



ABN: 90 009 679 734

Calga Sand Quarry

Noise Management Plan

Prepared for

Hanson Construction Materials Pty Ltd

Prepared by

Wilkinson Murray Pty Limited

and



R.W. CORKERY & CO. PTY. LIMITED

September 2017

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Noise Management Plan

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September 2017

Document Control

Document Title	Noise Management Plan			
Document No.	264/52b			
Version	Issued by – Date	Distributed to	Comments by – Date	
Version 1	N. Warren (RWC) – 2 August 2017	EPA	D. Bell 17 August 2017	
		DPE	G. Seed 14 September 2017	
Version 2	N. Warren (RWC) – 20 September 2017	DPE		
Final	Approved by:	DPE	Date:	19/10/17
Final Document Distribution	Hard Copy to:		No. of Copies:	
	CDs to:		No. of CDs	
	Email to:			

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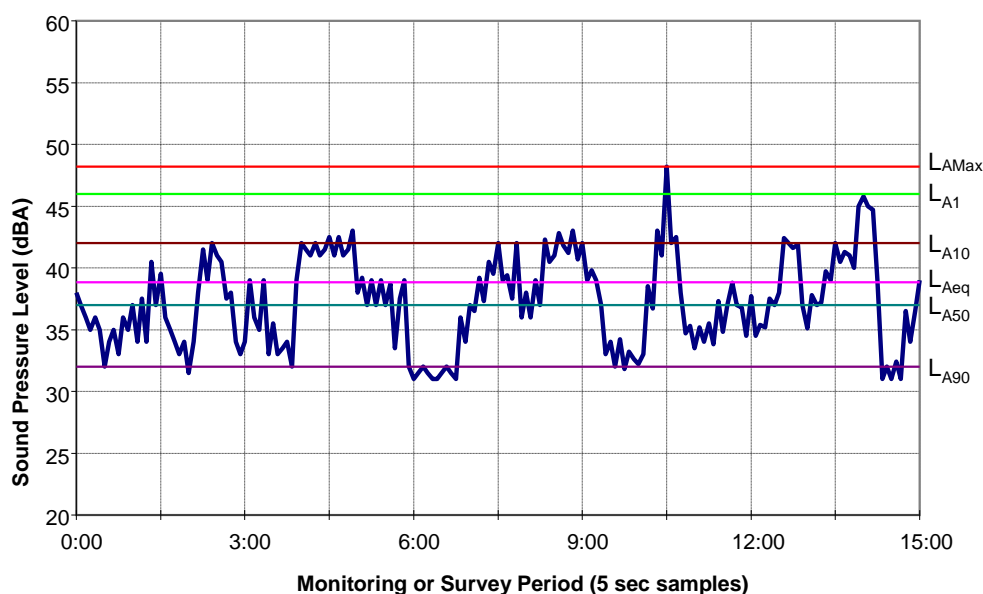
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COMMONLY USED ACRONYMS AND TERMS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L _{Amax})	The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.
L _{A1}	The L _{A1} level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the L _{A1} level for 99% of the time.
L _{A10}	The L _{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L _{A10} level for 90% of the time. The L _{A10} is a common noise descriptor for environmental noise and road traffic noise.
L _{A90}	The L _{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L _{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.
L _{Aeq}	The equivalent continuous sound level (L _{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.
ABL	The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10 th percentile (lowest 10 th percent) background level (L _{A90}) for each period.
RBL	The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



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1. INTRODUCTION

This *Noise Management Plan* ('the Plan') has been prepared for the Calga Sand Quarry (the Quarry) on behalf of Hanson Construction Pty Ltd ('Hanson') by Wilkinson Murray Pty Ltd (WM) and R.W. Corkery & Co (RWC). The Quarry is located on the Somersby Plateau, approximately 1.0km northwest of the Calga Interchange on the M1 Freeway (**Figure 1**). The Plan will be used as a tool to manage noise-related issues during Extraction Stages 3/4, 3/5 and 3/6 of operations.

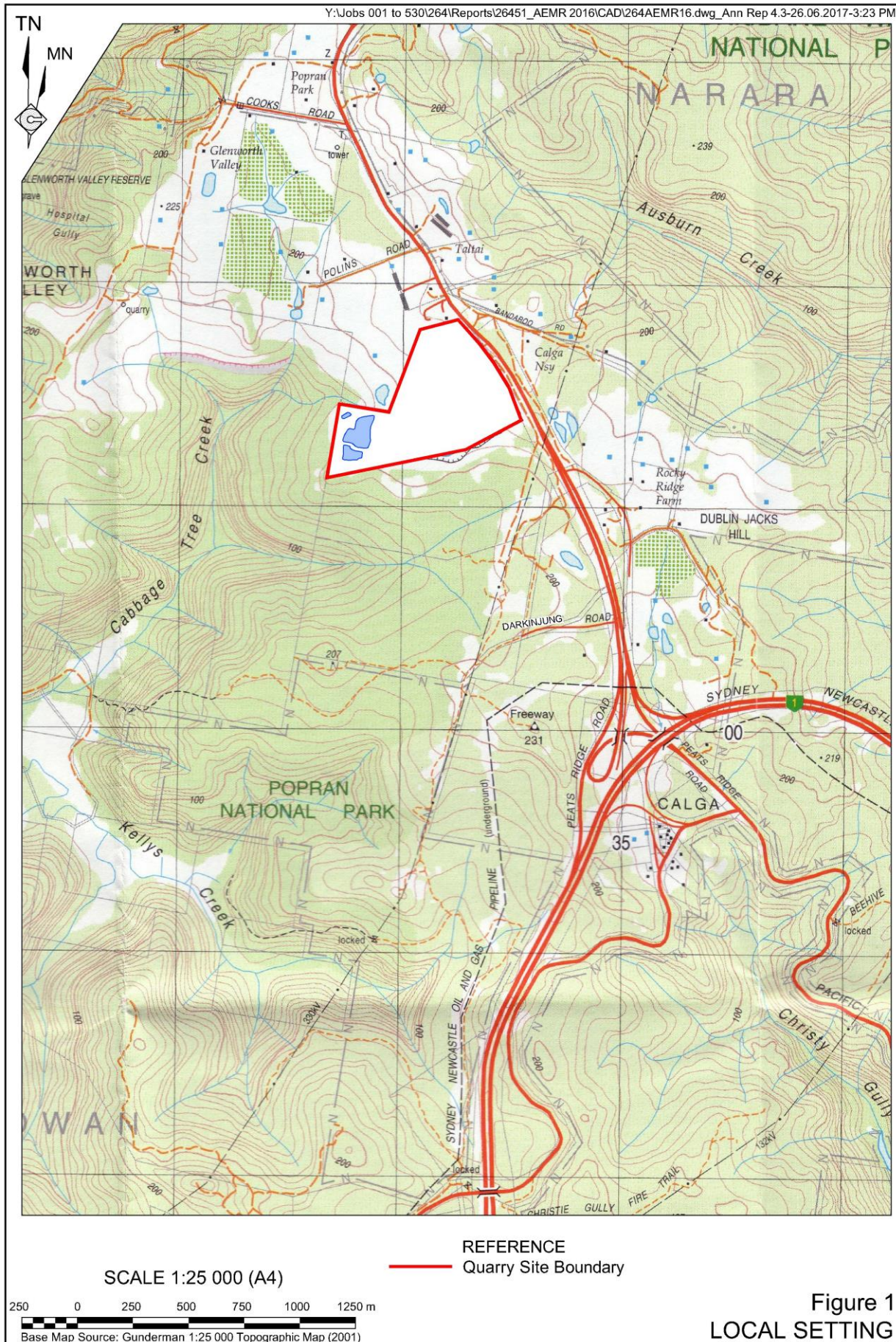
The Plan has been prepared to satisfy *Condition 3(7A)* of Development Consent DA 94-4-2004 (DA 94-4-2004) and *Condition 5(3)* of DA 94-4-2004 with regards to general requirements for all management plans. DA 94-4-2004 was approved on 28 October 2005 to permit the operation of Stage 3 of the Quarry and this Plan has been prepared following a modification to DA 94-4-2004 that was approved on 13 June 2017.

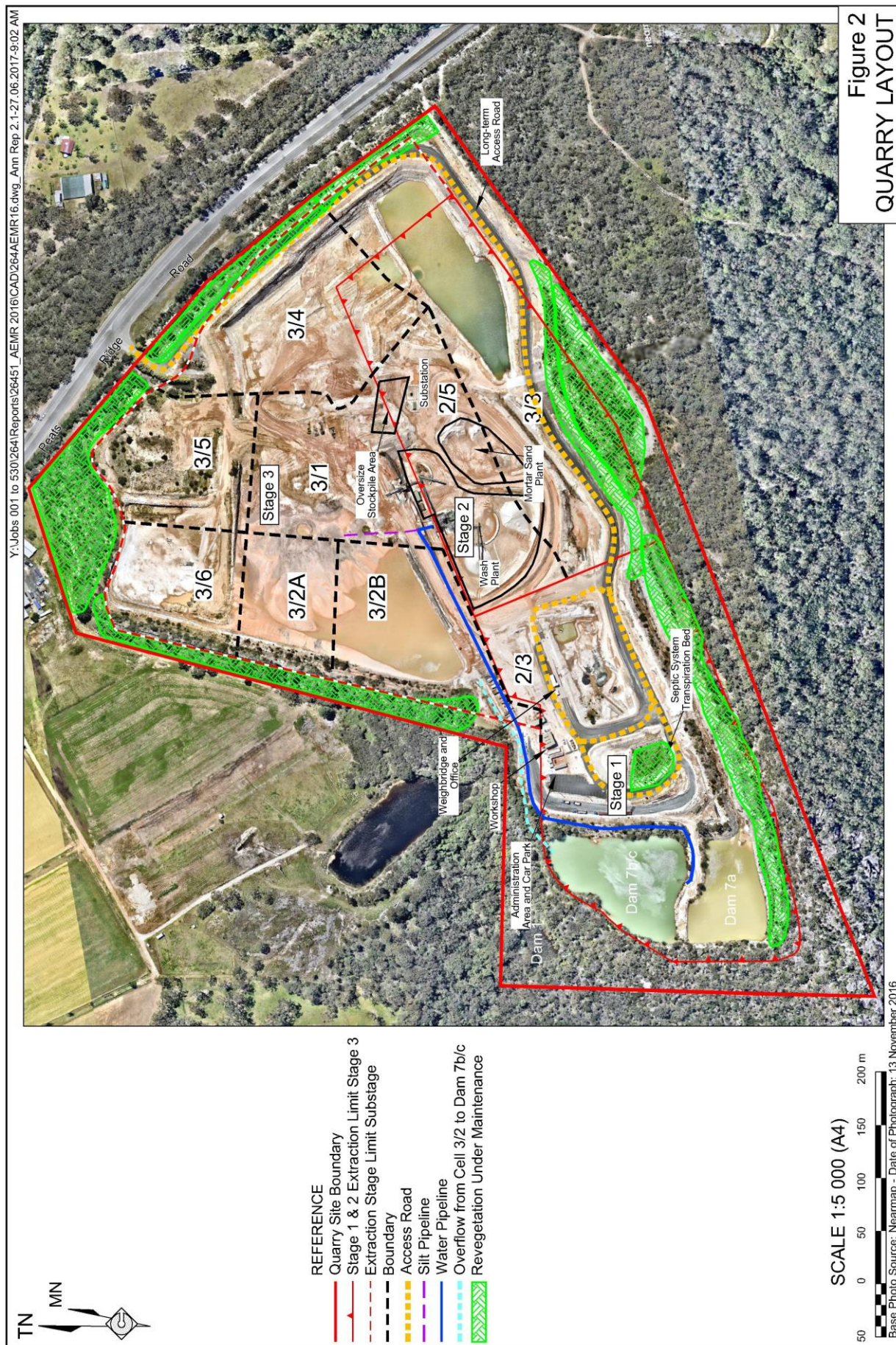
Condition 3(7A)

The Proponent shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:

- a) *be prepared in consultation with EPA,*
- b) *be submitted to the Secretary prior to operating the crushing system, unless otherwise agreed by the Secretary.*
- c) *describe measures that would be implemented to ensure:*
 - *compliance with the noise criteria in this consent;*
 - *best practice noise management is being employed; and*
 - *noise impacts of the development are minimised during meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 4);*
- d) *describe the proposed noise monitoring system; and*
- e) *include a monitoring program to be implemented to measure noise from the development against the noise criteria in Table 1, and which evaluates and reports on the effectiveness of the noise management system on site..*

The Plan describes the approach to the management of noise-related issues for operations within the Quarry. **Figure 2** displays the existing layout including the boundary of Stage 3 extraction operations and designated sub-stages. A description of the approved activities within the Quarry that are the subject of the Plan is provided in Section 3.





2. OBJECTIVES AND PERFORMANCE OUTCOMES

This Plan describes strategies for minimising and managing noise emissions for the Quarry. The Plan forms part of the Environmental Management System for the operation of the Quarry and has been developed in accordance with the conditional requirements outlined in Section 5.

The objectives of the Plan are to ensure:

- noise management at the Quarry is continually improved;
- any noise-related triggers or meteorological alerts are investigated, and actions taken are recorded;
- there are no exceedances of the noise criterion; and
- no complaints are received from the community in relation to noise.

The key performance outcomes from the Plan are:

- compliance with all criteria relating to noise at the Calga Sand Quarry (see Section 5).
- implementation of all identified noise-related operation control measures (see Section 7).
- all identified monitoring is undertaken, documented and displayed in accordance with the Plan (see Section 8 and Section 12).
- complaints are handled and responded to in an appropriate manner (see Section 10).
- corrective and preventative measures are implemented, if required (see Section 9); and
- incidents are reported in an appropriate and timely manner (see Section 11).

3. APPROVED ACTIVITIES

The approved activities within the Quarry comprise the full range of activities described in the *Environmental Impact Statement* that accompanied the application for development consent for the Quarry (RWC, 2004) and the *Environmental Assessment Modification 1* (RWC, 2005) and *Environmental Assessment Modification 3* (RWC, 2016). It is noted that the former extraction stages (Stages 1 and 2) are now the location of the current processing area, administration buildings and related infrastructure. This location is at a substantially lower topography than the surrounding landscape.

The Stage 3 extraction area comprises six extraction stages (Stage 3/1 to Stage 3/6). Extraction has been completed in Stages 3/1, 3/2 and 3/3. The approved activities within the Quarry Site for which this Plan relates to includes ongoing extraction in Extraction Stages 3/4, 3/5 and 3/6 and the related processing, product stockpiling, silt management and product despatch.

Preparatory Activities

Extraction has commenced in Stage 3/4 and the necessary preparatory activities have been commenced for Stage 3/5. Overburden previously stockpiled on the surface of Stage 3/5 will be progressively relocated prior to extraction commencing in this stage. It is anticipated that the stockpiled overburden will be placed on Cell 3/1 (and potentially, Cell 3/2) to initiate progressive rehabilitation of these silt cells.

No vegetation clearing, or soil stripping is required for operations within Stage 3/4, 3/5 or 3/6.

Extraction of Friable Sandstone

The sandstone is cross-ripped, pushed into operational stockpiles and loaded into a haul truck for transportation to the wash plant. Where needed a mobile mortar sand plant is used at the Quarry with raw sandstone loaded directly into the hopper of the plant.

On-site Load and Haul Operations.

The ripped friable sandstone material is loaded into a haul truck by front-end loader or excavator. Up to four haul trucks are used on site to transport the friable sandstone to the processing area. The route travelled to the processing area by the haul trucks will vary depending on the prevailing stage of extraction. Transportation of friable sandstone to the processing area will occur solely on internal unsealed access roads.

Processing Operations

Processing of the friable sandstone and any imported materials is undertaken by either washing (wash plant) or dry screening (mobile mortar sand plant).

The wash plant currently comprises:

- a receival hopper;
- a primary jaw crusher to further break and reduce the size of the ripped sandstone;
- a vibrating screen where oversize material is removed;
- a final screen deck where the product is washed, and the clay/fine silt content removed;

- a set of cyclones for dewatering the sand products prior to stockpiling; and
- radial stackers.

The primary jaw crusher is the only addition to the existing processing arrangement. The washing operation also requires a water pump and pipeline for the delivery of the slurry containing silts to the active silt cell.

The mortar sand plant incorporates:

- a receival hopper;
- a vibrating screen (a Powerscreen), which is used to separate the oversize material from the sand product; and
- a mobile conveyor belt to distribute the screened sand to stockpiles.

Product Loading and Despatch

Road-registered trucks used for product transportation are loaded from stockpiles located adjacent to the wash plant. All trucks travel from the stockpile areas to the weighbridge and then via the internal sealed access road to the Quarry entrance.

Off-site Transportation of Products

The existing northern entrance off Peats Ridge Road will be retained and used in the current fashion during operations in Extraction Stages 3/4, 3/5 and 3/6. The northern entrance comprises a seagull-type intersection with a left turn deceleration lane provided for trucks entering the Quarry from the south (via the M1 Freeway) and an acceleration lane for trucks exiting the Quarry and heading towards the M1 Freeway to the south.

The internal sealed access road (**Figure 2**) will continue to be used principally by the road-registered trucks entering the Quarry and transporting products from the Quarry but also provide access to the administration buildings for all light vehicles.

Progressive revegetation and maintenance

Areas that are being progressively revegetated and/or maintained are displayed on **Figure 2**. Revegetation and maintenance activities involve weekly work within these areas undertaken by an experienced horticulturalist.

4. CONSULTATION

4.1 GOVERNMENT AGENCY CONSULTATION

DA 94-4-2004 requires that the Plan be prepared in consultation with the EPA. The EPA's standard policy is not to comment on management plans under preparation. **Appendix 1** reproduces the correspondence received from the EPA in this regard.

4.2 COMMUNITY CONSULTATION

Consultation with the local community has principally focused on discussions with landholders whose land is either currently being used or is proposed to be used as a location for noise monitoring.

5. LEGAL AND OTHER REQUIREMENTS

5.1 DEVELOPMENT CONSENT DA 94-4-2004 CONDITIONS

A third modification to DA 94-4-2004 was granted by the NSW Planning Assessment Commission (PAC) on 13 June 2017, with *Condition 3(7A)* requiring the preparation of a Noise Management Plan. **Table 1** identifies all conditional requirements of DA 94-4-2004 that relate to noise management and the preparation and review of management plans. **Table 1** also identifies where in the Plan each individual requirement has been addressed.

Table 1
Relevant Conditional Requirements of DA 94-4-2004 within the Noise Management Plan

Page 1 of 4

Condition	Section																																		
Schedule 3																																			
<div>Noise Criteria</div> <div>2. The Applicant must ensure that the noise generated by the project does not exceed the criteria in Table 1 at any residence on privately-owned land.</div> <div>Table 1</div> <div>Noise impact assessment criteria dB(A) L_{Aeq} (15 min)</div> <table><tr><th rowspan="2">Receiver Location</th><th>Day</th><th>Evening</th><th>Night</th><th>Night</th></tr><tr><th>$L_{Aeq,15min}$</th><th>$L_{Aeq,15min}$</th><th>$L_{Aeq,15min}$</th><th>L_{A1} (1 min)</th></tr><tr><td>Residence 3 (CN-1) – Power</td><td>41</td><td>35</td><td>35</td><td>45</td></tr><tr><td>Residence 4 (CN-2) – King</td><td>40</td><td>35</td><td>35</td><td>45</td></tr><tr><td>Residence 5 (CN-3) – Kashouli</td><td>39</td><td>35</td><td>35</td><td>45</td></tr><tr><td>Residence 8 (CN-6) - Cauchi</td><td>36</td><td>35</td><td>35</td><td>45</td></tr><tr><td>All other privately-owned residences</td><td>35</td><td>35</td><td>35</td><td>45</td></tr></table> <div>Noise generated by the project is to be measured in accordance with the relevant requirements of the NSW <i>Industrial Noise Policy</i>. Appendix 6 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.</div> <div>However, these noise criteria do not apply if the Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.</div>	Receiver Location	Day	Evening	Night	Night	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$	L_{A1} (1 min)	Residence 3 (CN-1) – Power	41	35	35	45	Residence 4 (CN-2) – King	40	35	35	45	Residence 5 (CN-3) – Kashouli	39	35	35	45	Residence 8 (CN-6) - Cauchi	36	35	35	45	All other privately-owned residences	35	35	35	45	5
Receiver Location		Day	Evening	Night	Night																														
	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$	L_{A1} (1 min)																															
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Residence 8 (CN-6) - Cauchi	36	35	35	45																															
All other privately-owned residences	35	35	35	45																															
<div>Hours of Operation</div> <div>5. The Proponent must comply with the operating hours in Table 2.</div> <div>Table 2</div> <div>Operating Hours</div> <table><tr><th>Activity</th><th>Day</th><th>Time</th></tr><tr><td rowspan="3">Extraction and processing</td><td>Monday-Friday</td><td>7:00am to 6:00pm</td></tr><tr><td>Saturday</td><td>7:00am to 4:00pm</td></tr><tr><td>Sunday & Public Holidays</td><td>Nil</td></tr><tr><td rowspan="3">Delivery and distribution</td><td>Monday-Friday</td><td>5:00am to 10:00pm</td></tr><tr><td>Saturday</td><td>5:00am to 4:00pm</td></tr><tr><td>Sunday & Public Holidays</td><td>Nil</td></tr><tr><td>Maintenance (if inaudible at neighbouring residences)</td><td>Any day</td><td>Any time</td></tr></table> <div>Note: Construction activities, such as the construction of the acoustic barrier, must only be carried out between 7:00am to 6:00pm Monday to Friday, and 8:00am to 1:00pm on Saturdays. No construction activities are to be undertaken on Sundays or Public Holidays.</div>	Activity	Day	Time	Extraction and processing	Monday-Friday	7:00am to 6:00pm	Saturday	7:00am to 4:00pm	Sunday & Public Holidays	Nil	Delivery and distribution	Monday-Friday	5:00am to 10:00pm	Saturday	5:00am to 4:00pm	Sunday & Public Holidays	Nil	Maintenance (if inaudible at neighbouring residences)	Any day	Any time	7.2														
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Maintenance (if inaudible at neighbouring residences)	Any day	Any time																																	

Table 1 (Cont'd)
Relevant Conditional Requirements of DA 94-4-2004 within the Noise Management Plan

Page 2 of 4

Condition	Section
Schedule 3 (Cont'd)	
Hours of Operation (Cont'd)	
6. The following activities may be carried out at the premises outside the hours specified in Table 2: a) the delivery of materials as requested by Police or other authorities for safety reasons; and b) emergency work to avoid the loss of lives, property and/or to prevent environmental harm. In such circumstances the Applicant must notify EPA and affected residents prior to undertaking the works, or within a reasonable period in the case of emergency.	7.2
Operating Conditions	
7. The Applicant must:	
(a) implement best practice management to minimise the construction, operational and road transportation noise of the development;	7
(b) minimise the noise impacts of the development during meteorological conditions when the noise criteria in this consent do not apply (see Appendix 4);	7.3.1
(c) carry out noise monitoring (at least every 3 months or as otherwise agreed with the Secretary) to determine whether the development is complying with the relevant conditions of this consent; and	8
(d) regularly assess noise monitoring data and modify and/or stop operations on site to ensure compliance with the relevant conditions of this consent, to the satisfaction of the Secretary. <i>Note: Required frequency of noise monitoring may be reduced if approved by the Secretary.</i>	9.3
Noise Management Plan	This Plan
7A. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:	
(a) be prepared in consultation with the EPA;	4.1
(b) be submitted to the Secretary prior to operating the crushing system, unless otherwise agreed by the Secretary;	Noted
(c) describe the measures that would be implemented to ensure: • compliance with the noise criteria in this consent; • best practice noise management is being employed; and • noise impacts of the development are minimised during meteorological conditions under which the noise criteria in this consent do not apply (see Appendix 4);	7
(d) describe the proposed noise management system; and	9
(e) include a monitoring program to be implemented to measure noise from the development against the noise criteria in Table 1, and which evaluates and reports on the effectiveness of the noise management system on site.	8
The Applicant must implement the approved Noise Management Plan as approved from time to time by the Secretary.	
Schedule 4	
Notification of Landowners/Tenants	
1. If the results of monitoring required in schedule 3 identify that impacts generated by the development are greater than the relevant impact assessment criteria in schedule 3, then the Applicant must notify the Secretary and the affected landowners and/or existing or future tenants accordingly, and provide quarterly monitoring results to each of these parties until the results show that the development is complying with the criteria in schedule 3.	11.2

Table 1 (Cont'd)
Relevant Conditional Requirements of DA 94-4-2004 within the Noise Management Plan

Page 3 of 4

Condition	Section
Schedule 5	
Management Plan Requirements	
3. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
(a) detailed baseline data;	6
(b) a description of:	
– the relevant statutory requirements (including any relevant approval, licence or lease conditions);	5
– any relevant limits or performance measures/criteria; and	5
– 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;	5, 9
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	7
(d) a program to monitor and report on the:	8
– impacts and environmental performance of the development; and	
– effectiveness of any management measures (see (c) above);	
(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;	9.4
(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	14
(g) a protocol for managing and reporting any:	
– incidents;	11
– complaints;	10
– non-compliances with statutory requirements; and	11
– exceedances of the impact assessment criteria and/or performance criteria; and	9.4.2
(h) a protocol for periodic review of the plan.	14
Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	

Table 1 (Cont'd)

Relevant Conditional Requirements of DA 94-4-2004 within the Noise Management Plan

Page 4 of 4

Condition	Section
Schedule 5	
<p>Annual Review</p> <p>10. By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant must submit a report to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must:</p> <p>(a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;</p> <p>(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:</p> <ul style="list-style-type: none"> • relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • monitoring results of previous years; and • relevant predictions in the documents listed in condition 2(a) of Schedule 2; <p>(c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;</p> <p>(d) identify any trends in the monitoring data over the life of the development;</p> <p>(e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and</p> <p>(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the development.</p> <p>The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 7 of Schedule 5) and any interested person upon request.</p>	12

5.2 ENVIRONMENT PROTECTION LICENCE

The Quarry currently operates in accordance with Environment Protection Licence (EPL) 11295. **Table 2** identifies conditions that relate to noise management and where in the Plan individual requirements have been addressed. It is anticipated that EPL 11295 will be updated following approval of Modification 2 for DA 94-4-2004 with noise limits to be consistent with those in Condition 2 of Schedule 3 of DA 94-4-2004.

Table 2
Coverage of Environment Protection Licence 11295 within the Noise Management Plan

Page 1 of 2

Condition	Section																														
<div>L2 Noise Limits</div> <div>L2.1 Noise from premises must not exceed the following limits at the locations and times specified. Where L_{Aeq} means the equivalent continuous noise level – the level of noise equivalent to the energy-average of noise levels over a measurement period.</div> <table><tr><th>Location</th><th>Noise Limit ($L_{Aeq,15min}$)</th><th>Noise Limit ($L_{Aeq,15min}$)</th><th>Noise Limit ($L_{Aeq,15min}$)</th><th>Noise Limit ($L_{A1,1min}$)</th></tr><tr><td>(As shown on Figure 4.5 of the EIS for the Calga Sand Quarry Extension dated May 2004)</td><td>Day (7am-6pm)</td><td>Evening (6pm-10pm)</td><td>Night (10pm-7am)</td><td>Night (10pm-7am)</td></tr><tr><td>Residence 3 (CN-1)</td><td>41</td><td>35</td><td>35</td><td>45</td></tr><tr><td>Residence 4 (CN-2)</td><td>40</td><td>35</td><td>35</td><td>45</td></tr><tr><td>Residence 5 (CN-3)</td><td>39</td><td>35</td><td>35</td><td>45</td></tr><tr><td>All other residences</td><td>35</td><td>35</td><td>35</td><td>45</td></tr></table> <div>L2.2 Noise from the premises is to be measured or computed at the most noise-affected point at the boundary of the most affected receiver to determine compliance with this condition.</div> <div>Noise Measurement</div> <div>For the purpose of noise measures required for this condition, the L_{Aeq} noise level must be measured or computed for the required period (i.e. 15 minutes or full day, evening or night) using “FAST” response on the sound level meter.</div> <div>For the purpose of the noise limits for this condition, 5 dB(A) must be added to the measured level if the noise is substantially tonal, impulsive, intermittent or low frequency in nature. Where two or more of these characteristics are present, the maximum addition to the measured noise level is limited to 10 dB(A).</div>	Location	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{A1,1min}$)	(As shown on Figure 4.5 of the EIS for the Calga Sand Quarry Extension dated May 2004)	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)	Night (10pm-7am)	Residence 3 (CN-1)	41	35	35	45	Residence 4 (CN-2)	40	35	35	45	Residence 5 (CN-3)	39	35	35	45	All other residences	35	35	35	45	5.3
Location	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{Aeq,15min}$)	Noise Limit ($L_{A1,1min}$)																											
(As shown on Figure 4.5 of the EIS for the Calga Sand Quarry Extension dated May 2004)	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)	Night (10pm-7am)																											
Residence 3 (CN-1)	41	35	35	45																											
Residence 4 (CN-2)	40	35	35	45																											
Residence 5 (CN-3)	39	35	35	45																											
All other residences	35	35	35	45																											
<div>L2.3 The noise emission limits identified in this licence apply under meteorological conditions of:</div> <div>a) wind speeds (at 10m height) greater than 3m/s; and</div> <div>b) temperature inversion conditions of up to 3°C per 100m and wind speed up to 2m per second at 10m above ground level.</div>	5.3																														
<div>L3 Hours of Operation</div> <div>L3.1 Activities at the premises must not be undertaken on the days and at the times in the following table.</div> <table><tr><th>Activity</th><th>Day</th><th>Time</th></tr><tr><td>Extraction and Processing</td><td>Monday-Friday</td><td>7:00am to 6:00pm</td></tr><tr><td>Extraction and Processing</td><td>Saturday</td><td>7:00am to 6:00pm</td></tr><tr><td>Extraction and Processing</td><td>Sunday & Public Holidays</td><td>Nil</td></tr><tr><td>Delivery and Distribution</td><td>Monday-Friday</td><td>7:00am to 6:00pm</td></tr><tr><td>Delivery and Distribution</td><td>Saturday</td><td>7:00am to 6:00pm</td></tr><tr><td>Delivery and Distribution</td><td>Sunday</td><td>Nil</td></tr><tr><td>Maintenance (if inaudible at neighbouring residences)</td><td>Any day</td><td>Any time</td></tr></table> <div>L3.2 This condition does not apply to the delivery of material outside the hours of operation permitted by Condition L7.1, if that delivery is required by Police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification must be provided to the EPA and affected residents as soon as possible or within a reasonable period in the case of emergency</div>	Activity	Day	Time	Extraction and Processing	Monday-Friday	7:00am to 6:00pm	Extraction and Processing	Saturday	7:00am to 6:00pm	Extraction and Processing	Sunday & Public Holidays	Nil	Delivery and Distribution	Monday-Friday	7:00am to 6:00pm	Delivery and Distribution	Saturday	7:00am to 6:00pm	Delivery and Distribution	Sunday	Nil	Maintenance (if inaudible at neighbouring residences)	Any day	Any time	7.2						
Activity	Day	Time																													
Extraction and Processing	Monday-Friday	7:00am to 6:00pm																													
Extraction and Processing	Saturday	7:00am to 6:00pm																													
Extraction and Processing	Sunday & Public Holidays	Nil																													
Delivery and Distribution	Monday-Friday	7:00am to 6:00pm																													
Delivery and Distribution	Saturday	7:00am to 6:00pm																													
Delivery and Distribution	Sunday	Nil																													
Maintenance (if inaudible at neighbouring residences)	Any day	Any time																													

Table 2 (Cont'd)
Coverage of Environment Protection Licence 11295 within the Noise Management Plan

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Condition	Section
<p>M1 Monitoring records</p> <p>M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.</p> <p>M1.2 All records required to be kept by this licence must be:</p> <ul style="list-style-type: none"> a) in a legible form or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them. <p>M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:</p> <ul style="list-style-type: none"> a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample. 	12
<p>M2 Recording of pollution complaints</p> <p>M2.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.</p> <p>M2.2 The record must include details of the following:</p> <ul style="list-style-type: none"> a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a not to that effect; d) the nature of the complaint. e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken. <p>M2.3 The record of a complaint must be kept for at least 4 years after the complaint was made.</p> <p>M2.4 The record must be produced to any authorised officer of the EPAQ who asks to see them.</p>	11
<p>R1 Annual return documents</p> <p>R1.1 The licensee must complete and supply to the EPA, an Annual Return in the approved form comprising:</p> <ul style="list-style-type: none"> a) a Statement of Compliance; and b) a Monitoring and Complaints Summary. <p>At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.</p>	12

5.3 ASSESSMENT CRITERIA

Based on the conditional requirements of DA 94-4-2004 and EPL 11295, the assessment criteria to be applied for the evaluation of noise-related environmental performance and compliance are provided in **Table 3**.

Table 3
Noise Assessment Criteria (dB(A))

Location	Noise Limit (L _{Aeq,15min})	Noise Limit (L _{Aeq,15min})	Noise Limit (L _{Aeq,15min})	Noise Limit (L _{A1,1min})
	Day (7am-6pm)	Evening (6pm-10pm)	Night (10pm-7am)	Night (10pm-7am)
Residence 3 (CN-1) – Power	41	35	35	45
Residence 4 (CN-2) – King	40	35	35	45
Residence 5 (CN-3) – Kashouli	39	35	35	45
Residence 8 (CN-6) – Cauchi	36	35	35	45
All other residences	35	35	35	45

In accordance with *Condition 3(2)* and as described in *Appendix 4* of DA 94-4-2004, the noise criteria in **Table 3** are to apply under all meteorological conditions except the following:

- wind speeds greater than 3 m/s at 10 m above ground level; or
- temperature inversion conditions between 1.5°C and 3°C/100m and wind speed greater than 2 m/s at 10 m above ground level; or
- temperature inversion conditions greater than 3°C/100m.

In addition, the noise criteria in **Table 3** will not apply if Hanson has an agreement with the relevant landowner to exceed the noise criteria, and has advised the Department in writing of the terms of this agreement.

6. EXISTING ENVIRONMENT AND POTENTIAL/PREDICTED NOISE-RELATED IMPACTS

6.1 SURROUNDING RESIDENCES

Figure 3 shows the location of residences surrounding the Quarry. Some of the owners/tenants of these residences have requested that no monitoring be undertaken at their properties.

6.2 AMBIENT (BACKGROUND) NOISE CONDITIONS

Background noise levels in the Calga area are dominated by traffic noise generated by traffic travelling on Peats Ridge Road and the M1 Freeway. Other non-quarry related noise sources include agricultural activities, birds, wind in trees etc. Measured background noise levels are provided in **Table 4** with noise levels typically varying from 35dB(A) to 38dB(A) at those residences within close proximity to Peats Ridge Road and is higher the closer the location is to the M1 Freeway.

Table 4
Predicted Operational (Daytime) Noise Levels (dB(A))

Noise Monitoring Location (Figure 2.2)	Current Noise Limits ¹ (L _{Aeq,15min})	Rating Background Levels (L _{Aeq,15min})	Predicted Noise Level (L _{Aeq,15min}) Attributable to the Quarry Operations
Residence 3 (CN-1) – Power	41	36 ²	41
Residence 4 (CN-2) – King	40	35 ²	40
Residence 5 (CN-3) – Kashouli	39	36 ²	39
Residence 6 (CN-4) – Townsend	35	35 ²	35
Residence 8 (CN-6) – Cauchi	36	38 ³	36
Residence 9 (CN-7) – White	35	38 ³	35
Residence 20 (CN-8) – O'Bryan	35	43 ³	<35
Residence 13 (CN-9) – Barnard	35	38 ⁴	<35
Notes 1 – Established in DA 94-4-2004 and EPL 11295. 2 – Rating background levels at these locations were established in Wilkinson Murray (2004). 3 – Rating background levels at these locations were recorded in Wilkinson Murray (2009). 4 – The rating background level at Residence 13 was established by Wilkinson Murray (2010) and Renzo Tonin (2013). The Renzo Tonin (2013) estimate is included as it is the more conservative estimate at this location.			
Source: Predicted noise levels from Table 1 of Wilkinson Murray (2015)			

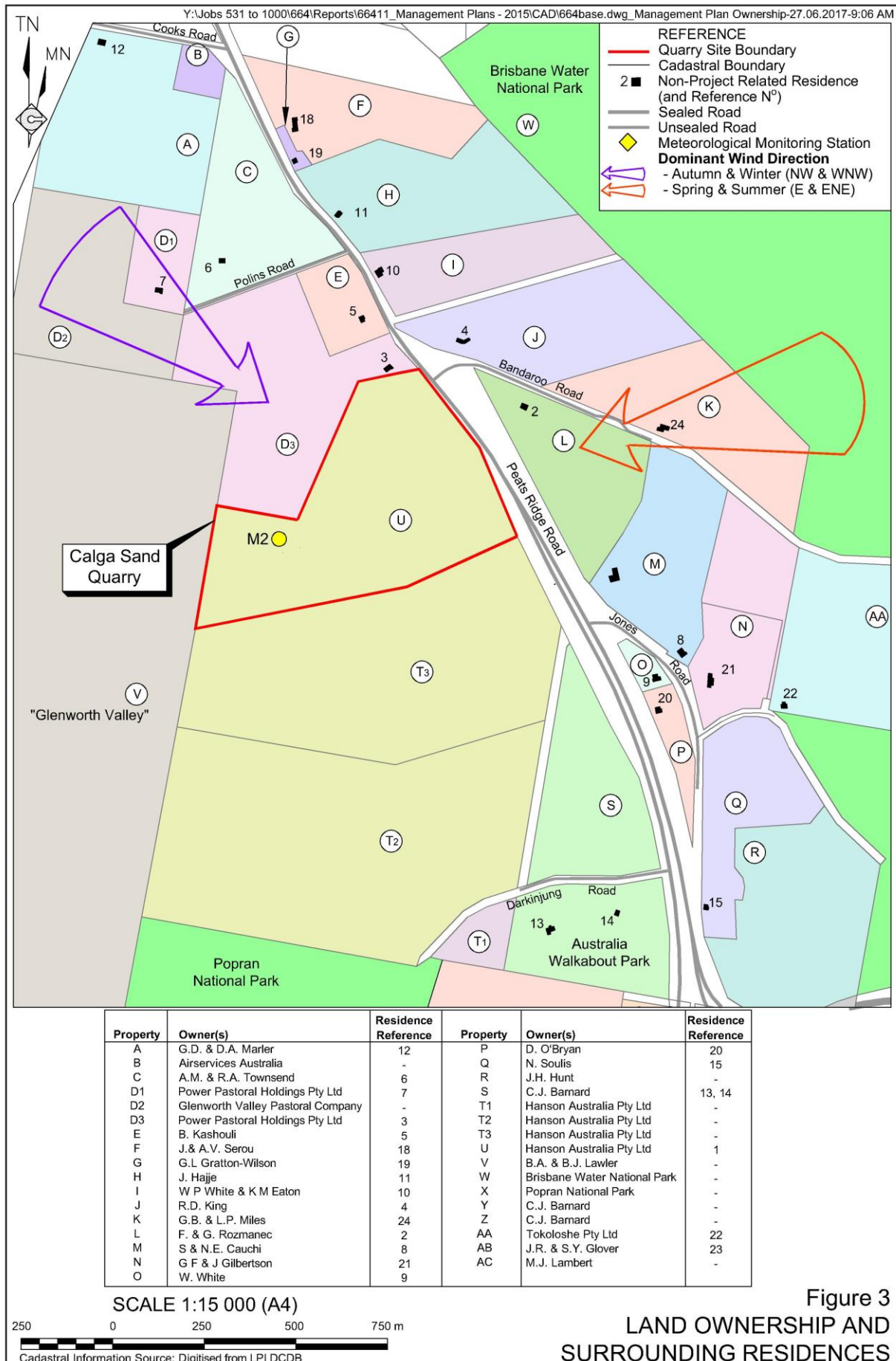


Figure 3
LAND OWNERSHIP AND
SURROUNDING RESIDENCES

6.3 NOISE-RELATED IMPACTS

6.3.1 Quarry Noise to Neighbours

Noise propagating beyond the Quarry Site boundary is influenced by wind speed and direction. Predicted noise levels are based on certain parameters recommended by the EPA, however at times noise levels may be higher as a result of meteorological conditions. Section 7.3.1 deals with the process of minimising noise impacts under these conditions.

The noise levels provided in **Table 4** have been predicted in relation to Stage 3 activities addressed in this Plan where levels are predicted to be higher than 35dB(A).

The predicted noise levels comply with the relevant criteria at all the identified receivers.

6.3.2 Traffic Noise

Peats Ridge Road is a major arterial road which links the M1 Freeway at Calga with Wisemans Ferry Road and George Downes Drive at Peats Ridge and Central Mangrove. The Calga Interchange on the M1 Freeway is located approximately 1.0km southeast of the Quarry and provides access to the M1 Freeway from Peats Ridge Road for northbound traffic towards Gosford and Newcastle or southbound traffic towards Sydney. Peats Ridge Road merges from a 4 lane divided road into a 2 to 3 lane rural road at the Calga Interchange. The speed limit at the Calga Interchange is 60km/h and 80km/h.

Traffic counts undertaken between 7 and 13 December 2006 recorded two way traffic on Peats Ridge Road south of the Quarry of 2 408 vehicles per day (vpd) (TUP, 2008). A total of 814 heavy vehicles represented 33.8% of total traffic on this section of Peats Ridge Road on an average weekday and heavy vehicles from the Calga Sand Quarry accounted for, on average, 5.7% of the heavy vehicle traffic (TUP, 2008). Heavy vehicle volumes associated with the Calga Quarry are therefore considered to be a small proportion of total traffic.

Recommendations within Section 7.4 are made to minimise noise impacts as trucks arrive and leave the Quarry.

7. NOISE-RELATED CONTROL MEASURES

7.1 INTRODUCTION

In modern quarries, many traditional noise control measures would now be considered as normal practice. This section deals with site-specific measures to control noise.

7.2 OPERATING HOURS AND CONDITIONS

In line with the operating hours provided in DA 24-4-2004 and reproduced in **Table 5**, the following general hours of operation will continue to be adopted on site.

Table 5
Operating Hours

Activity	Day	Time
Extraction and processing*	Monday-Friday	7:00am to 6:00pm
	Saturday	7:00am to 4:00pm
	Sunday & Public Holidays	Nil
Delivery and distribution	Monday-Friday	5:00am to 10:00pm
	Saturday	5:00am to 4:00pm
	Sunday & Public Holidays	Nil
Maintenance (if inaudible at neighbouring residences)	Any day	Any time
* Note: Construction activities, such as the construction of the acoustic barrier, must only be carried out between 7:00am to 6:00pm Monday to Friday, and 8:00am to 1:00pm on Saturdays. No construction activities are to be undertaken on Sundays or Public Holidays.		

7.3 QUARRY OPERATIONAL CONTROLS MEASURES

7.3.1 Adverse Weather Conditions

Weekly and daily weather data is reviewed to plan operations. Alternative work areas have been established and used to reduce noise propagation when adverse weather conditions prevail for extended periods as identified in Section 9.2.2.

7.3.2 Quarry Excavation

Since residences are generally located in an arc to the north and east of the quarry, the preferred method of extraction within each stage is to commence in the south and progress in a northerly direction behind a working face and benches. However, all benches need to be limited in height to maintain safe operations at all times.

7.3.3 Equipment Maintenance / Contractors Equipment

All equipment will be well maintained to ensure noise levels do not exceed the specified limits over time. In this regard, Quarry personnel will undertake comparative sound level measurements in accordance with Section 8.2 if they perceive an increase in noise, or alternatively repair equipment.

All equipment used by subcontractors or obtained on short term hire for more than 5 days will be supplied with a test certificate to demonstrate it also complies with the specified limit.

Any equipment on site during an attended quarterly monitoring period that hasn't been tested as part of the annual test, will be tested to confirm it complies with specified limits.

7.3.4 Truck Engine Brakes

Signs at the entrance to the Quarry and also at the top of the decline will remind drivers to avoid the use of engine brakes except in an emergency. In this regard, a reminder to select a low gear prior to descent is preferred.

7.3.5 Reversing Alarms

The product stockpile area is laid out in terms of stockpiles to allow forward movements only by delivery trucks. Any plant which operates on site is required to have a modern Squawker alarm rather than a tonal beep alarm. Subcontractors with plant likely to be used on site more than 5 days per year will also need to have a squawker style alarm.

Supply and delivery trucks are only required to have squawk style alarms if used on site prior to 7:00am or after 6:00pm.

7.3.6 Equipment Maintenance

Unless equipment is immobile, all maintenance work will typically be conducted in the workshop area.

7.4 TRANSPORTATION OPERATIONS CONTROL MEASURES

All drivers who visit the site on a regular basis will be required to undertake a specific site induction dealing with truck noise on the nearby roads requiring them to drive quietly on approaching and leaving the site, including the need to use engine brakes when slowing.

Signs will be placed at the exit to the site to remind all drivers to leave in a quiet manner.

Any drivers who visit the site in vehicles considered by site personnel to be excessively noisy or who drive in an unacceptable manner will be refused future entry.

8. NOISE MONITORING PROGRAM

8.1 INTRODUCTION

Regular noise monitoring at surrounding residences is required under DA 24-4-2004. In addition, sound level measurements on site are also necessary to confirm the equipment is operating at noise levels at or below the noise levels used for assessment. All measurements required under the license will be conducted using Class 1 Sound level meters, with a current NATA certificate, which should be field calibrated before and after use.

8.2 ON-SITE TESTING OF EQUIPMENT

This should be undertaken annually for all plant by a suitably qualified practitioner, in conjunction with one of the quarterly visits, and at the first quarterly visits after any new equipment has been introduced to site.

On site personnel can use an alternative Sound Level Meter to compare results during the annual test and use this as a basis for intervening testing if equipment is considered to be generating higher noise levels. If differences greater than 3dB are found, then this item of equipment will also be checked during the next quarterly visit.

8.2.1 Measurement Methods and Results

Measurements should be undertaken at a known distance (typically 7-30m) where a clear signal to noise ratio for the equipment in question can be obtained. This should include the loudest direction from the plant and any other directions deemed necessary. Any reflections of noise in the measurements should be noted.

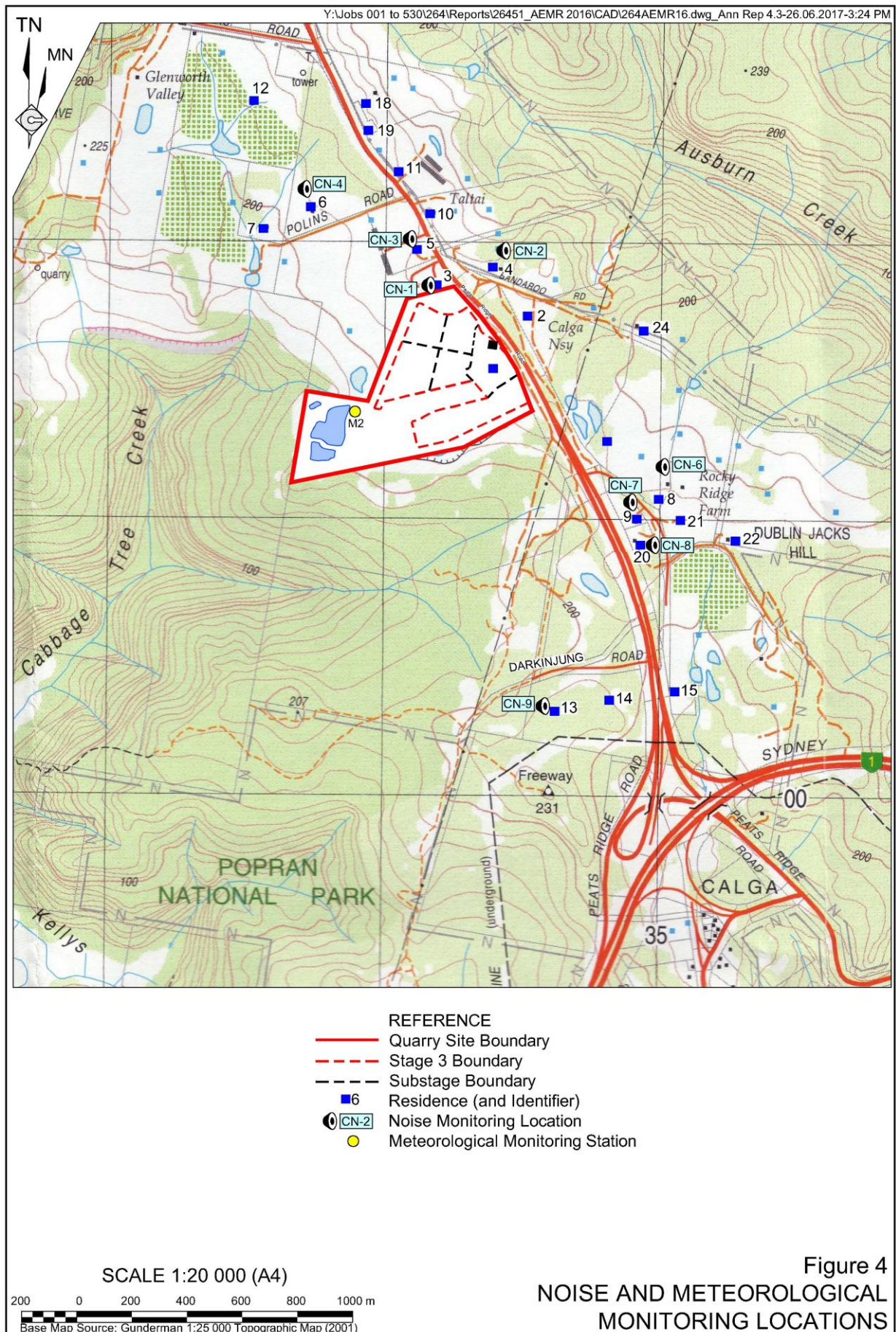
Calculation of Sound Power Level will be based on geometric spreading and adjustments for reflections.

8.3 OFF-SITE LOCATIONS

Attended monitoring by a suitable qualified practitioner will be undertaken quarterly in 15minute periods at a selection of the residential locations surrounding the Quarry (**Figure 4**).

The selection will include CN-1, CN-2, CN-6 and CN-9. Additional locations may be selected from those listed below based on wind direction on the day of the measurements (i.e. all locations in the downwind direction must be included in compliance assessment), areas where noise-generating activities are occurring within the Quarry and measurement outcomes (i.e. all locations in close proximity of exceedances will be included in compliance assessment).

- CN-3 Receiver 5: Kashouli Residence (30m south of the dwelling in the direction of the Site); and
- CN-4 Receiver 6: Townsend Residence (at the garden fence to the south of the dwelling).



- CN-7 Receiver 9: (at the most exposed point within 30m from the dwelling in the direction of the quarry)
- CN-8 Receiver 20: (at the most exposed point within 30m from the dwelling in the direction of the quarry)

8.4 METEOROLOGICAL MONITORING

Hanson will ensure that the meteorological station continues to operate in accordance with the guidelines outlined in *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (EPA, 2016).

The parameters to be measured are summarised in **Table 6**.

Table 6
Meteorological monitoring parameters and Frequency

Parameter	Units	Frequency	Averaging Period	Sampling Method
Rainfall	mm	Continuous	1-hour	AM-4
Temperature @ 2 m	°C		15 minute*	AM-4
Temperature @ 10 m	°C			AM-2 and AM-4
Wind Speed @10 m	m/s			AM-2 and AM-4
Wind Direction @ 10 m	Degrees			AM-2 and AM-4
Sigma Theta	Degrees			AM-2 and AM-4
Solar Radiation	W/m ²			AM-4
* Note: The meteorological station data logger will be configured to convert the wind speed and direction to an hourly average in order to provide SMS alerts in the event of an adverse meteorological condition				

During attended monitoring a small anemometer is used to confirm wind speed is suitable for noise measurements.

9. NOISE MANAGEMENT SYSTEM

9.1 INTRODUCTION

This section describes the system behind the plan. It is intended that noise management is proactive as indicated by the Plan but recognises there may need to be reactive noise management in response to complaints or regulator feedback.

9.2 PROACTIVE MANAGEMENT

9.2.1 Meteorological Forecasting

In the event of adverse weather conditions likely to prevail for extended periods of times, areas of the Quarry will be identified where works can be undertaken to minimise noise propagation towards residences. This will generally involve working at lower elevations.

9.2.2 Proactive Mitigation Measures

Preparatory measures that can be put in place for adverse weather include:

- Long-term (annual) scheduling of activities to limit noise generating activities during the seasonal or daily periods when noise enhancing conditions are most likely to occur.
- Short-term modification of noise generating activities in response to forecasting of noise-enhancing conditions in the short-term. Modifications could include the following.
 - Relocation of activities, e.g. extraction, to locations further from sensitive receivers or afforded better noise attenuation (by natural or constructed screening).
 - Modification (reduced intensity) of activities, e.g. reduction in the number of operating noise sources.
 - Modification to period over which activities are to occur, e.g. avoidance of early mornings and late evenings.
 - Postponement of activities until forecast provides for a cessation of noise enhancing conditions.

9.3 REACTIVE MANAGEMENT

9.3.1 Triggers

Two triggers for reactive management will be applied.

- a) Noise Complaint. Any complaint received, either directly or via Council, EPA or other regulatory agency, will trigger the implementation of the response and corrective action measures described in Section 10.

- b) Exceedance of noise criteria established through noise monitoring. Any record of noise exceeding the criteria in Section 5 will trigger the response and corrective action measures described in Section 9.4.2.

9.4 RESPONSE AND CORRECTIVE ACTIONS

9.4.1 Noise-Related Complaint

Complaint response and handling protocols are described in Section 10.

9.4.2 Noise Monitoring

In the event that noise monitoring identifies an exceedance of the noise criteria identified in Section 5, the exceedance will be investigated to determine the likely cause(s). An investigation will then follow to determine:

- what immediate action(s) need to be taken to fix the problem in the short term, if applicable;
- the root causes of the problem (e.g. management system, equipment design / performance, human factors/behaviour, work environment or training);
- corrective actions required to eliminate the root cause(s);
- action(s) taken to verify effectiveness of corrective action(s) (i.e. what measures and checks are taken to ensure the corrective actions that are in place are effective to prevent any further exceedance); and
- on completion of the investigation, an electronic copy will be forwarded to Development Manager for review/approval of corrective and preventative actions.

10. COMPLAINTS HANDLING AND RESPONSE

Noise-related complaints may be received via one of the following methods.

- Directly via an email, telephone call or text message.
- Indirectly via the relevant government agencies.

It remains Hanson's preference that all complaints are directed to the Quarry Manager (or his nominee) rather than via a government agency. This direct contact has proven effective in the past as the cause of the complaint can be quickly identified and the solutions adopted.

All complaints are referred to the Quarry Manager (or his nominee), thoroughly investigated and documented in the Quarry *Complaints Register* with the following information recorded.

- Date of the complaint

- Time of the complaint
- Name of complainant (if available).
- How the complaint was received.
- Detailed description of the complaint.
- Person who received the complaint.

Once the Quarry Manager is satisfied that the complaint is substantiated, an investigation of the location, sources and causes of the complaint will be undertaken. Following investigation of the issue, the Quarry Manager will provide feedback to the complainant that details the investigations undertaken, the results of the investigation and measures implemented to ensure that operations remain compliant. A description of any follow-up investigations and the response provided to the complainant will also be recorded in the *Complaints Register* upon satisfactory closure of the issue.

All complaints received are summarised in the *Annual Review*, which is made publicly available via the Hanson website. Complaints are also summarised in the *Annual Return* document to the EPA.

11. INCIDENT MANAGEMENT

11.1 INCIDENT IDENTIFICATION

DA 24-4-2004 defines an incident as “*a 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 accordance with the definition provided by Section 147 of the POEO Act, harm to the environment is deemed to be material if:

- i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial; or
- ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations).

As it relates to this Plan, an incident is not trivial where the emissions could impact human health or where specific clean-up actions are required.

For the purposes of identifying an incident and to guide management and notification actions, Hanson has separated incidents into two categories; notifiable or non-compliance incidents. An incident that causes or threatens to cause material harm to the environment is referred to as a *Notifiable Incident*. An incident that is only related to an exceedance of noise criterion without any impacts upon human health or material harm, is referred to as a *Non-Compliance Incident*.

11.2 INCIDENT MANAGEMENT AND NOTIFICATION

On identification of a notifiable incident, non-compliance incident, or where the action is in response to a complaint related to nuisance emissions an investigation into the source of the incident or complaint causing emissions will be commenced in accordance with the Quarry's *Pollution Incident Response Management Plan*.

DPE and the EPA will be notified as soon as practically possible following any notifiable incident or non-compliance incident.

In accordance with Condition 4(1) of DA 24-4-2004, Hanson will notify affected landowners in writing of any exceedance of assessment criteria (non-compliance incident). Hanson will continue to provide monitoring results to affected landowners until compliance is established.

On identification of the source of emissions resulting in or contributing to the incident, the Quarry Manager, will implement one or more of the corrective measures identified in the Noise Management System (see Section 9).

Following implementation and review of the corrective measures, the investigation process and results will be documented. If the investigation is the result of a complaint, feedback will be provided to the complainant in accordance with the process described in Section 10.

11.3 INCIDENT REPORTING

In accordance with Condition 8 of Schedule 5 of DA 94-4-2004, within 7 days of any incident, Hanson will prepare a report describing the incident and summarising the results if investigations or corrective actions implemented in accordance with the Quarry's *Pollution Incident Response Management Plan* or the Noise Management System (see Section 9).

A summary of all incidents, including dates of occurrence, corrective measures taken, and their success will be compiled and reported in the *Annual Review* to the DPE and *Annual Return* to the EPA.

12. PUBLICATION OF MONITORING INFORMATION AND REPORTING

Hanson will include all noise monitoring results within the appendices to the *Annual Review*. That document, once approved by the relevant government agencies, will be published on the Company's website.

In accordance with the requirements of Section 66(6) of the *Protection of the Environment Operations Act 1997*, the *Requirements for Publishing Pollution Monitoring Data*" (NSW EPA, 2012), and the *Wed-based Reporting Guideline* (DPE, 2015), Hanson will publish a meaningful summary of all pollution monitoring data on the Hanson website within 14 days of the monitoring results being received. In addition, Hanson will provide a copy of obtained data (the value of each individual monitoring sample) at no cost to any member of the public, when requested. The data will be published in a format that summarises raw data, is comprehensible by the general public and also includes all accompanying necessary information.

The following documents will also be available on the Hanson website in accordance with the *Web-based Reporting Guideline* (DPE, 2015).

- All statutory environmental, planning and cultural heritage approvals.
- Hanson's environmental management strategy documents relevant to the Calga Quarry.
- Compliance related documents including independent audits, *Annual Review* documents and a register of any incidents notified to DPE.
- The community complaints register (updated monthly).
- Minutes of the Community Consultative Committee meetings.

13. PERSONNEL MANAGEMENT

13.1 ROLES AND RESPONSIBILITY

Table 7 outlines the roles and responsibilities of personnel with reference to management of noise.

Table 7
Roles and Responsibilities of Personnel with Respect to Management of Noise

Role	Responsibilities
Development Manager	<p>Ensure compliance with the Noise Management Plan</p> <p>Ensure adequate resources are available to implement the Noise Management Plan.</p> <p>Ensure suitably trained personnel are available to implement the responsibilities of the Quarry Manager during any time of the Quarry Manager's absence from site.</p> <p>Coordinate the review of the Plan (see Section 14).</p>
Quarry Manager, or his/her nominee	<p>Ensure the implementation of the Noise Management Plan.</p> <p>Ensure noise monitoring results are regularly reviewed/evaluated and entered into the environmental database.</p> <p>Ensure reviews of meteorological forecasts are undertaken on a daily basis prior to the commencement of operations.</p> <p>Implementation of the Noise Management System (see Section 9).</p> <p>Relocate or postpone relevant activities in the event of adverse winds, where practical.</p> <p>Provide primary contact for complaints and supply follow-up information to any complainant.</p> <p>Initiate investigations of complaints as received from the public or government agency.</p> <p>Prepare a report to government agencies or neighbours following a notifiable incident (see Section 11).</p> <p>Inform the Development Manager of identified causes of elevated noise and any alterations to site operations that may or has influenced the noise environment.</p> <p>Ensure employees are competent through training and awareness programs.</p>
All On-site Personnel	<p>Operate in a manner that minimises risks of incidents to themselves, fellow workers or the surrounding environment.</p> <p>Fully implement the relevant control measures within the Noise Management Plan.</p> <p>Report any anomalous noise or extraordinary events to the Quarry Manager.</p> <p>Follow any instructions provided by the Quarry Manager.</p>
All Truck Drivers	<p>Follow any instructions provided by any on-site personnel.</p> <p>Follow all requirements relating to management of noise within the Driver's Code of Conduct.</p>

13.2 COMPETENCE TRAINING AND AWARENESS

All personnel and contractors working at the Quarry undergo an induction. This induction includes information on the management of noise while working on site.

After completing the induction, workers will sign a statement of attendance and records of this are kept in the administration office.

Regular toolbox meetings are held to discuss whole-of-site production, management, safety and environmental issues. Matters relating to noise are raised during these meetings, when necessary.

14. PLAN REVIEW AND CONTINUAL IMPROVEMENT PROTOCOL

The Plan will be reviewed annually from the date of approval or (in accordance with Condition 5(4) of DA 24-4-2004) within three months of submission of an *Annual Review*, an incident report resulting from a notifiable incident, each independent environmental audit and any modification to DA 24-4-2004. This will ensure the adequacy of the Plan and allow for opportunities of adaptive management and continual improvement. This will include a review of monitored noise levels and updating of trigger levels, as necessary, as the Quarry development progresses. Each review will also evaluate the effectiveness of the overall noise monitoring program and whether it should be modified or scaled back.

Continuous improvement of this Plan will be achieved by the ongoing evaluation of the measured noise levels against relevant criteria for the purpose of identifying opportunities for improvement. The continuous improvement process will be designed to:

- identify areas of opportunity for improvement of environmental management and performance;
- determine the cause or causes of non-compliance by reviewing the trigger conditions against any observed events or complaints that may be received. Triggers and responses may be refined where lessons from experience and feedback from stakeholders can inform changes to the Plan;
- develop and implement a plan of corrective and preventative action to address any non-compliance;
- verify the effectiveness of the corrective and preventative actions;
- document any changes in procedures resulting from process improvement; and
- make comparisons with objectives and targets.

15. REFERENCES

Environmental Protection Authority (2000). *Industrial Noise Policy.*

Environmental Protection Authority (2011). *Road Noise Policy.*

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Wilkinson Murray (2004). *Calga Sand Quarry Extension – Noise Assessment – May 2004.*

Wilkinson Murray (2009). *Calga Sand Quarry Southern Extension Noise Assessment, Part 5 of the Specialist Consultant Studies Compendium.* Prepared by Wilkinson Murray Pty Ltd on behalf of Rocla Pty Ltd.

Wilkinson Murray (2010) – Investigation of Noise Complaint from Australia Walkabout Wildlife Park - Noise Monitoring 26 Feb - 5 Mar 2010.

Wilkinson Murray (2015). *Calga Sand Quarry - Stage 3 Noise Assessment with Wash Plant Crushing System – 2015.*

Appendix 1

Consultation

(Total No. of pages including blank pages = 2)



DOC17/427196, File No. EF16/5974

RW Corkery & Co Pty Limited
PO Box 239
BROOKLYN NSW 2083

Attention: Mr Nick Warren

nick@rwcorkery.com

Dear Mr Warren

HANSONS CALGA SAND QUARRY – ENVIRONMENT MANAGEMENT PLANS

I refer to your email dated 14 August 2017 and attached copies of the Calga Noise Management Plan and the Calga Air Quality Management Plan for Hanson's Calga Sand Quarry.

The Environment Protection Authority (EPA) encourages the preparation of strategies, programs and plans as useful tools for industry to ensure that it meets the environmental objectives specified in conditions of Environment Protection Licences. As a regulatory authority, the EPA does not review or comment on these plans.

If you require any further information or assistance regarding this matter, please do not hesitate to contact me on (02) 4908 6817.

Yours sincerely

A handwritten signature in black ink, appearing to read 'D Bell', followed by the date '17/8/17'.

DAVID BELL
Operations Officer - Hunter
Environment Protection Authority

Contact officer: DAVID BELL
(02) 4908 6817
hunter.region@epa.nsw.gov.au