

30 March 2010

REFERRAL RESPONSE - HEALTH

FILE NO: DA 602/2009/1

ADDRESS: 8 Castra Place DOUBLE BAY 2028

PROPOSAL: Replacement of existing fixed wharf structure with berthing for 40 vessels & moorings for 25 vessels with a new floating structure with berths for 45 vessels and moorings for 20 vessels.

FROM: Louie Salvatore

TO: Mr P Kauter

Comments are provided in relation to DA 602/2009/1 proposing redevelopment of the Double Bay Marina, 8 Castra Place, Double Bay. The Marina currently consists of 40 wet berths in a fixed structure and 25 commercial swing moorings for vessels.

The proposed Marina upgrade will comprise of the following:

- Partial removal of existing structures;
- Construction of a new floating structure to accommodate 45 wet berths;
- Installation of a new access gangway from the existing timber deck to the new structure;
- Provision of a disabled toilet.
- Proposed hours of operation for the office are 9 am to 6 pm, 7 days during summer and 9 am to 5 pm, 7 days during winter;
- Marina users will have 24 hour access to the moored vessels by way of security gates;
- Maintenance activities at the Marina are to occur between the hours of 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday.

ACOUSTIC REPORT

Heggies (Report 10-5093R2 Revision 1) – Proposed Upgrade of Double Bay Marina Operation and Construction Noise Assessment

I refer to the acoustic report prepared by Heggies (Report 10-5093R2 Revision 1 dated 11 March 2010) – Proposed Upgrade of Double Bay Marina Operation and Construction Noise Assessment examining the potential noise impacts from the proposed redevelopment of the Double Bay Marina, 8 Castra Place, Double Bay. This report is an updated version of 10-509R1, based on the current marina design and also incorporates the relevant findings of the Joint Conference Report (for the Land & Environment Court in November 2008).

The report has identified three potential noise sources likely to impact on nearby residential receivers. These sources identified are Operational Noise, Maintenance Activities and Construction Noise.

Noise Objective for Redevelopment of Double Bay Marina

Unattended noise monitoring was carried out in 10 Castra Place which is the adjacent residence to the east of the Marina. The monitoring was conducted from Wednesday 6 December 2006 to Wednesday 20 December 2006. As a result of the monitoring a Rated Background Level (RBL) of 45 dB(A) and a LAeq of 54 dB(A) for Daytime (0700-1800) was determined for the location at 10 Castra Place. (Refer to Table 3 in the report).

As part of a Joint Conference Report, an additional ambient noise survey was conducted at 6 Castra Place in November 2008. This Joint Conference Report has placed more importance on the weekend, rather than weekday ambient noise, as this corresponds to busy use times of the Marina. The report has used the Joint Conference Report noise levels as the '**project noise criterion**' that was established in November 2008. The levels are summarised below:

Daytime 0700 - 1800	Evening 1800 - 2200	Pre Midnight 2200 - 0000	Night - time 0000 - 0700
RBL	RBL	RBL	RBL
42	37	35	33

Noise emissions from the site have been assessed against the DECC Industrial Noise Policy 'Intrusive & Amenity' Criterion. The 'Intrusive Criterion' controls noise impacts in the short term for residences while the 'Amenity Criterion' aims to limit continuing increases in noise levels (maximum ambient noise level) within an area from industrial sources specified in Table 2.1 of the INP.

As a result of the unattended noise survey conducted in November 2008, the following **Project Specific Intrusive & Amenity Noise Goals are applicable to the proposed redevelopment pertaining to Operational Noise and Maintenance Noise Activities:**

Time Period	Intrusive LAeq(15min) Criteria in dBA (RBL + 5 dBA)	Sleep disturbance LAmax criteria in dBA (RBL + 15 dBA)
Day 7am – 6pm	(42+5) 47	-
Evening 6pm – 10pm	(37+5) 42	-
Pre Midnight 10pm – 12 midnight	(35+5) 40	(35+15) 50
Night 12 midnight – 7am	(33+5) 38	(33+15) 48

Regarding **Construction Noise Objectives**, reference is made to the NSW DECC "Interim Construction Noise Guideline July 2009" which sets out Noise Management Levels (NML) at residences and provides respite for residents exposed to excessive construction noise outside the recommended standard hours whilst allowing

construction during the recommended standard hours without undue constraints. The **Construction Noise Objectives** are summarised below:

Time of Day	Management Level LAeq(15min)	How to Apply
Recommended Standard Hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays	Noise affected RBL + 10 dBA	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <p>Where the predicted or measured LAeq(15min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise.</p> <p>The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</p>
Recommended Standard Hours: Monday to Friday 7am – 6pm Saturday 8am – 1pm No work on Sundays or Public Holidays	Highly noise affected 75 dBA	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <p>Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level.</p> <p>If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that will be provided.</p>
Outside recommended standard hours	Noise affected RBL + 5 dBA	<p>A strong justification would typically be required for works outside the recommended standard hours.</p> <p>The proponent should apply all feasible and reasonable work practices to meet the noise affected level.</p> <p>Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.</p>

Operational Activities

- The Marina office will be open from 9 am to 6 pm, 7 days during summer and 9 am to 5 pm, 7 days during winter with Marina users having 24 hour access via security gates.
- “On water” operation of the Marina has been described as passive with the primary noise source being boat engine noise as boats leave and arrive at the Marina and boat tender.
- Noise from combined use of mechanical plant equipment, including air conditioning, sewerage pumps and fuel pumps.
- The proposed redevelopment maintains essentially the same vessel layout as currently employed and therefore no significant change in noise levels are expected at both the southern and western residences.

A 3 dimensional computer model using the CONCAWE algorithm for noise propagation was used to predict noise levels at the nearest residences to the south at Castra Place and to the east at Gladswood Place.

My previous comments in Health Referral Response of 11 December, 2009 raised concerns that, “measurements based on a single vessel, being the Marina’s tender

vessel, would not represent a worst case scenario where evening and pre-midnight operational goals may be exceeded. It is my opinion that the assessment should address noise resulting from speeds of vessel manoeuvring in proximity to the marina representing a worst case scenario, typical vessels and their noise generating capacity as well as Marina management regarding standard boating rules with respect to speed in proximity to the marina as issued by NSW Maritime and possible noise source computations".

In this regard the current report has addressed the above issue where noise levels have been calculated for vessels either arriving or leaving with one at night, two in the evening and five in the day in any 15 minute period. The vessels have been modelled idling for 30 seconds at the birth, then leaving with the speed initially 2 knots, then 4 knots and finally 8 knots. Included in the calculations are two people talking in a raised voice for 5 minutes near the office.

Based on the modelling, it is predicted that noise levels comply with the project specific daytime and night-time noise criteria. For the closet eastern residence a minor exceedance of the 42 dBA evening criterion of 1 dBA is predicted.

Sleep Disturbance Assessment

My previous comments in Health Referral Response of 11 December, 2009 raised concerns that, *"the report has applied the criteria only to people talking aboard a vessel moored at the Marina; for people talking outside the office; for people talking in the pedestrian access laneway and to the disposal of garbage. In my opinion the Sleep Disturbance Noise Criterion should have also been applied for the assessment of boat engine noise when manoeuvring to and from the marina remembering that users having 24 hour access to the Marina and such events occur in the sudden acceleration of a boat engine"*.

In the current report potential vessel sleep disturbing events have been calculated to include engine noise and the use of bow thrusters. The results of the calculations are included in Section 7.1 of the report. Although exceedances are acknowledged mainly from people talking in the pedestrian access laneway; the disposal of garbage; vessel engine noise and bow thruster noise, the explanation provided in the report would tend to indicate that such noise would not give rise to potential sleep disturbing events. The following reasons are given which I agree with:

- Historical evidence from the Marina indicates that there are less than 10 movements of boats per annum which equates to less than 1 movement per month between the hours of 10pm and 7am and as such the noise exceedance is considered infrequent and as such minor in its nature.
- There are currently 3 out of 40 vessels that have bow thrusters only used to avoid collision and it is not anticipated that this will increase. Furthermore being below 60 dBA these noise levels are unlikely to result in awakening reactions.
- That the above potential sleep disturbing events can be adequately addressed in the Marina Noise management Plan/Code of Conduct.

My previous comments in Health Referral Response of 11 December, 2009 raised concerns that, *"the report does not specify if such equipment (mechanical plant such*

as air conditioners, sewerage pumps, fuel pumps, fixed maintenance plant, water and air compressors) operates past the daytime hours where Marina users might have access to fuel pumps and the like therefore requiring compliance with both pre-midnight and post midnight noise operational noise goal". The report clarifies that such equipment will only be used during the daytime and shall not exceed the 47 dBA noise level at the boundary of the nearest residence. Again it should also be noted that the report has referred to the daytime noise objective of 47 dBA based on the NSW Intrusive Noise Criterion where the RBL plus 5 dBA being applied to the 15-minute LAeq noise emission of the noise source(s) at the boundary of residential receivers. It would be appropriate in order to maintain consistency that any noise emissions from such mechanical plant comply with Council's Noise Criterion for Mechanical Plant & Equipment, that is the noise level measured at any boundary of the site at any time while the mechanical plant and equipment is operating must not exceed the background noise level.

Maintenance Activities

Maintenance activities will only occur during work hours which are 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday. The current application proposes no change to the vessel maintenance operation with existing activities to continue which comprise of general repairs, cleaning and anti-fouling. The working area is approximately 6 m by 20 m adjacent to the office/workshop buildings and has a 3.5 m wall on the opposite side separating the slipway from the adjacent residence. During busy periods, up to 2 boats a day can be worked on by typically 2 workers in the maintenance area. Depending on the work that is to be carried out a range of tools can be used. The activities can include:

- Workshop Area: Winch lowering a boat back into the water; a winch raising a boat from the water; fuel pump under work area; garden hose on hull of vessel; high pressure cleaner on hull of vessel; 2HP 50L air compressor; and 125mm angle grinder.
- Wharf Area: 60HP outboard pass by; 60HP outboard tow boat bringing vessel to mooring; wave boat noise; and boat loading onto slipway.

The noise generated by the workshop is non-continuous where loud periods of work are inter-dispersed with quiet periods. The noisiest operation is the use of the high pressure water cleaner to remove mould and barnacles. The noise is generated from the machine vibrating on the ground as it operates as well as from the rotary head as it generates a pulsating water jet, resulting in regenerated noise from the ship's hull.

The current report reiterates that the daytime operational noise goal of 47 dBA has been used to determine compliance of maintenance activities occurring at the Marina which appears appropriate considering that such maintenance activities occur during work hours which are 9 am to 6 pm, Monday to Friday and 9 am to 12.30 pm on Saturday. Based on calculated noise measurements, distance attenuation and perimeter fence shielding, noise level exceedances range from 3 dBA to 28 dBA as follows:

- Garden hose on hull: 50 dBA (+ 3 dBA)
- 50L Air compressor: 55 dBA (+ 8 dBA)
- Angle grinder: 57 dBA (+ 10 dBA)

- Pressure cleaner: 75 dBA (+ 28 dBA)

In my previous comments in Health Referral Response of 11 December, 2009 I raised concerns that the only solution offered by Heggies in report **(Report 10-5093R2 Revision 1)** *“on the use of power tools at the Marina slipway to mitigate the noise is for such work where possible to occur inside the workshop. Where power tools are to be used external to the workshop, it is recommended to restrict the hours of use from 10 am to midday and 2 pm to 4 pm Monday to Friday. The cleaning of boat hulls using the water blaster at the Marina slipway is to be restricted between the hours of 10 am to midday and from 2 pm to 4 pm, Monday to Friday”*. The current report recommends the above with additional recommendations, including:

- The cleaning of boat hulls using the water blaster at the Marina slipway is to be restricted between the hours of 10 am to midday and from 2 pm to 4 pm, Monday to Friday. Noting this activity is 28 dBA above the criterion, it is recommended alternative methods of cleaning of boat hulls be considered.
- Provide noise mitigation to the air compressor by either acoustic enclosure/workshop location or replacement with a quieter unit.
- The introduction of work practices to reduce the simultaneous operation of noisier equipment e.g the use of the pressure cleaner and angle grinder.
- The potential future construction of an acoustic enclosure for the maintenance area adjacent to the east of the office and workshop to shield residences to the south and east from the maintenance area.

The report states that the above recommendations *“will provide an increased level of protection from noise impact to neighbours than presently exists and therefore the proposal provides a net benefit in relation to operational noise compared to the existing situation”*. As I previously stated the report has adequately addressed operational noise activities and I am satisfied that the daytime project specific noise goal will be achieved. However the question remains and it is acknowledged in the current report that exceedances from 3 dBA to 28 dBA will be experienced by residences as a result of maintenance activities. Again I state that Council should not accept noise exceedances of up to 28 dBA from maintenance activities for up to 4 hours a day, Monday to Friday.

The report has recommended that *alternative methods of cleaning of boat hulls be considered; that noise mitigation to the air compressor by either acoustic enclosure/workshop location or replacement with a quieter unit; the introduction of work practices to reduce the simultaneous operation of noisier equipment e.g the use of the pressure cleaner and angle grinder; that potential future construction of an acoustic enclosure for the maintenance area adjacent to the east of the office and workshop to shield residences to the south and east from the maintenance area.*

It is disappointing that the current report has not explored alternative work methods/equipment that would result in lowering the level of noise emitted from maintenance activities so that the daytime project specific noise goal of 47 dBA can be achieved. In addition, the current report should have detailed all noise mitigation measures that could have been applied to equipment or state what alternative equipment could be used to again achieve the daytime project specific noise goal of 47 dBA. As it stands, Council only knows that exceedances will occur of between 3 dBA and 28 dBA. *“The potential future construction of an acoustic enclosure to the*

maintenance area” is not considered an appropriate noise mitigation strategy unless Council considers noise exceedances from the maintenance activities acceptable until such time, if any that an acoustic enclosure is provided to the area.

It is recommended that the Recommendations presented in Section 7.2.2 of the current report be reviewed to provide Council definitive noise mitigation strategies that will be applied to the maintenance area should the proposed development be approved. All proposed acoustic enclosures and noise mitigation to equipment; alternative equipment and work methods shall be detailed and demonstrated that the daytime project specific noise goal will be achieved by such noise mitigation strategies.

Construction Noise

To determine the acoustical impact of the upgrading of the Marina in relation to construction noise on surrounding residences, hand calculations were performed to identify significant noise sources and scenarios that could potentially affect the nearest residential properties.

The overall construction period is now estimated at 13 weeks; 3 weeks for setup; 4 weeks for the installation of new piles and 6 weeks for the installation of the new floating structure and landside work. For the upgrading of the Marina, the following items have been identified as the main sources of noise:

- Excavator (30t)
- Angle grinder
- Impact piling rig

A combination of the plant operating simultaneously has been adopted in the report to represent different scenarios. Scenario 1: Removal of existing structures + angle grinder; Scenario 2: Impact piling rig + Excavator (30t).

The noisiest operation will involve the impact piling with excavator. The previous report stated that approximately 55 piles were to be installed and it is possible that two pile installation barges will be used, which will result in two piles being installed in any one day. The current report now states that only 37 piles will be installed and again it is possible that two pile installation barges will be used, which will result in two piles being installed in any one day. The method of pile installation is explained in Section 8.2 of the report.

Most of the construction activity will be over water during the Marina refurbishment. There will be minimal shielding of noise where activities will affect most of the residents in the immediate area. The predicted noise levels are summarised below:

Scenario	Plant items	Sound Pressure Levels At 30m	Correction Factor	NML (dBA)	Predicted LAeq noise level (dBA) at the nearest residence	Exceedance
Scenario 1	Angle grinder	102	-8	(42+10) 52	63	11
Scenario 2	Excavator 30t	110	-8	(42+10) 52	65	13
	Impact piling rig	134	-6		90	38

The Noise Management Level (NML) is derived from the daytime RBL being 42 dBA plus 10 dBA (52 dBA) in accordance with the "Interim Construction Noise Guideline July 2009". The noisiest scenario involves the Excavator 30t and Impact pile rig with exceedances of the design target of up to 38 dBA. The use of the angle grinder will exceed the daytime design goal by 11 dBA.

In the joint experts report with the potential reductions in noise of the order of 7 dBA to 12 dBA below the presented readings may be achieved by using rigs with noise mitigation measures employed.

I am in agreement with the proposed noise mitigation strategies for the construction activity and recommend that the strategies as detailed in Section 8.4.1 of the report being adopted and implemented during such works should the proposed application be approved.

In addition it is recommended that the reporting of the monitoring program during the Construction Phase shall identify all exceedences and be made available at all times to the appropriate certifying authority. The reporting shall describe the date, time and nature of exceedence/incident; identify the cause (or likely cause) of the exceedence/incident; describe what action has been taken and describe the proposed measures to address the exceedence/incident.