



DL130 Bauxite Mine

Noise Impact Assessment

Prepared for
ABx Group Limited

Client representative
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Rev 02



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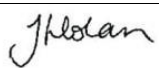
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Revision History

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A	Draft for Internal review	A Seen	D Ford	J Holan	20/2/23
B	Draft for Client Review	A Seen	D Ford	J Holan	20/2/23
C	Updated noise model	A Seen	D Ford	J Holan	14/4/23
00	Final issue	A Seen	D Ford	J Holan	18/4/23
01	Added crusher usage	A Seen	D Ford	J Holan	06/06/23
02	Minor noise source detail changes	A Seen	D Ford	J Holan	23/08/23

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Executive Summary

This noise assessment has been prepared to support an Environmental Effects Report (EER) for the proposed DL130 Bauxite Mine to be operated by ABx Group Limited (ABx) and located on Porters Bridge Road, near Exton.

The mining operation will involve the surface extraction and on-site screening of the ore, before despatching it by truck to the Port of Bell Bay for export. The proposed production rate is estimated to be up to 56,000 tonnes per year.

Noise emissions were modelled using SoundPLAN environmental noise modelling software. The level of the predicted noise emissions from the proposed mine at nearby residences meets the Quarry Code of Practice 2017 daytime noise limit.

On this basis it may be concluded that nearby residents will not suffer from environmental harm or have their amenity adversely effected by noise emissions from the proposed mine.

1. Introduction

This noise assessment has been prepared to support an Environmental Effects Report (EER) for the proposed DL130 Bauxite Mine to be operated by ABx and located on Porters Bridge Road, near Exton as shown in Figure 1 below.

The mining operation will involve the surface extraction and on-site screening of the ore, before despatching it by truck to the Port of Bell Bay or Port of Burnie for export. The proposed production rate is estimated to be up to 56,000 tonnes per year.

The site is located on Porters Bridge Road, approximately 6 kilometres North of the Bass Highway and the township of Exton. The mine is located on the edge of a eucalyptus plantation in an area surrounded by bush and farmland. The nearest sensitive receiver is a rural residence located approximately 800 metres southwest of the site, with several other residences located further away to the west and south of the mine. The only other significant noise source in the area is the Exton Quarry operated by Cresswells Transport approximately 2 kilometres southwest of the site. The surrounding area, including all residences within a nominal 3km radius are shown in Figure 1 below.



Figure 1: DL130 Bauxite Mine site (Blue) and surrounding area, including nearby residences (blue pins), existing major noise sources (green pins) and 3km radius (yellow). Basemap source: theList.

2. Description of Operations

Shallow surface excavation is the proposed primary extraction method on-site, with an average expected depth of excavation of approximately 7 metres. Mining operations will occur during a 10-hour daytime shift, with an estimated production rate of up to 56,000 tonnes per annum over a 20 to 30 year lifespan. Once extraction works are complete the site will be rehabilitated.

Clearing of topsoil will be undertaken using a bulldozer, with the ore then extracted using an excavator and transported to the ROM pad by haul trucks for screening. Once screened the material will be loaded into trucks and taken to the Port of Bell Bay for export. At the end of each campaign a mobile crusher will be brought on site to process oversized material accumulated from the screens.

The site contains two pits, Pit 2 the smaller pit in the north of the site and Pit 1, covering a larger expanse in the southern area of the site. An access road connects the site to a point on Porters Bridge Road, approximately 3 kilometres North of Exton. The layout of the site and access road route are shown in Figure 2, below.

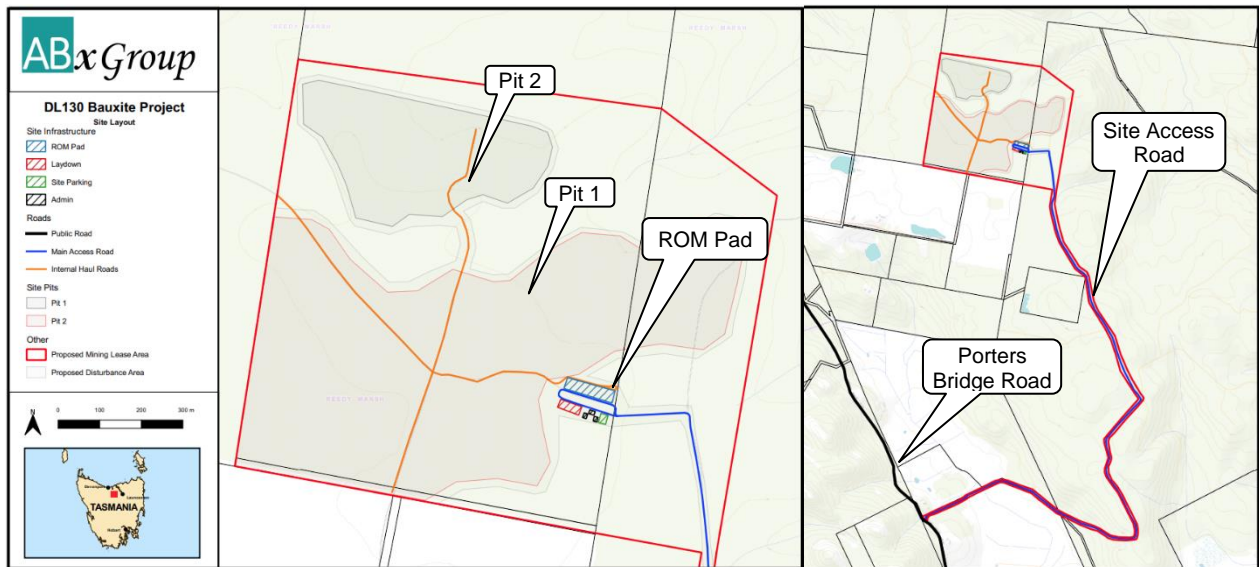


Figure 2: Mining lease layout (left) and access road (right)

3. Noise Assessment

3.1 Noise Criteria

The Tasmanian *Quarry Code of Practice* provides criteria for assessing noise emissions from quarrying operations at nearby sensitive receivers. Noise from quarrying and associated activities, when measured at any neighbouring sensitive receiver must not exceed the greater of:

- The $L_{A90,10min}$ plus 5 dB(A) excluding noise from the quarry; or
- 45 dB(A) during the daytime (0700 to 1900), when measured as an $L_{Aeq,10min}$.

These criteria are consistent with acoustic indicator levels in the Tasmanian *Environmental Protection Policy (Noise)*, 2009 for various daytime residential activities. The proposed mine will only operate during daytime hours. Noise monitoring was not undertaken as part of this assessment, so the 45 dB(A) level will be used as the assessment criterion.

3.2 Noise Sources

Table 1 below shows details of the sound power levels used to characterise the noise sources. As specific makes and models of equipment have yet to be confirmed for the project, sound power levels are based on noise measurements of equivalent equipment made recently at various Tasmanian industrial and quarrying sites by pitt&sherry. No blasting is proposed.

Noise measurements were made using a Rion NL-42 sound pressure meter, mounted on a tripod. All measurements were made in accordance with the Tasmanian DEPHA *Noise Measurement Procedures Manual*, 2008. One third octave spectra for the sound power levels (derived from the original measurements) are listed in Appendix A.

Table 1: Equipment sound power levels.

Noise Source	Description	Quantity	Nominal Height Above Ground – m	Sound Power Level – dB(A)
Excavator	CAT342DL (Nom 48t)	3	2	107.4
Loader	CAT966H (Nom 35t)	2	2	102.6
Trucks	Volvo (Nom 40t)	2	2	103.9
Mobile Screen	Powerscreen Chieftain 1400	2	2	109.2
Generator	Generic	1	1.5	92.5
Bulldozer	D8 or similar	1	2	110.0
Service Truck	Generic (Nom 35t)	1	2	103.9
Light Vehicles	Generic	2	0.5	75.0
Mobile Crusher & Excavator	Terex/Finlay J1175 & CAT 342DL Excavator	1	2	120.2

4. Noise Modelling

4.1 Methodology and Assumptions

Noise modelling was carried out in accordance with the Tasmanian DEPHA *Noise Measurement Procedures Manual*, 2008. Noise level calculations were implemented using SoundPLAN 8.2 environmental noise modelling software. Modelling assumptions and settings include:

- The ISO 9613-2 noise calculation standard was used within SoundPLAN. This standard incorporates “worst case” meteorological conditions for noise propagation
- Terrain topography was obtained from 5 metre elevation data sourced from the ELVIS online elevation database. No modifications to the digital ground model have been made to account for quarrying or stockpiles
- A ground absorption factor was set to 60% soft for the entire modelling area, reflecting the existing environment.
- The excavators, bulldozer, loaders, screens and crusher have been modelled as single point sources, located 2 metres above ground level; and
- Light vehicle and truck movements have been represented by line sources (1.5 m above ground level) representing typical travel paths around the site.

Two scenarios have been modelled:

- One scenario covering normal operations including material extraction with an excavator, mobile screen, loader and bulldozer located in the southwestern corner of Pit 2, another excavator, mobile screen and loader located in the northern area of Pit 2 and a loader and dispatch trucks and a generator located at the ROM Pad; and
- A second scenario covering crushing of oversized material at the end of each campaign, with only a mobile crusher, excavator, loader and dispatch trucks, located approximately 270 metres west of the site access point.

Figure 3, below shows the layout of the SoundPLAN noise model, including the location of the equipment modelled (shown as red dots/lines) and the receivers (shown as yellow dots).

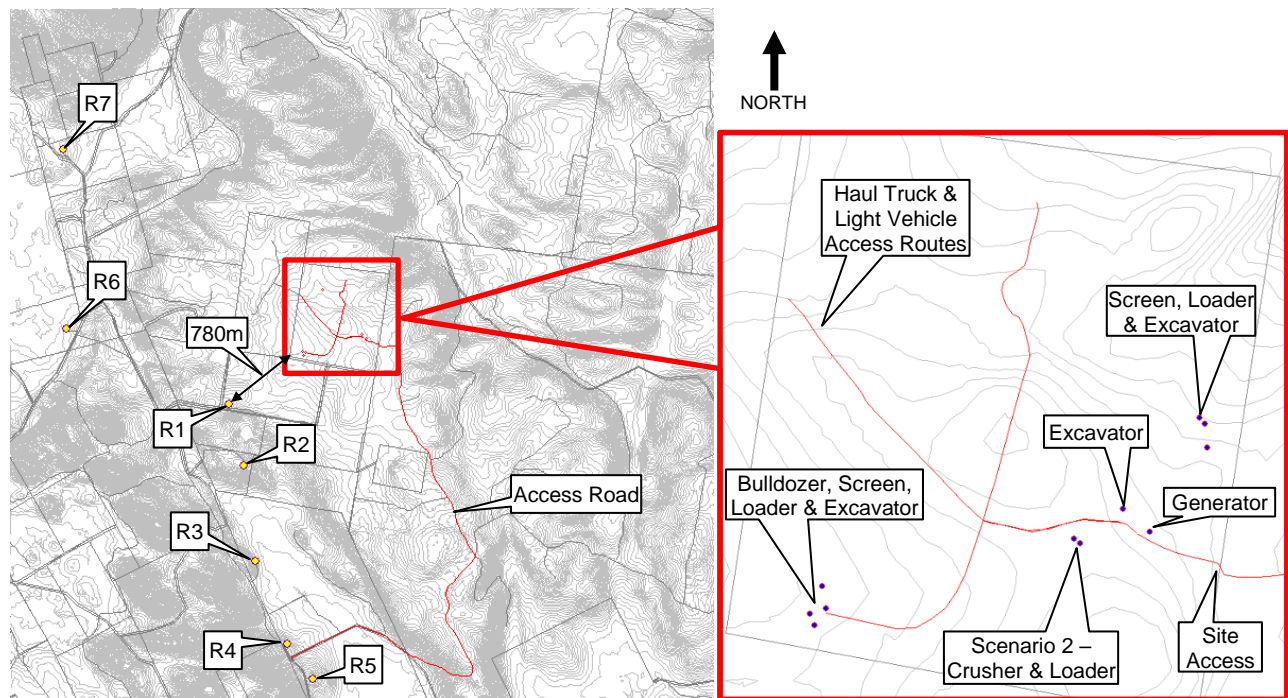


Figure 3: SoundPLAN Noise Model with a close-up of the mine site (right), including the position of the mobile crusher and loader in Scenario 2.

4.2 Intrusive or Dominant Noise Characteristics

Various characteristics of noise can increase the level of annoyance that is caused. These include Tonality, Impulsiveness, Modulation and Low Frequency content. Tonality is where particular frequency bands or “Tones” are present within the noise, such as the “whine” of a circular saw. Impulsiveness is where noise has rapid large changes in amplitude such as gunshots or jackhammers. Modulation is where the noise level cycles up and down rapidly. Low frequency noise is considered a problem when there is significant energy in the 20 Hz to 250 Hz frequency range.

When mining operations are in progress the noise generated contributes to some portion of the ambient noise at nearby residences, with traffic and natural noise making up the remainder. Traffic noise is relatively free from these characteristics, although low levels of tonality and low frequency noise are usually present. Whilst some impulsiveness is detected from mining equipment when in close proximity, these effects are well attenuated over distance and are minimal at the nearest residences.

The one third octave spectrum results from the noise modelling identified several tonal bands at the residential receivers. Using the methodology of the Tasmanian *Noise Measurement Guidelines*, 2008, penalties between 1.0 and 3.3 dB(A) have been applied. A 5 dB(A) correction was also required for low frequency noise.

4.3 Noise Modelling Results

The predicted levels of noise emissions from the mine, at residential premises within 3 km of the site are shown below in Table 2 below. None of the results exceed the 45 dB(A) Quarry Code of Practice limit for daytime operation, also noting that conservative weather conditions are assumed within the model. The results include the required penalties for low frequency and tonality, calculated at each receiver.

Table 2: SoundPLAN Results for proposed mining operations.

Location	Distance from Site Boundary – m	Scenario 1 – Normal Operations - dB(A)	Scenario 2 – Mobile Crusher – dB(A)
R1 - 620 Porters Rd	780	43.7	44.8
R2 - 550 Porters Rd	1200	40.4	40.5
R3 - 420 Porters Rd	2110	36.0	36.1
R4 - 340 Porters Rd	2895	39.0	33.2
R5 - 304 Porters Rd	3170	35.3	32.6
R6 - 875 River Road	2275	34.8	34.0
R7 - 114 Kellys Rd	2700	32.8	32.5



5. Mitigation Measures

As the noise levels are calculated to be below the Quarry Code of Practice daytime guideline level, no specific noise mitigation measures are required. The following “good practice” noise mitigation measures are to be adopted to ensure that noise emissions from mining activities meet the calculated levels:

- All plant and equipment will be maintained in good order at all times, especially noise control equipment such as mufflers and exhaust pipes
- Noise control issues will be considered carefully when selecting new plant or equipment or engaging contractors to carry out work onsite
- An on-site speed limit of 40 km/h will be observed
- All heavy vehicle based on site will use broad band style reversing beacons
- Unnecessary noises such as “dropped loads” or scraping loader buckets on the ground will be avoided
- When processing oversize material, the mobile crusher and loader should be located no further southwest than the position indicated in Figure 3, approximately 270 metres west of the site access point; and
- To ensure that sound levels do not exceed at the nearest sensitive receptor, rock crushing will not occur at the time of other mining activities such as screening.

6. Conclusions

The level of the predicted noise emissions from the proposed ABx DL130 bauxite mine meets the Quarry Code of Practice daytime noise limit and is consistent with the EPP (Noise). On this basis it may be concluded that nearby residents will not suffer from environmental harm or have their amenity adversely effected by the noise emissions from the mine.



Noise Source 1/3 Octave Spectra

Appendix A

Equipment sound power levels and A weighted 1/3 octave sound power levels

Equipment:	Excavator	Loader	Mobile Screen	Bull Dozer	Haul & Service Trucks	Crusher & Excavator
Model:	CAT 342DL Excavator	CAT 966H Wheel Loader	Powerscreen Chieftain 1400	CAT D8	Generic Truck	Terex/Finlay J1175 Mobile Jaw crusher & CAT 342DL Excavator
Total Sound Power Level :	107.4	102.6	109.2	110.0	103.9	120.2
A Weighted Spectrum – dB(A)						
12.5 Hz	28.0	78.3	-33.2	29.6	16.4	36.7
16 Hz	32.7	76.3	-15.5	38.8	21.3	48.9
20 Hz	37.2	74.6	0.5	49.4	29.9	48.8
25 Hz	46.2	78.3	4.5	55.9	44.9	54.2
31.5 Hz	61.0	76.4	23.3	62.6	45.9	65.4
40 Hz	71.2	82.0	46.4	69.2	54.1	72.4
50 Hz	69.5	91.0	54.0	76.0	68.1	81.0
63 Hz	79.7	94.3	63.3	88.0	65.9	89.5
80 Hz	81.3	98.2	65.8	92.5	70.7	93.8
100 Hz	81.4	90.9	67.9	98.2	73.9	100.5
125 Hz	84.4	88.8	67.1	91.2	76.4	99.3
160 Hz	88.5	86.5	72.0	90.1	81.8	100.5
200 Hz	87.5	86.4	79.6	91.5	82.2	102.6
250 Hz	90.6	85.0	84.2	91.6	83.4	102.3
315 Hz	90.4	84.0	89.0	94.9	85.9	101.2
400 Hz	91.4	85.8	92.0	97.6	87.9	106.0
500 Hz	96.1	86.4	95.6	98.5	91.1	108.9
630 Hz	98.8	86.8	95.6	96.4	92.2	112.1
800 Hz	98.9	85.9	96.7	99.0	94.0	111.0
1 kHz	96.3	86.1	98.6	100.1	94.9	109.8
1.25 kHz	98.2	85.0	104.4	99.2	96.4	110.0
1.6 kHz	97.1	88.5	99.9	99.5	95.7	110.3
2 kHz	95.6	83.3	97.9	99.2	93.3	109.0
2.5 kHz	97.2	81.7	98.8	98.8	91.9	108.5
3.15 kHz	94.9	80.5	96.6	97.3	90.4	107.0
4 kHz	91.1	79.7	95.0	96.0	88.2	104.9
5 kHz	86.1	76.1	91.7	94.4	85.8	101.8
6.3 kHz	81.1	74.2	85.3	91.1	82.5	98.2
8 kHz	76.8	72.8	79.2	90.1	79.4	94.3
10 kHz	72.1	71.6	73.5	85.1	76.3	89.8
12.5 kHz	66.4	70.6	65.6	80.7	71.6	84.0
16 kHz	59.0	68.6	56.3	75.6	65.6	77.5
20 kHz	47.6	62.3	41.0	65.5	55.5	66.5



DL130 Bauxite Mine

Noise Impact Assessment

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