

TITLE: NOISE MANAGEMENT PLAN

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

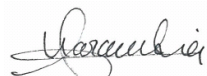
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Document Preparation and Control	Document Review
Rod Linnett	Muller Acoustic Consulting Pty Ltd (MAC)
Document Approval	Signature
Nelma Arancibia	

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01	11/03/2021	DRAFT	Updated for peer review
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05	25/11/2022	Reviewed	Muller Acoustic Consulting Pty Ltd - Review
06	1/02/2023	Final submission for	Updated and submitted to DPE for approval
07	21/02/2023	Final submission for	Updated following DPE review

GLOSSARY AND ABBREVIATIONS

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.
CoC	Conditions of Consent for MP10_0014
CSR	CSR Limited
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
DPE	Department of Planning and Environment
EMS	Environmental Management Strategy
ENM	Excavated Natural Material
EP&A Act	Environmental Planning and Assessment Act 1979
Fill	Virgin Excavated Natural Material and Excavated Natural Material
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
Incident	An occurrence or set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the conditions of approval.
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.

L _{Amax}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
LGA	Local Government Area
Mod	Modification
MP	Major Project
Non-compliance	An occurrence or set of circumstances that is a breach of conditions of approval 10_0014, or EPL 684, or ML 1771.
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
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.
RTS	Response to Submissions
Secretary, the	Planning Secretary under the EP&A Act, or nominee of the DPE
Sound power level (L _w)	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 : $= 10 \cdot \log_{10} (W/W_0)$ Where : W is the sound power in watts and W ₀ is the sound reference power at 10-12 watts.
VENM	Virgin Excavated Natural Material
1/3 Octave	Single octave bands divided into three parts

1 INTRODUCTION

1.1 Context

This Noise Management Plan (NMP or Plan) forms part of the Environmental Management Strategy (EMS) for the CSR Building Products Limited (CSR) site at Badgerys Creek (Figure 1). The site was formerly owned and operated by Boral Company however was acquired by PGH Bricks and Pavers (a subsidiary of CSR) in 2016. The site comprises of a previous mothballed brick manufacturing building which has now been demolished and exhausted quarry pits which have been filled with water over time.

This plan has been prepared following The Department of Planning and Environment's (DPE) determination of Badgerys Creek Quarry and Brick Making Project (MP10_0014) on 27/09/2011 and more recently modification 5 on 19/01/2022.

A brief description of each modification is shown below;

- Mod 1 - Mothballed the site and allowed minor maintenance requirement

- Mod 2 - It allowed for raw material exportation and building products storage (this modification has not been enacted)

- Mod 3 - Construct a new brick manufacturing plant incorporating new equipment and a new pit (Pit No. 3).

- Mod 4 - Rehabilitation of the site including dewatering of old pits and import of VENM to fill the pits.

- Mod 5 - Importation of excavated natural material

This NMP has been prepared to address the requirements of the Conditions of Consent (CoC), the Statement of Commitments (SoC) and applicable legislation to the extent that they apply to *Phase 1* of the Development. This Plan supersedes all other NMPs written to comply with this Consent.

1.2 Background

The Badgerys Creek Site is located at 235 Martin Road, Badgerys Creek, 41 kilometres to the southwest of Sydney, within the Liverpool City Council Local Government Area (LGA). Primary access to the site is provided through Martin Road at the north-eastern corner of the site. This vehicle access currently terminates at the northern site boundary, although the road reservation continues through the site. A Locality Plan is show in Appendix A.

The Site as shown in the abovementioned appendix, is a consolidation of lots which occupies an irregular shaped area of 200ha located to the south of Elizabeth Drive. The site is bound to the east by South Creek and to the west by Badgerys Creek while the large Inghams Enterprise site adjoins to the south and Australian Native Landscapes and rural residential properties adjoin to the north. The old brickmaking facility was located towards the centre of the site (the building has now been demolished with the concrete hardstand remaining in place) surrounded by excavated pits (a number of which are filled with water) and stockpiles.

2 PURPOSE AND OBJECTIVES

2.1 Purpose

CSR Building Products Limited (CSR) will implement all practicable measures to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the Badgerys Creek Quarry and Brick Making Project. This Noise Management Plan (NMP) has been prepared to:

- describe the measures to ensure the relevant conditions of approval for Phase 1 of the Badgerys Creek Quarry and Brick Making Facility are complied with;
- describe the measures to ensure commitments in the Environmental Assessment in relation to noise are implemented;
- describe the noise monitoring program to evaluate the performance of the Badgerys Creek operations;
- outline community engagement procedures in relation to noise issues; and
- describe the protocol to determine exceedance with relevant conditions of the project approval

This NMP also satisfies the Conditions of Consent (CoC) for the development, in particular Schedule 3, condition 8 Noise Management Plan.

2.2 Objectives

This NMP provides the basis for the management of noise and to minimise risk of impact during the Project. The construction methodology will be designed to minimise, mitigate, and manage generation noise and ensure they generally compile with the consent.

To achieve this objective, CSR will address the following issues;

- Implement a noise monitoring programme which would involve quarterly attended noise monitoring
- Use monitoring to assess the effectiveness of noise measures that are being applied during construction works
- Compliance and conformance with all Conditions of Consent (CoCs)

2.3 Targets

The following targets have been established for the management of noise during the operational lifetime of the facility:

- Ensure full compliance with the relevant legislative requirements and CoC;
- Minimise environmental non compliances

2.4 Proposed Development

The proposed development under Modifications 5 is staged as per the below;

Phase 1	-	2021 to 2027
Phase 2	-	2027 to 2031
Phase 3	-	2031 to 2034
Phase 4	-	2034 onwards

This Noise Quality Management Plan applies to Phase 1 of the Project and includes;

- Construction Activities
- Dewatering of pits 1, 2 and 3; and
- Quarrying activities in Pit 3
- Fill import for quarry rehabilitation activities and preferential backfilling of Pits 1, 2 and 3

Phase 1 of the Project also allows for construction activities and brickmaking activities, however, the construction and operation of the brick factory does not form part of the current operations

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

3 ENVIRONMENTAL REQUIREMENTS

The principal controls and constrains specified in the Consent in relation to air are detailed in the following:

Table 1: Operating hours

Activity	Permissible Hours
Quarrying operations (excluding truck arrival, loading and dispatch)	7.00 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Brickmaking Activities	24 hours per day, 7 days per week
Truck arrival and dispatch (raw materials only)	6.00 am to 10.00 pm Monday to Friday
	6.00 am to 6.00 pm Saturday
	At no time on Sundays or public holidays
Truck arrival and dispatch (finished building products only)	5.00 am to 10.00 pm Monday to Friday
	6.00 am to 6.00 pm Saturday
	At no time on Sundays or public holidays
Truck arrival and dispatch (Fill import only)	7.00 am to 6.00 pm Monday to Saturday
	9.00 am to 6.00 pm Sunday
	At no time on public holidays
Cash sales	6.00 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Sales selection/Customer Display Centre	8.00 am to 5.00 pm Monday to Sunday
Maintenance	At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations

Schedule 3, Condition 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.

Table 2: Operational noise criteria dB(A)

Receiver ID	Morning Shoulder	Day	Evening	Night	
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	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

Noise generated by the development 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 Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant 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 Applicant must comply with the noise criteria in Table 2.

Table 3: Road traffic noise criteria dB(A)

Road Noise Receiver ID	Day / Evening L _{Aeq} (1 hour)	Night L _{Aeq} (1 hour)
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 development 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 Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Schedule 3, Condition 6A:

Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the Applicant 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 Applicant 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.

Schedule 3, Condition 7:

The Applicant must:

- (a) take all reasonable steps to minimise the construction, operational, low frequency and road transportation noise of the development;*
- (b) take all reasonable steps to minimise the noise impacts of the development during noise enhancing meteorological conditions;*
- (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 consent;*
- (d) carry out regular noise monitoring to determine whether the development is complying with the relevant conditions of this consent; and*
- (e) modify or stop operations on the site to comply with the relevant conditions of this consent.*

Note: Monitoring under this consent 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.

Schedule 3, Condition 8:

The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:

- (a) be submitted to the Secretary for approval prior to commencing Modification 3 and 4, unless otherwise agreed by the Secretary;*
- (b) describe the measures to be implemented to ensure:*
 - compliance with the noise criteria and operating conditions of this consent;*
 - best practice management is being employed;*
 - residences listed in condition 6A of this Schedule are notified of their rights to request road noise mitigation measures;*
 - vibration impacts are minimised; and*
 - the construction and operational noise impacts of the development are minimised during noise enhancing meteorological conditions;*

(c) describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to noise are implemented;

(d) include a consultation plan detailing:

- procedures for notifying and consulting nearby residents prior to the recommencement of quarrying and brick making activities;*
- procedures for notifying and consulting nearby residents prior to the commencement of construction activities;*
- 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; (e) describe the proposed noise management system; and*

(f) include a noise monitoring program that:

- is capable of evaluating the performance of the development;*
- includes a protocol for determining any exceedances of the relevant conditions of this consent; and*
- effectively supports the noise management system.*

The Applicant must implement the Noise Management Plan as approved by the Secretary.

3.1 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.

3.2 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.

3.3 Minister’s Conditions of Consent

Any exceedance of criteria and/or performance measures required by the conditions of consent constitutes a breach of the approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

The conditions of consent relevant to this NMP are listed in Table 4 below;

Schedule	Condition Number	Condition of Project Approval	Location of where addressed in AQMP																										
3	1	<p>Hours of Operation The Applicant must comply with the operating hours set out in Table 1.</p> <p><i>Table 1: Operating hours</i></p> <table border="1"> <thead> <tr> <th>Activity</th> <th>Permissible Hours</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Quarrying operations (excluding truck arrival, loading and dispatch)</td> <td>7.00 am to 6.00 pm Monday to Saturday</td> </tr> <tr> <td>At no time on Sundays or public holidays</td> </tr> <tr> <td>Brickmaking Activities</td> <td>24 hours per day, 7 days per week</td> </tr> <tr> <td rowspan="3">Truck arrival and dispatch (raw materials only)</td> <td>6.00 am to 10.00 pm Monday to Friday</td> </tr> <tr> <td>6.00 am to 6.00 pm Saturday</td> </tr> <tr> <td>At no time on Sundays or public holidays</td> </tr> <tr> <td rowspan="3">Truck arrival and dispatch (finished building products only)</td> <td>5.00 am to 10.00 pm Monday to Friday</td> </tr> <tr> <td>6.00 am to 6.00 pm Saturday</td> </tr> <tr> <td>At no time on Sundays or public holidays</td> </tr> <tr> <td rowspan="3">Truck arrival and dispatch (Fill import only)</td> <td>7.00 am to 6.00 pm Monday to Saturday</td> </tr> <tr> <td>9.00 am to 6.00 pm Sunday</td> </tr> <tr> <td>At no time on public holidays</td> </tr> <tr> <td rowspan="2">Cash sales</td> <td>6.00 am to 6.00 pm Monday to Saturday</td> </tr> <tr> <td>At no time on Sundays or public holidays</td> </tr> <tr> <td>Sales selection/Customer Display Centre</td> <td>8.00 am to 5.00 pm Monday to Sunday</td> </tr> <tr> <td>Maintenance</td> <td>At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations</td> </tr> </tbody> </table>	Activity	Permissible Hours	Quarrying operations (excluding truck arrival, loading and dispatch)	7.00 am to 6.00 pm Monday to Saturday	At no time on Sundays or public holidays	Brickmaking Activities	24 hours per day, 7 days per week	Truck arrival and dispatch (raw materials only)	6.00 am to 10.00 pm Monday to Friday	6.00 am to 6.00 pm Saturday	At no time on Sundays or public holidays	Truck arrival and dispatch (finished building products only)	5.00 am to 10.00 pm Monday to Friday	6.00 am to 6.00 pm Saturday	At no time on Sundays or public holidays	Truck arrival and dispatch (Fill import only)	7.00 am to 6.00 pm Monday to Saturday	9.00 am to 6.00 pm Sunday	At no time on public holidays	Cash sales	6.00 am to 6.00 pm Monday to Saturday	At no time on Sundays or public holidays	Sales selection/Customer Display Centre	8.00 am to 5.00 pm Monday to Sunday	Maintenance	At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations	Section 3.5
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3	1A	With the written agreement of the Secretary, the Applicant may undertake limited campaign trucking (within the limits imposed under conditions 10 and 12 of Schedule 2) for the import of Fill outside of the operating hours prescribed in condition 1 of this Schedule.	Section 3.5																										
3	2	<p>The following activities may be carried out outside the hours specified in condition 1 of this Schedule:</p> <p>(a) activities that are inaudible at residences on privately-owned land;</p> <p>(b) the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or</p> <p>(c) emergency work to avoid the loss of life, property or to prevent material harm to the environment.</p> <p>In such circumstances, the Applicant must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.</p>	Section 3.5																										
3	3	<p>Construction Noise 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.</p>	Section 3.5																										

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RN16	64	55																																				
All other residences on Martin Road	60	55																																				
3	6A	<p>Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the Applicant 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.</p> <p>If within 3 months of receiving this request from the owner, the Applicant 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.</p>	Section 5.3																																			
3	7	<p>Noise Operating Conditions</p> <p>The Applicant must:</p>																																				

Schedule	Condition Number	Condition of Project Approval	Location of where addressed in AQMP
		<p>(a) take all reasonable steps to minimise the construction, operational, low frequency and road transportation noise of the development;</p> <p>(b) take all reasonable steps to minimise the noise impacts of the development during noise enhancing meteorological conditions;</p> <p>(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 consent;</p> <p>(d) carry out regular noise monitoring to determine whether the development is complying with the relevant conditions of this consent; and</p> <p>(e) modify or stop operations on the site to comply with the relevant conditions of this consent.</p> <p><i>Note: Monitoring under this consent 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.</i></p>	<p>Section 4</p> <p>Section 5.4</p> <p>Section 5</p> <p>Section 5</p> <p>Appendix F</p>
3	8	<p>Noise Management Plan</p> <p>The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:</p> <p>(a) be submitted to the Secretary for approval prior to commencing Modification 3 and 4, unless otherwise agreed by the Secretary;</p> <p>(b) describe the measures to be implemented to ensure:</p> <ul style="list-style-type: none"> • compliance with the noise criteria and operating conditions of this consent; • best practice management is being employed; • residences listed in condition 6A of this Schedule are notified of their rights to request road noise mitigation measures; • vibration impacts are minimised; and • the construction and operational noise impacts of the development are minimised during noise enhancing meteorological conditions; <p>(c) describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to noise are implemented;</p> <p>(d) include a consultation plan detailing:</p> <ul style="list-style-type: none"> • procedures for notifying and consulting nearby residents prior to the recommencement of quarrying and brick making activities; • procedures for notifying and consulting nearby residents prior to the commencement of construction activities; • 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; <p>(e) describe the proposed noise management system; and</p> <p>(f) include a noise monitoring program that:</p> <ul style="list-style-type: none"> • is capable of evaluating the performance of the development; • includes a protocol for determining any exceedances of the relevant conditions of this consent; and • effectively supports the noise management system. 	<p>This plan</p> <p>Section 4</p> <p>Section 5.4</p> <p>Section 6.2.1</p> <p>Section 5</p> <p>Section 6.2</p> <p>Appendix F</p> <p>Section 5</p> <p>Section 6</p>

Schedule	Condition Number	Condition of Project Approval	Location of where addressed in AQMP
		The Applicant must implement the Noise Management Plan as approved by the Secretary.	
5	3	<p>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) a summary of relevant background or baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> • 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 development or any management measures; <p>(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> • impacts and environmental performance of the development; and • effectiveness of any management measures (see © above); <p>(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;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> • incidents; • complaints; and • non-compliances with statutory requirements; <p>(h) a protocol for periodic review of the plan; and</p> <p>(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.</p>	<p>Section 3.6</p> <p>Section 4</p> <p>Section 5</p> <p>Appendix E</p> <p>Section 5</p> <p>Section 6</p> <p>Section 7</p> <p>Section 8</p> <p>Appendix E</p> <p>Section 7</p> <p>Section 8</p> <p>Section 7</p> <p>Page 3</p>

3.4 Aspects and Impacts

The Project may result in noise impacts as shown in 5.

Table 5 Noise aspects and impacts

Noise aspect	Potential environmental impacts
Noise from vehicle movements along Martin Road.	<ul style="list-style-type: none"> • Health and amenity impacts on neighbouring residential dwellings.
Noise from onsite vehicle and equipment movements.	

Noise from material handling and dumping.	
Noise from demolition.	

3.5 Risk assessment

CSR maintains an Environmental Risk Register for the Badgerys Creek Quarry operation. This register ranks the noise impacts aspects in Table 55 as low to medium risks.

Phase 1 was not predicted to result in exceedances of project noise trigger levels at sensitive receivers. Therefore, as the current operations will not comprise construction and operation of the brick factory, with 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.

4 REGULATORY FRAMEWORK

4.1 Codes, Standards and Guidelines

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).

The NMP was completed in reference to the following documents:

- Environment Protection Authority's (EPA's), Approved methods for the measurement and analysis of environmental noise in NSW, 2022;
- 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.

4.2 Permits and Licences

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 0.

5 TRAINING AND RESOURCE REQUIREMENTS

5.1 Training

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 Resources

The primary noise sources during importation of Fill 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: 2008 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Stationary test conditions'.
- ISO 6395: 2008 'Acoustics – Measurement of exterior noise emitted by earth-moving machinery – Dynamic test conditions'.
- ISO3744:2010 "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: 2010 "Acoustics - Determination of sound power levels of noise sources using sound pressure – Survey Method using an enveloping measurement surface over a reflecting plane'.

6 NOISE MANAGEMENT SYSTEM

The noise management measures from Appendix 6 of the CO relevant to Phase 1 are in table 6 and will be implemented by the site manager.

Table 6 Approval noise and vibration management measures

Measure	Timing	Responsibility
The Applicant will implement all practicable measures to undertake the development in a way that minimises the noise generated. The Applicant has made the following commitments in relation to operation noise management.	At all times	Contractors and Operational staff
The Applicant 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 Applicant 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 Applicant 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 Applicant will maintain a noise complaint register.	At all times	Site Manager
The Applicant 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 7** will be implemented.

Table 7 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

6.1 Noise management during noise-enhancing meteorological conditions.

It is recommended that when planning Fill 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.

7 MONITORING, AND PERFORMANCE CRITERIA

Condition 8 of Schedule 3 (PA 10_0014) requires that this plan include a noise monitoring program that is capable of evaluating the performance of the Project, including a protocol for determining any exceedances of the relevant conditions of the consent, and effectively supports the noise management system.

Operator attended noise monitoring will be undertaken in general accordance with the consent and EPL#648, as well as the procedures outlined in the following documents:

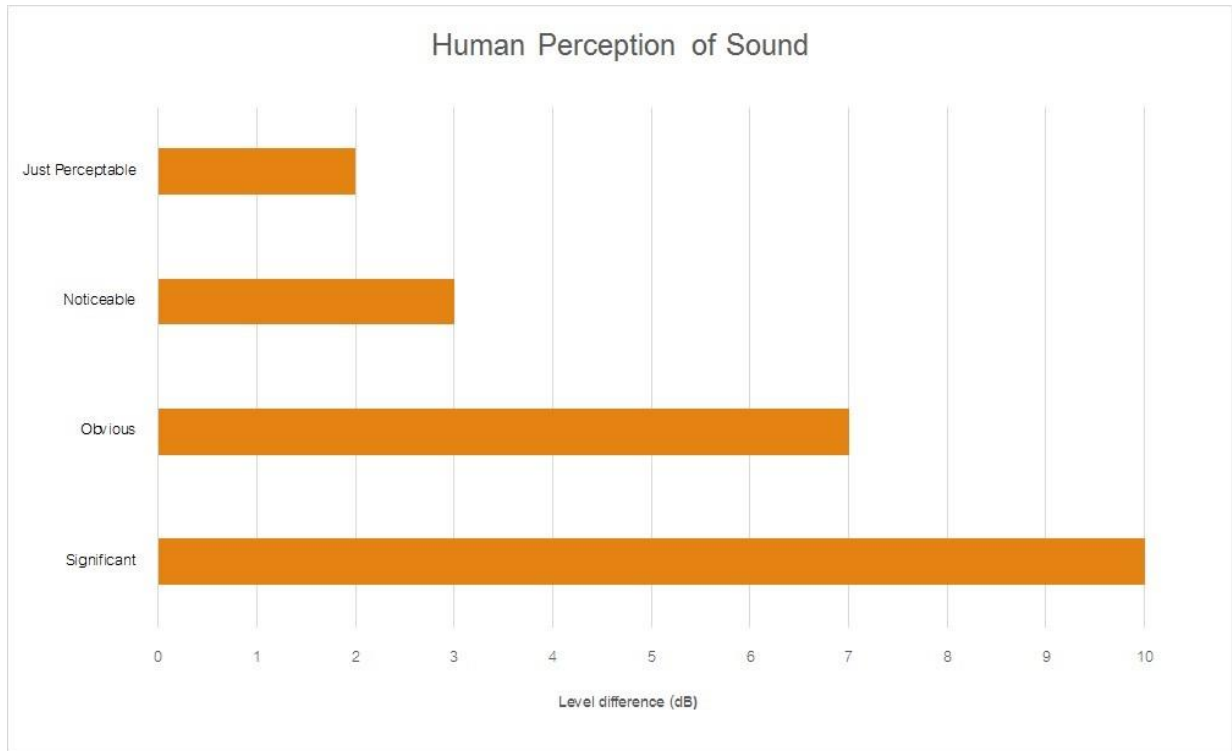
- Approved methods for the measurement and analysis of environmental noise in NSW (EPA, 2022);
- Noise Policy for Industry (NPI) (EPA, 2017);
- NSW Road Noise Policy (RNP), (DECCW, 2011); and
- AS 1055:2018 Acoustics – Description and Measurement of Environmental Noise.

The following table has been provided as a sound levels guide;

Table 8 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



7.1 Purpose

The purpose of the noise monitoring is to determine compliance with the criteria identified in Section **Error! Reference source not found.**

7.2 Instrumentation Requirements

Attended monitoring will be undertaken using a Type 1 integrating sound level meter with 1/3 octave filter and will be set to A-weighting (fast response).

Instrument calibration (all devices) shall be checked before and after each measurement survey, with the variation in calibrated levels not exceeding ± 0.5 dB(A). A hand held acoustic calibrator will be used to do these field checks and will comply with the requirements of Standards Australia AS/IEC 60942:2004 (IEC60942) – Australian Standard – Electroacoustics – Sound Calibrators.

All acoustic instrumentation shall meet the requirements of Standards Australia AS/NZS IEC 61672.1:2019 Electroacoustics - Sound level meters (AS61672.1).

7.3 Monitoring Locations

Table and Appendix D and Appendix E present the attended noise monitoring locations to determine compliance with operational noise criteria and road traffic noise criteria respectively.

Furthermore, noise monitoring at additional locations may be undertaken if required. This may include, for example, in response to a noise-related complaint.

Table 9 Noise Monitoring Locations

Monitoring Requirement	Monitoring Location	Representative of Receivers:	Coordinates (GDA94-MGA56)	
			Northing	Easting
Operational	NM-1	R9, R25, R35	292970	6247499
Operational	NM-2	R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46	292576	6247667
Operational	NM-3	R11, R12, R13, R14, R15	293459	6246431
Road Traffic	RNM-1	RN5	293094	6248989

7.4 Monitoring Frequency

Noise will be monitored on a quarterly basis for the first year of operations under Phase 1. 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.

Monitoring must be completed during each of the relevant assessment periods – day and evening periods at each location.

Road noise monitoring will be conducted for one one-hour period during the day period (ie 7am to 10pm).

In the event that monitoring ceases after the first year, an annual monitoring survey should be completed to satisfy the requirements of EPL684.

7.5 Monitoring Frequency

7.5.1 Operational attended monitoring method

Operator attended noise monitoring will be undertaken by an independent, suitably qualified acoustic consultant.

The Sound Level Meter (SLM) shall be programmed to record statistical noise levels including the LA_{max}, LA₁, LA₁₀, LA₉₀, LA_{min} and the LA_{eq} parameters, for each measurement conducted. The SLM microphone must be placed between 1.2 and 1.5 metres above the ground and be at least 3.5 metres from any reflecting structure other than the ground.

The operator will quantify site noise emissions and estimate the LA_{eq}(15min) noise contribution from the Project as well as the overall level of ambient noise. Information to be recorded for all operator attended monitoring will include:

- date and time, location and operator;
- meteorological conditions (i.e. temperature, humidity, cloud cover, and wind speed and direction);
- statistical noise level descriptors together with notes identifying the dominant noise sources;
- instrument make, model, serial number and calibration details;

- a brief description of activities at the Project wherever possible; and
- identify Project related noise sources and their relative contribution to overall ambient noise levels; and
- where possible, identify other extraneous noise sources.

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 Site Manager and inform them of the noise level and location of the noise exceedance.
- The Site Manager will immediately investigate the source of the noise and make necessary arrangements to alter operations to reduce noise levels.
- The Site 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 Site Manager.

7.5.2 Traffic Noise Monitoring

Road traffic noise monitoring will be conducted on a quarterly basis at one location for the first year of Phase 1 operations, or in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint.

Noise monitoring would ideally consist of attended monitoring over a one-hour period to accurately identify and quantify Project-related trucks 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).

7.5.3 Evaluation of Results

A noise monitoring report will be prepared by the person or company responsible for the monitoring and published on the CSR website. That report will include an assessment of the monitoring results against the criteria identified in Condition 5 of Schedule 3 (MPA 10_0014). The monitoring report will be reviewed by the Site Manager.

If the noise monitoring identifies an exceedance of the relevant criteria, the measures identified in Section 0 will be evaluated and amended where required.

Where exceedance of the noise criteria has been verified, monitoring should be repeated upon the implementation of additional noise mitigation measures to determine their effectiveness and whether the Plant complies with the noise criteria.

7.5.4 Targeted operational attended monitoring

Additional triggers that will necessitate targeted noise monitoring, above and beyond 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 F).

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.

8 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:

- Log the details of the complaint and immediately investigate the complaint and the source of the noise.
- 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).
- 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 DPE 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.
- Record and report the results of investigations and any amelioration activities in the annual review of the project.

8.1 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.

9 EVALUATION AND REVIEW

9.1 Annual review

Prior to commencement of Fill 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 DPE, Council and the Community Consultative Committee. It will also be available on the website, once approved and to any interested person on request.

9.2 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 0);
- the submission of an annual review (refer 0);
- the submission of an Independent Environmental Audit report; and
- any modification to the conditions of consent (unless the condition requires otherwise).

This is in accordance with the intent of the conditions of consent 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 the approved development consent be commenced.

10 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.

10.1 Regular reporting

10.1.1 Reporting under the CoA

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

10.1.2 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.

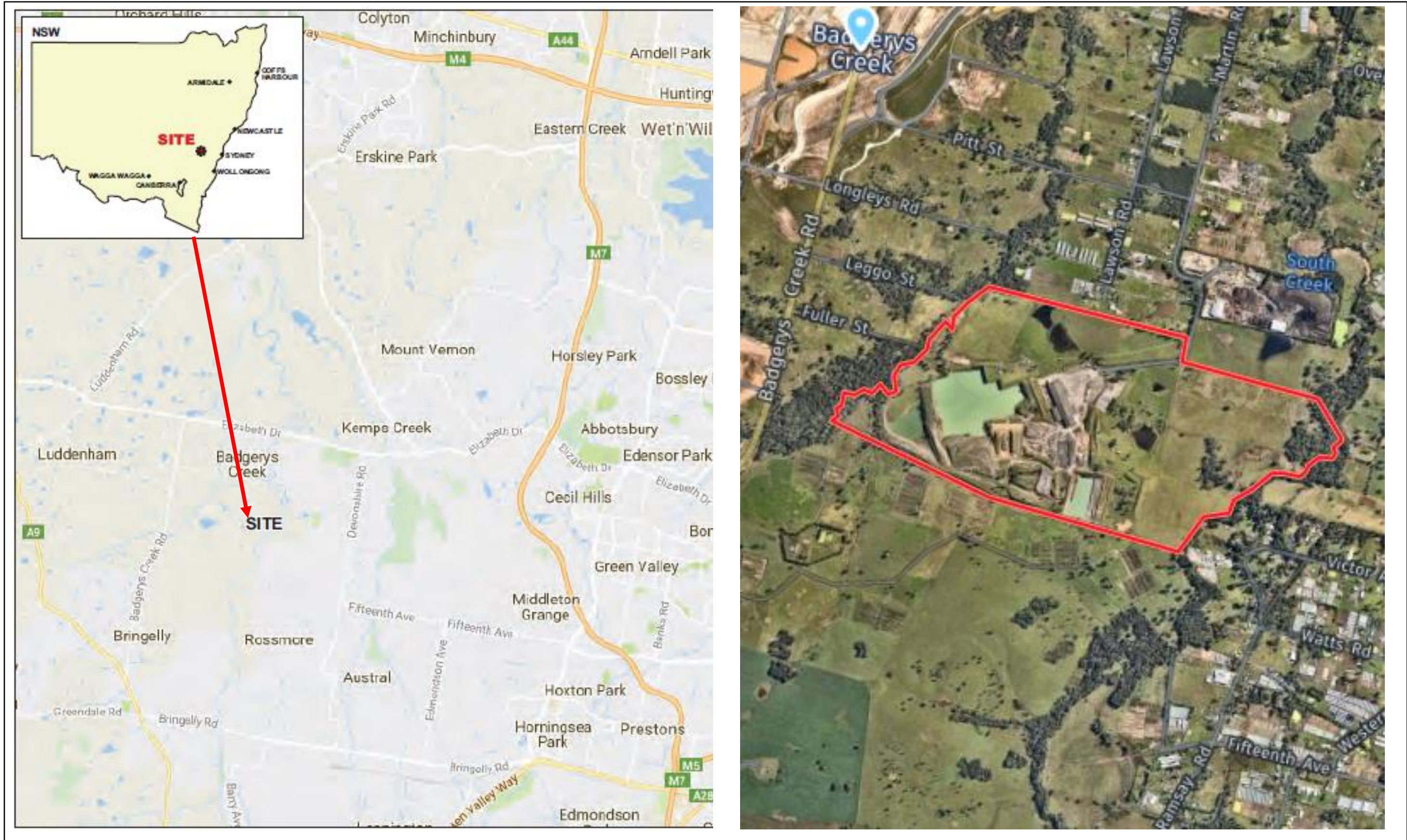
10.1.3 Incident and non-compliance reporting

As soon as possible after CSR becomes aware of a non-compliance against any of the conditions of consent, 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.

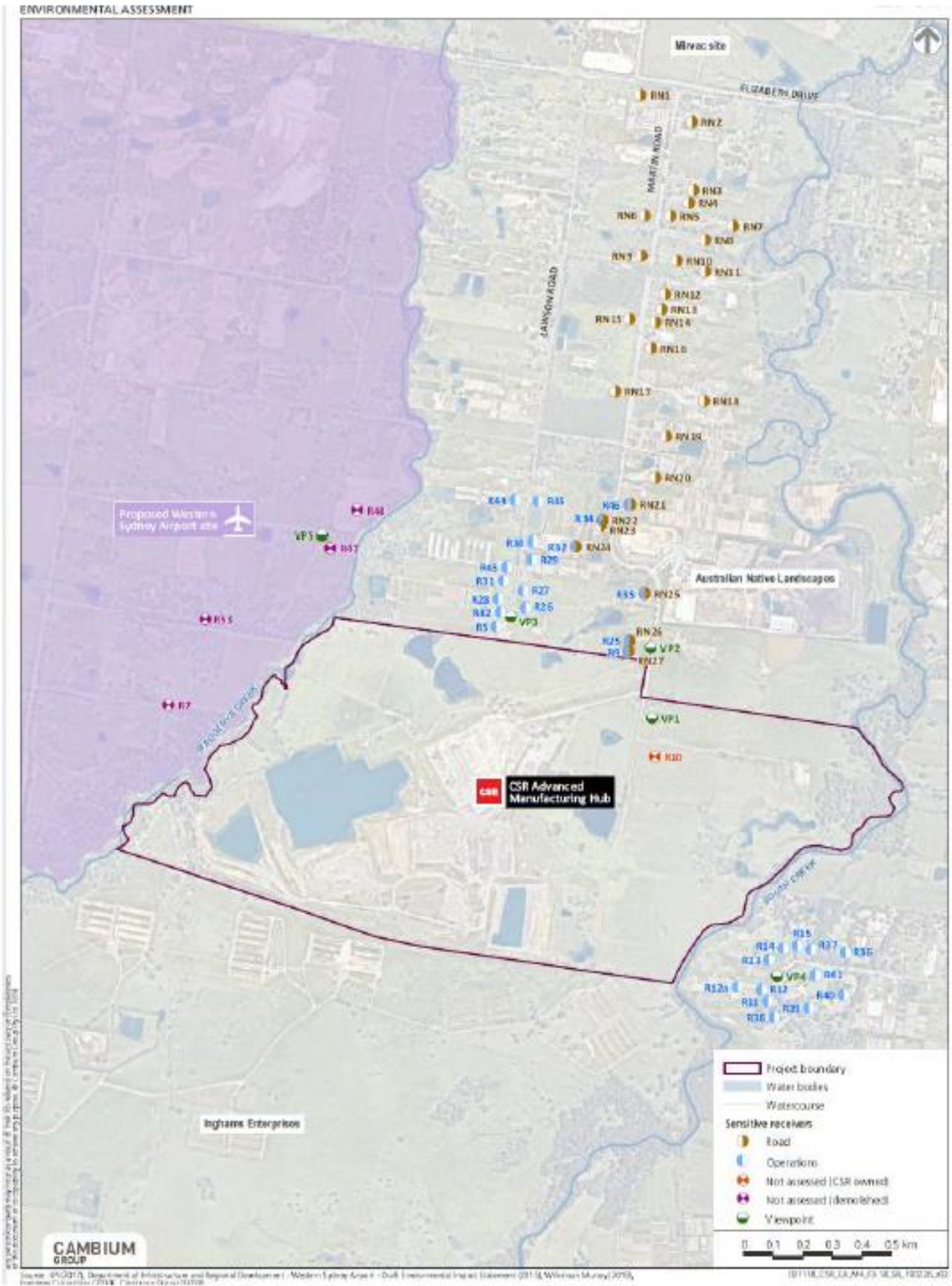
APPENDIX A – LOCALITY PLAN



APPENDIX B – PROJECT PLAN



APPENDIX C – ROAD NOISE RECIEVER ID



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 Error! Reference source not found. , replace with a quieter unit or implement noise controls (ie mufflers etc)	Site Manager
Community complaint regarding noise emissions	Noncompliance with noise limits	Community reaction to noise from site	See Section 0 <ul style="list-style-type: none"> - 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 DPE 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 	Site Manager
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