Environmental Risk Sciences Pty Ltd
PO Box 2537
Carlingford Court NSW 2118

Phone: +61 2 9614 0297
Fax: +61 2 8215 0657
jackie@enrisks.com.au
therese@enrisks.com.au
ruth@enrisks.com.au
adam@enrisks.com.au

www.enrisks.com.au

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Clayton Utz
Level 18
333 Collins Street
Melbourne VIC 3000

Attention: Chris Wiseman

Response to review of the Health Impact Assessment: West Gate Tunnel Project by Dr. Lyn Denison

Environmental Risk Sciences Pty Ltd (enRiskS) has reviewed the advice provided by Dr. Lyn Denison on 19/8/2017 to the West Gate Tunnel Project IAC, which is summarised below with our responses.

Issue: Use of more localised baseline health data

Response:

Dr Denison has suggested the use of health incidence data at the localised and collector district level.

In most cases localised and collector district health incidence data is not available. enRiskS approached the relevant Victorian government authorities and used the most refined health incidence data available, that being for the most part local government level data. It should be noted that the provision of localised or collector district level data by government authorities would be subject to privacy issues, as there may be the ability to identify individuals and their health status. Further incidence data at this small detail is also subject to statistical problems, where the lack of population may lead to an overestimation or underestimation of the true incidence within the community.

Issue: Use of more health endpoints, especially for the 65+ age group

Response:

Dr Denison has suggested the assessment of numerous health endpoints with a particular emphasis on the over 65 year age group. The 65+ year age group has been included as primary health indicators for the assessment of $PM_{2.5}$.

There is currently no agreed method in Australian regarding which health endpoints should be used for the assessment of the impact from particulate matter and nitrogen dioxide from a development. Therefore any assessment of this type is subject to professional judgement. The approach suggested by Dr. Denison involves the use of almost all identified concentration response functions for particulate matter and nitrogen dioxide. Concentration response functions being formulas developed from epidemiological studies that are used to assign a health impact with a concentration of pollution.

The quality of epidemiological evidence behind each concentration response function is variable and enRiskS has chosen those concentration response functions with more robust epidemiological evidence, the health

endpoints of which are been assessed by numerous national and international government agencies. These health endpoints were presented to the Victorian Department of Health and Human Services prior to calculation and have been agreed to by NSW Health in road developments in NSW. It should be noted that many of the health endpoints suggested by Dr. Denison, such as ischemic heart disease admission 65+, COPD hospital admissions 65+ and pneumonia and bronchitis hospital admission 65+, are captured within the assessment undertaken by enRiskS (Cardiovascular hospital admissions 65+, Respiratory hospital admissions 65+). Further, it is unusual in a health risk assessment to assess numerous health endpoints for one chemical exposure, this being a limitation of no agreed method in Australia at this time.

Issue: Lack of a full literature review in the hazard assessment

Response:

Dr Denison has suggested the hazard assessment in the Health Impact Assessment (HIA) provided by enRiskS should contain a full literature review of all the evidence regarding health impacts from particulate matter and nitrogen dioxide.

The review undertaken by enRiskS includes summarising the literature and its interpretation as provided in consensus policy documents such as the World Health Organization *Review of evidence on health aspects of air pollution REVIHAAP, Technical Report,* United States Environment Protection Authority (US EPA) *Provisional Assessment of Recent Studies on Health Effects of Particulate Matter,* National Environment Protection Council *Review of the National Environment Protection (Ambient Air Quality) Measure, Discussion Paper, Air Quality Standards*, and key papers in the field. The enRiskS review therefore reflects the consensus interpretation of the epidemiological evidence in this field. One aspect of the literature review is to identify concentration response functions. It is acknowledged that not all concentration response functions used by enRiskS are those suggested by Dr. Denison. However, it is important to note that the key concentration response functions that drive the risk, such as mortality from long term exposure to $PM_{2.5}$, are the same. While professional judgement does come into play for the selection of the concentration response functions it should be noted that those in dispute are not those driving the risk and therefore would not change the conclusions of the HIA.

Issue: More comprehensive assessment of stress, mental health and wellbeing

Response:

Dr Denison has suggested the HIA give greater consideration to stress, mental health and wellbeing, but provides no further information regarding how this should be done.

The limitations in evidence mean that stress, mental health and wellbeing cannot be assessed in a quantitative manner. The enRiskS report provides a qualitative assessment of the likely stress, mental health and wellbeing issues that may be experienced because of the development.

Issue: Balance of benefits and disbenefits

Response:

Dr Denison has suggested the HIA does not deal with the benefits and disbenefits of the project at a fine enough scale, further that the HIA has a much greater focus on the positive aspects.

The HIA used a systematic and transparent approach to identify the risks and benefits from the proposed development. Where risks and benefits could be quantified and compared, this was undertaken. For those

issues that could not be quantified, a qualitative approach was undertaken. The limitations regarding the scale at which these potential impacts could be quantified have been addressed above.

The purpose of the HIA is to also address positive aspects. These are therefore included in the assessment and need to be considered along with the negative aspects.

Issue: Unidentified sensitive receptors at Blackshaws road

Response:

Dr Denison has noted a school and kindergarten on Blackshaws road have not been identified.

The assessment in the HIA examined the high impacted resident / sensitive receptor across the whole 10km x 10km grid and concluded this impact to be in the acceptable range. The school and kindergarten is located within this grid and therefore the impacts on these sites would be acceptable.

Issue: Validity of the night time noise approach

Response:

Dr Denison has suggested further information and validity of L_{night} approach be provided.

The assessment of sleep disturbance has used the exposure-response relationships outlined in Table 7.1 of the HIA. This requires the use of the metric, L_{night}. This metric is determined from the modelled noise data provided for this project as outlined in Section 7.4.3 of the report. L_{night} is calculated from the $L_{A10,18hour}$ modelled noise level as $L_{night} = L_{A10,18\text{-}hour} – 5$ (dB). This adjustment is taken from the Vicroads *Traffic Noise* document.

The L_{night} value (or change in L_{night}) is what is used in the quantification of sleep disturbance. This can be clearly seen in the noise calculations presented in Appendix H of the HIA.

Issue: Risk Acceptability and addition of common health endpoints

Response:

Dr. Denison has suggested the acceptability of risk should not surpass $1x10^{-5}$ risk to align with enHealth documentation, with risk calculations of common health endpoints from air and noise assessments being added.

There is currently no agreed acceptable level of risk in Australia for the impact of particles or nitrogen dioxide on health. EnHealth, in their *Environmental Health Risk Assessment* publication acknowledge that acceptability of risk is beyond a purely scientific calculation and includes socio political factors. They however acknowledge that guideline values are necessary for decision making purposes and present a range of potential risk levels from $1 x10^{-6}$ to $1 x10^{-3}$, while suggesting $1 x10^{-5}$ may be considered acceptable. In understanding the limitations and factors that influence the acceptability of risk, the HIA in Appendix E has outlined its reasonings around the acceptability of risk set at $1 x10^{-4}$. This value has been agreed to by Victorian Department of Health and Human Services as a site specific acceptable / tolerable risk value for this project.

The addition of common health endpoints from air and noise assessment has merit from a theoretical perspective. However, it is important that a risk assessment does not compound the conservatism to a point of being unrealistic. It is likely that the health impacts identified in the noise studies may be impart driven by air impacts and vice versa. While some of the studies have attempted to adjust for the other environmental

stressor, this is at best an ecological exposure adjustment. Therefore, there is the potential for some proportion of double counting of the health effect should the noise and air assessment be added. The HIA has also assessed the maximum impacted individual for both air and noise over the 10km x 10km square grid, and adjacent to key roadways. Adding the common health endpoints assumes the maximum impacted individual is the same person for both exposures. For this proposed development, enRiskS argue that the current method of separate assessment is appropriate and sufficiently conservative.

Issue: Lack of suggestions around mitigation actions

Response:

Dr. Denison has suggested that further mitigation measures be added into the HIA.

The HIA has assessed the acceptability of the current proposal assuming the proposed mitigation measures and Environmental Performance Requirements (EPRs) are undertaken. It is essential that the EPR's are adhered to. If these are not implemented the risks calculated in the HIA will be underestimated.

If you require any additional information or if you wish to discuss any aspect of this response, please do not hesitate to contact me on (02) 9614 0297 or 0425 206 295.

Yours sincerely,

Dr Jackie Wright (Fellow ACTRA)
Principal/Director
Environmental Risk Sciences Pty Ltd