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Nepean Hospital - Acoustic Logic Response to NSW EPA and Penrith Council Comments

1 INTRODUCTION

This letter has been prepared in response to comments made by the NSW EPA and Penrith City Council in the response letters regarding the revision 7 SSD Acoustic Assessment (dated 23/07/2018) for the Stage 1 redevelopment of the Nepean Hospital.

Letter references received are NSW EPA; *DOC18/664903-02*, dated 11th October 2018 and Penrith City Council; ECM 8375601, dated 12th October 2018.

Our responses are presented below.

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2 NSW EPA RESPONSES – SECTION 3.1 OF EPA LETTER

2.1 BACKGROUND NOISE MEASUREMENT

NSW EPA Comments

background noise measurement

The EPA emphasises that properly establishing background noise levels in accordance with guidance material in the New South Wales Noise Policy for Industry (NPfI) is fundamental to a consistent approach to the quantitative assessment of noise impacts of development.

The NPfI specifies that at least a 'week's worth' of monitoring data is required to establish background noise levels and that noise levels measured during rainfall and when wind speeds exceed 5 metres per second (i.e. 18 kilometres per hour) should be excluded when deriving those background levels.

The NPfl guidance material also specifies that noise from an existing development should be excluded from background noise measurements.

However, Figure 2 to EIS Appendix 15 indicates that 2 noise loggers were deployed for the purposes of background noise monitoring.

Logger A was deployed at a residence in Barber Street over 11 days between 31 January 2017 and 10 February 2017 but no meteorological data is reported.

However, Logger B was deployed -

- (a) between 25 May 2018 and 1 June 2018 during which period background noise measurements were likely to be affected by rain on 28 and 30 May as well as wind speeds in excess of 5 metres per second on several days, and
- (b) on the hospital campus instead of at the most affected or potentially most affected residence in Somerset Street.

The EIS is not supported by a graphical representation of the daily background noise monitoring data and observed meteorological conditions.

Accordingly, the EPA is unable to provide an informed assessment of the suitability of the rating background levels and applicable noise criteria.

Acoustic Logic Response

- A revised report has been provided (Revision 9 Dated 08/11/2018) which includes the graphed results of the background noise monitoring for both logger locations A (Barber Street) and B (Somerset Street). Meteorological data has been included in the graphs in accordance with the NSW EPA NPfI 2017 to highlight times when logging data was excluding from analysis (during rainfall and wind speeds that exceed 5 metres per second).
- In regard to Logger Location B (Somerset Street), we make the following comments.
 - Comments have been provided by the EPA in relation to logger location B and the fact that it was not undertaken at the *most affected or potentially most affected residence in Somerset Street*.
 - As explained in section 4 table 2 of the Acoustic Assessment, during our site attendances (in particular, the 6/6/2018 measurement at 12am-2am) it was observed that existing mechanical plant from the Hospital is affecting the background noise levels along most of the Somerset Street residences.
 - In accordance with the NPfI, noise from an existing development should be excluded from background noise measurements.
 - All residences on Somerset Street are impacted to some degree by pre-existing plant noise (as detailed table 2). Most critically, the residences at the northern end of Somerset Street are impacted by plant noise from the existing Cancer Centre. This

applies to both the residences directly opposite (the nearest potentially impacted) as well as residences further to the east (see attended measurement locations 3, 4 and 5, page 9).

- Further, it is likely that the existing plant noise will change following the development of the hospital, meaning that a measurement of ambient noise levels at a location not impacted by existing plant noise is desirable.
- The noise Somerset Street logging location (Location B) that was used is the location on Somerset Street that is not impacted by existing plant noise (as it is shielded by the child care centre) and best represents the ambient environment excluding noise from the Hospital itself.
- The location selected was appropriate for use when setting noise emission limits. In fact, it was the best location on Somerset Street for this purpose.

2.2 AMBULANCE BAY

NSW EPA Comments

ambulance bay

Section 6.1.1 and Table 15 to EIS appendix 15 assess noise level exceedance by reference to the *Environmental Criteria for Road Traffic Noise*, 1999 which has been superseded by *Road Noise Policy* 2011.

Acoustic Logic Response

- As outlined in the Acoustic Assessment, in the assessment of sleep disturbance from the operation of the ambulance bay we have assessed the operation against the requirements of the NSW EPA *Noise Policy for Industry (NPfl) 2017* (refer to section 5.3).
- The Noise Policy for Industry recommends an initial "Background+15dB(A)" test when assessing intermittent noise events for sleep disturbance. In the event that this test is failed, the NPfI recommends a more detailed assessment of intermittent noise events, and refers to the EPA Road Noise Policy as a suitable document to provide guidance.
- We realise that the Road Noise Policy has superseded Environmental Criteria for Road Traffic Noise. The Acoustic Logic Report had referred to the ECRTN as the sleep disturbance analysis in that document is the more comprehensive.
- However, *both* the ECRTN and the RNP draw the same conclusion:

Maximum internal levels below 50-55dB(A) are unlikely to awaken people from sleep.

This is the justification that was used in the analysis of the Ambulance Bay.

• For completeness, Revision 8 of the Acoustic Assessment now replaces any reference to the ECRTN with the RNP.

2.3 MECHANICAL PLANT AND EQUIPMENT

NSW EPA Comments

mechanical plant and equipment

Section 6.4 to EIS Appendix 15 includes a qualitative assessment of the "... initial design of primary plant items ..", proposes acoustic treatments, and indicates the need to undertake a detailed quantitative assessment "... once plant is selected ...".

Acoustic Logic Response

- Section 5.2 of the submitted acoustic report outlines the noise emission objectives in accordance of the NSW EPA *Noise Policy for Industry (NPFI)*.
- Section 6.4 of the Acoustic Assessment addressed plant noise. The assessment is quantitative in that:
 - Typical major plant items (and their locations) have been identified.
 - Typical sound power levels of primary plant items are identified (cooling tower, chiller, generator, major fans).
 - Acoustic treatment (including positioning, attenuators sizes and blanking off of plant room louvres on critical facades) have been nominated.
- The level of quantitative assessment provided has identified key areas where acoustic treatment are required that could ultimately impact equipment location and building appearance.
- The level of detail provided is as high as can be provided for this stage of design. It is also consistent with what is typically provided at project approval stage for a State Significant Development in our experience.
- A higher level of detail would simply result in consultants making estimates of plant selections/noise levels before proper design is undertaken, and an acoustic assessment conducted on this information would be of little benefit.

2.3.1 Construction Noise

We note that the EPA has made the following recommendations:

Recommendation

The proponent be required to ensure that as far as practicable all demolition, site preparation, bulk earthworks, construction and construction-related activities likely to be audible at any noise sensitive receivers such as surrounding residences are only undertaken during the standard construction hours, being -

- (a) 7.00 am to 6.00 pm Monday to Friday,
- (b) 8.00 am to 1.00 pm Saturday, and
- (c) no work on Sundays or gazetted public holidays.

2.2.2 intra-day respite periods

The EPA anticipates that those demolition, site preparation, bulk earthworks, construction and construction-related activities generating noise with particularly annoying or intrusive characteristics (such as those identified as particularly annoying in section 4.5 of the Interim Construction Noise Guideline) would be subject to a regime of intra-day respite periods where –

- (a) they are only undertaken after 8.00 am,
- (b) they are only undertaken over continuous periods not exceeding 3 hours with at least a 1 hour respite every three hours, and.
- (c) 'continuous' means any period during which there is less than an uninterrupted 60 minute respite between temporarily halting and recommencing any of the intrusive and annoying work referred to in Interim Construction Noise Guideline section 4.5

The EPA emphasises that intra-day respite periods are not proposed to apply to those demolition, site preparation, bulk earthworks, construction and construction-related activities that do not generate noise with particularly annoying or intrusive characteristics.

Acoustic Logic Response

- We note that work is proposed on Saturdays between 7am and 8am and 1pm and 5pm. This is outside of standard hours, and as such a more stringent construction noise emission goal applies (Background+5dB(A)).
- Activities that can be conducted in this "outside of standard hours" period (ie those complying with the "Background+5dB(A) requirement) have been identified in the document *Construction Noise Management Plan* by Acoustic Logic (dated 16.11.2018).
- Respite periods:
 - Respite periods are recommended in the EPA Interim Construction Noise Guidelines when the *Highly Noise Affected* trigger level of 75dB(A) is reached.
 - Respite periods should only be adopted for activities that are expected to reach the Highly Noise Affected trigger level. There should be no blanket adoption of respite periods based on the *equipment used*, it should be based on the *noise level*.
 - It is not anticipated that noise levels exceeding 75dB(A) will be achieved at residences outside of the hospital precinct. As such respite periods are unlikely to be warranted.

 Any condition of consent addressing construction noise and respite periods should require respite periods for activities exceeding the 75dB(A) Highly Noise Affected trigger level. To do otherwise is contrary to the Interim Construction Noise Guidelines and will result in unnecessary delay to the project.

3 PENRITH CITY COUNCIL RESPONSES – SECTION 7 OF COUNCIL LETTER

3.1 GRAPHED RESULTS OF ONSITE NOISE MONITORING

Penrith City Council Comments

Logger data from long term unattended noise logging and attended noise measurements have not been provided for review. A copy of this data should be made available for review so as to validate the conclusions of the acoustic report.

Acoustic Logic Response

A revised report has been provided (Revision 8 – Dated 08/11/2018) which includes the graphed results of the background noise monitoring for both logger locations A and B. In addition, meteorological data has been included in the graphs in accordance with the NSW EPA NPfI 2017 (during rainfall and wind speeds that exceed 5 metres per second).

3.2 CHILD CARE CENTRE

Penrith City Council Comments

It is noted that a child care centre is located to the east of the site. It is stated in contamination documentation that this facility is to be demolished, however, no comment to this effect, or any consideration to this premises has been provided in the acoustic assessment. Should this facility continue to be operational during any stage of works, detailed assessment of potential impacts to this receiver should be undertaken.

Acoustic Logic Response

See comments below regarding construction noise and vibration impacts more generally.

3.3 CONSTRUCTION NOISE & VIBRATION IMPACTS

Penrith City Council Comments

Noise and Vibration impacts on existing buildings within the Nepean Hospital Precinct, which include adjacent general hospital wards, a cancer services centre and Tresillian, have not been duly considered as part of this acoustic assessment. Section 6.5.2 includes the statement "vibration impacts on other buildings within Nepean Hospital will be "addressed through internal hospital management". This is not considered appropriate given the internal noise and vibration criteria specific to each of these sensitive uses under AS2107: 2016 *Recommended design sound levels and reverberation times for building interiors*'. To ensure that potential impacts are identified and managed appropriately, it is recommended that further assessment of construction and operational noise be undertaken to demonstrate that the relevant internal criteria can be achieved.

Acoustic Logic Response

- Construction noise and vibration impacts should be assessed with reference to the following:
 - Construction noise from the site should be addressed in accordance with the NSW EPA *Interim Construction Noise Guideline (ICNG) 2009*, not Australian Standard AS2107:2016.
 - Construction vibration from the site should be addressed in accordance with the NSW EPA *Assessing Vibration: A technical guideline,* not Australian Standard AS2107:2016.
- Both of these documents (NSW EPA ICNG and Assessing Vibration) have been presented and established in section 5.5 of the Acoustic Assessment. AS2107 is not used in the assessment of construction noise.
- The intention of presenting the applicable construction noise and vibration criteria is to ensure neighbouring receivers (i.e. adjacent houses and or commercial developments, Private Hospital *outside* of the hospital grounds) are appropriately managed.
- For existing hospital buildings within the Nepean Hospital Precinct it will be open for NSW Health, the construction contractor and relevant affected parties to negotiate appropriate construction noise mitigation.
- Obviously any construction noise mitigation program is a balance of:
 - Noise/vibration impact.
 - Time (less noise/vibration intensive activities typically take longer).
 - Cost (cost of noise screens, façade upgrades or other acoustic treatments).

How this balance is struck is a decision for NSW Health and the other relevant stakeholders.

- However, we note:
 - The most noise/vibration intensive construction activities are typically demolition and excavation in rock, when use of hydraulic hammers, rock saws and similar equipment is used.
 - At the present site, demolition works are relatively minimal (primarily of the existing on grade car park, and the staff accommodation/Hope Cottage buildings) and there is no significant bulk excavation of rock or demolition of large ground floor slabs anticipated.
- The noisiest typical general construction works would therefore consist of:
 - Excavation/civil works using dozers or similar.
 - Trucks and other vehicles on site (work zones are located on the northern and eastern boundaries of the site).
 - Cranes.
 - Concreting works (form-working using powered hand tools, concrete pump, concrete vibrators).
 - Façade work (powered hand tools in external areas).
- That being the case, key construction noise/vibration considerations are:
 - Noise impact on the Child Care Centre (immediately east of the site, adjacent to a work zone - truck noise). If the Centre is occupied during the construction stage, it is proposed to construct an approximately 2.7m solid noise screen around the perimeter of this area to provide a noise barrier to the child care centre.

- Noise impact on the Drug and Alcohol Services Building (immediately north of the site, adjacent to northern work zone). Private offices directly facing the northern work zone will be considered for potential window upgrades (Magnetite secondary glazing or similar).
- Similarly, secondary glazing to south facing windows to sleeping areas in Tresillian (if any), Hope Cottage and the doctors accommodation building should be considered (in consultation with Health Infrastructure)
- Noise impact on Northern and Eastern Blocks of the existing hospital will be moderate. Use of powered hand tools, concrete vibrators and slab finishing works near the western and southern boundary of the site is likely to result in intermittent exceedances of EPA guidelines for internal noise criteria for rooms directly facing the work site.
- A detailed construction noise/vibration management plan is typically prepared by a Construction Contractor, (*Construction Noise Management Plan*, by Acoustic Logic dated 16/11/2018), addressing:
 - Noise screen (plywood/fc sheet) along the eastern edge of the site (between eastern work zone and the child care centre).
 - Secondary glazing (Magnetite) to office/consult room windows of the Drug and Alcohol Building and sleeping rooms in Tresillian to be considered.
 - Notification of management of the North Block and Eastern Block:
 - In the event that excavation in rock or vibratory ground compaction works are required.
 - On days of concrete pours adjacent to the southern/western boundary of the site.
 - It is also recommended that vibration monitoring is conducted in any operating theatre or medical imaging areas in the North or East Block in the event that use of hydraulic hammers or vibratory compaction is required.

4 CLOSURE

In our opinion, all queries raised by the EPA and Penrith have been adequately responded to with a level of detail appropriate to this stage of the project. Appropriate noise emission goals have been proposed and the acoustic viability of the project has been demonstrated.

Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd Matthew Furlong