
Date: 9/15/2021
Spatial Reference: GDA2020 MGA

Disclaimer: Map created by Snowy Hydro Limited. While the map has been created with all due care, Snowy Hydro does not guarantee or represent the map to be free of errors or omissions. Each user of this map is responsible for determining its suitability for their intended use or purpose. Snowy Hydro and its employees, officers, agents or representatives gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damages or costs (including consequential damages) relating to any use. © Snowy Hydro Limited, 2021

Figure 7-1: Snowy Hydro Rock Forest noise monitoring locations.

7.3. Training

All site personnel will undergo the Future Generation site induction training relating to noise management issues.

The induction training will address elements related to noise management including:

- relevant legislation;
- working hours;
- the process for seeking approval for OOHW;
- roles and responsibilities for noise management; and
- noise mitigation and management measures.

Further details regarding the staff induction and training are outlined in Section 5 of the EMS.

7.4. Auditing

Audits will be undertaken to assess the effectiveness of the management measures, compliance with this CNMP, the conditions of Approval, Main Works EIS, Submissions Reports and other relevant approvals, licences and guidelines.

Audit requirements are detailed in Section 8 of the EMS.

7.5. Reporting

Monitoring reports generated by validation noise monitoring for construction noise levels at early stages and during intensive works, as well as attended noise monitoring reports following a complaint will be published on the FGJV website.

All other reporting requirements and responsibilities are documented in the Sections 8.4 of the EMS.

APPENDIX A – PLANT AND EQUIPMENT SOUND LEVELS AND SCHEDULE - ROCK FOREST.

Table A-1: Plant and equipment sound power levels (Main Works EIS).

Activity or Plant	Sound Power (dB(A))	Sound Pressure @ 10m (dB(A))	Noise Descriptor
Pass-by/delivery using a truck	113	85	L _{Amax}
Transportation of material on-site using an excavator	116	88	L _{Amax}
Trucks	107	79	L _{Aeq} (15min)
CAT 740 ADT	107	79	L _{Aeq} (15min)
Dozer CAR D8	116	88	L _{Aeq} (15min)
21t Excavator	110	82	L _{Aeq} (15min)
Excavator CAT 330	99	71	L _{Aeq} (15min)
Excavator CAT 345	107	79	L _{Aeq} (15min)
25t Franna Crane	98	70	L _{Aeq} (15min)
5t telehandler Manitou MLT-X 960	107	79	L _{Aeq} (15min)
Grader CAT 12/14M	104	76	L _{Aeq} (15min)
16t Roller (smooth drum)	103	75	L _{Aeq} (15min)

Table A-2: Plant and equipment schedule (RWDI, 2022)

Description	Phase 1: Bulk earth works	Phase 2: Construction		Phase 3: Rehabilitation	Sound Power Level (dBA) per item
		Standard Hours	OOH		
Trucks	1	5	5	1	107
CAT 740 ADT	1			1	107
Dozer CAR D8	1			1	109
Dozer CAR D10		1	1		110
Excavator CAT 330	1	1	1		99
Excavator CAT 345	1				107
25t Franna Crane		1	1		98
825K compactor		1	1		110
5t telehandler Manitou MLT-X 960		1	1		107
Grader CAT 12/14M	1				104
16t Roller (smooth drum)	1				103
Fuel Farms/bowsers		1	1		79
Site Office		1	1		63
Weighbridge		1	1		n/a
Lighting Tower			8		101



APPENDIX B – OUT OF HOURS WORKS PROCEDURE

INTRODUCTION

Context

This Out of Hours Works (OOHW) Procedure (this procedure) forms part of the Construction Noise Management Plan (CNMP) for Phase 1 (site set up), Phase 3 (decommissioning) and part of Phase 2 (spoil emplacement) works at the Rock Forest site. It has been developed to provide a consistent approach to assess, approve and manage OOHW.

Rock Forest logistics Phase 2 works will be undertaken 24 hours, 7 days per week, and as a result are not subject to this OOHW Procedure. Where possible Future Generation will endeavour to restrict noisy activities to standard day time construction hours. Spoil emplacement will be limited to daytime construction hours.

This procedure provides guidance for determining the approval process for any activity proposed outside approved construction hours.

Purpose

This OOHW procedure has been developed as part of the CNMP and should be read in conjunction with the CNMP.

This OOHW Procedure:

- identifies the environmental mitigation measures applicable to OOHW;
- details project specific noise management levels;
- provides information on the need and justification for carrying out work outside of approved construction hours;
- provides detail on the requirement to carry out a noise assessment; and
- provides guidance on the approval pathway for an OOHW application and community and agency consultation approach for OOHW.

Construction Hours

The majority of construction activities for Phase 1, Phase 3 and Phase 2 spoil emplacement, will take place within standard day time construction hours.

Phase 1, Phase 3 and Phase 2 spoil emplacement works associated with the project will only be undertaken during the below approved hours, except if works have been approved otherwise through this OOHW procedure or agreed in writing by the Planning Secretary.

Standard Daytime Construction Hours of Work

- 7:00am to 6:00pm Mondays to Saturdays; and
- 8:00am to 6:00pm Sundays and NSW Public Holidays.

Noise management levels

The noise management levels for the residential receivers R6 and R19 are presented in Table B-1. This includes the NMLs for work outside standard construction hours.

Table B-1: Noise management levels

Receivers	Period	RBL ¹ (dB(A))	NML L _{Aeq,15min} (dB(A))
Residential assessment locations: R6, R19	Day (standard ICNG hours)	35	45 (RBL + 10)
	Evening (OOH)	30	35 (RBL + 5)
	Night including 'shoulder' ² (OOH)	30	35 (RBL + 5)

All out of hours works will be undertaken in accordance with the relevant mitigation measures within the Rock Forest – CNMP, provided in Table B-2 below.

Table B-2: Noise management levels

ID	Mitigation Measure / Requirement
NV04	Where feasible and reasonable noisy equipment and/or construction processes will be substituted by alternative low noise emitting equipment and/or construction process.
NV05	Plant and machinery based at Rock Forest will be fitted with non-tonal reversing alarms (this does not include site light vehicles). Where possible this will include site heavy vehicles.
NV06	All construction plant and equipment used on the site will be, in addition to other relevant requirements be: - maintained in an efficient condition; - operated in a proper and efficient manner; and - fitted with properly maintained noise suppression devices (i.e. mufflers, silencers) where manufacturer's specifications require.
NV10	Ongoing use of the logistics area during Phase 2 will be undertaken 24 hours 7 days per week throughout the life of the Project. Spoil emplacement works at the Rock Forest site will be undertaken during standard daytime construction hours (NV08). Where possible, Phase 2 logistic area works will be undertaken in standard day-time hours. During evening and night-time, high noise works will be minimised including but not limited to: - loading and unloading of deliveries; and - dropping materials from a height.
NV11	Sensitive receivers will be notified of construction activities that are likely to affect their noise amenity. Information provided will include: - the types of activities to be undertaken; - the timing of activities including expected start and finish; - the location of activities; and - details of the community information line and how to make an enquiry and / or complaint.
NV12	Specific consultation to be undertaken with the owner/occupier of (R6) for works at the Rock Forest site.

Justification for Out of Hours Work

Phase 1, Phase 3 and Phase 2 spoil emplacement works at the Rock Forest site may require that certain activities to take place outside of standard construction hours during the evening and night-time periods. OOHW may be required due to technical considerations (such as the need to meet particular quality specifications) or to maintain the safety of road users or construction workers.

Potential OOH construction activities

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

- product deliveries outside of peak traffic periods; and
- emergency project vehicle staging.

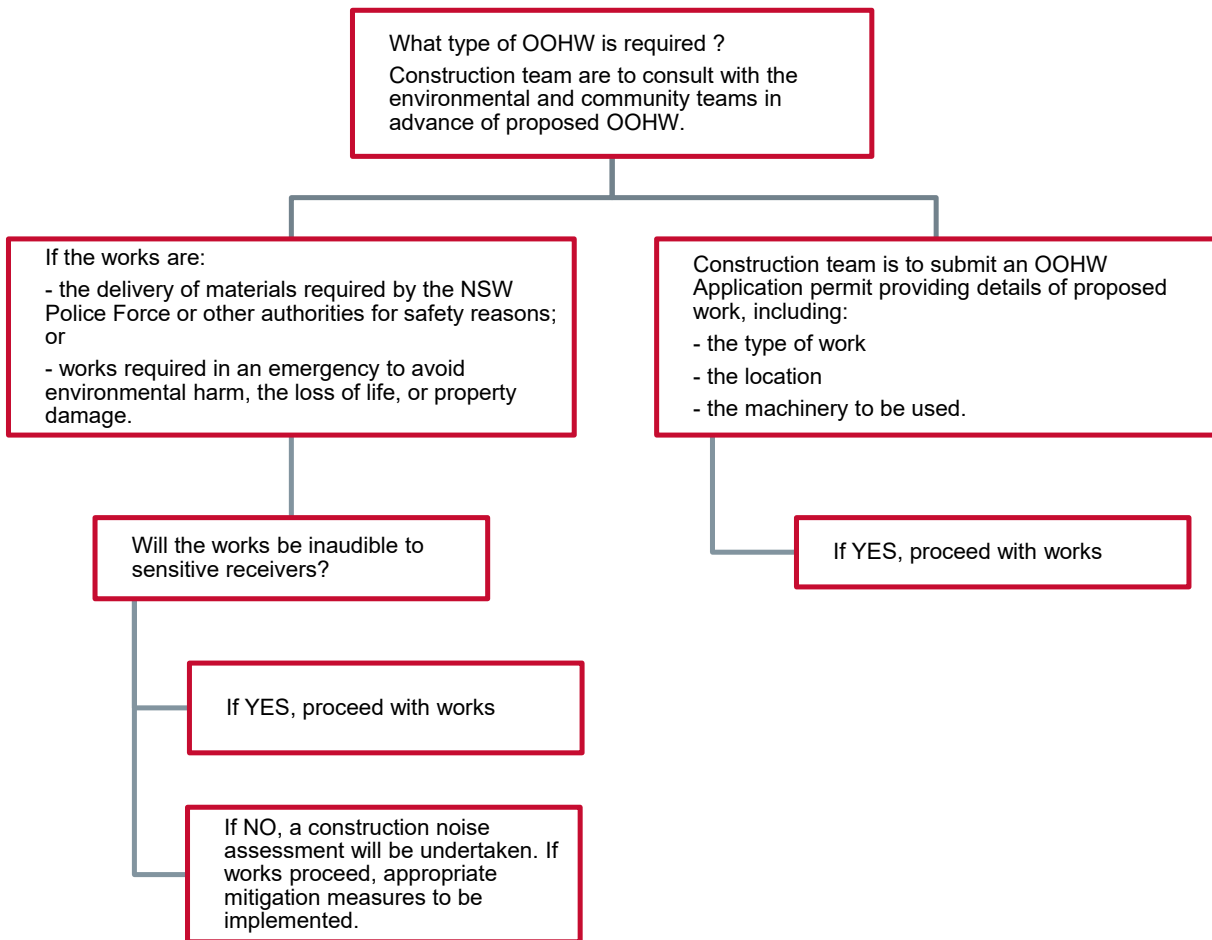
Other works which may be undertaken outside of the approved standard construction hours without further approval include:

- works that are inaudible at the nearest sensitive receivers;
- the delivery of materials required by the NSW Police Force or other authorities for safety reasons; or
- works required in an emergency to avoid environmental harm, the loss of life, or property damage.

Other construction activities may be required or proposed to be undertaken outside of standard working hours. These activities will also be assessed in accordance with the process outlined in this OOWH Procedure.

Out of Hours Works approval process

This section outlines the process for OOHW identification, assessment, consultation and approval.



Step 1 – Determine what type of OOHW is required

The construction team are to consult with the environmental and community teams in advance of proposed OOHW. The construction team is to provide details of the proposed work, including the type of work, the location and the machinery to be used.

Prior to the commencement of any new activity outside standard construction hours, and/or a change to any OOHW activity, an OOHW permit must be approved by the Environmental Team.

For works during an emergency and deliveries required by Police or other authorities

If works are for:

- the delivery of materials required by the NSW Police Force or other authority for safety reasons; or
- where it is required in an emergency to avoid injury or the loss of life, to avoid damage or loss of property or to prevent environmental harm.

These works may be undertaken without completion of the OOHW Permit.
For other OOHW follow step 2 below.

Step 2 – All other OOHW

Complete the OOHW application permit

The OOHW Application permit would be completed. This includes details on:

- the proposed scope of works;
- location of works;
- duration of works; and
- proposed machinery for use (if known).

The Future Generation Environment Team will assess whether the OOHW are likely to be audible to sensitive receivers. If inaudible, works may proceed without regulator approval.

Out of Hours Works noise assessment

Where OOHW will be audible to sensitive receivers, a construction noise assessment will be undertaken where the proposed works will be assessed against predicted construction noise levels assessed in the EIS (if consistent activities and machinery). Where the proposed works are not currently covered by an existing EIS noise assessment, the noise impacts will require further assessment.

Where assessment finds that excessive noise from OOHW is predicted to occur, further consultation will be undertaken and negotiated agreements may be used with affected landholders.

Residual impacts from OOHW will be mitigated using the principals of additional mitigation measures (AMM) specified in the Roads and Maritime Construction Noise and Vibration Guide (CNVG) to provide a structured and clear approach to manage noise depending on predetermined levels of impact. The AMM for the project are outlined in Table 7-1.

Table B-3: Additional mitigation measures for OOHW

Predicted airborne LAeq (15min) noise level at-receiver			Additional mitigation measures type ¹
Perception	dB(A) above RBL	dB(A) above NML	
Noticeable	5 – 10	5 – 10	N
Clearly audible	>10 – 20	>10 – 20	V, N
Moderately intrusive	>20 – 30	>20 – 30	V, N, SN
Highly intrusive	> 30	> 30	AA, V, N, SN

Note 1: Additional mitigation measure types are as follows. More detail on each is available in the CNVG:

- Notification N
- Specific Notifications SN
- Alternative Accommodation AA
- Verification (measurements)

Consistent with the adopted approach of AMM Future Generation will notify sensitive receivers via email, mail and door knock (depending on availability). Notifications will:

- be provided at least 5 working days prior to the start of works;
- clearly outline the reason that the work is required to be undertaken outside standard construction hours;
- include a diagram that clearly identifies the location of the proposed works in relation to nearby cross streets and local landmarks;
- include details of relevant time restrictions that apply to the proposed works;
- clearly outline, in plain English, the location, nature, scope and duration of the proposed works;
- detail the expected noise impact of the works on noise sensitive receivers;
- clearly state how complaints may be made and additional information obtained; and
- include the number of the telephone complaints line, an afterhours contact phone number specific to the works, and the project website address.



APPENDIX C – UPDATED NOISE ASSESSMENT (RWDI, 2022)



RWDI Australia Pty Ltd (RWDI)
Suite 6.02, Level 6, 80 William Street
Woolloomooloo, NSW, 2011

Tel: +61.2.9437.4611
E-mail: solutions@rwdi.com
ABN: 86 641 303 871

MEMORANDUM

DATE:	31 January 2021	RWDI REFERENCE #: 2190039
TO:	Nathan Jones	EMAIL: n.jones@futuregenerationjv.com.au
	CC: Vincent Gillies	EMAIL: vgillies@wolfpeak.com.au
FROM:	Remi Larmandieu	Email: rml@rwdi.com
RE:	Snowy 2.0 - Revision of predicted construction noise levels for the Rock Forest Site Update of Noise Impact Assessment	

Dear Nathan,

This report intends to discuss the changes in predicted noise levels from construction activities at the Rock Forest Site, which is part of the Snowy 2.0 – Main Works project. Noise levels were initially predicted and discussed in the construction noise management plan prepared by Future Generation JV, dated June 2020 and referenced S2-FGJV-ENV-PLN-0089. Construction noise levels were also discussed in the EMM Noise and Vibration Impact Assessment (NVIA) prepared in September 2019 for the Environmental Impact Statement (EIS).

The report indicated that exceedances of the Interim Construction Noise Guideline (ICNG) Noise Management Levels (NMLs) were predicted at R6 which is a residential property located approximately 200m to the north of the site access road, at 6560 Snowy Mountains Highway. Exceedances up to 14 dBA during standard construction hours and up to 11 dBA outside standard construction hours were predicted.

Design changes to the site moved the location of the access road to Snowy Mountains Highway approximately 800m to the south-east in order to reduce noise impacts to R6 residential receivers. An updated noise assessment dated 30 November 2020 was prepared by RWDI considering the relocation of the access road. At the time, the spoil emplacement area was subject to detailed design, and its associated noise impacts were not included in the November 2020 assessment.

For this assessment, the design of the spoil emplacement area was finalised and topography contours were provided to take noise impacts associated with this area into consideration.

Figure 1 below shows the proposed Rock Forest site location and layout, with the spoil emplacement area shown in yellow to the southwest of the site.

Figure 2 below shows the proposed emplacement depths for the Rock Forest spoil emplacement area.

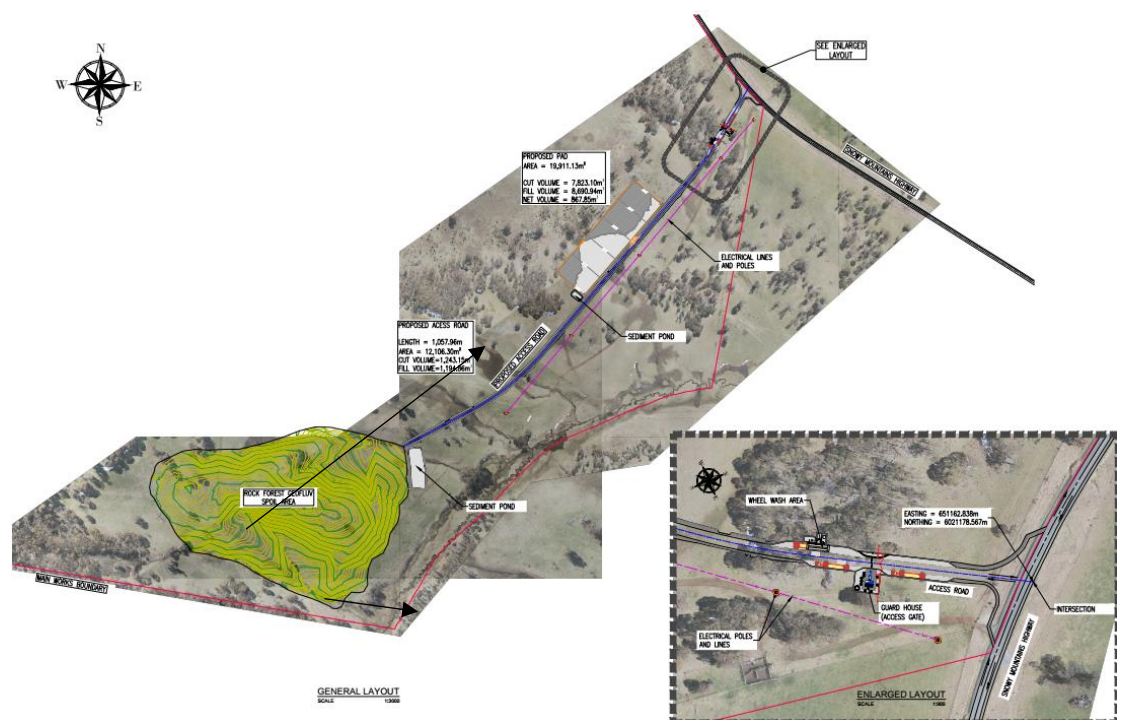


Figure 1: Proposed Rock Forest site location and layout

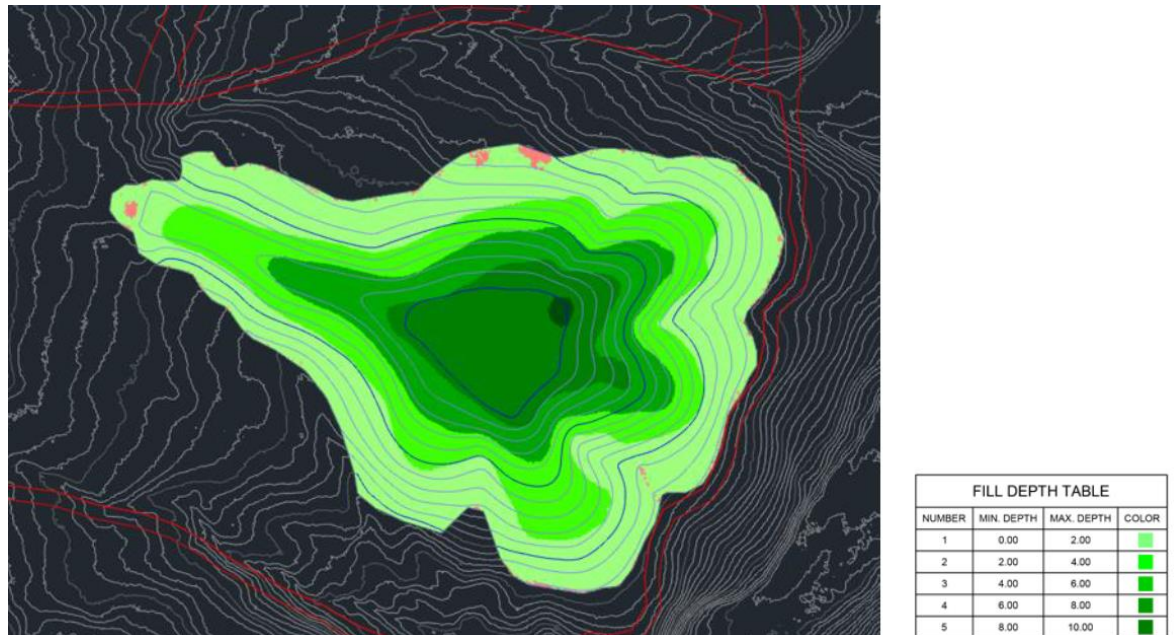


Figure 2: Proposed Rock Forest emplacement area contours

Construction Methodology

The following three construction phases are considered in the NVA and in this updated Noise Assessment:

Phase 1: Bulk earthworks and site establishment:

- pre-construction preparatory activities including dilapidation studies, minor clearing and erosion and sediment control works;
- internal road construction;
- site construction works associated with the logistics laydown and emplacement areas, including:
 - installation of services and drainage;
 - installation of temporary buildings and amenities; and
 - laying of concrete and gravel surfaces.

Phase 2: Construction activities:

- haulage, emplacement and land forming of spoil within the emplacement area;
- movement of trucks and plant onsite including within the emplacement area;
- movement and staging of personnel on site; and
- ongoing site maintenance.



Phase 3: Rehabilitation and decommissioning:

- post-construction revegetation and rehabilitation:
- demolition of structures and temporary infrastructure;
- final earthworks; and
- revegetation.

Construction Machinery

The following construction machinery, equipment and associated sound power levels were assumed for the Rock Forest site construction phases. Please note that following the results of this amended report, no works will be undertaken, or machinery used in the Rock Forest emplacement area outside of standard daytime construction hours.

Table 1 - Plant and Equipment Schedule (EIS)

Description	Phase 1: Bulk earth works	Phase 2: Construction		Phase 3: Rehabilit ation	Sound Power Level (dBA) per item
		Standard Hours	Out-of- hours		
Trucks	1	5	5	1	107
CAT 740 ADT	1			1	107
Dozer CAT D8	1			1	109
Dozer CAT D10		1 ¹	1 ¹		110
Excavator CAT 330	1	1 ¹	1 ¹		99
Excavator CAT 345	1				107
25t Franna Crane		1	1		98
825K compactor		1 ¹	1 ¹		110
5t telehandler Manitou MLT-X 960		1	1		107
Grader CAT 12/14M	1				104
16t Roller (smooth drum)	1				103
Fuel Farms/bowsers		1	1		79
Site Office		1	1		63
Weighbridge		1	1		n/a
Lighting Tower			8 ¹		101

Note 1: mobile plant located in spoil emplacement area, modelled as a line source



Working Hours

It is noted that site setup (Phase 1), decommissioning (Phase 3) and spoil emplacement (part Phase 2) works at the Rock Forest site will be undertaken during standard daytime construction hours:

- 7:00am to 6:00pm Monday to Saturday; and
- 8:00am to 6:00pm Sundays and NSW Public Holidays.

Works outside of these hours during Phase 1 and Phase 3 will only be undertaken in the following circumstances:

- for delivery of materials required outside these hours by the Police or other authorities for safety reasons; or
- where it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; and
- works approved under an Out-of-Hours Work Procedure.

Ongoing use of the logistics area during Phase 2 will be undertaken 24 hours 7 days per week throughout the life of the Project.

Modelling of airborne construction noise levels

Construction noise levels were modelled and predicted at the sensitive receivers surrounding the site and detailed in the EIS.

The noise prediction software SoundPLAN v8.2 utilising the CONCAWE prediction method has been used to model the noise emissions from the revised operations at the site.

This software accounts for attenuation due to distance, air absorption, ground absorption, terrain and shielding.

In accordance with the EIS NVIA, the construction noise model included conservative noise enhancing weather conditions (determined by EMM to be a feature of the area).



Noise Management Levels and Results

Noise levels were assessed against Noise Management Levels (NMLs) identified in the initial EIS and against Condition 57 from the Infrastructure Approval CSSI 9687.

Table 2 - Noise limits dBA (EIS)

Time of day	Rating Background Level (dB(A))	NML $L_{Aeq,15minute}$ dBA
Day (7am - 6pm Monday to Saturday and 8am-6pm on Sunday & Public Holidays)	35	40
Evening (6pm - 10pm)	30	35
Night (10pm - 7am Monday to Saturday, on Sunday & Public Holidays, night ends at 8am)	30	35

Predicted construction noise levels for Phase 1, 2 and 3 with noise enhancing weather conditions are detailed in **Table 3**, **Table 4** and **Table 5** respectively. Please note that following the results of this amended report, no works will be undertaken in the Rock Forest emplacement area outside of standard daytime construction hours.

Table 3 *Predicted construction noise levels, dBA – Phase 1*

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1 2} , dB L _{Aeq,15min}
R6	Residential	Standard	45	75	28
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R7	Residential	Standard	45	75	17
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R8	Residential	Standard	45	75	14
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R9	Residential	Standard	45	75	23
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R10	Residential	Standard	45	75	21
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R11	Residential	Standard	45	75	24
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R12	Residential	Standard	45	75	25
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R13	Residential	Standard	45	75	24
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R14	Residential	Standard	45	75	29
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R15	Residential	Standard	45	75	30
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R16	Residential	Standard	45	75	23
		OOH Day	40	75	

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1,2} , dB L _{Aeq,15min}
		OOH Evening/Night	35	n/a	
R17	Residential	Standard	45	75	27
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R18	Residential	Standard	45	75	29
		OOH Day	40	75	
		OOH Evening/Night	45	n/a	
R19	Residential	Standard	45	75	33
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R21	Residential	Standard	45	75	4
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	

Table 4 *Predicted construction noise levels, dBA – Phase 2*

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1 2} , dB L _{Aeq,15min}
R6	Residential	Standard	45	75	29
		OOH Day	40	75	29
		OOH Evening/Night	35	n/a	29
R7	Residential	Standard	45	75	17
		OOH Day	40	75	18
		OOH Evening/Night	35	n/a	18
R8	Residential	Standard	45	75	11
		OOH Day	40	75	12
		OOH Evening/Night	35	n/a	12
R9	Residential	Standard	45	75	22
		OOH Day	40	75	22
		OOH Evening/Night	35	n/a	22
R10	Residential	Standard	45	75	19
		OOH Day	40	75	19
		OOH Evening/Night	35	n/a	19
R11	Residential	Standard	45	75	20
		OOH Day	40	75	20
		OOH Evening/Night	35	n/a	20
R12	Residential	Standard	45	75	22
		OOH Day	40	75	22
		OOH Evening/Night	35	n/a	22
R13	Residential	Standard	45	75	25
		OOH Day	40	75	25
		OOH Evening/Night	35	n/a	25
R14	Residential	Standard	45	75	30
		OOH Day	40	75	30
		OOH Evening/Night	35	n/a	30
R15	Residential	Standard	45	75	30
		OOH Day	40	75	31
		OOH Evening/Night	35	n/a	31
R16	Residential	Standard	45	75	30
		OOH Day	40	75	31

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1 2} , dB L _{Aeq,15min}
		OOH Evening/Night	35	n/a	31
R17	Residential	Standard	45	75	32
		OOH Day	40	75	33
		OOH Evening/Night	35	n/a	33
R18	Residential	Standard	45	75	31
		OOH Day	40	75	31
		OOH Evening/Night	45	n/a	31
R19	Residential	Standard	45	75	43
		OOH Day	40	75	43
		OOH Evening/Night	35	n/a	44
R21	Residential	Standard	45	75	5
		OOH Day	40	75	6
		OOH Evening/Night	35	n/a	6

Table 5 *Predicted construction noise levels, dBA – Phase 3*

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1 2} , dB L _{Aeq,15min}
R6	Residential	Standard	45	75	29
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R7	Residential	Standard	45	75	18
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R8	Residential	Standard	45	75	13
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R9	Residential	Standard	45	75	25
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R10	Residential	Standard	45	75	22
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R11	Residential	Standard	45	75	23
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R12	Residential	Standard	45	75	25
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R13	Residential	Standard	45	75	26
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R14	Residential	Standard	45	75	27
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R15	Residential	Standard	45	75	27
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R16	Residential	Standard	45	75	25
		OOH Day	40	75	

Assessment location	Type	Period	Noise affected NML, dB	Highly noise affected NML, dB	Predicted construction noise level ^{1,2} , dB L _{Aeq,15min}
		OOH Evening/Night	35	n/a	
R17	Residential	Standard	45	75	28
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R18	Residential	Standard	45	75	25
		OOH Day	40	75	
		OOH Evening/Night	45	n/a	
R19	Residential	Standard	45	75	31
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	
R21	Residential	Standard	45	75	1
		OOH Day	40	75	
		OOH Evening/Night	35	n/a	

Discussion

The majority of activities within the site are predicted to generate noise levels within allowable levels as shown in **Table 3**, **Table 4** and **Table 5**.

The only exceedances are predicted to be generated during Stage 2 when haulage, emplacement and land forming works are being undertaken in the spoil emplacement area. Here, exceedances at Receiver R19 will be up to 3 dB during daytime out-of-hours periods, and up to 9 dB during out-of-hours night-time periods. The main noise contributions are expected to be from the dozer and compactor when operating near the highest point of the spoil emplacement area. Light towers will be in operation at night only are also expected to contribute to the noise levels.

Due to the predicted exceedances at R19 during daytime out-of-hours and night-time out-of-hours periods, the project will only undertake works within the emplacement area during standard day-time hours where noise levels at R19 are compliant. Works within the Rock Forest logistics and laydown area, adjacent to the Snowy Mountains Highway, may be undertaken during out-of-hours periods.

Conclusion

Predicted noise levels indicate that noise impacts from Rock Forest construction activities will generally comply with NMLs and condition 57 of Infrastructure Approval CSSI 9687.

It should be noted that the revisions to the site layout in 2020 resulted in predicted noise levels reducing by up to 20 dBA $L_{Aeq,15\text{minute}}$ for R6, which was initially the most affected receiver. Following inclusion of the spoil emplacement area in the model, residential receiver R19, located south of the site, is now the most affected property for all phases. Due to the predicted exceedances at R19 during daytime out-of-hours and night-time out-of-hours periods, the project will only undertake works within the emplacement area during standard day-time hours where noise levels at R19 are compliant. Works within the Rock Forest logistics and laydown area, adjacent to the Snowy Mountains Highway, may be undertaken during out-of-hours periods.

Management measures detailed in Section 6 of the Rock Forest Construction Noise Management Plan will be implemented to ensure compliance with the Infrastructure Approval and this report.

Please contact us if you have any further queries

Yours truly,



Remi Larmandieu, MAAS
Senior Engineer
31 January 2022