



## **National Environment Protection (Air Toxics) Measure**

made under subsection 14(1) of the

*National Environment Protection Council Act 1994 (Cwlth), 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), National Environment Protection Council (Northern Territory) Act 1994 (NT), and the National Environment Protection Council Act 1994 (ACT)*

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This Measure was made on 3 December 2004

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## Introductory Note

Section 14 of the *National Environment Protection Council Act 1994* and the equivalent provision of the corresponding Act of each participating State and Territory provides for the making of measures by the National Environment Protection Council and the matters to which they may relate. This Measure relates to ambient air quality (section 14 (1) (a)).

The Measure 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.

## Part 1 Preliminary

### 1 Citation

This Measure may be cited as the National Environment Protection (Air Toxics) Measure.

Note: This Measure commences on gazettal: see National Environment Protection Council Act 1994, s 21 and Acts Interpretation Act 1901, s 48 as applied by s 46A.

### 2 Definitions

- (1) This clause 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.

**air toxic** means a pollutant selected for assessment in this Measure and listed in Schedule 1

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

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**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.

**monitoring investigation level** means the concentration of an air toxic which if exceeded requires an appropriate form of further investigation and evaluation.

**\*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.

**ppm** means parts per million by volume.

**“Stage 1 site”** means a site where significantly elevated concentrations of one or more air toxics are expected to occur.

“*Stage 2 site*” means a Stage 1 site prioritised for monitoring on the basis of its potential for significant population exposure, (as described in Schedule 3 to this Measure), to one or more air toxics.

“*Year*” means a calendar year for the purposes of this Measure.

### **3 Application**

Participant jurisdictions must establish assessment monitoring and reporting procedures in accordance with the protocols in this Measure.

## **Part 2 National Environment Protection Goal**

### **4 Purpose of Part**

The purpose of this part is to set out a goal:

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

### **5 National environment protection goal**

The national environment protection goal of this Measure is to improve the information base regarding ambient air toxics within the Australian environment in order to facilitate the development of standards following a Review of the Measure within eight years of its making.

### **6 Desired environmental outcome**

The desired environmental outcome of this Measure is to facilitate management of air toxics in ambient air that will allow for the equivalent protection of human health and well being, by-

- (1) providing for the generation of comparable, reliable information on the levels of toxic air pollutants (“air toxics”) at sites where significantly elevated concentrations of one or more of these air toxics are likely to occur (“Stage 1 sites”) and where the potential for significant population exposure to air toxics exists (“Stage 2 sites”).
- (2) establishing a consistent approach to the identification of such sites for use by jurisdictions.
- (3) establishing a consistent frame of reference (“monitoring investigation levels”) for use by jurisdictions in assessing the likely significance of levels of air toxics measured at Stage 2 sites.
- (4) adopting a nationally consistent approach to monitoring air toxics at a range of locations (eg. near major industrial sites, major roads, areas affected by wood smoke).

**Section 7**

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## **Part 3                      National environment protection protocol**

### **7                      Purpose of Part**

The purpose of this Part is to set out the processes to be followed in

- (a) identifying Stage 1 sites and Stage 2 sites;
- (b) measuring the concentration of air toxics in the air at Stage 2 sites, and
- (c) evaluating the results of monitoring against monitoring investigation levels

This protocol sets out the process for monitoring air quality in such a way as to achieve the national environment protection goal specified in Part 2 of this Measure.

### **8                      Identification of Stage 1 and Stage 2 sites for monitoring of Air Toxics**

- (1) Each participating jurisdiction must undertake an assessment of locations within the jurisdiction to identify Stage 1 sites which may be used for the purpose of monitoring any of the air toxics specified in Schedule 1 to this Measure.
- (2) An assessment of locations as required under sub-clause (1) must be undertaken in accordance with the requirements for identification of Stage 1 sites set out in Schedule 2 to this Measure.
- (3) Following the assessment under sub-clause (1) each jurisdiction will determine which (if any) of its Stage 1 sites warrant designation as Stage 2 sites.
- (4) A determination as required under sub-clause (3) must be undertaken in accordance with requirements for the identification of Stage 2 sites set out in Schedule 2 of this Measure.
- (5) Where a participating jurisdiction identifies more than one Stage 2 site, the jurisdiction may establish the priority for monitoring each site in accordance with Schedule 2 to this Measure.
- (6) Where a jurisdiction decides to undertake preliminary monitoring the results may be used to assist in the prioritisation of Stage 2 sites. Prioritisation must be carried out in accordance with Schedule 2.

### **9                      Monitoring of Air Toxics**

- (1) Where a Stage 2 site identified in accordance with Clause 8 (3) is an industrial site, subject to jurisdictional regulatory control, the jurisdiction may decide that monitoring in accordance with this National Environment Protection Measure would not add value to existing statutory measures applied at that site and not undertake monitoring.

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**Clause 11**

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- (2) Where a jurisdiction decides not to monitor at such a site, it must report to Council the basis for that decision in accordance with Schedule 4.
- (3) Where one or more Stage 2 sites have been identified under Clause 8 of this Measure, and if monitoring of air toxics is undertaken, then monitoring must be in accordance with the requirements set out in Schedule 3 to this Measure.

**10 Siting of monitoring equipment**

- (1) Except where monitoring is carried out in accordance with sub-clause 10(2)(d), siting of monitoring equipment for each site at which monitoring is to be undertaken must, as far as practicable, comply with Australian Standard AS2922-1987 Ambient Air - Guide for the siting of sampling units for peak monitoring stations.
- (2) When siting monitoring equipment, the following must be taken into account -
  - (a) equipment for the purpose of monitoring air toxics must, where appropriate, be situated to determine the cumulative impact of multiple sources;
  - (b) despite the requirements under sub-clause (a), where the concentration of air toxics from road sources is being monitored, cumulative impacts may relate to emissions from one type of source, such as motor vehicles;
  - (c) when monitoring street canyons, monitoring equipment should be sited to ensure that maximum concentrations of air toxics are determined, as concentrations on opposing sides of canyons can vary widely; and
  - (d) in wood smoke impacted areas, PM10 performance monitoring stations as designated under the National Environment Protection (Ambient Air Quality) Measure may be used for monitoring of PAHs and other air toxics associated with wood smoke.
- (3) Notwithstanding the requirements of sub-clause (1), when siting monitoring equipment at roadside Stage 2 sites, equipment must be sited within 20 metres of the kerbside and the distance from the kerb must be reported.

**11 Accreditation**

- (1) Subject to subclause (2), an operator conducting monitoring for the purpose of this Measure must be accredited for the relevant methods by the National Association of Testing Authorities.
- (2) An operator may apply an equivalent system, approved by the National Association of Testing Authorities, for ensuring adequate monitoring, quality assurance and validation procedures.

**Section 12**

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**12 Evaluation of monitoring results against monitoring investigation levels**

The results of any monitoring must be assessed against the monitoring investigation levels identified in Schedule 3 to this Measure. For any exceedence of a monitoring investigation level identified in Schedule 3 to this Measure, the jurisdiction must undertake some form of evaluation to determine the circumstances that led to the exceedence, including the likely sources of the air toxics and influence of natural factors.

**13 Reporting**

- (1) Each participating jurisdiction must submit a report to Council in accordance with Schedule 4 to this Measure.
- (2) A report submitted in accordance with sub-clause (1) must be submitted to Council by the 30 June next following each reporting year.
- (3) In this clause “reporting year” means a year ending on 31 December.

**14 Review of the Measure**

- (1) This Measure will be subject to a full review to commence within eight years of commencement. This Review will consider -
  - (a) the effectiveness of the Measure in achieving the desired environmental outcome set out within it;
  - (b) the resources available for implementing the Measure; and
  - (c) the need, if any, for amending the Measure (in accordance with the Act), including:
    - (i) whether any changes should be made to the Schedules; and
    - (ii) whether any changes should be made to improve the effectiveness of the Measure in order to achieve the national environment protection goal set within it.
- (2) Provided that the review required under 14(1) has not been initiated before the commencement of the fifth year of the Measure, the Measure will undergo a preliminary review in the fifth year after being made to enable an assessment of progress toward meeting the specified Goal of the Measure to be made.

**15 Schedules to the Measure**

This measure contains the following Schedules:

- (1) Schedule 1  
Schedule 1 to this Measure identifies the air toxics to which this Measure applies.
- (2) Schedule 2



**Clause**

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Schedule 2 to this Measure prescribes the process to be undertaken when identifying and prioritising Stage 1 and Stage 2 sites.

(3) Schedule 3

Schedule 3 to this Measure prescribes the methodology for air toxics monitoring and assessment.

(4) Schedule 4

Schedule 4 to this Measure prescribes the reporting requirements for this Measure.

**Schedule 1      Air Toxics to which this Measure  
applies**

Benzene

Formaldehyde

Benzo(a)pyrene as a marker for  
Polycyclic Aromatic Hydrocarbons

Toluene

Xylenes (as total of ortho, meta and  
para isomers)

## **Schedule 2 Identification and prioritisation of stage 1 and stage 2 sites**

### **1. Purpose**

This schedule prescribes the methodology for identifying Stage 1 sites and Stage 2 sites and, where more than one Stage 2 site for one or more air toxics is identified, prioritising those sites for the purpose of monitoring the concentration of air toxics at that site. Further guidance is provided in the Guidance Paper for Desktop Analysis and Investigation Procedures

### **2. Background**

For significantly elevated levels of air toxics to occur, the following circumstances are generally required:

- There are sources of air toxics in the immediate vicinity.
- The sources emit substantial localised quantities of air toxics.
- The topography and meteorological conditions tend to limit dispersion of emissions.

### **3. Identification of Stage 1 sites**

- (i) Jurisdictions are required to undertake an initial assessment of locations in order to identify Stage 1 sites that may be monitored for air toxics. This assessment must be undertaken in a timeframe that ensures that Stage 2 sites can be identified within twelve months of the commencement of this Measure.
- (ii) The initial assessment should:
  - 1) Identify and locate sources of air toxics emissions; and
  - 2) Determine which locations in the jurisdiction have potential to experience significantly elevated ambient levels of air toxics.
- (iii) In making such assessments jurisdictions should consider:
  - a) potentially significant emission sources of air toxics such as:
    - i) highly trafficked roads;
    - ii) cumulative impacts associated with multiple sources including major industry;
    - iii) clustered small to medium enterprises; and
    - iv) areas where there is a high level of wood heater use;
  - b) existing monitoring data;
  - c) inventory and modelled data;
  - d) local meteorological, geographical and seasonal effects;
  - e) dispersion and airshed modelling; and
  - f) other relevant information.
- (iv) It is the responsibility of jurisdictions to take into account all available relevant information on emissions of air toxics when making this initial assessment.

Information sources and tools that jurisdictions may wish to use in the identification of Stage 1 sites include:

- monitoring data;
- emissions inventories including the National Pollutant Inventory;
- available licensing information from environmental protection agencies;
- registers of businesses under workplace, health and safety legislation;
- business and domestic activity surveys;
- traffic counts, including nature and volume of traffic;
- business directories;
- local knowledge/observations from jurisdictional officers;
- information about specific local sources of emissions of the air toxics;
- ambient dispersion modelling;
- regional air shed modelling; and
- town planning and development approval information.

Geographical Information Systems (GIS) software can assist visualisation of this type of information.

- (v) The identification of Stage 1 sites for a particular air toxic does not necessarily imply that it is a Stage 1 site for other air toxics.
- (vi) Jurisdictions must also repeat the desktop assessment of Stage 1 sites to identify additional Stage 2 sites of locations identified as Stage 1 sites no later than the end of the fourth year after the commencement of this Measure. In undertaking this repeat procedure, jurisdictions must reassess locations within their jurisdiction using the same methodology utilised for the initial assessment.

#### **4. Identification of Stage 2 Sites**

Stage 2 site means a Stage 1 site prioritised for monitoring on the basis of its potential for significant population exposure, to one or more air toxics.

Note: In the context of Stage 2 sites “significant population exposure” refers to a possible outcome of a qualitative assessment made by jurisdictions of the potential extent and implications for health of exposure of people to one or more air toxics in areas near a stage 1 site. It takes into account factors such as population size or density, sensitive subgroups and land uses (such as kindergartens, schools, age care facilities etc.) indicative of the presence of such groups in the area. There is no threshold population size associated with the expression significant population exposure nor is it in any way related to the threshold population value of 25,000 established in the National Environment Protection (Ambient Air Quality) Measure in relation to Performance Monitoring Stations.

This identification of Stage 2 sites must be undertaken within 12 months of the commencement of this Measure.

- (i) Jurisdictions must undertake the identification of Stage 2 sites from sites identified as Stage 1 sites.
- (ii) In identifying Stage 2 sites, jurisdictions must take into account the following factors:
  - estimated exposure (long and short term) to the air toxic(s);
  - size and susceptibility of the exposed population; and
  - health effects of the air toxic(s).
- (iii) Information sources/tools that jurisdictions may wish to access/use to help with determining population include:

- population data available from Australian Bureau of Statistics;
- land use planning information; and
- local knowledge/observations from jurisdictional officers.

- (iv) Where practicable, jurisdictions should select Stage 2 sites for air toxic(s) monitoring that are representative of other Stage 1 sites. This will allow an indicative evaluation of other Stage 1 sites where a monitored site is considered to be representative of those sites.
- (v) Jurisdictions must repeat the desktop assessment of sites identified as Stage 2 sites no later than the end of the fourth year after the commencement of this Measure. In undertaking this repeat procedure, jurisdictions must reassess Stage 1 sites within their jurisdiction using the same methodology utilised for the initial identification of Stage 2 sites.

**5. Prioritisation of Stage 2 Sites for the purpose of selecting sites for air toxic monitoring**

- (i) Subsequent to the identification of Stage 2 sites, jurisdictions may establish an order of priority for these sites. This should reflect the significance of potential health impacts arising from exposure to significantly elevated levels of air toxics.
- (ii) To assist in the prioritisation and to validate the selection of Stage 2 sites, jurisdictions may undertake preliminary monitoring using reference-monitoring methods. Results of such monitoring can be reported to Council. It would be expected that such preliminary monitoring would comprise a smaller number of samples than for reference monitoring.

**6. Preliminary Monitoring for the Prioritisation of Stage 2 Sites**

**(i) Application**

Preliminary monitoring may be used to assist in the prioritisation of multiple Stage 2 sites which have been identified from the initial desk top assessment.

Preliminary monitoring data cannot be assessed against the monitoring investigation levels listed in Schedule 3, as the limited sampling will not give a fully representative measure of conditions at a site. The data are to be used only in the prioritisation of sites.

**(ii) Assessment**

Once preliminary monitoring at a site(s) is complete the site(s) may then be assessed and prioritised with other jurisdictional sites as detailed in Schedule 2 to this Measure.

**(iii) Sampling and analysis for preliminary monitoring**

Sampling and analysis methods used for preliminary monitoring of air toxics must be as detailed in Schedule 3 to this Measure.

Sampling for preliminary monitoring should attempt to identify the peak concentrations at the site(s). Thus sampling should take place during the time of year when maximum air toxic(s) concentrations for the source(s)

under consideration are expected. As a minimum, sampling must be carried out every second day over two consecutive weeks.

**(iv) Applicable Parts**

Siting of equipment for preliminary monitoring is as detailed in Clause 10 of this Measure.

Data from preliminary monitoring must be reported as detailed in Part 2, Reporting of Monitoring of Air Toxics of Schedule 4 to this Measure.

### Schedule 3      **Methods for monitoring and assessment of Air Toxics**

1. Monitoring of benzene, toluene, xylenes and polycyclic aromatic hydrocarbons (PAHs) must be carried out in accordance with the appropriate methods listed in Table 2 and Section 3 (1) of this Schedule.
2. Monitoring for formaldehyde must be carried out in accordance with the appropriate methods listed in Table 2 and Section 3 (2) of this Schedule.
3. Jurisdictions may use alternative sampling and analysis methods where equivalence can be demonstrated in accordance with US EPA Method Reference for equivalence testing USEPA Code of Federal Regulations (40 CFR, Protection of Environment, Chapter I, Environmental Protection Agency (continued), Subchapter C - Air programs (continued), Part 53 - Ambient Air Monitoring, Reference and Equivalent Methods), or in accordance with National Association of Testing Authorities (NATA), Australia requirements Technical Note 17 – Format and Content of Test Methods and Procedures for Validation and Verification of Chemical Test Methods,

**Table 1: Reference Methods for Monitoring of Air Toxics**

Pollutant	Method title	Method number
Benzene	United States Environmental Protection Agency Compendium Method TO-14A. Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography – Jan 1999 <b>OR</b> United States Environmental Protection Agency Compendium Method TO-15. Determination Of Volatile Organic Compounds In Air Using Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS) – Jan 1999	USEPA –TO14-A Note 1 Note 4 USEPA –TO15 Note 1 Note 4
Formaldehyde	United States Environmental Protection Agency Compendium Method TO-11A. Determination of Formaldehyde in Ambient Air Using Adsorbant Cartridge Followed by High Performance Liquid Chromatography (HPLC) [Active Sampling Methodology] –Jan 1999.	USEPA – TO11-A Note 1 Note 2 Note 3
Benzo(a)pyrene (as a marker for Polycyclic Aromatic Hydrocarbons)	United States Environmental Protection Agency Compendium Method TO-13A. Determination of Polycyclic Aromatic Hydrocarbons (PAHs) Using Gas Chromatography/Mass Spectrometry (GC/MS) – Jan 1999	USEPA - TO13-A Note 1
Toluene	United States Environmental Protection Agency Compendium Method TO-14A. Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By	USEPA –TO14-A Note 1

	Gas Chromatography - Jan 1999 <b>OR</b> United States Environmental Protection Agency Compendium Method TO-15. Determination Of Volatile Organic Compounds (VOCs) In Air Using Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS) - Jan 1999	Note 4  USEPA -TO15 Note 1 Note 4
Xylenes (as total of ortho, meta and para isomers)	United States Environmental Protection Agency Compendium Method TO-14A. Determination Of Volatile Organic Compounds (VOCs) In Ambient Air Using Specially Prepared Canisters With Subsequent Analysis By Gas Chromatography - Jan 1999 <b>OR</b> United States Environmental Protection Agency Compendium Method TO-15. Determination Of Volatile Organic Compounds (VOCs) In Air Using Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS) - Jan 1999	USEPA -TO14-A Note 1 Note 4  USEPA -TO15 Note 1 Note 4

*Note 1* – Air toxics are to be measured and reported as individual compounds as, benzene, toluene, formaldehyde, and benzo[a]pyrene. Xylenes to be reported as the total of the ortho, meta and para isomers. The units to be used are parts per million by volume for all of these air toxics except benzo(a)pyrene which must be reported as nanograms/cubic metre at 25 degrees Celsius and 101.3 Kilopascals.

*Note 2* – As an alternative method to the reference method for formaldehyde the following method may be used:

United States Environmental Protection Agency Compendium Method TO15, Determination Of Volatile Organic Compounds (VOCs) In Air Using Specially-Prepared Canisters And Analysed By Gas Chromatography/Mass Spectrometry (GC/MS) – January 1999.

*Note 3* – United States Environmental Protection Agency Compendium Method TO15 can be used for monitoring formaldehyde provided that: canisters suitable for the detection of formaldehyde are used and, validation for formaldehyde is carried out to the requirements of the accrediting body used by the laboratory and in accordance with the method.

*Note 4* - United States Environmental Protection Agency Compendium Method TO17 can be used as an alternative method provided that equivalence can be demonstrated.

#### 4. Sampling Regime

- (i) The sampling regime for benzene, toluene, xylenes and PAHs is as follows:
- One sample every six days over an entire year; or
  - 30 samples per season (one day in three is the recommended frequency) for two seasons per year to obtain maximum variability in ambient levels of air toxics as appropriate.
- (ii) The sampling regime for formaldehyde is as follows:
- One sample every six days over an entire year; or
  - 30 samples (one day in three is the recommended frequency) over a sufficient timeframe to include periods when maximum



concentrations would be expected (to be conducted within one calendar year).

#### 5. Monitoring Investigation levels

The monitoring investigation levels specified in Table 2 are for use in assessing any air monitoring data collected for the purposes of this Measure. The monitoring investigation levels are established for use in assessing the significance of the monitored levels of air toxics with respect to protection of human health. If the monitoring investigation levels are exceeded then some form of further investigation by the relevant jurisdiction of the cause of the exceedance is appropriate.

Note: The monitoring investigation level values are levels of air pollution below which lifetime exposure, or exposure for a given averaging time, does not constitute a significant health risk. If these limits are exceeded in the short-term it does not mean that adverse health effects automatically occur.

Investigation of exceedances may include, but is not limited to:

- Further monitoring to ascertain whether the exceedance was an anomaly to typical of this area;
- Further monitoring over shorter time periods for the irritants to assess whether the health based guideline value is being exceeded;
- Identification of unusual events, such as bushfires, spills, major traffic accidents;
- Assessment of unusual meteorological conditions.

If there are regular exceedances at the same site jurisdictions may wish to consider management actions.

**Table 2: Monitoring investigation levels**

<b>Column 1 Pollutant</b>	<b>Column 2 Averaging period</b>	<b>Column 3 Monitoring investigation level</b>	<b>Goal</b>
Benzene	Annual average*	0.003ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
Benzo(a)pyrene as a marker for Polycyclic Aromatic Hydrocarbons	Annual average*	0.3ng/m <sup>3</sup>	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
Formaldehyde	24 hours#	0.04 ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
Toluene	24 hours# Annual average*	1 ppm 0.1 ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.
Xylenes (as total of ortho, meta and para isomers)	24 hours# Annual average*	0.25ppm 0.2 ppm	8-year goal is to gather sufficient data nationally to facilitate development of a standard.

\*For the purposes of this Measure the annual average concentrations in Column 3 are the arithmetic mean concentrations of 24-hour monitoring results.

# For the purposes of this Measure monitoring over a 24 hour period is to be conducted from midnight to midnight.

*Note 1* - For toluene and xylenes the Annual average and 24 hour monitoring investigation levels have been derived independently for different (chronic and acute) health endpoints.

*Note 2* - The 24 hour monitoring investigation levels in table 2 have been derived from health based guidelines of shorter averaging periods.

- For formaldehyde the health based guideline is 0.08 ppm for a 1 hour averaging period;
- For toluene the health based guideline is 4 ppm for a 6 hour averaging period; and
- For xylene the health based guideline is 1 ppm for a 30 minute averaging period.

## 6. Meteorological Monitoring

Monitoring of relevant meteorological data will assist in assessing data relative to sources. Meteorology monitoring stations would need to be set up to obtain data relevant to a Stage 2 site not further than 2km away depending on local site assessment. Meteorological data, such as wind speed and direction, temperature, relative humidity, and dewpoint temperature, should be recorded wherever practicable.

## **Schedule 4 Reporting requirements**

### 1. Purpose

This Schedule sets out reporting requirements for this Measure (refer Clause 13). The purpose of reporting is to inform the public of progress in the assessment of sites and subsequent monitoring of air toxics.

### 2. Reporting Requirements

Jurisdictions are required to report under this Measure to Council on an annual basis. This report must be submitted to Council by the 30 June next following each reporting year. Reporting requirements comprise four parts:

- Part 1: Identification of Stage 1 and Stage 2 Sites;
- Part 2: Reporting of Monitoring of Air Toxics;
- Part 3: Reporting on Assessment and Action, if any planned or taken to manage sources of air toxics; and
- Part 4: Repeat identification of Stage 1 and Stage 2 Sites.

Note that jurisdictions are only expected to report on Part 1 in the first reporting year, or subsequently when further Stage 1 and Stage 2 sites have been identified. A timetable for reporting requirements is provided at the end of this Schedule.

## **Part 1: Identification of Sites**

In Part 1 of the report, jurisdictions are to report to Council on the assessment of locations within their jurisdiction in order to identify Stage 1 sites. Jurisdictions must also report on the assessment of Stage 1 sites for the purpose of identifying Stage 2 sites.

### **(i) Stage 1 sites**

Jurisdictions are to provide the information detailed below.

- Areas assessed by desk top analysis;
- Brief description of desk-top analysis methodology;
- Information used in the analysis (eg. emissions inventory, traffic flows, estimate of population in the area, the use of any existing data and the source of that data);
- Location of the Stage 1 sites; and
- Types of sources impacting on the identified Stage 1 sites.

### **(ii) Stage 2 Sites**

In addition to the information relevant to the Stage 1 analysis for the site, jurisdictions are to provide the information detailed below.

- Location of the Stage 2 sites;
- Types of sources impacting on the identified Stage 2 sites;
- Estimated levels of air toxics, where possible;
- Size and susceptibility of the exposed population; and
- Health effects the air toxics.

## Part 2: Reporting of Monitoring of Air Toxics

- (i) In accordance with Clause 9 (2), where a jurisdiction decides not to monitor at a Stage 2 site because it is an industrial site subject to jurisdictional regulatory controls, the basis for that decision must be reported to Council as part of the jurisdiction annual reporting.
- (ii) Where a jurisdiction has decided not to undertake monitoring at an identified Stage 2 site, the basis for the decision must be reported.
- (iii) Where a jurisdiction has selected Stage 2 sites for monitoring, the jurisdiction is to report in a manner specified in proforma Table 1.

**Proforma Table 1: Stage 2 Sites and Proposed Monitoring Program**

Location of Stage 2 sites	Air toxics with possible elevated levels	Air toxics to be monitored	Proposed timeframe for monitoring	Estimate of size of population likely to be exposed and identification of susceptible groups.

- (iv) Where the monitoring of air toxics has been undertaken at a Stage 2 site by a jurisdiction, the jurisdiction is to report on the monitoring results in a manner specified in proforma Table 2.

**Proforma Table 2: Monitoring results**

	Site XXX	Site YYY	Site ZZZ
Air toxic			
Monitoring method			
Period of monitoring			
Frequency of monitoring			
Number of valid results			
Maximum 24-hour average concentration			
Annual average concentration (as arithmetic mean)			
Arithmetic Standard Deviation of 24-hour average concentrations			
Number of times monitoring investigation level exceeded*			

\* Must be evaluated as “not demonstrated” if no monitoring or assessment has taken place.

- (v) For each site at which monitoring is being undertaken, the following metadata must also be reported:
  - Map coordinates (Australian Map Grid, latitude, longitude or other), with enough detail for the site to be readily located;
  - Site elevation;
  - Sample intake height;
  - Street address if applicable;
  - Date monitoring established;
  - Date monitoring completed;
  - Exceptions to AS 2922-1987;
  - Description of surrounding land use;
  - Instrument details;

- Sources impacting on the site; and
  - Distance from the kerb for roadside monitoring.
- (vi) Air toxics monitoring programs may enable jurisdictions to monitor for air toxics not identified in Schedule 1, where such additional monitoring will not impose any additional, or only small marginal costs. Jurisdictions are encouraged to undertake such additional monitoring and report to Council where they have done so.

### **Part 3: Reporting on assessment and action taken to manage air toxics**

Part 3 requires jurisdictions to report on the circumstances that led to any exceedances of the monitoring investigation levels including those related to natural causes such as bushfires.

Jurisdictions are to report on any strategies/actions undertaken and planned to reduce concentrations of air toxics at Stage 2 sites identified under this Measure. These strategies/actions may be at a jurisdictional level or at a national level. Jurisdictions are also to provide a statement of progress made towards achieving the goal of this Measure.

### **Part 4: Reassessment of identification of Stage 1 and Stage 2 Site locations**

- (i) In order to ensure that information gathered by jurisdictions on air toxics at Stage 1 and Stage 2 sites is reliable, it is important that the currency of this information is regularly reassessed by jurisdictions. As such, jurisdictions must repeat the desktop assessment and identification of Stage 1 and Stage 2 sites within their jurisdictions no later than the end of the fourth year after the commencement of this Measure. In conducting this repeat assessment, jurisdictions should reassess Stage 1 and Stage 2 sites using the same methodology utilised for the initial identification of Stage 1 and Stage 2 sites (or an updated methodology agreed by Council).
- (ii) While only one formal repeat assessment of Stage 1 and Stage 2 sites is required prior to the review of this Measure, jurisdictions are encouraged to undertake more frequent reassessments as resources permit.

#### **Reporting Schedule**

<b>Report Year</b>	<b>Report components</b>
1	Part 1: Identification of Sites.
2	Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified); Part 2: Reporting of Monitoring of Air Toxics; and Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedances of monitoring investigation levels have been reported).

3	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported).</p>
4	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported); and</p> <p>Part 4: Results from repeat assessment of Stage 1 and Stage 2 Site locations.</p>
5	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported).</p>
6	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported).</p>
7	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported).</p>
8	<p>Part 1: Identification of Sites (if additional Stage 1 and/or Stage 2 sites have been identified);</p> <p>Part 2: Reporting of Monitoring of Air Toxics; and</p> <p>Part 3: Reporting on Action and Assessment taken to manage air toxics (only required where exceedences of monitoring investigation levels have been reported).</p>