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**Supplementary noise impact assessment
Wandoan Coal Project
Parsons Brinckerhoff Pty Ltd**

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Attachment A

Glossary

Attachment B

Predicted noise contours

Executive Summary

The development of the Wandoan Coal Project will introduce new noise sources into the existing rural environment directly west of Wandoan, Queensland. The scope of this supplementary noise impact assessment is to take into account the changes in operating schedule and location of mining pits in association to the EIS Volume 1, Chapter 15 Noise technical report 15-1-V1.5

Changes in the mining infrastructure and schedules in relation to noise impacts since the EIS are the introduction of a new Wubagul Pit proposed to be located at the south eastern section of the MLA 50230 as well as limited mining of the Frank Creek Pit, and removal of Woleebee South Pit from the 30-year mine schedule.

The sensitive receptor locations have been updated from the initial assessment due to either acquisition by the WJV or negotiations with the current owner. The receptors are listed and identified in Table 4 of the body of this report.

The methodology of the assessment and development of noise criteria are using *Environmental Protection (Noise) Policy 2008* with *Ecoaccess Guideline* used as a supplement where no direct guidance is provided by the policy. It is proposed that a criterion of $L_{Aeq,1hour}$ 35 dBA is implemented satisfying the night time Acoustic quality objective as well as taking into consideration minimum background creep criteria used for industrial developments in rural environments elsewhere in Australia.

Based on the results of the noise modelling for each updated operational scenario, minor exceedances were predicted at various receptors using sound power data for mining equipment in standard specification, without specific noise control treatments fitted.

It has been demonstrated that through the use of noise attenuation measures on appropriate mining equipment, the emitted noise levels can be controlled to within allowable limits for 24 hour operation during these scenarios at all receptors.

It is also recommended that regular review of noise monitoring results be carried out at Receptor MLA-378 at Nathan Rd through out the whole Project life due to predicted levels being close to the design criteria. Regular monitoring is also recommended at the most exposed receptors during each operating scenario.

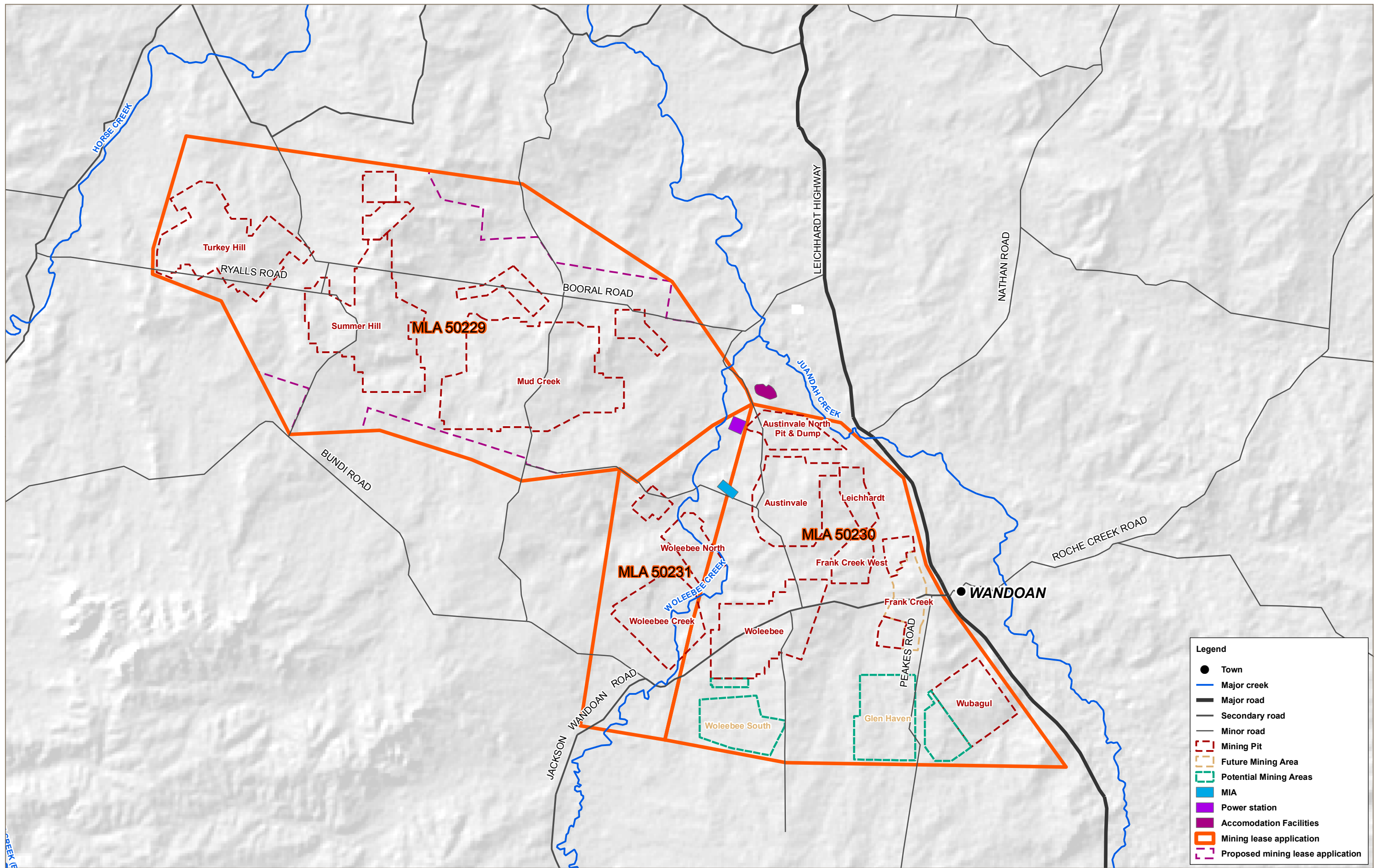
A summary of the recommended mitigation measures to ensure compliance with the *Environmental Protection (Noise) Policy 2008* near affected receptors for the Project are detailed below:

- broadband reversing sirens to be utilized on all equipment
- review permanent monitoring data at Receptor MLA-378 at Nathan Rd at regular intervals due to predicted noise levels being constantly close to the design criteria
- use noise attenuated equipment as outlined in Table 9 of the EIS noise technical report during specific scenarios at outlined locations as described in Section 8.1 of this report
- periodically monitor noise levels at the most exposed noise receptors as outlined in Section 8.1 of this report

1. Introduction

This report is part of the Supplementary EIS for the Wandoan Coal Project (the Project) and is an addendum to the EIS Volume 1, Chapter 15 Noise technical report 15-1-V1.5 (EIS noise technical report). Alterations to the mining schedule as well as pit locations required a new assessment of the proposed operation of the Project. Noise predictions have been carried out (Sections 7) and recommendations based on the modelling outcomes (Section 8) provided.

The Project background and study area are as per the EIS noise technical report with the exception of the updated MLA areas which are shown in Figure 1 below.



Source: Roads, QLD State Digital Road Network (2004); Towns, creeks 1:250K Topo, Geoscience Australia (2006)

2. Methodology of assessment

2.1 Relevant legislation and guidelines

The methodology of assessment for this report was based on the revised version of the *Environmental Protection (Noise) Policy. Ecoaccess Guideline* was used as a supplement where no direct guidance is provided by the EPP (Noise).

2.1.1 Environmental Protection (Noise) Policy 2008

The *Environmental Protection (Noise) Policy 2008* supersedes the *Environmental Protection (Noise) Policy 1997* which was used in the EIS assessment. The EPP (Noise) is designed to protect the environmental Acoustic environment qualities that are conducive to:

- protecting the health and biodiversity of ecosystems
- human health and wellbeing
- protecting the amenity of the community

Acoustic quality objectives for sensitive receptors

The most significant change in the updated policy refers to the identification of specific environmental values and acoustic quality objectives which are sensitive receptor specific. Section 8 of the EPP (Noise) outlines these acoustic quality objectives with an applicable section of the schedule shown in Table 1 below. It is intended that the acoustic quality objectives be progressively achieved as part of achieving the purpose of this policy over the long term. This however does not apply to safety and transport noise eg safety signal noise from a reversing vehicle.

Table 1 Acoustic quality objectives

Sensitive receptor	Time of day	Acoustic quality objective at receptor (dBA)			Environmental value
		L _{Aeq} , 1hr	L _{A10} , 1hr	L _{A1} , 1hr	
Dwelling (outdoors)	Daytime and evening	50	55	65	Health and wellbeing
Dwelling (indoors)	Daytime and evening	35	40	45	Health and wellbeing
	Night time	30	35	40	Health and wellbeing in relation to the ability to sleep
Library and educational institution (indoors)	When open for business or when classes being offered	35			Health and wellbeing
School playground (outdoors)	When the children usually sleep	55			Health and wellbeing, and community amenity
Hospital surgery or other medical institution (indoors)	Visiting hours	35			Health and wellbeing
	Anytime outside visiting hours	30			Health and wellbeing in relation to the ability to sleep
Commercial and retail activity (indoors)	When the activity is open for business	45			Health and wellbeing in relation to the ability to converse

The measured variable noise is subject to appropriate adjustment for tonal character or intrusiveness. Times of day are defined as:

- Day – 7 am to 6 pm
- Evening – 6 pm to 10 pm
- Night – 10 pm to 7 am

Management hierarchy for noise

To the extent that it is reasonable to do so, management of noise must be dealt with in the following order of preference:

- a) Firstly – avoid
- b) Secondly – minimise in the following order of preference
 - i) Firstly – orientate an activity to minimise noise
 - ii) Secondly – use best available technology
- c) Thirdly – manage

Controlling background creep

Section 10 of the EPP (Noise) outlines management intent of controlling background creep for an activity involving noise. To the extent it is reasonable to do so, noise from an activity must not be:

- for noise that is continuous noise measured by L_{A90} – more than nil dBA greater than the existing acoustic environment measured by L_{A90} ; or
- for noise that varies over time measured by L_{A90} – more than 5 dBA greater than the existing acoustic environment measured by L_{A90}

2.1.2 Ecoaccess Guideline – Noise – Planning for Noise Control

A detailed description of the *Ecoaccess Guideline – Planning for noise control* procedure is contained in Section 2.1.2 of the EIS noise technical report.

2.1.3 Comparison between the EPP (Noise) and *Ecoaccess Guideline*

A comparison between the two assessment procedures, that is the EPP (Noise) and the *Ecoaccess Guideline*, showed that both methods can produce low criteria for rural environments with very low existing background noise environments. The *Ecoaccess Guideline* provides a threshold background noise level of 25 dBA with therefore a minimum criterion of L_{eq} 28 dBA. Conversely the EPP (Noise) does not provide a threshold background noise level however a night-time criteria internally of 30 dBA for dwellings as outlined in Table 1 above. Without a threshold background noise level or criterion, unreasonable and impractical criteria could result. The *Ecoaccess Guideline* utilises the tenth percentile method to generate the rated background level based on the L_{90} as a descriptor of the background noise level whereas the EPP (Noise) does not provide any guidance on how to calculate the background noise level. The EPP (Noise) is the legally enforceable procedure which has been followed for this assessment with *Ecoaccess Guideline* used as a supplement where no direct guidance is provided by the EPP (Noise).

2.2 How the noise survey was conducted and information obtained

The Supplementary noise impact assessment was carried out as per the description in EIS noise technical report. The assessment method and data collection satisfied the criteria and requirements of the updated version of the EPP (Noise).

2.3 Limitations

Some irregularities in the noise survey have been identified which require new monitoring to determine the ambient noise levels (L_{eq} descriptor) in the area. However the background noise (L_{90} descriptor) data is still valid from which the rated background level (RBL) has been calculated. This is due to the

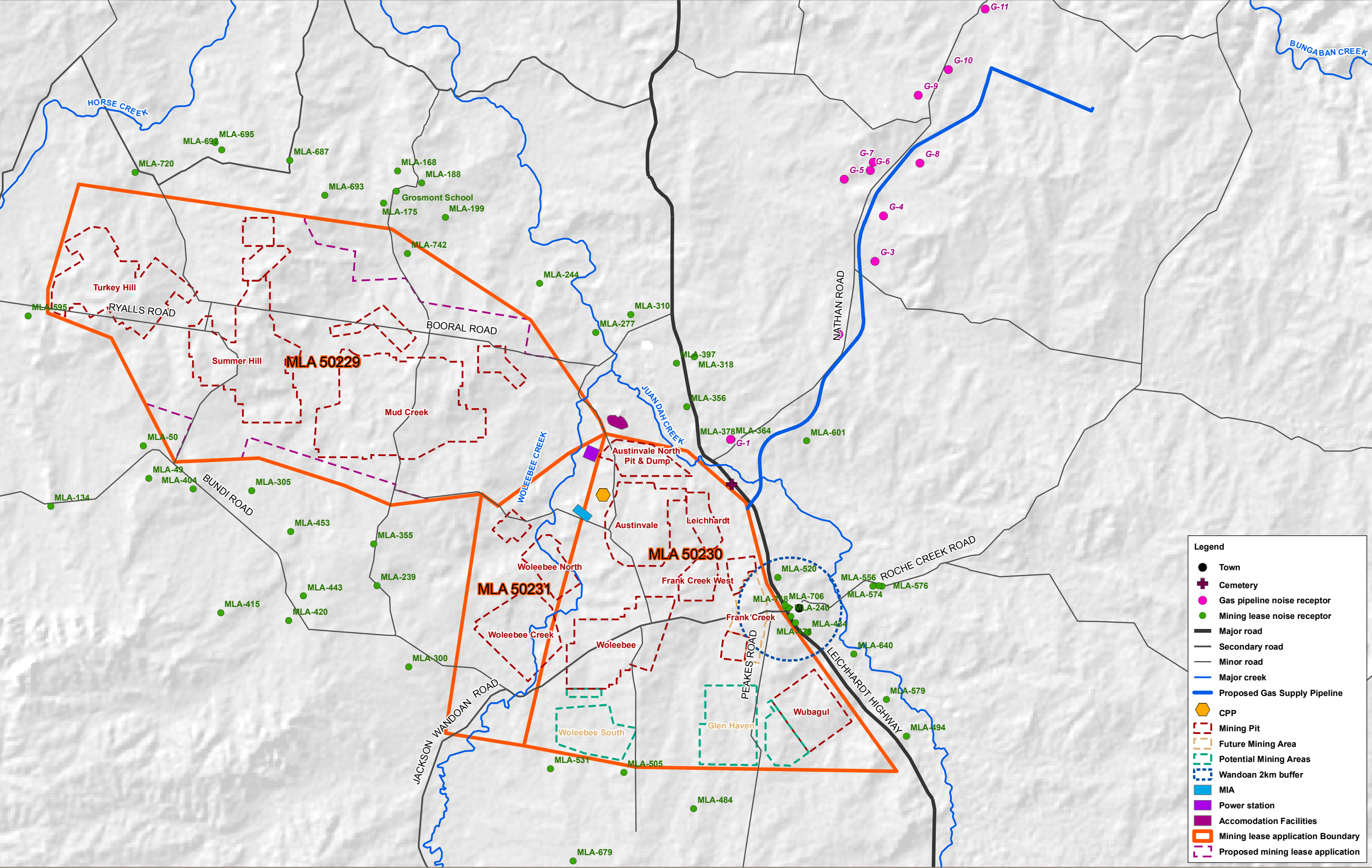
manufacturer of the sound level meters installed for the noise survey identified incorrect storage of the measured noise data with the exception of the L_{90} descriptor during the annual calibration of each unit.

The future noise surveys will provide a more accurate description of the ambient noise environment, however they will not affect the generated noise criteria which are based on the L_{90} descriptor that is still valid from the existing data collected.

The remainder of the limitations are as per the description in Section 2.3 of the EIS noise technical report.

3. Existing environmental values

The existing environment details are outlined in Section 3 of the EIS noise technical report, which include details of the environmental noise survey, existing meteorological conditions in the vicinity of Wandoan as well as further details on the sensitive receptors. Some sensitive receptors have been removed from the assessment due to either acquisition by the WJV or negotiations with the current owner with the intent to purchase by the WJV. Figure 2 shows the general location of sensitive receptors around the MLA areas incorporating any of the changes outlined above.



Source: Roads, QLD State Digital Road Network (2004); Towns, creeks 1:250K Topo, Geoscience Australia (2006)

4. Description of the Project

4.1 Development profile

Generally the Project development profile is consistent with the description in Section 4 of the EIS noise technical report. The changes to the Project outlined below have been incorporated as part of the Supplementary EIS assessment. The Project is proposed to produce approximately 30 million tonnes per annum (Mtpa) of ROM coal by the third year of operation.

In the original EIS, Frank Creek Pit generated the highest noise impacts during its mining for the sensitive receptors in the Wandoan township. A 2 km zone centred around the western edge of the township of Wandoan has been established based on review of EIS submissions and feedback from the local community. Mining will not initially be undertaken in the first years of operation, with the potential for future mining dependent upon the current and ongoing monitoring program results. Mining of Frank Creek Pit is currently proposed only for the north-west and south-west corners of the original pit layout. The proposed layout of the mine and its infrastructure is shown in Figure 3.

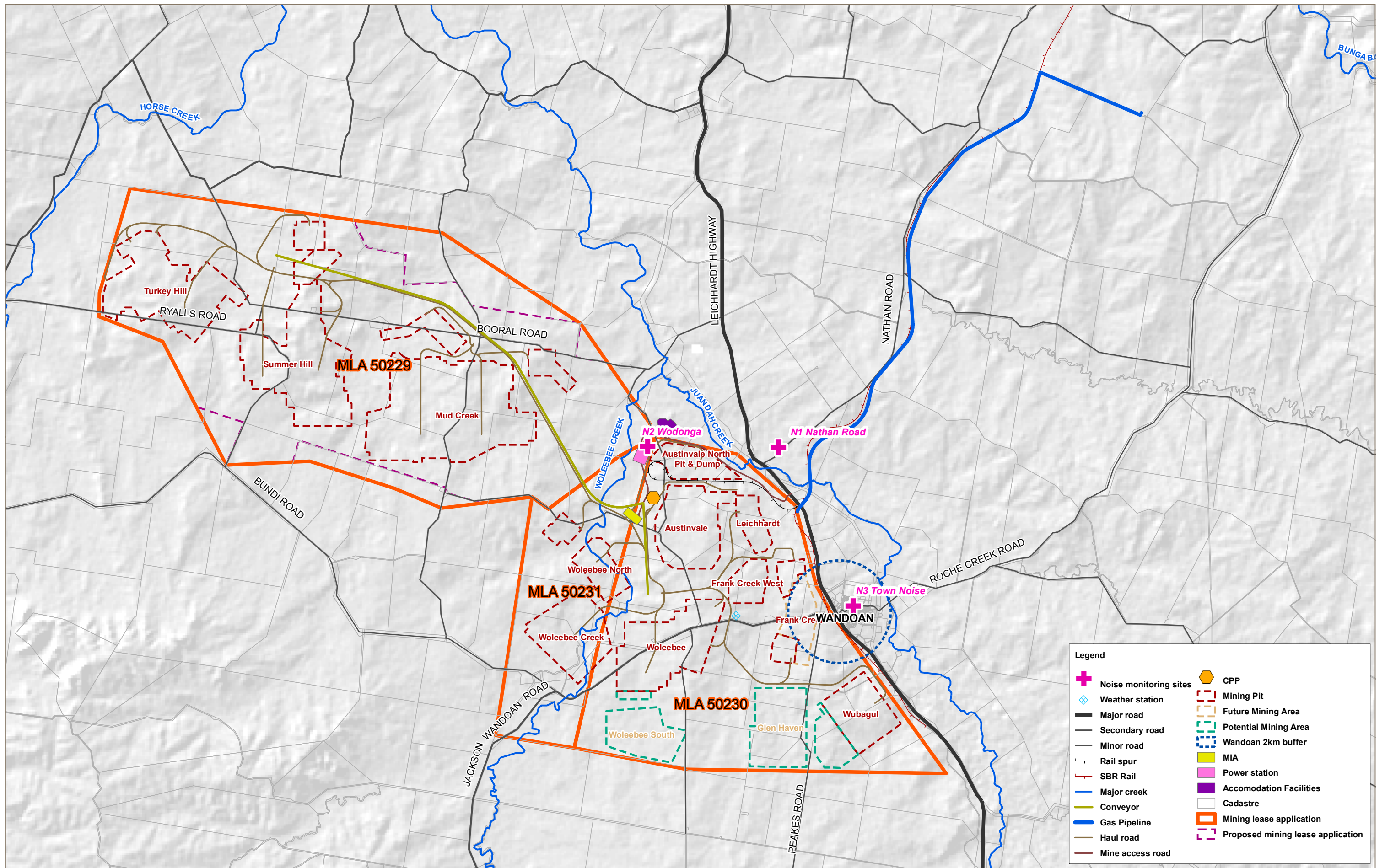
Any potential mining of the Woleebee South Pit is now proposed for consideration beyond the proposed 30 Year Life of Mine operations which is outside the scope of this assessment. The figures below also show an approximate outline of Glen Haven Pit which is located at the southern end of MLA 50230, as a future mining area. This Pit is subject to further exploration drilling and hence no noise assessment has been conducted for this pit area.

A new additional, Wubagul Pit is proposed to be located at the south eastern section of the MLA 50230 in the vicinity of Peakes Road to the Leichhardt Highway. Mining method is to be consistent with the remainder of the mining pits, that is, dragline for overburden then truck and excavator for coal extraction. The creation of this pit has also introduced a new haul road section to access the pit. This pit acts as a substitute to the mining of Frank Creek Pit and Woleebee South Pit as described in the EIS.

4.2 Associated infrastructure

Descriptions of the associated infrastructure at the mine site are outlined in Section 4.2 of the EIS noise technical report.

In addition, combined cycle gas fired power generators of less than 10 MW are being considered for construction power supply, which would then be utilised as an emergency or "top-up" during mine operations. The EIS noise assessment takes into account the worse case option of utilising an on-site 80 MW gas fired power station. The noise emissions from this power station contribute only a small amount to the overall noise emissions from the site. Given the smaller size of the proposed "construction" power generators, noise impacts are considered to be minimal in comparison to the 80 MW plant, given its centralised location within the MLA areas with significant distances to the closest receptors.



Source: Roads, QLD State Digital Road Network (2004); Towns, creeks 1:250K Topo, Geoscience Australia (2006)

5. Assessment criteria

5.1 Operational noise

Based on the noise survey data outlined in EIS Volume 1, Chapter 15 Noise, section 15.3.1, the following noise criteria were calculated using the EPP (Noise) controlling background creep procedure for noise that varies over time using the rated background level (RBL) data. Table 2 also shows the EPP (Noise) outdoor acoustic quality objectives for dwellings.

Table 2 EPP (Noise) generated outdoor criteria

Location	Time of day	RBL (dBA)	Controlling background creep $L_{Aeq,1hour}$ (dBA)	Acoustic quality objectives $L_{Aeq,1hour}$ (dBA)
N1 Nathan Road	Day	26	31	50
	Evening	30	35	50
	Night	18	23	30 (indoor)
N2 Wodonga	Day	25	30	50
	Evening	35	40	50
	Night	19	24	30 (indoor)
N3 Town	Day	26	31	50
	Evening	27	32	50
	Night	24	29	30 (indoor)

The night time levels at N1 Nathan Road and N2 Wodonga are 18 and 19 dBA respectively. The subsequent background creep criteria developed by the EPP (Noise) of $L_{Aeq,1hour}$ 23 and 24 dBA respectively for these locations are impractical to apply given limitations in the accuracy of noise measuring equipment at such low noise levels. The limitation in accuracy relates to the internal electrical noise levels of current sound monitoring equipment. Use of a minimum background noise level can provide reasonable “Controlling background creep” criteria for this Project to protect the amenity of the community.

It is proposed that a threshold background noise level of RBL 30 dBA be set leading to minimum background creep criteria of $L_{Aeq,1hour}$ 35 dBA (based on the EPP (Noise) Background + 5 dB procedure). This approach is consistent with what is considered reasonable generated noise levels for developments in very rural environments such as wind farm developments around Australia assessed against EPA(SA) *Environmental Guidelines: Wind Farms*, as well as industrial developments in NSW (based on the *NSW Industrial Noise Policy*) and Victoria (based on *SEPP N-1*). Each of these assessment methods provides a base noise limit of L_{Aeq} 35 dBA. The proposed $L_{Aeq,1hour}$ 35 dBA external noise criterion outside a dwelling will also satisfy the EPP (Noise) Acoustic quality objective for indoor night time level of $L_{Aeq,1hour}$ 30 dBA which assumes a conservative 5 dBA noise reduction across a bedroom facade with a large open window. Table 3 below outlines the proposed night criteria based on use of a threshold background noise level as well as satisfying the indoor dwelling Acoustic quality objective based on the above assumption.

In all cases satisfying the night criteria will ensure compliance with the criteria for day and evening periods.

Table 3 Proposed night assessment criteria based on threshold background noise level

Location	Time of day	RBL (dBA)	Controlling background creep L _{Aeq,1hour} (dBA)	Acoustic quality objectives L _{Aeq,1hour} (dBA)
N1 Nathan Road	Night	30*	35	35+
N2 Wodonga	Night	30*	35	35+
N3 Town	Night	30*	35	35+

Note * - threshold RBL of 30 dBA applied, + - assumes a 5 dBA noise reduction across a bedroom facade with a large open window to satisfy the EPP (Noise) Acoustic quality objective for indoor noise levels for dwellings at night time of L_{Aeq} 30 dBA

The criteria from the three background noise monitoring sites can be applied to the assessment of neighbouring properties which are expected to contain similar background noise, as outlined in Table 4 below which includes the updated list of applicable sensitive receptors. Criteria for the Cemetery are based on the *Ecoaccess Guideline* for planning outdoor levels at a church in a rural residential area.

Table 4 Representative background noise sites with similar design noise criteria

Receptor	Lot	Plan	Relevant Noise Survey Location	Receptor Type
Cemetery	-	-		Church
MLA-134	34	SP106737	N2 Wodonga	Dwelling
MLA-168	29	SP167183	N2 Wodonga	Dwelling
MLA-175	42	FT505	N2 Wodonga	Dwelling
MLA-188	32	FT444	N2 Wodonga	Dwelling
MLA-199	43	FT506	N2 Wodonga	Dwelling
MLA-239	47	FT466	N2 Wodonga	Dwelling
MLA-240	-	-	N3 Town	Commercial and retail activity
MLA-244	45	FT507	N2 Wodonga	Dwelling
MLA-277	50	FT508	N2 Wodonga	Dwelling
MLA-300	15	FT161	N2 Wodonga	Dwelling
MLA-305	29	FT467	N2 Wodonga	Dwelling
MLA-310	49	FT453	N2 Wodonga	Dwelling
MLA-318	66	FT521	N1 Nathan Road	Dwelling
MLA-355	38	CP899702	N2 Wodonga	Dwelling
MLA-356	68	SP137906	N1 Nathan Road	Dwelling
MLA-364	1	RP144130	N1 Nathan Road	Dwelling
MLA-378	1	RP144130	N1 Nathan Road	Dwelling
MLA-397	67	FT873	N1 Nathan Road	Dwelling
MLA-404	15	SP180948	N2 Wodonga	Dwelling
MLA-415	13	FT667	N2 Wodonga	Dwelling

Receptor	Lot	Plan	Relevant Noise Survey Location	Receptor Type
MLA-420	2	FT1019	N2 Wodonga	Dwelling
MLA-434	2	RP147174	-	-
MLA-443	39	FT576	N2 Wodonga	Dwelling
MLA-453	30	FT468	N2 Wodonga	Dwelling
MLA-478	1	RP170166	N3 Town	Dwelling
MLA-484	1	RP110817	N2 Wodonga	Dwelling
MLA-49	14	FT165	N2 Wodonga	Dwelling
MLA-494	28	FT913	N1 Nathan Road	Dwelling
MLA-50	1	SP210618	N2 Wodonga	Dwelling
MLA-505	6	FT788	N2 Wodonga	Dwelling
MLA-520	36	FT981	N1 Nathan Road	Dwelling
MLA-531	6	FT788	N2 Wodonga	-
MLA-556	5	RP900597	N1 Nathan Road	Dwelling
MLA-574	5	RP900597	N1 Nathan Road	Dwelling
MLA-576	3	RP900597	N1 Nathan Road	Dwelling
MLA-579	29	FT130	N1 Nathan Road	Dwelling
MLA-595	38	AB188	N2 Wodonga	Dwelling
MLA-601	22	FT746	N1 Nathan Road	Dwelling
MLA-616	-	-	N3 Town	Dwelling
MLA-640	2	SP106043	N1 Nathan Road	Dwelling
MLA-679	24	FT41	N2 Wodonga	Dwelling
MLA-687	28	FT563	N2 Wodonga	Dwelling
MLA-692	70	FT590	N2 Wodonga	Dwelling
MLA-693	41	CP857459	N2 Wodonga	Dwelling
MLA-695	70	FT590	N2 Wodonga	Dwelling
MLA-706	47	CP868426	N3 Town	Dwelling
MLA-718	162	FT999	N3 Town	Dwelling
MLA-720	72	FT590	N2 Wodonga	Dwelling
MLA-742	52	FT830	N2 Wodonga	Dwelling
Grosmont School	78	FT580	N2 Wodonga	School
Town Centre	-	-	N3 Town	-

Receptor MLA-531 is a feedlot which is not identified as sensitive receptors in the EP Act, regulations, EPP (Noise) or guidelines, as these have been developed to assess noise impacts on humans. Under the EPP (Noise) the feedlot would be classified as a 'commercial and retail activity' with an indoor

acoustic quality objective of 45 dBA. Benson *et al* (2004) outlines some effects of noise levels on livestock. The hearing frequency range of livestock is very similar to that of humans however it extends to 32,000 Hz (compared to 20,000 Hz for humans). This signifies that noise effects on livestock are similar to that of humans with the additional potential effects of ultrasonic noise (high frequency noise). The machinery that will operate for the Project does not emit large levels of high frequency noise, and as such high levels of ultrasonic noise are not expected to be an issue.

Benson *et al* (2004) also identifies that annoyance in livestock to noise, shown through adverse reactions by the animals (ie movement away from the noise source), was only displayed for steady tone sound and siren-like sounds at 110 and 120 dB. This is a similar reaction as demonstrated by humans to exposure of the same noise levels. These magnitudes of noise will not be experienced by livestock as a result of the Project. It is also noted that *"Livestock do show an amazing ability to habituate to what many people would consider uncomfortable levels of noise... Cattle may habituate to loud, fast moving freight trains to the extent that when they are grazing within 40 m of the tracks, they will not even look up at passing trains."* (Benson *et al* (2004) p112)

Given that the noise emissions emitted from the Project will generally be below L_{eq} 50 dBA as defined in the EPP (Noise) Acoustic quality objective for dwellings (outdoors) during daytime and evening, outside the MLA area boundaries, it can be concluded that these noise levels will not have adverse effects on the wellbeing of the animals.

5.2 Accommodation facility

The accommodation facility has not been treated as a sensitive receptor as it is part of the mine development. However the location and design of the facility will ensure that the EPP(Noise) 2008 outdoor and indoor acoustic quality objectives are met, as well internal noise levels as outlined in AS2107 *"Acoustics-Recommended design sound levels and reverberation times for building interiors"*.

5.3 Construction noise

Section 5.2 of EIS noise technical report discusses any available guidance and recommendations of best practice management and mitigation measures to ensure minimal impact on the sensitive receivers due to construction activities.

6. Noise model

Detailed description and discussion of the propagation noise model as well details of the noise emission data implemented into the noise predictions are outline in Section 6 of the EIS noise technical report.

7. Noise predictions

7.1 Modelling scenarios

The six scenarios outlined in Section 7.1 of the EIS noise technical report have been updated to take into account the changes in the Project operation schedule.

7.2 Operations phase noise predictions

7.2.1 Scenario 1

Scenario 1 is the same per the EIS noise technical report.

7.2.2 Scenario 2 – Year 1

The output during the initial year of operation will be limited to 10 Mt of ROM due to the ongoing establishment of all the equipment and processes on site. The mining activities will be limited to the Austinvale North Pit with the utilisation of only one dragline and three excavators. Table 5 shows the schedule of operating equipment for this scenario.

Table 5 Schedule of operating equipment for Scenario 2

Equipment Designation	Mining Pit	Haulage Road
	Austinvale	
Dragline	1	-
Dozer	5	1
Dump Truck	6	7
Excavator (Medium)	2	-
Excavator (Small)	1	-
Front End Loader	1	-
Grader	-	1
Overburden Drill	3	-
Water Truck	-	1

Predicted noise levels at the receptors are shown in Table 6 below with the complete area noise contours shown in Attachment B.

Table 6 Predicted Noise Levels for Scenario 2

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)	Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Night
Cemetery	40	-
MLA-134	<15	35
MLA-168	<15	35
MLA-175	<15	35
MLA-188	<15	35
MLA-199	<15	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)	Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Night
MLA-239	23	35
MLA-240	24	35
MLA-244	23	35
MLA-277	27	35
MLA-300	19	35
MLA-305	<15	35
MLA-310	26	35
MLA-318	27	35
MLA-355	23	35
MLA-356	31	35
MLA-364	30	35
MLA-378	31	35
MLA-397	28	35
MLA-404	<15	35
MLA-415	<15	35
MLA-420	<15	35
MLA-434	22	-
MLA-443	<15	35
MLA-453	<15	35
MLA-478	22	35
MLA-484	<15	35
MLA-49	<15	35
MLA-494	<15	35
MLA-50	<15	35
MLA-505	18	35
MLA-520	27	35
MLA-531	18	-
MLA-556	<15	35
MLA-574	<15	35
MLA-576	<15	35
MLA-579	<15	35
MLA-595	<15	35
MLA-601	24	35
MLA-616	25	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)	Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Night
MLA-640	<15	35
MLA-679	<15	35
MLA-687	<15	35
MLA-692	<15	35
MLA-693	<15	35
MLA-695	<15	35
MLA-706	26	35
MLA-718	27	35
MLA-720	<15	35
MLA-742	<15	35
Grosmont School	<15	35
Town Centre	24	35

The results are consistent with the EIS assessment with only small differences in predicted noise levels at some sensitive receptors. The predicted noise levels satisfy the assessment criteria, hence no additional attenuation measures are required as outlined in the EIS noise technical report.

7.2.3 Scenario 3 – Year 5

Scenario 3 is considered to have some of the greater potential impacts on the sensitive receptors in the vicinity of Wandoan township given the proximity of the mobile equipment and the dragline in the north eastern area of Wubagul Pit relative to the town. The worst case impacts on the Wandoan township will occur during the mining of the north western and south western corners of Frank Creek Pit. To mitigate those measures recommendations for Scenario 3 in the EIS noise technical report should be followed. Table 7 shows the updated schedule of operating equipment for Scenario 3.

Table 7 Schedule of operating equipment for Scenario 3

Equipment Designation	Mining Pit			Haulage Road
	Wubagul	Woleebee	Austinvale	
Dragline	1	1	1	-
Dozer	4	5	5	1
Dump Truck	3	3	3	10
Excavator (Medium)	1	-	1	-
Excavator (Small)	-	1	1	-
Front End Loader	1	1	-	-
Grader	1	-	-	2
Overburden Drill	-	2	1	-
Water Truck	-	-	-	3

Predicted noise levels at the receptors are shown in Table 8 with the complete area noise contours shown in Attachment B.

Table 8 Predicted noise levels for Scenario 3

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
Cemetery	40	40	-
MLA-134	<15	<15	35
MLA-168	<15	<15	35
MLA-175	<15	<15	35
MLA-188	<15	<15	35
MLA-199	<15	<15	35
MLA-239	23	23	35
MLA-240	38*	34	35
MLA-244	23	23	35
MLA-277	27	27	35
MLA-300	22	22	35
MLA-305	<15	<15	35
MLA-310	26	26	35
MLA-318	27	27	35
MLA-355	23	23	35
MLA-356	32	32	35
MLA-364	31	31	35
MLA-378	32	32	35
MLA-397	28	28	35
MLA-404	<15	<15	35
MLA-415	<15	<15	35
MLA-420	<15	<15	35
MLA-434	41	37	-
MLA-443	<15	<15	35
MLA-453	<15	<15	35
MLA-478	39*	35	35
MLA-484	25	24	35
MLA-49	<15	<15	35
MLA-494	29	28	35
MLA-50	<15	<15	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
MLA-505	29	29	35
MLA-520	32	31	35
MLA-531	27	27	-
MLA-556	27	25	35
MLA-574	28	25	35
MLA-576	28	25	35
MLA-579	34	32	35
MLA-595	<15	<15	35
MLA-601	25	25	35
MLA-616	35	32	35
MLA-640	39*	35	35
MLA-679	16	16	35
MLA-687	<15	<15	35
MLA-692	<15	<15	35
MLA-693	<15	<15	35
MLA-695	<15	<15	35
MLA-706	35	32	35
MLA-718	36*	33	35
MLA-720	<15	<15	35
MLA-742	<15	<15	35
Grosmont School	<15	<15	35
Town Centre	35	31	35

Note: * – exceedance of Assessment criteria

As can be observed from the above results, the assessment criteria are exceeded at a few locations under standard equipment specifications. The noise environment would be dominated by the intermittent impact noise of the dragline bucket jewellery as well as the mining machinery at or near natural surface level. Implementing noise reduction measures to the dragline bucket that is by installing resilient pads and coatings on impact surfaces on the bucket (outlined in detail in Section 6.2.2 of the EIS noise technical report) as well as the use of noise reduced dump trucks in Wubagul Pit would significantly reduce the noise level so that it complies with assessment criteria. .

In comparison to the findings of the EIS assessment, the predicted noise levels in this assessment are lower at the receptors in Wandoan township (MLA-520, MLA-706, MLA-616, MLA-718, MLA-240). This is due to limiting mining activities in Frank Creek to the western corners. Receptors immediately south of Wandoan (MLA-434, MLA-640 and MLA-579) have increased noise impacts due to the proximity of the new Wubagul Pit. Predicted noise at remaining receptors is essentially the same as per the EIS assessment.

It is recommended that continuous noise monitoring with regular reviews especially at the most affected receptors during the operation of Wubagul Pit be carried out to qualify the accuracy of the noise model.

7.2.4 Scenario 4 – Year 10

Scenario 4 contains equipment spread out across all MLA areas, reaching the western boundary of the development with the operation of the initial mining strips at the Turkey Hill Pit. Table 9 shows the updated schedule of operating equipment for this scenario.

Table 9 Schedule of operating equipment for Scenario 4

Equipment Designation	Mining Pit						Haulage Roads
	Turkey Hill	Summer Hill	Mud Creek	Woleebee	Austinvale	Frank Creek	
Dragline	1	1	-	1	-	-	-
Dozer	5	5	-	5	1	-	2
Dump Truck	6	2	-	2	1	1	15
Excavator (Medium)	1	1	-	-	-	-	-
Excavator (Small)	-	1	-	1	-	-	-
Front End Loader	1	-	-	-	-	1	-
Grader	-	1	-	-	-	-	2
Overburden Drill	2	1	1	1	-	-	-
Water Truck	-	-	-	-	-	-	3

Predicted noise levels at the receptors are shown in Table 10 with the complete area noise contours shown in Attachment B.

Table 10 Predicted noise levels for Scenario 4

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
Cemetery	39	39	-
MLA-134	18	17	35
MLA-168	19	19	35
MLA-175	22	22	35
MLA-188	17	17	35
MLA-199	17	17	35
MLA-239	23	23	35
MLA-240	27	27	35
MLA-244	23	23	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
MLA-277	27	27	35
MLA-300	22	22	35
MLA-305	23	23	35
MLA-310	25	25	35
MLA-318	26	26	35
MLA-355	24	24	35
MLA-356	30	30	35
MLA-364	29	29	35
MLA-378	29	29	35
MLA-397	27	27	35
MLA-404	24	24	35
MLA-415	<15	<15	35
MLA-420	<15	<15	35
MLA-434	25	25	-
MLA-443	<15	<15	35
MLA-453	19	19	35
MLA-478	26	26	35
MLA-484	21	21	35
MLA-49	24	23	35
MLA-494	<15	<15	35
MLA-50	28	28	35
MLA-505	30	30	35
MLA-520	27	27	35
MLA-531	31	31	-
MLA-556	<15	<15	35
MLA-574	<15	<15	35
MLA-576	15	15	35
MLA-579	<15	<15	35
MLA-595	40*	35	35
MLA-601	23	23	35
MLA-616	28	28	35
MLA-640	18	18	35
MLA-679	18	18	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
MLA-687	25	25	35
MLA-692	28	27	35
MLA-693	27	26	35
MLA-695	27	25	35
MLA-706	28	28	35
MLA-718	27	27	35
MLA-720	36*	31	35
MLA-742	24	24	35
Grosmont School	20	20	35
Town Centre	27	27	35

Note: * – exceedance of Assessment criteria

Similar to the findings of the EIS noise technical report, using standard specification equipment, exceedances of the assessment criteria are predicted at Receptor MLA-595 because of its close location to the edge of the Turkey Hill Pit (less than 1 km) as well as small exceedances at MLA-720 due to the position of the haulage route which brings the equipment within 2 km from the receptors.

Through the installation of attenuation measures to tracked dozers, mining trucks, dragline bucket jewellery and dragline body as well as water trucks the noise levels can be reduced to comply with assessment criteria.

In comparison to the findings of the EIS assessment, the predicted noise levels at the sensitive receptors are similar. The number of predicted exceedances has been reduced due to some sensitive receptors being purchased or currently undergoing acquisition negotiations with the WJV as well as implementation of the background creep criteria based on the EPP (Noise). Compared to the EIS noise technical attenuation measures are similar in the Turkey Hill Pit however there is no requirement to conduct acquisition negotiations MLA-595.

Given the limited "safety" margin between predicted noise levels and criteria, it is recommended that continuous noise monitoring with regular review especially during favourable noise propagating conditions and operation of Turkey Hill Pit to qualify the accuracy of the noise model be undertaken.

7.2.5 Scenario 5 – Year 20

Scenario 5 sees the mine operate all of the scheduled equipment across seven mining pits including all five draglines. The equipment is spread quite evenly across the whole MLA areas. Table 11 shows the updated schedule of the operating equipment for this scenario.

Table 11 Schedule of operating equipment for Scenario 5

Equipment Designation	Mining Pit							Haulage Roads
	Turkey Hill	Summer Hill	Mud Creek	Woleebee North	Woleebee Creek	Austinvale	Leichhardt	
Dragline	1	1	-	2	-	-	1	-
Dozer	4	3	2	5	3	1	3	3
Dump Truck	3	3	3	1	1	1	1	17

Equipment Designation	Mining Pit							Haulage Roads
	Turkey Hill	Summer Hill	Mud Creek	Woleebee North	Woleebee Creek	Austinvale	Leichhardt	
Excavator (Medium)	-	-	1	-	-	-	1	-
Excavator (Small)	-	1	-	-	1	-	-	-
Front End Loader	1	-	-	1	-	-	-	-
Grader	-	-	1	-	-	-	-	2
Overburden Drill	1	1	1	2	1	-	1	-
Water Truck	-	-	-	-	-	-	-	3

Predicted noise levels at the receptors are shown in Table 12 below with the complete area noise contours shown in Attachment B.

Table 12 Predicted noise levels for Scenario 5

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)	Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Night
Cemetery	42	-
MLA-134	21	35
MLA-168	20	35
MLA-175	23	35
MLA-188	21	35
MLA-199	22	35
MLA-239	27	35
MLA-240	29	35
MLA-244	25	35
MLA-277	28	35
MLA-300	25	35
MLA-305	29	35
MLA-310	26	35
MLA-318	27	35
MLA-355	28	35
MLA-356	31	35
MLA-364	33	35
MLA-378	33	35
MLA-397	28	35
MLA-404	27	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)	Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Night
MLA-415	17	35
MLA-420	19	35
MLA-434	26	-
MLA-443	21	35
MLA-453	25	35
MLA-478	28	35
MLA-484	15	35
MLA-49	25	35
MLA-494	<15	35
MLA-50	30	35
MLA-505	22	35
MLA-520	34	35
MLA-531	22	-
MLA-556	19	35
MLA-574	20	35
MLA-576	20	35
MLA-579	<15	35
MLA-595	29	35
MLA-601	26	35
MLA-616	31	35
MLA-640	19	35
MLA-679	<15	35
MLA-687	23	35
MLA-692	28	35
MLA-693	25	35
MLA-695	25	35
MLA-706	31	35
MLA-718	30	35
MLA-720	28	35
MLA-742	27	35
Grosmont School	22	35
Town Centre	29	35

As can be observed from the above results no exceedances occurred of the assessment criteria at any receptors. However as the equipment progresses towards the southern end of the Summer Hill Pit, it is recommended that attenuation measures are fitted to tracked dozers, mining trucks and dragline bucket in this pit to minimise noise impacts on the receptors directly south. This action should be confirmed by monitoring results at Receptors MLA-305 and MLA-50 highlighting an exceedance to the criteria.

Due to the operation of Leichhardt Pit, higher noise levels are experienced at the cemetery as well as at Receptors MLA-378, MLA-364 and MLA-520. It is once again recommended that continuous noise monitoring with regular review especially during favourable noise propagating conditions to qualify the accuracy of the noise model be undertaken with particular focus for Receptor MLA-378.

In comparison to the findings of the EIS assessment, the predicted noise levels at the sensitive receptors are essentially the same. However less exceedances have been predicted due to some sensitive receptors being purchased or currently undergoing acquisition negotiations with the WJV as well as implementation of the assessment criteria based on the EPP (Noise).

7.2.6 Scenario 6 – Year 30

Scenario 6 sees the mine operate in the Woleebee Pits and Wubagul Pit as well as finishing mining coal from the pits in the western MLA 50229. The Woleebee South Pit has been removed from this scenario due to a change in the mining schedule, but was as previously assessed in the EIS noise technical report. Table 13 shows the updated schedule of operating equipment for this scenario.

Table 13 Schedule of operating equipment for Scenario 6

Equipment Designation	Mining Pit						Haulage Roads
	Summer Hill North	Mud Creek	Woleebee North	Wubagul	Woleebee Creek	Austinvale	
Dragline	1	1	1	1	1	-	-
Dozer	3	3	3	5	4	1	3
Dump Truck	1	4	1	3	1	1	14
Excavator (Medium)	-	1	-	1	-	-	-
Excavator (Small)	1	-	-	1	-	-	-
Front End Loader	1	-	1	-	1	-	-
Grader	-	1	-	-	-	-	2
Overburden Drill	1	1	1	2	2	-	-
Water Truck	1	-	-	-	-	-	2

Predicted noise levels at the receptors are shown in Table 14 with the complete area noise contours shown in Attachment B.

Table 14 Predicted noise levels for Scenario 6

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
Cemetery	39	39	-
MLA-134	<15	<15	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
MLA-168	23	23	35
MLA-175	26	26	35
MLA-188	23	23	35
MLA-199	22	22	35
MLA-239	28	28	35
MLA-240	31	29	35
MLA-244	24	24	35
MLA-277	27	27	35
MLA-300	29	29	35
MLA-305	28	28	35
MLA-310	26	26	35
MLA-318	26	26	35
MLA-355	33	33	35
MLA-356	30	30	35
MLA-364	29	29	35
MLA-378	29	29	35
MLA-397	27	27	35
MLA-404	23	23	35
MLA-415	18	18	35
MLA-420	21	21	35
MLA-434	32	30	-
MLA-443	23	23	35
MLA-453	31	31	35
MLA-478	31	29	35
MLA-484	25	22	35
MLA-49	17	17	35
MLA-494	31	26	35
MLA-50	21	21	35
MLA-505	27	27	35
MLA-520	28	27	35
MLA-531	32	32	-
MLA-556	22	19	35
MLA-574	23	20	35

Receptor	Predicted Noise L_{eq} (1 hour) (dBA)		Assessment criteria L_{eq} (1 hour) (dBA)
	Unattenuated Sound Power	Attenuated Equipment	Night
MLA-576	23	20	35
MLA-579	35	28	35
MLA-595	16	16	35
MLA-601	23	23	35
MLA-616	29	28	35
MLA-640	36*	29	35
MLA-679	18	18	35
MLA-687	30	30	35
MLA-692	29	29	35
MLA-693	32	32	35
MLA-695	27	27	35
MLA-706	29	28	35
MLA-718	29	28	35
MLA-720	26	26	35
MLA-742	29	29	35
Grosmont School	24	24	35
Town Centre	29	28	35

Note: * – exceedance of Assessment criteria

There is only one exceedance of the assessment criteria at MLA-640 due to the dump truck activities associated with the Wubagul Pit. This is a new exceedance when compared to the original EIS assessment which is due to the activities at the new Wubagul Pit.

Previously, exceedances were also predicted at MLA-505 and MLA-552, however with no activities in the Woleebee South Pit in the updated mining schedule, incident noise levels at MLA-505 comply with the assessment criteria, while receptor MLA-552 has been acquired by the WJV. The increased noise levels at MLA-355, MLA-453 and MLA-305 are due to the revised location of some equipment in the Mud Creek Pit when compared to the EIS assessment.

Attenuated equipment (dragline bucket, tracked dozers and mining trucks) could still be required at the Summer Hill North Pit which should be indicated by monitoring results at Receptor MLA-693 as the equipment progresses north in the pit.

Continuous noise monitoring with regular review especially during favourable noise propagating conditions is required to qualify the accuracy of the noise model especially at Receptors MLA-300 and MLA-355. If required, noise levels at these receptors can be managed to within allowable limits through the attenuation of the dragline bucket in Woleebee Creek Pit and Mud Creek Pit respectively.

7.3 Road traffic noise

Road traffic noise assessment is as per Section 7.3 of the EIS technical report.

7.4 Potable water treatment plant

Details of the required attenuation measures for the Potable water treatment plant are outlined in Section 7.4 of the EIS noise technical report.

7.5 Wastewater treatment plant

Details of any required attenuation measures for the Wastewater treatment plant are outlined in Section 7.5 of the EIS noise technical report.

8. Recommendations

8.1 Operational noise mitigation strategies

The recommendations relating to operational noise mitigation strategies have been changed (when compared to the EIS noise technical report) due to the implementation of the new version of EPP (Noise). The driving night assessment criterion of 35 dBA based on the Acoustic quality objective and controlling background creep (as per Table 3) has allowed for less aggressive noise attenuation strategies for this project while still maintaining a reasonable background noise level for protecting the amenity of the community. The subsequent sections outline recommended noise attenuation measures associated with each modelled scenario.

8.1.1 Common mitigation measures

The attenuation and monitoring measures are the same as Section 8.1.1 of the EIS noise technical report with the removal of the following measures due to the WJV purchasing the affected sensitive receptors and the implementation of the EPP (Noise) criteria:

- Install resilient pads and coatings on all dragline buckets
- The WJV will consult with the owner of the abattoir (MLA-740 and MLA-741) with a view to reaching agreement on appropriate mitigation arrangements prior to the commencement of mining within the Frank Creek Pit.

8.1.2 Scenario 3 – Year 5

The attenuation and monitoring measures are the same as Section 8.1.2 of the EIS noise technical report with the addition of the following measures where monitoring and modelling confirms impacts on noise sensitive receptors:

- monitor noise levels at the most exposed receptors in the Wandoan township (ie Receptor MLA-520 and MLA-640) should be carried out on a monthly basis upon commencement and throughout ongoing mining of Wubagul Pit and Frank Creek Pit. One monitoring period should be carried out one month before the commencement of mining at Wubagul Pit
- use noise attenuated mining trucks in the Wubagul Pit so as to satisfy the overall noise levels outlined in Table 9 of the EIS noise technical report
- install resilient pads and coatings on Dragline 3 bucket in Wubagul Pit as per Table 9 of the EIS noise technical report

The following mitigation measures were removed when compared to the EIS noise technical report due to sensitive receptors being acquired or are under negotiations with the WJV as well as changes in operating schedule:

- mine Frank Creek Pit using truck and excavator method only, to remove overburden
- monitor noise levels at the most exposed receptors in the Wandoan township (ie Receptors MLA-520 and MLA-706) should be carried out on a monthly basis upon commencement and throughout ongoing mining of Frank Creek Pit. One monitoring period should be carried out one month before the commencement of mining at Frank Creek Pit.

- based on the monitoring data, if night time levels exceed criteria, limit operations in Frank Creek Pit to daytime only operation, as mining progresses towards the eastern edge of the pit, thereby becoming closer to Wandoan township
- use noise attenuated excavators, tracked dozers, mining trucks and water trucks in Frank Creek Pit.

8.1.3 Scenario 4 – Year 10

The attenuation and monitoring measures are the same as Section 8.1.3 of the EIS noise technical report with the addition of the following measures where monitoring and modelling confirms impacts on noise sensitive receptors:

- periodically monitor noise levels at Receptor MLA-595 (instead of MLA-728) and MLA-720 on a monthly basis to ensure compliance with criteria once operation of Turkey Hill Pit will commence
- use noise attenuated tracked dozers, mining trucks, dragline bucket jewellery and dragline body as well as water trucks, so as to satisfy the overall noise levels outlined in Table 9 of the EIS noise technical report for operations in Turkey Hill Pit

The following mitigation measures were removed when compared to the EIS noise technical report due to changes in operating schedule as well as the implementation of the EPP (Noise) criteria:

- The owner of the property upon which Receptor MLA-595 is located will be consulted by the proponent with a view to reaching agreement on appropriate mitigation arrangements before mining activities commence at Turkey Hill Pit (as noise emissions modelled in this report are predicted to significantly exceed the criteria from operations at Turkey Hill Pit)

8.1.4 Scenario 5 – Year 20

The attenuation and monitoring measures are the same as Section 8.1.4 of the EIS noise technical report with the alteration of the following measure where monitoring and modelling confirms impacts on noise sensitive receptors:

- periodically monitor noise levels at Receptor MLA-305 (instead of MLA-459) on a monthly basis once mining the northern 50% of Summer Hill Pit will be reached

The following mitigation measures were removed when compared to the EIS noise technical report due to changes in operating schedule as well as the implementation of the EPP (Noise) criteria:

- use noise attenuated excavators, tracked dozers, mining trucks and water trucks, so as to satisfy the overall noise levels outlined in Table 9 of the EIS noise technical report for operations in Leichhardt Pit and Summer Hill Pit
- apply acoustic treatment to Dragline 5 body in Leichhardt Pit as per Table 9 of the EIS noise technical report

8.1.5 Scenario 6 – Year 30

The attenuation and monitoring measures are the same as Section 8.1.5 of the EIS noise technical report with the addition of the following measures where monitoring and modelling confirms impacts on noise sensitive receptors:

- use noise attenuated mining trucks so as to satisfy the overall noise levels outlined in Table 9 of the EIS noise technical report for operations in Wubagul Pit
- periodically monitor noise levels at Receptor MLA-640 on a monthly basis once mining of Wubagul Pit recommences identifying any potential exceedances
- periodically monitor noise levels at Receptor MLA-693 (instead of MLA-712) on a monthly basis once mining of Summer Hill North Pit commences identifying any potential exceedances
- periodically monitor noise levels at Receptor MLA-355 on a monthly basis once mining the northern 50% of Mud Creek Pit will be reached
- periodically monitor noise levels at Receptor MLA-300 on a monthly basis once mining the northern 50% of Woleebee Creek Pit will be reached

The following mitigation measures were removed when compared to the EIS noise technical report due to sensitive receptors being acquired or are under negotiations with the WJV, changes in operating schedule as well as the implementation of the EPP (Noise) criteria:

- The owner of the property upon which Receptor MLA-505 is located will be consulted by the Proponent with a view to reaching agreement on appropriate mitigation arrangements before mining activities commence at Woleebee South Pit (as noise emissions modelled in this report are predicted to significantly exceed the criteria from operations at Woleebee South Pit)
- use noise attenuated overburden drills, excavators, tracked dozers, mining trucks and water trucks, so as to satisfy the overall noise levels outlined in Table 9 of the EIS noise technical report for operations in Woleebee Creek Pit
- apply acoustic treatment to Dragline 4 body in Woleebee Creek as per Table 9 of the EIS noise technical report
- periodically monitor noise levels at Receptor MLA-712 on a monthly basis once mining of Summer Hill North Pit commences identifying any potential exceedances

8.1.6 Onsite gas-fired power station

As outlined in Section 8.1.6 of the EIS noise technical report.

8.1.7 Potable water treatment plant

As outlined in Section 8.1.7 of the EIS noise technical report.

8.2 Construction noise

As outlined in Section 8.2 of the EIS noise technical report.

8.3 Noise Management Plan

The only changes relating to the management plan due to the Supplementary EIS assessment relate to the Operating phase noise monitoring which is outlined below. Remaining recommendations are as per the EIS noise technical report.

8.3.1 Operating phase noise monitoring

The noise monitoring measures are the same as Section 8.3.1 of the EIS noise technical report with the addition of the following measures:

- mobile automated continuous monitoring using an unattended noise logger for a 7 day period at:
 - Scenario 3 – During Operation of Wubagul Pit and Frank Creek Pit – Receptors MLA-520 and MLA-640
 - Scenario 4 – During Operation of Turkey Hill Pit – Receptor MLA-720 and MLA-595
 - Scenario 5 – Once mining of the northern 50% of Summer Hill Pit will be reached – Receptor MLA-305
 - Scenario 6
 - During Operation of Wubagul Pit – Receptor MLA-640
 - During Operation of Summer Hill North Pit – Receptor MLA-693
 - Once mining of the northern 50% of Mud Creek Pit will be reached – Receptor MLA-355
 - Once mining of the northern 50% of Woleebee Creek Pit will be reached – Receptor MLA-300

The following measures have been removed due to sensitive receptors being acquired or are under negotiations with the WJV as well as changes in operating schedule:

- mobile automated continuous monitoring using an unattended noise logger for a 7 day period at:
 - Scenario 3 – Monitoring at Receptor MLA-706 is no longer required due to the changes to Frank Creek Pit
 - Scenario 4 – Monitoring at Receptor MLA-728 is no longer required due receptor being under acquisition negotiations with WJV

- Scenario 5 – Monitoring at Receptor MLA-459 is no longer required due receptor being under negotiations with WJV
- Scenario 6 – Monitoring at Receptors MLA-552 and MLA-712 is no longer required due to receptor being acquired or are under negotiations with the WJV respectively

8.4 Health effects

Assessment of health effects is as per Section 8.4 of the EIS noise technical report.

8.5 Low frequency noise

Assessment of low frequency noise is as per Section 8.5 of the EIS noise technical report.

9. Residual impacts

The residual impacts are the same as Section 9 of the EIS noise technical report. Recommended purchases by the WJV of receptors MLA-505 and the abattoir (MLA-740 and MLA-741) have already occurred.

10. Conclusions

The conclusions are the same as Section 10 of the EIS noise technical report with the changes of the following items:

- Through the use of operating scenario specific noise mitigation measures, 24 hour operation can be carried out at all proposed mining pits. Under the updated Frank Creek Pit operating schedule, its operation can also occur over 24 hours per day.
- Operation of Frank Creek Pit will be limited to truck and excavator method to remove overburden no longer required due to changes in Frank Creek Pit operation
- Based on noise monitoring data, operation of Frank Creek Pit to be restricted to daytime hours during favourable noise propagation conditions. Due to operational schedule changes in Frank Creek Pit, this conclusion is no longer required.

11. Summary of mitigation strategies

The mitigation strategies are the same as Section 11 of the EIS noise technical report with the addition of the following items:

- Use noise attenuated equipment as outlined in Table 9 of the EIS noise technical report during specific scenarios at outlined locations as described in Section 8.1 of this report.
- Periodically monitor noise levels at most exposed noise receptors as outlined in Section 8.1 of this report.

The following mitigation strategies have been removed when compared to the EIS noise technical report due to sensitive receptors being acquired or are under negotiations with the WJV as well as changes in operating schedule:

- Operation of Frank Creek Pit using truck and excavator method to remove overburden.
- An agreement with receptor MLA-505 should be achieved before the mining of Woleebee South Pit
- The abattoir (MLA 740 and MLA-741) should be acquired prior to commencement of mining

12. References

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Attachment A

Glossary

Attachment A

Glossary

Ambient noise	See L_{eq}
Background noise	See L_{90}
CHPP	Coal Handling and Processing Plant
dBA	A unit of measurement, decibels (A), of sound pressure level which has its frequency characteristics modified by a filter (A-weighted) which approximates the frequency response of the human ear.
EIS noise technical report	Wandoan Coal Project, EIS Volume 1, Chapter 15 Noise technical report 15-1-V1.5
EP Act	Environmental Protection Act 1994 Reprint No 8D
EPP (Noise)	Environmental Protection (Noise) Policy 2008, Reprint No.1
L_{90}	The noise level which is equalled or exceeded for 90% of the measurement period. L_{90} is an indicator of the mean minimum noise level, and is the descriptor for background noise
L_{eq}	The equivalent continuous noise level for the measurement period, weighted for duration and intensity. L_{eq} is an indicator of the average noise level which is the descriptor for ambient noise.
MLA	Mining Lease Application
PNL	Planning Noise Level
Project	Wandoan Coal Project
Proponent	Wandoan Joint Venture
Receptor	Noise-sensitive land use at which noise from a development can be heard. Referred to as "receiver" in <i>Ecoaccess Guidelines</i> .
RBL	Rated Background Level - The overall single-figure background noise level representing each assessment period (day, evening, night) over the whole monitoring period. Calculated using the tenth percentile method as outlined in the <i>Ecoaccess Guidelines</i> using the collected L_{90} data
ROM	Run of mine
Sound Power Level (SWL)	Property of the source of the sound and it gives the total acoustic power emitted by the source
Sound Pressure Level (SPL)	Property of the sound at a given observer distance from the source and can be measured by a single microphone
WJV	Wandoan Joint Venture

Attachment B

Predicted noise contours

