THE

# AUSTRALIAN CAPITAL TERRITORY
# 2004 AMBIENT AIR QUALITY REPORT

AGAINST THE

# AMBIENT AIR QUALITY
# NATIONAL ENVIRONMENT PROTECTION MEASURE

JUNE 2005

## Section A - Monitoring Summary

This 2004 Ambient Air Quality National Environment Protection Measure (NEPM) annual report has been prepared with reference to the national Peer Review Committee's (PRC) *Technical Paper No. 8 – Annual Reports* (October 2002).

This report covers five of the six criteria pollutants, namely carbon monoxide, nitrogen dioxide, ozone, particulate matter less than 10 microns ($PM_{10}$) and for the first time particulate matter less than 2.5 microns ($PM_{2.5}$). Lead monitoring ceased in 2002 with levels significantly less then the national standard and sulfur dioxide has never been measure due to a lack of industry.

With a population of 322,492[1] Canberra only requires one performance monitoring station (PMS). In regions where only a single PMS is required, the PRC recommends that such a station be located to be generally representative of upper bound (GRUB) pollutants concentrations.

By using GRUB stations to monitor the ambient air across a region we can be reasonably sure that, if the NEPM Standards are met at those sites, then in theory most of the total population of the region would be exposed to air at or below these pollution levels. In this way the NEPM's desired environmental outcome of adequate protection of human health and well-being should be assured.

Maximums measured at the existing station at Monash are at the upper bound of levels historically recorded in Canberra and it has been designated as the ACT's NEPM PMS.

Monash is located in southern Canberra and sits centrally in the Tuggeranong Valley. The station is located approximately 250 metres north of Isabella Drive and 150 metres west of Cockcroft Avenue on vacant land.

The Monash station has been operational since 1996 and is sited in accordance with AS2922-1987 (*Ambient Air - Guide for Siting of Sampling Sites*). It is intended that this remain a permanent monitoring and trend site for the ACT.

The ACT Government monitoring network is NATA accredited.

[1] Source Australian Bureau of Statistics, Publication number 3218.0 Regional Population Growth, Friday 22 March 2004

## Section B - Assessment of Compliance with Goal and Standards

### Annual compliance summary for 8-hour carbon monoxide

NEPM standard - 9.0 ppm

| Region/ Performance monitoring station | Data availability rates (% of hours) | | | | | Number of exceedences (days) | Performance against the standards and goal |
|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Annual | | |
| Canberra<br><br>Monash | 95.6 | 94.3 | 91.0 | 95.7 | 94.1 | 0 | Met |

### Annual compliance summary for 1-hour and 1-year nitrogen dioxide

NEPM standard - 1hour 0.12 ppm, 1year 0.03 ppm

| Region/ Performance monitoring station | Data availability rates (% of hours) | | | | | Annual mean Concentration (ppm) | Number of 1-hour exceedences (days) | Performance against the standards and goal | |
|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Annual | | | 1- hour | 1-year |
| Canberra<br><br>Monash | 94.3 | 92.7 | 89.5 | 90.6 | 91.8 | 0.017 | 0 | Met | Met |

### Annual compliance summary for 1-hour and 4-hour ozone

NEPM standard - 1-hour 0.10 ppm , 4-hour 0.08 ppm

| Region/ Performance monitoring station | Data availability rates (% of hours) | | | | | Number of exceedences (days) | | Performance against the standards and goal | |
|---|---|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Annual | 1-hour | 4-hour | 1-hour | 4-hour |
| Canberra<br><br>Monash | 95.6 | 94.0 | 91.0 | 95.7 | 94.1 | 0 | 0 | Met | Met |

### Annual compliance summary for 24-hour $PM_{10}$*

NEPM standard 50 $\mu g/m^3$

| Region/ Performance monitoring station | Data availability rates (% of days) | | | | | Number of exceedences (days) | Performance against the standards and goal |
|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Annual | | |
| Canberra<br><br>Monash | 97.8 | 100 | 100 | 100 | 99.5 | 3 | Met |

* TEOM data adjusted in accordance with Technical paper No. 10

**Annual compliance summary for 24-hour and 1-year $PM_{2.5}$***
NEPM standard - 24hour 25 μg/$m^3$, 1year 8 μg/$m^3$

| Region/ Performance monitoring station | Data availability rates (% of days) | | | | | Annual mean Concentration (μg/$m^3$) | Number of 24-hour exceedences (days) |
|---|---|---|---|---|---|---|---|
| | Q1 | Q2 | Q3 | Q4 | Annual | | |
| Canberra | | | | | | | |
| Monash | 90.1 | 87.9 | 98.9 | 95.7 | 93.1 | 8.2 | 15 |

* All $PM_{2.5}$ data has been invalidated due to a failure to meet filter conditioning criteria.

**Section C - Analysis Of Air Quality Monitoring**

The ACT is making steady progress towards achieving the goal of the NEPM, which is to achieve the standards by June 2008. With the exception of $PM_{10}$ all parameters measured are well below the standards and all parameters met the NEPM goal.

Historical monitoring indicates that Canberra experiences elevated $PM_{10}$ levels due to emission from domestic wood heaters with two exceedences recorded during the winter months. However due to ongoing drought conditions elevated levels are also being recorded due to dust storms with a third exceedence of the standard recorded on 30 November.

All $PM_{2.5}$ data collected during the reporting period has been invalidated due to a failure to meet filter conditioning criteria. However the data has been analysed and included in the report for comparison against the advisory reporting standards.

**Annual summary statistics for daily peak 8-hour carbon monoxide**
NEPM standard 9.0 ppm

| Region/ Performance monitoring station | Number of valid days | Highest (ppm) | Highest (date/ time) | 2nd Highest (ppm) | 2nd Highest (date/ time) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 359 | 3.2 | 22May:02 | 3.0 | 23 May:04 |

**Annual summary statistics for daily peak 1-hour nitrogen dioxide**
NEPM standard 0.12 ppm

| Region/ Performance monitoring station | Number of valid days | Highest (ppm) | Highest (date/ time) | 2nd Highest (ppm) | 2nd Highest (date/ time) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 354 | 0.040 | 25 Mar:21 | 0.039 | 22 Apr :19 |

**Annual summary statistics for daily peak 1-hour ozone**
NEPM standard 0.10 ppm

| Region/ Performance monitoring station | Number of valid days | Highest (ppm) | Highest (date/ time) | 2nd Highest (ppm) | 2nd Highest (date/ time) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 358 | 0.064 | 7 Feb:12 | 0.062 | 19 Feb:14 |

**Annual summary statistics for daily peak 4-hour ozone**
NEPM standard 0.08 ppm

| Region/ Performance monitoring station | Number of valid days | Highest (ppm) | Highest (date/ time) | 2nd Highest (ppm) | 2nd Highest (date/ time) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 358 | 0.059 | 19 Feb:16 | 0.054 | 3 Jan:14 |

**Annual summary statistics for 24-hour $PM_{10}$**
NEPM standard 50 $\mu g/m^3$

| Region/ Performance monitoring station | Number of valid days | Highest ($\mu g/m^3$) | Highest (date) | 6th Highest ($\mu g/m^3$) | 6th Highest (date) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 364 | 52 | 30 Nov | 48.0 | 7 May |

**Annual summary statistics for 24-hour $PM_{2.5}$**
NEPM standard 25 $\mu g/m^3$

| Region/ Performance monitoring station | Number of valid days | Highest ($\mu g/m^3$) | Highest (date) | 6th Highest ($\mu g/m^3$) | 6th Highest (date) |
|---|---|---|---|---|---|
| Canberra<br>Monash | 341 | 38.3 | 22 July | 33.5 | 22 May |

**Percentiles of daily peak pollutant concentration for Monash 2004**

| Pollutant | Data recovery rates (%) | Max conc. (ppm) | 99th percen tile (ppm) | 98th percen tile (ppm) | 95th percen tile (ppm) | 90th percen tile (ppm) | 75th percen tile (ppm) | 50th percen tile (ppm) |
|---|---|---|---|---|---|---|---|---|
| CO 8 hr | **98.1** | **3.2** | **2.7** | **2.5** | **2.0** | **1.6** | **0.9** | **0.5** |
| NO2 1hr | **96.7** | **0.040** | **0.033** | **0.031** | **0.028** | **0.026** | **0.022** | **0.018** |
| Ozone 1hr | **98.1** | **0.064** | **0.056** | **0.054** | **0.048** | **0.044** | **0.038** | **0.030** |
| Ozone 4hr | **98.1** | **0.060** | **0.053** | **0.051** | **0.045** | **0.042** | **0.036** | **0.029** |
| PM10 | **99.7** | **52.0** | **48.2** | **46.0** | **33.8** | **28.5** | **20.7** | **14.7** |
| PM2.5* | **93.4** | **38.3** | **35.8** | **31.5** | **23.5** | **16.6** | **9.5** | **6.2** |

* All $PM_{2.5}$ data has been invalidated due to a failure to meet filter conditioning criteria.