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Jackson Environment and Planning Pty Ltd
Suite 102, Level 1
25 - 29 Berry Street
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NSW 2060

Attention: Mark Jackson

Dear Mark

Addendum Report
Kariong Sand & Soil Supplies Facilities Upgrade
Noise & Vibration Responses to the EIS Submissions

1 Introduction

Waves Acoustic Consulting Pty Ltd (Waves Consulting) provided a Noise & Vibration Impact Assessment (Document No. 60.00741.05 RPT1R2.DOCX) as part of the EIS for the Kariong Sand & Soil Supplies Facilities Upgrade, 90 Gindurra Road, Somersby, NSW.

During the EIS exhibition the Department of Planning, Industry & Environment (DPIE) and The Environment Protection Authority (EPA) have provided submission questions regarding noise and vibration impacts from the site which will be addressed in this Addendum Report. The questions from the DPIE and EPA are provided in Table 1 below with the corresponding section of this report where each question is addressed.

Table 1. Summary of DPIE and EPA Submission Questions

Dept	Question / Comment	Where Addressed in this Report
DPIE	Please include predictions of PNLs at all receivers without mitigation measures in place in the Noise and Vibration Impact Assessment.	Section 2
	Please respond to all issues raised in the technical review prepared by Muller Acoustic Consulting dated 23 September 2020.	Section 3
EPA	Demonstrate: that the ambient monitoring location is representative of the ambient noise levels likely to be experienced at sensitive receivers located further to the east and at greater separation distances from the road and industrial noise sources.	Section 4
	Determine whether noise from existing operations at the Kariong Sand and Soil premises influenced the monitored ambient noise levels at the monitoring location.	Section 5
	The EPA notes that the sound power levels presented for the crushing and screening plant appear low compared to data supplied to EPA for similar items of plant and equipment on similar projects. The proponent needs to demonstrate that the sound power levels are achievable and are based on the plant and equipment operating under normal load. Additionally, the NIA should present feasible and reasonable contingency measures that could be deployed should the major noise producing items of plant and equipment exceed levels considered in the assessment resulting in non-compliance with applied limits.	Section 6

2 DPIE – Noise Levels Without Mitigation Measures

Noise modelling of the fixed and mobile noise sources has been used to predict the noise emissions from the typical operation of the facility to the surrounding sensitive receivers.

A selection of the predicted worst-case operational noise levels due to onsite noise sources (with no mitigation measures) are summarised and compared against the NPI project noise trigger levels in Table 2 below.

Table 2. Predicted Operational Noise Levels Compared to PNTLs (No Mitigation)

Location	Worst-Case LAeq,15m			PNTLs Exceedance LAeq,15m			LAeq,15m Sleep Disturbance
	Day	Eve	Night	Day	Eve	Night	
Residential				48	43	43	49
5 Kowara Rd	≤30	≤20	≤20	0	0	0	0
9 Kowara Rd	≤30	≤20	≤20	0	0	0	0
31 Kowara Rd	≤30	≤20	≤20	0	0	0	0
41 Kowara Rd	31	≤30	≤30	0	0	0	0
51 Kowara Rd	33	≤30	≤30	0	0	0	0
10 Acacia Rd	52	47	43	4	4	0	0
12 Acacia Rd	50	44	41	2	1	0	0
16 Acacia Rd	47	41	38	0	0	0	0
32 Acacia Rd	51	42	39	3	0	0	0
125 Debenhams Rd Sth	≤20	≤20	≤20	0	0	0	0
127 Debenhams Rd Sth	≤30	≤30	≤30	0	0	0	0
129 Debenhams Rd Sth	32	≤30	≤30	0	0	0	0
184 Debenhams Rd Sth	≤30	≤30	≤30	0	0	0	0
198 Debenhams Rd Sth	33	≤30	≤30	0	0	0	0
214 Debenhams Rd Sth	42	31	28	0	0	0	0
223 Debenhams Rd Sth	43	41	38	0	0	0	0
242 Debenhams Rd Sth	52	46	42	4	3	0	0
252 Debenhams Rd Sth	41	35	32	0	0	0	0
Correctional / Residential				48	43	43	49
Frank Baxter Juvenile Justice Centre	46	36	33	0	0	0	0
Commercial / Active Recreation				53	53	-	-
Central Coast Riding for the Disabled	47	31	28	0	0	-	-
Industrial				68	68	68	
All Industrial sites	<50	<30	<30	0	0	0	-

With no noise mitigation several of the nearby residential receivers demonstrated moderate exceedances of the PNTLs during daytime operations when the crusher and screening plant are operational. In addition, delivery trucks and onsite vehicle movements were found to exceed the PNTLs during the evening and night-time periods.

These results mean that noise mitigation measures should be investigated as addressed in Section 6.1 of the original NVIA report.

3 DPIE – Muller Acoustic Consulting Letter

During the submissions period a local resident commissioned a peer review study of the Noise & Vibration Impact Assessment (NVIA) which was submitted to the DPIE as part of the response submissions. The peer review was conducted by Muller Acoustic Consulting (Document No. MAC201200-01LR1V1). The Muller Acoustic Consulting (MAC) letter raises two technical (2) concerns regarding the original NVIA. These technical concerns will be addressed in the discussion below.

3.1 MAC Letter: Adopted Sound Power Levels

Section 2.1.1. of the MAC letter states the following:

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.

The Waves Consulting report used actual measured data as provided by the manufacturer for each item of equipment (as stated in Section 2.3 of the report). The MAC letter discredits the adopted Sound Power Level data used in the report citing noise level data from a generic data source - in this case the 2016 Roads and Maritime (RMS) Construction Noise and Vibration Guideline (CNVG).

Actual manufacturer's data should always be used in an assessment instead of generic data, when available.

We note that the RMS CNVG refers to the noise level data as: *Highest allowable noise levels for construction equipment*. In other words, the data should be used as limiting factor for construction vehicles on site. This means that this noise data is considered the absolute worst-case. It is not suitable for comparison in this case.

Furthermore, the MAC letter claims that the RMS CNVG identifies a 'mobile crusher' in the data tables. Waves Consulting could not find a 'mobile crusher' in the RMS CNVG data tables. We did find a 'mobile crane' with the same 113 dBA sound power level. Perhaps this was the equipment used in the MAC letter as a reference?

Overall, the MAC letter claims are inaccurate by referencing a generic data source and not acknowledging the manufacturer's data used in the Waves Consulting assessment. The adopted sound power levels used in the Waves Consulting assessment are satisfactory as a result.

3.2 MAC Letter: Background Noise Assessment Location

Section 2.1.2. of the MAC letter states the following:

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).

The Waves Consulting report used a 'representative' background noise level location as per the requirements of the NSW Noise Policy for Industry (NPI). The NPI does not target the lowest background noise level in an area which may only affect a few receivers. The aim of the NPI background noise monitoring is to capture a representative noise level which characterises the average of the receivers in the area.

The noise logger in this study was located on the boundary line for the residential property at 10 Acacia Road, Kariong, which is the closest residential receiver to the site. The logger was situated at the boundary so that no 'self-noise' from the property at 10 Acacia Road would influence the measurements (ie unduly increase the background noise levels). No industrial operations occurred on the subject site during the noise study. However, industrial and road traffic noise sources are located in all directions (eg industrial - west, roads - north, east and west, excavation - east, commercial - south). Waves Consulting are of the opinion that the noise logger is suitably located to capture the representative background noise levels. Therefore, the Project Noise Trigger Levels (PNTLs) derived from the background noise levels are correct as a result.

The MAC letter claims that the noise levels would be lower by 1 to 3 dB at 10 Acacia Road address. However, the report shows the noise logger was located on the boundary of this property, which would avoid 'self-noise' from the property. In addition, this claim is made with no measurements or data to back-up the claim. Therefore, MAC letter claim is not based on objective evidence and should not be considered further.

Finally, we note that background noise levels (the L90) are typically comprised from diffuse sound sources in the environment. In other words, the L90 comprises noise from all directions in the environment. The environment surrounding the project site has roads, industry and excavation operations in all directions. It is incorrect to claim that line-of-sight or topographical differences between measurement locations can be used to accurately estimate noise level changes in diffuse / complex noise environments.

4 EPA – Background Noise Monitoring Location

The Waves Consulting report used a 'representative' background noise level location as per the requirements of the NSW Noise Policy for Industry (NPI). The NPI does not target the lowest background noise level in an area which may only affect a few receivers. The aim of the NPI background noise monitoring is to capture a representative noise level which characterises the average of the receivers in the area.

The noise logger in this study was located on the boundary line for the residential property at 10 Acacia Road, Kariong, which is the closest residential receiver to the site. The logger was situated at the boundary so that no 'self-noise' from the property at 10 Acacia Road would influence the measurements (ie unduly increase the background noise levels). However, industrial and road traffic noise sources are located in all directions (eg industrial - west, roads - north, east and west, excavation – east, commercial – south).

Therefore, Waves Consulting are of the opinion that the noise logger is suitably located to capture the representative background noise levels. Therefore, the Project Noise Trigger Levels (PNTLs) derived from the background noise levels are correct as a result.

5 EPA – Existing Operation During Noise Study

No industrial operations occurred on the subject site during the noise study. Therefore, Waves Consulting are of the opinion the original noise study is valid and representative of noise environment in this area.

6 EPA – Adopted Sound Power Levels

The Waves Consulting report used actual measured data as provided by the manufacturer for each item of equipment (as stated in Section 2.3 of the report). The worst-case noise levels (ie equipment operating under maximum load) were used in each case. The adopted sound power levels and recommended mitigation measures (ie noise walls and partial enclosure of the equipment) demonstrated compliance at all of the residential receivers as per the NVIA.

Recent proposed design changes as provided by Jackson Environmental Planning Pty Ltd (dated 27 November 2020) show that the Screen and Crusher operations will now be housed inside fully enclosed buildings, with only small openings to allow conveyor belts into and out of the building. The conveyor belts will also be fully enclosed and capped with thick rubber curtains. The buildings / enclosures will be constructed of standard Colourbond sheeting and the openings will be covered with thick rubber curtains. The adjacent bunkers will be constructed of thick concrete walls with one (1) thick rubber curtain wall and roof. Waves Consulting estimate that these changes will reduce noise emissions by 10 to 15 dB.

If we assume that the manufacturers noise levels are incorrect by 10 dB, this will mean that the equipment in question would have sound power levels as follows:

Screen: 108 dB LWA → 118 dB LWA
Crusher: 110 dB LWA → 120 dB LWA

These sound power levels are considered extreme and would not be typical for this type of equipment. In any case, the 10 dB increase (assumed) would be counteracted by the proposed design changes and enclosure of the equipment.

The proposed design changes mean that overall, the equipment noise emissions will either: 1) decrease by 10 dB if existing manufacturers data is used, or 2) remain unchanged if we assume manufacturers data is wrong and apply a significant 10 dB penalty to the sound power levels.

In either case, Waves Consulting is of the opinion that the noise emissions from the site will satisfy the noise criteria and that no further contingency or mitigation measures are required as a result.

I trust this addendum provides sufficient detail for your current requirements. If you have any questions, please do not hesitate to contact me.

Yours sincerely



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