



EDOs of Australia

Submission responding to the proposed variation to the National Environment Protection (Ambient Air Quality) Measure (NEPM) standards for ozone (O₃), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂)

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EDOs of Australia (formerly ANEDO, the Australian Network of Environmental Defender's Offices) consists of eight independently constituted and managed community legal centres located across the States and Territories.

Each EDO is dedicated to protecting the environment in the public interest. EDOs:

- provide legal representation and advice,
- take an active role in environmental law reform and policy formulation, and
- offer a significant education program designed to facilitate public participation in environmental decision making.

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Introduction

EDOs of Australia (**EDOA**) welcomes the opportunity to comment on the proposed variation to the National Environment Protection (Ambient Air Quality) Measure standards for ozone (O₃), nitrogen dioxide (NO₂) and sulfur dioxide (SO₂) (**the proposed variation**).

EDO offices around Australia have advocated for stronger air emission regulation for many decades and have provided input into previous National Environment Protection Council (**NEPC**) and National Environment Protection (Ambient Air Quality) Measure (**NEPM**) consultations at both the state/territory and national level.¹

In summary

In general EDOs of Australia support the changes proposed to ensure a stronger framework for air quality standards and management in the future. Overall, the Impact Statement reflects an improved up-to-date evaluation of appropriate air quality standards for the three gaseous pollutants. However, we strongly recommend that the following suggestions are implemented to ensure that the regulation of air emissions in Australia meets the Desired Environmental Outcome of the NEPM to 'minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live'.

In summary, we recommend the following:

1. **NEPM standards should be used to better protect health, lead emissions reductions, and to deliver international best practice**
2. **Implement solutions to the causes of NO₂, SO₂ and ozone emissions as a priority**
3. **In order to ensure improved environmental justice in air emissions regulation:**
 - a. **Implement the proposed amendments to the Desired Environmental Outcome immediately to improve air emission regulation**
 - b. **Provide guidance material to help determine 'potential population at risk'**
 - c. **Implement improved monitoring around areas exposed to emissions of concern**
4. **Develop a central database of reliable real-time data on air emissions**
5. **Invest in more research to better understand health impacts and exposure levels**
6. **Introduce mandatory regular revisions of the NEPM standards**
7. **Implement more consistent and certain regulation of air emissions**

¹ Previous relevant submissions are available at: <https://www.edo.org.au/pollution1>.

1. NEPM standards should be used to better protect health, lead emissions reductions, and to deliver international best practice

The NEPM standards for NO₂, ozone, and SO₂ were set in 1998 and are overdue for revision. Scientific understanding of the impacts of these air emissions on human health has greatly changed since these standards were put in place.

International and Australian studies show that NO₂, ozone, and SO₂ are non-threshold pollutants, meaning that there is no safe level, or threshold, below which no health effects are observed. These standards and the regulatory frameworks that seek to implement them should therefore encourage continual air pollution emission reductions in Australia. We are concerned that the standards proposed in the Impact Statement appear designed to prevent a further degradation of air quality rather than requiring meaningful, or any, abatement from existing emissions sources. In light of the knowledge that there are no safe levels of these emissions, the proposed regulatory framework will have relatively little benefit for protecting human health.

We are concerned that this proposal has not properly taken account of current scientific findings, and rather focuses on what is achievable for industries affected, particularly for the proposed 1-day standard for SO₂ and annual standard for NO₂. This risks missing important opportunities to improve health. Australian's deserve ambitious standards that are focused on improving the health benefits from regulation of air emissions.

Accumulating evidence has led to significant concern regarding the impact of atmospheric pollution of population health in recent years. Pollution levels vary dramatically by location and over time depending on changing meteorological factors such as wind speed and wind direction, making it difficult to isolate the health effects of individual pollutants. Current international and Australian scientific literature draws strong links between air pollution and adverse health impacts including increased mortality and cardiorespiratory morbidity.

This is particularly the case where susceptible parts of the community including children, the elderly and those with existing medical conditions are concerned. For example, individuals suffering from respiratory conditions such as asthma and chronic obstructive pulmonary disease can be particularly sensitive to ozone; while children, the elderly and adults with cardiovascular or lung disease can be sensitive to particulate pollutants.² In addition to clinical outcomes of air pollution such as increased hospital admissions and mortality, the adverse impacts also extend to include diminished quality of life and other symptoms which may interfere with engagement in daily activities.³

The Impact Statement demonstrates that there are material health benefits to be derived from implementing the stronger standards that have been proposed in this review. The Impact Statement recognises that there are health effects, and significant costs in the order of \$562 million to \$2,405 million between 2010 - 2014, associated with emissions of SO₂, NO₂ and ozone. This is compared to the benefits from reducing air pollution which in other jurisdictions have been proven to be significant. For example, in the USA the US Clean Air Act for 1970–1990 has been

² Australian Medical Association Submission Senate Community Affairs References Committee, Parliament of Australia, Impacts on health of air quality in Australia, 2013.

³ Ibid.

estimated to have led to health related economic benefits in the order of \$US 22.2 trillion compared to the implementation costs of \$US 0.52 trillion.⁴

Stronger standards need to be implemented

While the proposed standards will go some way to improving air quality outcomes, in our opinion stronger standards are required. We strongly support the adoption of the World Health Organization (WHO) 1-day SO₂ standard of 8 ppb, and a new annual standard for NO₂ of 9 ppb, the latter of which has been demonstrated to have a substantial effect in reducing children’s asthma when implemented in Australian schools.⁵ Australia’s current 24 h SO₂ standard of 80ppb is 10 times higher than the recommended WHO standard. Australia should follow the precedents of the US and Canada in adopting the 99th centile of daily worst hour as the form for both 1-hour SO₂ and NO₂ standards.

We support the recommendations of Doctors for the Environment, excerpted below from their submission to this review. We do not support delaying implementation of a 1 hour NO₂ or SO₂ standard cited in Table 1 until 2025 and recommend that they are implemented at the time that the proposed NEPM changes are brought into effect. Given how rarely the NEPM standards are reviewed, agreed increases to standards should be required to be implemented by the states and territories within 6 months. To date there have been significant delays in the implementation of the increases to standards. For example, in 2015 the standards for PM_{2.5} and PM₁₀ were strengthened by agreement under the NEPM framework. Only recently in 2019, over 3 years later, the Queensland Government has notified that it intends to update the law enshrining these standards for Queensland (the *Environmental Protection (Air) Policy 2008*). This is a significant delay which has meant all communities impacted by new proposals that have been assessed and approved in the meantime have not been protected by the implementation of the agreed improved standards.

Table 1: Recommended NEPM levels

Pollutant	Time	Number	Form
SO₂	1 hour	60 ppb	99 th centile of daily worst hour, averaged over 3 years
SO₂	24 hours	8 ppb	Maximum value
NO₂	1 hour	72 ppb	99 th centile of daily worst hour, averaged over 3 years
NO₂	Annual	9 ppb	Maximum value

Further, we raise concern with the use of an 8 hour standard for ozone. We suggest that this proposal be justified through health studies before any implementation. High levels of ozone for short periods (i.e. 1 hr) can cause breathing and other health difficulties for sensitive people. We suggest that the original 1-hour and 4-hour standard be maintained. This could be made a compliance standard of 70ppb, in line with the New Zealand standard. Also, the 8-hour average

⁴ US EPA (2011) Benefits and costs of the Clean Air Act 1990-2020: the second prospective study, 15 September 493:<http://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study>

⁵ Knibbs, L., et al. (2018). "The Australian Child Health and Air Pollution Study (ACHAPS): A national population-based cross-sectional study of long-term exposure to outdoor air pollution, asthma, and lung function." *Environment International* **120**: 394-403.

for ozone could be made a compliance standard of 47ppb, in line with the World Health Organisation standard set in 2005.

We support formalising the proposed changes to the definition of exceptional events.

2. Implement solutions to the causes of NO₂, SO₂ and ozone emissions as a priority

The largest sources of these emissions are mostly as follows:

- **NO₂**: The major source of nitrogen dioxide in Australia is burning of the fossil fuels coal, oil and gas.⁶ Vehicle exhausts are the biggest source in urban areas.⁷
- **SO₂**: emitted mainly through metal smelting and burning of fossil fuels coal, oil and gas. Sulfur dioxide is also present in motor vehicle emissions, as the result of fuel combustion.⁸
- **Ozone**: is a secondary pollutant; it can arise via motor vehicle exhaust, oil refining, printing, petrochemicals, lawn mowing, aviation, bushfires and burning off. Motor vehicle exhaust fumes produce 50% of the organic chemicals that form ozone.⁹

These substances are known to cause and contribute to many health ailments for those who inhale them, including asthma, lung cancer, heart attacks, stroke, respiratory disease and headaches.

There are measures that Australia could be taking to reduce these emissions and consequently the health effects and associated costs. Both electricity generation and vehicles are currently subject to significant technological change which could reduce emissions from these major sources to between low and zero pollution if these changes are embraced and supported. The solutions below are all possible through clear government policies that support these measures. Strong pollution reduction policies based on good standards will assist Australia in reaching the best outcome during this period of change.

Vehicle emissions

Exposure to vehicle pollution is reduced by better vehicle emissions standards, by situating schools and child care away from busy roads, by better public transport, by reducing the use of diesel fuel, and by encouraging electric vehicles.

More clean public transport options, smart urban planning of transportation infrastructure and investment to incentivise public transport usage will all assist in reducing vehicle emissions, while also increasing wellbeing of citizens in their commutes.

⁶ <https://soe.environment.gov.au/theme/ambient-air-quality/topic/2016/nitrogen-dioxide>

⁷ Ibid.

⁸ <https://www.environment.gov.au/protection/publications/factsheet-sulfur-dioxide-so2>.

⁹ <https://www.environment.gov.au/protection/publications/factsheet-ground-level-ozone-o3>.

Emissions from burning fossil fuels

Coal fired power stations are considered to be Australia's biggest source of SO₂ and NO₂ as well as fine particles (PM2.5).¹⁰ There are many solutions to reducing the emissions from power stations. Most obviously, moving to renewable energy will greatly assist in reducing emissions by avoiding emissions completely. As we transition to renewable energy, power stations can be retrofitted with post combustion treatment of flue gases. For example, after the US Clean Air Act 1990 was introduced, many US power plants installed wet fluegas desulfurisation units (scrubbers), known to be able to remove 99% of sulfur dioxide emissions and selective catalytic reduction to remove nitrogen dioxide emissions. It would be appropriate for each state and territory to instigate a review of existing coal fired power stations to determine whether they confirm with best practice emissions standards to protect local community health.

3. In order to ensure improved environmental justice in air emissions regulation:

- (a) Implement the proposed amendments to the Desired Environmental Outcome immediately to improve air emission regulation**
- (b) Provide guidance material to help determine 'potential population at risk'**
- (c) Implement improved monitoring around areas exposed to emissions of concern**

We support the proposed amendments to the desired environmental outcome (s5) to provide that it 'minimise the risk of adverse health impacts from exposure to air pollution for all people, wherever they may live'. This will assist in providing more clarity in the purpose of the NEPM and acknowledgment of environmental injustice that can be prevalent in the regulation of air emissions. Communities who live in rural areas are frequently not provided with the same level of regulatory protection from harmful air pollutants. Nor are there requirements to monitor and report air emissions that these smaller rural communities are exposed to because historically the population has not been considered large enough.

For example, in the Land Court mining objection decision for the New Acland Coal (**NAC**) coal mine Stage 3 expansion in Queensland the presiding Member found:¹¹

[580] 'Evidence from nearby residents such as Mrs Harrison, Mrs Mason, Mr Beutel and the Plant family indicate that dust has been an ongoing issue for them since NAC began its open cut coal mining operations some 15 years ago. In fact there has been over 100 complaints recorded on NAC's complaint's register regarding dust and another 30 or so dust related complaints to EHP.

[581] In response to air quality and dust issues, NAC has monitored air quality and dust for 27 days over an 11 year period at locations around the mine. Additional monitoring has also taken place at Balgowan over 27 days from December 2011 to April 2012.'

¹⁰ National Pollutant Inventory (2017) Department of Environment and Energy, Australian Government, for reports 2015/16 for sulfur dioxide, oxides of nitrogen and PM2; https://www.envirojustice.org.au/sites/default/files/files/EJA_CoalHealth_final.pdf.

¹¹ New Acland Coal Pty Ltd v Ashman & Ors and Chief Executive, Department of Environment and Heritage Protection (No. 4) [2017] QLC 24.

...

[589] Because no regular monitoring has been undertaken by NAC in or around the mine site, it is impossible to confirm whether EA air quality limits have or have not been adhered to.'

This community has no benefit of independent, regular government monitoring of the range of air pollutants likely to be emitted from this site. This information would provide necessary information for the community to know what they are breathing and whether the environmental authority conditions are being breached. This information is only provided by the very company that is producing the problem and with no requirement for even the company to provide regular monitoring. The conditions on the mine do not regulate SO₂ or NO₂ emissions directly unless related to an odour nuisance, despite mining activity blast explosion plumes having been found to emit these pollutants after community complaints. Under the conditions for this mine, air quality monitoring only occurs once the community puts in a complaint; making it incumbent on the community to be aware that there is a problem and then for the company and regulator to take action in time based on a complaint. Given the variables of weather and timing of mine activities which cause emissions, this regulatory method makes it extremely difficult to determine when the mine has breached their conditions unless the community themselves are constantly monitoring the site with high quality monitoring equipment. In addition, the environmental impact statement provided for the application for the Stage 3 expansion did not provide any data on SO₂ or NO₂ emissions, despite the fact that these emissions would likely have been occurring from the site since it commenced operation and would continue with the expansion.¹²

A study published in 2014 stated: "This national level quantitative assessment of environmental justice has found significant and systemic inequities in the social distribution of industrial air pollution in Australia. Regardless of how air pollution was measured; facility presence, emission volume, or toxicity, our analysis indicated a consistent and disproportionate impact on indigenous and socially disadvantaged communities."¹³

We support the removal of the figure of 25,000 as the base number for requiring monitoring of air quality in section 14. This is being replaced with a requirement that the 'number of performance monitoring stations must be based on determining the potential population at risk.' We strongly recommend that guidance is provided to help determine when a population would be said to be 'at risk' to help clarify the right of communities to have local air quality monitored and to avoid uncertainty.

In order to accurately reflect population exposure, we recommend that there is an expansion of NEPM compliance monitors, including locations next to roads such as offices, schools and childcare centres. Busy roads expose many citizens to air emissions which can be many times higher than the urban background, particularly for NO₂, however the current NEPM does not monitor along these hotspots.

Specified methods and locations for uniform measurement of roadside NO₂ for each city should be introduced, to ensure data can be established to then lead to better informed management of

¹² https://www.dea.org.au/wp-content/uploads/2012/01/Acland_EIS_assessment_Ch_9-2012.pdf.

¹³ Chakarabarty and Green, Australia's first national level quantitative environmental justice assessment of industrial air pollution, Environmental Research Letters 9 (2014) 044010.

the emissions. For example, this should include a requirement for the establishment of roadside monitoring sites on roads with more than 20,000 vehicles per day (amending s13).

4. Develop a central database of reliable real-time data on air emissions

What we are breathing in and what is being emitted to the air in Australia is a matter of public interest. We strongly recommend that real-time and historical air pollution monitoring data must be made publicly available to community members in all states and territories. This could be done through a coordinated national website. The New South Wales air pollution monitoring website could be used as a template for this.

5. Invest in more research to better understand health impacts and exposure levels

We strongly encourage investment in more research to assist in developing understanding around health impacts of air pollutants and continual improvement of standards to protect health of humans and other species. This research could include better understanding of impacts of air emissions near busy roads. We also recommend that research be undertaken into the impacts around major emissions sites on the surrounding environment. Current air emissions regulation is focused on ensuring that emissions are low for surrounding humans with little to no regard for other species that inhabit areas adjacent areas.

6. Introduce mandatory regular revision of the NEPM standards

We recommend that a revision of the NEPM standards be required to be undertaken every 5 years at most, to ensure that it is kept up to date with the most recent scientific understanding and technological advancements to best protect health.

7. Implement more consistent and certain regulation of air emissions

The legal framework that relates to the health impacts of atmospheric pollution in Australia is not a clearly identifiable body of law. Due to this complexity and the way relevant instruments are drafted (for example, as policy documents) the legal status of the standards is uncertain and the standards are therefore largely unenforceable. Furthermore, their intersection with state and territory planning regimes is very uncertain. Despite these concerns, EDOA believes that the NEPM is a necessary mechanism to drive consistency in air quality standards across Australia and ensure continual improvement across all jurisdictions.

It is important that existing mechanisms for enforcement are strengthened. Both improvements to monitoring and reporting requirements, and an increase in the penalties imposed for breach of pollution laws, will help reaffirm and strengthen the deterrent function of enforcement mechanisms. Collation of compliance reports made at a state level will allow for assessment of industry compliance across jurisdictions and will assist in developing enforcement responses that are both pollutant and industry specific.

As noted above, we believe that an appropriately constituted NEPM has the potential to drive continual improvement in air quality. As such a strong and ambitious exposure reduction framework is required and, with appropriate incentives, would be feasible.

We further recommend that the government considers introducing national legislation focused on regulating air emissions consistently across Australia with mandatory standards provided which can only be improved upon by state and territory regulation.¹⁴

We also recommend a review of how we regulate air emissions across Australia, and whether incentives to reduce emissions consistently are able to be introduced and laws are enforced.

¹⁴ Australian Panel of Experts on Environmental Law, Climate Law (Technical Paper 5, 2017), p20.