

DISCUSSION PAPER ON (AAQ NEPM) AIR QUALITY STANDARDS DEWHA SUBMISSION

The AAQ NEPM has been a positive step forward in the management and assessment of air quality in Australia. There is now a nationally consistent framework for the monitoring and reporting of air quality and nationally consistent benchmarks against which to assess quality. The air quality database increases every year and offers valuable information for air quality managers to target management responses and determine the effectiveness of the responses. The air quality database is also assisting in health research—for example the recent EPHC Multi City Mortality and Morbidity Study on the impacts of air pollution on health—and in reviews of the air quality standards.

1. Is there sufficient new health evidence to support a revised standard and if so, for which pollutants?

DEWHA believes the development of air quality standards should be informed by the latest health research on the impacts of air pollution. The Discussion Paper reviews a large body of evidence compiled since the existing NEPM standards were devised that support a revision of the standards. Australian and international studies show that PM₁₀, PM_{2.5}, NO₂, O₃, CO and SO₂ have health effects associated with exposure below the current NEPM standards.

The evidence supports having an 8-hour standard for ozone, in addition to the 1-hour and 4-hour standards; and an annual average standard for PM₁₀, in addition to a daily standard. This would accord with overseas jurisdictions (e.g. WHO, Europe and United Kingdom) which have 8-hour standards for ozone and annual average standards for PM₁₀, to account for effects from longer-term exposure.

DEWHA notes that the complex nature of particulate matter (PM) and differing composition may exclude the possibility of devising health-based standards for fine particles with a high degree of certainty. The evidence supports making the current PM_{2.5} annual and daily advisory reporting standards into compliance standards at the current levels. The PM_{2.5} advisory reporting standards are health-based and are set at levels equal to, and in some cases, more stringent than overseas standards.

The current NEPM standard for lead of 0.5µg/m³ (annual average) is based on 10µg/dL blood lead level. The National Health and Medical Research Council (NHMRC), from 1993 to 2005, recommended an overall goal of all Australians having a blood lead concentration below 10 µg/dL. It was never intended that this goal of 10 µg/dL be interpreted as either a 'safe' level of exposure or a 'level of concern'. DEWHA notes that the United States has recently lowered its lead standard to 0.15µg/m³ (quarterly average) and the United Kingdom has a lead standard of 0.25µg/m³ (annual average), both of which are lower than the current NEPM standard.

Previous discussion papers on the review of the AAQ NEPM raised the question of whether lead should remain in the AAQ NEPM or be moved to the Air Toxics NEPM. Lead levels in urban air are now below detectable levels as a result of removing lead from petrol and many jurisdictions have gained approval to cease NEPM lead monitoring in urban areas. Lead exposure is still an issue in communities with industrial point sources (e.g. Port Pirie in South Australia). Resources for lead health protection would be better directed to monitoring lead and reducing lead exposure in these communities rather than on monitoring in urban air where it is not needed.

Monitoring protocols in the Air Toxics NEPM are focused on measuring pollutants at peak sites or 'hot-spots' where people may be exposed and so the Air Toxics NEPM might be a

more appropriate place for lead. A review of the Air Toxics NEPM will commence in 2012. This review will examine the need for developing standards for air toxic pollutants and this might be the time to consider a review of the lead standard.

Ozone and particles commonly exceed current ambient air quality standards and the predicted impacts of climate change and growth in energy consumption and population will present further challenges. Any new standards arising from the current Air NEPM review also require a strategic approach in which national actions to reduce emissions are identified and implemented.

The revision of the standards could be staged, beginning with priority pollutants, such as PM₁₀, PM_{2.5}, NO₂, and O₃, identified in the reviews and cost-benefit analysis. The planned cost-benefit analysis looking at the health costs of pollution will provide information on which standards should be reviewed first.

2. Does the current approach, which allows for a number of exceedences of the standard, meet the requirement for adequate protection or are there alternative methods that could provide more consistency in the level of health protection associated with complying with the NEPM standards?

The stated environmental outcome of the NEPM is for ambient air quality that allows for adequate protection of human health and well-being. The term ‘adequate protection’ is not defined in the NEPM. The NEPM only sets out the air monitoring protocols, and air quality standards and goals that are to be met. However, the Australian and international studies reviewed in the discussion paper show that PM₁₀, PM_{2.5}, NO₂, O₃, CO and SO₂ are non-threshold pollutants, meaning that there is no safe level, or threshold, below which no health effects are observed. Consequently, there is always some level of residual risk associated with any standards set for non-threshold pollutants for sensitive groups in the community. This is generally not well understood by the community. A clear definition of ‘adequate protection’, either in the NEPM or other forum that explains the NEPM, would assist the community to understand the limitations of any standards and ensure that governments are working toward a commonly understood goal.

The current NEPM standards are not-to-be-exceeded health-based standards, but have associated compliance goals that allow for one to five exceedences (five for particles, one for other pollutants) of the standard per year to take into account natural events, such as bushfires and dust storms, that can cause high pollution levels. Compliance with the goals is assessed and if these are met, then it is assumed that there is an adequate level of health protection for the population.

A more transparent approach to assessing the level of health protection afforded by the NEPM would require analysis of ‘population exposure’ that reports the typical range of air pollutant concentrations experienced by the majority of the population in the assessment year, rather than just peak values and exceedences of the goals and standards. To take into account the residual risk associated with the standards, the exposure information could be compared to an appropriate health index. One way to do this would be to compare relevant percentile concentrations, or percentages of the standard, with the Air Quality Index used in many jurisdictions to assess air quality. This type of assessment would not necessarily need to be complex and could be presented in a way that is easily understood by the general public.

Setting goals that allow for a certain number of exceedence days for natural events is not appropriate in the context of adequate protection, because such events could still cause acute health impacts, even if they cannot be easily managed. However, adopting a US-style approach for compliance purposes, that excludes ‘natural’ or ‘exceptional’ events that cannot be easily managed is acceptable in the context of air quality management and is worth consideration.

However, DEWHA is not in favour of excluding natural events from the overall assessment and reporting of air quality. All exceedences of the standard and the circumstances for them should be assessed and documented to provide an overall picture of air quality. Information about the occurrence and frequency of these types of events is useful for assessing the impacts of climate change, land management, and exceptional meteorological events.

If a US-style approach is adopted, clear assessment procedures would need to be developed and definitions of what constitutes a “natural” or “exceptional” event and what constitutes ‘anthropogenic’ impacts would be required.

3. Should changes be made to the reporting protocols that would lead to a greater transparency and better understanding of the causes of exceedences in jurisdictions, the potential risk to population health, and management approaches being undertaken to address these exceedences?

As discussed in the response to question 2 above, DEWHA supports stricter reporting protocols to make assessment and reporting on air quality more transparent. As the discussion paper notes, the reporting of air quality against the NEPM standards is the key mechanism for jurisdictional accountability for the implementation of the NEPM requirements. Currently reporting only requires jurisdictions to evaluate and report on their performance at each monitoring station against the NEPM standards and goals. They are not required to provide a more detailed analysis of air quality in regions as a whole or of population exposure or risk.

Consequently, the current reporting protocols could be improved to allow decision-makers, researchers and the general public to assess air quality trends and inform management actions. For instance, reporting protocols could be improved with information beyond the number of exceedences reported. Including more information on percentile concentrations, population exposure and risk etc would give a much clearer picture of air quality over the reporting year. All key uncertainties and limitations in the monitoring data should also be made transparent.

More information on the management strategies being implemented to improve air quality and the effectiveness of those strategies would also increase transparency for the general community. Assuming there is some residual risk to population health, even if non-threshold pollutants meet the standards, there is benefit to reporting on management approaches being undertaken to reduce overall air pollution levels and population exposure, not just those aimed at meeting standards.

DEWHA agrees that clear guidance for assessment and reporting should be developed and included as a schedule to the NEPM to ensure national consistency. The Peer Review Committee (PRC) was established by the EPHC to advise on jurisdictional monitoring plans and technical issues and is an appropriate body to develop guidance on these and other technical issues. The existing PRC Technical Guidance Papers should be updated in conjunction with any variation to the NEPM.

DEWHA notes that any future variation to the NEPM offers a good opportunity to better inform the public’s understanding of air quality and its management in Australia.

4. Other issues

In this and the previous discussion paper developed for this review, the issue was raised as to whether benzene and benzo(a)pyrene should be moved from the Air Toxics NEPM to the AAQ NEPM. The reason stated for the move is the more diffuse nature of the major sources of these two pollutants compared to other air toxics in the Air Toxics NEPM. The major source of benzene in the environment is motor vehicles and monitoring suggests that benzene is ubiquitous in ambient air in our cities, although at low levels. Benzo(a)pyrene arises

primarily from combustion processes that include motor vehicles and domestic wood heating and is also ubiquitous in the air environment at low levels.

DEWHA believes it is premature to include these pollutants in the AAQ NEPM before the full review of the Air Toxics NEPM is completed. The full review of the Air Toxics NEPM will provide a better indication of where the levels of these pollutants are highest and whether exposure is occurring in the ambient air environment or whether it is restricted to “hot spots”.