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ACOUSTICS ASSESSMENT

Unit 2,

No.10-12 Smith Street Emu Plains NSW

Industrial Noise Impact

Report: BGMA 100711

Date: September 2010

Prepared For: SEMF Pty Ltd

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BGMA Pty Ltd

INTRODUCTION

No Fuss Liquid Waste Pty Ltd is located at 10-12 Smith Street, Emu Plains. It is proposed that the site will process oily liquid waste at Unit 2, 10-12 Smith Street.

No Fuss Liquid Waste Pty Ltd currently treats septic and sullage waste in Unit 1, 10-12 Smith Street.

BGMA Pty Ltd, acoustical consultants, has been engaged to provide a noise assessment of the proposed development on nearby residential and commercial premises.

AREA DESCRIPTION

The development is located off the eastern side of the Smith Street.

The following indicates in red, the location of the development at No.10-12 Smith Street.



The site lies within a small industrial area with Smith Street running north-south down the centre and Railway Street along its eastern edge. The Emu Plains Corrective Centre shares the western boundary. The area to the north and east is a Boreal quarry.

Smith Street continues south past the intersection with Lee Street to join the Old Bathurst road that provides access, via a railway line underpass, to the Great Western Highway.

The industrial area is about 175 metres east-west by 210 metres north south. The site is about 70 metres from the northern end and about 50 metres from Railway Street.

The nearest “residential areas” appear to be Nepean River Holiday Village 550 metres to the west, and residential areas to the south-east along the Great Western Highway.

The McCarthy Catholic School is 550 metres to the west. Nepean High is 500 metres to the south-south-west.

The residential part of the Emu Plains Corrective Centre about 530 metres to the north-north-east.

Assuming a ‘background’ of 30 dB(A), the premises would require a sound power level in excess of 100 dB(A) to exceed the background residential noise criteria.

SITE DESCRIPTION

The site at No.10-12 Smith Street is about 27 metres north south by 35 metres east-west.

The building on the site is L-shaped extending 27 metres across the rear of the site, and 27 metres along the northern boundary from the rear boundary.

The area across the rear eastern boundary extends 6 metres from the eastern boundary. The area along the northern boundary extends 15 metre from the northern boundary. The roof is 5 metres above floor level.

The area currently devotes to septic and sullage waste is about 15 metres east-west by 15 metres north south.

The proposed oily liquid waste treatment area is at the rear with the treatment equipment located along, but not touching the rear wall.

The northern end of this area is 12 metres by 15 metres with the southern end being 6 metres by 15 metres.

Two small rooms, plus amenities take up an area 3 metres by 6 metres plus an area 5 metre by 2.2 metres on the western side. Part of the amenities area has been given over to compressor containment.

Measurements were carried out in this area with the equipment operating but without waste product.

The building is of concrete block construction with the roof being of profiled sheet metal construction.

Based on discussion with the operator, the premises to the north operate as a warehouse, the premises to the east are recyclers and the area is used for storage of mini-skips, the premises to the south operates as a metal workshop.

ENVIRONMENTAL BACKGROUND NOISE LEVELS

Environmental noise measurements were carried out by 'attended monitoring' on Thursday, 2 September, 2010.

Noise levels were measured using a 01dB-Stell "Symphonie" (S/N #01481) attached to a Toshiba Satellite M50 portable computer (S/N X5250779K), with 01dB-Stell pre-amplifier (S/N 011280) and microphone (S/N 18528). This sound level acquisition system conforms to appropriate Australian Standard for sound level meters, as a Type 1 precision sound meter. The calibration of the meter was checked before and after the measurement period with a Svantek SV 30A acoustical calibrator (S/N 7942). No significant system drift was observed.

To assess the general noise levels of the area during the day, attended monitoring was carried out between 11:30am and 13:30pm.

The monitoring occurred at the boundary of No.12 Smith Street, exposed to the general noise of the areas.

Table 1 — Measured Environmental Noise Levels – Front of Premises

Time Intervals	Standard Noise Descriptors for 15 minute Measurement Periods in dB(A)					
	L _{Aeq}	L _{Amax}	L _{A01}	L _{A10}	L _{A90}	L _{Amin}
11:30am – 11:45am	59	80	71	61	48	46
11:45am – 12:00pm	53	69	63	56	46	43
12:00pm – 12:15pm	55	77	65	58	48	45
12:15pm – 12:30pm	54	74	65	57	48	46

These noise levels would be representative of the frontal exposure of the premises along this portion of Smith Street.

The L_{Amax} noise levels of 74 to 80 dB(A) were due to passing traffic on Smith Street. The L_{A01,15min} noise levels of 56 to 61 dB(A) were indicative of the workshop noise from other nearby premises.

The general L_{Aeq,15min} noise level of the area was 53 to 55 dB(A) due local industry noise.

NOISE CRITERIA

For the site to be acceptable, it should not be a source of 'offensive noise'. 'Offensive noise' is defined within the protection of Environmental Operations Act' (1997) as meaning:

'Noise:

a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances, prescribed by the regulations.'

Guidance on the assessment of 'offensive noise' is provided by criteria contained within the 'Industrial Noise Policy' (January 2000).

For a site surrounded by commercial premises, Amenity Criteria is applied.

The Industrial Noise Policy (January 2000) stated that:

'To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed the acceptable noise levels specified in Table 2.1.'

The relevant sections of Table 2.1 in the Industrial Noise Policy are reproduced in Table 2. The area would be classified as 'commercial premises' according to the Industrial Noise Policy classifications for interpretation of Table 2.1. Daytime is defined as 0700 to 1800 hrs, and evening from 1800 to 2200 hrs.

Table 2 – Recommended Noise Levels from Industrial & Commercial Noise Sources in dB(A).

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level	
			Acceptable	Extreme
Commercial	All	When in use	65	70

Modifications are applied relative to an Amenity Noise Level to account for the existing level of environmental noise. Where a site is exposed to constant industrial noise or relatively consistent traffic noise, an Amenity limit is recommended. These modifiers are shown in Table 2.

Table 3 – Modifications to Acceptable Noise Level to Account for the Existing Level of Industrial Noise.

Total existing $L_{Aeq,15\text{ min}}$ noise level from Industrial sources, dB(A)	Maximum $L_{Aeq,15\text{ min}}$ noise from new sources alone, dB(A)
Acceptable noise level $\geq$ plus 2	If existing unlikely to decrease – Existing noise level minus 10 If existing likely to decrease – Acceptable noise level minus 10
Acceptable noise level plus 1	Acceptable noise level minus 8
Acceptable noise level	Acceptable noise level minus 8
Acceptable noise level minus 1	Acceptable noise level minus 6
Acceptable noise level minus 2	Acceptable noise level minus 4
Acceptable noise level minus 3	Acceptable noise level minus 3
Acceptable noise level minus 4	Acceptable noise level minus 2
Acceptable noise level minus 5	Acceptable noise level minus 2
Acceptable noise level minus 6	Acceptable noise level minus 1
Less than Acceptable noise level minus 6	Acceptable noise level

At the front of the premises the $L_{Aeq,15\text{ min}}$ noise levels were measured as being 54 dB. The $L_{A90,15\text{ min}}$ noise level was assessed to be 48 dB(A).

If there were nearby residences the criteria would be an acceptable "Intrusive noise limit" of (48+5) or 54 dB(A), but as the only nearby commercial premises, the "Amenity" noise limit" applies.

The measured $L_{Aeq,15min}$ noise level was 54 dB(A), which is 11 dB(A) below the recommended 'acceptable' noise limit was 65 dB(A).

The acceptable $L_{Aeq,15min}$ noise limit to nearby premises would be 65 dB(A).

EQUIPMENT NOISE EMISSIONS

Noise measurements were carried out within Suite 2, with the equipment operating briefly. Due to the equipment location and spacing measurements were carried out of the 'reverberant' sound field. This would be the sound field impacting on the walls and ceiling.

The equipment was measured with, and without the air compressor.

With no equipment operating the following levels were measured within the space.

Table 4 – Noise Level of Space with No Equipment Operating

	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A
L_{Eq}	57	54	46	41	36	34	30	29	21	40
L_{Min}	39	38	33	31	28	27	23	21	16	35
L_{Max}	69	66	56	58	52	47	43	45	35	50

The internal space is exposed to L_{Amax} noise levels of up to 50 dB(A) from passing traffic on Smith Street and the general internal noise levels is between 35 and 40 dB(A).

With the process equipment operating (without the air compressor), the following levels were measured within the space.

Table 5 – Noise Level of Space with Equipment Operating

	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A
L_{Eq}	68	56	60	65	56	47	42	36	33	58
L_{Min}	61	42	50	60	50	43	39	34	30	56
L_{Max}	74	67	64	69	60	52	48	43	41	62

When the process is operating, the internal space is exposed to L_{Amax} noise levels of up to 62 dB(A) and the general internal noise levels is between 56 and 58 dB(A).

With the process equipment operating (with the air compressor), the following levels were measured within the space.

Table 6 – Noise Level of Space with Equipment Operating (including Air Compressor)

	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A
L_{Eq}	70	59	63	65	58	58	48	44	41	62
L_{Min}	64	46	55	58	53	54	45	41	39	60
L_{Max}	74	66	68	68	63	62	51	47	43	64

When the process is operating, the internal space is exposed to L_{Amax} noise levels of up to 64 dB(A) and the general internal noise levels is between 60 and 62 dB(A).

PREDICTED NOISE LEVELS FOR STATIONARY NOISE SOURCES

Tank aeration is part of the oil / water separation process. The air is supplied by an air compressor to a pressurised air tank. The predicted levels will be based on the higher process equipment, plus air compressor, noise levels.

The building is of concrete block construction with the roof being of profiled sheet metal construction. The side walls and rear walls are offset from the walls buildings on the adjacent properties. The adjacent buildings appear to be of similar construction. The roof areas appear to be a combination of profiled sheet metal cladding with translucent cladding to allow the entry of natural light.

The premises to the east at 53 Railway Street are, as we understand, recyclers and the area is also used for storage of mini-skips. The rear wall of Suite 2 is of concrete block construction. The predicted L_{Amax} noise emission levels at 1 metres from the wall, via the wall, is 36 dB(A) or less. The predicted L_{Amax} noise emission levels via the roof construction, is 42 dB(A) or less.

The predicted L_{Amax} noise emission levels to 53 Railway Street would be 42 dB(A) or less.

The premises to the north at 1A-1B Railway Street is, as we understand, a warehousing facility. The side wall of Suite 2 is of concrete block construction. The wall of Suite 2 abuts the wall of 1A-1B Railway Street. The predicted L_{Amax} noise emission level into the 1A-1B Railway Street warehouse is 27 dB(A) or less. The predicted L_{Amax} noise emission levels above the roof of 1A-1B Railway Street via the roof construction, is 44 dB(A) or less. These levels would be further attenuated into the warehouse via the warehouse roof to 32 dB(A) or less.

The predicted L_{Amax} noise emission levels into 1A-1B Railway Street would be 34 dB(A) or less.

The premises to the south at 14-16 Smith Street are, as we understand, a metal workshop. The side wall of Suite 2 is of concrete block construction. The wall of Suite 2 abuts the wall of 14-16 Smith Street. The predicted L_{Amax} noise emission level into the 14-16 Smith Street workshop is 17 dB(A) or less. The predicted L_{Amax} noise emission levels above the roof of 14-16 Smith Street via the roof construction, is 33 dB(A) or less. These levels would be further attenuated into the metal workshop via the workshop roof to 27 dB(A) or less.

The predicted L_{Amax} noise emission levels into 14-16 Smith Street would be 27 dB(A) or less.

The premises at 10-12 Smith Street are in the form of an L-shaped building. Suite 1 (currently in use) forms most of the upright of the "L". Suite 2, the site of the proposed operations, forms the lower part of the upright and the base of the "L".

Within the angle of the "L" is the truck movement area with walls facing south and facing west. The west facing wall has a window and a vehicle door facing west. In front of the south facing wall, the predicted component L_{Amax} noise emission level at 1 metre is 31 dB(A). In the west facing wall, the predicted component L_{Amax} noise emission level at 1 metre from the wall is 32 dB(A). In front of the west facing window, the predicted component L_{Amax} noise emission level at 1 metre is 33 dB(A). In the west facing wall, the predicted component L_{Amax} noise emission level at 1 metre from face of the door is 66 dB(A) with the door open, and 49 dB(A) with the door closed.

The component contribution via the vehicle door far exceeds the other contributions, out into the truck movement area. The side wall of 14-16 Smith Street forms the southern wall of the truck movement area.

PREDICTED NOISE LEVELS FOR MOBILE NOISE SOURCES

No Fuss Liquid Waste currently has four (4) trucks that are used for various pump outs. They range in capacity from 6,000 L to 24,000 L, with each truck designated to a particular waste.

At the commencement of operations No Fuss estimate that 1-2 trucks will access the property three times per day to unload. That equates to 3 to 6 deliveries per day. The liquid waste will be unloaded by gravity feed, rather than being pumped from the tankers.

A traffic count has been conducted in the area.

In Smith Street, the traffic count indicated 272 cars entering, 169 cars leaving, 52 trucks entering, 15 trucks leaving, plus a bus entering, over 12 hours (6:00am to 6:00pm).

Discrepancies in the numbers are possibly due to vehicle movements outside of the 12 hour period and differences in vehicles being worked on within the various mechanical repair shops along Smith Street.

The number of trucks leaving would indicate at least 15 truck movements per day over the 12 hours. No Fuss Liquid Waste could increase it by 3 to 6 trucks. This is amongst at least 169 car entering and leaving Smith Street.

Measurements were carried out of one of No Fuss Liquid Waste's truck entering the property. A point was selected 7.5 metres from the semi-circular track of the reversing vehicle.

As the truck reversed, L_{Amax} noise levels due to the 'reversing alarm' rose to 85 dB(A) at 7.5 metres.

Engine noise peaked at 72 dB(A) at 7.5 metres.

'Air brake release' produced a one-off L_{Amax} of 95 dB(A) that diminishing over 1.3 seconds to background.

The whole reversing operation took less than 15 seconds. Thereafter the truck idled at between 63 dB(A) and 66 dB(A) at 7.5 metres.

Current deliveries have the trucks reversing from the street to the vehicle door in the southern wall of Unit 1.

Trucks for the proposed operation will enter in a forward direction, turning into the open area between the front facade of Unit 1 and the front boundary. The trucks will then reverse to the vehicle door to Unit 2, where the trucks will unload by gravity feed. The centre line for reversing will be about 4.5 metres from the boundary with No.14-16 Smith Street.

The side wall of the adjacent metal workshop at No.14-16 Smith Street extends 18 metres along the side boundary from the front facade of Suite 2.

As the trucks reverse, the 'reversing alarm' noise levels are likely to be 92 dB(A) at 1 metres from the wall along the boundary. The predicted L_{Amax} noise levels within the metal workshop should be less than 55 dB(A), within the metal workshop.

Engine noise levels are likely to be 79 dB(A) at 1 metres from the wall along the boundary. The predicted L_{Amax} noise levels within the metal workshop should be less than 39 dB(A), within the metal workshop.

The air brake release noise level is likely to be 102 dB(A) at 1 metres from the wall along the boundary. The predicted L_{Amax} noise levels within the metal workshop should be less than 66 dB(A), within the metal workshop.

Reversing to unload should take about 45 to 60 seconds. As the tanker will empty without need for pumping, the truck can be turned off until the tanker is empty. The truck can then drive out in a forwards direction.

SUMMARY

Environmental noise measurements have been carried out at the site during a normal working day.

Passing traffic produced L_{Amax} noise levels of 74 to 80 dB(A), local business operations produced $L_{A01,15min}$ noise levels of 56 to 61 dB(A), and the general $L_{Aeq,15min}$ noise level of the area was 53 to 55 dB(A).

The L_{Aeq} noise levels within Suite 2, with the equipment operating, was 58 to 62 dB(A) inside the building. The L_{Amax} noise levels within Suite 2, with the equipment operating, was 62 to 64 dB(A) inside the building.

Noise break in from general environmental noise of the area produced an internal L_{Aeq} noise level of 40 dB(A) with L_{Amax} levels to 50 dB(A). Similar levels are likely to occur in other nearby premises of similar construction

Due the proximity of nearby premises, noise breakout via the walls and roof area was assessed. Where buildings immediately adjoined the proposed site of the 'oily liquid waste' treatment area, the noise intrusion into the adjoining premises was also assessed.

The building structure will attenuate the operational L_{Amax} noise levels values to less than 42 dB(A) to the open area to the rear, to less than 34 dB(A) to within the premise to the north, and to less than 27 dB(A) to within the premises to the south. These levels are unlikely to adversely affect these businesses.

Trucks associated with the operation of Suite 2 should be no louder than those currently successfully servicing the existing operation in Suite 1, when operating at the front of the property.

When reversing to the unloading point to Suite 2, these trucks are likely to produce L_{Amax} noise levels within the adjacent metal workshop of less 55 dB(A), from reversing alarms, of less than 39 dB(A) from engine noise, and less than 66 dB(A) from air brake release. Given the short duration of these noise events and the limited number of times per day that they will occur, these levels are unlikely to adversely affect these businesses.

Examination of the local area indicates that there are no potentially affected residences within 500 metres of the site. During operation, the calculated sound power level of the building envelope is an L_{Aeq} sound power level of 59 dB(A) and a L_{Amax} sound power level of 64 dB(A). Distance attenuation along across this distance is 54 dB.

CONCLUSION

It is the opinion of BGMA Pty Ltd that the proposed oily liquid waste operation in Suite 2, 10-12 Smith Street Emu Plains, should be able to operate without adversely impacting on nearby residential areas and nearby business premises.

Even during truck movements, the noise levels should be similar to those currently experienced and accepted with the area.



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