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15 December 2017

Ms Melissa Anderson
Environmental Assessment Officer
NSW Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Dear Ms Anderson

RE: SSD-5145 MOD 1 Response to Submissions Letter Report

Set out below is Centennial Northern Coal Services' (Centennial) response to matters raised following public exhibition of the SSD-5145 Modification 1 Statement of Environmental Effects (SEE). A formal response to matters raised was requested by the Department of Planning and Environment (DP&E) in correspondence dated 29 November 2017.

Background

Centennial lodged an application and supporting SEE to modify State Significant Development (SSD) consent SSD-5145 pursuant to Section 96(1A) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The application is seeking approval to increase the number of employees based at the Cooranbong Entry Site (CES) and make administrative amendments to the operational noise criteria and air quality criteria.

The application and supporting SEE were placed on public exhibition from 10 November 2017 to 24 November 2017. Three government agency submissions were received with DP&E identifying several areas where further assessment or additional information is required. No public submissions were received. **Attachment 1** summarises and responds to matters raised (Section 1) in addition to responding to the additional matters raised by DP&E (Section 2).

Modification Contact

I can be contacted on (02) 4935 8901 or via email iain.hornshaw@centennialcoal.com.au should DP&E have any queries regarding this Response to Submissions Letter Report.

Yours sincerely

Iain Hornshaw
Approvals Coordinator

Encl: Attachment 1 – Summary and Response to Submissions
Attachment 2 – Noise Monitoring Results Letter Report

Centennial Northern Coal Services Pty Limited ABN 47 125 670 288

Attachment 1 – Summary and Response to Submissions

1. Response to Submissions

1.1 Division of Resources and Geoscience

Submission matter: The Division advises the Department of Planning and Environment – Planning Services Division that the information provided in the SEE identifies that there will be no impact upon rehabilitation outcomes or resource sterilisation related to the Northern Coal Logistics Project. The Division has no objections or further requirements to be met in relation to the Project.

Response: Noted.

1.2 NSW Environment Protection Authority

Submission matter: This proposed modification appears to be inconsistent with the operational noise modelling in the Centennial Northern Coal Services Pty Limited – Northern Coal Logistics Project – Environmental Impact Statement, prepared by SLR Consulting Australia Pty Ltd, 2014. The modelling for the CES in Table 92 showed predicted level of less than 35 dB(A) across the day, evening and night time period for the receptors identified as 22, 23, 26, 28 and 32.

Response: Centennial is seeking consistency between the Secretary's Environmental Assessment Report and the noise criteria listed under Condition 2 of Schedule 3 of SSD-5145. As outlined in the Statement of Environmental Effects (SEE), this is an administrative change designed to rectify a consenting error. No physical changes are proposed to noise generating activities.

As part of the Environmental Impact Statement (EIS) which supported the original application for SSD-5145, Project Specific Noise Levels (PSNLs) were predicted for the sensitive receptors located in the vicinity of the CES in accordance with the procedures of the NSW Industrial Noise Policy which applied at the time. The PSNLs demonstrated that the CES would not exceed the Project Specific Noise Criteria (PSNC) at any receptor locations, as listed in Table 92 of the EIS.

The Secretary's Environmental Assessment Report reiterated that the development would comfortably meet the PSNC at sensitive receptors listed in the vicinity of the CES. DP&E recommended noise impact assessment criteria of 37 dB(A) across the day, evening and night time periods for receptors 22, 23, 26, 28 and 32. This recommendation was based on the information provided in the EIS, the various government agency and public submissions received, the response to submissions (RTS) and agency responses to the RTS. This included various correspondences from the EPA. Unless disputed (and we are unaware of any such dispute), the recommended conditions of consent as set out in the Secretary's Environmental Assessment Report should be reflected in the development consent for SSD-5145. The inconsistency between Table 9 in the Secretary's Environmental Assessment Report and SSD-5145 is a consent drafting error and this validates the proposed administrative amendment to 37 dB(A).

Submission matter: The EPA does not typically set ambient air quality limits, criteria or standards for industrial premises. In the EPA's view, ambient air quality limits are not enforceable, which is why they are not included in Environment Protection Licences (EPL). The EPA focuses its regulatory efforts on controlling emissions at the source. For mines, which generate fugitive dust emissions, this is consistent with Section 128(2) of the Protection of the Environment Operations Act (1997), which requires that all practicable means are taken to prevent and minimise air pollution. The EPA reflects this legislative requirement in its standard EPL conditions, requiring that activities occurring at the licenced

premises be undertaken in a manner that prevents or minimises dust. The EPA therefore has no comment on the proposed amendment.

Response: Noted.

Submission matter: The proponent has noted that the proposed modification to increase the number of employees at the CES from 14 to 60 will create additional light vehicle traffic movements on the local road network, due to increased employee numbers commuting to and from the CES. Any change in noise impacts appear to have not been assessed and therefore the EPA cannot comment on this aspect of the proposal.

Response: In responding to this matter, we refer to the consultative nature of the SEE assessment scoping process and noise generating carrying capacity of the road network.

As outlined in Sections 1 and 5.1 of the SEE, Centennial wrote to the DP&E on 5 October 2017 providing an overview of the proposed modification and seeking confirmation of the proposed approval pathway and assessment scope. Given the additional traffic associated with the increased number of employees, Centennial proposed to undertake a Traffic Impact Assessment (TIA). DP&E in their response dated 17 October 2017 confirmed that a TIA was necessary whilst noting that a noise impact assessment was not required.

As further outlined in Section 5.1 of the SEE, Centennial also wrote to the EPA and Lake Macquarie City Council (LMCC) on 23 October 2017 to provide an overview of the proposed modification and assessment scope. No response was received from the EPA or LMCC.

Centennial holds that a noise impact assessment is not warranted due to the following:

- Receptors 22, 23, 26, 28 and 32 exist along Gradwells Road. From the TIA, Gradwells Road has a carrying capacity of 920 vehicle trips per hour. The incorporation of the additional employee traffic (48) to the existing traffic and predicted 2027 mid-block two way traffic volumes indicate that traffic volumes will remain well below the capacity of the local road network. In 2017 this is estimated to be 102 and in 2027 this is estimated to be 108. Given the low traffic volumes when contrasted against the significantly higher carrying capacity, road traffic noise impacts are considered negligible.

- Gradwells Road exists under the care and management LMCC. LMCC have not made a submission in regards to this modification concerning road or community noise matters.

- As outlined in Section 5.2 of the SEE, Centennial wrote to receptors 22, 23, 26, 28 and 32 on 24 October 2017 outlining the proposed modification. No responses have been received from these receptors and no public submissions were made following exhibition of the SEE.

- The Mandalong Mine CCC, which is independently chaired and comprises representatives from LMCC and the local community, incorporates matters in relation to the CES. Centennial presented the proposed modification to the CCC on 24 October 2017. While there was general discussion regarding the proposed modification, including all three elements detailed in the SEE, the CCC did not raise any issues or objections.

- As outlined in Section 6.2.3 of the SEE and following ongoing consultation with landowners along Gradwells Road, Centennial has committed to the following mitigation measures:

- Employee and contractor inductions for the CES will be updated to include road safety along Gradwells Road.

- An audit of road signs and line markings along Gradwells Road will be undertaken to ensure they are adequate in accordance with relevant standards and, if necessary, representations will be made to LMCC (as the road authority).

- Centennial will continue to liaise with landowners along Gradwells Road in addition to the Mandalong CCC to address any matters should they arise.

1.3 Office of Environment and Heritage

Submission matter: OEH has reviewed the Statement of Environmental Effects prepared for this modification. The modification does not change the impacts of this project on Aboriginal cultural history, flood risk and flood plain management, or biodiversity. Therefore, OEH has no comments on this proposed modification and has no additional recommended conditions for the modification.

Response: Noted.

2. Additional DP&E Matters

2.1 Scope

DP&E matter: Please clarify that the overall number of employees for the project will not increase. Please specify that the increased number of employees based at the Cooranbong Entry Site (CES) is due to a re-allocation of approved employee numbers as alluded to in Section 3.1 of the SEE.

Response: As outlined in Section 3.1 of the SEE, Centennial is seeking an increase to the number of approved full time equivalent (FTE) employees based at the CES from 14 to 60.

Section 4.6 of the original EIS stated that the Project's operational employment requirements would be 120 FTE personnel of which 106 will be based at the Newstan Colliery Surface Site and 14 at the CES. As the modification is seeking to only increase the number of staff at the CES, the Newstan Colliery Surface Site will remain unchanged.

Section 3.1 of the SEE outlines that the increase to approved FTE employees is predominantly due to staff overcrowding at Centennial's Fassifern Office. Employees at Centennial's Fassifern Office do not form part of the Northern Coal Logistics Project and are therefore not included in current approved employee numbers under SSD-5145. Despite being a transfer of employees between Centennial business units, the increase from 14 to 60 does change the total number of employees approved under SSD-5145. The total number of employees will increase from 120 to 166.

2.2 Noise Impacts

DP&E matter: The Department is seeking submission of the past three years of noise monitoring data conducted within the vicinity of the CES, and details of all recorded noise complaints received from the community within the vicinity of the CES over the last three years.

Response: The noise data requested appears in Attachment 2 of this report.

DP&E matter: EPA has suggested the proposed noise limits appear to be inconsistent with the operational noise modelling in Noise Impact Assessment (NIA) contained within the Environmental Impact Assessment for the project.

Response: Please refer to Section 1.2 of this report.

2.3 Agency and Public Submissions

DP&E matter: DPE requests that the RTS consider and respond carefully to all agency submissions received, including advice presented and recommendations made therein.

Response: Noted. This has been fulfilled above in Section 1.

DP&E matter: No public submissions were received.

Response: Noted.

Attachment 2 – Noise Monitoring Results Letter Report

15 December 2017

Iain Hornshaw
Approvals Coordinator
Centennial Coal Company Limited
100 Miller Road
FASSIFERN NSW 2283

Our ref: 2219106-62075
Your ref:

Dear Iain

Annual Compliance Noise Monitoring Results 2015 to 2017

1 Introduction

GHD Pty Ltd (GHD) has been engaged by Centennial Mandalong Pty Ltd (Centennial) to compile the operational noise compliance monitoring data associated with the Cooranbong Entry Site. The request to provide all noise monitoring data was made by the Department of Planning and Environment as part of the Response to Submissions regarding SSD-5145 Mod 1.

1.1 Purpose of this report

The purpose of this report is to present the results and findings of the operational noise compliance monitoring data conducted over the previous three years (2015, 2016 and 2017) associated with the Cooranbong Entry Site.

1.2 Limitations

This report has been prepared by GHD for Centennial Mandalong Pty Ltd and may only be used and relied on by Centennial Mandalong Pty Ltd for the purpose agreed between GHD and Centennial Mandalong Pty Ltd as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Centennial Mandalong Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The noise monitoring data outlined in this report represent the findings apparent at the date and time of the conducted and the conditions of the area at the time. It is the nature of environmental assessments that all variations in environmental conditions cannot be accessed and all uncertainty concerning the conditions of the ambient noise environment cannot be eliminated. Professional judgement must be exercised in the investigation and interpretation of observations.

In conducting this assessment and preparing the report, current guidelines for noise were referred to. This work has been conducted in good faith with GHD's understanding of the client's brief and the generally accepted consulting practice noise criteria.

1.3 Development Consent SSD-5145

Development Consent SSD-5145 was approved in October 2015. Prior to the approval of SSD-5145 the Cooranbong Entry Site was approved under DA97/800. Table 1 of DA97/800 provides the noise impact assessment criteria which applied to the Cooranbong Entry Site prior to the approval of SSD-5145.

Development Consent SSD-5145 provides the current relevant noise criteria and is reproduced as follows:

Operational Noise Criteria

2. *Until the automated coal recovery and train loading system required by condition 8 of Schedule 2 is in use, the Applicant shall ensure that the operational noise generated by the development (including maintenance activities) does not exceed the criteria in Table 2 at any residence on privately-owned land.*

Table 2 Operational Noise Criteria

Receiver	*Noise Limit (dB(A))*				
	Morning Shoulder ($L_{Aeq(15min)}$)	*Day $L_{Aeq(15minute)}$*	*Morning Shoulder ($L_{Aeq(15min)}$)*	*Night $L_{Aeq(15minute)}$*	*Morning Shoulder ($L_{Aeq(15min)}$)*
NC2	*36*	*36*	*35*	*35*	*45*
NC3, Residences around NC6	*40*	*40*	*39*	*39*	*45*
22,23, 26,28, 32	*-*	*35*	*35*	*35*	*45*
All other residences on privately-owned land	*-*	*35*	*35*	*35*	*45*
			($L_{Aeq(1 hour)}$)		
NC6 (school),when in use	*-*	*45(external to school building)*	*-*	*-*	*-*

Notes to Table 2:

The receiver locations in Table 2 are shown in Figures 1 and 2 of Appendix 4.

Criteria for the Morning Shoulder period only applicable where these have been specifically developed for this period.

Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 3 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria in Table 2, and the Applicant has advised the Department in writing of the terms of this agreement.

3. *Once the automated coal recovery and train loading system required by condition 8 of schedule 2 is in use, and thereafter, the Applicant shall ensure that the operational noise generated by the development (including maintenance activities) does not exceed the criteria in Table 3 at any residence on privately-owned land.*

Table 3: Operational Noise Criteria

Receiver	Noise Limit (dB(A))				
	Morning Shoulder ($L_{Aeq(15min)}$)	Day ($L_{Aeq(15min)}$)	Evening ($L_{Aeq(15min)}$)	Night ($L_{Aeq(15min)}$)	Night ($L_{A1(1min)}$)
NC2	35	35	35	35	45
NC3, Residences around NC6	38	38	37	37	45
22,23, 26,28, 32	-	37	37	37	45
All other residences on privately-owned land	-	35	35	35	35
($L_{Aeq(1\ hour)}$)					
NC6 (school),when in use	-	45(external to school building)	-	-	-

Notes to Table 3:

The receiver locations in Table 3 are shown in Figures 1 and 2 of Appendix 4.

Criteria for the Morning Shoulder period only applicable where these have been specifically developed for this period

Noise generated by the development is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy. Appendix 3 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.

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

Operating Conditions

4 The Applicant shall:

(a) implement best management practice to minimise the construction, operational, road and rail noise of the development;

(b) operate an on-site noise management system that uses a combination of predictions, forecasting and real-time and attended noise monitoring of all noise associated with the development, to ensure compliance with the relevant conditions of this consent, including noise during construction and operations;

(c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 3); and

(d) regularly assess noise monitoring data to determine whether the development is complying with the relevant conditions of consent, to the satisfaction of the Secretary.

APPENDIX 3: NOISE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 2 of the conditions are to apply under all meteorological conditions except the following:

(a) Wind speeds greater than 3 m/s at 10 m above ground level; or

(b) Temperature inversion conditions between 1.5 ºC and 3ºC/100 m and wind speeds greater than 2 m/s at 10 m above ground level; or

(c) Temperature inversion conditions greater than 3ºC/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the NSW Industrial Noise Policy (as amended from time to time), in particular the requirements relating to:

(a) Monitoring locations for the collection of representative noise data;

(b) Meteorological conditions during which collection of noise data is not appropriate;

(c) Equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and

(d) Modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

1.4 Environment Protection Licence 365

Conditions of the Environment Protection Licence (EPL) 365 provide noise criteria for Mandalong Mine and are reproduced as follows:

L5 Noise limits

L5.1 The licensee must ensure that noise generated by the activities within the premises do not exceed the following criteria measured by dB(A) at any of the following locations or on more than 25% of any privately-owned land.

Location	*Day* $L_{Aeq\ (15\ minute)}$	*Evening* $L_{Aeq\ (15\ minute)}$	*Night* $L_{Aeq\ (15\ minute)}$	*Night* $L_{A1\ (1\ minute)}$
23 Gradwells Rd	*38*	*38*	*38*	*45*
26 Gradwells Rd	*37*	*37*	*37*	*45*
R1 (64) *R2 (82)* *R4 (109)*	*35*	*35*	*35*	*45*
R3 (97)	*37*	*37*	*37*	*45*
R5 (110)	*36*	*36*	*36*	*45*
R6 (86) (87)	*40*	*40*	*40*	*45*
R7 (85) (89)	*43*	*43*	*43*	*45*
R8 (72)	*43*	*43*	*43*	*45*
R9 (73)	*40*	*40*	*40*	*45*
R10 (66)	*41*	*41*	*42*	*45*
All other residences on privately-owned land	*35*	*35*	*35*	*45*

Note: *Locations '23 and 26 Gradwells Road' are defined in Figure 2 of the Noise Impact Assessment contained within the Mandalong Mine - Cooranbong Entry Site Environmental Assessment dated May 2012. Locations 'R1 to R10' are defined in the Mandalong Mine - Modification 4 to Development Consent Environment Assessment dated September 2008.*

The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above table.

L5.2 For the purpose of condition L5.1:

(a) Day is defined as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays;

(b) Evening is defined as the period 6 pm to 10 pm, and

(c) Night is defined as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.

It is relevant to note that the noise limits presented in condition 44 of the development consent are consistent with the noise limits in EPL 365.

L5.3 The noise limits set out in conditions L5.1 apply under all meteorological conditions except for any one of the following:

(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

(b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or

(c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:

(a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point W1.

(b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW industrial Noise Policy (EPA 2000)

Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.

L5.5 For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.

L5.6 To determine compliance:

1. With the LAeq(15 min) noise limits in condition L5.1, the licensee must locate noise monitoring equipment;

(a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more than 30 metres from the property boundary that is closest to the premises;

(b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable,

(c) within approximately 50 metres if the boundary of a national park or nature reserve.

2. With the LA1(1 minute) noise limits in condition L5.1, the noise monitoring equipment must be located within 1 metre of a dwelling facade.

3. With the noise limits in condition L5.1, the noise monitoring equipment must be located;

(a) at the most affected point at a location where there is no dwelling at the location, or

(b) at the most affected point within an area at a location prescribed by conditions L5.6 1(a) or L5.6 1(b).

L5.7 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measure;

- *at a location other than an area prescribed by conditions L5.6 1(a) and L5.6 1(b), and/or*
- *at a point other than the most affected point at a location.*

L5.8 *For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.*

M4.1 *To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.5 and L5.6, and*

(a) *at each one of the locations listed in condition L5.1;*

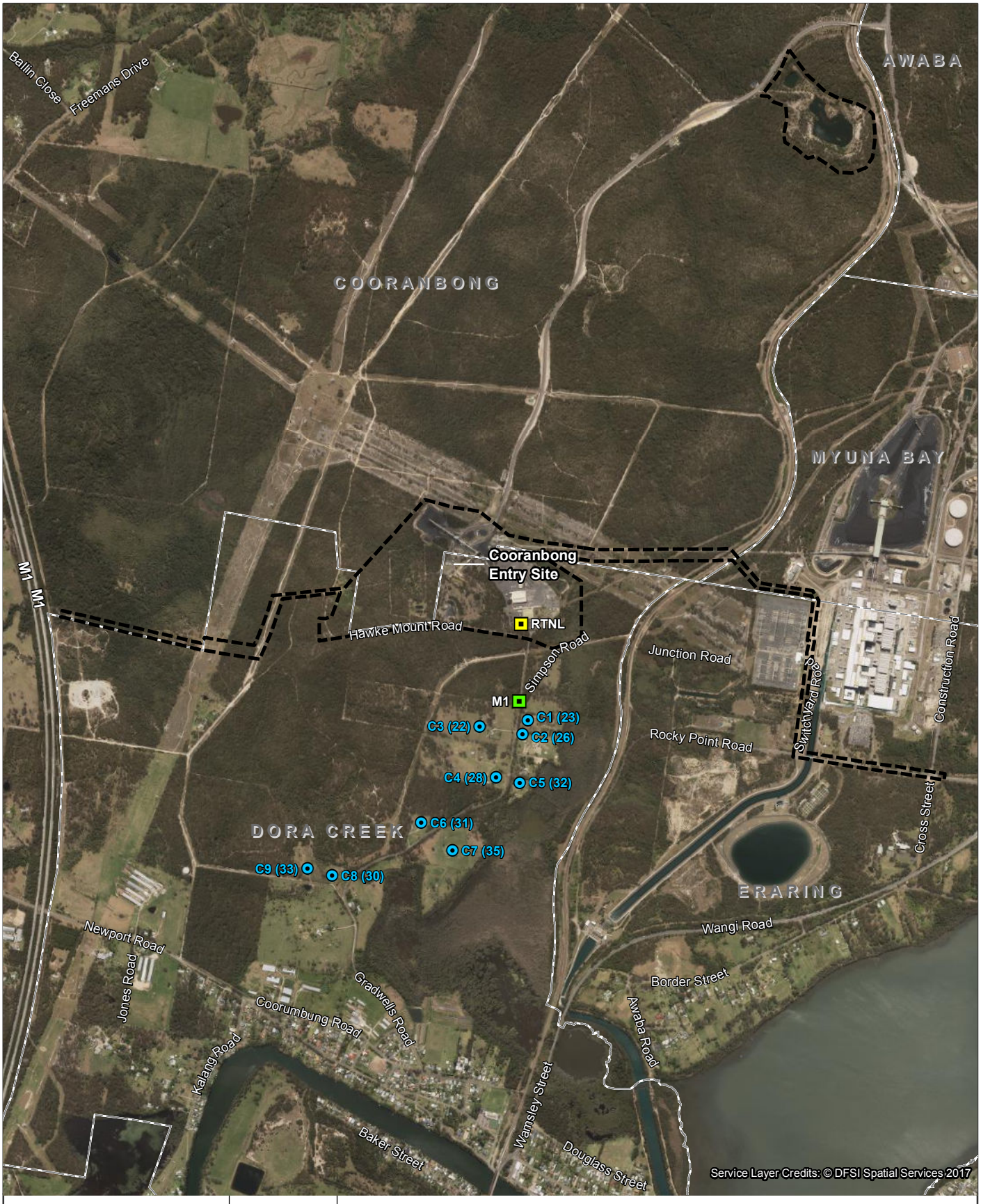
(b) *occur annually within the reporting period of the Environment Protection Licence;*

(c) *occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night, and*

(d) *occur for three (3) consecutive days.*

2 Monitoring locations

The Cooranbong Entry Site real-time noise monitor and operator attended noise monitoring location M1 are shown in Figure 2-1.



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0 105 210 420 630 840

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geodetic Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

N

LEGEND

- Site boundary
- Suburb
- Noise attended
- Noise unattended
- Sensitive receiver

LOCATION	-
DRAWN	T.M
CHECKED	A.R
APPROVED	
SCALE	refer to scalebar

Centennial Coal
Northern Region
Environmental Monitoring
Noise sensitive receivers
Cooranbong Entry Site

Centennial Coal

DATE 1/12/2017

Figure 2-1

GIS Filename: G:\22\18129\GIS\Maps\Deliverables\2219106\Noise\2219106_N002_SensiitiveReceivers_DDP_0.mxd

Data source: LPI: DTDB / DCDB / Aerial Imagery, 2012. Created by:tmorton

3 Real-time noise monitoring data

Centennial Mandalong has installed a real time noise monitoring system at The Cooranbong Entry Site to determine when noise emissions are approaching noise limits.

The real time noise monitoring system enables Centennial Mandalong to remotely interrogate current noise levels and access the historical monitoring data. The system is designed to send alerts when levels are recorded above a prescribed limit. Adaptive management can be implemented at the site to reduce noise generating activities.

The following sections present the monthly and yearly comparison of results for the previous three years (2015, 2016 and 2017).

3.1 Monthly ambient L_{A90} noise levels

The long-term monthly average L_{A90} noise levels collected from Cooranbong Entry Site real-time noise monitor is presented graphically in Figure 3-1 to Figure 3-6 for the daytime, evening and night-time periods.

Due to the constant nature of the noise sources in operation at Cooranbong Entry Site and the ambient noise environment at times being largely dominated by other noise sources (i.e. birds, insects, wind in trees, train passby etc.), the measured L_{A90} has been assumed to be the equivalent of the L_{Aeq} noise emission level.

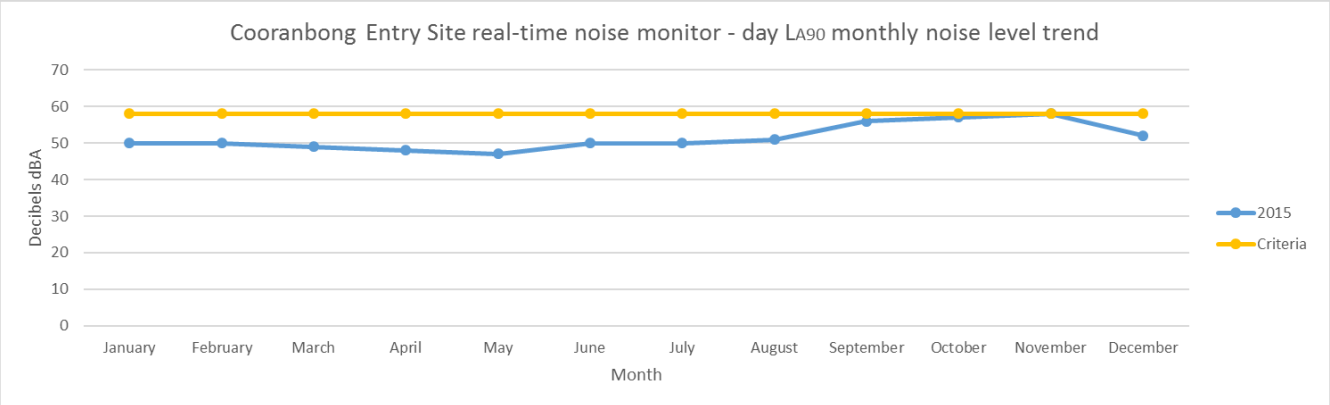

Figure 3-1 Long term daytime L_{A90} noise levels 2015

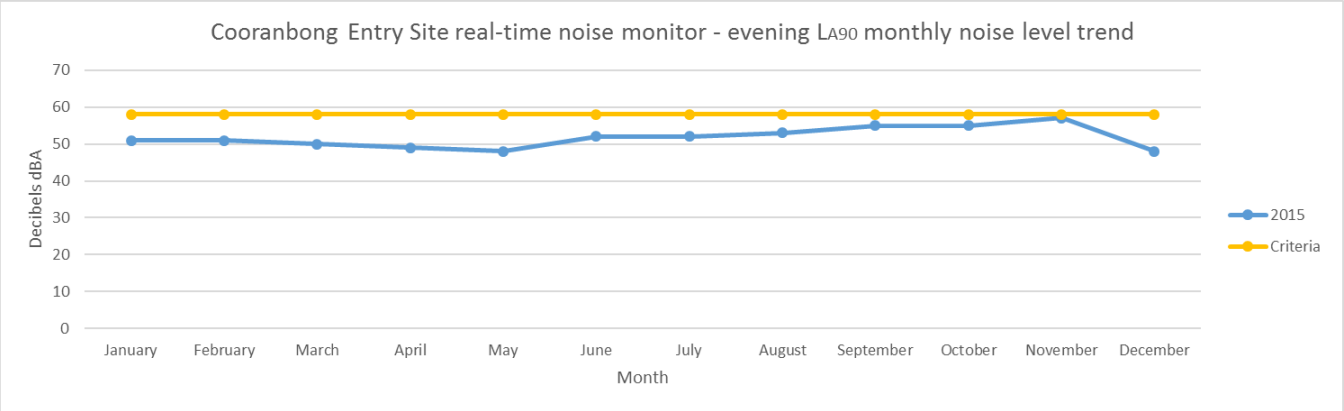

Figure 3-2 Long term evening L_{A90} noise Levels 2015

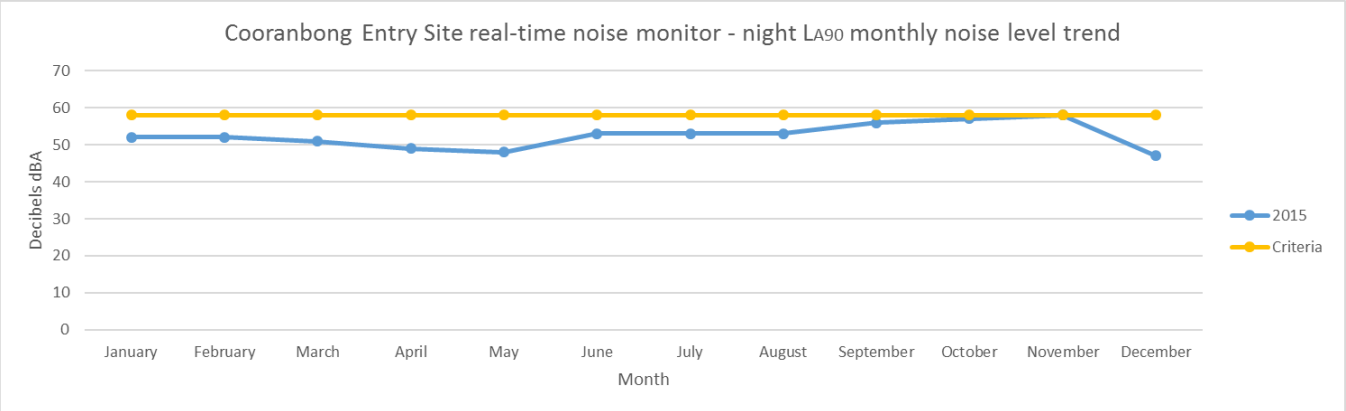

Figure 3-3 Long term night-time L_{A90} noise levels 2015

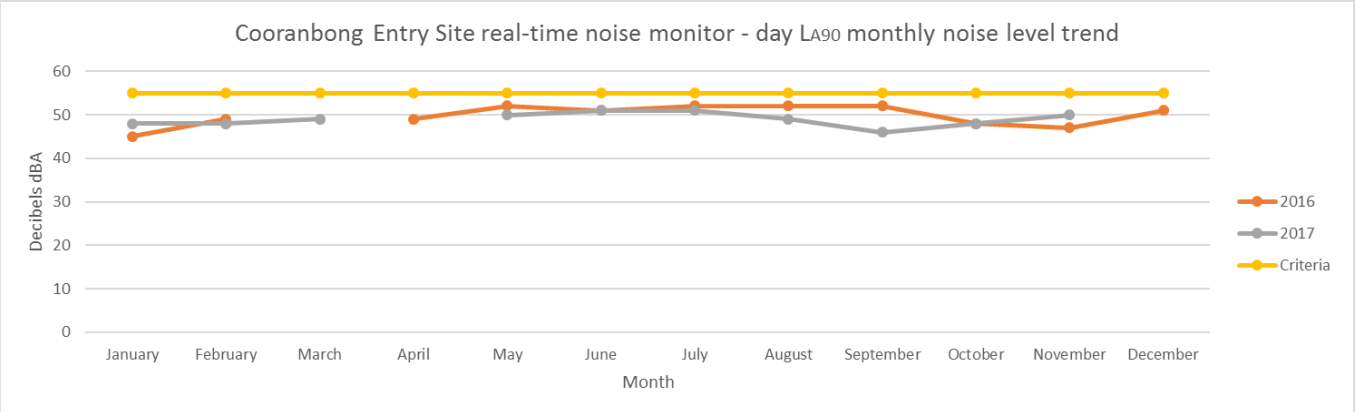

Figure 3-4 Long term daytime L_{A90} noise levels 2016- 2017

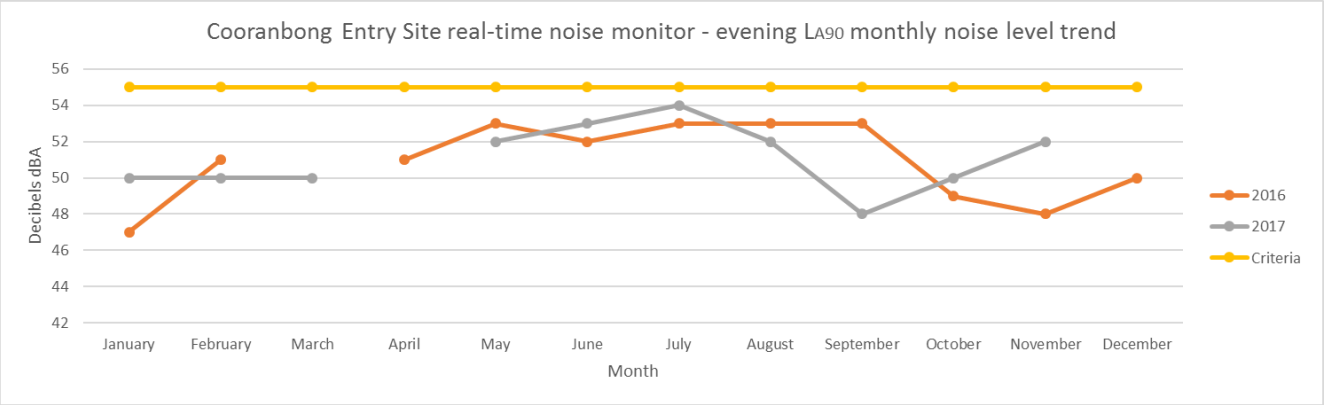

Figure 3-5 Long term evening L_{A90} noise Levels 2016- 2017

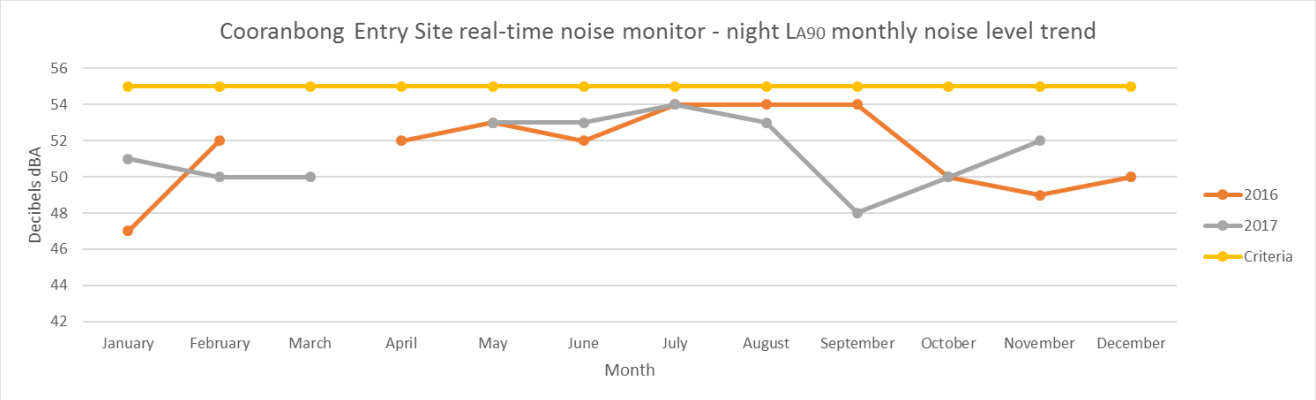

Figure 3-6 Long term night-time L_{A90} noise levels 2016- 2017

3.2 Yearly ambient L_{A90} noise levels

The long-term yearly average L_{A90} noise levels collected from Cooranbong Entry Site real-time noise monitor is presented graphically in Figure 3-7 for the daytime, evening and night-time periods.

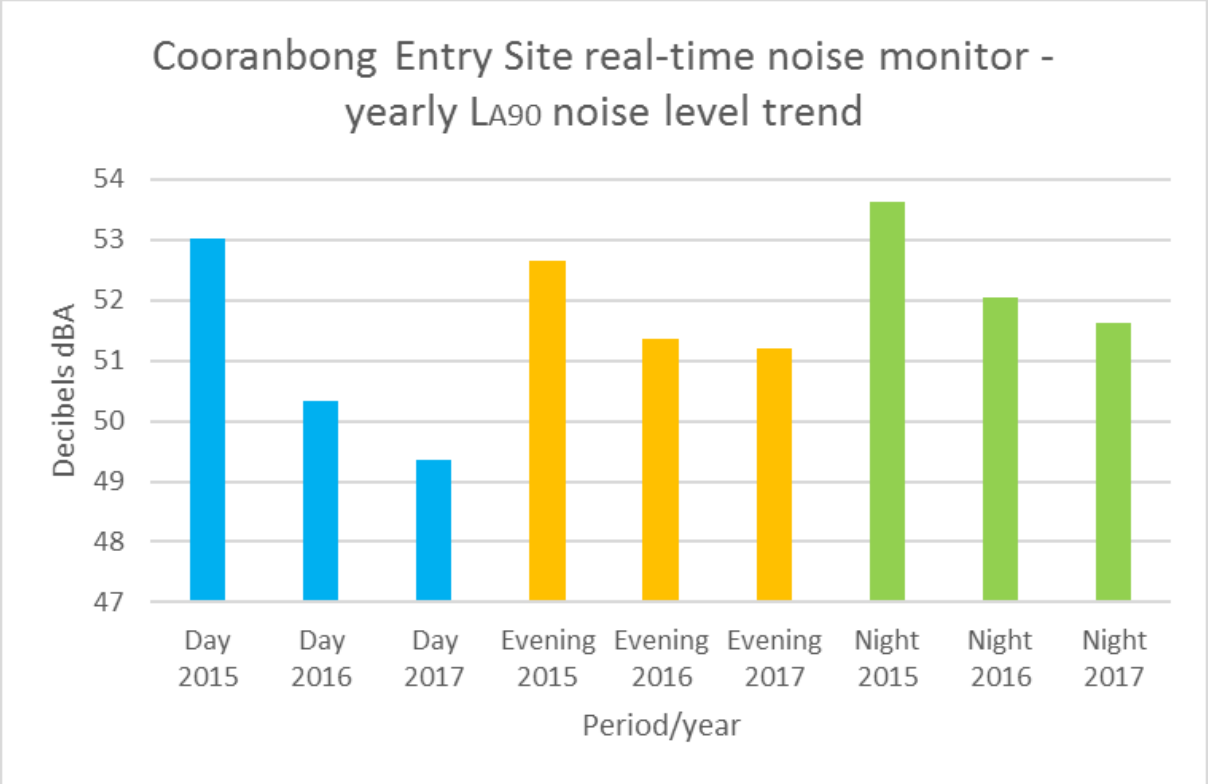

Figure 3-7 Long term yearly L_{A90} noise levels

3.3 Summary and discussion of real-time noise monitoring results

Monthly L_{A90} noise levels

2015

Based on onsite operator attended noise calibration measurements, if the measured L_{A90} noise level at the real-time noise monitor location exceeds 58 dBA, the noise level at the nearest potentially affected residential location would likely exceed the Development Consent 97/800 noise level of 38 dBA at receptor 23. A review of the measured L_{A90} noise levels show that the noise levels were below or equal to 58 dBA during the day, evening and night-time period throughout 2015.

2016-2017

Based on onsite operator attended noise calibration measurements, if the measured L_{A90} noise level at the real-time noise monitor location exceeds 55 dBA, the noise level at the nearest potentially affected residential location would likely exceed the Development Consent noise level of 35 dBA at receptor 23. A review of the measured L_{A90} noise levels show that the noise levels were below or equal to 55 dBA during the day, evening and night-time period throughout 2016 and 2017.

It is relevant to note that due to the close proximity of the real-time noise monitor to the Cooranbong Entry Site operations, the effects of noise-enhancing wind and temperature inversion conditions are negligible.

Yearly L_{A90} noise levels

The long term yearly average L_{A90} noise levels presented in Figure 3-7 shows that noise level at the Cooranbong Entry Site have been declining over the past three years. Centennial have implemented a number of acoustic mitigation measures over the previous years in order to reduce onsite noise impacts experienced at the nearest potentially affected residential receiver locations. These mitigation measures include additional acoustic cladding to the coal handling plant and rotary crusher buildings and installation of a noise wall for the haul trucks loading at the final production bin.

4 Annual operator attended noise compliance monitoring

Annual operator attended noise measurements at the Cooranbong Entry Site are conducted at the monitoring location M1 as identified in Figure 2-1.

The following sections provide the results of the annual operator attended noise measurements conducted at location M1 for the years 2015, 2016 and 2017.

The tables include all noise sources such as traffic, insects, birds, mine operations as well as any other industrial operations.

The tables provide the following information:

- Monitoring location
- Date and start time
- Wind velocity (m/s), temperature (ºC), relative humidity (%) and cloud cover at the measurement location
- Stability category
- Typical maximum (L_{Amax}) and contributed noise levels

4.1 Cooranbong Entry Site – 2015

Operator attended noise monitoring was not undertaken during 2015 to determine compliance with the noise impact assessment criteria that applied under DA97/800. Noise contributions were estimated from the Cooranbong Entry Site real-time noise monitor during 2015 and were found to be compliant with the DA97/800 noise criterion.

4.2 Cooranbong Entry Site – 2016

The results of the 2016 operator attended noise measurements are given in Table 4-1 to Table 4-3.

Table 4-1 Day time operator attended noise survey results - 2016

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
25/07/2016 14:47 W = 4.17 WNW Temp = 12.8°C Stability category A (Tristan Robertson) B&K 2250L S/N 3004635	M1 23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	1	77	55	51	46	51	Local traffic – 77 to 86 dBA Wind in trees – 48 to 64 dBA Cooranbong entry site – 45 to 47 dBA
			2	86	68	52	47	59	
			3	83	71	53	45	58	
			4	84	76	58	47	62	
			5	85	69	50	45	58	
			6	84	64	50	46	56	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 45 dBA						
7/10/2016 15:34 Wind = 2.9-3.6 m/s NW/NNW Temp = 29-30°C Stability category D			1	73	55	48	40	48	Local traffic – 69 to 79 Distant traffic 38 to 43 Residents music 40 to 41 Train to 55 Wind in trees – 40 to 53 Birdsong 43 to 57 Cooranbong entry site – 35 to 45
			2	59	49	46	41	44	
			3	74	53	46	42	48	
			4	69	54	46	41	46	
			5	67	52	45	41	44	
			6	79	62	48	41	50	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 37 dBA						

Note 1: Day is defined as the period from 7:00 am to 6:00 pm Monday to Saturday; or 8 am to 6 pm on Sundays and Public Holidays.

Table 4-2 Evening time operator attended noise survey results - 2016

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
26/07/2016 20:21 W = Calm Temp = 7.8°C Stability category G (Tristan Robertson) B&K 2250L S/N 3004635	M1 23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	1	57	55	52	47	50	Insects 49-55 constant Rail passby 54 to 66 Cooranbong entry site 45-46 dBA
			2	66	61	53	45	51	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 45 dBA						
6/10/2016 21:39 Wind = Calm Temp = 15°C Stability category G			1	69	50	43	40	44	Insects 33-37 Constant Local traffic to 69 Distant traffic 35 to 36 Train to 48 Cooranbong entry site 35- 42
			2	48	45	42	39	41	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 36 dBA						

Note 1: Evening is defined as the period from 6:00 pm to 10:00 pm.

Table 4-3 Night time operator attended noise survey results - 2016

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
28/07/2016 0:15 W = Calm Temp =5°C Stability category G (Tristan Robertson) B&K 2250L S/N 3004635	M1 23 Gradwells Rd L_{Aeq} 39 dBA L_{A1} 45 dBA 26 Gradwells Rd L_{Aeq} 37 dBA L_{A1} 45 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA L_{A1} 45 dBA 26 Gradwells Rd L_{Aeq} 35 dBA L_{A1} 45 dBA	1	70	67	64	55	61	Local road traffic 74 dBA Insect/frogs 47 to 52 (constant) dBA Dog barking 52 to 55 dBA Cooranbong entry Site 42 to 44 dBA
			2	73	68	65	53	61	
			3	73	69	64	52	61	
			4	69	66	62	50	59	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 42 dBA $L_{A1\ (1\ minute)}$ <44 dBA						
6/10/2016 22:12 Wind = Calm Temp = 13-14°C Stability category G			1	55	52	45	39	43	Local road traffic 70 Distant traffic to 34 Train 52 to 54 Insect/frogs 32 to 33 Dog barking 52 to 59 Cooranbong entry Site 37 to 48
			2	70	50	43	40	44	
			3	59	47	43	41	42	
			4	63	52	45	42	44	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 39 dBA $L_{A1\ (1\ minute)}$ 44 dBA						

Note 1: Night time is defined as the period between 10:00 pm to 7:00 am Monday to Saturday, or 7:00 am to 8:00 am on Sundays and Public Holidays

4.3 Cooranbong Entry Site – 2017

The results of the 2017 operator attended noise measurements are given in Table 4-4 to Table 4-6.

Table 4-4 Day time operator attended noise survey results - 2017

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
28/08/2017 12:08 W = 2.7-3.9 SSW, S Temp = 15-16˚C Stability category A, B, C (Tristan Robertson) SVAN 977 S/N 45751	M1 23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	1	78	58	54	46	53	Gradwells Road – 55 to 78 dBA Trees rustling – 45 to 63 dBA Birds – 51 to 64 dBA Aircraft flyover 57 to 60 dBA Train passby 51 to 63 dBA Dog barking 47 to 57 dBA Cooranbong Entry Site: Coal handling plant and rotary crusher – 32 to 33 dBA
			2	64	58	54	44	51	
			3	73	61	53	44	51	
			4	76	62	56	46	54	
			5	62	59	54	45	51	
			6	76	65	51	44	53	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 33 dBA						

Note 1: Day is defined as the period from 7:00 am to 6:00 pm Monday to Saturday; or 8 am to 6 pm on Sundays and Public Holidays.

Table 4-5 Evening time operator attended noise survey results - 2017

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
28/08/2017 20:29 W = Calm Temp = 6˚C Stability category G (Tristan Robertson) SVAN 977 S/N 45751	M1 23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	1	50	48	49	45	47	Gradwells Road – 85 dBA Distant Road traffic – 45 to 50 dBA Cooranbong entry site: Coal handling plant and rotary crusher – 40 to 43 dBA
			2	85	48	59	45	55	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 43 dBA						

Note 1: Evening is defined as the period from 6:00 pm to 10:00 pm.

Table 4-6 Night time operator attended noise survey results - 2017

Date/start time Weather (operator) SLM Details	Measurement location/relevant criteria $L_{Aeq(15minute)}$		Measurement number	Primary noise descriptor (dBA re 20 µPa)					Description of noise emission and typical maximum levels L_{Amax} (dBA)
	EPL 365	SSD-5145		L_{Amax}	L_{A1}	L_{A10}	L_{A90}	L_{Aeq}	
30/08/2017 22:00 W = Calm - 1.3 m/s NW, SE, SW, S Temp = 6-10˚C Stability category D, E, F, G (Tristan Robertson) SVAN 977 S/N 45751	M1 23 Gradwells Rd L_{Aeq} 39 dBA L_{A1} 45 dBA 26 Gradwells Rd L_{Aeq} 37 dBA L_{A1} 45 dBA	M1 23 Gradwells Rd L_{Aeq} 35 dBA L_{A1} 45 dBA 26 Gradwells Rd L_{Aeq} 35 dBA L_{A1} 45 dBA	1	53	44	46	41	42	Distant road traffic 38 to 41 dBA Insect/frogs 42 to 44 dBA (constant) Eraring power station 40 dBA (constant) Dog barking 52 to 53 dBA Train passby 49 to 62 dBA Cooranbong Entry Site: Coal handling plant and rotary crusher 33 dBA
			2	62	51	60	41	49	
			3	53	43	48	39	42	
			4	61	45	57	38	45	
			Cooranbong Entry Site $L_{Aeq\ (15\ minute)}$ 33 dBA $L_{A1\ (1\ minute)}$ 33 dBA						

Note 1: Night time is defined as the period between 10:00 pm to 7:00 am Monday to Saturday, or 7:00 am to 8:00 am on Sundays and Public Holidays

4.4 Summary and discussion of operator attended noise compliance results

4.4.1 Operational noise

A summary of the operational noise compliance results are presented in Table 4-7.

Table 4-7 Operator attended noise monitoring summary

Measurement location	Period	Measured noise level $L_{Aeq\ (15minute)}$	Relevant criteria $L_{Aeq(15minute)}$				Compliance
			EPL 365[2]	Condition L5.3 applicable?	SSD-5145[2]	Appendix 3 Applicable?	
2016							
M1	Day	45 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	Yes. Wind speeds greater than 3 m/s	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	Yes. Wind speeds greater than 3 m/s	Yes
		37 dBA		Yes. Wind speeds greater than 3 m/s		Yes. Wind speeds greater than 3 m/s	
	Evening	45 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	Yes. Stability category G temperature inversion conditions	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	Yes. Stability category G temperature inversion conditions	Yes
		36 dBA		Yes. Stability category G temperature inversion conditions		Yes. Stability category G temperature inversion conditions	
	Night	42 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	Yes. Stability category G temperature inversion conditions	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	Yes. Stability category G temperature inversion conditions	Yes

Measurement location	Period	Measured noise level $L_{Aeq\ (15minute)}$	Relevant criteria $L_{Aeq(15minute)}$				Compliance
			EPL 365[2]	Condition L5.3 applicable?	SSD-5145[2]	Appendix 3 Applicable?	
		39 dBA		Yes. Stability category G temperature inversion conditions		Yes. Stability category G temperature inversion conditions	
2017							
M1	Day	33 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	No.	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	No.	Yes
	Evening	43 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	Yes. Stability category G temperature inversion conditions	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	Yes. Stability category G temperature inversion conditions	Yes
	Night	33 dBA	23 Gradwells Rd L_{Aeq} 39 dBA 26 Gradwells Rd L_{Aeq} 37 dBA	Yes. Stability category F and G temperature inversion conditions	23 Gradwells Rd L_{Aeq} 35 dBA 26 Gradwells Rd L_{Aeq} 35 dBA	Yes. Stability category F and G temperature inversion conditions	Yes

Note 1: Day is defined as the period from 7:00 am to 6:00 pm Monday to Saturday; or 8:00 am to 6:00 pm on Sundays and Public Holidays. Evening is defined as the period from 6 pm to 10 pm. Night time is defined as 10:00 pm to 7:00 am; or 7:00 am to 8:00 am on Sundays and Public Holidays.

Note 2: *The noise limits apply under all meteorological conditions except for any one of the following:*

(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

(b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or

(c) Stability category G temperature inversion conditions.

2016 monitoring results

The operator attended operational noise monitoring results summary presented in Table 4-7 shows that the noise contributions from Cooranbong Entry Site exceeded all relevant noise criteria during 2016. However, it is relevant to note that the meteorological conditions during these times were either at times when the wind speed was greater than 3 m/s or during stability category F or G. As specified in condition L5.3, the noise limits do not apply under these conditions.

2017 monitoring results

The operator attended operational noise monitoring results summary presented in Table 4-7 shows that the noise contributions from Cooranbong Entry Site comply with all relevant noise criteria during all periods except the evening time period during 2017. However, it is relevant to note that the meteorological conditions during this time was either at times when the wind speed was greater than 3 m/s or during stability category F or G. As specified in condition L5.3, the noise limits do not apply under these conditions.

4.4.2 Sleep disturbance

A summary of the sleep disturbance noise compliance results are presented in Table 4-8.

Table 4-8 Sleep disturbance noise compliance results summary

Measurement location	Period[1]	Measured noise level $L_{A1\ (1\ minute)}$	Relevant criteria $L_{A1\ (1\ minute)}$		Compliance
			EPL 365[2]	SSD-5145	
2016					
M1	Night	<44	23 Gradwells Rd L_{A1} 45 dBA 26 Gradwells Rd L_{A1} 45 dBA	23 Gradwells Rd L_{A1} 45 dBA 26 Gradwells Rd L_{A1} 45 dBA	Yes
		44			Yes
2017					
M1	Night	33	23 Gradwells Rd L_{A1} 45 dBA 26 Gradwells Rd L_{A1} 45 dBA	23 Gradwells Rd L_{A1} 45 dBA 26 Gradwells Rd L_{A1} 45 dBA	Yes

Note 1: Day is defined as the period from 7:00 am to 6:00 pm Monday to Saturday; or 8:00 am to 6:00 pm on Sundays and Public Holidays. Evening is defined as the period from 6:00 pm to 10:00 pm. Night time is defined as 10:00 pm to 7:00 am; or 7:00 am to 8:00 am on Sundays and Public Holidays

Note 2: *The noise limits apply under all meteorological conditions except for any one of the following:*

(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or

(b) Stability category F temperature inversion conditions and wind speeds greater the 2 metres/second at 10 metres above ground level; or

(c) Stability category G temperature inversion conditions.

The operator attended sleep disturbance noise monitoring results summary presented in Table 4-8 shows that the noise contributions from the Cooranbong Entry Site complies with the EPL 365 and Development Consent SSD-5145 relevant sleep disturbance noise criteria at all monitoring locations.

5 Community complaints

5.1 2015 community complaints

Centennial Mandalong received no noise related complaints from the community during the period January 2015 to December 2015.

5.2 2016 community complaints

Centennial Mandalong received one noise related complaint from the community during the period January 2016 to December 2016, as described in Table 5-1.

Table 5-1 2016 Community complaint details

Mandalong complaint log number	Date complaint logged	Type of complaint	Comments
4/2016/ccapp1000316	15/7/2016 11:45 am	The complaint was made in relation to night-time noise from the Cooranbong Entry Site	The complaint can record the times of any loud noises at their property and can notify Centennial Mandalong. A check can then be undertaken to determine the source via the real-time noise logger at the Cooranbong Entry Site. Annual compliance monitoring was undertaken at the Cooranbong Entry Site in July/August 2016. Refer to Section 6.1 of the Annual Review for further details.

5.3 2016 community complaints

Centennial Mandalong received no noise related complaints from the community during the period January 2017 to December 2017.

6 References

- Mandalong Mine Annual Compliance Noise Monitoring August 2015, SLR, 9 September 2015
- Mandalong Mine Annual Compliance Noise Monitoring July 2016, SLR, 26 August 2016
- Mandalong Mine Annual Compliance Noise Monitoring - Addendum Report – Additional Noise Monitoring July 2016, SLR, 8 December 2016

- Cooranbong Entry Site Ambient Noise Logging Results January 2015, SLR, 3 February 2015
- Cooranbong Entry Site Ambient Noise Logging Results February 2015, SLR, 5 March 2015
- Cooranbong Entry Site Ambient Noise Logging Results March 2015, SLR, 8 April 2015
- Cooranbong Entry Site Ambient Noise Logging Results April 2015, SLR, 6 May 2015
- Cooranbong Entry Site Ambient Noise Logging Results May 2015, SLR, 10 June 2015
- Cooranbong Entry Site Ambient Noise Logging Results June 2015, SLR, 3 July 2015
- Cooranbong Entry Site Ambient Noise Logging Results July 2015, SLR, 7 August 2015
- Cooranbong Entry Site Ambient Noise Logging Results August 2015, SLR, 4 September 2015
- Cooranbong Entry Site Ambient Noise Logging Results September 2015, SLR, 9 October 2015
- Cooranbong Entry Site Ambient Noise Logging Results October 2015, SLR, 3 November 2015
- Cooranbong Entry Site Ambient Noise Logging Results November 2015, SLR, 12 December 2015
- Cooranbong Entry Site Ambient Noise Logging Results December 2015, SLR, 29 January 2016
- Cooranbong Entry Site Ambient Noise Logging Results January 2016, SLR, 23 February 2016
- Cooranbong Entry Site Ambient Noise Logging Results February 2016, SLR, 29 March 2016
- Cooranbong Entry Site Ambient Noise Logging Results April 2016, SLR, 11 May 2016
- Cooranbong Entry Site Ambient Noise Logging Results May 2016, SLR, 23 June 2016
- Cooranbong Entry Site Ambient Noise Logging Results June 2016, SLR, 10 August 2016
- Cooranbong Entry Site Ambient Noise Logging Results July 2016, SLR, 10 August 2016
- Cooranbong Entry Site Ambient Noise Logging Results August 2016, SLR, 19 January 2017
- Cooranbong Entry Site Ambient Noise Logging Results September 2016, SLR, 19 January 2017
- Cooranbong Entry Site Ambient Noise Logging Results October 2016, SLR, 19 January 2017
- Cooranbong Entry Site Ambient Noise Logging Results November 2016, SLR, 19 January 2017
- Cooranbong Entry Site Ambient Noise Logging Results December 2016, SLR, 6 June 2017
- Cooranbong Entry Site Ambient Noise Logging Results January 2017, SLR, 6 June 2017
- Cooranbong Entry Site Ambient Noise Logging Results February 2017, SLR, 6 June 2017
- Cooranbong Entry Site Ambient Noise Logging Results March 2017, SLR, 6 June 2017
- Cooranbong Entry Site Ambient Noise Logging Results May 2017, SLR, 6 June 2017
- Cooranbong Entry Site Ambient Noise Logging Results June 2017, SLR, 1 August 2017
- Cooranbong Entry Site Ambient Noise Logging Results July 2017, SLR, 8 December 2017
- Cooranbong Entry Site Ambient Noise Logging Results August 2017, SLR, 8 December 2017
- Cooranbong Entry Site Ambient Noise Logging Results September 2017, SLR, 8 December 2017

- Cooranbong Entry Site Ambient Noise Logging Results October 2017, SLR, 8 December 2017
- Cooranbong Entry Site Ambient Noise Logging Results November 2017, SLR, 8 December 2017

7 Closing

I trust that the preceding provides sufficient detail for your current requirements. If you require any further information please contact me on ph (02) 4910 7723 or email tristan.robertson@ghd.com.

Kind regards

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