TITLE: NOISE MANAGEMENT PLAN

Badgerys Creek Brick Quarry and Brick Making Project
235 Martin Road, Badgerys Creek, NSW, 2171

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Document control page

Document Preparation and Control	Document Review
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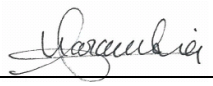
Document Approval	**Signature**
Nelma Arancibia	

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Version No.	**Date**	**Document Status**	**Brief Description of Change(s) from Previous Version**
01	11/03/2021	DRAFT	Updated for peer review
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04	06/05/2021	Response to review	Updated following DPIE review

1 INTRODUCTION

1.1 Purpose

This Noise Management Plan (NMP) has been prepared for Phase 1a of the Badgerys Creek Quarry and Brick Making Extension Project (the 'project') situated in Badgerys Creek, NSW.

The NMP has been prepared to assist with the management of noise emissions associated with projects operation and off-site road traffic and to satisfy Condition 8 of Schedule 3 of the site's Project Approval (PA) (ref: PA10_0014).

A glossary of terms, definitions and abbreviations used in this report is provided in Appendix A.

1.2 Scope and application

The Badgerys Creek Brickworks (Site) is located at 235 Martin Road, Badgerys Creek, 41 kilometres to the south west of Sydney, within the Liverpool City Council Local Government Area (LGA) (see Appendix B). Primary access to the site is provided through Martin Road at the north eastern corner of the site. Features of the existing site are shown on Appendix C.

As outlined in Section 2.1, this NMP applies to Phase 1a of the Project including:

- Dewatering of pits 1, 2 and 3; and
- Importation of VENM to backfill pits 1, 2 and 3 as part of quarry rehabilitation works.

Hereafter, Phase 1a is referred to as 'the Project'. The Project layout including the location of pits to be dewatered and backfilled is shown on Appendix C.

1.3 Interface with environmental strategy

In operational terms, the NMP aims to minimise noise impacts from the Project at nearby sensitive receivers. In this way, the NMP supports the Environmental Management Strategy (EMS) of Badgerys Creek Quarry and Brick Making Project by helping minimise harm to the environment.

2 STRATEGIC FRAMEWORK FOR ENVIRONMENTAL MANAGEMENT

In addition to meeting the specific performance measures and criteria established under the PA, CSR will implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction or operation of the project, and any rehabilitation required under the approval.

2.1 Environmental context

Quarrying and brick making activities have been undertaken on the site for over 30 years. In August 2020, a modification (Mod 3&4) to the development consent was granted by the Minister for Planning and Public Spaces to continue operations on the site including dewatering of the quarry pits, extraction of clay (quarrying), brick manufacturing, and importation of VENM to backfill and rehabilitate the quarry pits.

The Department of Planning, Industry and Environment (DPIE) has since approved the delivery of the Project and associated strategies, plans and programs in stages as follows:

Phase 1a:

- Dewatering of pits 1, 2 and 3; and
- Importation of VENM to backfill pits 1, 2 and 3 as part of quarry rehabilitation works.

Phase 1b:

- Construction activities;
- Brickmaking activities; and
- Quarrying activities in Pit 3.

This NMP applies to Phase 1a of the Project. Prior to the commencement of Phase 1b activities, this NMP will be updated to include additional noise management measures associated with Phase 1b.

2.2 Aspects and impacts

The Project may result in noise impacts as shown in **Table 1.**

Table 1 Noise aspects and impacts

Noise aspect	Potential environmental impacts
Noise from vehicle movements along Martin Road.	• Health and amenity impacts on neighbouring residential dwellings.
Noise from onsite vehicle and equipment movements.	
Noise from material handling and dumping.	
Noise from demolition.	

2.3 Risk assessment

CSR maintains an Environmental Risk Register for the Badgerys Creek Quarry operation. This register ranks the noise impacts aspects in **Table 1** as low to medium risks.

Phase 1a was assessed as part of Phase 1, with results reported in Element Environment (2019) *CSR Advanced Manufacturing Hub – Modification 4 Environmental Assessment – Response to Submissions and Preferred Project Report.* Phase 1 was not predicted to result in exceedances of project noise trigger levels at sensitive receivers. Therefore, as Phase 1a will comprise fewer activities than those reported for Phase 1 in Element Environment (2019), noise generated by the Project is unlikely to impact sensitive receivers.

The road noise assessment reported in Element Environment (2019) predicted road traffic noise will impact six receivers (RN5, RN9, RN14, RN16, RN21 and RN22), which qualify for, and may require, mitigation.

The above risks will be mitigated by the management measures outlined in this NMP.

3 PROJECT APPROVAL CONDITIONS AND CRITERIA

3.1 General noise conditions

Any exceedance of criteria and/or performance measures required by the conditions of approval constitutes a breach of the approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. **Table 2** reproduces the noise related conditions from Schedule 3 of the Conditions of Approval (CoAs) relevant to Phase 1a.

Table 2 Conditions of approval

Condition	Detail	Ref
1	The Proponent must comply with the operating hours set out in Section 3.5.	3.5
1A	With the written agreement of the Secretary, the Proponent may undertake limited campaign trucking (within the limits imposed under conditions 10 and 12 of Schedule 2) for the import of VENM outside of the operating hours prescribed in condition 1 of this Schedule.	3.5
2	The following activities may be carried out outside the hours specified in condition 1 of this Schedule: (a) activities that are inaudible at residences on privately-owned land; (b) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or (c) emergency work to avoid the loss of life, property or to prevent material harm to the environment. In such circumstances, the Proponent must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.	3.5
3	Approved construction works must only be undertaken during standard construction hours (7 am to 6 pm, Monday to Friday and 8 am to 1 pm on Saturdays), unless the Secretary agrees otherwise.	3.4
5	The Proponent must ensure that operational noise generated by the project (including construction activities) does not exceed the criteria in Table 2 (see Section 3.6) at any residence on privately-owned land. Noise generated by the project must be monitored and measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (NSW EPA 2017). However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement. Note: Should an agreement with a landowner be terminated for any reason, the Proponent must comply with the noise criteria in Table 2.	3.6, 6
6	The Proponent must ensure that the road traffic noise generated by the project does not exceed the criteria in Table 6 (see Section 3.7) at any privately-owned residence. Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW). However, the noise criteria in Table 3 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement.	3.7

6A	Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the Proponent must implement noise mitigation treatment packages as described in the EA (Mod 3 and 4) and as set out in the RMS Draft At-Receiver Treatment Packages. If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.	3.7
7	The Proponent must:	
a	(a) take all reasonable steps to minimise the operational, low frequency and road transportation noise of the project;	5
b	(b) take all reasonable steps to minimise the noise impacts of the project during noise enhancing meteorological conditions;	5.4
c	(c) operate a noise management system to guide the day to day planning of quarrying operations and the implementation of noise mitigation measures to ensure compliance with the relevant conditions of this approval;	5
d	(d) carry out regular noise monitoring to determine whether the project is complying with the relevant conditions of this approval; and	6.1
e	(e) modify or stop operations on the site to comply with the relevant conditions of this approval.	Appendix D
	Note: Monitoring under this approval is not required at all residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria, if agreed to by the Secretary.	5.3

3.2 Noise management plan conditions

Condition 8 of Schedule 3 of the Approval, PA10_0014 (PA) requires a NMP to be prepared to the satisfaction of the Secretary to assist in the management of noise emissions from the project.

Table 3 outlines the section of this report which addresses this CoA.

Table 3 NMP requirements

Condition	Detail	Ref
8	The Proponent must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must:	This plan
a	be submitted to the Secretary for approval prior to commencing Modification 3 and 4, unless otherwise agreed by the Secretary;	This plan
b	describe the measures to be implemented to ensure:	
	compliance with the noise criteria and operating conditions of this approval;	3
	best practice management is being employed;	5
	residences listed in condition 6A of this Schedule are notified of their rights to request road noise mitigation measures;	6.2.1
	vibration impacts are minimised; and	5.5

	the construction and operational noise impacts of the project are minimised during noise enhancing meteorological conditions;	5.4
c	describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to noise are implemented;	5.3
d	include a consultation plan detailing:	6.2.1
	procedures for notifying and consulting nearby residents prior to the recommencement of quarrying and brick making activities [taken to include Phase 1a];	
	details of a telephone complaints line (operated at all hours) and relevant site persons responsible for following up complaints;	
	procedures for handling and monitoring all complaints received; and	
	contingency measures that would be implemented where complaints are received;	Appendix D
e	describe the proposed noise management system; and	5
f	include a noise monitoring program that:	6
	is capable of evaluating the performance of the project;	
	includes a protocol for determining any exceedances of the relevant conditions of this approval; and	
	effectively supports the noise management system.	

3.3 General management plan requirements

Condition 3 of Schedule 5 of the PA requires management plans include certain information. This information and where it is included in this plan is outlined in Table 4 .

Table 4 General management plan requirements

Condition	Detail	Ref
3a	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) a summary of relevant background or baseline data;	3.6
b	(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	4 4 5, 5 and Appendix D
c	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	5
d	(d) a program to monitor and report on the: • impacts and environmental performance of the project; and • effectiveness of any management measures (see (c) above);	6, 7, 8
e	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Appendix D
f	(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	7
g	(g) a protocol for managing and reporting any:	8

	• incidents; • complaints; and • non-compliances with statutory requirements;	
h	(h) a protocol for periodic review of the plan; and	7
i	(i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.	Version control table on Page 3

3.4 Approved hours of construction

Construction works will only be undertaken during standard construction hours (7 am to 6 pm, Monday to Friday and 8 am to 1 pm on Saturdays), unless the Secretary agrees otherwise

3.5 Approved hours of operation

The approved hours for truck arrival and dispatch to import VENM in Condition 1 of Schedule 3 are:

- Monday to Saturday – 7.00 am to 6.00 pm.
- Sunday – 9.00 am to 6.00 pm.
- Public holidays – at no time.

Condition 1A of Schedule 3 states:

> *With the written agreement of the Secretary, the Proponent may undertake limited campaign trucking (within the limits imposed under conditions 10 and 12 of Schedule 2) for the import of VENM outside of the operating hours prescribed in condition 1 of this Schedule.*

CSR will apply to the Secretary for agreement to import VENM outside the approved hours in accordance with this condition, should this request be approved the Noise Management Plan will be updated to reflect the new operating conditions.

Condition 2 of Schedule 3 states:

> *The following activities may be carried out outside the hours specified in condition 1 of this Schedule:*
>
> *(a) activities that are inaudible at residences on privately-owned land;*
> *(b) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or*
> *(c) emergency work to avoid the loss of life, property or to prevent material harm to the environment.*

In such circumstances, the Proponent must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

CSR will notify the Department and affected residents prior to carrying-out the above or soon thereafter in accordance with this condition.

3.6 Operational noise criteria

The project has operational noise criteria prescribed by both the DPIE in the PA and Environmental Protection License (EPL) (EPL#684) from NSW Environment Protection Authority (EPA).

Notwithstanding, as a conservative approach the criteria prescribed in the PA has been adopted as the applicable noise criteria as it is more stringent and thus compliance with the PA would also ensure compliance with the EPL.

The applicable noise criteria are presented in Table 5 .

Table 5 Operation noise criteria (dB(A)

Receiver	AM shoulder $L_{Aeq\ (15min)}$	Day $L_{Aeq\ (15min)}$	Evening $L_{Aeq\ (15min)}$	Night $L_{Aeq\ (15min)}$	Night (L_{AFmax})
R9, R25, R35	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46	42	42	41	38	52
R11, R12, R13, R14, R15	43	43	43	38	52
All other residences	-	40	35	35	52

Furthermore, noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (NPI) (EPA, 2017) (formerly NSW INP).

However, the noise criteria in Table 5 do not apply if CSR has an agreement with the relevant landowner to exceed the noise criteria, and CSR has advised the DPIE in writing of the terms of this agreement. However, should an agreement with a landowner be terminated for any reason, CSR must comply with the noise criteria in Table 5.

3.7 Road noise criteria

CSR must ensure that the traffic noise generated by the project does not exceed the criteria in Table 6 **Error! Reference source not found.**.

This is in accordance with Condition 6, Schedule 3 of the PA specified noise criteria for off-site road trucks from the facility. These criteria are consistent with those outlined in the RNP for local roads.

Table 6 Road traffic noise criteria

Receiver	Day $L_{Aeq\ (15hour)}$	Night $L_{Aeq\ (9hour)}$
Prior to Martin Road – Elizabeth Road intersection upgrade		
Residents on Martin Road	60	55
Following Martin Road – Elizabeth Road intersection upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residences on Martin Road	60	55

Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW).

However, the noise criteria in Table 3 do not apply if CSR has an agreement with the relevant landowner to exceed the noise criteria, and CSR has advised the Department in writing of the terms of this agreement.

Condition 6A of Schedule 3 states:

> *Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the Proponent must implement noise mitigation treatment packages as described in the EA (Mod 3 and 4) and as set out in the RMS Draft At-Receiver Treatment Packages.*
>
> *If within 3 months of receiving this request from the owner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.*

4 REGULATORY FRAMEWORK

4.1 Legislation

The following legislation is relevant to the project:

- NSW Protection of the Environment Operations Act 1997 (PoEOA).
- NSW Protection of the Environment (General) Regulation 2009 (POEO General Regulation).

4.2 Guidelines

The NMP was completed in reference to the following documents:

- Environment Protection Authority's (EPA's), Noise Policy for Industry (NPI), 2017;
- Environment Protection Authority's (EPA's), Industrial Noise Policy (INP), 2000 (superseded by the NPI).
- NSW Department of Environment, Climate Change and Water (DECCW), NSW Road Noise Policy (RNP), 2011.

4.3 License

The site is subject to Environment Protection Licence (EPL) 684, issued under the NSW POEO Act. The EPL includes the following requirements in relation to noise:

L4.1 – Noise from the premises (excluding mobile plant) must not exceed: a) An LA10(15 minute) noise emission criterion of 55 dB(A)(0700 to 2200) Monday to Saturday and 0800 to 2200 Sundays and Public Holidays; and b) An LA10(15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.

L4.2 – Noise from the operation of the mobile plant must not exceed: a) An LA10(15 minute) noise emission criterion of 50 dB(A)>(0700 to 2200) Monday to Saturday and (0800 to 2200) Sundays and Public Holidays; and b) An LA10[15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.

L4.3 – Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 metres from the residence, at the most affected point within 30 metres of the residence to determine compliance with condition L4.1. 5dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 – Noise from the operation of the mobile plant is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 metres

from the residence, at the most affected point within 30 metres of the residence to determine compliance with condition L4.2. 5dB(A) must be added if the noise is tonal or impulsive in character.

As the EPL noise criteria are not consistent with those in the CoA (Section 6), the PA has been adopted as the applicable noise criteria as it is more stringent and thus compliance with the PA would also ensure compliance with the EPL.

Conditions L4.3 and L4.4 will be applied to the monitoring described in Section 6.

5 BEST PRACTICE MANAGEMENT AND CONTROL OF NOISE EMISSIONS

5.1 Training and education

All employees and contractors working at the project site will undergo a project induction in accordance with Section 5.2 of the EMS, during which personnel will be made aware of the location of noise sensitive receivers and the mitigation measures to be implemented to reduce noise impact to the community.

Records of noise training and awareness for all staff and contractors will be held on site. Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site.

5.2 Sound power levels

The primary noise sources during importation of VENM will be:

- Truck and dog combinations – 103 dBA.
- Compactor – 112 dBA.
- Water cart – 110 dBA.
- Excavator (30 t) – 104 dBA.

This information will be used to help plan operations and ensure compliance with relevant noise criteria.

Sound pressure testing to determine plant sound power levels will be completed following a complaint or when plant is noted to be emitting unnecessary operational noise.

A suitably qualified acoustic consultant should be engaged to complete the tests with testing to be conducted in general accordance with the following Australian and International Standards.

- ISO 6393 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Stationary test conditions'.
- ISO 6395 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Dynamic test conditions'.
- ISO3744 "Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure – Engineering methods for an essentially free field over a reflecting plane.
- ISO3746 "Acoustics - Determination of sound power levels of noise sources using sound pressure – Survey Method using an enveloping measurement surface over a reflecting plane'.

5.3 Noise management measures

The noise management measures from Appendix 6 of the PA relevant to Phase 1a are in Table 7 and will be implemented by the site manager.

Table 7 Approval noise and vibration management measures

Measure	Timing	Responsibility
The Proponent will implement all practicable measures to undertake the development in a way that minimises the noise generated. The Proponent has made the following commitments in relation to operation noise management.	At all times	Contractors and Operational staff
The Proponent and/or its appointed contractors will select and maintain bulk earthwork machinery as specified in the preferred project noise impact assessment report (appended to the RTS).	Prior to works	Contractors and Operational staff
Broadband reversing alarms or other non-tonal vehicle movement and warning alarms shall be fitted to all machinery on site. The potential noise impact associated with reversing alarms shall be managed and minimised via a combination of proactive driver/operator training and operational procedures.	At all times	Contractors and Operational staff
The Proponent shall implement a noise monitoring programme which would involve quarterly attended noise monitoring at a number of nearby identified receiver locations for 12 months after all Modification 3 and 4 activities are in full operation. If there are no exceedances of the project noise trigger levels during quarterly noise monitoring during the first year of monitoring then noise monitoring will cease. Additional noise monitoring would be undertaken in response to any noise complaints.	At all times	Site Manager
The Proponent shall undertake consultation with identified Martin Road residential receivers predicted to exceed the RNP criteria and conduct further investigation of their residences (as detailed in Section 2.3.3 and 4.1 of the RTS) to determine whether they qualify for and require the 'Type 1' treatment package from RMS's (2015) At-receiver Treatment Guideline.	Prior to works	Site Manager
Further investigations of the six residences potentially affected by road noise will be undertaken prior to increasing heavy vehicle movements along Martin Road above the approved heavy vehicle numbers and no greater than 180 truck movements in the daytime period. The investigation will determine whether the residences require the 'Type 1' treatment package from RMS's (2015) At-receiver Treatment Guideline.	Prior to increase in vehicle volumes	Site Manager
Prior to construction of the Martin Road-Elizabeth Drive intersection, existing road noise levels would be qualified to determine if architectural treatment should be offered to receivers along Elizabeth Drive raising complaints about increased road noise levels.	Prior to intersection upgrade	Site Manager
The Proponent will maintain a noise complaint register.	At all times	Site Manager
The Proponent must not use vibratory rollers at the site within 100 m of any privately-owned residence	At all times	Contractors and Operational staff

The additional noise management measures in Table 8 will be implemented.

Table 8 Additional noise management measures

Measure	Timing	Responsibility
Toolbox meetings prior to shift to discuss noise control measures that may be implemented to reduce noise emissions to the community	Daily	Site Manager
All plant should be idled or shut down when not in use	At all times	Contractors and Operational staff
Maximize the offset distance between noisy plant items and nearby noise sensitive receivers with plant to be parked/started/loaded and unloaded at farthest point from receiver locations as possible and oriented away from sensitive receivers when operating	At all times	Contractors and Operational staff
Operating plant in a conservative manner (no over-revving) and avoidance of noisy plant/machinery working simultaneously where practicable	At all times	Contractors and Operational staff
Conduct regular maintenance on plant to avoid unnecessary operational noise	At all times	Contractors and Operational staff
Minimisation of metallic impact noise	At all times	Contractors and Operational staff
Erect portable temporary screens adjacent to construction activities where noise reduction is required to meet construction noise management levels	During construction	Contractors
Dampened tips should be used on rock breakers	During construction	Contractors
Where necessary, noise source controls will be used, such as residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks	During construction	Contractors
Selecting site access points and roads as far as reasonably practicable away from sensitive receivers	During construction	Contractors

5.4 Noise management during noise-enhancing meteorological conditions

It is recommended that when planning VENM emplacement campaigns, prevailing metrological conditions are reviewed to ascertain their influence on noise propagation and potential to cause exceedance of the noise criteria at surrounding noise sensitive receivers.

5.5 Vibration management

Vibration during construction must comply with the limits prescribed in British Standard BS 7385 for structural damage and in *Assessing Vibration: a technical guide* (DECCW, 2006) for human response.

The safe working distances for building damage and human comfort applying to a vibratory roller (the plant item likely to generate the most vibration) are 25 m and 100 m, respectively.

During construction of the VENM haul road (the closest construction activity to sensitive receivers), vibratory rollers (and other plant generating less vibration) will not be used within 100 m of a sensitive receptor. Therefore, it is unlikely there will be vibration impacts during construction.

6 MONITORING, ACTIONS AND REPORTING

6.1 Monitoring method

6.1.1 Operational attended monitoring method

Noise will be monitored on a quarterly basis for the first year of operations under Phase 1a. Monitoring will cease if no exceedances are recorded during this time. Noise will be monitored quarterly again if any other activity under modifications 3 or 4 commences.

Noise will be monitored at three receiver locations (Appendix B) to determine compliance with operational noise criteria.

Attended noise monitoring using a hand-held noise meter will be undertaken during operations by a suitably qualified and experienced acoustic consultant.

If attended noise monitoring indicates that noise generated from the project is higher than noise limit criteria the following actions will occur:

- On observing exceedance information during attended noise monitoring, the person undertaking the monitoring will contact the Plant Manager and inform them of the noise level and location of the noise exceedance.
- The Plant Manager will immediately investigate the source of the noise and make necessary arrangements to alter operations to reduce noise levels.
- The Plant Manager will inform the person undertaking the noise monitoring when site operations have been altered.
- The person undertaking the monitoring will recheck and confirm noise levels with the Plant Manager.

All attended noise surveys for the project site shall be conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, “Acoustics - Description and Measurement of Environmental Noise”, PA and EPL. The acoustic instrumentation used for the assessment will carry current NATA calibration and comply with AS IEC 61672.1-2004- Electroacoustics - Sound level meters Specifications. Calibration of all instrumentation will be checked prior to and following measurements.

6.1.2 Targeted operational attended monitoring method

Furthermore, triggers that will necessitate targeted noise monitoring in addition to the routine campaign assessments include:

- Community complaints regarding noise emissions;
- Significant alterations or changes to onsite plant or operational practices; and
- When items listed in the Action Response Plan (Noise) are triggered (see Appendix C).

Additional targeted noise monitoring can take the form of attended or unattended noise monitoring. Receiver locations to be monitored will be selected to consider the worst-case scenario based on nature of the complaint, weather conditions and proximity to the noisy activity.

Targeted noise assessment will investigate the source of the noise so noise controls or changes to operations can be implemented.

6.1.3 Traffic Noise Monitoring

Road traffic noise monitoring will be conducted in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint. The noise monitoring will be conducted for two one-hour periods (ie one day and one night).

Noise monitoring should ideally consist of attended monitoring so that accurate identification of project trucks can be quantified against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport or where traffic flows are <10,000 vehicles per day a model that can accurately calculate low flow noise levels such as US Federal Highways Administration TNM (or equivalent).

6.2 Responsibility, community concerns and complaints

Responsibility for noise management from site, predominantly lies with the
Site Manager, especially with respect to implementing noise control measures and community consultation.

Notwithstanding, all site staff share the responsibility in minimising noise, whether from general operation of plant, to identifying potential issues that may lead to increasing off-site noise levels such as faulty mufflers or inefficient/ineffective bunds.

Additionally, truck drivers share responsibility in minimising noise whilst on and off-site by reducing tailgate 'clanging', eliminating the use of compression brakes and avoiding rapid acceleration.

Where community concerns or complaints pertaining to noise emissions are received the Site Manager will handle the complaint in accordance with the Environmental Complaints Procedure outlined in Section 9.5.1 of the EMS, which includes:

- Ensuring the telephone complaints line is operated at all hours and that staff required to implement the environmental complaints handling procedure are appropriately trained.
- Log the details of the complaint and immediately investigate the complaint and the source of the noise. This will allow CSR to identify what activities were taking place on the site at the time of the complaint that may have been the cause of the complaint.
- Document the prevailing meteorological conditions (such as wind and temperature inversions) when investigating noise complaints in order to assist in the development of possible amelioration measures. It is noted that inversions for the site are anticipated to have a limited influence on received noise levels due to distance of receivers, topography and hours of operation (i.e. daytime operations).
- Contacting the complainant within 24 hours of receiving the complaint and ask the complainant to describe as accurately as possible what the noise sounded like, exactly what time they heard that noise, where they heard the noise from (eg address) and what direction the noise was coming from.

  This will allow CSR to confirm that the noise was from their site operations and to identify if there was a particular activity that caused the noise complaint.

  The complainant will also be asked how the noise they can hear is affecting them (waking them up at night vs irritating daytime noise) to ascertain the seriousness of the complaint and the level of priority it receives.
- If it is established that the noise complaint is from activities at the site and is causing disturbance to the complainant, then CSR will relocate or isolate that particular noise source where it is obvious that a particular noise source from the site is responsible for elevated noise emissions.
- Travel to the approximate location of the complaint and assess whether the noise nuisance has been mitigated and confirm with the complainant if the noise in question has been mitigated.
- Discuss the subsequent results with the complainant to ensure a resolution is reached. If a resolution cannot be reached DPIE will be contacted.

- Where required, the Site Manager may need to engage a suitably qualified acoustic consultant to complete attended compliance testing to validate compliance.
- All aspects of the noise complaints handling procedure will be recorded including where and when it occurred, results of any initial noise monitoring (if required), noise management measures applied, results of follow up noise monitoring (if required) and all correspondence with the complainant.

  The results of noise complaint investigations and any amelioration activities will be reviewed and reported in the annual review of the project.
- In planning future phases of work, CSR will ensure that where the same or similar plant and equipment (or with similar sound power levels or noise characteristics) is to be used, that all noise management measures identified as being necessary during previous noise complaint handling processes, are implemented.

6.2.1 Community Consultation

Further to the engineered noise controls and strategies, the following community consultation will be completed:

- a sign on the front gate of the site prominently displays the telephone number, and postal address to register a complaint.
- as part of the modification process, surrounding landowners are to be notified by letter of the proposed changes to the site's operation.
- any updated strategies, plans and programs, are available to the public 14 days after approval by the Secretary.
- community consultation is undertaken when changes are planned to the project operations that will impact on the surrounding neighbours. Where atypical operations are planned that may create adverse impacts, all affected receptors are to be notified 24 hours prior to the works.
- the notification shall include the duration and extent of the works, the likely noise to be experienced, and a contact telephone number. The operator does not hold open days or distribute regular newsletters, however regular verbal communication with neighbours and the community is undertaken on an informal and unplanned basis.

Additionally, prior to increasing heavy vehicle movements along Martin Road above 180 truck movements in the daytime period, residents along Martin Road will be invited to request road noise mitigation measures in accordance with Condition 8b, Schedule 3 of the approval. If they do request road noise mitigation measures, then further investigation of their residences will be undertaken (as detailed in Section 2.3.3 and 4.1 of the RTS) to determine whether they qualify for and require the 'Type 1' treatment package from RMS's (2015) At-receiver Treatment Guideline.

7 EVALUATION AND REVIEW

7.1 Annual review

Prior to commencement of VENM import, and annually thereafter, CSR will review the environmental performance of the project in accordance with Section 9.1.1 of the EMS.

As part of this review and through the Community Consultation Committee, the nearby residents will be consulted regarding the effectiveness of the noise mitigation measures. The results of this consultation and any proposed actions will be reported as part of the review.

The annual review report will be submitted to the Secretary of the DPIE, Council and the Community Consultative Committee. It will also be available on the website, once approved and to any interested person on request.

7.2 Plan and program revision

This plan will be reviewed and revised within three (3) months of the following:

- the submission of an Incident Report (refer 8.2);
- the submission of an annual review (refer 7.1);
- the submission of an Independent Environmental Audit report; and
- any modification to the conditions of approval (unless the condition requires otherwise).

This is in accordance with the intent of the conditions of approval to ensure that strategies, plans and programs are updated on a regular basis, incorporate any recommended measures to improve the environmental performance of the project, and update for new technologies and Best Practice procedures.

All approved management plans, strategies and programs will be implemented until any updated measures have been approved by the relevant authorities.

The NMP will be reviewed and revised if necessary should any other activity under modifications 3 and 4 be commenced.

8 REPORTING

CSR will provide regular reporting in accordance with the approval and EPL conditions. All monitoring results and environmental performance will be published on the website, in accordance with procedures detailed in the EMS.

8.1 Regular reporting

8.1.1 Reporting under the CoA

In accordance with the conditions of approval and as detailed in Chapter 9 of the EMS, CSR will provide regular reporting to the DPIE, EPA and other interested stakeholders.

8.1.2 Information required on website

As detailed in Section 9.1.4 of the EMS, CSR will provide regular reporting on the environmental performance of the Badgerys Creek project on its website.

8.2 Incident and non-compliance reporting

As soon as possible after CSR becomes aware of a non-compliance against any of the conditions of approval, or any other incident, notification will be made via phone and/or email in accordance with the protocol detailed in Section 9.2 of the EMS.

As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing:

a) an exceedance of any criteria in Table 7, CSR will notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria.

APPENDIX A – GLOSSARY OF TERMS

Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms

Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA90 statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
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 attempts to closely approximate the frequency response of the human ear. In some cases the overall change in noise level is described in dB rather than dBA, or dBZ which relates to the weighted scale.
dB(Z)	Linear Z-weighted decibels.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA90	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LAeq	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LAmax	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.

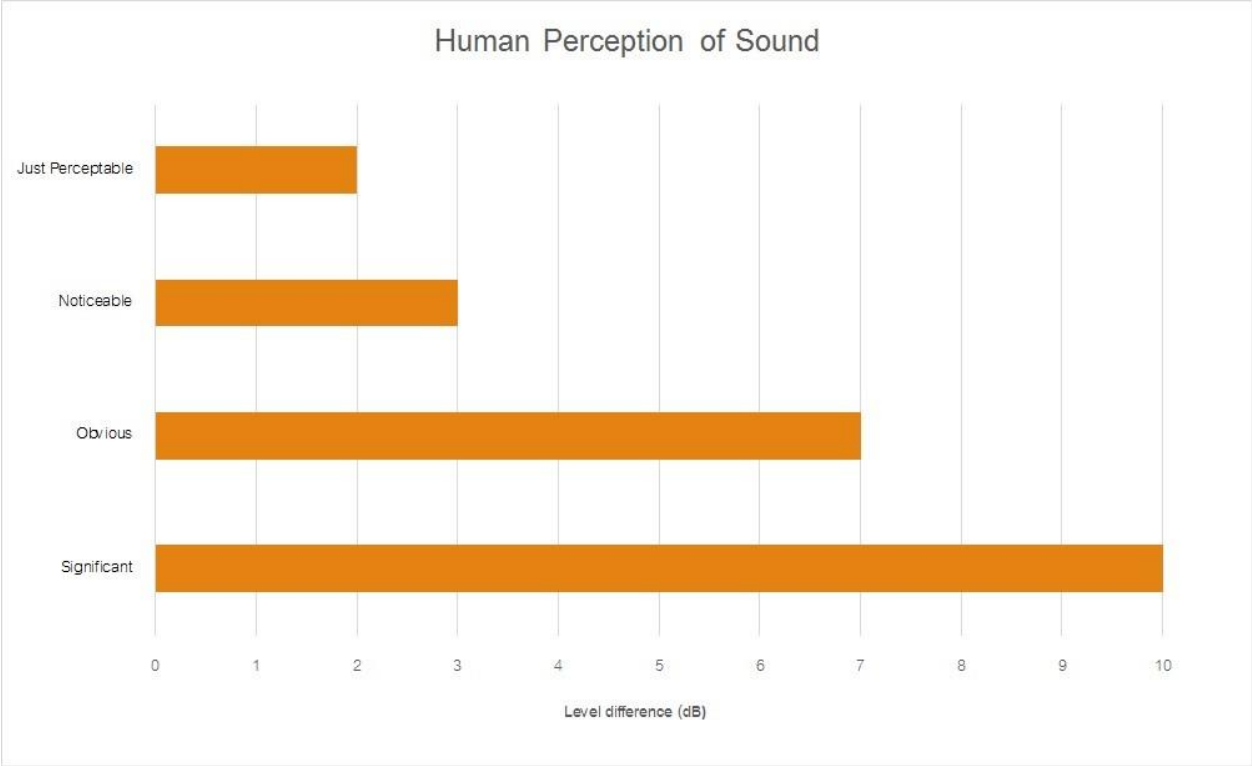
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

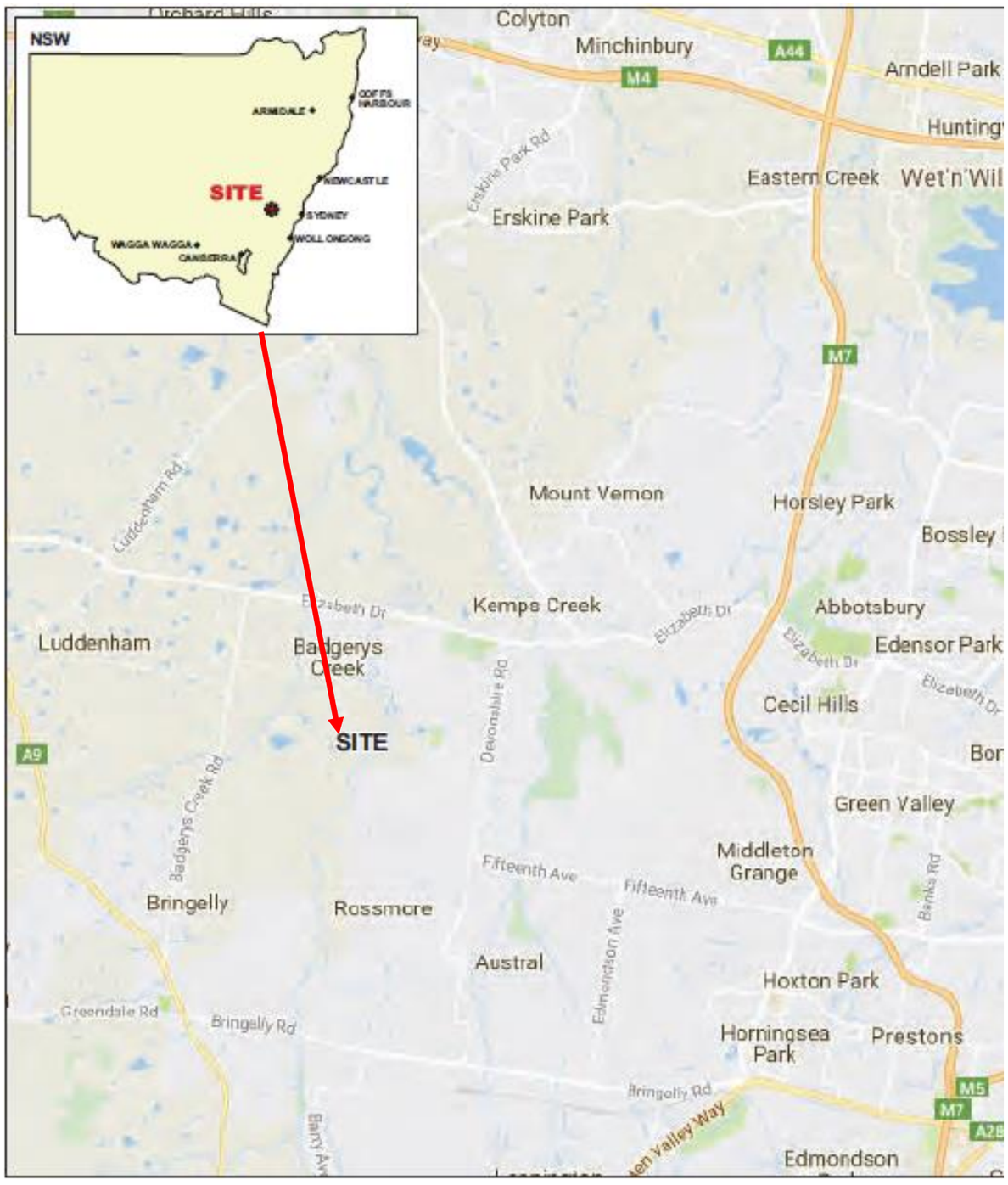
Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



APPENDIX B – LOCALITY PLAN



APPENDIX C – PROJECT PLAN

APPENDIX D – ACTION RESPONSE PLAN (NOISE)

Table C1 Action Response Plan (Noise)				
Event	Potential Adverse Outcome	Trigger Level	Actions to be implemented	Responsibility
New plant item introduced to site	Elevated off-site noise levels and potential non compliance	Complete in field observations to identify if new plant is audible in off-site locations or if sound power level of items is greater than an equivalent plant item listed in Section 5.2	Measure plant item in question to determine sound power level. If louder than equivalent item in Section 5.2, replace with quieter unit or implement noise controls (ie mufflers etc)	Plant Manager
Community complaint regarding noise emissions	Noncompliance with noise limits	Community reaction to noise from site	See Section 6.2 - log details of complaint - relocate or eliminate the noise source in question - confirm with complainant that amelioration measures are effective - the results will also be discussed with the complainant to ensure a resolution is reached - if a resolution cannot be reached DPIE will be contacted - where required, the plant manager may need to engage a suitably qualified	Plant Manager

			acoustic consultant to complete attended compliance testing to validate compliance	
Noisy trucks (exhaust noise)	Generating on-site and offsite elevated noise levels	Check serviceability of exhaust system	Where faulty muffler or exhaust is identified organise repairs to rectify noise emissions	Plant Manager/All drivers
Using air brakes (site ingress)	Generating off-site elevated noise levels with tonal and low frequency components	Instruct drivers minimise the use of air brakes when possible and minimise air brake usage when entering site.	Re-iterate this management strategy during inductions, and regularly communicate the importance of reducing non and off-site noise emissions	Plant Manager/All drivers