

17 February 2015

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Re: White Bay 6 - Operational noise compliance assessment

## 1 Introduction

EMGA Mitchell McLennan Pty Limited (EMM) has been engaged by White Bay 6 Pty Ltd to complete an operational noise compliance assessment of the marine refuelling facility (the site) at Berth 6, White Bay, NSW.

The purpose of the assessment is to address the requirements of the Minister's Condition of Approval (MCoA).

This report presents noise measurement data collected on 6 February 2015 and the results, findings and discussions of the compliance noise assessment.

The following material was referenced as part of this assessment:

- Minister's Condition of Approval (MP 06\_0037) (MCoA); and
- Environmental Protection Authority 2000, *Industrial Noise Policy* (INP).

## 2 Minister's Condition of Approval (MCoA)

The Minister's Condition of Approval (MCoA) for the site was granted on 14 September 2009 and has been modified four times to date. The site is currently operating under restrictions during day, evening and night periods. Condition A7 of the MCoA summarises time restrictions that apply at the site.

### Condition A7 - Hours of Operation

Activity	Day	Time
Mixed marine tenancies and commercial storage & work sheds & dry boat storage use	Monday – Saturday Sunday and Public Holidays	7:00 am to 6:00 pm 8:00 am to 6:00 pm
All activities on hardstand/lay down areas eg. Power tools, travel lifts, roll on roll off ramp, cranes forklifts		
Truck movements to and from the site		
General deliveries		
Disposal and collection of garbage including cans and bottles from vessels	Monday – Sunday	5:00 am to 10:00 pm
Recreational vessel arrivals, departures		

Condition A7 - Hours of Operation

Activity	Day	Time
and mooring		
Recreational vessel refuelling and grey water sewerage pump out *(refer to Condition F15)		
Commercial vessel arrivals, departures and mooring	Monday – Sunday	Anytime
Commercial vessel refuelling and grey water and sewerage		
Commercial offices		
Office buildings mechanical services e.g. A/C plant, compressors for chiller room etc.		

The MCoA summarises the sites noise contributions limits in Conditions F1, F2 and F3.

“Condition F1 - Noise Limits:

The use of any part of the premises including vessel refuelling and other activities, and the operation of the plant, machinery or other equipment on the site must not exceed the sound pressure (noise) limits presented in the table below

a) Noise limits – During operation of the facility

Residential location	Day	Evening		Night	
	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (15 minute)	L <sub>Aeq</sub> (9 hours)	L <sub>A1</sub> (1 minute)
1 Grafton St, Balmain	54	48	48	45	59*
Datchett St, Balmain	49	44	44	41	54*
33 Adolphus St, Balmain	36	35	35	35	60*
2 Point St, Pyrmont	40	35	35	35	61

Notes: 1.\*The sleep disturbance limits do not apply to trucks whilst engaged in movements on the access road to enter or leave the site.

b) For the purpose of clause (a) of this condition:

- i. Day is defined as the period from 7.00 am to 6.00 pm Monday to Saturday and 8.00 am to 6.00 pm Sundays and Public Holidays;
- ii. Evening is defined as the period from 6.00 pm to 10.00 pm; and
- iii. Night is defined as the period from 10.00 pm to 7.00 am Monday to Saturday, and 10.00 pm to 8.00 am Sundays and Public Holidays.

Condition F2 – Noise measurements

- (1) Noise from the premises is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of the dwelling where the dwelling is more than 30 metres from the boundary, to determine compliance with the noise level limits in Condition F1 unless otherwise stated.
- (2) Noise from the premises is to be measured at 1 metre from the dwelling facade to determine compliance with the LA1(1 minute) noise level in Condition F1.

- (3) *Where it can be demonstrated that direct measurement of noise from the premises is impractical, the DECC may accept alternative means of determining compliance (See Chapter 11 of the Industrial Noise Policy).*
- (4) *The modification factors presented in section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where practicable.*
- (5) *The noise emission limits identified in F1 apply under meteorological conditions of wind speed up to 3 metres per second at 10 metres above ground level, and temperature inversion conditions.*

### *Condition F3 – Noise Compliance Monitoring*

*A noise compliance assessment must be undertaken within three months of commencement of operations at the premises and submitted to the Director General. The assessment must be prepared by a suitably qualified and experienced acoustical practitioner and must assess compliance with noise limits in Condition F1.*

*Should the assessment indicate any non-compliance with the specified noise limits the Proponent must take appropriate measures to limit any impacts and must submit a further report upon the implementation of the measures. Further reporting must be undertaken every 12 months unless otherwise directed by the Director General.”*

## 3 Assessment methodology

To quantify noise emissions from the site, attended noise measurements were completed to capture the plant and equipment activities as outlined in condition A7. The noise measurements were used to predict the noise contribution from site at the surrounding residences in accordance with condition F2 (3). The noise contributions were assessed against noise limits in condition F1(a).

The noise contribution from the site was determined using a noise propagation model. The model was calibrated using an attended noise measurement conducted at the closest, most affected receiver at 1 Grafton Street, Balmain, and boundary noise measurements.

The noise monitoring was carried out using a Svantek 959 Type 1 integrating sound level meter (s/n 14572). The unit carries current NATA calibration and complies with *Australian Standard AS 2659.1 - 1998: Guide to the use of sound measuring equipment - Portable sound level meters*. The sound level meter was calibrated in the field prior to and following the noise measurements and the drift in noise level was found to be within acceptable limits (+/- 0.5 dB(A)).

## 4 Noise measurements

EMM undertook short term attended noise measurements at the site boundaries and at the closest, most exposed receiver (1 Grafton Street, Balmain) on 6 February 2015. The noise measurement locations are shown on Figure 1.

2/17/2015

33 Adolphus Street

1 Grafton Street

Datchett Street

2 Point Street

Johnstons Bay

Jones Bay

**Key**

- Short term attended noise monitoring locations
- Sensitive receivers
- ▬ Site boundary

Site locality and noise monitoring locations – White Bay 6, Balmain

Figure 1

The noise measurements were conducted in accordance with NSW Environmental Protection Authority's (EPA) 2000 *NSW Industrial Noise Policy* (INP) requirements. Table 1 summarises the attended noise measurements. The weather conditions at the time of monitoring included clear skies, no rain and very mild southerly winds (<3m/s).

**Table 1 Attended noise measurements – 6 February 2015**

Location	Time	Duration	Noise measurement, dB(A)				Comment
			L <sub>eq</sub>	L <sub>90</sub>	L <sub>max</sub>	L <sub>eq, contribution</sub> <sup>1</sup>	
1 Grafton St, Balmain (Street level south of building)	12:00	15 minutes	52	48	56	50	Construction work (54 to 56 dB(A)); Boat lift (start to finish) at 50 to 54 dB(A) for 6 minutes; Refuelling tanks on-site were inaudible. Overall site hum (without boat lift) at 48 dB(A).
1 Grafton St, Balmain (Street level south of building)	12:17	15 minutes	53	51	54	53	Boat lift parked in most exposed position during operation. Running at high revs for 15 minutes; Marina bull operating but inaudible; Boat cleaning activities occurring in background inaudible.
North – eastern extent of site	14:24	15 minutes	69	67	74	69	Boat lift parked on deck. Cleaning commencing; Marina Bull pulling up with a boat ready to drop in water. Measurement taken on motor side of boat lift and is the noisiest side.
North-western extent of site – 1 Grafton Street, Balmain (Site level)	13:07	9 minutes	53	50	65	53	Boat lift parked on deck. Engine running as per normal operations. Marina Bull and 3.5 tonne forklift in operation. Site contribution of 53dB(A) for 9 minutes.

Notes: 1. The noise contribution from site only.

It should be noted that measurements taken at 1 Grafton Street, Balmain (Street level) are representative of a possible worst case scenario over a 15 minute period (ie boat hoist used to lift and lower boats in water/storage of boats).

## 5 Noise compliance assessment

Chapter 11 of the INP states that where existing noise levels are too high, measurements may be taken closer to the source and then calculated back to a specific location. This method has been adopted to determine the site noise contribution at residential locations listed in the MCoA.

The adopted calculation method accounts for measured sound power levels (at source), distance from sources to receiver, air absorption and any shielding effects from terrain and building structures. The short-term attended noise measurements conducted at the closest most exposed receiver (1 Grafton Street) and site boundaries were used to calibrate the noise predictions.

The refuelling facility is currently operating over a 24 hour period, with limited activities during the evening and night periods. Based on observations on-site and information provided by the proponent, it is understood that the activities presented in condition A7 can be in operation for a full 15 minute period



during daytime operations at any one time. However, the site operations are restricted to fuel pumping only during evening and night periods. This has been accounted for in noise predictions.

Attended noise measurements completed at 1 Grafton Street, Balmain and on site boundaries confirmed that the dominant noise source on-site is the boat hoist. On-site observations during the noise measurements also note the change in location of the boat hoist during a full operation cycle.

Table 2 summarises the predicted noise levels at the most affected facade of the closest residences outlined in condition F1.

**Table 2** Noise level predictions, dB(A)

Location	Criteria					Predicted noise contributions					Compliance		
	Day		Evening		Night	Day		Evening		Night	Day	Evening	Night
	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (9 hour)	L <sub>A1</sub> (1min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (9 hour)	L <sub>A1</sub> (1min)	L <sub>Aeq</sub> (15min)	L <sub>Aeq</sub> (15min)
1 Grafton St, Balmain	54	48	48	45	59	53	<25	<25	<25	<25	Yes	Yes	Yes/Yes/Yes
Datchett St, Balmain	49	44	44	41	54	49	<25	<25	<25	<25	Yes	Yes	Yes/Yes/Yes
33 Adolphus St, Balmain	36	35	35	35	60	33	<25	<25	<25	<25	Yes	Yes	Yes/Yes/Yes
2 Point St, Pymont	40	35	35	35	61	40	<25	<25	<25	<25	Yes	Yes	Yes/Yes/Yes

Notes: 1. All activities included in the daytime. Only refuelling activities included during evening and night-time periods

The predicted site noise contribution satisfies the noise limits at all residential locations as listed in the MCoA.

It should be noted that calculations incorporated activities operating at full duty for a full 15 minute period. Based on discussions with the operator we understand that this is not general practice for the site. This is confirmed from site observations which note that a typical boat storage and lay down operation occurs for approximately 7 to 9 minutes (pending on other activities occurring on-site). The assessment is therefore considered conservative.

## 6 Conclusion

EMM has completed a noise compliance assessment for Berth 6 White Bay, Balmain. The assessment was completed in accordance with the requirements of the Minister's Conditions of Approval (MCoA) and the EPA's Industrial Noise Policy (INP).

In order to determine compliance with the MCoA, short term attended noise measurements of plant and equipment were conducted. In addition to on-site measurements, attended noise measurements were completed at the closest, most exposed receiver (1 Grafton Street, Balmain) and were used to calibrate noise predictions to the surrounding residences. This is an INP approved method of determining noise compliance where non-site related noise is dominant at residential locations.

The predicted noise contribution from the site satisfies the MCoA noise limits at all residences outlined in the MCoA.

It should be noted that calculations incorporated activities operating at full duty for the entire 15 minutes. Based on discussions with the operator we understand that this is not general practice for this site. Hence, the assessment of noise emissions from the site is considered conservative.

We trust this information satisfies your requirements and if you require any further details please contact the undersigned.

Yours sincerely



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**Reviewed by: DW**



## Appendix A

### Glossary of acoustic terms

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Several technical terms are discussed in this report. These are explained in Table A.1.

**Table A.1**      **Glossary of acoustic terms**

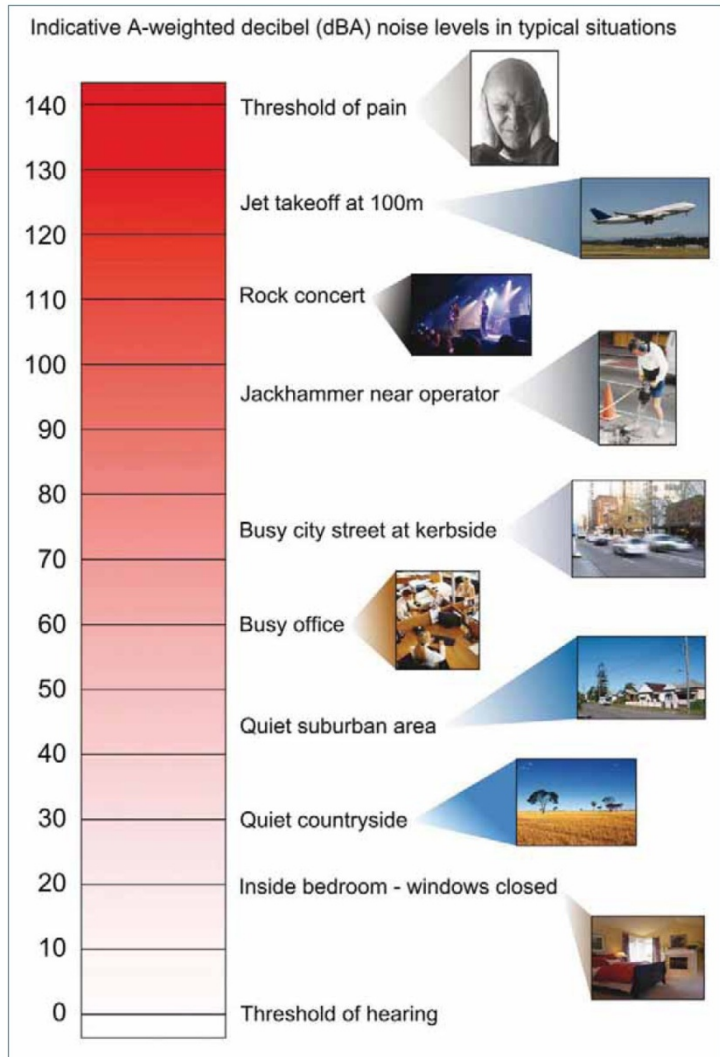
<b>Term</b>	<b>Description</b>
dB(A)	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
L <sub>90</sub>	Commonly referred to as the background noise level. The noise level exceeded 90% of the time.
L <sub>eq</sub>	The energy average noise from a source. This is the equivalent continuous sound pressure level over a given period. The L <sub>eq(15min)</sub> descriptor refers to an L <sub>eq</sub> noise level measured over a 15 minute period.
L <sub>max</sub>	The maximum root mean squared sound pressure level received during a measuring interval.

It is useful to have an appreciation of decibels, the unit of noise measurement. Table A.2 gives an indication as to what an average person perceives about changes in noise levels:

**Table A.2**      **Perceived change in noise**

<b>Change in sound level (dB)</b>	<b>Perceived change in noise</b>
0-2	Typically indiscernible
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times as loud (or quarter) as loud

Examples of common noise levels are provided in Figure A.1.



Source : RNP (Department of Environment, Climate Change and Water (DECCW), 2011)

**Figure A.1** Common noise levels