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DA/
Ref: 151005_Addendum Noise Impact Assessment_5Jan2016
06 January 2016

Megan Kublins
Executive General Manager Property & Development
Brickworks Ltd

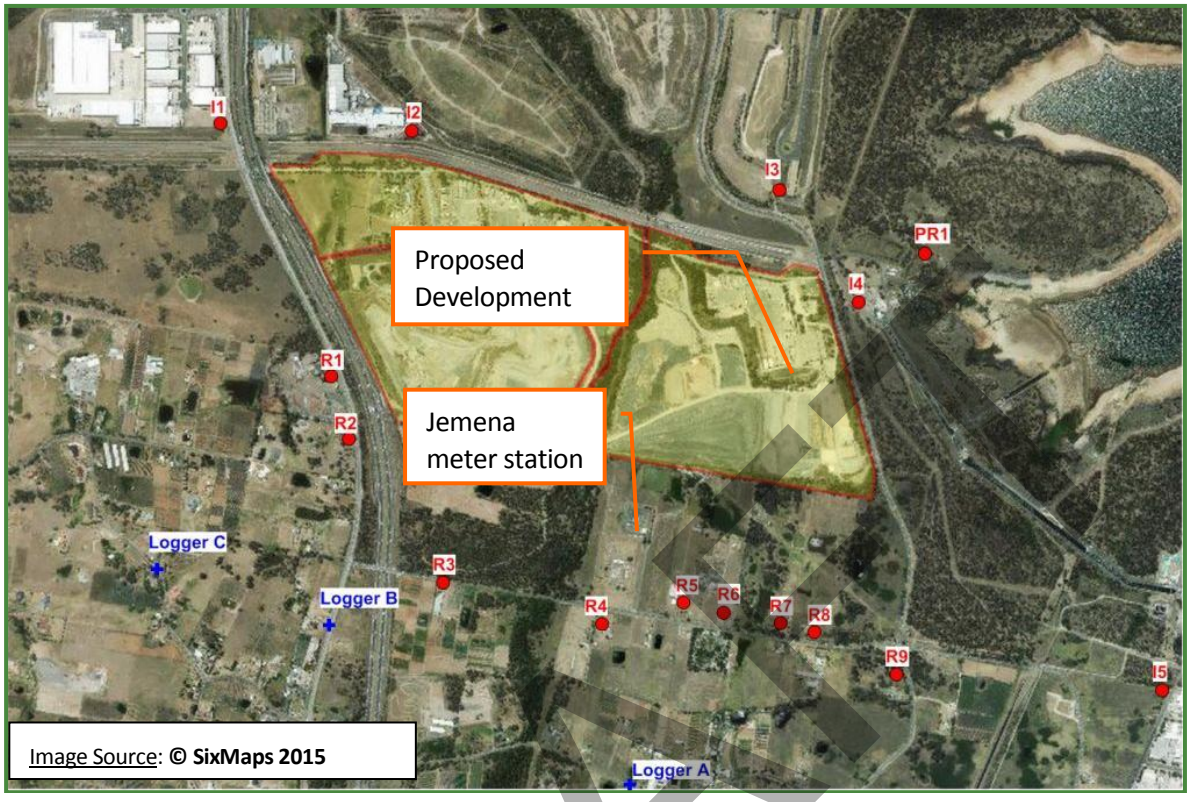
Re: 151002 Noise Impact Assessment Addendum

Benbow Environmental prepared a Noise Impact Assessment for the proposed alterations and additions to the existing Brickworks facility located at 780 Wallgrove Road, Horsley Park.

This addendum letter report has been prepared in order to clarify certain matters raised by the NSW Environment Protection Authority regarding the amenity noise levels at two particular residential locations.

The location of the proposed development, the nearest receptors, the noise monitoring locations and the Jemena meter station are shown in Figure 1.

Figure 1: Noise Monitoring Location and Nearest Sensitive Receptors



Note: R: Residential; PR: Public Recreation; I: Industry

The ambient and background noise levels at location R4 and R5 is dominated by the noise emissions from the Jemena meter station.

The noise contribution from the Jamena meter station was measured to be 49dB(A) and 43dB(A) at location R4 and R5 respectively.

Logger A was located away from the residences and the Brickworks' site in order to exclude the noise contribution from the existing on-site activities. At location R4 and R5 the actual background noise level is higher than the one measured at location Logger A. This resulted in a more stringent intrusiveness criterion which gives a conservative approach to the assessment.

The project specific noise levels were established for location R4 and R5. These are shown in Table 1.

Table 1: Project Specific Noise Levels Associated with Operational Activities, dB(A)

Receptor	Time Period	Measured RBL L90	Estimated Industrial Noise L_{eq}	Acceptable Noise Level L_{eq}	Intrusive Criterion $L_{eq,15minute}$	Amenity Criterion $L_{eq, period}$	Sleep Disturbance L_{max}
Residential Receptors							
R4	Day	46	49	60	51	60	-
	Evening	46	49	50	51	50	-
	Night	41	49	45	46	39	55
R5	Day	46	43	60	51	60	-
	Evening	46	43	50	51	50	-
	Night	41	43	45	46	41	55

With noise control measures in place the predicted noise levels were found to comply with both the intrusive noise criterion and the amenity criterion at all receptors under neutral weather conditions. Under noise enhancing weather conditions exceedances were predicted at location R4 and R5.

The predicted noise levels at receptor R4 and R5 under noise enhancing weather conditions have been presented in the Table 2. This shows the predicted $L_{eq(15minute)}$ assessed against the intrusiveness criteria.

Table 3 shows the predicted $L_{eq(period)}$ assessed against the amenity criteria. The $L_{eq(period)}$ has been considered to be equal to the $L_{eq(15minute)}$ minus 2 dB.

The cumulative noise impact resulting when considering the Jemena meter station operation is shown in Table 4.

Table 2: Noise Modelling Results, dB(A) – Intrusive Criteria

Receptor	Predicted Noise Levels				Intrusive Criteria			
	Day $L_{eq, 15min}$	Evening $L_{eq, 15min}$	Night $L_{eq, 15min}$	Night L_{max}	Day $L_{eq, 15min}$	Evening $L_{eq, 15min}$	Night $L_{eq, 15min}$	Night L_{max}
Residential Receptors								
R4	43 ✓	43 ✓	43 ✓	43 ✓	51	51	46	55
R5	45 ✓	45 ✓	45 ✓	45 ✓	51	51	46	55

The predicted noise levels were found to comply with the intrusive noise criterion.

Table 3: Noise Modelling Results, dB(A) – Amenity Criteria

Receptor	Predicted Noise Levels			Amenity Criteria		
	Day $L_{eq, day}$	Evening $L_{eq, evening}$	Night $L_{eq, night}$	Day $L_{eq, day}$	Evening $L_{eq, evening}$	Night $L_{eq, night}$
Residential Receptors						
R4	41 ✓	41 ✓	41 ×	60	50	39
R5	43 ✓	43 ✓	43 ×	60	50	41

The predicted noise levels were found to exceed the amenity criterion by 2dB during night time and under noise enhancing weather conditions.

Table 4: Noise Modelling Results, dB(A) – Cumulative Noise Impact

Receptor	Predicted Noise Levels			Jemena	Cumulative Noise Impact		
	Day $L_{eq, day}$	Evening $L_{eq, evening}$	Night $L_{eq, night}$	Day, Evening and Night $L_{eq(period)}$	Day $L_{eq, day}$	Evening $L_{eq, evening}$	Night $L_{eq, night}$
Residential Receptors							
R4	41	41	41	49	49.6✓	49.6✓	49.6 ×
R5	43	43	43	43	46✓	46✓	46 ×
Acceptable Amenity Noise Level					**60**	**50**	**45**

The cumulative impact would result in no significant increase at location R4 (+0.6dB).

At location R5 an increase to the existing industrial noise level up to 3dB has been predicted. The cumulative impact would exceed the acceptable amenity noise level by 1dB during night time under noise enhancing weather conditions. This is considered to be a negligible exceedance.

The above predicted noise levels were obtained after implementation of all reasonable and feasible noise mitigation measures. Table 5 presents a list of the possible noise control measures and a discussion to determine if these controls are feasible and/or reasonable.

Table 5: Noise Control Measures

Noise Control	Feasible?	Reasonable?
Controlling noise at the source	Controlling noise at the source is considered feasible for a number of noise sources. Feasible noise control measures would be applied to the vent stack, vent fan, cyclone, throttle valve and stack. These would consist of silencers and acoustic enclosure. The noise control measures are listed in the Noise Impact Assessment (ref. 151005_Noise_Rep_Rev5. Controlling noise at the existing crusher and the proposed triple deck screen is not considered a feasible option. The southern facade of the existing crusher is open in order to allow front end loaded access.	All the reasonable noise controls at the sources have been implemented. In order to further reduce the noise emissions from the subject site noise controls should be applied to the existing crusher and the triple deck screen. However, these were determined not feasible control measures.

Table 5: Noise Control Measures

Noise Control	Feasible?	Reasonable?
Controlling noise in transmission	Controlling noise in transmission is a feasible option for the existing crusher and front end loader operating within it. A 10m high earth berm has been implemented to the southern side of the site. This is considered a feasible option. Another feasible noise control measure would apply to the gas burner. The building located around the burner would need to be constructed using a double cladding system of 0.48 BMT steel having a 200 mm air gap filled with insulating material. The opening present to the western side of the existing crusher building would need to be sealed by using a 0.42BMT colorbond steel or alternative. A large stockpile is present to the southern side of the site and it would provide significant acoustic shielding. No further feasible noise control measures in transmission were found.	These noise control measures are considered reasonable in order to provide adequate noise reduction for the noise associated with the proposed kilns and the existing crusher and associated front end loader operations.
Controlling noise at the receiver	Controlling noise at the receptors R4 and R5 is a feasible option	Benbow Environmental does not consider this option reasonable as the existing ambient noise at both receptors is dominated by the noise emissions associated with the Jemena meter station.

The Noise Impact Assessment determined that the predicted operational noise levels would comply with the project specific noise level under neutral weather conditions.

Compliance with the PSNL is also achieved under noise enhancing weather conditions during daytime and evening time.

During night time, an exceedance of the acceptable amenity noise level was predicted. At location R4 the current ambient noise level would not be significantly increased by the noise associated with the proposed development.

At location R5 the cumulative noise impact from the proposed development and the existing Jemena meter station was predicted to exceed the acceptable amenity noise level during night time by 1dB. This exceedance is considered negligible.

The predicted noise impact would generate a marginal increase in the existing noise levels at location R4 and R5 under noise enhancing weather conditions. Benbow Environmental believes that all feasible and reasonable noise control measures have been implemented and included in the Noise Impact Assessment.

Yours faithfully,

Daniele Albanese
Senior Acoustical Consultant