Adam Carlon, NEPC Executive Officer
National Environment Protection Council
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601
Email: nepc@environment.gov.au

Submission on the proposed variation to the National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) standards for ozone, nitrogen dioxide and sulfur dioxide

Christine Cowie, Guy Marks, Tom Cole-Hunter, Jane Heyworth, Bin Jalaludin, Luke Knibbs, Mandana Mazaheri, Lidia Morawska, Geoffrey Morgan, Joy Tripovich, and Graeme Zosky on behalf of the Centre for Air pollution, energy and health Research (CAR)

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Thank you for the opportunity to comment on the proposed variation to the National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM) standards for ozone, nitrogen dioxide and sulfur dioxide.

About the Centre for Air pollution, energy and health Research (CAR)

CAR is a Centre of Research Excellence funded by the National Health and Medical Research Council. The centre brings together more than 30 researchers at the forefront of their fields, based in seven of Australia's leading universities.

CAR is the only group of its kind nationally to bring together researchers focusing on health impacts of air pollution, and new versus traditional forms of energy. The centre supports teams of researchers in the fields of epidemiology, exposure assessment, toxicology, chemistry, biostatistics and clinical respiratory medicine to pursue collaborative projects and to develop their capacity. Our centre's vision for a healthier community is the driving force behind our research.

CAR is facilitating and translating research on moving to alternative, renewable forms of energy that have the most beneficial (or least detrimental) impacts on economy, environment and health, considering a technology's life cycle. For example, CAR is assessing how a transition in domestic energy use (from solid-fuel combustion to solar-generated electricity) may reduce household air pollution and therefore reduce childhood mortality rates in some Pacific Island Countries. Conversely, CAR plans to assess the potential for negative impacts from energy transitions, such as the environmental health impacts of disposal of photovoltaic solar panels at the end of their life cycle.

General comments on the proposed NEPM changes

1. CAR welcomes the review of the AAQ NEPM, which is almost certainly overdue, given that the current standards were set in 1998 and a wealth of peer-reviewed scientific research has been published since then.

2. We support 'Desired environmental outcome and goal #1' - *"The desired environmental outcome of the AAQ NEPM should be revised to 'minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live'*. This is an important advance. However, we propose that the definition be broadened to also include protection of people in other locations where they spend significant parts of the day eg school, child care centres, nursing homes, etc. It should be noted that these locations cater for sub-populations who are potentially vulnerable to the effects of air pollution.

3. We support the removal of *"allowable exceedances"* and their replacement with "exceptional events", which will need to be justified as an unavoidable cause for an exceedance eg bushfire events.

4. We support the recognition that the market fails to prevent the adverse health effects of air pollution due to failure to apply this cost to polluters (Impact Statement Section 3.3). We support mechanisms to ensure that the adverse health effects of polluting activities be costed, and those costs should be offset against the economic benefits of the polluting behaviours and activities, with mechanisms in place to transfer the costs to those responsible. This is equitable and provides an appropriate incentive against generating pollutants that have adverse health effects with their associated burden (cost) on the health system and reduced productivity of the working population.

5. We have a major concern about the inclusion of many extraneous considerations into the setting of standards. In particular, the following considerations seem to have had an undue influence on the recommendations:

a. The abatement packages. While a valid process for selecting items was used, it cannot be concluded that this package is comprehensive. The conclusion that the abatement package is not effective (or cost-effective) is NOT a justification for failing to set appropriate health-based standards and amounts to "putting the cart before the horse". Standards should be set based on the desired health goals and further work should be undertaken to look for future ways of achieving these goals. It is beyond the scope of the NEPM process to decide what those strategies might be. However, it is noteworthy and an omission that the strategies did not include any interventions relating to reducing on-road vehicle numbers and kilometres travelled or improving public and active transport in general. This would seem to be an important potential area for mitigation that is not included.

b. The cost-benefit analysis. This depends entirely on the interventions that are selected, and the costs involved in implementing them. These are not fixed and future interventions and cost-saving strategies for achieving mitigation cannot be foreshadowed. Setting targets or thresholds based on current technology and costs offers no incentive to drive down pollutant concentrations.

c. "Achievability" (Impact Statement Section 4.1 and 4.6). Reference is made to the relative contribution of anthropogenic and natural sources. This is obviously relevant to achievability and to standard setting. However, current and projected future pollutant levels are less obviously relevant, and care must be taken not to set levels on the perceived difficulty of changing current levels.

We advocate the health-based standards should be set solely on health-based criteria. The question of implementation and regulation is a separate issue. Jurisdictions need to decide on a framework for implementation which takes account of the costs and likely benefits of achieving these standards.

6. We strongly support the move toward an exposure reduction approach. This is consistent with the approach advocated by WHO. We would argue that the AAQ NEPM could be considered as one component of the strategy for reducing exposure to SO_2, NO_2 and O_3 in Australia. However, we do not agree with the contention in the report (Impact Statement section 3.4) that it is the only relevant mechanism. Indeed, we argue, as the report does, for continuous exposure reduction, which requires action outside the AAQ NEPM. We also argue that planning controls have an important role to play in limiting population exposure to harmful air pollution. This mechanism is entirely separate from the AAQ NEPM and, as the report implies, the thresholds set for the AAQ NEPM may not be appropriate when applied in the planning context.

7. We agree that international data on concentrations response functions are relevant to setting the Australian standards, but also believe that Australian data are more relevant where available and appropriate. There have been a number of Australian studies published in the last few years from which CRFs can be used. We advocate the concentration-response functions used for setting Australian standards should ideally use Australian CRF's. However this may not be possible for all health outcomes assessed due to a limited number of Australian studies. In these situations the Australian CRF's should be considered in the context of the international literature. In some cases it may be possible to combine the Australian CRF's with the international CRF's to develop a summary CRF that gives additional weight to the Australian CRF's because of their relevance to the Australian context.

8. We agree with the contention in the report that it is implausible that there are no adverse health effects below threshold levels. In view of this it is surprising that the report has preferentially applied concentration-response functions (CRFs) that make this assumption (labelled "Group 1 CRF" in the report). We would prefer to see the analysis based on concentration-response functions that assume no lower limit for the adverse health effects.

9. The problem with the "roll back" approach to assessing the health outcomes avoided by meeting the standards (Impact Statement Section 4.7.4) is that it assumes that there are no health effects below the standard, and this is not the case. It also assumes that jurisdictions will use a particular strategy, with across-the-board reductions, to achieve these standards. The greater health burden is likely due to air pollution concentrations below the standard that happen frequently rather than infrequent air pollution episodes above the standard. Alternative strategies, such as targeting high pollution events, may not have the same benefits.

10. The Impact Statement acknowledges "hot spot" locations such as point sources of air pollution and roads, but at the same time indicates that the air quality standards specify monitoring in locations that are "generally representative of the level of exposure of the broad population" and expressly "avoid" monitoring locations along main roads or industrial areas (Sec 2.2.4.1 (pg 16); Sec 2.3.1 (pg17); Section 2.3.8 (pg 20); Key Points (pg 22). We disagree with this approach and advocate for some monitoring to be conducted in hotspot locations, especially where there are also facilities for sensitive populations such as schools. With population growth in Australia's major cities occurring in infill locations we are concerned over the drastic increase in medium-high rise housing being built along busy roads. Over the next two decades, this will have the net effect of increasing population

exposure to elevated levels of air pollution. Furthermore, some states eg Victoria, have policies which preferentially direct specific developments such as child care centres (ie sensitive population) to main road locations. Without hotspot monitoring to validate modelled data, it will be difficult to drive relevant exposure reduction programs for such locations. The notion that the monitoring does not apply to such locations also goes against the main goal of the NEPM to protect people "wherever they live". It is unclear how the proposed changes to the NEPM will address this inadequacy.

Specific comments on the Impact Statement

11. Pg xiv – How relevant is it to use reference conditions of 0^{o}C for Australia where our average temperatures are much higher?

12. Pg 5. It would be useful to have a definition for a "validated monitoring method".

13. Pg 6. Rec 17 appears to be missing.

14. Pg 10. It would be useful to define "to the extent practicable".

15. Sec 3.4. NOx emissions. It is unclear why NOx emissions are projected to decrease between 2011 and 2031, but increase between 2031 and 2040.

16. Sec 8.2, pg 80, Ozone. The Impact Statement states "*International studies have provided evidence that exposure to O_3 is causally linked to short-term acute mortality and morbidity primarily for respiratory causes, but not long-term chronic mortality*". However this is at odds with the WHO REVIHAAP report (2013) pg 47, 192-193, which quotes a number of studies that reported increased premature mortality associated with long-term exposure to ozone.

17. Pg 81 of the Impact Statement states "*The WHO did not find evidence that a 1-hour standard provided any additional health protection*" and that *"…., an 8-hour averaging period was more relevant than a 1-hour averaging period for the protection of human health, due to the increasing health impacts of O_3 with exposure over multiple hours*", however the WHO REVIHAAP (2013) report provides evidence of studies published since 2005 which report increased adverse effects associated with 1-hour exposures to ozone. It is not clear from our reading that WHO will not instate a 1 hour guideline in the forthcoming revision of the WHO ambient air quality guidelines.

General comments on draft changes to the NEPM regulation

18. We welcome the reference to "High risk areas" (Part 2 Definitions, pg 4), however the definition does not specifically include, for instance, locations around polluting industry or high traffic locations (main/busy roads), both of which are known pollutant sources or "hot spots" of pollution. There is sufficient scientific evidence to link such exposures with increased risk of adverse health effects. As such, we advocate that the definition is more inclusive of known "hot spot" or higher exposure situations such as busy roads, industrial areas, ports, airports, etc.

19. We welcome the reference to "Populations at risk" (Part 2 Definitions, pg 5), however we feel that the current definition of "population at risk" appears to rely on real detection of

increased health outcomes in specific populations. However, it is important to note that detecting or estimating the "rate of adverse health effects" in very small populations, eg school populations, is difficult to achieve with sufficient accuracy, because of the small sample sizes. For instance, detecting mortality and cancer cases is very difficult in small populations. Likewise detecting more common health effects can be difficult in small populations unless specific health studies are conducted. These are usually beyond the means of participating jurisdictions. However, there is substantial scientific evidence of harmful effects from which we can estimate likely adverse outcomes. We advocate for a different definition of “population at risk” to be used.

20. Part 2 (Definitions, pg 5) refers to “sensitive land uses” as including residential premises, along with education, healthcare and child care facilities. It is the placement of dwellings along main roads or around polluting industries that confers a higher health risk to the population compared to if the dwellings were placed away from roads or industries. This is true for the other listed sensitive land uses although they also display innate sensitivity given the populations housed within those land uses (eg. children, elderly, the immunocompromised).

21. Part 2, Sec 5, Desired Environmental Outcome. As mentioned above, the statement on desired environmental outcome is welcomed, however we suggest the definition be broadened to include protection for people in other locations where substantial time is spent eg hospitals, schools, child care centres, etc.

22. Part 4, Sec 14, Number of performance monitoring stations. The sole criteria for estimating the number of monitoring stations is based on population. Shouldn't it also be based on determining the largest variability in pollutant concentrations?

23. Part 4, Sec 16, Monitoring methods. The wording in subsection 3. seems non-specific. For instance will jurisdictions determine how extensive the validation data should be?

Response to Recommendations

Recommendation		CAR response
Desired environmental outcome and goal		
Rec 1	The desired environmental outcome of the AAQ NEPM should be revised to 'minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live'.	Agreed, however see also comment 2 & 21 above.
Rec 2	The goal of the AAQ NEPM should be revised to make reference to the air quality standards and incorporation of exposure-reduction targets for priority pollutants	We strongly agree with an exposure reduction approach.
Sulfur dioxide		
Rec 3	The status quo should be maintained of not including a 10-minute SO_2 standard in the AAQ NEPM.	We disagree. WHO ((WHO 2018) recommends a 10-minute standard for SO_2. CAR recommends consistency with WHO and adoption of a 10 min standard for SO_2 of 175 ppb (500 $\mu g/m^3$). WHO states that *"Studies indicate that a proportion of people with asthma experience changes in pulmonary function and respiratory symptoms after periods of exposure to* SO_2 *as short as 10 minutes*". CAR recommends that SO_2 is measured in high-risk areas, for high-risk populations (eg. asthmatics).
Rec 4	The 1-hour standard for SO_2 in the AAQ NEPM should be retained, and the numerical value of the standard should be reduced to 100 ppb	Agreed.
Rec 5	A future 1-hour SO_2 standard of 75 ppb is recommended for implementation from 2025 (this timeframe is consistent with the	Agreed.

	goals for $PM_{2.5}$ in the AAQ NEPM).	
Rec 6	The 24-hour standard for SO_2 in the AAQ NEPM should be retained, and the numerical value of the standard should be reduced to 20 ppb.	Agree with the proposed standard of 20 ppb.
Rec 7	No future target for 24-hour average SO_2 concentrations is recommended at this stage	CAR recommends review with a future reduction to 7 ppb, consistent with WHO guidelines. "*Health effects are now known to be associated with much lower levels of SO_2 than previously believed. A greater degree of protection is needed. Although the causality of the effects of low concentrations of SO_2 is still uncertain, reducing SO_2 concentrations is likely to decrease exposure to co-pollutants*."(WHO 2018) https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health
Rec 8	The current annual mean standard for SO_2 should be removed from the AAQ NEPM.	Agree with the removal of an annual average for SO_2. This is consistent with the WHO guidelines.
Rec 9	The form of both the 1-hour and 24-hour SO_2 standards should be the maximum value with no allowable exceedances.	Agreed.
Nitrogen dioxide		
Rec 10	The 1-hour standard for NO_2 in the AAQ NEPM should be retained, and the numerical value of the standard should be reduced to 90 ppb.	Agree but recommend a move to 80 ppb immediately.
Rec 11	The annual standard for NO_2 in the AAQ NEPM should be	Agree but recommend a move to 15 ppb immediately.

	retained, and the numerical value of the standard should be reduced to 19 ppb.	From an exposure perspective, Australian research by CAR researchers has shown that 15 ppb NO_2 is about the 99th percentile for national exposure estimated at a spatial unit of census mesh block level (Knibbs et al. 2014)(Supplement). A recent study comparing three sets of NO_2 model estimates (land use regression (LUR),. satellite-LUR and a Bayesian Maximum Entropy (BME) method) for the western half of Sydney reported mean annual averages of 7.3, 7.0 and 7.9 ppb respectively and maximum annual averages of 17.7, 18.0, and 18.1 ppb (Cowie et al. 2019). Furthermore, Cowie et al (2019) (Supplement) measured the highest mean NO_2 concentrations (time weighted 2 week averages) at 16 “traffic” sites (along roads > 5000 vpd)at 11.6 ppb, compared to 24 “urban background” sites (>100m from busy roads) of 7.7 ppb. Therefore, an annual average level of 15 ppb is highly achievable in most urban areas. As a result, halving the guideline level to 15 ppb may not have a substantial benefit re: general ambient exposures, but if contemporaneous and widespread exposure reduction occurs, including along busy roads, then there should be benefits. From a health perspective, Australian studies indicate that exposures to annual average NO_2 concentrations around 8ppb and lower were associated with increased risk of prevalent asthma and decreased lung function in children (ACHAPS study; (Knibbs et al. 2018). The effects were linear and seen for each interquartile increase in NO_2 of 4ppb. A study of Tasmanian adults with annual mean exposure to 5.1 ppb NO_2 reported an increased risk of atopy (allergy) & current wheeze with an increase in interquartile NO_2 levels (Bowatte et al. 2016)). These studies demonstrate adverse health outcomes at the generally low levels of NO_2 already experienced. They strongly support the need for a continued exposure reduction approach to

		NO_2 to minimise health impacts.
Rec12	The form of both the 1-hour and annual NO_2 standards should be the maximum value with no allowable exceedances.	Agree
Rec 13	An exposure-reduction framework, in the form of a long-term goal for NO_2, should be established to reduce population exposure and associated health risk.	Agree
Rec 14	A future 1-hour NO_2 standard of 80 ppb is recommended for implementation from 2025 as part of an exposure-reduction framework (this timeframe is consistent with the goals for $PM_{2.5}$ in the AAQ NEPM).	Please see our response to Rec 10 above.
Rec 15	A future annual NO_2 standard of 15 ppb is recommended for implementation from 2025 as part of an exposure-reduction framework (this timeframe is consistent with the goals for $PM_{2.5}$ in the AAQ NEPM).	Please see our response to Rec 11 above. We recommend a lower future annual NO_2 standard as part of the exposure reduction framework for the reasons stated in Rec 11 and specifically because adverse health effects are currently being reported for annual average levels below 10 ppb and lower.
Rec 16	Jurisdictions should also commence annual reporting on population exposure to NO_2 from the commencement of a varied AAQ NEPM.	Agree
Ozone		
Rec 17	The current 1-hour and 4-hour standards for O_3 should be removed from the AAQ NEPM.	We agree with the removal of the 4 hr standard for O_3, but recommend a watching brief with regard to a 1-hour maximum guideline for O_3. WHO REVIHAAP (2013) report provides evidence of studies published since 2005 which report increased adverse effects associated with 1-hour exposures to ozone. The REVIHAAP Report states "*The*

		evidence from epidemiological studies for a threshold for short-term exposure is inconsistent with some large, multicity studies that reported little evidence of a threshold down to near background ozone concentrations, whereas other short-term studies suggest a threshold between 20 µg/m3 and 90 µg/m3 (10 ppb and 45 ppb) (daily maximum 1-hour). In summary, the evidence for a threshold for short-term exposure is not consistent, but where a threshold is observed, it is likely to lie below 90 µg/m3 (45 ppb) (maximum 1 hour)" (pg 59). Pg 49 states "*In Europe, adverse effects of short-term exposure to daily concentrations of ozone (maximum 1-hour or 8-hour mean) on all-cause, cardiovascular and respiratory mortality have been reported*". Given this, it is not clear to CAR that WHO will not instate a 1 hour guideline in the forthcoming revision of the WHO ambient air quality guidelines. However, we acknowledge that the Impact Statement highlights Australian data which shows that exceedances of the 8 hr criterion is more frequent than the 1-hr standard, thus suggesting that the 8 hr standard will be protective of 1-hr excursions, although the Impact Statement does not indicate whether the exceedances for both occur simultaneously.
Rec 18	Jurisdictions should continue to record and report 1-hour O_3 concentrations.	Agreed and see response to Rec 17.
Rec 19	A rolling 8-hour standard for O_3 in the AAQ NEPM should be introduced, and the numerical value of the standard should be 65 ppb.	Agree with the averaging period of 8 hrs as it is consistent with the evidence and other guideline averaging periods. However, it is unclear why the value of 65 ppb was chosen as it sits in the concentration range associated with identified health effects and is above the known threshold (if one exists). We recommend as a minimum adopting the limit recommended by the WHO of 47 ppb (100 $\mu g/m^3$) as a

		rolling daily maximum 8 hr conc. The WHO in 2005 indicated that "possible health effects could occur below 100 $\mu g/m^3$ in some sensitive individuals". The WHO's REVIHAAP (2013) report refers to studies published since 2005 which provide evidence for effects at lower O_3 levels.
Rec 20	The 8-hour standard should be reviewed in 2025, with the option of reducing it once there is a better understanding of O_3 generation in capital city airsheds.	See our response to Rec 19.
Rec 21	The form of the 8-hour standard for O_3 should be the maximum value with no allowable exceedances (excluding exceptional events).	Agreed, but see our response to Rec 19. Will this be a rolling maximum value?
Rec 22	An exceptional event rule should be implemented for O_3, defined in a way that is consistent with the approach for PM_{10} and $PM_{2.5}$ in the AAQ NEPM.	Agreed.
Rec 23	An exposure-reduction framework, in the form of a long-term goal for O_3, should be considered to reduce population exposure and associated health risk once there is a better understanding of O_3 generation in capital city airsheds.	Agreed.
Rec 24	Jurisdictions should commence annual reporting on population exposure to O_3 from the commencement of a varied AAQ NEPM.	Agreed.
Other recommendations (Sec 10.3, pg 107)		
	To assist in the assessment of air quality in the future in all Australian cities, detailed and nationally consistent emission inventories need to be developed to enable air dispersion modelling for all jurisdictions. This will enable cost-effective abatement measures to be identified for each jurisdiction based	Agreed.

	on an understanding of pollutant formation in that jurisdiction.	
	A 1-hour O_3 community health information value or alternative forecast mechanism should be used by states and territories to provide quick community health alerts in conjunction with an 8-hour standard.	Agreed. The WHO's REVIHAAP report (pg 49) (WHO 2013) states "*In Europe, adverse effects of short-term exposure to daily concentrations of ozone (maximum 1-hour or 8-hour mean) on all-cause, cardiovascular and respiratory mortality have been reported*".
	Given the growing evidence on the long-term effects of O_3 on health, it is recommended that a watching brief be kept on key research and trends in international standards in this area, with a view to potentially adopting a long-term goal as part of an exposure-reduction framework, in the future.	Agreed.
	A watching brief should be kept on the association between SO_2 and low birth weights.	Agreed.
	Consideration should be given to investigating additional abatement measures that address motor vehicle emissions and broader transport options, given the significant contribution to NO_2 levels in Australian cities from these sources.	Agreed. Please see our comments under "General Comments (5a)". This is an omission which we have highlighted.
	Clause 14 in the AAQ NEPM (Number of performance monitoring stations) should be amended to introduce a primary focus on risk as determined by jurisdictions.	Agreed, however monitoring locations should also be chosen to capture the range of expected pollutants concentrations. See our response under *General comments* 22.
	The allowable exceedances rule should be removed for CO for consistency with the other pollutants in the AAQ NEPM, and based on the recent historical and likely concentrations of CO in the future.	Agreed.

Consultation questions within the Impact Statement (pgs 110-112)

We have addressed most of the content of the consultation questions in the Recommendations table and refer to them briefly below.

Chapter 1 Introduction and Chapter 2 Air quality management in Australia

Do you support the recommended changes to clause 14 (incorporating risk into how the number of performance monitoring stations is determined) and the inclusion of relevant definitions?

We refer to our response under *"General comments (22 & 23)".*

Do you support the removal of allowable exceedances for CO?

We support this.

Chapter 3 Statement of the problem

Do you agree with the assessment of options in this report? Have any options been missed?

Do you agree with the preferred option to vary the AAQ NEPM? In particular, do you agree that continued government involvement is required to address the current and potential future health impacts and costs of SO_2, NO_2 and O_3?

We refer to our response under *"General comments (5, 6)".*

Chapter 4 Methodology

Have all key assumptions been correctly identified and included in the analysis? If not, please provide details.

Can you suggest any improvements to the methodology used in this report for future reviews?

We refer to our response under *"General comments (5, 6, 7, 8, 9)".*

Chapter 5 Assessment of desired environmental outcome and goal

Do you support the desired environmental outcome of the AAQ NEPM being revised to 'minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live'?

Do you support the goal of the AAQ NEPM being revised to make reference to the air quality standards and incorporation of exposure-reduction targets for priority pollutants?

We refer to our response under *"General comments (2, 6, 21)".*

Chapter 6 Impact assessment for sulfur dioxide

We have addressed comments to these questions in the table of recommendations. For the following specific questions:

a) See our response in the table of recommendations (Rec 3).

b) See our response in the table of recommendations (Recs 4, 6, 7, 8).

c) See our response in the table of recommendations (specifically Rec 3).

d) See our response in the table of recommendations (Recs 4 & 5).

e) See our response in the table of recommendations (Rec 6 & 7).

f) that there should be no allowable exceedances for the SO_2 standards

We support this.

g) that an exposure-reduction framework is not needed for SO_2.

CAR disagrees with this position. We recommend that an exposure reduction framework be considered for locations subject to elevated SO_2 concentrations. The Impact Statement does not justify the recommendation made. We point to the large populations of Perth and the Latrobe Valley as examples of major populations living in areas with elevated SO_2 concentrations. Exceedances in such locations should be addressed. For instance, monitoring stations could be preferentially placed near locations with sensitive populations, such as child care centres, schools and hospitals, within high risk areas, to allow reporting on SO_2 across all recommended averaging periods.

Other comments on sulfur dioxide

- Need clarification on non-bold values contained in Table E-1.
- The impact statement does not present in any detail data on the major sources of SO_2 in Australia. While industry is a main source, are there other significant sources that should be mentioned eg fossil fuel consumption and power generation, or others?

Chapter 7 Impact assessment for nitrogen dioxide

We have addressed comments to these questions in the table of recommendations. For the following specific questions:

c) See our response in the table of recommendations (Recs 10 & 14);

d) See our response in the table of recommendations (Recs 11 & 15).

Chapter 8 Impact assessment for ozone

We have addressed comments to these questions in the table of recommendations. For the following specific questions:

a) See our response in the table of recommendations (Recs 17 and 19);

b) with jurisdictions continuing to record and report 1-hour concentrations even if there is no 1-hour standard;

Agreed.

c) See our response in the table of recommendations (Rec 17).

d) See our response in the table of recommendations (Rec 19).

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For more information

This submission has been produced by the Centre for Air pollution, energy and health Research (CAR).

For more information about CAR and our work on the health impacts of air pollution: contact us at car@sydney.edu.au or visit our website: www.car-cre.org.au