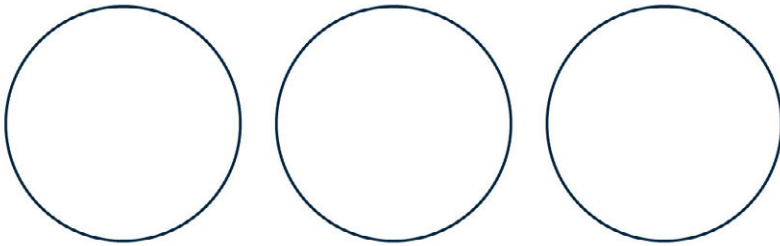


# 14

## NOISE



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# 14 NOISE

*This section summarises the results of the Noise Assessment undertaken for the Ensham Central Project. The detailed Noise Assessment is presented in Appendix G.*

## **14.1 INTRODUCTION**

A detailed assessment of noise impacts has been undertaken by Bassett Acoustics. It has been prepared to address noise issues associated with the project, including those described in the EIS Terms of Reference and raised by stakeholders during the EIS consultation program.

Construction and operation of the project will take place concurrently with, and adjacent to, approved Ensham mining operations. Consequently the cumulative noise impacts of both the project and the approved Ensham mining operations have been assessed in this section. This approach was adopted because noise impacts of the project cannot be meaningfully assessed in isolation, given their close proximity to approved Ensham mining operations.

Impacts from blasting are addressed separately in Section 15 - Blasting.

## **14.2 PROJECT SETTING**

Ensham Mine and the project are located in a rural setting. The only sensitive locations are a number of isolated rural residences, the closest of which is located approximately 3 km from the closest Ensham Central Project open cut mining activity (Figure 14-1). There are no other sensitive locations in the vicinity of the project.

## **14.3 DESCRIPTION OF EXISTING NOISE ENVIRONMENT**

Information about the existing noise environment was obtained from noise monitoring conducted at Residence No's. 32A, 35, 68, 88, 98 and 113 (Figure 14-1) in the vicinity of the project site. Environmental noise loggers were used for monitoring. The noise loggers were positioned at the rear of the residences, and were thus shielded from the existing mine noise by the respective houses. Ambient noise logging was therefore conducted in the absence of noise from the existing Ensham mining operations.

The results from the noise logging at the six residences are presented in Table 14-1.

**Table 14-1  
Measured Rating Background Levels (RBL)**

Residence No.	Measured Median Average Background Level (ABL)			Minimum RBL
	Day	Evening	Night	
32A	32	35	34	32
35	32	33	32	32
68	32	35	33	32
88	32	33	32	32
98	31	34	31	31
113	32	39	35	32

The measured background noise levels have been used to determine the environmental noise emission criteria applicable to the project, as detailed in the *Noise Assessment (Appendix G)*.

## 14.4 REGULATORY REQUIREMENTS

### 14.4.1 Mining Operations

A summary of the criteria applicable to noise emission from the project is provided in Table 14-2. This is discussed further in *Appendix G*. These criteria are applicable to noise levels at sensitive locations, such as residential dwellings on acreage or rural properties.

**Table 14-2  
Summary of Mine Noise Emission Criteria**

Period	Queensland EPA Criteria				World Health Organisation (WHO) Criterion
	"Planning for noise control"	EPA Guideline No. 8	Recent Coal Mine EA Limits	Low Frequency Noise	
Day (6am – 6pm)	34 dB(A) $L_{Aeq}$	36 dB(A) $L_{A10, ADJ, 10 mins}$	50 dB(A) $L_{Aeq, 1 hr}$	50 dB(Linear)	40-45 dB(A) $L_{Aeq}$
Evening (6pm – 10pm)	35 dB(A) $L_{Aeq}$	38 dB(A) $L_{A10, ADJ, 10 mins}$	45 dB(A) $L_{Aeq, 1 hr}$		40-45 dB(A) $L_{Aeq}$
Night (10pm – 6am)	30 dB(A) $L_{Aeq}$	31 dB(A) $L_{A10, ADJ, 10 mins}$	40 dB(A) $L_{Aeq, 1 hr}$		35-40 dB(A) $L_{Aeq}$

The night-time noise emission criteria in Table 14-2 are more stringent than the day and evening criteria due to the lower night-time background noise levels. Consequently compliance with the night-time noise emission criteria will result in 24 hour compliance.

### 14.4.2 Road and Rail Traffic

The project will result in an increase in the workforce and corresponding increase in road and rail traffic to and from the Ensham Mine. The number of trains being loaded at the Ensham rail load out will increase from approximately three trains/day for the existing approved mining operations, to approximately seven trains/day to accommodate the increased production capacity of the mine with the project. Noise criteria applicable to road traffic noise and rail noise have been summarised in Table 14-3.

**Table 14-3  
Road Traffic and Rail Noise Criteria**

Noise Type	Authority	Descriptor	Criterion
Road Traffic	EPP Noise	$L_{10}$ (18 hour)	State controlled road – 68 dB(A) Another public road – 63 dB(A)
		$L_{Aeq}$ (1 hour)	68 dB(A)
		$L_{max}$	80 dB(A)
Train	EPP Noise	$L_{Aeq}$ (24 hour)	65 dB(A)
		$L_{max}$	87 dB(A)

There will be no increase in rail traffic on the Yongala rail loop and no increase in road traffic on Wyuna Road as a result of the project.

## 14.5 PREDICTION METHODOLOGY

A *SoundPLAN 6.3* computer noise model was developed to determine the extent of noise emission from the site. The mine equipment sound power levels used in the environmental noise modelling are based on levels measured during normal equipment operations in the field and on stationary equipment noise measurements provided by manufacturers.

The typical worst-case mine noise impact for the project was established by modelling three different mining operation scenarios as outlined below:

- Project Year 4;
- Project Year 8; and
- Project Year 12.

The typical adverse meteorological weather conditions used in the modelling are:

- Summer Conditions: Pasquil Stability Class D and north-easterly, 3m/s winds; and
- Winter Conditions: Pasquil Stability Class F and south-south-easterly, 3m/s winds.

## 14.6 IMPACT ASSESSMENT

### 14.6.1 Mine Operation

Forecast noise levels at each nearby residence are presented in Table 14-4. *Appendix G* provides noise contours for the modelled scenarios. Residence No. 32A (under Year 4 summer conditions) and Residence No. 94 (under Year 12 winter conditions) are forecast to experience noise levels of

up to 30 dB(A). The noise levels at other residences are not expected to exceed 30 dB(A) under the modelled meteorological conditions. Noise levels of up to 30 dB(A) comply with the most stringent night-time noise criterion of 30 dB(A). Accordingly all residences within the vicinity of the Ensham Mine are predicted to comply with the nominated criteria.

**Table 14-4  
Predicted Environmental Noise Impact at Nearby Residences**

Residence No.	Sound Pressure Levels due to Mine Operation (dB(A))					
	Project Year 4		Project Year 8		Project Year 12	
	Class D	Class F	Class D	Class F	Class D	Class F
	3m/s NE Wind	3m/s SSE Wind	3m/s NE Wind	3m/s SSE Wind	3m/s NE Wind	3m/s SSE Wind
26A, 26B, 26C	<10	<10	<10	<10	<10	<10
27	<b>18</b>	<10	<10	<10	<10	<10
32A, 32B, 32C	<b>30</b>	21	<10	<10	<10	<10
35	<b>26</b>	24	24	18	<b>26</b>	21
44	<10	<10	<10	<10	<10	<10
68	<10	<10	<10	<10	<10	<10
73A, 73B	<10	<10	<10	<10	<10	<10
75	<10	<10	<10	<10	<10	<10
83	<10	<10	<10	<10	<10	<10
86	<10	<10	<10	<10	<10	<10
87	<10	<10	<10	<10	<10	<10
88	<10	<10	<10	<10	<b>23</b>	<b>23</b>
89	<10	<10	<10	<10	<10	<10
94	17	21	23	27	25	<b>30</b>
95	<10	<10	<10	<10	<10	<10
98	<10	<10	<10	<10	<10	<10
99	<10	<10	<10	<10	<10	<10
100A, 100B	<10	<10	<10	<10	<10	<10
102A, 102B	<10	<10	<10	<10	<10	<10
112	<10	<10	<10	<10	<10	<10
113	<10	<10	<10	<10	<10	<10

Note: Bolding identifies highest SPL at each residence

#### 14.6.2 Low Frequency Noise

The predicted low frequency noise emission (Linear Sound Power Level) for Residence No. 94 under Year 12, Class F and 3m/s wind from the SSE conditions and for Residence No. 32A under Year 4, Class D and 3m/s wind from the NE conditions was calculated. The results are presented in *Appendix G*. Low frequency noise emissions were calculated for these residences because they are predicted to experience the highest noise impact from the Ensham Mine, and therefore the highest low-frequency noise impact.

The low-frequency noise impact assessment determined that the predicted Linear Sound Power Level is less than 50 dB (Linear) therefore complying with the low-frequency noise criterion.

#### **14.6.3 Ventilation Shaft**

A ventilation shaft is proposed for the underground mining operations. The noise impact from a ventilation shaft was assessed in *Appendix G*. The assessment determined that simple treatments, e.g. combining a suitable setback distance with commercially available attenuators, can be used to ensure that noise levels at the most affected residence comply with the noise criteria.

#### **14.6.4 Reversing Alarms**

The impact of intermittent high frequency noise from items such as horns and reversing alarms is not reflected in the noise prediction results as noise predictions are based on the dominant noise emission sources. The proponent will monitor any adverse impact from reversing alarm noise through ongoing consultation with neighbouring residents. In the event of reversing alarm noise adversely impacting neighbouring residents, opportunities to reduce the impact through volume/pitch changes or substitution of another system which provides the same level of warning will be investigated and implemented.

#### **14.6.5 Traffic**

The roads that will be affected by the project are Duckponds Road and the Capricorn Highway. The traffic data for these two roads is detailed in Section 9 – Transport and *Appendix G*.

Using the *Calculation of Road Traffic Noise (Department of Transport, 1988)*, the predicted  $L_{10(18 \text{ hour})}$  at the setback distances of 50 m, 100 m and 200 m from Duckponds Road and the Capricorn Highway are all forecast to comply with the 63 dB(A)  $L_{10(18 \text{ hour})}$  criterion for public roads. Accordingly, no mitigation measures are required to control traffic noise emission.

#### **14.6.6 Rail**

The project will continue to use the existing rail transport system to transport coal from Ensham Mine to the Port of Gladstone. The number of trains transporting coal from the mine will roughly double to handle the increased production, but the size of the trains will not increase. This is detailed in *Appendix G*.

The nearest residence to the Ensham rail spur load is Residence No. 89. The overall  $L_{eq}$  (24 hour) noise level of train movements is forecast to increase to 23-24 dB(A) at Residence No. 89. Predicted rail noise impacts from the expanded mining operations, including the project, comply with the 65 dB(A)  $L_{eq}$  (24 hour) rail noise criterion at the nearest residence. Accordingly, no mitigation measures are required to control rail noise emission.

#### **14.6.7 Construction**

The project will utilise the existing infrastructure at the Ensham Mine. Construction activities will comprise the construction of a new washplant, conveyor, ancillary buildings and new underground mine surface facilities as detailed in Section 3 – The Proposal. These activities may include the use of scrapers, dozers, loaders and excavators to clear, level and prepare the site. In addition, the construction of buildings and the washplant will involve a number of building activities, including the use of various hand-powered tools. This type of equipment generates moderate levels of noise. Noise levels generated during the construction of these facilities is no louder than

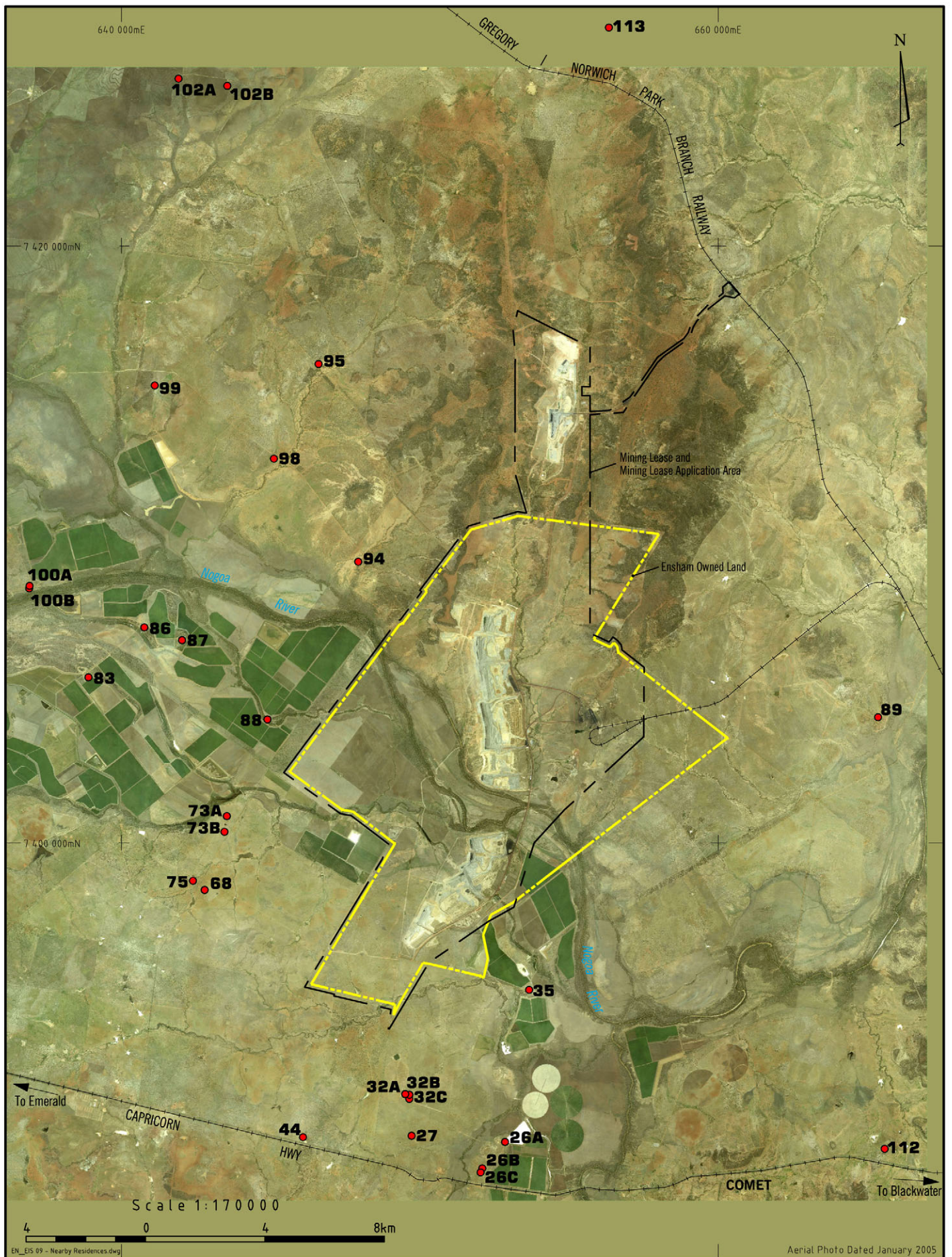
the operation of these facilities and consequently a separate assessment of construction noise is not necessary.

#### **14.7 MITIGATION MEASURES**

The assessment presented in Section 14.6 predicts compliance with relevant noise criteria. Accordingly, no specific noise control measures are required for the project. The proponent will continue to maintain all plant and equipment in good working order to ensure compliance with the noise criteria.

As detailed in the Section 21 – Environmental Management Plan, the proponent has an existing complaints handling protocol to respond to any complaints in relation to noise and conduct investigations, where necessary. The proponent will undertake noise monitoring in response to complaints and/or at the request of the EPA.

# FIGURES



- Privately Owned Residence
- Ensham Owned Land
- Mining Lease and Mining Lease Application Area

ENSHAM CENTRAL PROJECT

## Location of Neighbouring Residences