



# **National Environment Protection (Ambient Air Quality) Measure Variation Instrument 2021**

*National Environment Protection Council Act 1994*

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The NATIONAL ENVIRONMENT PROTECTION COUNCIL makes this variation to the National Environment Protection (Ambient Air Quality) Measure under section 19 of the *National Environment Protection Council Act 1994* (ACT) and section 20 of the the *National Environment Protection Council Act 1994* (Cth), *National Environment Protection Council (New South Wales) Act 1995* (NSW), *National Environment Protection Council (Victoria) Act 1995* (Vic), *National Environment Protection Council (Queensland) Act 1994* (Qld), *National Environment Protection Council (Western Australia) Act 1996* (WA), *National Environment Protection Council (South Australia) Act 1995* (SA), *National Environment Protection Council (Tasmania) Act 1995* (Tas), and the *National Environment Protection Council (Northern Territory) Act 1994* (NT)

Dated 15 April 2021

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**1 Name**

This instrument is the *National Environment Protection (Ambient Air Quality) Measure Variation Instrument 2021*.

**2 Commencement**

This instrument commences on the day after it is registered on the Federal Register of Legislation.

**3 Authority**

This instrument is made in accordance with the following:

- i. section 19 of the *National Environment Protection Council Act 1994* (ACT); and
- ii. section 20 of the following:
  - (a) the *National Environment Protection Council Act 1994* (Cth);
  - (b) the *National Environment Protection Council (New South Wales) Act 1995* (NSW);
  - (c) the *National Environment Protection Council (Victoria) Act 1995* (Vic);
  - (d) the *National Environment Protection Council (Queensland) Act 1994* (Qld);
  - (e) the *National Environment Protection Council (Western Australia) Act 1996* (WA);
  - (f) the *National Environment Protection Council (South Australia) Act 1995* (SA);
  - (g) the *National Environment Protection Council (Tasmania) Act 1995* (Tas);
  - (h) the *National Environment Protection Council (Northern Territory) Act 1994* (NT).

**4 Variation of National Environment Protection (Ambient Air Quality) Measure**

The *National Environment Protection (Ambient Air Quality) Measure* is amended as set out in Schedule 1.

## Introductory Note

Section 20 of the *National Environment Protection Council Act 1994* and the equivalent provision of the corresponding Act of each participating State and Territory enables the National Environment Protection Council to vary a National Environment Protection Measure. This is a variation to the National Environment Protection (Ambient Air Quality) Measure made by the National Environment Protection Council on 26 June 1998 and varied on 23 May 2003 and 3 February 2016.

The Variation is to be implemented by the laws and other arrangements participating jurisdictions consider necessary (see Section 7 of the Commonwealth Act and the equivalent provision of the corresponding Act of each participating State and Territory).

## Schedule 1– Amendments

### *National Environment Protection (Ambient Air Quality) Measure*

#### [1] Introductory Note

Omit “section”, substitute “paragraph”.

#### [2] Sections 2 and 3

Repeal the sections, substitute:

### 2 Definitions

- (1) This section defines particular words and expressions used in this Measure.
- (2) The words and expressions indicated by an asterisk are defined in the Commonwealth Act and are included for information only to assist readers of the Measure. Minor changes from the definitions in the Commonwealth Act are indicated by square brackets ([ ]).
- (3) In this Measure:

**\*Agreement** means the agreement made on 1 May 1992 between the Commonwealth, the States, the Australian Capital Territory, the Northern Territory and the Australian Local Government Association, a copy of which is set out in the Schedule [to the Commonwealth Act].

**ambient air** means the external air environment, it does not include the air environment inside buildings or structures.

**Australian Standard** means a standard that is published by Standards Australia Limited denoted by the letters “AS” and identifying numbers and letters. It includes an Australian/New Zealand Standard that is jointly published by Standards Australia Limited and Standards New Zealand, denoted by the letters “AS/NZS” and identifying numbers and letters.

**Commonwealth Act** means the *National Environment Protection Council Act 1994* of the Commonwealth.

**Council** means the National Environment Protection Council established by section 8 of the Commonwealth Act and the equivalent provision of the corresponding Act of each participating State and Territory.

**exceptional event** means a fire or dust occurrence that adversely affects air quality at a particular location that:

- (a) causes an exceedance of one or more of the following that is in excess of normal historical fluctuations and background levels:
  - (i) 1 day average standard for particles as PM<sub>10</sub>;
  - (ii) 1 day average standard for particles as PM<sub>2.5</sub>;
  - (iii) 8 hour average standard for photochemical oxidants (as ozone); and
- (b) is directly related to bushfire, jurisdiction authorised hazard reduction burning or continental scale windblown dust.

**fire management** means all activities associated with the management of fire prone land, including the use of fire to meet land management goals and objectives.

**gravimetric method** means a manual method for sampling particles by drawing air through a filter and determining the mass by weighing the filters.

**high risk areas** means areas, determined by jurisdictions, where there is a high likelihood for adverse health effects from air pollution. High risk areas include regions or sub-regions containing:

- (a) sensitive land uses; or
- (b) a large population at risk; or
- (c) particular communities where there is relative disadvantage.

**Measure** means the *National Environment Protection (Ambient Air Quality) Measure*.

**monitoring station** means a facility for measuring the concentration of one or more pollutants in the ambient air in a region or sub-region.

**\*national environment protection goal** means a goal:

- (a) that relates to desired environmental outcomes; and
- (b) that guides the formulation of strategies for the management of human activities that may affect the environment.

**\*national environment protection protocol** means a protocol that relates to the process to be followed in measuring environmental characteristics to determine:

- (a) whether a particular standard or goal is being met or achieved; or
- (b) the extent of the difference between the measured characteristic of the environment and a particular standard or a particular goal.

**\*national environment protection standard** means a standard that consists of quantifiable characteristics of the environment against which environmental quality can be assessed.

**\*participating jurisdiction** means the Commonwealth, a participating State or a participating Territory.

**\*participating State** means a State:

- (a) that is a party to the Agreement; and

- (b) in which an Act that corresponds to [the Commonwealth] Act is in force in accordance with the Agreement.

*\*participating Territory* means a Territory:

- (a) that is a party to the Agreement; and  
(b) in which an Act that corresponds to [the Commonwealth] Act is in force in accordance with the Agreement.

*particles as PM<sub>10</sub>* means particulate matter with an equivalent aerodynamic diameter of 10 micrometres or less.

*particles as PM<sub>2.5</sub>* means particulate matter with an equivalent aerodynamic diameter of 2.5 micrometres or less.

*performance monitoring station* means a monitoring station used to measure achievement against the goal.

*pollutant* means a pollutant mentioned in Schedule 1.

*population at risk* means the population of a region or sub-region that is at risk of being harmed by air pollution, as determined by the relevant participating jurisdiction based on:

- (a) the number of, or potential for, adverse health effects from exposure to air pollution (for example fatalities, cancers or illnesses) in the population of a region or sub-region over a specified period of time; or  
(b) the rate of adverse health effects from exposure to air pollution for a given location or sub-population within the region or sub-region.

*ppm* means parts per million by volume.

*reference method* means a validated monitoring method used for collection of data.

*region* means an area within a boundary surrounding population centres as determined by the relevant participating jurisdiction.

*sensitive land uses* include residential premises, education and childcare facilities, nursing homes, retirement villages, hospitals and outdoor recreation sites.

*sub-region* means a populated area within a region in which air quality differs from other areas in the region due to the topography, meteorology or sources of pollutants as determined by the relevant participating jurisdiction.

*µg/m<sup>3</sup>* means microgram per cubic metre referenced to a temperature of 0 degrees Celsius and an absolute pressure of 101.325 kilopascals.

- (4) In this Measure a reference to an Australian Standard is a reference to that standard as published and in force on 1 January 2020.

### **3 Application**

Participating jurisdictions must monitor, assess and report in accordance with the protocol in this Measure for carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), sulfur dioxide, lead, particles as PM<sub>2.5</sub> and particles as PM<sub>10</sub>.

### **[3] Parts 2, 3 and 4**

Repeal the Parts, substitute:

## **Part 2                      National environment protection goal**

### **4                      Purpose of Part**

The purpose of this Part is to set out goals:

- (a) that relate to the desired environmental outcomes; and
- (b) that guide the formulation of strategies for the management of human activities that may affect the environment.

### **5                      Desired environmental outcome**

The desired environmental outcome of this Measure is ambient air quality that minimises the risk of adverse health impacts from exposure to air pollution.

### **6                      National Environment Protection Goal**

The national environment protection goals of this Measure are:

- (a) for carbon monoxide, nitrogen dioxide, photochemical oxidants (as ozone), lead and particles (as PM<sub>10</sub> and PM<sub>2.5</sub>)—to achieve the national environment protection standards specified in table 1 of Schedule 2;
- (b) for sulfur dioxide—to achieve the national environment protection standards specified in table 1 of Schedule 2, and from 1 January 2025 to achieve the national environment protection standard specified in table 1A of Schedule 2;
- (c) for particles as PM<sub>2.5</sub> from 1 January 2025—to seek to achieve the further reductions in maximum concentrations specified in table 2 of Schedule 2.

Note The goal for particles as PM<sub>2.5</sub> from 1 January 2025 will provide a framework for continuous improvement and facilitate a review of the PM<sub>2.5</sub> standard.

## **Part 3                      National environment protection standards**

### **7                      Purpose of Part**

The purpose of this Part is to set standards that consist of quantifiable characteristics of the air against which ambient air quality can be assessed.

### **8                      National environment protection standards**

- (1) The national environment protection standards of this Measure are the standards set out in tables 1 and 1A of Schedule 2.
- (2) The national environment protection standards must be assessed in accordance with the national environment protection protocol in Part 4 of this Measure.
- (3) Subject to subsection (4), for each pollutant mentioned in table 1 of Schedule 2, the standard for an averaging period mentioned in the Schedule is the concentration in column 4 of table 1 of Schedule 2.
- (4) For sulfur dioxide, from 1 January 2025 the standard for an averaging period mentioned in column 2 of table 1A of Schedule 2 is the concentration in column 3 of that table.



## **Part 4 National environment protection protocol**

### **9 Purpose of Part**

The purpose of this Part is to set out the processes to be followed in measuring the concentration of pollutants in the air to determine:

- (a) whether the standards of this Measure are being met; or
- (b) the extent of the difference between the measured concentration of pollutants in the air and the standards.

### **10 Monitoring plans**

- (1) Each participating jurisdiction must ensure that a monitoring plan consistent with this Part is prepared setting out how the jurisdiction proposes to monitor air quality for the purposes of this Measure.
- (2) Each monitoring plan must be submitted to Council.

### **11 Methods of measuring and assessing concentration of pollutants**

For the purpose of evaluating performance against the standards the concentration of pollutants in the air:

- (a) is to be measured at performance monitoring stations; or

Note Because the concentrations of different pollutants vary across a region, it would not be necessary or appropriate to co-locate the measuring instrumentation for all pollutants at each performance monitoring station.

- (b) is to be assessed by other means that provide information equivalent to measurements which would otherwise occur at a performance monitoring station.

Note These methods could include, for example, the use of emission inventories, windfield and dispersion modelling, and comparisons with other regions.

### **12 Accreditation of performance monitoring**

- (1) Subject to subsection (2) the operator of a performance monitoring station must be accredited by the National Association of Testing Authorities.
- (2) The operator may apply an equivalent system for ensuring adequate monitoring, quality assurance, and validation procedures.

### **13 Location of performance monitoring stations**

- (1) To the extent practicable, performance monitoring stations must be sited in accordance with the requirements for Australian Standard AS/NZS 3580.1.1:2016 (Methods for sampling and analysis of ambient air – Guide to siting air monitoring equipment). Any variations from AS/NZS 3580.1.1:2016 must be notified to Council for use in assessing reports.
- (2) Performance monitoring station(s) must be located in a manner such that they contribute to obtaining a representative measure of the air quality likely to be experienced by the general population in the region or sub-region.

- (3) To the extent practicable, performance monitoring stations must be operated in the same location for at least 5 years unless the integrity of the measurements is affected by unforeseen circumstances.

#### **14 Number of performance monitoring stations**

- (1) The number of performance monitoring stations must be based on determining the potential population at risk.
- (2) In high risk areas, additional performance monitoring stations may be needed if determined by relevant participating jurisdictions.
- (3) Fewer performance monitoring stations may be needed where it can be demonstrated that pollutant levels are reasonably expected to be consistently lower than the standards specified in this Measure.
- (4) Subject to subsections (1) to (3), the number of performance monitoring stations for a region with a population of 25,000 people or more must be at least the next whole number above the number calculated in accordance with the formula:

$$1.5P + 0.5$$

where P is the population of the region (in millions).

Note To ensure national consistency, the determination of risk shall be undertaken in accordance with any procedures or methods agreed by participating jurisdictions.

#### **15 Trend stations**

- (1) A number of performance monitoring stations in each participating State and participating Territory must be nominated as trend stations.
- (2) The number of performance monitoring stations to be nominated as trend stations must be sufficient to monitor and assess long term changes in ambient air quality in different parts of the jurisdiction.
- (3) A trend station must be operated in the same location for one or more decades.

#### **16 Monitoring methods**

- (1) Subject to subsections (2) and (3), the Australian Standard Methods set out in Schedule 3 must be used as reference methods for monitoring pollutants in the air.
- (2) Where an Australian Standard Method has not yet been developed for a monitoring method, appropriate internationally recognised methods or standards may be used that provide equivalent information for assessment purposes.
- (3) Other monitoring methods may be used if:
  - (a) calibration and validation studies show:
    - (i) the accuracy and precision of the other method; and
    - (ii) the method can be compared with the relevant Australian Standard Method; and
  - (b) the equipment used is calibrated to the standard required by the equipment manufacturer; and
  - (c) the equipment provides equivalent information for assessment purposes.

## 17 Evaluation of performance against standards and goal

- (1) Each participating jurisdiction must evaluate its annual performance as set out in this section.
- (2) For each performance monitoring station in the participating jurisdiction or assessment in accordance with paragraph 11(b) there must be:
  - (a) a determination of the exposed population in the region or sub-region represented by the station; and
  - (b) an evaluation of performance against the standards and goal of this Measure, other than in relation to table 2 of Schedule 2, as:
    - (i) meeting; or
    - (ii) not meeting; or
    - (iii) not demonstrated.
- (2A) Each participating jurisdiction must evaluate and report population exposures to:
  - (a) particles as PM<sub>2.5</sub> from June 2018; and
  - (b) nitrogen dioxide and photochemical oxidants (as ozone) from June 2021.

Note To ensure national consistency, evaluation and reporting shall be undertaken in accordance with any procedures or methods agreed by participating jurisdictions.

- (3) Participating jurisdictions may provide an evaluation of a region as a whole against the standards using appropriate methodologies that provide equivalent information for assessment purposes.
- (4) Performance must be evaluated as ‘not demonstrated’ if there has been no monitoring or no assessment by an approved alternative method as provided in section 11.

## 18 Reporting

- (1) Each participating jurisdiction must submit a report on its compliance with the Measure, other than in relation to table 2 of Schedule 2, in an approved form to Council by the 30 June next following each reporting year.
- (2) In this section **reporting year** means a year ending on 31 December.
- (2A) The report must include:
  - (a) the evaluations and assessments mentioned in section 17; and
  - (b) an analysis of the extent to which the standards of this Measure are, or are not, met in the jurisdiction; and
  - (c) a statement of the progress made towards achieving the goal.
- (3) The description of the circumstances which led to exceedances, including the influence of natural events and fire management, must be reported to the extent that such information can be determined.
- (3A) When reporting against the PM<sub>10</sub> and PM<sub>2.5</sub> 1 day average and photochemical oxidants (as ozone) 8 hour average standards specified in this measure, participating jurisdictions will report all measured data, including monitoring data that is directly associated with an exceptional event, and identify and describe any exceptional event.

- (3B) Participating jurisdictions are to maintain and make available records relating to the determination of exceptional events.
- (3C) For the purpose of reporting compliance against the PM<sub>10</sub> and PM<sub>2.5</sub> 1 day average and photochemical oxidants (as ozone) 8 hour average standards specified in this measure, participating jurisdictions shall exclude monitoring data that has been determined as being directly associated with an exceptional event.
- (3D) For the purpose of reporting compliance against the PM<sub>10</sub> and PM<sub>2.5</sub> 1 year average standards specified in this measure, participating jurisdictions shall include all measured data, including monitoring data that is directly associated with an exceptional event.

Note To ensure national consistency, all reporting or record-keeping referred to in subsections 18(3A), (3B), (3C) or (3D) shall be undertaken in accordance with any procedures or methods agreed by participating jurisdictions.

- (4) A report for a pollutant must include the percentage of data available in the reporting period.

**[4] Schedules 2 and 3**

Repeal the Schedules, substitute:

## Schedule 2 Standards and Goal

**Table 1: Standards for Pollutants**

<b>Column 1 Item</b>	<b>Column 2 Pollutant</b>	<b>Column 3 Averaging period</b>	<b>Column 4 Maximum concentration standard</b>
1	Carbon monoxide	8 hours	9.0 ppm
2	Nitrogen dioxide	1 hour 1 year	0.08 ppm 0.015 ppm
3	Photochemical oxidants (as ozone)	8 hours	0.065 ppm
4	Sulfur dioxide	1 hour 1 day	0.10 ppm 0.02 ppm
5	Lead	1 year	0.50 µg/m <sup>3</sup>
6	Particles as PM <sub>10</sub>	1 day 1 year	50 µg/m <sup>3</sup> 25 µg/m <sup>3</sup>
7	Particles as PM <sub>2.5</sub>	1 day 1 year	25 µg/m <sup>3</sup> 8 µg/m <sup>3</sup>

Note There are no maximum allowable exceedances.

**Table 1A: Standards for SO<sub>2</sub> from 2025**

<b>Column 1 Pollutant</b>	<b>Column 2 Averaging period</b>	<b>Column 3 Maximum concentration</b>
Sulfur dioxide	1 hour	0.075 ppm

**Table 2: Goal for Particles as PM<sub>2.5</sub> from 2025**

<b>Column 1 Pollutant</b>	<b>Column 2 Averaging period</b>	<b>Column 3 Maximum concentration</b>
Particles as PM <sub>2.5</sub>	1 day	20 µg/m <sup>3</sup>
	1 year	7 µg/m <sup>3</sup>

For the purposes of this Measure the following definitions shall apply:

- (1) Lead sampling must be carried out for a period of 24 hours at least every sixth day.
- (2) Measurement of lead must be carried out on Total Suspended Particles (TSP) or its equivalent.
- (3) In Column 3 of table 1 and Column 2 of tables 1A and 2 of Schedule 2, the averaging periods are defined as follows:
  - 1 hour      clock hour average
  - 8 hour      rolling 8 hour average based on 1 hour averages
  - 1 day      calendar day average
  - 1 year      calendar year average
- (4) All averaging periods of 8 hours or less must be referenced by the end time of the averaging period. This determines the calendar day to which the averaging periods are assigned.
- (5) For the purposes of calculating and reporting 8 hour averages, the first rolling average in a calendar day ends at 1:00 am, and includes hours from the previous calendar day.
- (6) The concentrations in Column 4 of table 1 and Column 3 of table 2 of Schedule 2 are the arithmetic mean concentrations.

## Schedule 3 Australian Standards Methods for Pollutant Monitoring

Pollutant	Method title	Method number
Carbon monoxide	Determination of Carbon Monoxide-Direct Reading Instrumental Method	AS 3580.7.1-2011/Amdt 1-2012
Nitrogen dioxide	Determination of Oxides of Nitrogen-Chemiluminescence Method	AS 3580.5.1-2011
Photochemical oxidants (as ozone)	Determination of Ozone-Direct Reading Instrumental Method	AS 3580.6.1-2016
Sulfur dioxide	Determination of Sulfur Dioxide-Direct Reading Instrumental Method	AS 3580.4.1-2008 REC:2018
Lead	Determination of Suspended Particulate Matter – Particulate metals high or low volume sampler gravimetric collection – Inductively coupled plasma (ICP) spectrometric method	AS/NZS 3580.9.15:2014
	Determination of Suspended Particulate Matter – Total suspended particulate matter (TSP) - High volume sampler gravimetric method	AS/NZS 3580.9.3:2015
Particles as PM <sub>10</sub>	Determination of Suspended Particulate Matter-PM <sub>10</sub> High Volume Sampler with Size Selective Inlet-Gravimetric Method	AS/NZS 3580.9.6:2015
	Determination of Suspended Particulate Matter-Dichotomous sampler (PM <sub>10</sub> , coarse PM and PM <sub>2.5</sub> ) – Gravimetric method	AS/NZS 3580.9.7:2009
	Determination of Suspended Particulate Matter-PM <sub>10</sub> continuous direct mass method using tapered element oscillating microbalance analyser.	AS 3580.9.8-2008 REC:2018
	Determination of Suspended Particulate Matter-PM <sub>10</sub> Low Volume Sampler-Gravimetric Method	AS 3580.9.9:2017
	Determination of Suspended Particulate Matter-PM <sub>10</sub> beta attenuation monitors	AS/NZS 3580.9.11: 2016
	Determination of suspended particulate matter – PM <sub>10</sub> continuous direct mass method using a tapered element oscillating microbalance monitor incorporating a filter dynamic measurement system (FDMS) unit	AS/NZS 3580.9.16:2016
Particles as PM <sub>2.5</sub>	Determination of Suspended Particulate Matter-PM <sub>2.5</sub> low volume sampler-Gravimetric Method	AS 3580.9.10:2017
	Determination of Suspended Particulate Matter-PM <sub>2.5</sub> beta attenuation monitors	AS/NZS 3580.9.12:2013
	Determination of Suspended Particulate Matter-PM <sub>2.5</sub> continuous direct mass method using a tapered element oscillating microbalance monitor	AS/NZS 3580.9.13:2013
	Determination of Suspended Particulate Matter-PM <sub>2.5</sub> high volume sampler with size selective inlet – Gravimetric Method	AS/NZS 3580.9.14:2013

Note The standards in this table can be obtained from Standards Australia Ltd (see <https://www.standards.org.au/>.)