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Daniel Gorgioski
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Department of Planning and Environment

(via the Major Projects Planning Portal)

Dear Daniel

**Sydney Metro West – The Bays to Sydney CBD
Modification 1 – to remove limits on 24-hour tunnelling (SSI 19238057 Mod 1)
EPA advice on Modification Request**

I am writing to you in reply to the Department of Planning and Environment's (DPE) invitation to the NSW Environment Protection Authority (EPA) to provide comment on above request to modify Condition D23 of the Sydney Metro West – The Bays to Sydney CBD (SMW Stage 2) SSI approval.

Condition D23 outlines the circumstances in which construction works outside of standard hours may be undertaken – including for safety and emergencies, for low impact works, by approval, or by prescribed activity. One of the prescribed activity circumstances under D23(d)(i) is: *“tunnelling by Tunnel Boring Machine (TBM) only (excluding cut and cover tunnelling, and surface works) are permitted 24 hours a day, seven days a week”*. The Modification seeks to delete “by Tunnel Boring Machine (TBM) only” to enable tunnelling by any means.

The limit on non-TBM tunnelling was applied to prevent a large number of receivers from potentially experiencing excess noise and vibration impacts 24 hours a day during construction of the station caverns, crossover caverns, turnback tunnels, and cross passages. These tunnel components are constructed using road headers and are localised, and therefore would have lengthier ground borne noise impacts to receivers above compared with the constantly moving TBM where impacts are transient. In particular, the EPA was concerned about the high number of residential receivers at Pyrmont that could potentially experience excess noise for up to three months – a significant portion of which would be eligible for alternative accommodation – and the lack of detail in the EIS about how this would be reasonably and feasibly managed.

The EPA has reviewed the document *Modification Request (Mod 1)*, dated 1 February 2023, prepared by Sydney Metro (Modification report). The Modification report also discusses a proposal to relocate a train crossover passage from east of The Bays Station to west of Pyrmont Station. This has formed part of a separate consistency review but the outcomes of a Detailed Noise and Vibration Impact Statement (DNVIS) for the crossover passage are discussed in the report.

Breakdown of non-TBM tunnelling components is required

The Modification report states that 24-hour tunnelling is required for safety and stability reasons and that tunnelling by road header is not conducive to starting and stopping, as excavations by road header must be immediately followed by temporary support in the form of shotcrete, steel sets, rockbolts and grouting.

However, the report has not provided a breakdown of these activities associated with non-TBM tunnelling and their noise levels. Such details would provide an understanding of the components of this tunnelling method and identify whether there is an opportunity to schedule noise-generating works during more suitable hours – particularly outside of night-time – thus avoiding the potential need to relocate households.

The EPA requests that additional detail is provided on what reasonable and feasible mitigation measures are to be put in place for non-TBM tunnelling. This includes a breakdown of the construction programme to schedule noise-generating activities during less sensitive times (e.g. until 9 pm at night) to enable the less intrusive elements of tunnelling to be done during sensitive times (e.g. between 9 pm and 7 am) – particularly while the underground works are at a depth where ground noise impacts to receivers on the surface exceed noise management levels (NMLs).

Outcomes of Detailed Noise and Vibration Impact Statements (DNVIS)

The Modification report states that the modelling approach in the EIS included a number of conservative assumptions that would be adjusted as part of the DNVIS required under condition D29. It draws on two examples of predicted exceedances for SMW Stage 1 (The Bays to Westmead) where the DNVIS indicated that ground borne noise levels were below the predicted outcome and in fact met the NMLs at those locations.

Also included in the Modification report is a summary of the outcomes of the DNVIS for the relocated crossover cavern to the west of Pyrmont Station which *“has been prepared by the construction contractor to assess the noise impacts using the preferred construction methodology for this proposed change”*. The DNVIS identified that: up to 16 receivers would experience exceedances of the NMLs by between 1 dB and 10 dB during daytime out-of-hours; up to 16 receivers by 1-10 dB during the evening; and up to 50 receivers by 1-10 dB at the night. As an example of refinement, the DNVIS night-time assessment compares with the EIS prediction where up to 91 receivers were expected to experience noise levels 1-10 dB above the NML, and up to seven receivers between 11-20 dB above.

The summary states: *“No receivers are predicted to experience an exceedance of the NML by greater than 10 dB during construction of the Pyrmont crossover tunnel during any time period. However, the duration of construction by non-TBM tunnelling would mean the noise impacts would likely be experienced for a longer duration when compared to tunnelling by TBM.”* Note that 1-10 dB above NMLs equals 6-15 dB above background noise levels. The Modification report also states: *“These worst-case potential impacts to any receiver above the cavern are expected to last for around six to 12 weeks.”*

The DNVIS summary for the crossover passage has not identified the reasonable and feasible mitigation measures that would be implemented to reduce construction noise that does not meet NMLs. The EPA requests this detail be provided in a Response to Submissions for this Modification request.

Crossover passage and Pyrmont Station cavern interface

Regarding the interface between the Pyrmont Station cavern and crossover passage excavation works, the Modification report states: *“Some receivers in proximity to the Pyrmont crossover cavern adjacent to the station cavern may experience longer duration as a result of additional non-TBM tunnelling, however the impacts are similarly expected to remain for around six to 12 weeks.”*

The EPA requests more information is provided to explain what is meant by this statement, to identify impacts to receivers that may fall into the Venn diagram of the Pyrmont Station and Crossover work areas, and to outline the reasonable and feasible mitigation measures that would be applied to reduce construction noise impacts below NMLs.

Excavation by non-TBM means at Pymont Station

Regarding the station cavern excavations, the Modification report states “... *the proposed depth of Pymont Station cavern ranges from around 36-39 metres. Applying the ground-borne noise level graph in Figure 3 ... noise levels would be expected to comply with noise management levels in most cases with some potential for marginal exceedances in the 1-5dB range.*” Figure 3 illustrates the sliding scale of ground borne noise levels in relation to distance from the receiver and shows that “*the residential night-time noise management level of 35 dBA would only be exceeded when works are within a 30 metre slant distance from receivers.*”

This additional information regarding tunnel depth at Pymont, coupled with indicative road header noise levels in Figure 3, provides the EPA with increased confidence that ground-borne noise impacts at Pymont may be kept below NMLs. However, the Modification report states that exceedances could be in the 1-5 dB range (6-10 dB above background). The report does not identify how frequently or for how long these “marginal exceedances” would occur.

The EPA requests the Response to Submissions provide details on the frequency and duration of any exceedances of NMLs at Pymont Station, and the reasonable and feasible mitigation measures that would be applied to reduce these impacts.

Tunnel depths at Hunter Street have not been discussed. The EPA requests this information be provided in the Response to Submissions to demonstrate whether this will have an impact on noise exceedances at this location.

In addition, the EPA would like the DNVIS for Pymont and Hunter Street to be provided as part of the Response to Submissions, so that it can be assured that all reasonable and feasible measures, including the scheduling of high-impact noise works, have been adopted to keep noise levels below the NML as far as practicable.

EPA considerations

The Modification report has presented the findings of DNVIS outcomes elsewhere to illustrate that the worst-case predictions are unlikely to be realised for SMW Stage 1. While the EPA understands the nature of conservative assumptions, the lack of detail in the EIS about what reasonable and feasible measures would be applied, and how effective they would be, underpinned recommendations to limit non-TBM tunnelling to standard construction hours – unless they fell within the limits for low noise impact works identified in condition D23(b).

The EPA’s policy approach to noise management outlined in its construction noise guidelines requires proponents to firstly consider whether noise-generating works outside of construction hours are necessary, and if they are what reasonable and feasible mitigation measures would be put in place to reduce construction noise impacts as far as possible.

As part of the Response to Submissions, the EPA requests the proponent respond to the requested additional information highlighted in this letter.

Should you require clarification of any of the above please contact Anna Timbrell on 9274 6345 or email anna.timbrell@epa.nsw.gov.au

Yours sincerely



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