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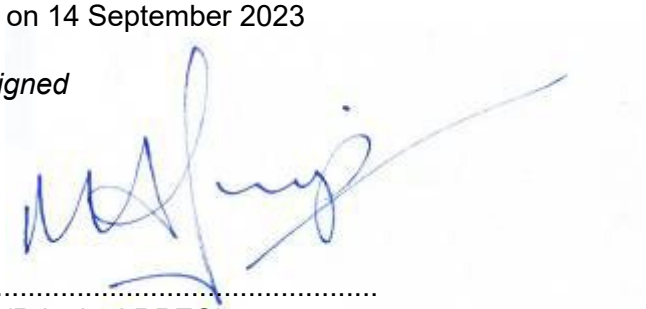

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1 Introduction

Baralaba South Pty Ltd (BS) engaged Simpson Engineering Group Pty Ltd (SEG) to prepare a noise assessment of the haul route for the Baralaba South Project, (the Project). The proposed project is located approximately 8 kilometres (km) south of the township of Baralaba and 115 km west of Rockhampton in the lower Bowen Basin region of Central Queensland.

The objective of this assessment is to provide BS with information to assist with obtaining the necessary environmental approvals for the project. The impacts from the haul route utilising public roads are assessed in consideration of an existing and approved road haul use associated with the related Baralaba North Mine. Baralaba North Mine is to wind down production operations at about the same time as the proposed Baralaba South is to commence operations.

The report addresses the following issues:

- Measurement of existing noise levels from ABB Quad trucks (currently hauling from Baralaba North Mine) on the route;
- Determine appropriate noise level criteria;
- Determine the likely road traffic noise along the haul route at peak production; and,

1.1 Baralaba South Project Description

Approval is being sought to develop a greenfield, open-cut metallurgical coal mine which would extract up to 2.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal to produce pulverised coal injection (PCI) coal for international export to the steel production industry over a life of 23 years. Mining activities are to be undertaken within the area of Mining Lease Application (MLA) 700057, which covers a total of 2,214 ha.

Open-cut coal mining activities would target the Baralaba Coal Measures, including the basal sub-unit Kaloola Member, where the structural dip of the Permian geology brings them to or near the surface within MLA 700057. The total resource targeted comprises 48.6 Mt of ROM coal estimated to produce approximately 35.5 Mt of PCI product coal over the life of the Project. Overburden and interburden will be disposed of in out-of-pit spoil dumps located contiguous with the pit excavation, and in-pit dumps as part of ongoing progressive rehabilitation behind the advancing operations.

Product coal would be hauled approximately 40km by public road using covered road trains to the Company's existing Train Load-out (TLO) facility located 2km east of Moura. The project includes a realignment of approximately 4.5 km of Moura Baralaba Road to the east of MLA 700057 (Realignment of Moura Baralaba Road is subject to separate approvals). Coal from the currently operating Baralaba North Coal Mine is hauled along the same road to the train load-out facility to the south near Moura. The route passes adjacent to Baralaba South Project.

Figure 1 shows the location of the Project, the haul route on public roads and sensitive receptors within approximately 300m of the route.

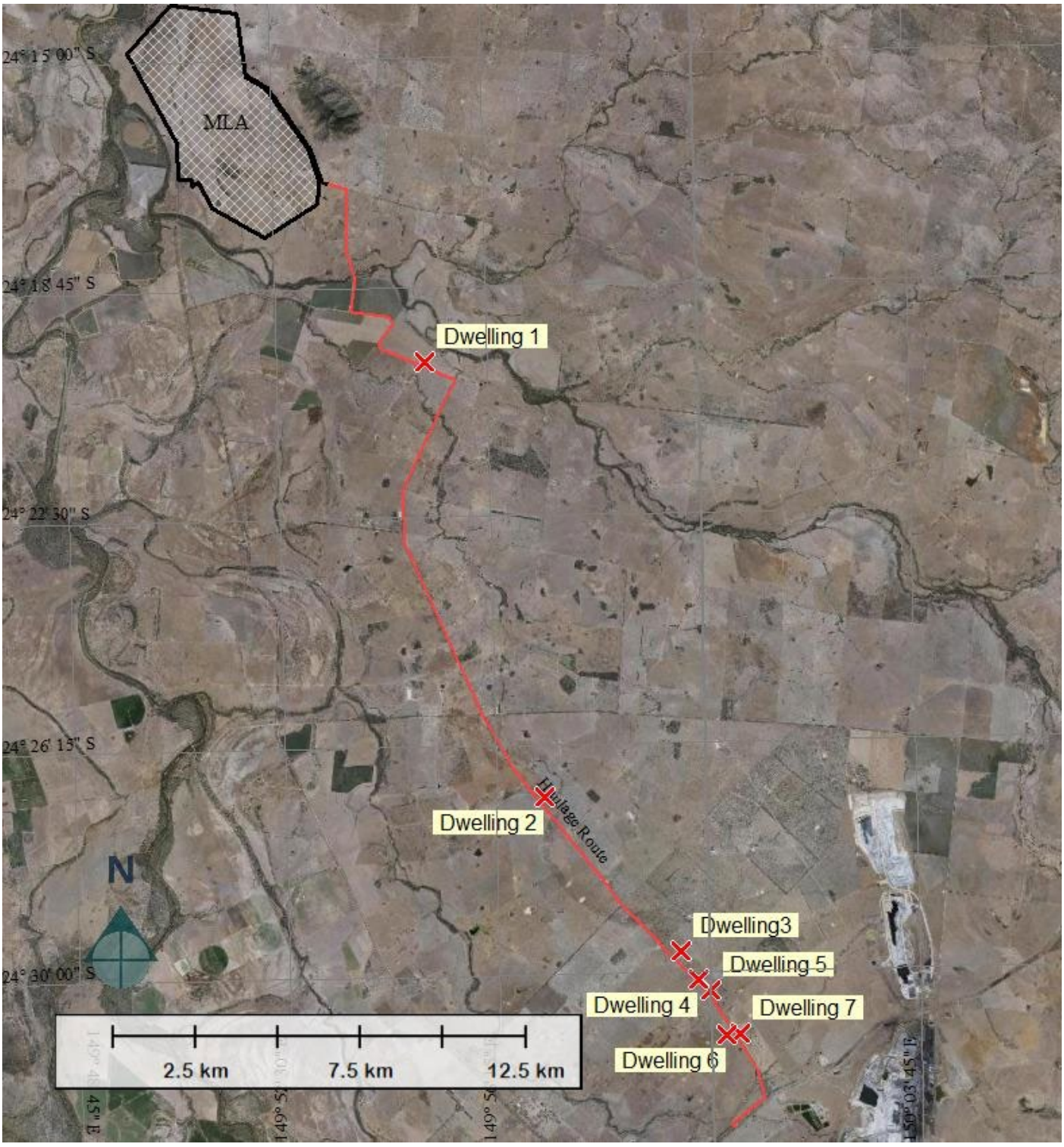

Figure 1: Haul Route From Baralaba South MLA and Dwellings within Approximately 300m of Route

1.2 Sensitive Receptors Discussion

The entire route, from the mine to the rail load-out facility is shown in Figure 1. There are seven dwellings south of the proposed Baralaba South Project adjacent to the haul route.

Details of each sensitive receptor are contained in Table 1

Table 1: Dwellings Within Approximately 300m of Route

Dwelling	GPS	Comment
Dwelling 1	24.332°S, 149.919°E	Approximately 140m from the route and to the north
Dwelling 2	24.452°S, 149.952°E	Approximately 180m from the route and to the north-east
Dwelling 3	24.494°S, 149.991°E	Approximately 330m from the route and to the north-east
Dwelling 4	24.502°S, 149.996°E	Approximately 110m from the route and to the north-east
Dwelling 5	24.505°S, 150.000°E	Approximately 140m from the route and to the north-east
Dwelling 6	24.517°S, 150.004°E	Approximately 190m from the route and to the south-west
Dwelling 7	24.517°S, 150.009°E	Approximately 190m from the route and to the north-east

2 Measured Noise Levels From Traffic

SEG conducted attended noise monitoring of ABB-Quad road trucks transporting coal between Baralaba North Mine and the train load-out facility. The noise monitoring location was south of the proposed Baralaba South Project and approximately 100m north of Dwelling 3.

The monitoring was carried out in compliance with Queensland Noise Measurement Manual 2000 (DERM, 2001) and AS 1055 Parts 1 & 2 Acoustics—Description and measurement of environmental noise.

The attended noise measurements were conducted on 20th June 2019. The days were warm, sunny and wtihout significant wind. The nights were cool and clear. The measurements comprise the maximum noise level occuring from the bypass of vehicles whilst traveling on a straight road in a 100km/h zone. Refer to ***Table 2*** for the measurements of all vehicles related to a distance of 30m.

Table 2: Measured Noise Levels of All Vehicles travelling the Monitoring Site over 4-hour period.

Measurement	Time	Direction	Vehicle	LAmax [dB(A)] at 30m
1	9:10 AM	S to N	Mine Quad Unladen	79.9
2	9:13 AM	N to S	4WD (Not Mine)	67.2
3	9:16 AM	N to S	4WD (Not Mine)	71.9
4	9:20 AM	S to N	4WD (Not Mine)	76.0
5	9:21 AM	S to N	4WD (Not Mine)	70.7
6	9:24 AM	S to N	4WD (Not Mine)	72.4
7	9:33 AM	S to N	4WD (Not Mine)	70.8
8	9:34 AM	N to S	4WD (Not Mine)	67.3
9	9:55 AM	N to S	4WD (Not Mine)	66.7
10	10:07 AM	N to S	4WD & Caravan (Not Mine)	72.4
11	10:09 AM	N to S	4WD (Not Mine)	68.2
12	10:11 AM	S to N	Truck (Not Mine)	76.6
13	10:13 AM	N to S	Mine Quad Laden	81.1
14	10:16 AM	N to S	Campervan (Not Mine)	66.9
15	10:20 AM	S to N	4WD (Not Mine)	70.2
16	10:22 AM	N to S	4WD (Not Mine)	64.1
17	10:25 AM	N to S	Mine Quad Laden	82.4
18	10:39 AM	S to N	Mine Quad Unladen	80.0
19	10:43 AM	N to S	4WD (Not Mine)	69.8

Measurement	Time	Direction	Vehicle	LAmax [dB(A)] at 30m
20	10:45 AM	N to S	Mine Quad Laden	80.6
21	10:50 AM	S to N	Mine Quad Unladen	80.0
22	10:54 AM	S to N	Light Truck (Not Mine)	73.4
23	11:00 AM	N to S	Mine Quad Laden	80.8
24	11:01 AM	N to S	Car (Not Mine)	65.2
25	11:05 AM	S to N	Car (Not Mine)	70.9
26	11:11 AM	S to N	4WD (Not Mine)	72.5
27	11:14 AM	S to N	Mine Quad Unladen	80.5
28	11:27 AM	S to N	4WD (Not Mine)	68.3
29	11:39 AM	S to N	Light Truck	69.5
30	11:42 AM	S to N	Mine Quad Unladen	80.1
31	11:46 AM	S to N	Car (Not Mine)	72.3
32	11:47 AM	N to S	Car (Not Mine)	66.1
33	11:52 AM	S to N	Car (Not Mine)	69.0
34	11:59 AM	S to N	4WD (Not Mine)	72.0
35	12:05 PM	S to N	Light Truck	70.8
36	12:06 PM	S to N	Light Truck	73.4
37	12:06 PM	N to S	Car (Not Mine)	66.8
38	12:30 PM	S to N	4WD (Not Mine)	74.1

The calculated noise levels from the Mine ABB-Quads and other traffic on public roads are contained in ***Table 3***. It was noticed the noise from vehicles travelling at 100km/h is mostly road noise, i.e the interation of tyre noise with the road surface. The road surface at the test location was chip seal. This type of road surface produces more tyre noise than dense graded road surfaces. However, as chip seal ages, the surface becomes less noisy. Since traffic flow on the rural roads is usually low, the roads surfaces do not wear or age as quickly as roads in urban areas.

Table 3: Noise Survey Results (Signposted Speed 100 km/h) Chip Seal Road Surface

Vehicles	Vehicles/hr (daytime)	L_{Amax} [dB(A)] at 30m		
		Average	Min	Max
Mine Quad Unladen	1.4	80.1	79.9	80.5
Mine Quad Laden	1.1	81.2	80.6	82.4
Non-mine vehicles				
Truck	0.3	76.6	-	-
Light Truck	1.1	71.8	69.5	73.4
4WD	4.6	70.3	64.1	76.0
4WD & Caravan	0.3	72.4	-	-
Campervan	0.3	66.9	-	-
Cars	1.7	68.4	65.2	72.3

3 Noise and Vibration Criteria

3.1 Environmental Protection Act 1994

The objective of the *Environmental Protection Act 1994* (EP Act) is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The EP Act states a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm. This is termed the 'general environmental duty'.

Environmental harm is defined as any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

The noise level goals for operations may be determined from the *Environmental Protection (Noise) Policy 2019* (EPP (Noise) 2019).

The EPP (Noise) 2019 came into effect on 1 Sept 2019.

The purpose of the EPP(Noise) is to achieve the objects of the Act and achieved by:

a) identifying and declaring the environmental values of the acoustic environment; and
b) stating acoustic quality objectives that are directed at enhancing or protecting the environmental values; and
c) providing a framework for making consistent, equitable and informed decisions that relate to the acoustic environment.

The environmental values to be enhanced or protected under the EPP(Noise) are:

(a) the qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystems; and
(b) the qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following-
    a. sleep;
    b. study or learn;
    c. be involved in recreation, including relaxation and conversation; and
(c) the qualities of the acoustic environment that are conducive to protecting the amenity of the community.

There are two main considerations namely:

1. Acoustic quality objective (noise levels that are conducive to human health and well-being, ensuring a suitable acoustic environment for individuals to sleep, study or learn, be involved in recreation, including relaxation and conversation; and preserve the qualities of the acoustic environment that are conducive to protecting the amenity of the community); and
2. Management Intent.

3.1.1 Acoustic Quality Objectives

The 'Acoustic Quality Objectives' seek to protect the amenity of an acoustic environment. The indoor night-time goals effectively address sleep disturbance and sleep awakenings, while during the day it protects

conversation. It should be noted that these are not strictly design limits for individual sources but objectives that are considered to provide acceptable health and wellbeing for the community.

The acoustic quality objectives are expressed as indoor noise level goals for dwellings at Night (10pm to 7am) and outdoor noise level goals during the Day (7 am to 6 pm) and Evening (6 pm to 10 pm. These objectives are all contained in ***Table 4***.

The indoor noise quality objective for dwellings is converted to an outdoor noise level by conservatively assuming that the windows of the dwellings are wide open. The equivalent external noise levels measured at least 4 m from the dwelling would be 5 dB higher (to allow for the reduction of noise through the building envelope). However, it is not uncommon for bedrooms in hot, arid or tropical areas to be air-conditioned. For air conditioners to work efficiently the windows of dwellings are kept closed. For these air conditioned dwellings (where windows are closed) the assumed noise reduction from outside to inside is typically 20 dB (i.e. the equivalent external noise levels measured at least 4 m from the residence would be 20 dB higher than the acoustic quality objective noted in ***Table 4***). It is noted that most air conditioners in residences create their own noise, making the inside of rooms louder. This methodology conservatively assumes the air conditioners do not have any noise emissions, i.e., the air conditioners do not increase the internal noise levels thereby masking the potentially intrusive external noise level.

Table 4: Acoustic Quality Objectives for Dwellings During the Day (7 am to 6 pm), Evening (6 pm to 10 pm) and Night (10 pm to 7 am).

Location	**Time of Day**	**Acoustic Quality Objectives (Measured at the receptors) dB(A)**			**Environmental Value**
		$L_{Aeq,\ adj,\ 1\ hr}$	$L_{A10,\ adj,\ 1\ hr}$	$L_{A1,\ adj,\ 1\ hr}$	
Dwelling outdoors	Daytime & evening	50	55	65	Health and wellbeing
Dwelling indoors	Daytime & evening	35	40	45	Health and wellbeing
Dwelling indoors	Night-time	30	35	40	Health wellbeing in relation to the ability to sleep
Protected area, or an area identified under a conservation plan under the *Nature Conservation Act 1992* as a critical habitat or an area of major interest	Anytime	The level of noise that preserves the amenity of the existing area or place			Health and biodiversity of ecosystems

Source: EPP (Noise) 2018.

3.1.2 Management Intent for Noise

It is intended that noise from an activity that affects or may affect an environmental value to be enhanced or protected under the EPP(Noise) be appropriately managed.

To the extent it is reasonable to do so, noise must be dealt with in a way that ensures-

a) the noise does not have any adverse effect, or potential adverse effect, on an environmental value under this policy; and
b) background creep in an area or place is prevented or minimised.

In the situation where existing noise levels exceed the Acoustic Quality objectives, to the extent it is reasonable to do so, noise at that sensitive place must be dealt with in a way that progressively improves the acoustic environment of the area or place.

Background creep, for noise in an area or place, is described as a gradual increase in the total amount of background noise in the area or place.

The EPP(Noise) does not provide any guidance nor limits regarding how to address background creep.

However, the guiding principles are:

I. Background creep in an area is to be prevented or minimised.
II. Any control requirements are to be reasonable.

Background creep can be prevented by ensuring the noise from activity is always below the background noise level. However, this may be excessively onerous for many situations. The EPP(Noise) does not include any guidance regarding how to assess "reasonable" noise control. A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements. Selecting reasonable measures from those that are feasible involves making a judgement to determine whether the overall noise-reduction benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the noise abatement measure. To make such a judgement, consideration may be given to aspects such as noise level impacts, noise mitigation benefits, cost effectiveness and community views.

3.2 Road Traffic Noise Goals

Queensland Department of Transport and Main Roads (TMR) is responsible for setting noise level limits from road traffic on public roads in Queensland. There are no noise level goals in Queensland for assessing noise from a traffic producing development. However, TMR have guidelines[1] for existing roads no roadworks. For this category priority may be given to treatment in cases where there is a:

- sudden increase in traffic volumes (at least double equal to a 3 dB increase), or
- there is a high percentage of heavy vehicles (greater than 20%) at night.

TMR have a road traffic noise level goal of 68 dB(A) as an $L_{A10(18\ hour)}$ at the facade of existing residences from existing roads. Since the route is a low volume country road it is likely that the existing $L_{A10(18\ hour)}$ (at the dwelling) would be less than 60 dB(A) and it is unlikely the site would qualify for noise amelioration under the TMR guidelines.

In NSW the EPA have developed goals for land use developments with the potential to create additional traffic on local roads. The noise level goals are in terms of the $L_{Aeq(1\ hour)}$ and the day goal is 55 dB(A) and at night the goal is 50 dB(A) and existing noise levels should not increase road traffic noise levels by more than 2 dB(A). Along existing freeway/arterial/sub-arterial roads the noise level goals are in terms of the $L_{Aeq(15\ hour)}$ 60 dB(A) during the day and the $L_{Aeq(9\ hour)}$ 55 dB(A) during the night.

[1] *Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise November 2013*

3.3 Summary of Noise Goals

Application of Road Traffic Goals

The primary noise level goal comprises the TMR goal to limit traffic noise increase to no more than 3 dB(A).

In the event the traffic increase is more than 3 dB(A) it is proposed to adopt the NSW EPA day and night goals at dwellings, i.e. the $L_{Aeq(1\ hour)}$ and the day goal is 55 dB(A) and at night the goal is 50 dB(A) from the traffic associated with the Project.

4 Road Traffic Noise Modelling

A survey of peak hour traffic on Moura Baralaba Road (North) has been carried out by Cardno[2] in 2019. The report noted the morning peak traffic flow comprised 17 vehicles (5 heavy vehicles) and during the afternoon peak the hour traffic comprised 18 vehicles (7 heavy vehicles).

During the four-hour noise testing period there were 9 mine ABB-Quads pass-by of the noise monitoring site.

The approved coal haulage from Baralaba North Coal mine is up to 3.5 MTPA and would typically require 103 heavy vehicle trips per day, i.e. 206 heavy vehicles pass-by per day. Thus, it is known there will be (or possibly could be) 206 heavy vehicles on the route per day.

Currently, in 2023, Baralaba North mine is producing 1.8Mtpa of ROM coal for transport on public roads. As the existing Baralaba North mine ROM production ramps down, the production from the proposed Baralaba South mine will ramp up with the maximum production from the two mines is projected to be 2.5 Mtpa for the years 2030 and 2031. The long-term production estimates for Baralaba South mine are predicted to be below 1.85 Mtpa.

Assuming 24 hour per day transport on public roads, 48 weeks per year operation and an average 100 tonnes of ROM per trip the average number of ABB-Quads vehicles per hour is contained in Table 5. The allowance of 48 weeks per year allows for interruptions for wet weather and equipment breakdown.

Table 5: Calculated Change in $L_{Aeq(1\ hour)}$ Traffic Noise from mining Vehicles

Case	Production	Year	Number of ABB-Quads per hour (return trips divide by 2)	Change in road traffic noise levels [dB(A)] relative to case	
				Approved use	2023(Note 1)
Approved use of road	3.5 Mtpa	All years	8.7	-	-
Current Baralaba North	1.8 Mtpa	2023	4.5	-2.9	-
Maximum Baralaba South and Baralaba North 2.5Mtpa And Maximum likely Rom production from Baralaba South	2.5 Mtpa	2030 & 2031	6.2	-1.5	+1.4
Maximum Baralaba south	1.85 Mtpa	After 2031	4.6	-2.8	+0.1

Note 1: the greatest possible change is based on all existing and future traffic being from the coal mine

Thus, based on current (2023) production from Baralaba North there is likely to be an increase in traffic noise for all sensitive receptors of approximately +1.4 dB(A) for the years 2030 and 2031. Then subsequently it is calculated to be a minor increase of +0.1dB(A) compared with the current (2023) noise exposure.

[2] *Cardno 2019, Environmental Impact Study – Traffic Impact Assessment – Baralaba South Project*

Noise from ABB-Quads

A road traffic model has been developed for the coal haul route on public roads south of Baralaba South mine. The model is based on the PEN3D modelling methodology and incorporating the moving vehicle module. It is a mathematically correct prediction based on the speed and number of vehicles travelling along a route. The model divides the route into segments, then calculates the L_{Aeq} for each segment individually, then combining the results to obtain the overall noise level.

The calculations are based on the following assumptions:

1. Coal haulage occurring over 24 hours, seven days per week, 48 weeks per year
2. 2.5 Mtpa annual ROM from Baralaba south
3. Coal haulage by ABB-Quads;

The noise levels are based on measurements at a speed of 100km/h and chip seal road surface. It is assumed the traffic speed along the route is 100 km/h and the road surface is chip seal asphalt. The noise levels emissions from the ABB Quads are presented in ***Section 2***.

One of the current road fleet trucks operating from Baralaba North coal mine is shown in ***Figure 2.***

Figure 2: ABB Quad Hauling Coal from Baralaba North Coal Mine

The calculated free-field noise levels at each Dwelling are contained in Table 6 in terms of the $L_{Aeq(1\ hour)}$.

Table 6: Calculated FreeField $L_{Aeq(1\ hour)}$ at all Dwellings Within nominally 300m of Route

Dwelling	**Calculated $L_{Aeq(1\ hour)}$ [dB(A)]**
Dwelling 1	52
Dwelling 2	50
Dwelling 3	48
Dwelling 4	53
Dwelling 5	52
Dwelling 6	50
Dwelling 7	50

The predicted L_{Aeq} is contained in ***Figure 3*** for Dwelling 1. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing the site each hour. The calculated noise level at this dwelling is an $L_{Aeq(1hour)}$ of 52 dB(A). There are sheds on the opposite side of the road at this location.

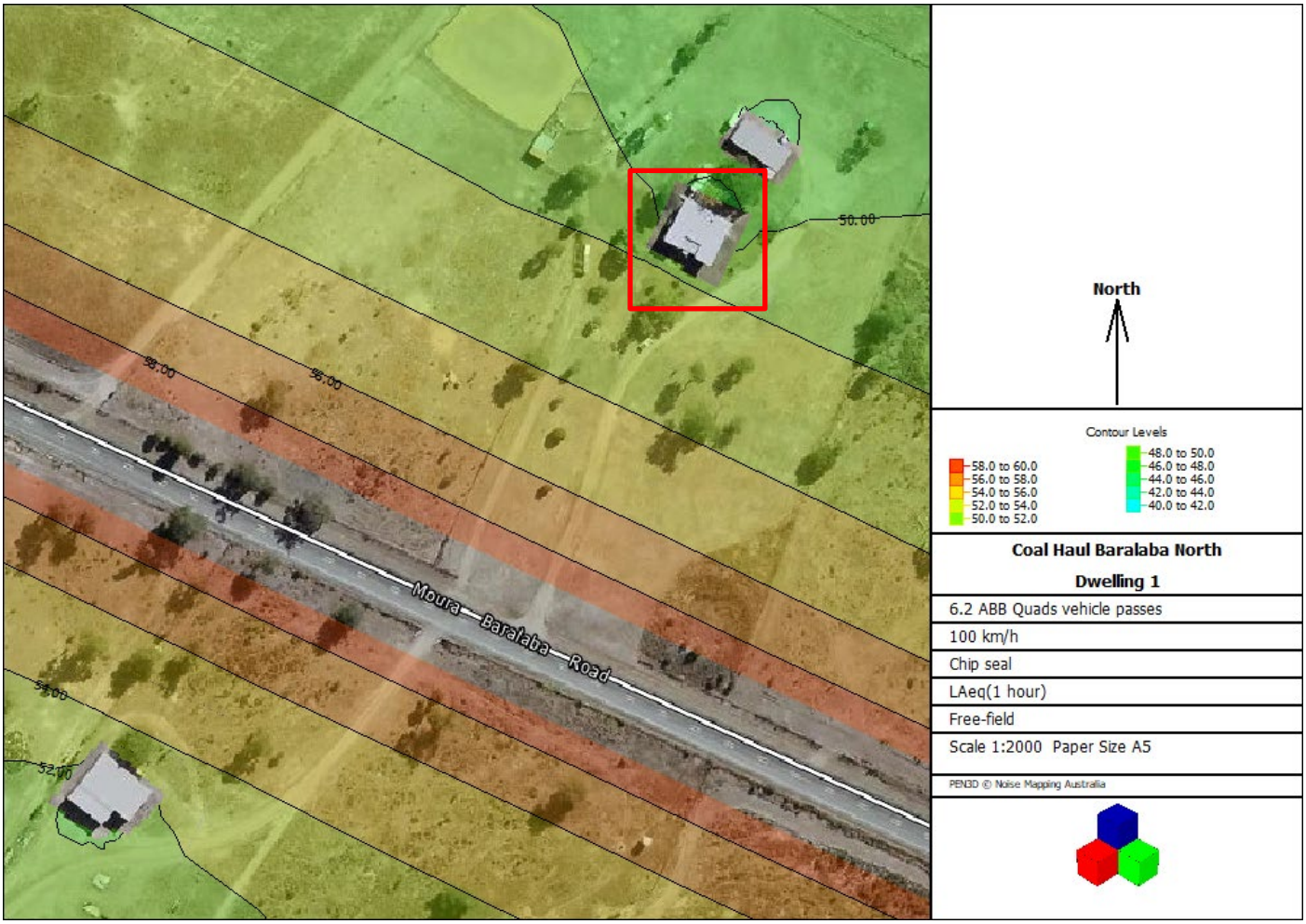

Figure 3: Predicted L_{Aeq} Noise Levels for Project Road Trucks – Dwelling 1

The predicted L_{Aeq} is contained in ***Figure 4*** for Dwelling 2. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing the site each hour. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. The calculated noise level at this dwelling is an $L_{Aeq(1hour)}$ of 50 dB(A).

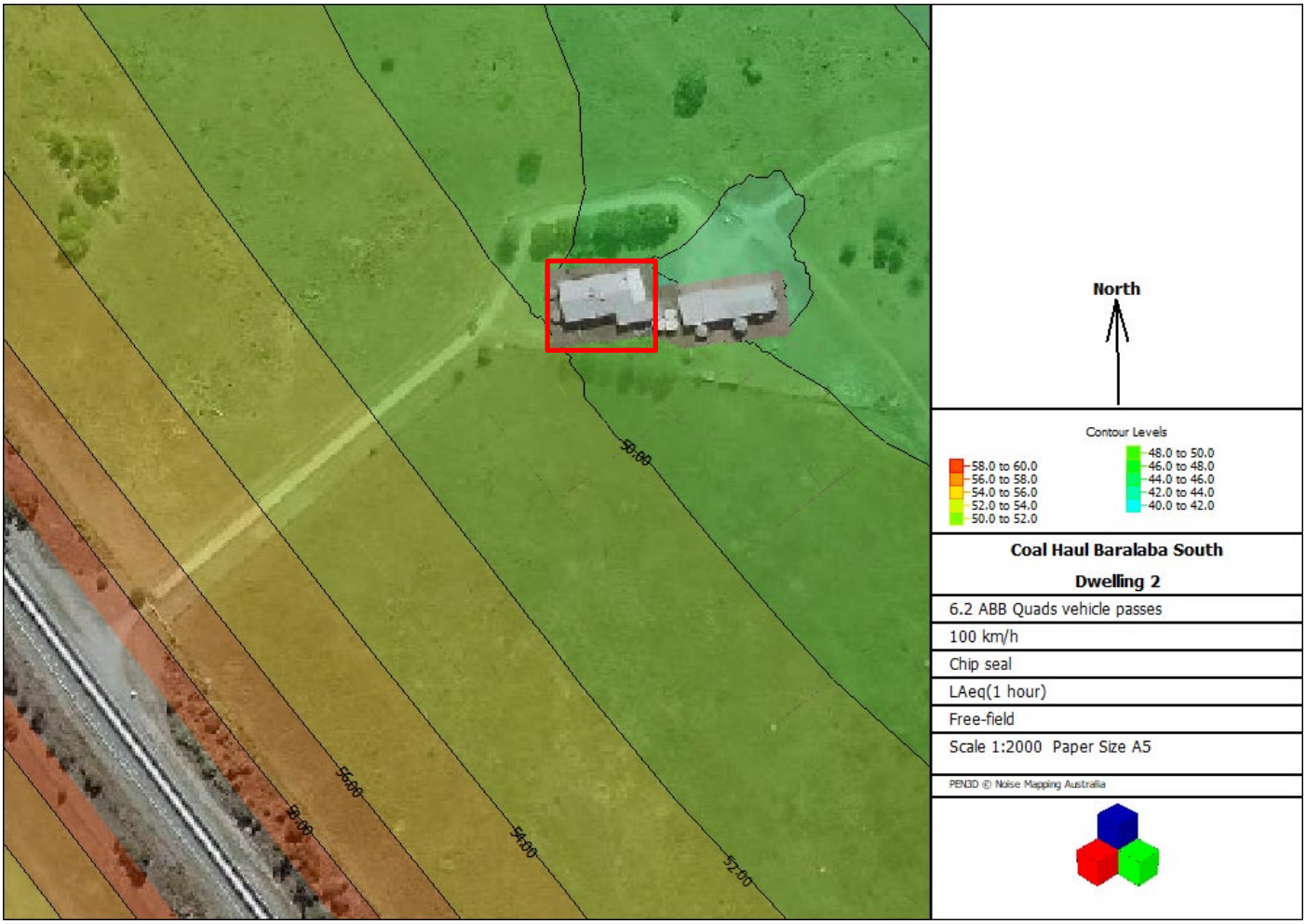

Figure 4: Predicted L_{Aeq} Noise Levels for Project Road Trucks – Dwelling 2

The predicted L_{Aeq} is contained in ***Figure 5*** for Dwelling 3. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing the site for each hour. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. The calculated noise level at this dwelling is an $L_{Aeq(1hour)}$ is 48 dB(A).

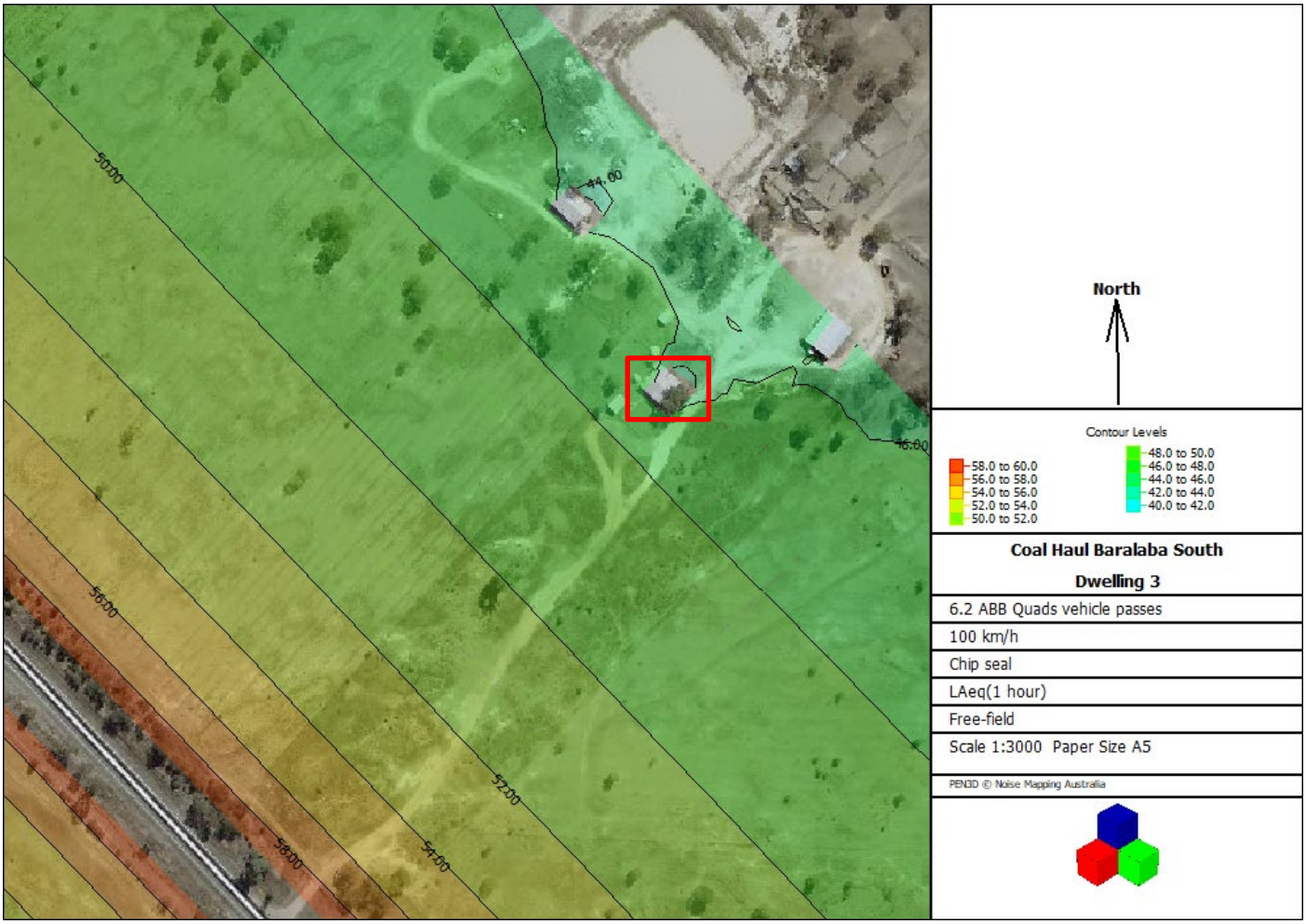

Figure 5: Predicted L_{Aeq} Noise Levels for Road Trucks – Dwelling.

The predicted L_{Aeq} is contained in ***Figure 6*** for Dwelling 4. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing the site each hour. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. The calculated noise level at this dwelling is an $L_{Aeq(1hour)}$ of 53 dB(A).

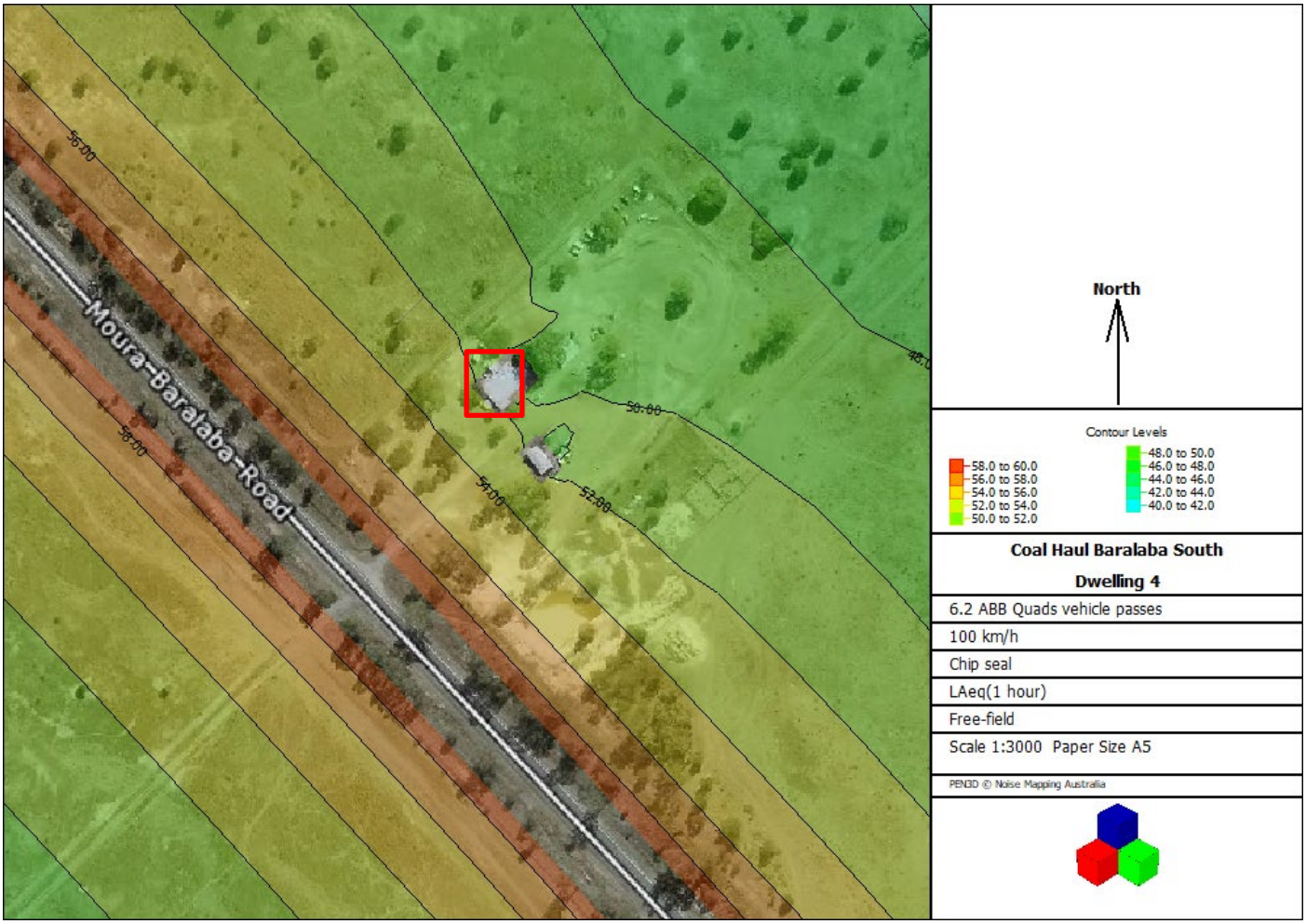

Figure 6: Predicted L_{Aeq} Noise Levels for Road Trucks – Dwelling 4.

The predicted L_{Aeq} is contained in Figure 7 for Dwelling 7. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing the site each hour. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. The calculated noise level at this dwelling is an $L_{Aeq(1hour)}$ is 52 dB(A).

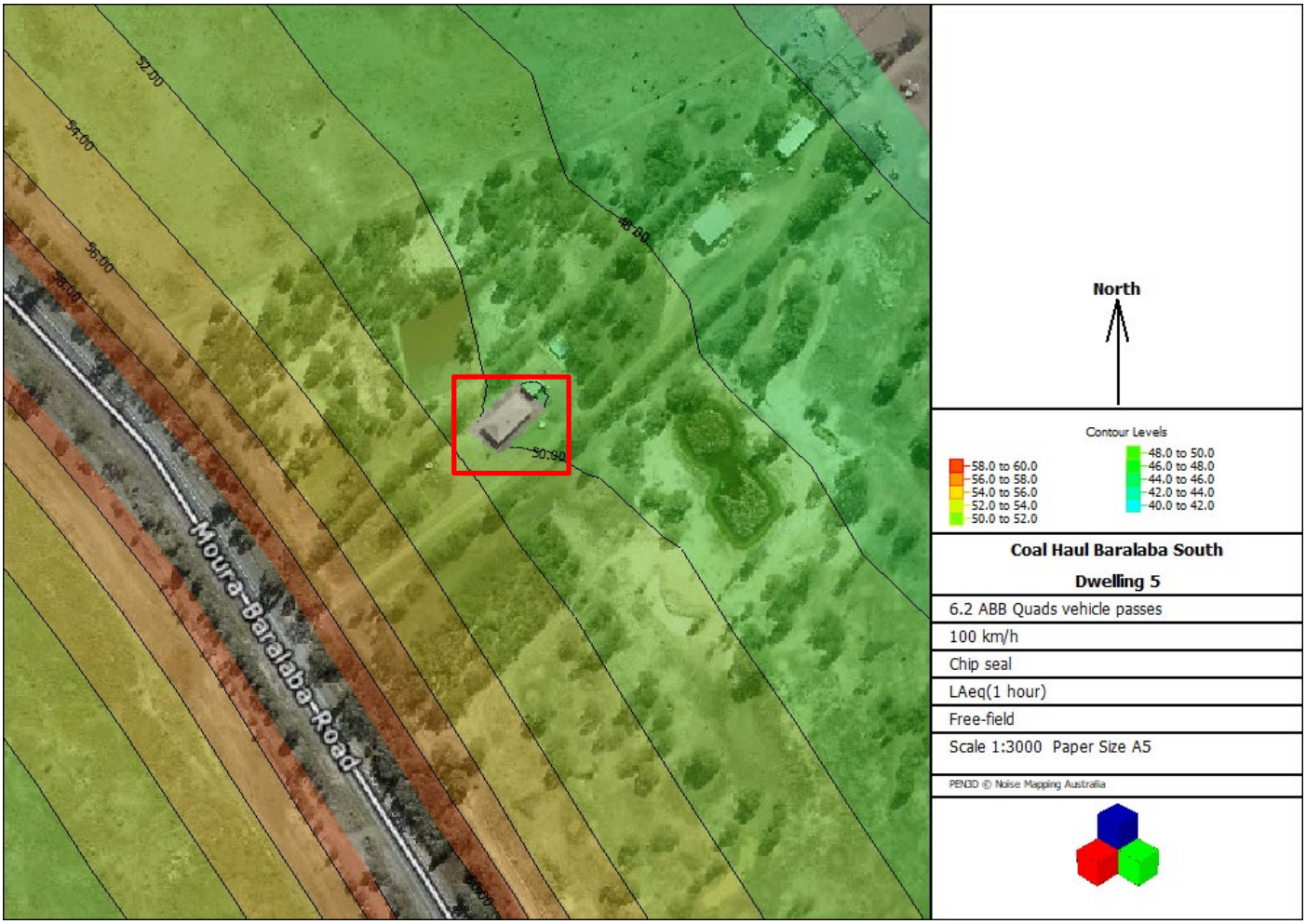

Figure 7: Predicted L_{Aeq} Noise Levels for Project Road Trucks – Dwelling 5.

The predicted L_{Aeq} is contained in ***Figure 8*** for Dwellings 6&7. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. It is assumed there are 6.2 ABB-Quads passing these sites each hour. It is assumed the average speed is 100km/h and the road surface is chip seal asphalt. The calculated noise level at Dwelling 6 is an $L_{Aeq(1hour)}$ of 50 dB(A) and at Dwelling 7 an $L_{Aeq(1hour)}$ of 49 dB(A). It is noted that there is an airstrip and many large buildings between the route and Dwelling 9.

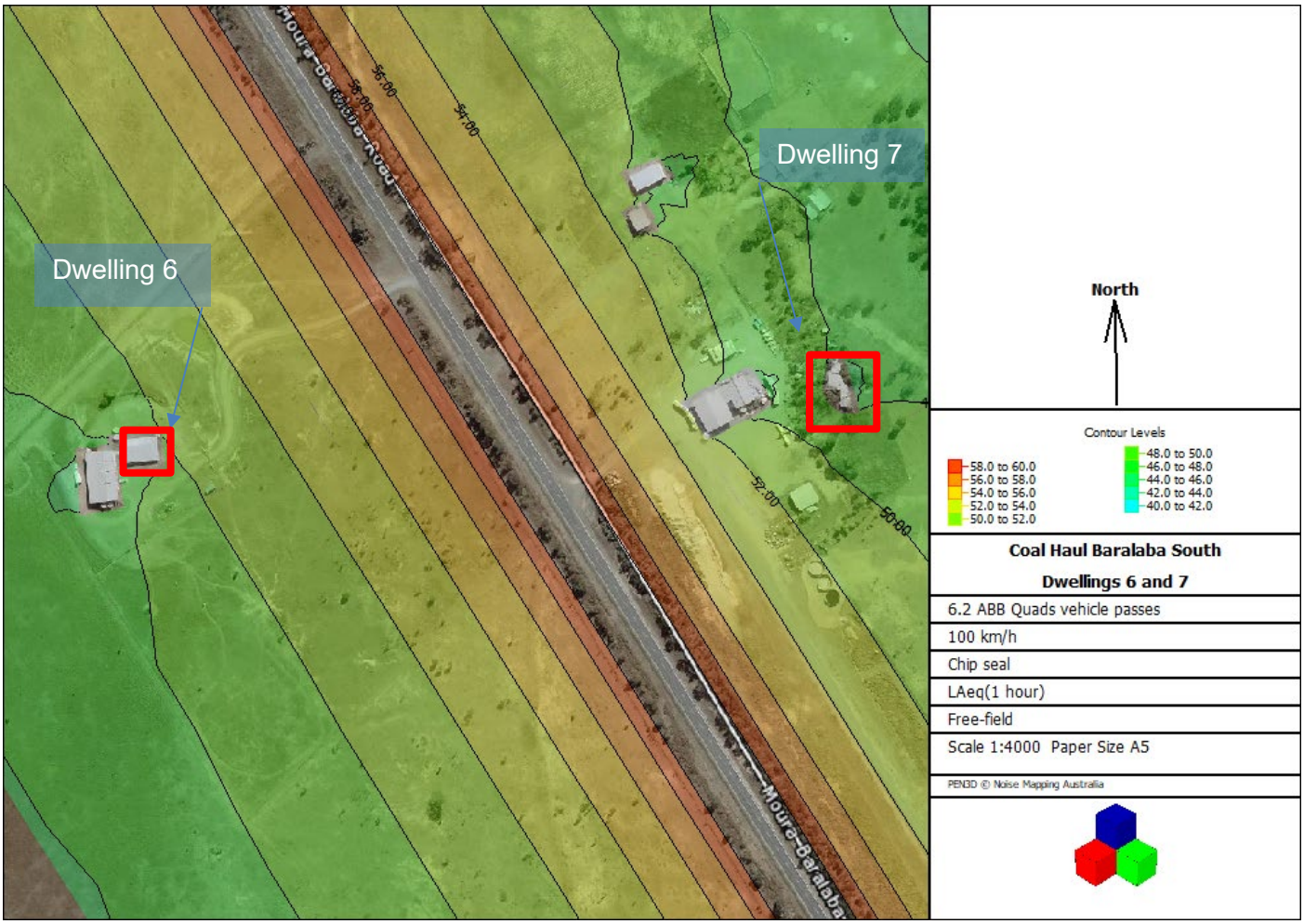

Figure 8: Predicted L_{Aeq} Noise Levels for Project Road Trucks – Dwelling 6 & 7.

4.1 Assessment

It is noted that there are seven dwellings between Baralaba South coal mine and the rail load out facility within nominally 300m of the route. As Baralaba South coal mine ramps up production, Baralaba North Coal mine will be ramping down and then ceasing production. The maximum ROM transport is predicted to be 2.5 Mtpa from both mines combined for the years 2030 and 2031. This is also the proposed maximum production from Baralaba South alone. The long-term projected production from Baralaba South coal mine is similar to the current Baralaba North coal mine for the year 2023.

The noise modelling determined that based on current production (2023) from Baralaba North coal mine there is likely to be an increase in the hourly traffic noise of approximately +1.4 dB(A) for the years 2030 and 2031. This case comprises transportation of coal from both Baralaba North mine and Baralaba South during startup phase. Then, after Baralaba North mine ceases production and Baralaba South has achieved the target long-term production there is calculated to be a minor increase of 0.1dB(A) compared with the current (2023) noise exposure. Consequently, since the increase in traffic noise is less than 3 dB for all cases it is not necessary to consider noise mitigation measures.

For completeness, the likely noise level from the haulage operation has been determined for all dwellings along the haul route. The range in the noise levels at the dwellings are between $L_{Aeq(1hour)}$ of 48 dB(A) and 53 dB(A).

5 Conclusions and Recommendations

A noise survey of the existing haul fleet of ABB Quads was carried out while in operation, hauling coal from Baralaba North Coal mine to the rail load out facility. It was found the ABB-Quad haul trucks are typically noisier than other heavy trucks using the route by approximately 5 dB(A).

The noise level goals for this project are based on the EP Act, The EPP(Noise) and various guides provided by the Department of Environment and Heritage Protection and NSW EPA guideline was adopted as appropriate to assess noise from a traffic generating development. A summary of the noise goals adopted comprise:

- The Department of Transport guidelines for existing roads experiencing an increase in traffic noise over a short period of time
- NSW EPA - Road noise

A noise model of the haul route on public roads was developed encompassing all the sensitive receptors along the haul route. The model has been based on the maximum likely traffic flow of both Baralaba South and Baralaba North mines combined and the maximum likely traffic flow at maximum possible production of Baralaba South mine. The calculations are based on traffic flows of 6.2 ABB Quads travelling per hour.

The noise modelling determined that the increase in road traffic noise along the route is well below the noise criterion. Consequently, it is not necessary to consider noise mitigation measures.

Subject to the ongoing monitoring/maintenance program for the ABB-Quad trucks and road pavement it is expected that the project will comply with the adopted noise level goals throughout the life of the project.

Glossary of Acoustical Terms

$L_{A01,t}$	The L_{A01} is the "A"-weighted statistical noise level exceeded 1% of the time. Commonly accepted time periods (t) include 10 minutes, 15 minutes, 30 minutes, 60 minutes and 24 hours.
$L_{A10,t}$	The L_{A10} is the "A"-weighted statistical noise level exceeded 10% of the time. Commonly accepted time periods (t) include 10 minutes, 15 minutes, 30 minutes, 60 minutes and 24 hours. It is sometimes referred to as the average maximum noise level.
$L_{A90\ ,t}$	The L_{A90} is the "A"-weighted statistical noise level exceeded 90% of the time. Commonly accepted time periods (t) include 10 minutes, 15 minutes, 30 minutes, 60 minutes and 24 hours. It is commonly referred to as the background noise level.
$L_{Aeq,\ t}$	The L_{Aeq} is the "A"-weighted energy average noise level over the time in question. It is the constant noise level containing the same energy as the actual fluctuating noise level. Commonly accepted time periods (t) include 10 minutes, 15 minutes, 30 minutes, 60 minutes and 24 hours.
Day	Refers to the period between 6 am and 6 pm
Evening	Refers to the period between 6 pm and 10 pm
Night	Refers to the period between after 10 pm and before 6 pm
Ambient noise	The all-encompassing noise associated within a given environment. It is the composite of sounds from many sources, both near and far.
Free field	A position where there are no reflecting surfaces, other than the ground, close enough to influence the sound pressure level. Taken as a minimum of 1.2 metres above ground level and 4m from the closest building façade.
Noise floor	The noise floor, inherent or 'self-noise' of sound level measuring equipment is the combination of the preamplifier's electrical noise and thermal noise from the microphone.
median	The median is the middle number in a sorted list of numbers.
dB (linear) peak	the maximum reading in decibels (dB) obtained using the "P" time – weighting characteristic as specified in AS 1259.1 – 1990 with all frequency-weighted networks inoperative.

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