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Department of Planning and Environment
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Dear Ms Garland

WestConnex Stage 2 New M5 project (SSI 14_6788)

Thank you for the opportunity to comment on the Environmental Impact Statement (EIS) for the WestConnex Stage 2 New M5 project (SSI 14_6788). NSW Health makes the following submission for your consideration. The appendix to this letter provides more detailed comments on the matters raised.

NSW Health has reviewed the EIS with emphasis on the technical adequacy of the Human Health Risk Assessment (HHRA), the Air Quality assessment and the Noise and Vibration impact assessment. NSW Health is satisfied that for this particular project the HHRA has used an appropriate approach for the assessment of human health.

Exposure to traffic related air pollution has been shown in epidemiological and clinical studies to be associated with a range of cardiovascular and respiratory health outcomes. Importantly, there is little evidence of any threshold below which exposure to components of traffic related air pollution are not associated with adverse health effects. There is also some evidence of the adverse health impacts of exposure to elevated environmental noise including cardiovascular disease, sleep disturbance and cognitive outcomes in children.

Consistent with this, the National Health and Medical Research Council (NHMRC) 2008 report *Air quality in and around traffic tunnels* concludes that it is good practice to limit exposure to traffic related air pollution and to strengthen measures to ensure in-tunnel and external air quality impacts are continually minimised. NSW Health supports this position and recommends that all reasonable measures are taken to minimise exposure to traffic related air pollution inside and outside the tunnel as well as on the traffic network.

In developing this advice, I have consulted with the Chief Health Officer's Environmental Health Expert Advisory Panel (EHEAP), that includes experts in public health, air modelling, noise, epidemiology and risk assessment.

External air quality

Information provided within the EIS does not demonstrate that the model used to estimate air pollution has been adequately validated. However, I do note that the model used in the EIS is the same model that was used to assess the external air quality for the proposed M4 East and that subsequently substantial additional work (mainly sensitivity studies) has been undertaken to validate the modelling work for the proposed M4 East development. As such, NSW Health is happy to accept that the model is appropriate for this EIS.

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I note that many of the input variables presented in the HHRA section of the EIS are inconsistent with the variables reported in the Air Quality assessment section of the EIS. For some of the input variables into the HHRA, no results are presented in the Air Quality assessment. It would be useful to assure that these data align.

NSW Health notes that portal emissions are not included in the proposal. This is in keeping with good design and consistent with the NHMRC (2008) observation that "In urban locations, it is often felt that portal emissions are not acceptable because of the localised effect of such a powerful point source of air pollutants."

The EIS predicts reductions in PM_{2.5} and nitrogen dioxide exposure in a number of the areas surrounding the proposed development in 2021 and 2031. There are, however, limited areas of increased PM_{2.5} and nitrogen dioxide exposure that appear to align with areas of surface traffic congestion. The HHRA predicts a non-negligible increased risk of hospitalisation and mortality (to a maximum increased risk of 6 per 100,000 per annum) for residents who experience an increase in PM_{2.5} and /or nitrogen dioxide exposure. Based on this assessment, it is recommended that there is further exploration of all feasible and reasonable measures to reduce ground level concentrations in those areas currently predicted to experience an increase. Further, some workplace areas and some locations at 30m elevation are predicted to have an increased risk of morbidity and mortality ranging from 1 per 10,000 per annum to 2 per 1000 per annum. In these areas it is important to consider the impacts of pollutants and their dispersion in any future land use change. Future approval of elevated residences may expose people to unacceptable levels of pollutants as well as change the stack dispersion patterns.

In-tunnel air quality

The EIS proposes an in-tunnel limit of 0.5 ppm of nitrogen dioxide as a rolling 15 minute average. It is noted that this would likely result in the usual exposure levels of nitrogen dioxide being significantly lower. In addition, the significant protective effect of a vehicles ventilation system when set to recirculate would be expected to appropriately reduce exposure to nitrogen dioxide. The degree of reduction in exposure is dependent on air conditioning recirculation being actively promoted to tunnel users, which should be considered in the conditions placed on this project, if approved. Consideration of travel through multiple tunnels has not been comprehensively undertaken, for example providing scenarios of travel times and exposure.

Noise and vibration impact assessment

During the **construction period** noise and vibration impacts are estimated to exceed acceptable noise levels in several areas affecting a substantial number of receptors. Appropriate mitigation measures are required to minimise potential adverse health impacts. However, a comprehensive plan for mitigation measures will only be developed in the specific construction noise and vibration management plans (CNVMP's) during the detailed construction planning phase; hence it is currently not possible to comment on the adequacy of mitigation measures. I strongly recommend all feasible and reasonable mitigation strategies be applied in order to prevent adverse health effects for all sensitive receptors, and where necessary, tailoring interventions for the most vulnerable residents.

NSW Health assumes the validation of the traffic noise model used for this EIS was appropriate and the model is using adequate inputs for the proposed scenarios. I note this EIS does not present a sensitivity analysis discussing the uncertainties of the prediction.

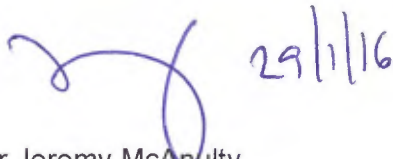
During the **operation of the project** significant noise exceedances are predicted, especially around the St Peters area. NSW Health has concerns for the substantial number of impacted receptors including the two school buildings of St Peters Public School. Potential mitigation strategies are outlined; however, I note that final feasible and reasonable noise mitigation strategies will only be determined during the detailed design phase. The mitigation measures described are based on having external windows and doors shut and having minimal use of outdoor areas. For many residential receptors and the St Peters Public School community this will result in an impact on their use of outdoor areas. NSW Health recommends that all feasible and reasonable mitigation strategies are applied in order to prevent adverse health effects for all sensitive receptors. Particular emphasis should be placed on tailoring interventions for the St Peters Public School buildings reducing noise levels by as much as possible to promote best learning conditions for all students.

Other issues

The issues of groundwater, asbestos and other health issues are further addressed in the Appendix.

Thank you for considering NSW Health comments on the WestConnex New M5 project (SSI 14_6788) EIS. Should you wish to discuss our submission further, please contact Professor Wayne Smith Director, NSW Health Environmental Health Branch on 9424 5918.

Yours sincerely



Dr Jeremy McAulity
**Acting Chief Health Officer and Deputy Secretary
Population and Public Health**

Detailed comments on the Environmental Impact Statement (EIS) for the WestConnex Stage 2 New M5 project (SSI 14_6788).

External Air quality

The Human Health Risk Assessment (HHRA) has used an appropriate approach for the assessment of human health. Many of the input variables presented in the HHRA section of the EIS are inconsistent with the variables reported in the Air Quality assessment section of the EIS. For some of the input variables into the HHRA, no results are presented in the Air Quality assessment. Further, the HHRA calculates the risk from threshold chemicals (such as air toxics) without consideration of background concentrations. Concentrations considered for the assessment should be the maximum predicted total concentrations, and not the difference in concentrations between scenarios, as would be used for non-threshold chemical.

It is noted that potential exceedances for PM₁₀ could occur in the industrial area on the southern boundary of the Alexandria Landfill zone. Dispersion modelling for odour has also predicted the chance of 'some industrial receptors at the southern boundary experiencing levels up to 7 odour units, and therefore some occupants (workers) will experience odour annoyance. It is recommended that comment is sought from SafeWork NSW on this issue.

Future development proposals and rezoning could result in new multi-storey residential buildings being built in close proximity to the stacks. In addition, there are a number of existing receptors which are currently deemed not to be at risk of unacceptable exposures due to the project as they are non-residential. There needs to be special consideration around these receptors if there is a proposed change to land use, such as from industrial to residential. We support the approach outlined in the EIS, namely that any future developments will have to consider the air dispersion performance of the stacks along with how the future development may affect this performance, and that Roads and Maritime Services will work with the Department of Planning and Environment and local governments in determining the suitability of any relevant development proposals.

It is noted that the New M5 EIS includes air pollution modelling at 10 and 30 metres in addition to ground level with classified "unacceptable" health impacts close to the stacks. This must be taken into account in any rezoning plans. Specifically, it is noted that the increased risk for some health outcomes for potential future elevated receptors (30m) would be within the "unacceptable" range (Table 6.24). The EIS states that Roads and Maritime Services would ensure that it works closely with Department of Planning and Environment and local governments to ensure no inappropriate developments adjacent to proposed stacks occur. It is strongly recommended that the proponent ensures during joint regional planning that consideration of a height exclusion zone is created around the Southern Ventilation Facility, which prohibits unsafe building around the stack.

It is noted that approval is being sought for two lanes to be used in each of the tunnels. However it is understood that the tunnel construction would allow for additional lanes to be built in both directions. Should there be additional lanes be proposed, the impact of these should be assessed on in tunnel and external air quality.

In-tunnel Air Quality

NSW Health would support all reasonable and feasible measures to ensure that measures are taken to minimise exposure to traffic related air pollution inside the tunnel.

Available evidence indicates that setting a car's ventilation system to recirculate can significantly reduce exposure to nitrogen dioxide. A clear communication strategy is required to ensure that tunnel users are informed of the need to switch the car's ventilation system to recirculate when using the tunnel.

The modelling indicates that PM levels in the tunnel may be similar or higher than what has been measured in the current M5 tunnel^{1,2}.

To ensure that the tunnel's performance is monitored accurately when operational, it is important that adequate monitoring data regarding in-tunnel levels of air pollutants is recorded. This would include appropriate positioning of monitoring equipment (such as entry and exit portal, at the base of any ventilation or emergency extraction outlets, ramp junctions and at midpoints between portals, ramps and ventilation outlets), redundancy for potential mechanical failure, and that the data produced are made available in a timely manner.

Noise and vibration

The EIS states that a comprehensive plan for mitigation measures from construction noise will only be developed in the specific construction noise and vibration management plans (CNVMPs) during the detailed construction planning phase; hence it is currently not possible to comment on the adequacy of mitigation measures.

During the **operation of the project** significant noise exceedances are predicted, especially around the St Peters area. NSW Health has concerns for the substantial number of impacted receptors including the two school buildings of St Peters Public School. The mitigation measures proposed for these areas are based on having external windows and doors shut and having minimal use of outdoor areas. For many residential receptors and the St Peters Public School community this will result in an impact on their use of outdoor areas. NSW Health recommends that all feasible and reasonable mitigation strategies are applied in order to prevent adverse health effects for all sensitive receptors. Particular emphasis should be placed on tailoring interventions for the St Peters Public School buildings reducing noise levels by as much as possible to promote best cognitive outcomes for all students.

The noise and vibration assessment should provide greater clarity and more details in the following areas:

1. **Noise reduction around open windows:** There is a question about the noise level reduction from outside to inside. This is commonly accepted as being 10 dBA for an open window. It is likely that in many cases, this assumption is correct but there are also cases where this assumption is too optimistic. There is data to suggest that for some house constructions, it may be as low as maybe 5 dBA. NSW Health would like to see a

¹ South Eastern Sydney Public Health Unit & NSW Department of Health *M5 East Tunnels Air Quality Monitoring Project –Report July 2003*

[<http://www.health.nsw.gov.au/environment/air/Documents/m5complete.pdf>]

² Stacey Agnew *Westconnex New M5 Ventilation Report for the WestConnex Delivery Authority – 10 November 2015, Ref 1505*.

discussion about what that might mean in practice in relation to the numbers and types of houses impacted and in terms of noise mitigation for those affected.

2. **Noise mitigation strategies:** NSW Health understands that it can be difficult to determine exact noise mitigation strategies during the current stage of the project. NSW Health would like to emphasise the importance on developing detailed mitigation strategies outlining the specific amount in decibels for which each measure will be used to reduce noise below guideline levels.
3. **Protecting vulnerable individuals:** For the construction phase it is noted that normal practice is to mitigate noise by undertaking most works during daytime hours. However, this may not be sufficient for those who are at home during the day including the elderly, young children and their carers, those who are unwell and those who are unemployed, who are likely to be more susceptible to adverse health effects of noise. Tailored mitigation strategies for these vulnerable individuals may need to be developed.
4. **Communication plan:** NSW Health notes that a communication plan will be part of developing CNVMPs. It is important that such a plan includes ways in which two-way communication will occur with individuals who may find it difficult to advocate for themselves, especially those who are elderly, who do not speak English, are housebound, or who may be unwell.
5. **Cumulative noise and vibration impacts:** The EIS states it is possible construction of the M4-M5 link and the Sydney Gateway may occur concurrently with the New M5 project. NSW Health requests a detailed description of potential exceedances resulting from concurrent major projects including detailed mitigation strategies at the earliest possible opportunity.

Groundwater

It is noted that contaminated groundwater is to be collected, treated and discharged into the Cooks River and Alexandra Canal. The EIS also refers to a groundwater and surface water quality monitoring program which will be implemented to monitor groundwater and surface water impacts during tunnel operations on groundwater quality and wetlands. The program will be developed in consultation with the Environment Protection Authority, Department of Primary Industry and relevant local governments, however we recommend that Southern Sydney Region of Councils (SSROC) also be consulted during the planning stage.

Other health impacts

The EIS does not provide detail regarding the health effects of property acquisition, its effects on specific vulnerable populations, or mitigation measures such as support services for affected residents. It is noted that relocation may have significant mental and physical health impacts on those affected, particularly on the elderly or those with a disability, so further detail on health effects and mitigation strategies is warranted.