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23 September 2020

MAC201200-01LR1

Attention: Roger Kennard
Accent Superannuation Pty Ltd
Via email: roger.kennard@burgtec.com

Dear Roger,

Technical Acoustic Review: Noise and Vibration Impact Assessment

Kariong Sand and Soil Supplies Facilities Upgrade

90 Gindurra Road, Somersby, NSW.

1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Technical Acoustic Review (TAR) of the Noise and Vibration Impact Assessment (the 'historic assessment'), Kariong Sand and Soil Supplies Facilities Upgrade, 90 Gindurra Road, Somersby, NSW (the 'project') prepared by Waves Consulting Pty Ltd (15 January 2020).

The TAR has been prepared on behalf of five nearby landowners of Acacia Road and Debenham Road, Somersby (Lot 3 239 Debenham Road East, Somersby, NSW, 252 Debenham Road East, Somersby, NSW, 242 Debenham Road East, Somersby, NSW, 10 Acacia Road, Somersby NSW, and 12 Acacia Road, Somersby, NSW,).

The TAR has been undertaken in general accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI) 2017; and
- Association of Australasian Acoustical Consultants (AAAC) - Consultants Guideline for Report Writing, 2017.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A.**

2 Key Outcomes of the Technical Review of the Historic Noise Assessment

2.1 General Findings

The TAR identified that the historic report used proprietary 3D modelling software to quantify noise emissions from the project to the nearest affected receivers. The method and meteorological parameters adopted in the model are considered representative of industry standards.

The outcomes of the sleep disturbance assessment (L_{Amax}) and road noise intrusion assessment (RNP) have also been reviewed. MAC concur with the historic report in the findings that the relevant criteria for sleep disturbance and road noise would be achieved at surrounding receivers. Hence these items have not been considered further in this TAR.

2.1.1 Adopted Sound Power Levels

The adopted sound power levels of equipment to be used on site (ie the noise emission data) and adopted as part of the historic assessment is considered to be slightly lower than industry standard (see Table F1 of the Roads and Maritime, Construction Noise and Vibration Guideline (2016) (the 'guideline')).

In particular, the sound power levels of the crusher was modelled at 108dBA and screen 110dBA, the guideline identifies a mobile crusher as having sound power levels up to 113dBA. Similarly, the wood shredder was modelled at 110dBA, while the guideline identifies that sound levels of up to 116dB are relevant for this source. Therefore, the modelling results from the historic assessment are conservatively low and under predict noise emissions to receivers by around 4dB to 5dB.

2.1.2 Background Noise Assessment Location

It is noted that the selection of the background noise monitoring location to establish Project Noise Trigger Levels (PNTL) (noise criteria) was situated on the project site. It is understood that selection of background monitoring locations can be at times difficult due to access, community engagement and security, although an additional background monitoring location at residential receivers to the east (ie 10 Acacia Road which is 150m east of the project site) of the project would be considered beneficial. These receivers are the potentially most affected and appear to have a reduced line of site to the M1 motorway due to lowering and intervening topography compared to the monitoring location adopted in the historic report. It is noted that the M1 Motorway is identified as one of the significant ambient noise sources within the project area.

As such, noise levels measured in this area may also be slightly lower than reported, hence would result in lower project criteria (between 1dB to 3dB lower).

2.1.3 Key Findings and Summary

Section 3.3.3 of the NPI identifies that a development is considered to have a noise impact if the predicted levels at a receiver exceeds the corresponding project noise trigger level. Review of operational noise levels from the historic report identifies an exceedance of the PNTL at 24 Debenhams Road South, hence the project will have noise impacts on this receiver.

Furthermore, taking into account the conservatively low sound power levels in conjunction with lower background noise levels east of the project site, project impacts would be up to 8dB higher than reported.

This potentially results in multiple receivers (10 Acacia Road, 12 Acacia Road, 16 Acacia Road 32 Acacia Road, 242 Debenhams Road South and 252 Debenhams Road South) exceeding the PNTL. The maximum potential exceedance is 9dBA above the PNTL (for 242 Debenhams Road South) which would be above both the PNTL and relevant Amenity Noise Level and is also considered a significant exceedance under the NPI.

We trust this information is satisfactory for your requirements at this time, if you have any questions please contact the undersigned.

Yours sincerely

Oliver Muller
Principal Acoustic Scientist
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Attached: MAC Terms and Conditions and Oliver Muller CV.

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Appendix A – Glossary of Terms

Table A1 provides a number of technical terms have been used in this report.

Table A1 Glossary of Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured LA_{90} statistical noise levels.
Adverse Weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30% of the time in any assessment period in any season and/or temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The noise associated with a given environment. Typically a composite of sounds from many sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.
dB(A)	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear. In some cases the overall change in noise level is described in dB rather than dB(A), or dB(Z) which relates to the weighted scale.
dB(Z)	Linear Z-weighted decibels.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA_{10}	A noise level which is exceeded 10 % of the time. It is approximately equivalent to the average of maximum noise levels.
LA_{90}	Commonly referred to as the background noise, this is the level exceeded 90 % of the time.
LA_{eq}	The summation of noise over a selected period of time. It is the energy average noise from a source, and is the equivalent continuous sound pressure level over a given period.
LA_{max}	The maximum root mean squared (rms) sound pressure level received at the microphone during a measuring interval.
RBL	The Rating Background Level (RBL) is an overall single figure background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the ABL's.
Sound power level (LW)	This is a measure of the total power radiated by a source. The sound power of a source is a fundamental location of the source and is independent of the surrounding environment. Or a measure of the energy emitted from a source as sound and is given by : = 10.log10 (W/Wo) Where : W is the sound power in watts and Wo is the sound reference power at 10-12 watts.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dB(A)	
Source	Typical Sound Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound