

Expert Conclave Report: Health

Date: 11 August 2017

Attendees:

Dr Jackie Wright – Environmental Risk Sciences Pty Ltd

Associate Professor Louis Irving – Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital

Professor Gary Anderson – Lung Health Research Centre, University of Melbourne

Dr Victor Kabay – EPA Victoria

1) Issues of agreement:

- a) None of the experts from health fundamentally oppose the project
- b) There is no safe level of exposure or safe lower limit of exposure for many of the air pollutants, including particulate matter (PM₁₀, PM_{2.5}) and NO₂
- c) Agree pollutants including particulates cause lung cancer and adverse cardiovascular health effects, damage respiratory health, and increase mortality. These effects can, variously, occur after both acute and chronic exposures
- d) Fine details on population demographics, health statistics and existing air quality is not available and limits the assessment of local changes – it has been very difficult for the author of the health impact assessment to get this data. Such data would have benefited the assessment.
- e) Roadside changes in air quality have the potential to impact on health, both positively and negatively.

2) Issues of disagreement:

The following are a list of the points of disagreement between the experts, with the various differing opinions from the experts included for each point.

a) Conclusions that there are no significant risks to health

- i) Jackie Wright: The health impact assessment established a process for enabling the assessment of risks posed by air pollution, where there is no threshold, to be quantified and assessed. This involved quantifying risks posed to the community from exposures to changes in air quality and evaluating whether those changes are of significance. We regularly assess the significance of risks posed to the community from chemicals and pollutants where there is no threshold (e.g. drinking water guidelines, contaminated land). Where this process is followed risks have been calculated in the health impact assessment and determined to be very small such that they are not measurable within the community and hence are not of significance.
- ii) Louis Irving: The recent scientific literature indicates that exposure to traffic pollution has adverse health effects, even at low levels of exposure. Also, some people are more susceptible than others. There is very incomplete information about existing traffic pollution levels in the immediate areas affected by the West Gate Tunnel project. However they are likely to be higher than most other areas of Victoria. Unless the WGT project leads to a significant lowering of local traffic pollution, it is very likely that the health of the local community will be adversely impacted by this project.

- iii) Gary Anderson: there is no safe exposure limit for exposure to air pollutants and there is clear evidence for causation of very serious, incurable and of terminal diseases and sudden very serious or fatal cardiovascular effects. The adverse effects are cumulative over-time and lead to molecular changes in cells that are irreversible. The effects of pollutants are of particular concern in susceptible populations including the young, the elderly and the socially disadvantaged.
 - iv) Victor Kabay: I consider the methodologies adopted in the health impact assessment to be in line with best practice assessment and management. In fact, this level of assessment greatly exceeds the scope and level of detail that is often associated with similar developments. Whilst, as per section 1b, the experts agreed that there is no intrinsically “safe” level for many substances release by vehicles, it is my view that it is still possible to make decisions based on levels of risk that are considered to be tolerable or acceptable (rather than “no risk”). This form of risk-based decision making is commonplace in many environmental assessments.
- b) Need to evaluate and include risk mitigation measures to reduce emissions to the maximum extent achievable by technology¹ , as there is no safe level for many of these pollutants, and existing air quality is already of concern in the area.**
- i) Jackie Wright: The implementation of risk mitigation measures should be applied where there is the potential for a measurable improvement in air quality and health. In addition, it is normal for there to be a process to decide whether risk mitigation is required or necessary. This process has been followed in the health impact assessment. For this project, the health impacts have been evaluated from changes in air quality and these are very small such that they are not measurable. These impacts, both negative and positive, are greatest adjacent to major roadways where there are predicted changes in traffic. Impacts predicted from the tunnel ventilation outlets are much lower than impacts predicted roadside. All impacts predicted are small and would not be measurable in the community. As such there is no trigger to implement risk management measures for the project.
 - ii) Louis Irving: Using risk of worse health outcomes as a trigger to consider mitigation strategies is an inadequate policy. One of the aims of this project should be to take every opportunity to reduce traffic pollution in the local region, so as to improve air quality. Overseas studies have shown that improving air quality has measurable effects on the health of individuals (eg the association of increased lung growth in children with improved air quality demonstrated in a recent study from California).
 - iii) Gary Anderson: The exposure modelling that has been used assumes no net change in total pollution and assumes the redistribution will therefore have no net effect. This flawed logic has been used to argue against the utility of mitigation strategies. However, particularly at risk socially disadvantaged populations who are already burdened by poor air quality will be exposed and this will have adverse health effects. Moreover, if the tunnel were to lead to an increased use by heavy commercial vehicles the mix of pollutant and their concentration will change adversely and this would further worsen health risks.
 - iv) Victor Kabay: One of the findings of the health impact assessment was that emissions from the tunnel stack are very minor contributors to health risks in the community, with the bulk of the contribution being attributable to road-side emissions. It also found that overall risks (combined stack and road-side) were low and not measurable. Based on the

¹ State Environment Protection Policy (Air Quality Management)

fact that the tunnel stack is a very minor contributor to an overall risk that is low in the first place, I do not consider it a priority to implement further in-stack risk mitigation measures.

c) Including low birth weight (lung growth) as a health endpoint in the health impact assessment.

- i) Jackie Wright: Effects on lung growth will already be included in the respiratory health endpoints already included in the health impact assessment. Where the report as being prepared the science related to low birth weight was still being further refined and a causal association is only now being more clearly determined. As a result, it was not included as a separate health endpoint in the health impact assessment for this project.
- ii) Louis Irving: The association of air pollution with restricted foetal growth has been demonstrated in a number of international studies, and the effect is seen at concentrations of PM2.5 below national standards. Restricted foetal growth has the potential to influence the health of an individual for the remainder of their life. Therefore all measures to reduce exposure of pregnant women to traffic pollution should be strongly considered.
- iii) Gary Anderson: there is now very strong scientific evidence that pollution adversely affects lung growth. Low lung growth is well established as a cause of serious and irreversible lung disease in later life because normative aging causes progressive loss of lung function. Furthermore small lung are more susceptible to manifesting more symptoms and more severe symptoms because of irreversibly narrowed airways that can narrow and collapse more easily.

d) Agree there are uncertainties (including finer detail on population demographics, health statistics and existing air quality) in the assessment, however the impact of these uncertainties on the outcomes of the assessment is in disagreement.

- i) Jackie Wright: The uncertainties have been addressed in the health impact assessment (Section 9). More specifically, the underlying health statistics for asthma were evaluated. Where the baseline data was doubled, i.e. double the number of children in the area visited emergency departments for asthma, the risks remained low and acceptable, not changing the outcomes of the assessment. While the assessment of health impacts in the local areas evaluated would be better communicated with more refined data, the outcomes of the health impact assessment do not change.
- ii) Louis Irving: Unless these measurements are made, the size and extent of adverse health impacts will not be known, and it will not be possible to state that there will be no adverse health impacts from the West Gate Tunnel project. Also, establishing an accurate baseline of the existing state of air quality and health of the local population is essential for monitoring any changes related to the West Gate Tunnel project.
- iii) Gary Anderson: the modelling of current disease burdens and exposure assumptions that underlie the HIA are not based on actual measurements from relevant local sites under local conditions. There is no rigorous current baseline exposure data for the air quality of affected local populations. As such the conclusions are speculative and inferential rather than definitive.
- iv) Victor Kabay: Uncertainties are an intrinsic component of all environmental assessment, and are taken into account in the health impact assessment by including a series of conservative assumptions (i.e. making sure that risks are over- rather than under-estimated). It is my view that the conservative assumptions in the health impact assessment are in line with best practice and ensure that any uncertainties present would not change the outcome of the assessment.

e) Need for measuring local air quality and health outcomes before and after the project.

- i) Jackie Wright: EPRs already exist for the monitoring of ambient air in the community 1 year before and 5 years post operation (AQP4). There are no EPRs for the monitoring of health outcomes as a result of the project. Such monitoring would be difficult to do due to the small population size.
- ii) Louis Irving: There are methodologies, such as case control studies, that can be used to detect changes in small populations.
- iii) Gary Anderson: the science of measuring air quality and burdens of disease in small population or within discrete geographical areas is well established and could be implemented.

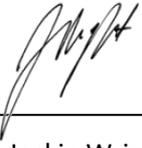
f) Inclusion of a literature review in the methodology to inform the body of on health effects from exposures to particulates.

- i) Jackie Wright: A detailed literature review was not part of the scope for the completion of the health impact assessment. It is clear that there are health impacts from air pollution and that there is no threshold. While including a detailed literature review may have added further detail and context to the assessment of air quality, it does not change the health endpoints considered, the calculations that would be undertaken, or the interpretation of the risks calculated within the community. As such the conclusions of the health impact assessment would not change with the inclusion of a detailed literature review.
- ii) Louis Irving: Knowledge about the adverse health impacts of traffic pollution is changing rapidly. Up-to-date information refines estimates of risks, but also informs us more broadly and can highlight new areas for consideration and opportunities for improvement. The scope of the HIA should have included an updated and detailed literature review.
- iii) Gary Anderson: it is a strong concern that the HIA does not include a comprehensive review of current and most recent literature and knowledge. Since the background science has not been systematically reviewed and is not up-to-date, the inferences drawn in the HIA are open to question.

3) Comments/observations from all experts

- a) Development of the methodology and scope of the health impact assessment would have benefited from more consultation with stakeholders early. This would have assisted in ensuring the scope was sufficient to capture all issues of concern from all stakeholders.
- b) It is quite possible that there are sources of health outcomes (e.g. from Department of Health and local hospitals), and air quality data relevant to this project that were not available to the writer of the HIA that would be very useful.

Signed



Dr Jackie Wright
Environmental Risk Sciences Pty Ltd

Date: 21 August 2017

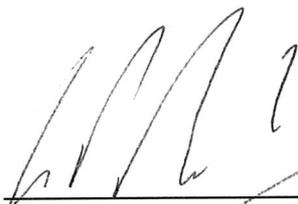
Signed



Associate Professor Louis Irving
Department of Respiratory and Sleep Medicine, Royal Melbourne Hospital

Date: 21 August 2017

Signed

A handwritten signature in black ink, appearing to be 'G. Anderson', written over a horizontal line.

Professor Gary Anderson
Lung Health Research Centre, University of Melbourne

Date: 21 August 2017

Signed

A handwritten signature in black ink, appearing to read "Victor Kabay", written over a horizontal line.

Dr Victor Kabay
EPA Victoria

Date: 21 August 2017