NATIONAL ENVIRONMENT PROTECTION (AMBIENT AIR QUALITY) MEASURE

NEW SOUTH WALES ANNUAL COMPLIANCE REPORT 2009

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Contents

Acronyms, abbreviations and glossary

Following is a list of acronyms, abbreviations and terms used in this report.

AAQ NEPM	Ambient Air Quality – National Environment Protection Measure
ABS	Australian Bureau of Statistics
Ambient air	The external air environment (does not include the air environment inside buildings or structures)
AQMP	Air Quality Monitoring Plan
AS	Australian Standards
BAM	Beta Attenuation Monitor
CO	Carbon monoxide
DECCW	Department of Environment, Climate Change and Water (NSW)
EPA	Environment Protection Authority
FDMS	Filter Dynamics Measurement System (used with TEOM)
FRM	Federal Reference Method (USEPA)
GRUB	Generally Representative Upper Bound
ICP-AES	Inductively Coupled Plasma-Atomic Emission Spectroscopy
Monitoring station	A facility for measuring the concentration of one or more pollutants in the ambient air in a region or sub-region
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NO_2	Nitrogen dioxide
NO_x	Oxides of nitrogen
O_3	Ozone
Pb	Lead
$PM_{2.5}$	Particulate Matter with aerodynamic diameter of 2.5 microns or less
PM_{10}	Particulate Matter with aerodynamic diameter of 10 microns or less
POEO	Protection of the Environment Operations Act (1997) – key piece of environmental protection legislation in NSW
ppm	Parts per million by volume – parts of pollutant per million parts of air
PRC	Peer Review Committee
RAAS	Reference Ambient Air Sampler
SO_2	Sulfur dioxide
TEOM	Tapered Element Oscillating Microbalance
USEPA	United States Environmental Protection Agency
$\mu g/m^3$	microgram (1 millionth of a gram) per cubic metre referenced to a temperature of 0°C and an absolute pressure of 101.325 kilopascals
VOC	Volatile Organic Compounds – compounds that vaporise, that is become a gas, at normal atmospheric temperatures

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Overview

This report, required under clause 18 of the National Environment Protection (Ambient Air Quality) Measure (AAQ NEPM), presents the results of air quality monitoring in New South Wales for the 2009 calendar year and assesses them against the requirements of the AAQ NEPM. The Department of Environment, Climate Change and Water (DECCW), the department which undertakes this monitoring for the NSW State Government, also releases these data on its public website (http://www.environment.nsw.gov.au/AQMS/search.htm).

The AAQ NEPM establishes:

- requirements for monitoring air quality,
- air quality standards that are levels of specified pollutants against which air quality can be assessed,
- a goal that the air quality standards are met by 2008 to the extent specified in the NEPM. Recognizing that certain events can impact on air quality, the NEPM specifies a maximum number of days on which it is permissible to exceed the standard.

Monitoring was performed in accordance with New South Wales' monitoring plan, AAQ NEPM Technical Papers and DECCW's NATA accreditation.

The major impacts on New South Wales's air quality in 2009 came from smoke from bush fires and a series of severe dust storms.

Ambient Air Quality monitoring at the AAQ NEPM monitoring stations in NSW during 2009 showed no exceedences of the AAQ NEPM standards for carbon monoxide (CO), nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) (monitoring for lead ceased in 2004 due to extremely low ambient concentrations).

Exceedences of the AAQ NEPM standards and goals in the AAQ NEPM monitoring network (a sub-set of DECCW's total ambient air quality monitoring network) occurred for:

- 1-hour ozone in Sydney on 11 calendar days and in the Illawarra on two calendar days;
- 4-hour ozone in Sydney on 14 calendar days and in the Illawarra on three calendar days;
- 24-hour particles (as PM_{10}) at all stations in the network (total of 56 calendar days – 44 days in rural areas) due mainly to dust storms and to a lesser extent bushfires and agricultural practices.

The number of exceedences of the PM_{10} particle standard recorded at monitoring sites in NSW was the highest since the bushfires of the 2002/03 summer. The particle concentrations measured during the major dust storms affecting all of NSW and Queensland in late September 2009, were the highest ever recorded.

The number of exceedences of the Photochemical smog (as ozone) standard was similar to previous years and was the result of a return to hot, dry, calm summer conditions conducive to the formation of smog. Smoke from bushfires was also identified as having a significant influence on the ozone exceedences on five days for both the 1-hour and 4-hour standards.

NSW's ambient air quality monitoring network met with several technical challenges in 2009. Faulty air conditioners resulted in data being invalidated for short periods at the Liverpool, Wollongong and Wagga Wagga monitoring stations. The Oakdale station was temporarily closed while the temporary enclosure was replaced with a permanent one. Data was also invalidated due to unsuitable equipment calibrations and equipment failures (notably sulfur dioxide) at the Newcastle, Wallsend, Bringelly, Rozelle and Albion Park South stations for short periods in 2009. As a result of these technical problems, nine stations did not meet the 75% data availability criterion required in every quarter, resulting in compliance with the ANEPM being "Not Demonstrated" at these sites. All technical issues have been addressed and resolved and systems revised where necessary to ensure minimal data loss.

Note on $PM_{2.5}$ data in 2009

The current approved compliance method for monitoring $PM_{2.5}$ is a non-continuous (batch), 1-day-in-3 technique that requires pre and post laboratory weighing. This introduces a significant time delay in acquiring data so jurisdictions use other continuous techniques (e.g. TEOM monitors) to provide the near real-time reporting of air quality via the web expected by the community. However, the $PM_{2.5}$ ANEPM variation requires us to report all $PM_{2.5}$ data (by the compliance method and continuous) and historically, our $PM_{2.5}$ data collected by the continuous TEOM method have been reported with the internal USEPA PM_{10} equivalency factors of A = 3 and B = 1.03 (where y = A + Bx) included in the calculation.

In this year's report, the assessment of continuous TEOM $PM_{2.5}$ data in the main body of the report uses data without these PM_{10} equivalency factors applied (Table 21, Tables 124 to 134). Removing the PM_{10} equivalency factor brings NSW in line with other Australian jurisdictions and more approximates that data from the reference method specified in the $PM_{2.5}$ ANEPM variation.

However, until the national $PM_{2.5}$ Equivalency Project reports its findings, and an agreed continuous methodology is agreed, all $PM_{2.5}$ data collected by TEOM in NSW will be reported with and without the internal PM_{10} equivalency factors. Thus, the Appendix (Tables A1 to A13) provides the continuous TEOM $PM_{2.5}$ data with the PM_{10} equivalency factors included.

In 2009 (using the non-adjusted continuous TEOM data), concentrations in excess of the $PM_{2.5}$ advisory 24-hour reporting standard were recorded on nine days at the seven $PM_{2.5}$ monitoring sites due mainly to dust storms. Concentrations in excess of the 1-year $PM_{2.5}$ advisory reporting standard were recorded at two sites (Liverpool and Beresfield) due to the contribution of very high short-term $PM_{2.5}$ episodes (dust storms) and background urban $PM_{2.5}$ sources.

Section A – Monitoring summary

Current AAQ NEPM Monitoring network

The NSW Ambient Air Quality NEPM Monitoring Plan (*http://www.environment.nsw.gov.au/air/nepm/index.htm*) details the monitoring that NSW performs to assess compliance with the Ambient Air Quality NEPM. The majority of monitoring occurs in the high population regions of Sydney, Newcastle and Wollongong. These regions contain over 60% of the NSW population. Campaign monitoring is also performed at a number of rural population centers.

The AAQ NEPM monitoring network is only part of an overall 24-station air monitoring network operated by the Department of Environment, Climate Change and Water (DECCW). The AAQ NEPM network is designed to characterise general air quality and frequently will pick up individual pollutant events. This approach ensures that there is adequate coverage of the populated areas and of the broad differences in pollutant distribution within a region. The choice of stations in each region was made to optimise both population coverage and representation of the occurrences of higher pollutant concentrations.

NSW characterises the air quality to which the general population is exposed in a region by monitoring all air pollutants of interest at a network of trend stations. These stations capture the majority of pollution events that occur from time to time, but are supplemented by additional permanent upper bound stations at which selected pollutants only will be monitored to ensure that all major pollutant events are captured and reported.

Campaign monitoring is being undertaken in regional centres. Initial monitoring is occurring at Albury, Wagga Wagga, Bathurst and Tamworth. Data from these stations will be used to validate and review the screening measures applied to the urban centres outside the Sydney-Wollongong-Newcastle regions.

In total, the AAQ NEPM network in NSW currently monitors pollutants at 20 stations – the majority of pollutants at eight trend stations (T), selected individual pollutants at four additional permanent upper bound stations or performance stations (P), and selected pollutants on a campaign basis at a further eight stations (C) in Sydney, the lower Hunter and provincial cities (see Table 1 and Figures 1-4 for further details).

In addition NSW also maintains a number of air quality monitoring stations that are not designated for NEPM monitoring. Some stations that are designated NEPM stations for particular pollutants are not designated for other pollutants. For instance St Marys is designated as a NEPM station for ozone however nitrogen dioxide and PM_{10} are also measured at this station. Data from stations that are not designated as NEPM stations for a particular pollutant are not presented in this report.

New sites and site closures

No new sites were established or closed in the NSW monitoring network during 2009. The Earlwood and Chullora sites have been included for $PM_{2.5}$ in this report for the first time.

Table 1: NSW Ambient Air Quality NEPM monitoring network

Station	Station type [1]	Year established	Number of parameters	Ozone	Nitrogen dioxide	PM_{10}	$PM_{2.5}$	Carbon monoxide	Sulfur dioxide
Sydney									
Blacktown [6]	T	1992 – 2004	5	X	X	X		X	X
Bringelly	T	1992	4	X	X	X			X
Central Coast [2]	C	To be established	4	X	X	X			X
Chullora [3]	T	2003	6	X	X	X	X	X	X
Earlwood	C	1998	1				X		
Liverpool	C	1990	5	X	X	X	X	X	
Macarthur	T	2003	5	X	X	X		X	X
Oakdale	P	1996	2	X		X			
Prospect [6]	T	2007	5	X	X	X		X	X
Richmond	T	1992	5	X	X	X	X		X
Rozelle	T	1978	4	X	X	X		X	
St Marys	P	1992	1	X					
Lower Hunter									
Newcastle	T	1992	5	X	X	X		X	X
Maitland [2]	T	To be established	4	X	X	X			X
Beresfield [4]	C	1993	2			X	X		
Wallsend [4]	C	1992	4	X	X		X		X
Illawarra									
Albion Park	P	1978 – 2005	4	X	X	X			X
Albion Park South	P	2005	4	X	X	X			X
Kembla Grange	P	1994	2	X		X			
Warrawong	P	1993 - 2006	1						X
Wollongong	T	1993	6	X	X	X	X	X	X
Regional NSW									
Albury	C	2000	1			X			
Bathurst [7]	C	2000	2	X		X			
Dubbo [5]	C	Dependent on campaign monitoring results	1			X			
Lismore [5]	C		1			X			
Orange [5]	C		1			X			
Tamworth	C	2000	1			X			
Wagga Wagga	C	2001	1			X			

1 P denotes performance; T denotes trend; C denotes campaign

2 Postponed – under review

3 Replaced the Lidcombe trend station

4 Data from Beresfield and Wallsend will be reported at least until the Maitland station is established

5 Monitoring subject to results from initial campaign monitoring

6 Prospect station replaces Blacktown station from 2007

7 Bathurst ozone analyzer removed in August 2007 due to the completion of the campaign

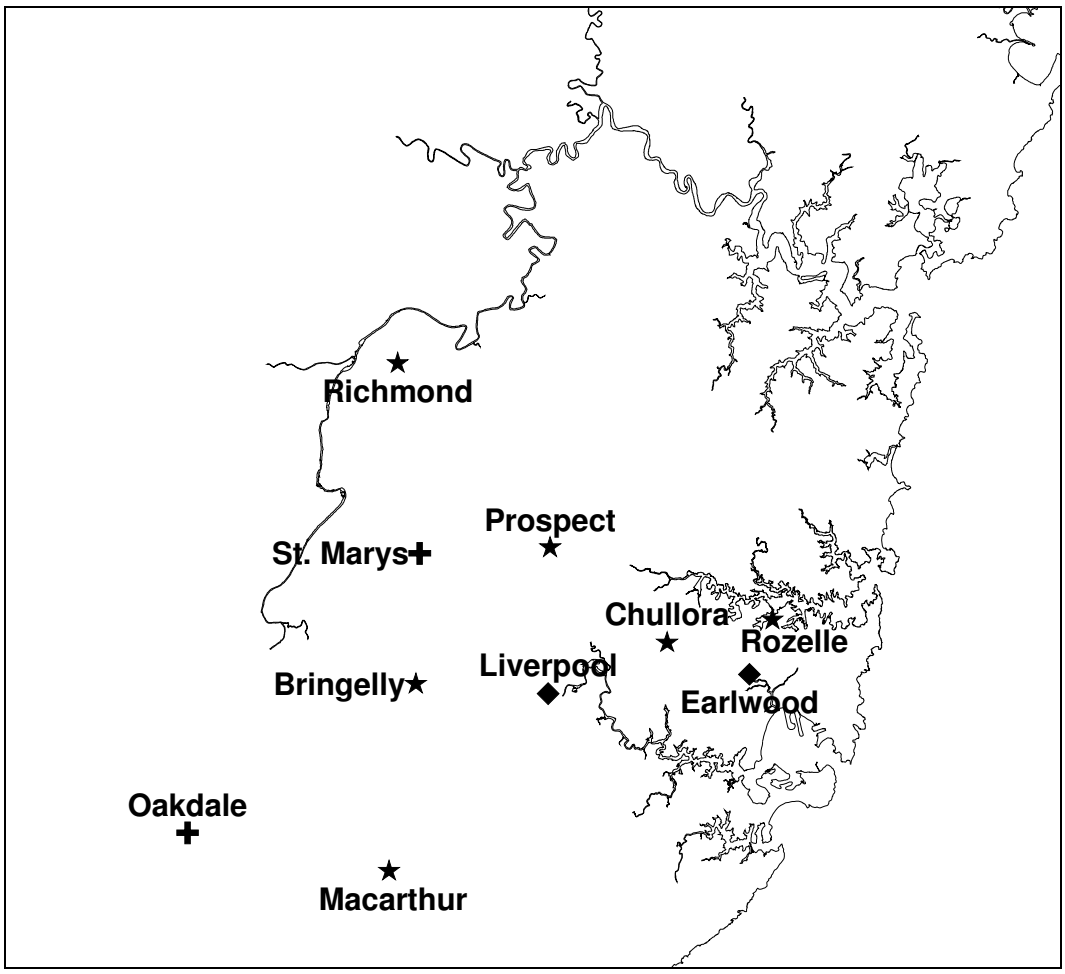

Figure 1: Ambient Air Quality NEPM Monitoring in the Sydney region (AMG co-ordinates)
★ trend station; ✚ performance station; ◆ campaign station;

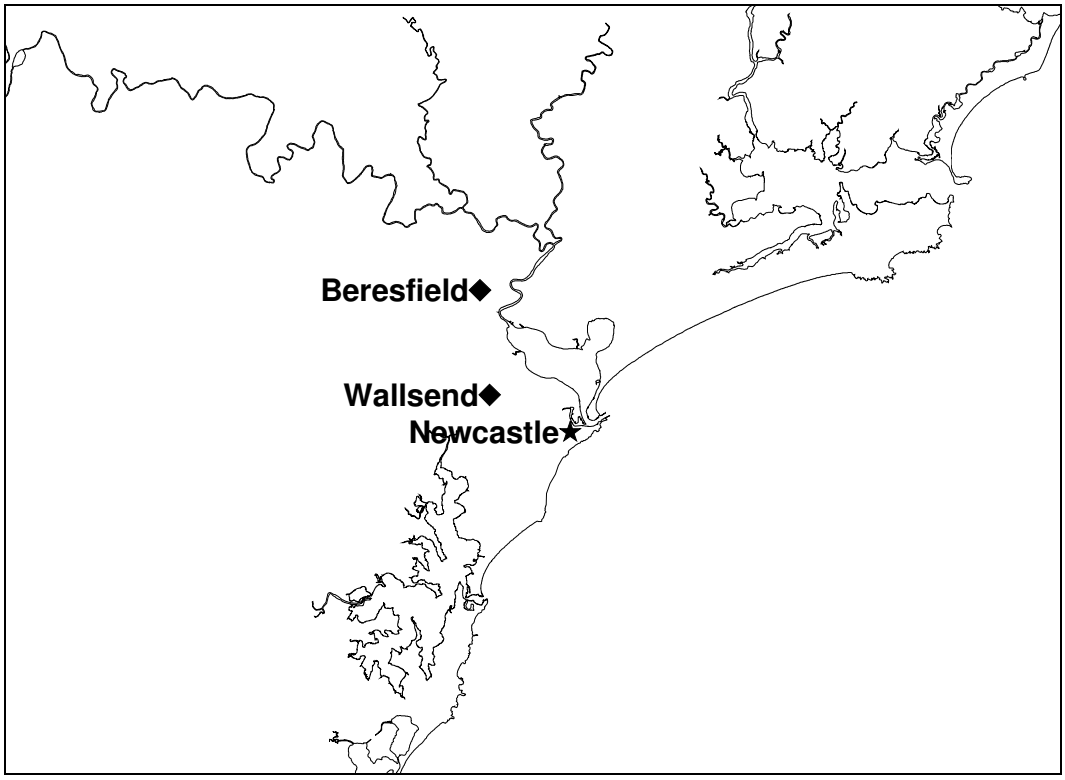

Figure 2: Ambient Air Quality NEPM Monitoring in the Lower Hunter region
★ trend station; ◆ campaign station;

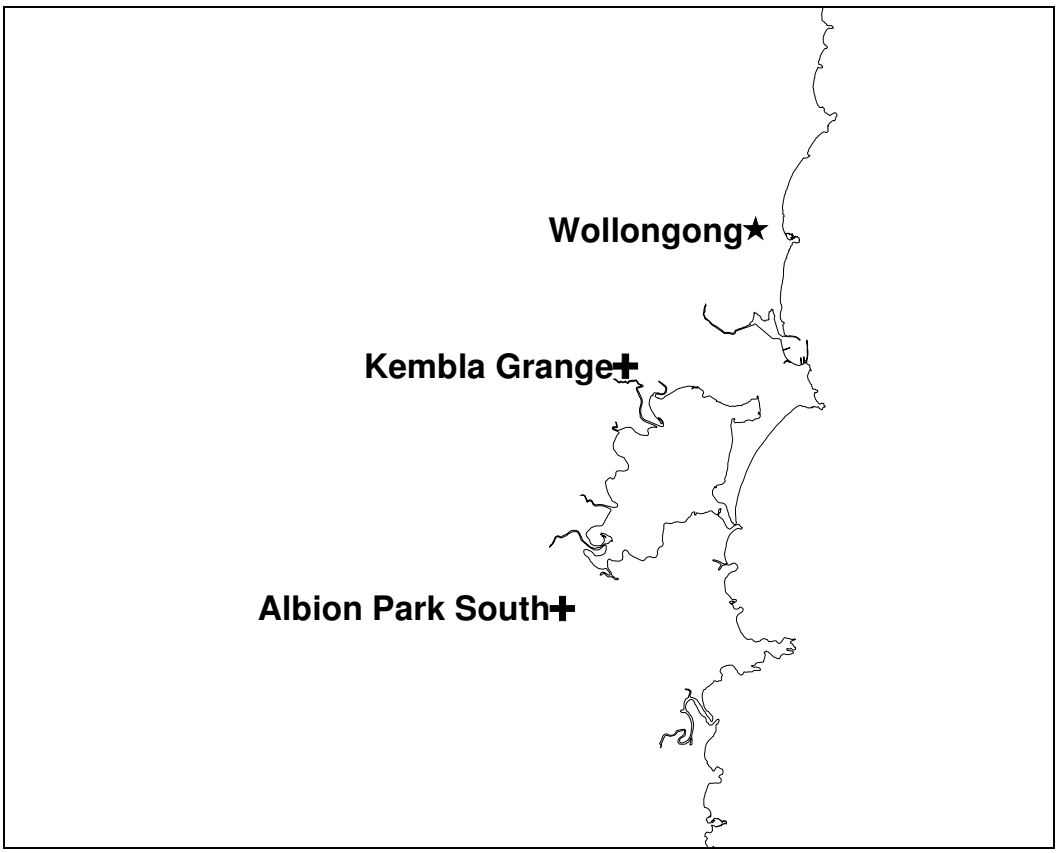

Figure 3: Ambient Air Quality NEPM Monitoring in the Illawarra region
★ trend station; ✚ performance station;

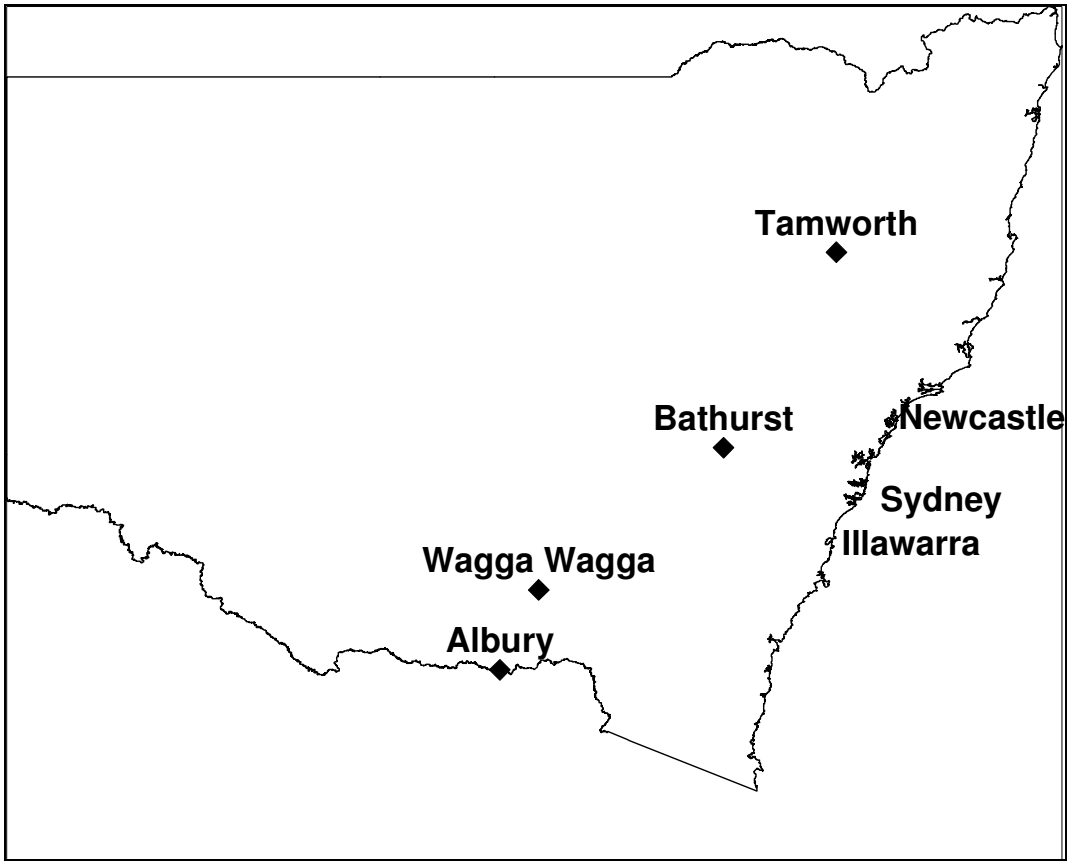

Figure 4: Ambient Air Quality NEPM Monitoring in rural New South Wales
◆ campaign station;

Station siting and exposure

All stations within the network meet all of the Ambient Air Quality NEPM siting and exposure criteria with the exceptions of Earlwood, Liverpool, Rozelle, Tamworth, and Wagga Wagga (see Table 2 for further details).

Table 2: Stations not complying with all siting and exposure criteria

Station	Siting criteria not met	Comments
Earlwood	Clear sky angle <120°. Less than 20m from trees.	Trees have grown since establishment of station.
Liverpool	Clear sky angle <120°.	Trees have grown since establishment of station.
Rozelle	Clear sky angle <120°. Less than 20m from trees.	Trees have grown since establishment of station.
Tamworth	Less than 20m from trees.	Best location in urban area specifically targeted for monitoring.
Wagga Wagga	Less than 20m from trees.	Street trees within about 15 m of station

Monitoring methods

The NSW network is comprised of instruments that are in accordance with the relevant Australian standard (See Table 3 for further details). It will be noted that, in the case of PM_{10}, the Tapered Element Oscillating Microbalance (TEOM) method is used for NEPM monitoring and reporting. PM_{10} data from the TEOM are presented as measured and unadjusted for temperature.

Table 3: Instruments used in NSW for NEPM monitoring

Pollutant	Standard	Title	Method used
Carbon monoxide	AS3580.7.1-1992	Ambient Air - Determination of Carbon Monoxide - Direct Reading Instrument Method	Gas Filter Correlation /Infra-Red
Nitrogen dioxide	AS3580.5.1-1993	Ambient Air - Determination of Oxides of Nitrogen - Chemiluminescence Method	Gas Phase Chemi-luminescence
Photochemical oxidant (ozone)	AS3580.6.1-1990	Ambient Air - Determination of Ozone - Direct Reading Instrument Method	Non Dispersive Ultra-violet
Sulfur dioxide	AS3580.4.1-1990	Ambient Air - Determination of Sulfur Dioxide - Direct Reading Instrument Method	Pulsed Fluorescence
Lead [+]	AS2800 -1985	Ambient Air - Determination of Particulate Lead-High Volume Sampler - Gravimetric Method	Atomic Absorption
Particles as PM_{10}	AS 3580.9.8-2001	Determination of Suspended particulate matter - PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser.	Tapered Element Oscillating Microbalance (TEOM)
Particles as $PM_{2.5}$	AS3580.9.8 -2001*	Technical Paper on Monitoring for Particles as $PM_{2.5}$	Tapered Element Oscillating Microbalance (TEOM)

* Modified for use in the $PM_{2.5}$ Equivalence Program according to the NEPM Technical Paper+

[+] No longer measured in NSW

NATA accreditation

As required under Clause 12 of the Ambient Air Quality NEPM, the DECCW is accredited by the National Association of Testing Authorities (NATA) for the measurement of all Ambient Air Quality NEPM parameters. The biennial reassessment of the Air Quality Monitoring Laboratory and associated monitoring stations by NATA was completed in early 2007 and accreditation has been continued.

Pollutant screening criteria

Clause 14(2) of NEPM allows for fewer performance monitoring stations where it can be demonstrated that pollutant levels are reasonably expected to be consistently lower than the NEPM standards. These screening criteria have been used for carbon monoxide, nitrogen dioxide, ozone, sulfur dioxide, and lead, at several regions in NSW. More detailed information regarding screening of pollutants for specific regions is given in the NSW Monitoring Plan, available on the DECCW website (*http://www.environment.nsw.gov.au/air/nepm/index.htm*)

Section B – Assessment of compliance with standards and goals

Air quality is assessed against the Ambient Air Quality (AAQ) NEPM standards and goals as specified in Schedule 2 of the NEPM and reproduced below in Table 4.

The **Standards** against which air quality is assessed are concentrations in parts per million (ppm) or micrograms per cubic metre ($\mu g/m^3$) – (see column 3 of Table 4.)

The **Goal** of the AAQ NEPM is to achieve the Standards as assessed in accordance with the monitoring protocol within 10 years of commencement (i.e. 2008) to the extent specified in Schedule 2 of the NEPM. The extent is expressed as a maximum allowable number of exceedances for each standard (see column 4 in Table 4). These are set to account for unusual meteorological conditions and, in the case of particles, natural events such as dust storms and bushfires, that can't be controlled through normal air quality management programs.

The AAQ NEPM also specifies advisory reporting standards for $PM_{2.5}$ (see Table 4). The goal for $PM_{2.5}$ is to collect sufficient data to facilitate a review of the $PM_{2.5}$ standards.

Table 4: NEPM Standards and Goals

Pollutant	Averaging period	AAQ NEPM Standard maximum concentration	AAQ NEPM Goal. maximum number of allowable exceedances
Carbon monoxide	8 hour rolling average	9.0 ppm	1 day a year
Nitrogen dioxide	1 hour average	0.12 ppm	1 day a year
	1 year average	0.03 ppm	None
Photochemical oxidants – as ozone	1 hour average	0.10 ppm	1 day a year
	4 hour rolling average	0.08 ppm	1 day a year
Sulfur dioxide	1 hour average	0.20 ppm	1 day a year
	1 day average	0.08 ppm	1 day a year
	1 year average	0.02 ppm	None
Particles as PM_{10}	1 day average	50 $\mu g/m^3$	5 days a year
Lead	1 day average	0.50 $\mu g/m^3$	None
Particles as $PM_{2.5}$ #	1 day average	25 $\mu g/m^3$	Gather sufficient data nationally to facilitate a review of Advisory Reporting Standard.
	1 year average	8 $\mu g/m^3$	

- Reporting standard only.

The following tables summarise compliance with the standards and goals of the AAQ NEPM. For each pollutant, the data availability (quarterly and annual), the number of days when standards were exceeded, the annual mean (where an annual standard exists) and an assessment of compliance, are given for each monitoring station within each region.

A station's performance is assessed as **complying with the NEPM (i.e. 'MET')** if the number of exceedances is no more than the number specified in Schedule 2 of the AAQ NEPM and data availability was at least 75% in each quarter of 2009. A region demonstrates compliance with the NEPM when either all stations in the region demonstrate compliance, or when the region meets approved *pollutant screening criteria*.

A station's performance is assessed as **not complying with the NEPM (i.e.'NOT MET')** if there is more than the number of exceedances specified in Schedule 2 of the AAQ NEPM, even if the data availability rates are less than the 75% required.

A station's performance is assessed as **'NOT DEMONSTRATED' (ND)** if it records no exceedances, or exceedances on a number of days less than that allowed, but has data availability rates less than 75% in any quarter. This may be due to instrument failures, temporary closures for upgrading or closures to allow relocation of the station.

These categories (i.e. MET, NOT MET and ND) are used in the tables on the following pages.

Calculation and reporting methods used comply with the requirements detailed in the NEPC Peer Review Committee Technical paper No 8: Annual Reports (NEPC 2002). Previous reports included daily average calculations for PM_{10}, $PM_{2.5}$ and sulfur dioxide using hours 0 to 23 – daily averages are now calculated using hours 1 to 24 as detailed in the NEPM Technical Paper No.5, "Data Collection and Handling". There are also some minor differences in the data included in this year's report when compared to previous year's reports due to the way the NSW DECCW's new air quality database performs its internal calculations, especially in relation to percentiles.

PM_{10} TEOM data indicate data which has undergone an internal correction factor for USEPA equivalency but without subsequent treatment or temperature adjustment.

$PM_{2.5}$ TEOM data indicate data which has not undergone an internal correction for USEPA PM_{10} equivalency or any subsequent treatment or adjustment for temperature.

All days where a particular standard for a pollutant has been exceeded are listed. Also listed are the stations that recorded an exceedance of the standard on that day, and for averaging periods less than twenty-four hours, the number of averaging periods in the day that the standard was exceeded.

Where possible, a brief comment is given for particular pollution events. Events that have been clearly influenced by extraordinary natural events, such as bushfires and dust storms, are highlighted. It should be noted that the absence of a comment does not necessarily indicate the absence of such influences, rather that there is no clear information available. In some cases it is likely that there has been some influence, but the extent of this influence cannot be absolutely determined.

Data loss

Detailed below are the reasons why the data availability rates are lower then the Ambient Air Quality NEPM goal for 2009 for the following ambient air pollutants:

Technical issues resulted in data losses for the following pollutants and sites during 2009:

- Carbon monoxide at Wollongong and Newcastle.
- Nitrogen dioxide at Bringelly, Liverpool, Rozelle. Wollongong and Wallsend.
- Ozone at Liverpool, Oakdale, Newcastle and Wallsend.
- Sulfur dioxide at Albion Park Sth, Wollongong, Newcastle and Wallsend.
- PM_{10} at Oakdale and Wagga Wagga.

Carbon monoxide

Table 5: 2009 compliance summary for CO in New South Wales

Region/ Performance monitoring Station	Data availability rates (% of hours)					Number of exceedances (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
						AAQ NEPM Standard 9.0 ppm (8-hour average)	
Sydney							
Chullora	92.8	93.1	89.6	91.7	91.8	0	Met
Liverpool	83.7	94.7	85.8	92.1	89.1	0	Met
Macarthur	88.6	93.6	92.1	89.3	90.9	0	Met
Prospect	94.2	92.5	92.5	89.6	92.2	0	Met
Rozelle	82.1	94.2	95.2	91.0	90.7	0	Met
Illawarra							
Wollongong	85.0	87.0	62.8	77.5	78.0	0	ND
lower Hunter							
Newcastle	78.6	66.4	91.5	82.7	79.9	0	ND

ND Not demonstrated.

Bold font indicates values that exceed the AAQ NEPM standard

During 2009 no exceedances of the carbon monoxide standard were recorded in NSW. Compliance with the Ambient Air Quality NEPM goal was demonstrated in the Sydney region however was not demonstrated in with the Illawarra or Lower Hunter regions due to low data availability rates in Q3 and Q2 respectively.

Nitrogen dioxide

Table 6: 2009 compliance summary for NO_2 in New South Wales

Region/ Performance monitoring Station	Data availability rates (% of hours)					Number of Exceed-ences (days)	Annual mean (ppm)	Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual			1-hour	1-year
						AAQ NEPM standard			
						0.12 ppm (1-hour average)			
						0.03 ppm (1-year average)			
Sydney									
Bringelly	80.6	74.2	69.7	87.1	77.9	0	0.004	ND	ND
Chullora	89.1	92.8	92.1	88.1	90.5	0	0.013	Met	Met
Liverpool	72.0	92.4	85.0	91.8	85.3	0	0.010	ND	ND
Macarthur	91.2	93.6	94.2	84.9	91.0	0	0.009	Met	Met
Prospect	78.0	91.3	91.2	77.9	84.6	0	0.011	Met	Met
Richmond	83.3	93.1	94.1	95.1	91.4	0	0.005	Met	Met
Rozelle	82.9	95.1	92.7	73.8	86.1	0	0.011	ND	ND
Illawarra									
Albion Park Sth	94.0	93.5	91.9	85.9	91.3	0	0.003	Met	Met
Wollongong	81.2	75.4	71.6	52.8	70.1	0	0.010	ND	ND
lower Hunter									
Newcastle	85.6	87.7	94.1	90.3	89.5	0	0.008	Met	Met
Wallsend	93.7	65.7	84.7	91.0	83.8	0	0.008	ND	ND

ND Not demonstrated.

Bold font indicates values that exceed the AAQ NEPM standard

No exceedances of the nitrogen dioxide 1-hour and annual standards were recorded in NSW during 2009. However, compliance with the Ambient Air Quality NEPM goal was not demonstrated in each of the three regions due to low data availability rates in some quarters.

Ozone

Table 7: 2009 compliance summary for O_3 in New South Wales

AAQ NEPM standard
0.10 ppm (1-hour average)
0.08 ppm (4-hour average)

Region/ Performance monitoring Station	Data availability rates (% of hours)					Number of exceedances (days)		Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual	1-hour	4-hour	1-hour	4-hour
Sydney									
Bringelly	89.3	89.4	93.5	91.0	90.8	**4**	**5**	Not Met	Not Met
Chullora	93.1	93.4	91.7	92.8	92.7	**2**	**2**	Not Met	Not Met
Liverpool	74.7	95.3	93.2	92.0	88.9	**2**	**4**	Not Met	Not Met
Macarthur	91.4	94.0	94.8	89.1	92.3	**7**	**9**	Not Met	Not Met
Oakdale	94.1	94.5	94.9	60.6	85.9	**6**	**6**	Not Met	Not Met
Prospect	94.7	93.1	94.6	90.6	93.3	**3**	**6**	Not Met	Not Met
Richmond	77.9	94.8	92.6	95.0	90.1	1	**3**	Met	Not Met
Rozelle	91.8	95.2	94.2	89.3	92.6	0	0	Met	Met
St Marys	94.1	93.4	90.3	94.2	93.0	**5**	**5**	Not Met	Not Met
Illawarra									
Albion Park Sth	95.0	93.5	94.9	89.5	93.2	1	1	Met	Met
Kembla Grange	90.0	83.9	94.7	81.5	87.5	1	**2**	Met	Not Met
Wollongong	94.5	93.4	93.7	81.4	90.7	0	0	Met	Met
lower Hunter									
Newcastle	85.0	74.3	94.4	91.3	86.3	0	0	ND	ND
Wallsend	95.0	71.7	84.8	91.2	85.7	0	0	ND	ND

ND Not demonstrated.

Bold font indicates values that exceed the AAQ NEPM standard

Both the 1-hour and 4-hour standards for ozone were exceeded in NSW during 2009. The Sydney and Illawarra regions did not comply with the Ambient Air Quality NEPM goal. Compliance was not demonstrated in the lower Hunter region because the data availability criteria were not met at both Newcastle and Wallsend.

Sulfur dioxide

Table 8: 2009 compliance summary for SO_2 in New South Wales

Region/ Performance monitoring Station	Data availability rates (% of hours)					Number of exceedances (days)		Annual Mean (ppm)	Performance against the standards and goal		
	Q1	Q2	Q3	Q4	Annual	1-hour	24-hour		1-hour	24-hour	1-year
								AAQ NEPM standards	**0.20 ppm (1-hour average)**	**0.08 ppm (24-hour average)**	**0.02 ppm (1-year average)**
Sydney											
Bringelly	78.5	80.0	89.8	90.0	84.6	0	0	0.000	Met	Met	Met
Chullora	93.1	82.7	94.6	88.7	89.8	0	0	0.001	Met	Met	Met
Macarthur	90.6	95.4	93.3	87.1	91.6	0	0	0.001	Met	Met	Met
Prospect	89.4	91.4	94.6	89.6	91.3	0	0	0.000	Met	Met	Met
Richmond	77.7	91.1	94.1	95.0	89.5	0	0	0.000	Met	Met	Met
Illawarra											
Albion Park Sth	69.8	87.9	94.9	88.6	85.4	0	0	0.001	ND	ND	ND
Wollongong	46.4	80.4	93.6	80.2	75.3	0	0	0.000	ND	ND	ND
lower Hunter											
Newcastle	10.0	87.7	90.7	89.3	69.7	0	0	0.001	ND	ND	ND
Wallsend	17.8	88.1	82.1	80.1	67.2	0	0	0.001	ND	ND	ND

ND Not demonstrated.

Bold font indicates values that exceed the AAQ NEPM standard

The 1-hour, 24-hour and annual standards for sulfur dioxide were not exceeded in NSW during 2009. Compliance with the Ambient Air Quality NEPM goal was met throughout the Sydney region however it was not demonstrated in the Illawarra and lower Hunter regions due to low data availability rates in Q1 and Q4.

Particles as PM_{10}

Table 9: 2009 compliance summary for PM_{10} in New South Wales

Region/ Performance monitoring Station	Data availability rates (% of days)					Number of exceedances (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
						AAQ NEPM Standard 50 µg/m^3 (24-hour average)	
Sydney							
Bringelly	93.1	93.6	94.7	97.1	94.7	**6**	Not Met
Chullora	97.1	99.0	99.0	98.1	98.3	**9**	Not Met
Liverpool	82.6	97.4	97.7	93.6	92.9	**8**	Not Met
Macarthur	96.3	98.5	98.3	92.6	96.4	**7**	Not Met
Oakdale	98.0	98.0	98.5	67.2	90.4	**6**	Not Met
Prospect	98.4	98.2	92.5	99.3	97.1	**11**	Not Met
Richmond	93.5	97.5	96.8	92.9	95.2	**6**	Not Met
Rozelle	96.7	96.7	89.5	98.6	95.4	**8**	Not Met
Illawarra							
Albion Park Sth	98.2	98.3	98.6	98.3	98.4	**9**	Not Met
Kembla Grange	95.8	97.5	96.8	92.9	95.2	**14**	Not Met
Wollongong	97.5	96.6	95.2	87.0	94.1	**6**	Not Met
lower Hunter							
Beresfield	95.5	96.5	96.4	95.2	95.9	**15**	Not Met
Newcastle	98.6	93.1	96.3	84.5	93.1	**13**	Not Met
Regional							
Albury	95.6	97.7	93.3	98.7	96.3	**15**	Not Met
Bathurst	93.4	95.6	91.9	93.8	93.7	**12**	Not Met
Tamworth	94.0	93.8	92.8	97.9	94.6	**17**	Not Met
Wagga Wagga	67.0	70.1	97.9	95.9	82.9	**21**	Not Met

ND Not demonstrated.

Bold font indicates values that exceed the AAQ NEPM standard

The PM_{10} standard was exceeded in many regions of NSW during 2009, with none of the regions in NSW complying with the Ambient Air Quality NEPM.

Particles as $PM_{2.5}$

Table 10: Summary of $PM_{2.5}$ concentrations in NSW (2009) – continuous TEOM method

Advisory Reporting Standard
25 µg/m^3 (24-hour average)
8 µg/m^3 (Annual average)

Region/ Performance monitoring station	Data availability rates (% of hours) Q1	Q2	Q3	Q4	Annual	Days above ARS	Annual mean (µg/m^3)
Sydney							
Chullora	96.4	90.9	92.2	92.3	92.9	3	7.1
Earlwood	96.7	68.5	37.5	96.6	74.7	1	6.8
Liverpool	87.5	96.5	97.7	93.2	93.8	3	**8.2**
Richmond	84.6	83.7	71.6	91.3	82.8	3	5.8
Illawarra							
Wollongong	97.4	96.4	95.1	87.0	93.9	3	7.0
lower Hunter							
Beresfield	95.2	96.0	95.9	79.2	91.5	5	**8.4**
Wallsend	86.7	97.0	81.7	88.2	87.6	5	8.0

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=1.00 and B=0

In 2009, both the Sydney and lower Hunter regions exceeded the AAQ NEPM annual average advisory reporting standard for $PM_{2.5}$. The Illawarra complied with the advisory reporting standard with an annual average below 8.0 µg/m^3.

Table 11: Summary of $PM_{2.5}$ equivalency study concentrations in NSW (2009) – FRM method

Advisory Reporting Standard
25 µg/m^3 (24-hour average)
8 µg/m^3 (Annual average)

Region/ Performance monitoring station	Data availability rates * (no of valid samples) Q1	Q2	Q3	Q4	Annual	Days above ARS	Annual mean (µg/m^3)
Sydney							
Chullora	90.0	83.3	83.9	93.3	87.6	2	6.7

* Please note that the data availability rates are based on a one day in three sampling regime.

** Please note that sampling at the Richmond site ceased at the end of 2007

Lead

Changes to fuel formulation have brought marked reductions in the levels of lead in the atmosphere. Annual averages throughout New South Wales are now typically less than 0.03µg/m^3 with many 24-hour average samples below the minimum detection limit for lead of 0.007µg/m^3 using ICP-AES (Inductively Coupled Plasma-Atomic Emission Spectroscopy) analysis. Since 2002 the highest annual average recorded in New South Wales was 0.09µg/m^3 at Wallsend during 2003, only 18% of the standard.

With a complete ban on lead in petrol now in force, the primary source of lead in air at the regional scale has been eliminated.

The Department of Environment, Climate Change and Water began phasing out ambient lead monitoring for the AAQ NEPM during 2004. All lead monitoring ceased from 1st January 2005.

A report summarising the case for a cessation of lead monitoring was presented to NEPC and can be found on the EPHC website.

Section C – Analysis of air quality

Data availability rate

Throughout this report data availability rates are presented as either percentages of available data, or as days available. These two rates are calculated using different methods. When presented as a percentage, the value is the number of averaging periods where data is valid, divided by the total number of averaging periods in the year. When presented as number of valid days, this value represents the number of days during the year when at least seventy-five percent of averaging periods during the day are valid.

For example the carbon monoxide standard is based on eight hour rolling averages. A valid hour (the end point of an eight hour average) is the average, over the preceding eight hours, of the valid one-hour averages, when at least six of those hours hold valid data. A valid day has at least eighteen valid hours. If we hypothesize that on each day throughout the year we had *exactly* eighteen valid hours, then annual data availability would be seventy-five percent. The number of valid days would be 365.

For the gaseous pollutants, carbon monoxide, nitrogen dioxide, ozone and sulfur dioxide, the NSW DECCW undertakes daily an automated instrument calibration check. This occurs during the early hours of the morning, and sample data obtained during the calibration check is considered as invalid data. Hence for these pollutants the maximum number of valid one-hour averages in a day is twenty-three. All calculations for data availability given in this report *include* the invalid calibration hour (i.e. calculations assume that there are twenty-four *possible* valid hours in a day). Therefore for these pollutants the maximum that the annual one-hour data availability can be is 95.8 %.

For a pollutant that is reported against more than one standard, data availability rates may not be the same for each standard. For instance when measuring ozone, one hour of each day is lost during instrument calibration checks. This affects the data availability rates when reporting against the one hour standard but does not affect data availability rates when reporting against the four hour standard. The maximum data availability rates are thus 95.8% and 100% respectively.

For compliance reporting on standards with averaging periods less than twenty-four hours, peak daily values are given regardless of the number of valid hours in that day. For reporting of statistics, such as percentiles of daily maxima, on standards with averaging periods less than twenty-four hours, only days that have at least seventy-five percent of valid hours are used.

Carbon monoxide

Table 11: Summary for CO - Daily maximum rolling 8-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Chullora	96.1	342	2.6	15/06/2009 02:00	2.5	14/06/2009 23:00
Liverpool	92.4	327	2.2	13/06/2009 02:00	2.0	23/06/2009 02:00
Macarthur	95.1	339	0.8	12/07/2009 02:00	0.8	26/06/2009 24:00
Prospect	97.5	349	2.3	14/06/2009 24:00	2.2	14/06/2009 23:00
Rozelle	95.6	343	2.3	15/06/2009 02:00	2.1	14/06/2009 23:00
Illawarra						
Wollongong	82.1	279	1.3	11/08/2009 02:00	1.2	10/08/2009 23:00
lower Hunter						
Newcastle	84.3	297	1.9	05/08/2009 02:00	1.8	04/08/2009 23:00

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Carbon monoxide levels are well below the Ambient Air Quality NEPM standard. The highest recorded value in the state was 2.6ppm (Chullora). This is only 29 per cent of the standard. Levels in all regions are significantly lower than the NEPM standard.

Nitrogen dioxide

Table 12: Summary for NO_2 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Bringelly	77.9	280	0.034	11/09/2009 19:00	0.034	16/11/2009 18:00
Chullora	90.5	344	0.052	01/10/2009 21:00	0.050	26/03/2009 19:00
Liverpool	85.3	313	0.053	12/09/2009 19:00	0.048	06/01/2009 22:00
Macarthur	91.0	346	0.048	12/09/2009 21:00	0.048	26/03/2009 19:00
Prospect	84.6	313	0.051	06/01/2009 21:00	0.048	06/01/2009 24:00
Richmond	91.4	350	0.030	26/03/2009 21:00	0.028	28/08/2009 20:00
Rozelle	86.1	326	0.049	15/01/2009 09:00	0.047	26/03/2009 18:00
Illawarra						
Albion Park Sth	91.3	347	0.052	12/09/2009 19:00	0.044	26/03/2009 17:00
Wollongong	70.1	224	0.048	12/09/2009 19:00	0.047	17/09/2009 18:00
lower Hunter						
Newcastle	89.5	341	0.043	01/10/2009 20:00	0.040	17/09/2009 22:00
Wallsend	83.8	319	0.040	07/05/2009 18:00	0.033	30/09/2009 22:00

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Within NSW levels of nitrogen dioxide are well below the NEPM standard. The highest recorded 1-hour average value in the state was 0.053ppm (44 per cent of the standard) at the Liverpool station. The highest annual average of 0.013ppm (43 percent of the standard) was recorded at Chullora.

Ozone

Table 13: Summary for O_3 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Bringelly	90.8	352	**0.120**	08/02/2009 14:00	**0.113**	20/11/2009 13:00
Chullora	92.7	356	**0.154**	20/11/2009 13:00	**0.102**	07/02/2009 14:00
Liverpool	88.9	334	**0.151**	20/11/2009 13:00	**0.106**	07/01/2009 13:00
Macarthur	92.3	353	**0.116**	06/01/2009 15:00	**0.112**	07/01/2009 13:00
Oakdale	85.9	329	**0.128**	08/02/2009 16:00	**0.125**	06/02/2009 16:00
Prospect	93.3	362	**0.126**	20/11/2009 12:00	**0.111**	06/01/2009 15:00
Richmond	90.1	344	**0.102**	20/11/2009 12:00	0.100	19/11/2009 14:00
Rozelle	92.6	357	0.083	15/01/2009 12:00	0.083	20/11/2009 12:00
St Marys	93.0	356	**0.132**	20/11/2009 12:00	**0.112**	08/02/2009 14:00
Illawarra						
Albion Park Sth	93.2	359	**0.102**	20/11/2009 15:00	0.077	20/01/2009 13:00
Kembla Grange	87.5	336	**0.103**	07/02/2009 14:00	0.098	15/01/2009 13:00
Wollongong	90.7	348	0.083	20/11/2009 13:00	0.077	07/02/2009 14:00
lower Hunter						
Newcastle	86.3	335	0.073	03/11/2009 14:00	0.073	22/11/2009 15:00
Wallsend	85.7	328	0.086	20/11/2009 14:00	0.076	22/11/2009 12:00

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 14: Summary for O_3 - Daily maximum rolling 4-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Bringelly	92.5	352	**0.108**	08/02/2009 16:00	**0.096**	20/11/2009 14:00
Chullora	96.8	355	**0.112**	20/11/2009 14:00	**0.085**	15/01/2009 14:00
Liverpool	92.5	334	**0.103**	20/11/2009 14:00	**0.086**	07/01/2009 15:00
Macarthur	96.6	353	**0.097**	20/11/2009 14:00	**0.096**	08/02/2009 15:00
Oakdale	89.9	329	**0.108**	08/02/2009 17:00	**0.102**	06/02/2009 17:00
Prospect	95.7	361	**0.100**	20/11/2009 14:00	**0.093**	08/02/2009 16:00
Richmond	94.2	342	**0.090**	06/02/2009 17:00	**0.087**	19/11/2009 16:00
Rozelle	94.8	356	0.073	15/01/2009 14:00	0.071	20/11/2009 14:00
St Marys	97.2	356	**0.106**	20/11/2009 13:00	**0.103**	08/02/2009 16:00
Illawarra						
Albion Park Sth	95.4	358	**0.083**	20/11/2009 16:00	0.072	14/01/2009 15:00
Kembla Grange	90.1	336	**0.090**	07/02/2009 15:00	**0.081**	15/01/2009 14:00
Wollongong	92.9	346	0.074	20/11/2009 15:00	0.071	15/01/2009 14:00
lower Hunter						
Newcastle	88.2	333	0.067	27/11/2009 17:00	0.067	22/11/2009 18:00
Wallsend	89.2	327	0.076	20/11/2009 15:00	0.069	22/11/2009 15:00

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Ozone events in the Sydney and Illawarra regions are highly variable in terms of both frequency and severity. This is largely the result of the annual variability of meteorological conditions, which has the greatest effect on measures of frequency but can also have some influence on measures of peak concentrations. In the Sydney region emissions of ozone precursors (NOx and VOCs) are sufficient to generate concentrations of ozone well above the Ambient Air Quality NEPM standards (EPA 2003).

Both the 1-hour and 4-hour NEPM standards were exceeded in the Sydney and the Illawarra regions. There were no exceedances of either standard in the lower Hunter.

The 1-hour standard was exceeded at eight Sydney monitoring stations: Bringelly, Chullora, Liverpool, Macarthur, Oakdale, Prospect, Richmond and St Marys. Of these, Macarthur recorded the highest number of exceedances with seven days where hourly averages were greater than the standard. Rozelle did not exceed the 1-hour standard. The maximum 1-hour average during the year was 0.154 ppm recorded at Chullora on the 20th November.

In the Illawarra, the 1-hour standard was exceeded at Albion Park Sth on the 20th November and at Kembla Grange on the 7th February. The maximum 1-hour ozone concentration in the Illawarra was 0.103ppm recorded at Kembla Grange on that day.

Table 15: Days when O_3 1-hour Ambient Air Quality NEPM standard exceeded

Date	Stations where standard exceeded (and hour number/s where concentration exceeding standard)	Comments(#)
6 Jan 2009	Prospect (15), Macarthur (15), St Marys (16)	Bushfire smoke
7 Jan 2009	Liverpool (13), Macarthur (13)	Bushfire smoke
31 Jan 2009	Oakdale (16)	
5 Feb 2009	Oakdale (17)	
6 Feb 2009	Macarthur (14), Oakdale (15-16), Bringelly (14), St Marys (15)	Bushfire smoke
7 Feb 2009	Macarthur (13), Oakdale (13-14), Bringelly (13), Kembla Grange (14), Chullora (14)	Bushfire smoke
8 Feb 2009	Prospect (13), Macarthur (13-14), Oakdale (15-17), Bringelly (13-15), St Marys (14-15),	Bushfire smoke
19 Nov 2009	St Marys (14-15)	
20 Nov 2009	Liverpool (12-13), Prospect (12-13), Macarthur (12-13), Bringelly (12-13), Richmond (12), St Marys (11-13), Albion Park Sth (15), Chullora (12-13)	
26 Nov 2009	Oakdale (16)	
23 Dec 2009	Macarthur (14)	

(#) Events that can be clearly identified as influencing pollution levels

Table 16: Days when O_3 4-hour Ambient Air Quality NEPM standard exceeded

Date	Stations where standard exceeded (and the hour number/s where concentration exceeding standard)	Comments(#)
6 Jan 2009	Prospect (15-18), Macarthur (15-18), St Marys (17),	Bushfire smoke
7 Jan 2009	Liverpool (14-15), Macarthur (14),	Bushfire smoke
14 Jan 2009	Liverpool (15-17)	
15 Jan 2009	Chullora (13-14), Kembla Grange (14),	
31 Jan 2009	Macarthur (16-17), Oakdale (17-19), Bringelly (16-17)	
5 Feb 2009	Macarthur (16), Oakdale (17-19)	
6 Feb 2009	Macarthur (15-16), Oakdale (15-19), Bringelly (16-17), Richmond (16-17), St Marys (16-17)	Bushfire smoke
7 Feb 2009	Macarthur (14-16), Oakdale (14-16), Bringelly (15), Kembla Grange (15-16)	Bushfire smoke
8 Feb 2009	Liverpool (15-16), Prospect (14-17), Macarthur (14-17), Oakdale (14-19), Bringelly (14-18), St Marys (14-18)	Bushfire smoke
19 Nov 2009	Prospect (16-17), Richmond (15-17), St Marys (15-18),	
20 Nov 2009	Liverpool (13-15), Prospect (13-15), Macarthur (13-15), Bringelly (13-15), Chullora (13-16), Richmond (13-14), St Marys (12-15), Albion Park Sth (16-17)	
21 Nov 2009	Prospect (15-16)	
26 Nov 2009	Oakdale (17-18)	
23 Dec 2009	Prospect (15), Macarthur (14-16)	

(#) Events that can be clearly identified as influencing pollution levels

The 4-hour standard was exceeded at most stations in the Sydney and Illawarra regions. Eight stations in Sydney (Bringelly, Chullora, Liverpool, Macarthur, Oakdale, Prospect, Richmond and St Marys) exceeded the standard on two or more days. The maximum value recorded in Sydney was 0.112ppm at Chullora on the 20th November.

In the Illawarra, the 4-hour standard was exceeded on the 15th January and 7th February at Kembla Grange and on the 20th November at Albion Park Sth. The maximum 4-hour ozone concentration in the Illawarra was 0.090ppm recorded at Kembla Grange on the 7th February.

Action for Air, the NSW Government's Air Quality Management Plan for Sydney, the Lower Hunter and the Illawarra, sets out measures to support NSW meeting AAQ NEPM goals, including to address exceedances of goals for ground level ozone. The Plan covers actions to reduce ozone precursor emissions from industry, motor vehicles and domestic/commercial sources. Key NSW measures to reduce ground level ozone formation include limiting the volatility of petrol in summer and regulating to expand Stage 1 petrol vapour recovery (from underground tanks) and progressively require Stage 2

vapour recovery (when cars are refuelled at service stations) in areas of the GMR from July 2010. NSW is also supporting the development of national approaches to reduce ozone precursor emissions from small engines, non-road engines and surface coatings.

Sulfur dioxide

Table 17: Summary for SO_2 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Bringelly	84.6	318	0.012	23/10/2009 08:00	0.009	10/08/2009 24:00
Chullora	89.8	345	0.029	28/08/2009 10:00	0.023	12/09/2009 11:00
Macarthur	91.6	350	0.010	12/09/2009 21:00	0.009	13/03/2009 12:00
Prospect	91.3	352	0.017	04/05/2009 12:00	0.014	19/03/2009 01:00
Richmond	89.5	342	0.013	27/08/2009 19:00	0.011	28/11/2009 23:00
Illawarra						
Albion Park Sth	85.4	323	0.031	12/09/2009 18:00	0.028	09/08/2009 11:00
Wollongong	75.3	268	0.020	28/12/2009 20:00	0.017	17/12/2009 23:00
lower Hunter						
Newcastle	69.7	268	0.039	06/08/2009 14:00	0.037	26/05/2009 17:00
Wallsend	67.2	249	0.044	29/03/2009 10:00	0.043	11/04/2009 11:00

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 18: Summary for SO_2 - Maximum 24-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Bringelly	87.1	318	0.003	23/10/2009	0.002	19/11/2009
Chullora	94.5	345	0.005	12/09/2009	0.004	10/08/2009
Macarthur	95.9	350	0.004	19/03/2009	0.003	13/03/2009
Prospect	96.4	352	0.003	14/01/2009	0.003	19/11/2009
Richmond	93.7	342	0.004	07/02/2009	0.004	06/02/2009
Illawarra						
Albion Park Sth	88.5	323	0.012	14/01/2009	0.011	07/02/2009
Wollongong	73.4	268	0.004	10/08/2009	0.004	28/12/2009
lower Hunter						
Newcastle	73.4	268	0.010	26/05/2009	0.008	06/08/2009
Wallsend	68.2	249	0.007	27/06/2009	0.006	26/05/2009

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

SO_2 levels are significantly below the 1-hour, 24-hour and annual NEPM standards. Wallsend recorded the highest 1-hour value with 0.044 ppm (22 percent of the standard). The highest 24-hour average was recorded at Albion Park, 0.012 ppm (15 percent of the standard). The highest annual average of 0.001 ppm, which is just 5 percent of the standard, was measured at Chullora, Macarthur, Albion Park Sth, Newcastle and Wallsend.

Particles as PM_{10}

Table 19: Summary for PM_{10} – Maximum 24-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (µg/m^3)			
			Highest Value	Highest Date	6th Highest Value	6th Highest Date
Sydney						
Bringelly	94.8	346	**1683.9**	23/09/2009	**63.5**	22/11/2009
Chullora	99.5	363	**1474.7**	23/09/2009	**71.4**	15/04/2009
Liverpool	93.7	342	**1579.8**	23/09/2009	**76.4**	15/04/2009
Macarthur	96.7	353	**1146.3**	23/09/2009	**92.1**	28/11/2009
Oakdale	91.2	333	**1528.3**	23/09/2009	**82.4**	28/11/2009
Prospect	96.4	352	**1680.3**	23/09/2009	**89.8**	19/09/2009
Richmond	95.9	350	**1637.3**	23/09/2009	**60.7**	22/11/2009
Rozelle	95.3	348	**1562.8**	23/09/2009	**60.7**	15/04/2009
Illawarra						
Albion Park Sth	99.5	363	**1359.6**	23/09/2009	**52.9**	07/02/2009
Kembla Grange	99.2	362	**1174.0**	23/09/2009	**72.5**	29/11/2009
Wollongong	95.9	350	**1145.4**	23/09/2009	**52.9**	20/11/2009
lower Hunter						
Beresfield	98.6	360	**1999.0**	23/09/2009	**96.2**	25/04/2009
Newcastle	93.2	340	**2426.8**	23/09/2009	**73.9**	17/04/2009
Regional						
Albury	96.7	353	**249.7**	09/02/2009	**128.9**	22/01/2009
Bathurst	97.8	357	**2114.4**	23/09/2009	**80.3**	28/11/2009
Tamworth	96.7	353	**1791.4**	23/09/2009	**159.0**	13/10/2009
Wagga Wagga	82.5	301	**297.4**	20/11/2009	**120.9**	17/12/2009

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

In Sydney, exceedances of the standard were observed on 12 days throughout the year. It should be noted that some days recorded exceedances at multiple sites across the region. The highest PM_{10} level recorded in Sydney during 2009 was 1683.9µg/m^3 recorded at Bringelly on the 23rd September.

In the Illawarra region the Ambient Air Quality NEPM standard was exceeded on 16 days, with some days have exceedances at multiple sites. The maximum value recorded for the year was 1359.6 µg/m^3 at Albion Park South on the 23rd September.

In the lower Hunter region the standard was exceeded on 18 days, with the highest concentration of 2426.8 µg/m^3 recorded at Newcastle on the 23rd September. It should be noted that some days recorded exceedances at multiple sites across the region.

PM_{10} levels in regional centres are influenced by dust events, agricultural activities and the use of solid fuel heaters. The highest PM_{10} level recorded in NSW during 2009 was 2114.4µg/m^3 at Bathurst on the 23rd September. Elevated PM_{10} levels occur more frequently at Wagga Wagga than elsewhere in NSW. During 2009 at Wagga Wagga the standard was exceeded on 21 days.

Further details on the dust storm on the 23rd September 2009 can be found in the case study on pgs. 29-30.

Table 20: Days when PM_{10} 24-hour Ambient Air Quality NEPM standard exceeded

Date	Stations where standard exceeded	Comments(#)
7 Jan 2009	Wagga Wagga	
14 Jan 2009	Albion Park Sth	
15 Jan 2009	Wollongong, Kembla Grange	
16 Jan 2009	Wagga Wagga	
20 Jan 2009	Wagga Wagga	Dust Storm & Bushfire smoke
21 Jan 2009	Wagga Wagga, Albury	Dust storm & Bushfire smoke
22 Jan 2009	Albury	Dust storm & Bushfire smoke
6 Feb 2009	Prospect	
7 Feb 2009	Wagga Wagga, Albury, Albion Park Sth	
8 Feb 2009	Wagga Wagga, Albury	Bushfire smoke
9 Feb 2009	Wagga Wagga, Albury, Newcastle	Bushfire smoke
10 Feb 2009	Wagga Wagga	Bushfire smoke
24 Feb 2009	Albury	Bushfire smoke
28 Feb 2009	Albury, Bathurst	
3 Mar 2009	Albury	Dust storm
5 Mar 2009	Beresfield, Tamworth, Bathurst	Dust storm
25 Mar 2009	Wagga Wagga	
15 Apr 2009	Rozelle, Kembla Grange, Wollongong, Albury, Bathurst, Liverpool, Prospect, Macarthur, Oakdale, Chullora, Albion Park Sth	Dust storm
16 Apr 2009	Newcastle, Beresfield, Rozelle, Wollongong, Kembla Grange, Richmond, Bathurst, Liverpool, Prospect, Macarthur, Oakdale, Bringelly, Chullora, Albion Park Sth	Dust storm
17 Apr 2009	Newcastle, Beresfield, Rozelle, Prospect, Chullora	
21 Apr 2009	Albury	
22 Apr 2009	Albury	
23 Apr 2009	Albury	
25 Apr 2009	Newcastle, Beresfield, Tamworth	
26 Apr 2009	Beresfield	
6 May 2009	Wagga Wagga	
7 May 2009	Wagga Wagga	
8 May 2009	Wagga Wagga, Prospect	
1 Jul 2009	Newcastle, Beresfield	
25 Aug 2009	Newcastle, Beresfield, Tamworth, Kembla Grange,	Dust storm
29 Aug 2009	Newcastle	
19 Sep 2009	Prospect	
22 Sep 2009	Kembla Grange, Wagga Wagga, Albion Park Sth	Dust storm
23 Sep 2009	Newcastle, Beresfield, Tamworth, Rozelle, Wollongong, Kembla Grange, Richmond, Bathurst, Wagga Wagga, Liverpool, Prospect, Macarthur, Oakdale, Bringelly, Chullora, Albion Park Sth	Dust storm
25 Sep 2009	Wagga Wagga	
26 Sep 2009	Newcastle, Beresfield, Tamworth, Rozelle, Wollongong, Kembla Grange, Richmond, Bathurst, Liverpool, Prospect, Macarthur, Oakdale, Bringelly, Chullora, Albion Park Sth	Dust storm
30 Sep 2009	Newcastle,	Bushfire smoke
1 Oct 2009	Newcastle, Beresfield, Kembla Grange,	Bushfire smoke
2 Oct 2009	Beresfield, Tamworth, Wagga Wagga,	Bushfire smoke
13 Oct 2009	Newcastle, Beresfield, Tamworth,	Dust storm
14 Oct 2009	Newcastle, Beresfield, Tamworth,	Dust storm
16 Nov 2009	Wagga Wagga	
19 Nov 2009	Albury, Wagga Wagga	
20 Nov 2009	Wollongong, Kembla Grange, Albury, Wagga Wagga,	Dust storm
22 Nov 2009	Tamworth, Rozelle, Kembla Grange, Richmond, Prospect, Bathurst, Liverpool, Macarthur, Bringelly, Chullora, Albion Park Sth	Dust storm
27 Nov 2009	Rozelle, Kembla Grange, Bathurst, Liverpool, Chullora	Dust storm
28 Nov 2009	Beresfield, Tamworth, Kembla Grange, Richmond,	Dust storm

Date	Stations where standard exceeded	Comments(#)
	Bathurst, Liverpool, Prospect, Macarthur, Oakdale, Bringelly, Chullora	
29 Nov 2009	Beresfield, Tamworth, Rozelle, Kembla Grange, Richmond, Bathurst, Liverpool, Prospect, Macarthur, Oakdale, Bringelly, Chullora, Albion Park Sth	Dust storm
8 Dec 2009	Tamworth, Bathurst	Dust and bushfire smoke
9 Dec 2009	Tamworth	Dust and bushfire smoke
10 Dec 2009	Tamworth	Dust and bushfire smoke
12 Dec 2009	Tamworth	Dust and bushfire smoke
13 Dec 2009	Tamworth	Dust and bushfire smoke
14 Dec 2009	Tamworth	
17 Dec 2009	Kembla Grange, Wagga Wagga, Bathurst	
24 Dec 2009	Albury, Wagga Wagga	Dust storm

(#) Events that can be clearly identified as influencing pollution levels

The Department of Environment, Climate Change and Water continues to work towards reducing emissions of anthropogenically-produced particles. The Government's key strategies in the management of particle emissions are outlined in Action for Air.

Case Study: Dust storm across NSW on the 22 - 23 September 2009

A remarkable dust storm occurred on the 22-23 September 2009 affecting all of New South Wales. The Bureau of Meteorology' s Monthly Weather Review (BoM, 2009) for the month noted that "With dry conditions and numerous windy days across the state, dust storms and raised dust were a common phenomenon during September".

The most significant of these dust storms was that of the 22-23 September. The Monthly Weather Review noted the following for this event that the dust originated from Lake Eyre and western NSW and was swept over the state by strong westerly winds. Visibility was reduced to less than 1 kilometre in most parts of the state, with visibility in Sydney reduced to 300 metres, the worst since 1942. This resulted in the airport being closed and ferry services being cancelled. The dust storm lasted six to eight hours in much of the state, and up to twelve hours in the Cobar area.

Raised dust generated elevated concentrations of PM_{10} on both days, although this was modest on the 22nd. Calendar-day concentrations greater than the standard of 50 µg/m^3 occurred only for Wagga Wagga, Albion Park South, and Kembla Grange. Hourly concentrations of up to 110 µg/m^3 occurred in the Sydney and lower Hunter regions but calendar-day concentrations were unremarkable.

As can be seen from PM_{10} concentrations at Wagga Wagga (DECCW's most western air quality monitoring station affected by the dust storm), the dust storm caused a significant jump in PM_{10} concentration, where it rose from 105 µg/m^3 in the hour to midnight to 679.7 µg/m^3 the next hour. As the dust storm front moved east across the state, concentrations rose sharply at all other sites except Albury over the next five hours, with peak one –hour concentrations greater than 10000 µg/m^3 at 15 of the 23 sites (figures 5 & 6). This increase in PM_{10} concentrations coincided with a marked increase in wind speed and a change of wind direction from northerly to north-westerly. PM_{10} concentrations greater than the 24 hour standard persisted for 10-12 hours at most sites and for 21 hours at Tamworth.

This dust front caused the greatest hourly and calendar-day PM_{10} concentrations ever recorded, with all stations except Wagga Wagga and Albury recording a twenty four hour average PM_{10} concentration greater than 1100 µg/m^3, twenty two times greater than the standard.

Other significant dust storms were also recorded on the 26th September 2009, 22nd November 2009, 28th November 2009 and the 29th September 2009.

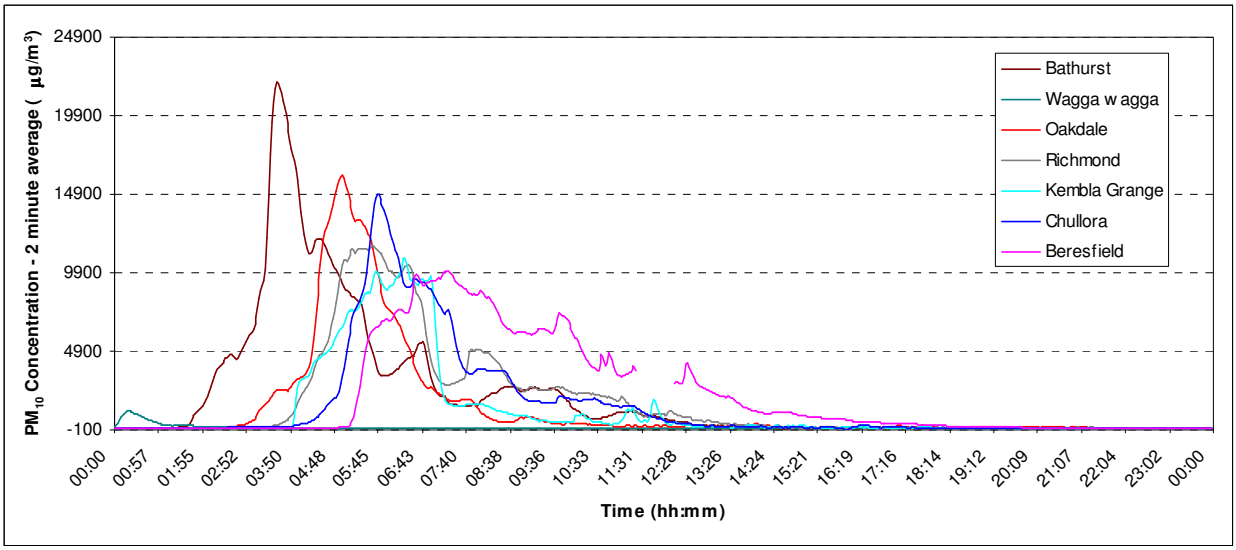

Figure 5 Graph showing the dust plume peaks as it passes through selected DECCW air monitoring stations on the 23rd September 2009.

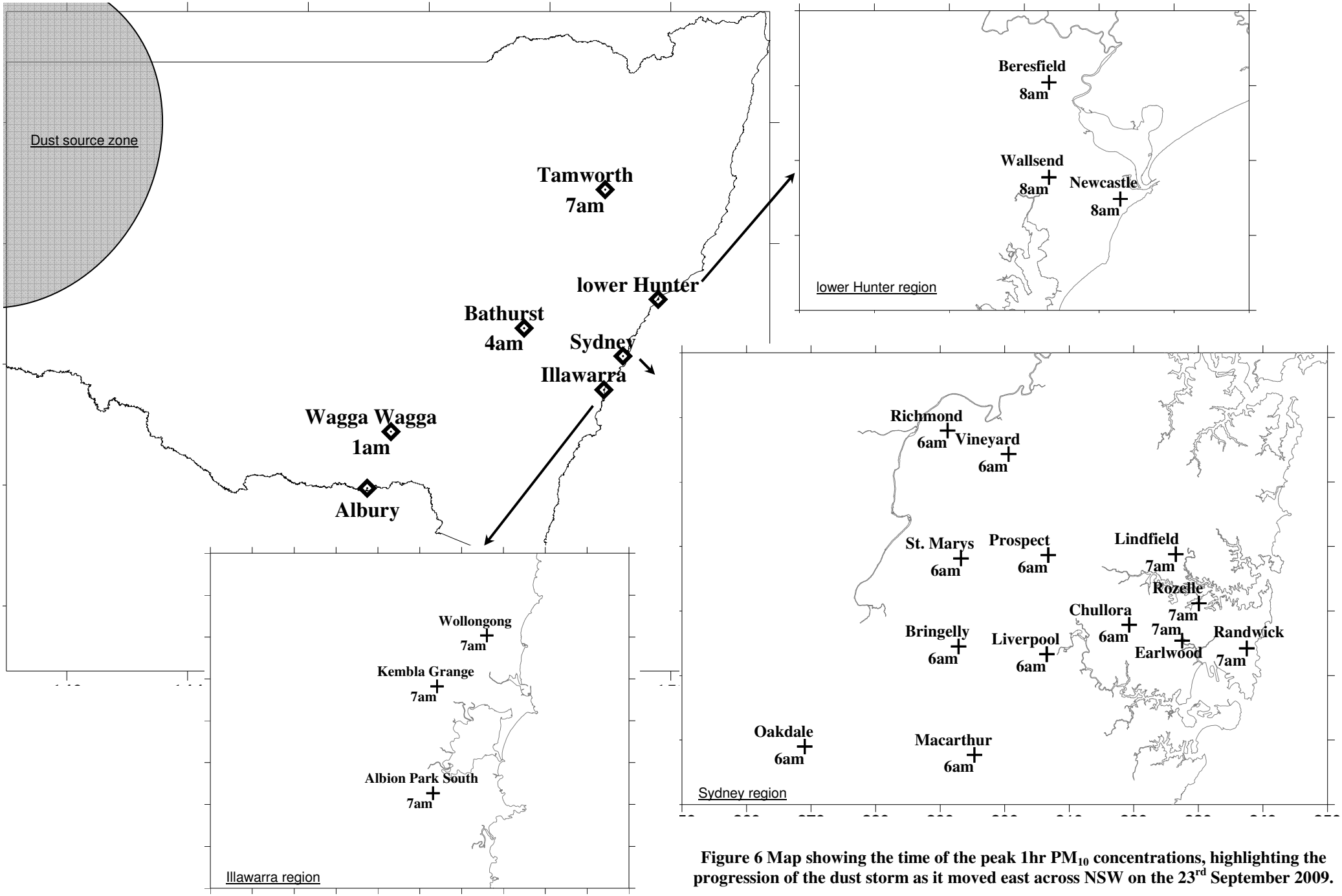

Figure 6 Map showing the time of the peak 1hr PM_{10} concentrations, highlighting the progression of the dust storm as it moved east across NSW on the 23rd September 2009.

Particles as $PM_{2.5}$

Table 21: Summary for $PM_{2.5}$ – Maximum 24-hour average concentrations (2009) – continuous TEOM method

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Chullora	89.3	360	**183.2**	23/09/2009	**27.9**	16/04/2009
Earlwood	75.6	276	**186.7**	23/09/2009	**23.3**	20/09/2009
Liverpool	95.1	347	**268.2**	23/09/2009	**40.3**	16/04/2009
Richmond	98.6	326	**192.3**	23/09/2009	**27.9**	16/04/2009
Illawarra						
Wollongong	96.2	351	**241.0**	23/09/2009	**29.8**	16/04/2009
lower Hunter						
Beresfield	94.0	343	**230.9**	23/09/2009	**58.7**	16/04/2009
Wallsend	90.7	331	**415.6**	23/09/2009	**50.6**	29/11/2009

AAQ NEPM advisory reporting standard – 25 µg/m³ (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data use USEPA factors of A=0 and B=1.00

Table 21A: Summary for $PM_{2.5}$ equivalency study – Maximum 24-hour average concentrations (2009) – FRM method

Region/ Performance monitoring Station	Data availability rates * (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Chullora	87.6	106	**27.5**	12/09/2009	**27.1**	14/06/2009

* data availability rates are based on a one day in three sampling regime.

** Please note that sampling at the Richmond site ceased at the end of 2007

Table 22: Days above the $PM_{2.5}$ 24-hour Ambient Air Quality NEPM advisory reporting standard

Date	Stations where advisory reporting standard exceeded	Comments(#)
15 Apr 2009	Wollongong	Dust storm
16 Apr 2009	Liverpool, Wallsend, Beresfield, Wollongong	Dust storm
17 Apr 2009	Beresfield	Dust storm
14 Jun 2009	Chullora	
12 Sept 2009	Liverpool, Chullora	Dust and bushfire smoke
23 Sept 2009	Liverpool, Earlwood, Wallsend, Beresfield, Wollongong, Richmond, Chullora	Dust storm
26 Sept 2009	Wallsend, Beresfield	Dust storm
14 Oct 2009	Wallsend	Dust storm
29 Nov 2009	Wallsend, Beresfield	Dust storm

Beresfield recording the highest annual 24hr $PM_{2.5}$ average of 8.5µg/m³. All regions and sites in NSW recorded concentrations above the AAQ NEPM 24-hour average advisory reporting standard for $PM_{2.5}$, with the highest 24-hour average of 415.6µg/m³ recorded at Wallsend. The maximum 24-hour averages recorded at each station were influenced by a large dust storm which moved across a large majority of NSW on the 22nd and 23rd September 2009.

Assessment of progress towards achieving the goal

The NSW Government puts in place air quality management programs and strategies to protect ambient air quality and public health. The Ambient Air Quality NEPM goal is a driver for these strategies and a benchmark against which progress in managing air quality can be assessed.

Framework for Air Quality Management in the Sydney Greater Metropolitan Region

The updated NSW State Plan released in 2010 includes a priority to improve air quality, with a target of meeting the national goals under the Ambient Air Quality NEPM. Under the State Plan, lead agencies for each priority work with partner agencies to deliver on targets. The Department of Environment, Climate Change and Water (DECCW) leads on improving air quality.

Action for Air, the NSW Government's Air Quality Management Plan for Sydney, the Lower Hunter and the Illawarra, sets out a program of measures that target the pollutants of most concern in the region – ground level ozone in summer and particles. The plan covers strategies designed to reduce emissions from industry, motor vehicles and domestic/commercial sources.

The following outlines the key mechanisms for managing ozone and particles.

Motor Vehicle and Motor Vehicle Fuels

As motor vehicles are the main source of air pollution in Sydney (producing 71% of anthropogenic NOx emissions and 38% of VOCs), the NSW Government has implemented a range of policies to address vehicle emissions.

NSW Cleaner Vehicles and Fuels Strategy: Released in August 2008, the Strategy sets out an expanded list of NSW Government actions for cleaner fuels and a cleaner fleet. The ten initiatives under the Strategy include vapour recovery at service stations and the NSW diesel retrofit program (see below), as well as low volatility summertime petrol, alternative fuels, improved national standards for fuels and motor vehicles, benchmarking the fleet, a heavy vehicle rating scheme, an awareness and behaviour change component, a "FleetWise" partnership and Government leading by example.

Stage 1 vapour recovery (VR1), which captures VOC emissions from underground petrol storage tanks as they are filled by road tankers, has been in place in most parts of Sydney for some time. Regulatory changes made in November 2009 extend VR1 to all parts of Sydney, Illawarra, Lower Hunter and Central Coast areas from July 2010 for new and modified service stations, and from 2014 for existing service stations.

Stage 2 vapour recovery (VR2) captures VOC emissions from vehicle petrol tanks during refuelling at petrol bowsers. VR2 will be introduced on a staged basis starting in July 2010 for new and modified service stations, with vapour recovery equipment to be installed at the largest service stations in Sydney, Newcastle, Wollongong and the Central Coast by 2014, and at all but the smallest service stations in Sydney by 2017.

Vapour recovery initiatives are expected to reduce VOC emissions in the Greater Metropolitan Area by 5000 tonnes per year.

The Diesel retrofit program provides for retrofitting approximately 850 existing diesel vehicles with exhaust treatment devices to reduce particle emissions. The program focuses on transport carriers and, to date, 71 fleets have taken part, reducing particle emissions from participating diesel vehicles by 50% on average.

Commercial and domestic emissions

The NSW Government has implemented a number of policies focussing on the domestic-commercial sector as a significant contributor to air pollution in NSW.

The Woodsmoke Reduction Program has included DECCW conducting woodsmoke reduction workshops for councils in Sydney and regional NSW during the 2007-2009 winters. The workshops help local council officers manage local woodsmoke issues, such as woodheater installation, enforcement action for excessive woodsmoke, the use of planning instruments to manage the number

of woodheaters in a local government area, and community education programs to foster better woodheater operation. Working with the former Growth Centres Commission, DECCW has investigated measures to manage installation of woodheaters in new land release areas to protect air quality and amenity of nearby residents. As a result, Development Control Plans for a number of precincts in the North West and South West Growth Centres – such as Oran Park, Turner Road and North Kellyville prohibit open fireplaces and slow combustion stoves.

NSW is supporting development of national actions to reduce particle and ozone precursor emissions from the product and equipment sectors. NSW is working with the Commonwealth and other jurisdictions through the Air Quality Working Group of the EPHC on national approaches to reduce emissions, from woodheaters, small engines, surface coatings and non-road engines (as used for example in construction and mining). NSW is leading a study of the costs and benefits of identified options for reducing emissions from the surface coatings sector. In 2009, NSW and the Commonwealth commissioned a study of measures to support the uptake of cleaner non-road engines.

Industry emissions

The Protection of the Environment Operations (Clean Air) Regulation 2002 provides the framework for managing air pollution from major industry.

Tighter industrial emission standards for NO_x, VOCs and particles were introduced when the Regulation was reviewed in 2005, as well as a timetable for the upgrade of old plant and equipment. The first phase of implementation was undertaken in 2008-09, introducing more stringent particle emission limits for industrial premises commissioned before 1972, including some of the oldest and largest industrial facilities in NSW, among them refineries and steel mills. The second phase of the project will introduce more stringent particle and NO_X emission limits for industry commissioned before 1979 and is to commence in 2012.

In 2008 a program commenced that **targeted existing industry** with the greatest potential to contribute to ozone formation in the Sydney and Illawarra. The program used regulatory tools to require operational and maintenance changes in these industries to reduce VOC air emissions. These included substituting VOC containing materials or improving efficiency in handling VOC materials. The program is scheduled for completion by the end of July 2010.

In February 2009 DECCW published the **interim NO_X policy for cogeneration in the Sydney and Illawarra** to reduce nitrogen oxide emissions from cogeneration by use of best available techniques (BAT). The interim policy is available at:
http://www.environment.nsw.gov.au/resources/air/inp09124.pdf.
After extensive stakeholder consultation, DECCW determined that a NO_X emission standard of 250 mg/m^3 is BAT for a cogeneration plant in Sydney and the Illawarra. This is more stringent than the current regulation limit of 450 mg/m^3. The BAT emission standard for a cogeneration plant was published on DECCW's website in November 2009 at:
http://www.environment.nsw.gov.au/air/cogentrigen.htm.

Regional emissions

Regional particle emissions are a significant contributor to exceedances of the Air NEPM particle goal. There are a number of potential contributors to rural air pollution in NSW including dust storms, agricultural burning, woodsmoke and bushfires. DECCW and the Department of Industry and Investment are working together with local government and local communities to develop and deliver coordinated actions addressing the multiple particle sources. A pilot project commenced in Wagga Wagga in August 2009.

Section D – Data analysis

The following section provides a basic statistical summary, using percentiles, for each station and for each standard. Percentiles for daily maximum values are presented. Only valid days are used in calculating these statistics.

For stations that have data sets of two years or longer, trend data, in the form of annual maximums, are provided for each standard for each pollutant. Trend data are presented if any monitoring of a particular pollutant occurred at a station in a given year and the annual data availability rate for the pollutant at that station is fifteen percent or greater.

Carbon monoxide

Statistical summary

Table 23: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Chullora	96.1	2.6	2.2	1.6	1.3	1.0	0.7	0.4	0.3
Liverpool	92.4	2.2	1.9	1.7	1.5	1.2	0.8	0.5	0.3
Macarthur	95.1	0.8	0.8	0.7	0.6	0.6	0.4	0.4	0.2
Prospect	97.5	2.3	2.1	1.8	1.3	1.1	0.7	0.5	0.3
Rozelle	95.6	2.3	1.5	1.4	1.2	1.0	0.7	0.5	0.4
Illawarra									
Wollongong	82.1	1.3	1.1	1.1	1.0	0.8	0.5	0.4	0.2
lower Hunter									
Newcastle	84.3	1.9	1.6	1.4	1.1	0.9	0.6	0.4	0.3

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Trend analysis

Table 24: Daily maximum rolling 8-hour average concentrations for CO (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/Prospect*	3.1	2.6	3.0	2.5	1.6			2.0*	1.5*	2.3*
Chullora					3.4	2.8	2.3	1.8	1.6	2.6
Liverpool	4.8	3.5	3.6	5.5	3.0	2.8	2.1	2.1	2.4	2.2
Macarthur						1.0	1.8	1.8	0.9	0.8
Rozelle	4.5	3.2	2.8	2.2	2.2	2.1	2.0	1.8	1.5	2.3
Illawarra										
Wollongong	2.4	4.2	2.3	2.1	2.1	2.6	1.5	1.5	1.3	1.3
lower Hunter										
Newcastle	3.1	4.0	3.2	2.8	2.4	1.9	2.2	1.7	2.0	1.9

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 25: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Blacktown[(1)]/Prospect[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	92.3	0	3.1	2.7	2.4	2.2	1.8	1.1	0.4	0.2
2001[(1)]	95.5	0	2.6	2.5	2.1	1.8	1.5	0.9	0.4	0.2
2002[(1)]	94.5	0	3.0	2.8	2.5	2.0	1.6	0.8	0.3	0.1
2003[(1)]	93.6	0	2.5	2.2	1.9	1.3	0.9	0.4	0.1	0.0
2004[(1)]	40.9	0	1.6	1.5	1.4	1.2	0.9	0.4	0.1	0.0
2005[#]	0.0									
2006[#]	0.0									
2007[(2)]	78.5	0	2.0	1.7	1.5	1.3	1.1	0.6	0.3	0.2
2008[(2)]	91.7	0	1.5	1.3	1.2	1.0	0.9	0.6	0.3	0.1
2009[(2)]	97.5	0	2.3	2.1	1.8	1.3	1.1	0.7	0.5	0.3

Station closed pending relocation.

Table 26: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Chullora

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2004	84.8	0	3.4	2.2	1.9	1.7	1.3	0.8	0.5	0.3
2005	97.0	0	2.8	1.9	1.7	1.5	1.2	0.7	0.4	0.3
2006	94.7	0	2.3	1.6	1.4	1.2	1.0	0.7	0.4	0.3
2007	90.7	0	1.8	1.6	1.4	1.2	1.0	0.5	0.3	0.2
2008	92.9	0	1.6	1.3	1.2	1.0	0.8	0.5	0.3	0.2
2009	96.1	0	2.6	2.2	1.6	1.3	1.0	0.7	0.4	0.3

Table 27: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Liverpool

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	98.0	0	4.8	3.7	3.4	3.1	2.1	1.4	0.9	0.5
2001	98.1	0	3.5	3.1	2.9	2.6	2.0	1.2	0.8	0.5
2002	85.6	0	3.6	3.2	3.0	2.5	2.0	1.2	0.7	0.5
2003	93.4	0	5.5	3.3	3.0	2.3	1.7	1.0	0.6	0.4
2004	88.9	0	3.0	2.9	2.6	2.1	1.7	0.9	0.6	0.4
2005	91.9	0	2.8	2.4	2.3	1.9	1.6	0.9	0.5	0.3
2006	96.4	0	2.1	1.8	1.7	1.5	1.3	0.9	0.5	0.3
2007	94.7	0	2.1	1.9	1.7	1.3	1.1	0.7	0.4	0.2
2008	88.0	0	2.4	2.1	1.8	1.6	1.3	0.7	0.4	0.2
2009	92.4	0	2.2	1.9	1.7	1.5	1.2	0.8	0.5	0.3

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 28: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	55.2	0	1.0	0.9	0.8	0.7	0.5	0.4	0.3	0.2
2006	98.2	0	1.8	1.6	1.5	0.6	0.4	0.3	0.2	0.2
2007	94.0	0	1.8	1.7	1.1	0.6	0.5	0.4	0.3	0.2
2008	97.5	0	0.9	0.6	0.6	0.5	0.4	0.3	0.2	0.1
2009	95.1	0	0.8	0.8	0.7	0.6	0.6	0.4	0.4	0.2

Table 29: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Rozelle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.0	0	4.5	3.0	2.8	2.0	1.4	0.8	0.5	0.4
2001	95.0	0	3.2	2.7	2.5	2.0	1.5	0.8	0.5	0.3
2002	87.5	0	2.8	2.0	1.7	1.5	1.2	0.8	0.5	0.3
2003	93.1	0	2.2	1.8	1.5	1.3	1.0	0.7	0.4	0.3
2004	94.0	0	2.2	1.9	1.7	1.4	1.1	0.7	0.4	0.3
2005	97.3	0	2.1	1.8	1.6	1.3	1.0	0.6	0.4	0.2
2006	96.6	0	2.0	1.6	1.4	1.2	0.9	0.6	0.4	0.3
2007	96.1	0	1.8	1.7	1.3	0.9	0.8	0.5	0.3	0.2
2008	94.4	0	1.5	1.3	1.2	1.1	0.9	0.5	0.3	0.2
2009	95.6	0	2.3	1.5	1.4	1.2	1.0	0.7	0.5	0.4

Table 30: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	98.7	0	2.4	2.2	1.8	1.4	1.2	0.8	0.5	0.3
2001	97.6	0	4.2	1.8	1.6	1.2	1.0	0.7	0.5	0.3
2002	91.2	0	2.3	2.1	1.8	1.5	1.2	0.9	0.5	0.3
2003	96.4	0	2.1	1.9	1.5	1.3	1.0	0.7	0.5	0.3
2004	97.3	0	2.1	1.6	1.5	1.2	1.0	0.7	0.5	0.3
2005	96.8	0	2.6	1.8	1.5	1.2	1.1	0.7	0.5	0.3
2006	98.6	0	1.5	1.3	1.2	1.0	0.9	0.6	0.4	0.3
2007	90.7	0	1.5	1.3	1.1	1.0	0.8	0.6	0.4	0.2
2008	94.0	0	1.3	0.9	0.9	0.8	0.7	0.5	0.3	0.2
2009	82.1	0	1.3	1.1	1.1	1.0	0.8	0.5	0.4	0.2

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 31: Statistical summary for CO - Daily maximum rolling 8-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	83.1	0	3.1	2.9	2.8	2.3	1.5	0.8	0.4	0.2
2001	96.7	0	4.0	2.9	2.6	2.1	1.4	0.7	0.4	0.3
2002	94.6	0	3.2	2.8	2.0	1.4	1.1	0.6	0.4	0.3
2003	93.0	0	2.8	2.5	2.0	1.6	1.1	0.6	0.3	0.2
2004	97.0	0	2.4	2.0	1.7	1.3	1.1	0.6	0.4	0.2
2005	95.8	0	1.9	1.7	1.6	1.3	0.9	0.4	0.3	0.2
2006	94.7	0	2.2	1.6	1.5	1.0	0.8	0.4	0.3	0.2
2007	43.4	0	1.7	1.6	1.5	1.1	0.8	0.5	0.2	0.1
2008	96.1	0	2.0	1.5	1.4	1.2	1	0.6	0.4	0.3
2009	84.3	0	1.9	1.6	1.4	1.1	0.9	0.6	0.4	0.3

AAQ NEPM Standard - 9.0 ppm (rolling 8-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Nitrogen dioxide

Statistical summary

Table 32: Statistical summary for NO_2 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	77.9	0.034	0.027	0.025	0.022	0.018	0.013	0.010	0.006
Chullora	90.5	0.052	0.044	0.041	0.036	0.033	0.028	0.023	0.018
Liverpool	85.3	0.053	0.044	0.042	0.034	0.030	0.024	0.020	0.015
Macarthur	91.0	0.048	0.044	0.040	0.035	0.031	0.025	0.020	0.016
Prospect	84.6	0.051	0.040	0.039	0.035	0.032	0.027	0.022	0.017
Richmond	91.4	0.030	0.027	0.026	0.023	0.020	0.016	0.012	0.009
Rozelle	86.1	0.049	0.039	0.036	0.033	0.031	0.026	0.021	0.015
Illawarra									
Albion Park Sth	91.3	0.052	0.038	0.033	0.024	0.022	0.014	0.009	0.004
Wollongong	70.1	0.048	0.044	0.037	0.034	0.030	0.025	0.019	0.013
lower Hunter									
Newcastle	89.5	0.043	0.037	0.032	0.029	0.027	0.022	0.016	0.010
Wallsend	83.8	0.040	0.033	0.031	0.027	0.025	0.021	0.016	0.011

AAQ NEPM Standard - 0.12 ppm (1-hour average

Bold font indicates values that exceed the AAQ NEPM standard

Trend analysis

Table 33: Maximum 1-hour average concentrations for NO_2 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/Prospect+	0.070	0.058	0.057	0.055	0.048			0.049*	0.048*	0.051*
Bringelly	0.045	0.048	0.052	0.044	0.041	0.045	0.040	0.044	0.033	0.034
Lidcombe/Chullora*	0.070	0.071	0.052	0.066*	0.056*	0.064*	0.066*	0.049*	0.044*	0.052*
Liverpool	0.079	0.067	0.068	0.064	0.060	0.063	0.053	0.053	0.046	0.053
Macarthur					0.052	0.081	0.066	0.047	0.044	0.048
Richmond	0.037	0.038	0.048	0.036	0.037	0.036	0.044	0.029	0.027	0.030
Rozelle	0.070	0.066	0.086	0.052	0.064	0.052	0.057	0.050	0.040	0.049
Illawarra										
Albion Park/Albion Park Sth+	0.055	0.051	0.048	0.048	0.044	0.035	0.051*	0.045*	0.029*	0.052*
Wollongong	0.065	0.056	0.056	0.049	0.044	0.058	0.050	0.043	0.046	0.048
lower Hunter										
Newcastle	0.044	0.040	0.047	0.039	0.044	0.041	0.042	0.032	0.033	0.043
Wallsend	0.054	0.044	0.043	0.050	0.041	0.038	0.037	0.035	0.031	0.040

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 34: Annual average concentrations for NO_2 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/Prospect*	0.013	0.013	0.014	0.013	0.013			0.012*	0.010*	0.011*
Bringelly	0.007	0.006	0.009	0.007	0.006	0.006	0.006	0.006	0.005	0.004
Lidcombe/Chullora*	0.015	0.016	0.013	0.016*	0.016*	0.014*	0.014*	0.013*	0.013*	0.013*
Liverpool	0.014	0.014	0.015	0.013	0.013	0.013	0.013	0.012	0.011	0.010
Macarthur					0.009	0.012	0.011	0.011	0.010	0.009
Richmond	0.006	0.007	0.007	0.007	0.007	0.006	0.006	0.006	0.005	0.005
Rozelle	0.014	0.014	0.015	0.014	0.014	0.013	0.013	0.012	0.011	0.011
Illawarra										
Albion Park/Albion Park Sth*	0.005	0.004	0.004	0.005	0.004	0.013*	0.005*	0.004*	0.004*	0.003*
Wollongong	0.010	0.010	0.011	0.010	0.009	0.009	0.009	0.009	0.009	0.010
lower Hunter										
Newcastle	0.009	0.009	0.009	0.008	0.009	0.009	0.008	0.007	0.007	0.008
Wallsend	0.008	0.009	0.009	0.008	0.008	0.008	0.009	0.008	0.007	0.008

AAQ NEPM Standard - 0.03 ppm (Annual average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 35: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Blacktown(1)/Prospect(2)

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000(1)	90.3	0	0.070	0.053	0.044	0.039	0.034	0.029	0.024	0.019
2001(1)	93.3	0	0.058	0.047	0.046	0.037	0.034	0.030	0.025	0.020
2002(1)	92.4	0	0.057	0.051	0.047	0.043	0.037	0.032	0.025	0.020
2003(1)	89.8	0	0.055	0.049	0.047	0.038	0.035	0.030	0.025	0.020
2004(1)	39.3	0	0.048	0.045	0.043	0.038	0.035	0.030	0.024	0.019
2005#	0.0									
2006#	0.0									
2007(2)	64.7	0	0.049	0.044	0.042	0.037	0.034	0.029	0.025	0.020
2008(2)	59.5	0	0.048	0.037	0.036	0.034	0.031	0.026	0.019	0.015
2009(2)	84.6	0	0.051	0.040	0.039	0.035	0.032	0.027	0.022	0.017

Station closed pending relocation.

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 36: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.4	0	0.045	0.034	0.030	0.026	0.022	0.019	0.015	0.010
2001	94.4	0	0.048	0.036	0.032	0.026	0.023	0.019	0.015	0.011
2002	93.1	0	0.052	0.041	0.038	0.034	0.029	0.022	0.017	0.012
2003	87.1	0	0.044	0.032	0.029	0.022	0.020	0.017	0.013	0.010
2004	90.8	0	0.041	0.033	0.029	0.025	0.022	0.017	0.013	0.010
2005	91.5	0	0.045	0.033	0.030	0.026	0.022	0.018	0.013	0.009
2006	92.0	0	0.040	0.036	0.032	0.026	0.022	0.018	0.014	0.010
2007	92.2	0	0.044	0.033	0.029	0.024	0.022	0.016	0.012	0.009
2008	86.3	0	0.033	0.027	0.024	0.020	0.018	0.014	0.011	0.007
2009	77.9	0	0.034	0.027	0.025	0.022	0.018	0.013	0.010	0.006

Table 37: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Lidcombe(1) / Chullora(2)

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000(1)	91.7	0	0.070	0.056	0.052	0.042	0.036	0.030	0.025	0.020
2001(1)	93.8	0	0.071	0.056	0.051	0.043	0.038	0.033	0.028	0.022
2002(1)	30.8	0	0.052	0.049	0.042	0.036	0.030	0.027	0.022	0.017
2003(2)	76.0	0	0.066	0.055	0.050	0.043	0.038	0.033	0.027	0.022
2004(2)	84.3	0	0.056	0.052	0.051	0.044	0.041	0.034	0.028	0.023
2005(2)	92.5	0	0.064	0.048	0.044	0.040	0.037	0.030	0.026	0.020
2006(2)	91.7	0	0.066	0.052	0.046	0.041	0.037	0.031	0.025	0.019
2007(2)	90.3	0	0.049	0.047	0.045	0.038	0.035	0.029	0.024	0.017
2008(2)	88.9	0	0.044	0.041	0.040	0.037	0.034	0.029	0.024	0.018
2009(2)	90.5	0	0.052	0.044	0.041	0.036	0.033	0.028	0.023	0.018

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 38: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Liverpool

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	89.2	0	0.079	0.060	0.051	0.041	0.036	0.030	0.025	0.020
2001	94.3	0	0.067	0.053	0.047	0.043	0.037	0.031	0.027	0.021
2002	93.0	0	0.068	0.053	0.048	0.045	0.040	0.033	0.027	0.022
2003	89.2	0	0.064	0.048	0.044	0.039	0.034	0.028	0.024	0.020
2004	93.2	0	0.060	0.050	0.049	0.042	0.036	0.030	0.025	0.020
2005	92.0	0	0.063	0.051	0.045	0.039	0.034	0.029	0.024	0.020
2006	92.7	0	0.053	0.049	0.047	0.041	0.035	0.029	0.024	0.018
2007	90.5	0	0.053	0.046	0.039	0.035	0.032	0.028	0.023	0.017
2008	84.7	0	0.046	0.040	0.037	0.033	0.030	0.027	0.021	0.016
2009	85.3	0	0.053	0.044	0.042	0.034	0.030	0.024	0.020	0.015

Table 39: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2004	16.2	0	0.052	0.052	0.051	0.039	0.032	0.024	0.020	0.016
2005	91.9	0	0.081	0.053	0.048	0.042	0.035	0.030	0.024	0.019
2006	93.9	0	0.066	0.049	0.048	0.043	0.036	0.030	0.024	0.018
2007	90.2	0	0.047	0.043	0.041	0.037	0.033	0.028	0.023	0.018
2008	89.0	0	0.044	0.041	0.039	0.035	0.032	0.026	0.021	0.016
2009	91.0	0	0.048	0.044	0.040	0.035	0.031	0.025	0.020	0.016

Table 40: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.3	0	0.037	0.029	0.027	0.025	0.023	0.019	0.015	0.011
2001	92.3	0	0.038	0.031	0.030	0.027	0.025	0.020	0.016	0.011
2002	92.9	0	0.048	0.037	0.033	0.029	0.027	0.022	0.017	0.012
2003	93.0	0	0.036	0.032	0.029	0.026	0.024	0.020	0.016	0.012
2004	88.4	0	0.037	0.035	0.033	0.030	0.026	0.021	0.015	0.011
2005	90.1	0	0.036	0.032	0.030	0.027	0.025	0.020	0.014	0.010
2006	91.4	0	0.044	0.036	0.033	0.027	0.024	0.020	0.015	0.011
2007	89.1	0	0.029	0.028	0.026	0.023	0.021	0.017	0.012	0.009
2008	86.9	0	0.027	0.024	0.023	0.021	0.019	0.015	0.011	0.008
2009	91.4	0	0.030	0.027	0.026	0.023	0.020	0.016	0.012	0.009

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 41: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Rozelle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.3	0	0.070	0.058	0.052	0.044	0.038	0.031	0.025	0.019
2001	93.2	0	0.066	0.051	0.049	0.040	0.037	0.032	0.026	0.019
2002	87.1	0	0.086	0.061	0.054	0.045	0.041	0.035	0.027	0.019
2003	88.6	0	0.052	0.047	0.047	0.042	0.038	0.032	0.026	0.019
2004	89.2	0	0.064	0.054	0.047	0.043	0.037	0.031	0.025	0.019
2005	91.2	0	0.052	0.047	0.044	0.040	0.035	0.031	0.023	0.017
2006	92.9	0	0.057	0.050	0.044	0.038	0.035	0.030	0.025	0.017
2007	89.2	0	0.050	0.043	0.040	0.038	0.033	0.028	0.023	0.015
2008	79.1	0	0.040	0.037	0.036	0.033	0.031	0.027	0.022	0.015
2009	86.1	0	0.049	0.039	0.036	0.033	0.031	0.026	0.021	0.015

Table 42: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	90.3	0	0.055	0.047	0.041	0.032	0.024	0.017	0.010	0.004
2001[(1)]	93.0	0	0.051	0.042	0.035	0.029	0.024	0.017	0.010	0.004
2002[(1)]	57.5	0	0.048	0.039	0.034	0.030	0.024	0.015	0.008	0.005
2003[(1)]	90.0	0	0.048	0.040	0.036	0.030	0.023	0.017	0.011	0.006
2004[(1)]	91.4	0	0.044	0.036	0.035	0.027	0.021	0.016	0.010	0.006
2005[(1)]	4.8	0	0.035	0.035	0.035	0.034	0.031	0.011	0.005	0.004
2006[(2)]	78.9	0	0.051	0.042	0.034	0.027	0.022	0.016	0.011	0.007
2007[(2)]	93.0	0	0.045	0.034	0.031	0.027	0.021	0.015	0.010	0.006
2008[(2)]	55.9	0	0.029	0.026	0.025	0.021	0.018	0.014	0.009	0.004
2009[(2)]	91.3	0	0.052	0.038	0.033	0.024	0.022	0.014	0.009	0.004

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 43: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.0	0	0.065	0.049	0.044	0.034	0.030	0.026	0.021	0.017
2001	93.6	0	0.056	0.044	0.040	0.037	0.031	0.027	0.022	0.016
2002	94.2	0	0.056	0.051	0.046	0.039	0.035	0.029	0.023	0.016
2003	93.3	0	0.049	0.041	0.037	0.035	0.032	0.027	0.022	0.017
2004	92.2	0	0.044	0.041	0.038	0.034	0.030	0.026	0.020	0.015
2005	88.6	0	0.058	0.043	0.039	0.032	0.029	0.025	0.019	0.014
2006	87.8	0	0.050	0.045	0.041	0.035	0.031	0.025	0.020	0.015
2007	89.6	0	0.043	0.038	0.037	0.032	0.029	0.025	0.020	0.014
2008	83.1	0	0.046	0.037	0.036	0.033	0.030	0.026	0.020	0.014
2009	70.1	0	0.048	0.044	0.037	0.034	0.030	0.025	0.019	0.013

Table 44: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.1	0	0.044	0.042	0.034	0.031	0.028	0.024	0.018	0.011
2001	91.5	0	0.040	0.034	0.032	0.030	0.029	0.026	0.020	0.012
2002	85.9	0	0.047	0.040	0.038	0.034	0.031	0.025	0.019	0.011
2003	95.0	0	0.039	0.035	0.034	0.032	0.029	0.025	0.019	0.011
2004	91.0	0	0.044	0.038	0.035	0.032	0.029	0.025	0.020	0.012
2005	89.7	0	0.041	0.035	0.033	0.031	0.029	0.025	0.018	0.011
2006	89.2	0	0.042	0.035	0.033	0.031	0.028	0.024	0.018	0.010
2007	40.6	0	0.032	0.031	0.029	0.026	0.025	0.021	0.015	0.009
2008	82.8	0	0.033	0.030	0.029	0.027	0.026	0.021	0.016	0.010
2009	89.5	0	0.043	0.037	0.032	0.029	0.027	0.022	0.016	0.010

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 45: Statistical summary for NO_2 - Annual daily maximum 1-hour average concentrations
Station: Wallsend

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	91.8	0	0.054	0.038	0.033	0.029	0.026	0.022	0.016	0.012
2001	87.5	0	0.044	0.039	0.036	0.032	0.030	0.024	0.017	0.013
2002	63.2	0	0.043	0.039	0.034	0.029	0.028	0.024	0.018	0.014
2003	85.9	0	0.050	0.037	0.035	0.029	0.027	0.021	0.016	0.012
2004	92.2	0	0.041	0.035	0.033	0.029	0.027	0.023	0.017	0.012
2005	93.4	0	0.038	0.033	0.032	0.029	0.028	0.023	0.018	0.012
2006	92.1	0	0.037	0.035	0.034	0.030	0.027	0.023	0.018	0.013
2007	93.9	0	0.035	0.032	0.031	0.029	0.026	0.022	0.016	0.011
2008	87.1	0	0.031	0.029	0.028	0.026	0.023	0.020	0.015	0.010
2009	83.8	0	0.040	0.033	0.031	0.027	0.025	0.021	0.016	0.011

AAQ NEPM Standard - 0.12 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Ozone

Statistical summary

Table 46: Statistical summary for O_3 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	90.8	**0.120**	**0.102**	0.089	0.072	0.062	0.041	0.030	0.026
Chullora	92.7	**0.154**	0.089	0.077	0.061	0.050	0.035	0.027	0.023
Liverpool	88.9	**0.151**	0.092	0.088	0.068	0.052	0.038	0.029	0.024
Macarthur	92.3	**0.116**	**0.108**	**0.102**	0.078	0.062	0.043	0.032	0.028
Oakdale	85.9	**0.128**	**0.106**	0.093	0.078	0.058	0.042	0.032	0.029
Prospect	93.3	**0.126**	0.099	0.086	0.070	0.061	0.041	0.032	0.026
Richmond	90.1	**0.102**	0.086	0.078	0.066	0.058	0.043	0.034	0.029
Rozelle	92.6	0.083	0.068	0.060	0.050	0.042	0.032	0.028	0.023
St Marys	93.0	**0.132**	**0.102**	0.082	0.073	0.062	0.041	0.032	0.028
Illawarra									
Albion Park Sth	93.2	**0.102**	0.075	0.070	0.053	0.044	0.037	0.034	0.030
Kembla Grange	87.5	**0.103**	0.083	0.070	0.052	0.044	0.035	0.031	0.027
Wollongong	90.7	0.083	0.074	0.056	0.046	0.041	0.034	0.030	0.026
lower Hunter									
Newcastle	86.3	0.073	0.068	0.062	0.050	0.043	0.037	0.032	0.027
Wallsend	85.7	0.086	0.068	0.063	0.054	0.044	0.036	0.030	0.024

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 47: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	92.5	**0.108**	**0.085**	0.078	0.063	0.054	0.039	0.029	0.025
Chullora	96.8	**0.112**	0.075	0.070	0.056	0.045	0.033	0.026	0.021
Liverpool	92.5	**0.103**	**0.085**	0.077	0.057	0.046	0.035	0.028	0.022
Macarthur	96.6	**0.097**	**0.090**	**0.083**	0.068	0.056	0.040	0.031	0.027
Oakdale	89.9	**0.108**	**0.090**	0.080	0.064	0.053	0.040	0.032	0.029
Prospect	95.7	**0.100**	**0.087**	0.074	0.063	0.053	0.039	0.030	0.024
Richmond	94.2	**0.090**	0.079	0.069	0.058	0.051	0.040	0.032	0.027
Rozelle	94.8	0.073	0.059	0.054	0.044	0.037	0.031	0.026	0.022
St Marys	97.2	**0.106**	**0.087**	0.073	0.063	0.055	0.039	0.031	0.026
Illawarra									
Albion Park Sth	95.4	**0.083**	0.066	0.060	0.048	0.041	0.036	0.033	0.028
Kembla Grange	90.1	**0.090**	0.075	0.065	0.046	0.040	0.033	0.029	0.026
Wollongong	92.9	0.074	0.064	0.050	0.043	0.037	0.033	0.029	0.025
lower Hunter									
Newcastle	88.2	0.067	0.062	0.056	0.047	0.042	0.035	0.031	0.025
Wallsend	89.2	0.076	0.063	0.058	0.046	0.040	0.034	0.028	0.023

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 48: Maximum 1-hour average concentrations for O_3 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/ Prospect*	**0.113**	**0.153**	**0.130**	**0.181**	**0.123**			0.089*	**0.107***	**0.126***
Bringelly	**0.130**	**0.175**	**0.118**	**0.155**	**0.122**	**0.112**	**0.119**	**0.111**	**0.093**	**0.120**
Lidcombe/ Chullora*	**0.118**	**0.156**	0.100	0.084*	**0.105***	0.086*	**0.117***	0.088*	0.080*	**0.154***
Liverpool	**0.133**	**0.141**	0.100	**0.151**	**0.113**	**0.149**	**0.128**	**0.116**	0.098	**0.151**
Macarthur					0.099	**0.142**	**0.128**	**0.121**	0.085	**0.116**
Oakdale	**0.126**	**0.135**	0.094	**0.102**	**0.124**	**0.130**	**0.109**	**0.142**	0.093	**0.128**
Richmond	0.088	**0.117**	**0.125**	**0.148**	0.096	**0.125**	**0.108**	**0.134**	0.078	**0.102**
Rozelle	0.080	**0.115**	0.100	0.083	0.094	0.081	0.093	0.088	0.056	0.083
St Marys	**0.158**	**0.146**	**0.119**	0.093	**0.142**	**0.113**	**0.124**	**0.123**	0.096	**0.132**
Illawarra										
Albion Park/ Albion Park Sth*	**0.106**	0.088	0.094	**0.130**	**0.112**	0.067	0.096*	0.092*	0.062*	**0.102***
Kembla Grange	**0.117**	**0.119**	0.099	**0.113**	**0.120**	0.091	0.093	0.093	0.072	**0.103**
Wollongong	**0.108**	**0.116**	**0.121**	0.097	**0.103**	**0.102**	0.096	0.077	0.067	0.083
lower Hunter										
Newcastle	0.071	0.072	0.083	0.079	**0.112**	0.078	0.068	0.053	0.064	0.073
Wallsend	0.073	0.078	0.081	0.077	**0.103**	0.094	0.086	0.070	0.057	0.086
Regional										
Bathurst		0.063	0.064	0.056	0.092	0.056	0.075	0.068		

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 49: Maximum rolling 4-hour average concentrations for O_3 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/ Prospect*	**0.101**	**0.120**	**0.107**	**0.157**	**0.107**			**0.085***	**0.096***	**0.100***
Bringelly	**0.114**	**0.128**	**0.099**	**0.133**	**0.110**	**0.102**	**0.110**	**0.095**	0.078	**0.108**
Lidcombe/ Chullora*	**0.095**	**0.137**	**0.084**	0.077*	**0.086***	0.080*	**0.104***	0.074*	0.074*	**0.112***
Liverpool	**0.107**	**0.120**	**0.089**	**0.132**	**0.092**	**0.121**	**0.124**	**0.094**	**0.089**	**0.103**
Macarthur					**0.084**	**0.126**	**0.117**	**0.101**	0.070	**0.097**
Oakdale	**0.098**	**0.105**	0.080	**0.089**	**0.099**	**0.106**	**0.085**	**0.116**	0.075	**0.108**
Richmond	0.078	**0.111**	**0.112**	**0.138**	**0.088**	**0.100**	**0.095**	**0.121**	0.067	**0.090**
Rozelle	0.073	**0.083**	**0.087**	0.070	**0.087**	0.065	**0.082**	0.075	0.048	0.073
St Marys	**0.136**	**0.125**	**0.093**	**0.091**	**0.128**	**0.091**	**0.109**	**0.105**	**0.082**	**0.106**
Illawarra										
Albion Park/ Albion Park Sth*	**0.083**	**0.082**	**0.083**	**0.111**	**0.092**	0.063	0.077*	0.080*	0.055*	**0.083***
Kembla Grange	**0.089**	**0.092**	**0.083**	**0.107**	**0.100**	**0.084**	**0.081**	**0.082**	0.066	**0.090**
Wollongong	**0.085**	**0.091**	**0.099**	0.080	**0.090**	**0.099**	**0.086**	0.073	0.063	0.074
lower Hunter										
Newcastle	0.065	0.069	0.077	0.061	0.073	0.070	0.064	0.047	0.058	0.067
Wallsend	0.069	0.073	0.074	0.059	0.078	0.074	0.066	0.068	0.054	0.076
Regional										
Bathurst		0.060	0.062	0.053	0.067	0.054	0.071	0.066		

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 50: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Blacktown[(1)]/Prospect[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	91.5	2	**0.113**	0.088	0.077	0.064	0.051	0.037	0.028	0.023
2001[(1)]	93.6	5	**0.153**	**0.110**	0.089	0.075	0.054	0.040	0.030	0.024
2002[(1)]	91.7	2	**0.130**	0.097	0.085	0.068	0.059	0.043	0.033	0.026
2003[(1)]	90.3	3	**0.181**	0.089	0.080	0.061	0.051	0.037	0.029	0.024
2004[(1)]	39.5	2	**0.123**	**0.103**	0.091	0.084	0.068	0.050	0.036	0.028
2005[#]										
2006[#]										
2007[(2)]	73.3	0	0.089	0.069	0.066	0.061	0.052	0.039	0.030	0.024
2008[(2)]	89.5	1	**0.107**	0.084	0.063	0.052	0.045	0.035	0.027	0.023
2009[(2)]	93.3	3	**0.126**	0.099	0.086	0.070	0.061	0.041	0.032	0.026

Station closed pending relocation.

Table 51: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.9	3	**0.130**	0.100	0.093	0.071	0.059	0.040	0.032	0.027
2001	91.5	9	**0.175**	**0.126**	**0.104**	0.080	0.060	0.043	0.033	0.027
2002	93.0	2	**0.118**	0.098	0.091	0.074	0.064	0.045	0.034	0.028
2003	91.3	3	**0.155**	0.099	0.078	0.066	0.056	0.041	0.032	0.028
2004	91.1	6	**0.122**	**0.105**	0.095	0.074	0.060	0.044	0.033	0.029
2005	88.4	3	**0.112**	0.091	0.081	0.066	0.057	0.043	0.034	0.029
2006	92.1	6	**0.119**	**0.107**	0.095	0.071	0.057	0.044	0.033	0.027
2007	92.1	4	**0.111**	**0.103**	0.079	0.069	0.058	0.044	0.033	0.028
2008	89.8	0	0.093	0.083	0.071	0.055	0.051	0.039	0.030	0.026
2009	90.8	4	**0.120**	**0.102**	0.089	0.072	0.062	0.041	0.030	0.026

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 52: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Lidcombe[(1)] / Chullora[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	94.7	1	**0.118**	0.082	0.074	0.059	0.048	0.033	0.026	0.020
2001[(1)]	94.5	4	**0.156**	**0.101**	0.087	0.066	0.050	0.035	0.025	0.020
2002[(1)]	31.0	0	0.100	0.088	0.077	0.063	0.050	0.038	0.029	0.021
2003[(2)]	80.6	0	0.084	0.067	0.064	0.046	0.040	0.034	0.028	0.023
2004[(2)]	87.2	1	**0.105**	0.091	0.075	0.063	0.051	0.038	0.030	0.026
2005[(2)]	92.0	0	0.086	0.078	0.067	0.058	0.048	0.037	0.030	0.025
2006[(2)]	94.3	1	**0.117**	0.078	0.073	0.058	0.049	0.037	0.030	0.024
2007[(2)]	93.0	0	0.088	0.069	0.064	0.054	0.044	0.036	0.029	0.024
2008[(2)]	93.9	0	0.080	0.064	0.057	0.049	0.042	0.032	0.027	0.022
2009[(2)]	92.7	2	**0.154**	0.089	0.077	0.061	0.050	0.035	0.027	0.023

Table 53: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Liverpool

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.3	2	**0.133**	0.090	0.081	0.070	0.058	0.035	0.028	0.024
2001	94.7	5	**0.141**	**0.122**	0.090	0.072	0.053	0.039	0.031	0.025
2002	93.6	0	0.100	0.091	0.085	0.066	0.054	0.040	0.030	0.024
2003	93.3	4	**0.151**	**0.105**	0.074	0.055	0.047	0.035	0.029	0.024
2004	84.0	3	**0.113**	0.100	0.086	0.069	0.054	0.040	0.030	0.025
2005	88.0	1	**0.149**	0.085	0.077	0.059	0.052	0.040	0.032	0.026
2006	91.4	4	**0.128**	**0.105**	0.090	0.069	0.054	0.040	0.030	0.025
2007	90.3	2	**0.116**	0.086	0.078	0.062	0.052	0.039	0.029	0.024
2008	87.1	0	0.098	0.074	0.065	0.057	0.046	0.035	0.028	0.023
2009	88.9	2	**0.151**	0.092	0.088	0.068	0.052	0.038	0.029	0.024

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 54: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2004	16.2	0	0.099	0.099	0.091	0.076	0.062	0.055	0.039	0.028
2005	94.7	6	**0.142**	**0.106**	0.091	0.073	0.061	0.044	0.033	0.029
2006	94.3	8	**0.128**	**0.116**	**0.103**	0.074	0.059	0.044	0.032	0.027
2007	90.6	3	**0.121**	0.098	0.089	0.071	0.059	0.042	0.032	0.027
2008	93.6	0	0.085	0.081	0.072	0.059	0.052	0.037	0.031	0.027
2009	92.3	7	**0.116**	**0.108**	**0.102**	0.078	0.062	0.043	0.032	0.028

Table 55: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Oakdale

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.1	4	**0.126**	**0.105**	0.091	0.065	0.055	0.038	0.030	0.027
2001	34.7	7	**0.135**	**0.125**	**0.118**	**0.101**	0.078	0.045	0.031	0.025
2002	18.6	0	0.094	0.094	0.089	0.083	0.077	0.062	0.047	0.037
2003	91.1	1	**0.102**	0.083	0.075	0.066	0.055	0.042	0.033	0.029
2004	77.3	7	**0.124**	**0.106**	**0.103**	0.074	0.065	0.047	0.035	0.030
2005	91.9	4	**0.130**	**0.105**	0.085	0.071	0.058	0.043	0.034	0.030
2006	87.9	1	**0.109**	0.089	0.083	0.070	0.060	0.048	0.035	0.030
2007	87.6	4	**0.142**	**0.104**	0.092	0.071	0.060	0.044	0.034	0.030
2008	92.5	0	0.093	0.070	0.065	0.058	0.050	0.039	0.032	0.027
2009	85.9	6	**0.128**	**0.106**	0.093	0.078	0.058	0.042	0.032	0.029

Table 56: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	89.7	0	0.088	0.082	0.071	0.062	0.051	0.038	0.030	0.024
2001	90.8	5	**0.117**	**0.112**	0.097	0.074	0.056	0.042	0.033	0.027
2002	92.5	2	**0.125**	0.097	0.085	0.071	0.063	0.044	0.034	0.029
2003	86.1	2	**0.148**	0.086	0.078	0.061	0.053	0.039	0.030	0.026
2004	89.5	0	0.096	0.080	0.076	0.065	0.058	0.045	0.034	0.029
2005	91.8	2	**0.125**	0.091	0.083	0.065	0.058	0.045	0.035	0.029
2006	92.8	2	**0.108**	0.088	0.077	0.069	0.058	0.046	0.035	0.029
2007	91.1	1	**0.134**	0.086	0.075	0.068	0.058	0.045	0.034	0.029
2008	90.6	0	0.078	0.066	0.061	0.053	0.045	0.036	0.030	0.026
2009	90.1	1	**0.102**	0.086	0.078	0.066	0.058	0.043	0.034	0.029

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 57: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Rozelle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	87.8	0	0.080	0.069	0.061	0.048	0.036	0.030	0.025	0.020
2001	93.4	1	**0.115**	0.069	0.058	0.048	0.040	0.032	0.026	0.021
2002	88.1	0	0.100	0.076	0.066	0.055	0.044	0.035	0.028	0.023
2003	91.2	0	0.083	0.069	0.059	0.045	0.037	0.031	0.027	0.023
2004	88.9	0	0.094	0.080	0.074	0.056	0.045	0.034	0.027	0.024
2005	88.9	0	0.081	0.069	0.060	0.051	0.044	0.034	0.029	0.024
2006	92.2	0	0.093	0.069	0.063	0.052	0.042	0.032	0.027	0.023
2007	92.0	0	0.088	0.058	0.050	0.046	0.041	0.033	0.027	0.023
2008	92.8	0	0.056	0.050	0.046	0.042	0.038	0.030	0.026	0.022
2009	92.6	0	0.083	0.068	0.060	0.050	0.042	0.032	0.028	0.023

Table 58: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: St Marys

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	91.5	3	**0.158**	0.100	0.088	0.069	0.058	0.041	0.032	0.027
2001	90.3	6	**0.146**	**0.113**	0.100	0.077	0.059	0.043	0.033	0.028
2002	95.3	1	**0.119**	0.093	0.085	0.067	0.059	0.046	0.034	0.028
2003	92.7	0	0.093	0.077	0.068	0.059	0.052	0.037	0.030	0.026
2004	93.3	3	**0.142**	0.097	0.085	0.068	0.058	0.044	0.033	0.029
2005	92.1	2	**0.113**	0.090	0.078	0.066	0.058	0.042	0.034	0.029
2006	92.6	3	**0.124**	0.091	0.078	0.067	0.056	0.043	0.032	0.027
2007	92.2	3	**0.123**	0.093	0.077	0.065	0.057	0.044	0.033	0.028
2008	92.7	0	0.096	0.076	0.060	0.053	0.048	0.038	0.031	0.026
2009	93.0	5	**0.132**	**0.102**	0.082	0.073	0.062	0.041	0.032	0.028

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 59: Statistical summary for O_3 - Annual daily maximum 1-hour average concentration
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	90.0	1	**0.106**	0.088	0.082	0.059	0.045	0.035	0.030	0.026
2001[(1)]	93.6	0	0.088	0.079	0.068	0.056	0.045	0.037	0.032	0.027
2002[(1)]	57.6	0	0.094	0.084	0.072	0.050	0.044	0.033	0.027	0.024
2003[(1)]	92.8	4	**0.130**	**0.105**	0.067	0.044	0.040	0.034	0.030	0.027
2004[(1)]	93.5	1	**0.112**	0.083	0.068	0.051	0.044	0.035	0.030	0.027
2005[(1)]	4.8	0	0.067	0.067	0.067	0.066	0.060	0.038	0.030	0.023
2006[(2)]	86.2	0	0.096	0.083	0.075	0.054	0.046	0.036	0.031	0.027
2007[(2)]	91.4	0	0.092	0.071	0.060	0.051	0.042	0.035	0.031	0.028
2008[(2)]	90.5	0	0.062	0.058	0.056	0.047	0.040	0.034	0.030	0.025
2009[(2)]	93.2	1	**0.102**	0.075	0.070	0.053	0.044	0.037	0.034	0.030

Table 60: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Kembla Grange

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.9	3	**0.117**	0.095	0.081	0.056	0.045	0.034	0.029	0.025
2001	82.3	2	**0.119**	0.087	0.079	0.056	0.046	0.036	0.030	0.025
2002	91.7	0	0.099	0.084	0.080	0.056	0.044	0.036	0.031	0.026
2003	93.3	2	**0.113**	0.095	0.069	0.044	0.038	0.033	0.030	0.026
2004	91.3	3	**0.120**	0.093	0.064	0.052	0.043	0.036	0.031	0.027
2005	92.6	0	0.091	0.074	0.066	0.054	0.044	0.036	0.032	0.027
2006	94.6	0	0.093	0.074	0.065	0.052	0.047	0.036	0.030	0.026
2007	94.1	0	0.093	0.076	0.063	0.049	0.043	0.034	0.031	0.027
2008	93.6	0	0.072	0.063	0.055	0.048	0.042	0.032	0.029	0.025
2009	87.5	1	**0.103**	0.083	0.070	0.052	0.044	0.035	0.031	0.027

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 61: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.1	1	**0.108**	0.087	0.075	0.064	0.046	0.034	0.028	0.024
2001	94.0	1	**0.116**	0.082	0.073	0.061	0.051	0.037	0.030	0.025
2002	90.7	2	**0.121**	0.085	0.082	0.064	0.048	0.036	0.030	0.024
2003	92.8	0	0.097	0.086	0.072	0.046	0.040	0.033	0.029	0.025
2004	92.5	1	**0.103**	0.084	0.071	0.056	0.043	0.034	0.029	0.026
2005	92.4	1	**0.102**	0.074	0.066	0.054	0.046	0.035	0.030	0.026
2006	94.6	0	0.096	0.073	0.064	0.054	0.047	0.036	0.030	0.026
2007	90.2	0	0.077	0.068	0.062	0.051	0.042	0.035	0.029	0.025
2008	94.0	0	0.067	0.062	0.056	0.048	0.043	0.033	0.029	0.025
2009	90.7	0	0.083	0.074	0.056	0.046	0.041	0.034	0.030	0.026

Table 62: Statistical summary for O_3 - Annual daily maximum 1-hour average concentration
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	88.4	0	0.071	0.066	0.060	0.048	0.042	0.031	0.027	0.023
2001	93.3	0	0.072	0.064	0.058	0.050	0.040	0.034	0.029	0.024
2002	94.0	0	0.083	0.079	0.062	0.054	0.046	0.037	0.030	0.025
2003	92.4	0	0.079	0.065	0.055	0.045	0.039	0.035	0.030	0.025
2004	92.3	1	**0.112**	0.070	0.067	0.052	0.044	0.036	0.030	0.025
2005	92.4	0	0.078	0.061	0.058	0.049	0.042	0.035	0.030	0.026
2006	93.7	0	0.068	0.063	0.060	0.047	0.042	0.035	0.029	0.024
2007	43.9	0	0.053	0.052	0.051	0.047	0.040	0.033	0.027	0.022
2008	89.9	0	0.064	0.054	0.049	0.044	0.039	0.034	0.028	0.024
2009	86.3	0	0.073	0.068	0.062	0.050	0.043	0.037	0.032	0.027

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 63: Statistical summary for O_3 - Annual daily maximum 1-hour average concentration
Station: Wallsend

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.4	0	0.073	0.071	0.065	0.050	0.042	0.033	0.027	0.023
2001	87.9	0	0.078	0.072	0.065	0.053	0.046	0.036	0.028	0.023
2002	81.9	0	0.081	0.075	0.070	0.058	0.049	0.038	0.031	0.025
2003	91.6	0	0.077	0.065	0.061	0.050	0.042	0.034	0.029	0.025
2004	88.2	1	**0.103**	0.075	0.065	0.054	0.048	0.037	0.031	0.026
2005	91.3	0	0.094	0.070	0.065	0.053	0.046	0.037	0.031	0.026
2006	93.2	0	0.086	0.070	0.062	0.051	0.045	0.036	0.029	0.024
2007	92.3	0	0.070	0.063	0.055	0.049	0.045	0.036	0.029	0.025
2008	91.9	0	0.057	0.054	0.052	0.044	0.040	0.033	0.028	0.023
2009	85.7	0	0.086	0.068	0.063	0.054	0.044	0.036	0.030	0.024

Table 64: Statistical summary for O_3 - Annual daily maximum 1-hour average concentrations
Station: Bathurst

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2001	50.4	0	0.063	0.054	0.051	0.048	0.045	0.036	0.032	0.027
2002	34.7	0	0.064	0.063	0.063	0.058	0.052	0.044	0.038	0.031
2003	76.4	0	0.056	0.052	0.051	0.047	0.042	0.036	0.032	0.029
2004	89.9	0	0.092	0.069	0.061	0.054	0.050	0.043	0.034	0.029
2005	90.7	0	0.056	0.054	0.052	0.048	0.044	0.038	0.033	0.030
2006	94.5	0	0.075	0.067	0.060	0.054	0.048	0.041	0.034	0.029
2007	54.3	0	0.068	0.067	0.062	0.054	0.050	0.039	0.032	0.029

AAQ NEPM Standard - 0.10 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 65: Statistical summary for O3 - Daily maximum rolling 4-hour average concentration
Station: Blacktown[(1)]/Prospect[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	95.3	3	**0.101**	0.080	0.071	0.056	0.047	0.034	0.026	0.021
2001[(1)]	97.7	8	**0.120**	**0.092**	**0.081**	0.065	0.048	0.037	0.029	0.022
2002[(1)]	95.7	5	**0.107**	**0.084**	0.079	0.061	0.054	0.039	0.031	0.023
2003[(1)]	94.3	3	**0.157**	0.080	0.069	0.056	0.045	0.035	0.028	0.023
2004[(1)]	41.3	4	**0.107**	**0.089**	**0.081**	0.070	0.062	0.044	0.033	0.026
2005[#]										
2006[#]										
2007[(2)]	75.1	1	**0.085**	0.063	0.060	0.055	0.048	0.036	0.028	0.023
2008[(2)]	93.1	1	**0.096**	0.069	0.058	0.047	0.042	0.033	0.026	0.022
2009[(2)]	95.7	6	**0.100**	0.087	0.074	0.063	0.053	0.039	0.030	0.024

Station closed pending relocation.

Table 66: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	99.3	6	**0.114**	**0.086**	0.077	0.064	0.052	0.037	0.030	0.026
2001	95.4	12	**0.128**	**0.107**	**0.088**	0.070	0.054	0.039	0.032	0.026
2002	96.8	7	**0.099**	**0.089**	**0.082**	0.066	0.055	0.041	0.032	0.026
2003	95.3	5	**0.133**	**0.083**	0.069	0.059	0.050	0.038	0.031	0.026
2004	95.1	6	**0.110**	**0.088**	0.080	0.064	0.053	0.041	0.032	0.028
2005	92.4	3	**0.102**	0.079	0.072	0.060	0.050	0.040	0.032	0.027
2006	96.1	5	**0.110**	**0.084**	0.077	0.062	0.051	0.041	0.031	0.026
2007	94.8	4	**0.095**	**0.083**	0.071	0.058	0.052	0.040	0.031	0.027
2008	93.6	0	0.078	0.071	0.061	0.050	0.046	0.036	0.029	0.025
2009	92.5	5	**0.108**	0.085	0.078	0.063	0.054	0.039	0.029	0.025

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 67: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Lidcombe[(1)] / Chullora[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	98.7	2	**0.095**	0.076	0.067	0.054	0.044	0.031	0.025	0.019
2001[(1)]	98.5	4	**0.137**	**0.082**	0.077	0.057	0.044	0.032	0.024	0.019
2002[(1)]	32.4	1	**0.084**	0.078	0.071	0.055	0.044	0.036	0.026	0.020
2003[(2)]	84.2	0	0.077	0.059	0.055	0.041	0.037	0.032	0.026	0.021
2004[(2)]	91.2	4	**0.086**	**0.081**	0.067	0.054	0.045	0.035	0.029	0.024
2005[(2)]	96.2	0	0.080	0.066	0.061	0.052	0.042	0.034	0.028	0.023
2006[(2)]	98.8	2	**0.104**	0.071	0.064	0.054	0.044	0.034	0.028	0.022
2007[(2)]	97.1	0	0.074	0.065	0.057	0.051	0.041	0.033	0.027	0.022
2008[(2)]	98.3	0	0.074	0.058	0.050	0.045	0.039	0.030	0.025	0.020
2009[(2)]	96.8	2	**0.112**	0.075	0.070	0.056	0.045	0.033	0.026	0.021

Table 68: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Liverpool

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.5	3	**0.107**	0.079	0.071	0.061	0.048	0.033	0.027	0.022
2001	99.0	7	**0.120**	**0.095**	0.080	0.065	0.048	0.036	0.029	0.023
2002	97.7	5	**0.089**	**0.082**	0.073	0.058	0.048	0.036	0.028	0.022
2003	97.1	3	**0.132**	0.076	0.063	0.049	0.041	0.033	0.028	0.022
2004	87.6	4	**0.092**	**0.082**	0.071	0.062	0.048	0.036	0.029	0.023
2005	92.0	2	**0.121**	0.074	0.068	0.053	0.046	0.036	0.030	0.024
2006	95.2	4	**0.124**	**0.088**	0.074	0.064	0.049	0.037	0.028	0.023
2007	92.3	2	**0.094**	0.074	0.067	0.057	0.046	0.035	0.028	0.022
2008	90.5	1	**0.089**	0.064	0.057	0.050	0.042	0.032	0.026	0.021
2009	92.5	4	**0.103**	**0.085**	0.077	0.057	0.046	0.035	0.028	0.022

Table 69: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2004	16.9	1	**0.084**	**0.084**	0.080	0.061	0.055	0.047	0.037	0.027
2005	98.9	7	**0.126**	**0.096**	0.080	0.061	0.055	0.040	0.032	0.028
2006	98.5	8	**0.117**	**0.094**	**0.085**	0.066	0.054	0.040	0.030	0.025
2007	94.1	7	**0.101**	**0.084**	0.079	0.063	0.054	0.039	0.030	0.025
2008	97.9	0	0.070	0.065	0.063	0.054	0.047	0.035	0.030	0.025
2009	96.6	9	**0.097**	**0.090**	**0.083**	0.068	0.056	0.040	0.031	0.027

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 70: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Oakdale

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.0	4	**0.098**	**0.088**	0.074	0.055	0.047	0.037	0.029	0.026
2001	36.2	8	**0.105**	**0.100**	**0.095**	**0.087**	0.058	0.042	0.029	0.024
2002	19.4	0	0.080	0.080	0.079	0.073	0.069	0.055	0.043	0.034
2003	95.0	3	**0.089**	0.079	0.067	0.057	0.050	0.039	0.032	0.028
2004	80.6	6	**0.099**	**0.090**	**0.084**	0.066	0.057	0.043	0.033	0.030
2005	95.9	4	**0.106**	**0.088**	0.074	0.062	0.052	0.040	0.032	0.029
2006	91.6	1	**0.085**	0.078	0.072	0.061	0.053	0.043	0.033	0.029
2007	91.0	5	**0.116**	**0.086**	0.077	0.063	0.053	0.042	0.033	0.029
2008	96.8	0	0.075	0.061	0.056	0.052	0.045	0.037	0.031	0.026
2009	89.9	6	**0.108**	**0.090**	0.080	0.064	0.053	0.040	0.032	0.029

Table 71: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.2	0	0.078	0.067	0.062	0.054	0.046	0.036	0.028	0.022
2001	94.5	6	**0.111**	**0.089**	0.076	0.065	0.050	0.039	0.031	0.026
2002	96.3	4	**0.112**	**0.081**	0.074	0.062	0.056	0.041	0.032	0.027
2003	89.5	3	**0.138**	0.078	0.068	0.056	0.048	0.037	0.029	0.025
2004	93.8	1	**0.088**	0.074	0.068	0.057	0.052	0.042	0.032	0.028
2005	96.3	3	**0.100**	0.080	0.069	0.060	0.052	0.042	0.033	0.028
2006	97.3	2	**0.095**	0.078	0.072	0.061	0.052	0.042	0.034	0.027
2007	94.1	3	**0.121**	0.079	0.068	0.059	0.053	0.042	0.032	0.027
2008	94.5	0	0.067	0.060	0.055	0.048	0.041	0.034	0.029	0.024
2009	94.2	3	**0.090**	0.079	0.069	0.058	0.051	0.040	0.032	0.027

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 72: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Rozelle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	91.5	0	0.073	0.060	0.052	0.043	0.034	0.028	0.023	0.019
2001	97.4	1	**0.083**	0.057	0.051	0.041	0.036	0.030	0.024	0.019
2002	92.1	1	**0.087**	0.061	0.057	0.047	0.040	0.031	0.026	0.021
2003	95.3	0	0.070	0.058	0.052	0.039	0.034	0.029	0.025	0.021
2004	92.9	1	**0.087**	0.071	0.066	0.051	0.041	0.032	0.026	0.022
2005	92.9	0	0.065	0.060	0.055	0.045	0.039	0.032	0.027	0.022
2006	96.6	1	**0.082**	0.063	0.056	0.047	0.037	0.031	0.025	0.021
2007	93.7	0	0.075	0.054	0.046	0.042	0.037	0.031	0.026	0.021
2008	97.0	0	0.048	0.046	0.043	0.038	0.034	0.028	0.025	0.020
2009	94.8	0	0.073	0.059	0.054	0.044	0.037	0.031	0.026	0.022

Table 73: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: St Marys

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	95.6	5	**0.136**	**0.088**	0.076	0.064	0.054	0.038	0.030	0.025
2001	94.2	10	**0.125**	**0.102**	**0.085**	0.068	0.051	0.040	0.031	0.027
2002	99.7	7	**0.093**	**0.085**	0.075	0.060	0.053	0.042	0.032	0.026
2003	96.8	2	**0.091**	0.063	0.061	0.052	0.047	0.035	0.029	0.025
2004	97.5	3	**0.128**	**0.081**	0.070	0.060	0.052	0.040	0.032	0.027
2005	96.2	3	**0.091**	0.078	0.068	0.059	0.050	0.040	0.032	0.027
2006	96.6	4	**0.109**	**0.084**	0.067	0.059	0.052	0.041	0.030	0.026
2007	93.1	4	**0.105**	**0.088**	0.069	0.058	0.051	0.040	0.031	0.026
2008	97.0	1	**0.082**	0.069	0.056	0.048	0.044	0.036	0.029	0.025
2009	97.2	5	**0.106**	**0.087**	0.073	0.063	0.055	0.039	0.031	0.026

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 74: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	93.7	3	**0.083**	0.080	0.070	0.051	0.041	0.034	0.028	0.025
2001[(1)]	97.7	1	**0.082**	0.067	0.061	0.049	0.042	0.036	0.031	0.026
2002[(1)]	60.0	1	**0.083**	0.071	0.066	0.046	0.039	0.031	0.026	0.022
2003[(1)]	96.8	4	**0.111**	**0.085**	0.061	0.040	0.037	0.033	0.029	0.025
2004[(1)]	97.5	1	**0.092**	0.077	0.057	0.047	0.040	0.033	0.029	0.026
2005[(1)]	5.0	0	0.063	0.063	0.063	0.061	0.054	0.039	0.029	0.022
2006[(2)]	90.0	0	0.077	0.073	0.065	0.048	0.041	0.035	0.030	0.026
2007[(2)]	94.6	0	0.080	0.061	0.057	0.046	0.039	0.033	0.030	0.026
2008[(2)]	94.1	0	0.055	0.053	0.048	0.044	0.038	0.032	0.029	0.024
2009[(2)]	95.4	1	**0.083**	0.066	0.060	0.048	0.041	0.036	0.033	0.028

Table 75: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Kembla Grange

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.9	4	**0.089**	**0.082**	0.070	0.050	0.039	0.032	0.028	0.024
2001	85.7	2	**0.092**	0.076	0.063	0.052	0.042	0.034	0.029	0.024
2002	95.8	1	**0.083**	0.074	0.070	0.048	0.040	0.034	0.029	0.025
2003	97.4	3	**0.107**	0.077	0.060	0.042	0.035	0.032	0.028	0.024
2004	95.4	3	**0.100**	0.078	0.055	0.047	0.040	0.034	0.029	0.025
2005	96.7	1	**0.084**	0.063	0.059	0.048	0.041	0.034	0.030	0.026
2006	98.9	1	**0.081**	0.063	0.057	0.046	0.042	0.034	0.029	0.025
2007	97.8	1	**0.082**	0.065	0.059	0.046	0.040	0.033	0.029	0.025
2008	97.5	0	0.066	0.054	0.050	0.043	0.039	0.031	0.028	0.023
2009	90.1	2	**0.090**	0.075	0.065	0.046	0.040	0.033	0.029	0.026

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 76: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	98.2	2	**0.085**	0.079	0.068	0.057	0.040	0.031	0.027	0.023
2001	98.0	1	**0.091**	0.070	0.067	0.053	0.045	0.034	0.029	0.024
2002	94.6	2	**0.099**	0.077	0.071	0.059	0.044	0.034	0.028	0.023
2003	96.4	0	0.080	0.077	0.062	0.042	0.037	0.031	0.028	0.024
2004	96.3	2	**0.090**	0.068	0.061	0.050	0.040	0.032	0.028	0.024
2005	96.2	1	**0.099**	0.064	0.061	0.049	0.041	0.033	0.029	0.024
2006	98.6	1	**0.086**	0.066	0.055	0.048	0.042	0.033	0.028	0.024
2007	93.2	0	0.073	0.064	0.054	0.046	0.039	0.033	0.028	0.023
2008	97.9	0	0.063	0.056	0.051	0.043	0.040	0.031	0.027	0.023
2009	92.9	0	0.074	0.064	0.050	0.043	0.037	0.033	0.029	0.025

Table 77: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	92.1	0	0.065	0.059	0.056	0.043	0.038	0.029	0.025	0.021
2001	97.4	0	0.069	0.057	0.052	0.043	0.037	0.032	0.027	0.023
2002	98.2	0	0.077	0.072	0.055	0.050	0.041	0.034	0.028	0.023
2003	96.3	0	0.061	0.055	0.050	0.042	0.038	0.033	0.028	0.024
2004	96.4	0	0.073	0.062	0.059	0.048	0.041	0.034	0.028	0.024
2005	96.5	0	0.070	0.055	0.050	0.044	0.039	0.033	0.028	0.024
2006	97.9	0	0.064	0.057	0.053	0.043	0.038	0.033	0.028	0.022
2007	45.6	0	0.047	0.046	0.046	0.041	0.036	0.031	0.025	0.021
2008	93.8	0	0.058	0.049	0.046	0.040	0.037	0.032	0.027	0.022
2009	88.2	0	0.067	0.062	0.056	0.047	0.042	0.035	0.031	0.025

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 78: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Wallsend

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.2	0	0.069	0.062	0.058	0.046	0.040	0.031	0.026	0.021
2001	91.7	0	0.073	0.065	0.056	0.048	0.041	0.033	0.027	0.021
2002	85.6	0	0.074	0.068	0.065	0.053	0.043	0.035	0.029	0.023
2003	95.7	0	0.059	0.058	0.056	0.044	0.039	0.032	0.028	0.024
2004	92.0	0	0.078	0.065	0.057	0.050	0.044	0.035	0.029	0.024
2005	95.4	0	0.074	0.063	0.058	0.048	0.041	0.034	0.029	0.024
2006	97.3	0	0.066	0.064	0.057	0.046	0.040	0.033	0.027	0.023
2007	95.1	0	0.068	0.057	0.050	0.045	0.041	0.034	0.028	0.023
2008	95.7	0	0.054	0.048	0.045	0.040	0.036	0.031	0.027	0.022
2009	89.2	0	0.076	0.063	0.058	0.046	0.040	0.034	0.028	0.023

Table 79: Statistical summary for O_3 - Daily maximum rolling 4-hour average concentration
Station: Bathurst

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2001	52.3	0	0.060	0.051	0.050	0.046	0.042	0.035	0.030	0.025
2002	36.1	0	0.062	0.060	0.057	0.054	0.049	0.043	0.037	0.030
2003	79.6	0	0.053	0.050	0.049	0.045	0.040	0.035	0.031	0.028
2004	93.7	0	0.067	0.058	0.055	0.050	0.048	0.041	0.032	0.027
2005	94.5	0	0.054	0.052	0.050	0.046	0.042	0.036	0.032	0.029
2006	98.5	0	0.071	0.062	0.058	0.051	0.045	0.040	0.033	0.028
2007	56.7	0	0.066	0.062	0.059	0.050	0.048	0.037	0.031	0.028

AAQ NEPM Standard - 0.08 ppm (rolling 4-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Sulfur dioxide

Statistical summary

Table 80: Statistical summary for SO_2 - Daily maximum 1-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	84.6	0.012	0.008	0.005	0.004	0.003	0.001	0.000	0.000
Chullora	89.8	0.029	0.015	0.012	0.010	0.008	0.004	0.002	0.001
Macarthur	91.6	0.010	0.009	0.007	0.006	0.004	0.003	0.002	0.001
Prospect	91.3	0.017	0.010	0.010	0.008	0.006	0.004	0.002	0.001
Richmond	89.5	0.013	0.010	0.009	0.006	0.004	0.002	0.001	0.000
Illawarra									
Albion Park Sth	85.4	0.031	0.027	0.023	0.018	0.013	0.005	0.001	0.000
Wollongong	75.3	0.020	0.016	0.014	0.010	0.007	0.004	0.002	0.000
lower Hunter									
Newcastle	69.7	0.039	0.033	0.027	0.021	0.015	0.008	0.005	0.002
Wallsend	67.2	0.044	0.028	0.025	0.019	0.014	0.009	0.005	0.001

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Table 81: Statistical summary for SO_2 - Daily 24-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles (ppm)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	87.1	0.003	0.002	0.001	0.001	0.001	0.000	0.000	-0.001
Chullora	94.5	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000
Macarthur	95.9	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
Prospect	96.4	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000
Richmond	93.7	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000
Illawarra									
Albion Park Sth	88.5	0.012	0.009	0.008	0.006	0.004	0.002	0.000	0.000
Wollongong	73.4	0.004	0.003	0.003	0.002	0.002	0.001	0.000	-0.001
lower Hunter									
Newcastle	73.4	0.010	0.008	0.006	0.004	0.004	0.002	0.001	0.000
Wallsend	68.2	0.007	0.006	0.006	0.004	0.003	0.002	0.001	0.000

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Trend analysis

Table 82: Maximum 1-hour average concentrations for SO_2 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown / Prospect*	0.015	0.020	0.021	0.016	0.016			0.022*	0.014*	0.017*
Bringelly	0.018	0.012	0.010	0.017	0.015	0.009	0.009	0.017	0.019	0.012
Chullora						0.015	0.015	0.020	0.021	0.029
Macarthur						0.015	0.010	0.015	0.015	0.010
Richmond	0.015	0.012	0.028	0.012	0.021	0.015	0.018	0.024	0.015	0.013
Illawarra										
Albion Park / Albion Park Sth*	0.042	0.034	0.029	0.035	0.034	0.032	0.038*	0.038*	0.028*	0.031*
Warrawong	0.110	0.162	0.046	0.063	0.088	0.070	0.022			
Wollongong	0.031	0.030	0.039	0.031	0.053	0.038	0.035	0.032	0.021	0.020
lower Hunter										
Newcastle						0.037	0.034	0.043	0.033	0.039
Wallsend	0.041	0.049	0.045	0.047	0.067	0.048	0.058	0.039	0.044	0.044

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Table 83: Maximum 24-hour average concentrations for SO_2 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown / Prospect*	0.004	0.005	0.004	0.004	0.004			0.005*	0.004*	0.003*
Bringelly	0.004	0.003	0.002	0.002	0.002	0.002	0.002	0.003	0.003	0.003
Chullora						0.005	0.004	0.004	0.005	0.005
Macarthur						0.003	0.003	0.004	0.004	0.004
Richmond	0.004	0.010	0.004	0.003	0.004	0.002	0.003	0.004	0.003	0.004
Illawarra										
Albion Park / Albion Park Sth*	0.014	0.013	0.009	0.009	0.009	0.011	0.010*	0.014*	0.008*	0.012*
Warrawong	0.009	0.013	0.009	0.011	0.012	0.009	0.007			
Wollongong	0.008	0.007	0.008	0.006	0.015	0.006	0.007	0.008	0.007	0.004
lower Hunter										
Newcastle						0.008	0.009	0.012	0.008	0.010
Wallsend	0.011	0.013	0.011	0.010	0.014	0.007	0.009	0.007	0.007	0.007

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 84: Annual average concentrations for SO_2 (ppm)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown / Prospect*	0.001	0.001	0.001	0.001	0.001			0.001*	0.000*	0.000*
Bringelly	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chullora						0.001	0.001	0.001	0.001	0.001
Macarthur						0.001	0.001	0.001	0.001	0.001
Richmond	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Illawarra										
Albion Park / Albion Park Sth*	0.001	0.001	0.001	0.001	0.001	0.007*	0.001*	0.001*	0.001*	0.001*
Warrawong	0.001	0.002	0.001	0.001	0.001	0.001	0.001			
Wollongong	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000
lower Hunter										
Newcastle						0.002	0.001	0.001	0.001	0.001
Wallsend	0.002	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.002	0.001

AAQ NEPM Standard - 0.02 ppm (Annual average)

Table 85: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Blacktown(1)/Prospect(2)

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000(1)	85.9	0	0.015	0.011	0.010	0.008	0.006	0.004	0.002	0.001
2001(1)	93.9	0	0.020	0.015	0.012	0.009	0.007	0.005	0.003	0.002
2002(1)	93.2	0	0.021	0.014	0.012	0.008	0.006	0.004	0.003	0.002
2003(1)	91.3	0	0.016	0.012	0.010	0.007	0.006	0.004	0.003	0.002
2004(1)	39.1	0	0.016	0.013	0.012	0.010	0.007	0.006	0.004	0.002
2005#										
2006#										
2007(2)	67.0	0	0.022	0.016	0.013	0.007	0.006	0.003	0.002	0.001
2008(2)	85.1	0	0.014	0.011	0.010	0.008	0.005	0.003	0.002	0.001
2009(2)	91.3	0	0.017	0.010	0.010	0.008	0.006	0.004	0.002	0.001

Station closed pending relocation.

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 86: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.8	0	0.018	0.009	0.006	0.005	0.004	0.003	0.001	0.001
2001	94.7	0	0.012	0.010	0.008	0.005	0.005	0.003	0.002	0.001
2002	94.6	0	0.010	0.009	0.009	0.006	0.004	0.002	0.001	0.001
2003	93.0	0	0.017	0.007	0.006	0.004	0.003	0.002	0.001	0.001
2004	90.8	0	0.015	0.008	0.007	0.005	0.004	0.002	0.001	0.000
2005	91.3	0	0.009	0.008	0.006	0.004	0.004	0.002	0.001	0.000
2006	91.4	0	0.009	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2007	84.2	0	0.017	0.009	0.007	0.005	0.004	0.002	0.001	0.000
2008	89.2	0	0.019	0.008	0.006	0.005	0.003	0.002	0.001	0.000
2009	84.6	0	0.012	0.008	0.005	0.004	0.003	0.001	0.000	0.000

Table 87: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Chullora

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	68.8	0	0.015	0.013	0.011	0.009	0.007	0.004	0.002	0.001
2006	93.9	0	0.015	0.013	0.011	0.009	0.007	0.004	0.003	0.002
2007	86.7	0	0.020	0.016	0.012	0.009	0.007	0.003	0.002	0.001
2008	77.5	0	0.021	0.018	0.012	0.007	0.006	0.004	0.002	0.001
2009	89.8	0	0.029	0.015	0.012	0.010	0.008	0.004	0.002	0.001

Table 88: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	53.1	0	0.015	0.012	0.008	0.006	0.004	0.003	0.002	0.001
2006	93.2	0	0.010	0.008	0.006	0.005	0.004	0.002	0.001	0.001
2007	90.9	0	0.015	0.011	0.010	0.006	0.005	0.003	0.002	0.001
2008	92.1	0	0.015	0.013	0.009	0.006	0.004	0.003	0.001	0.001
2009	91.6	0	0.010	0.009	0.007	0.006	0.004	0.003	0.002	0.001

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 89: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	85.6	0	0.015	0.009	0.008	0.006	0.004	0.002	0.001	0.001
2001	84.7	0	0.012	0.010	0.007	0.005	0.004	0.002	0.001	0.001
2002	93.3	0	0.028	0.009	0.008	0.006	0.004	0.003	0.001	0.001
2003	93.0	0	0.012	0.010	0.009	0.006	0.004	0.003	0.001	0.001
2004	89.7	0	0.021	0.012	0.009	0.007	0.005	0.002	0.001	0.001
2005	92.8	0	0.015	0.009	0.007	0.006	0.004	0.002	0.001	0.001
2006	92.0	0	0.018	0.011	0.009	0.006	0.004	0.002	0.001	0.001
2007	91.0	0	0.024	0.008	0.007	0.005	0.004	0.002	0.001	0.000
2008	72.0	0	0.015	0.010	0.007	0.005	0.003	0.002	0.001	0.000
2009	89.5	0	0.013	0.010	0.009	0.006	0.004	0.002	0.001	0.000

Table 90: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	94.2	0	0.042	0.033	0.031	0.024	0.018	0.008	0.001	0.000
2001[(1)]	93.7	0	0.034	0.028	0.024	0.019	0.013	0.008	0.001	0.000
2002[(1)]	57.4	0	0.029	0.028	0.027	0.022	0.016	0.006	0.001	0.000
2003[(1)]	93.7	0	0.035	0.026	0.022	0.016	0.012	0.005	0.001	0.000
2004[(1)]	92.9	0	0.034	0.029	0.027	0.017	0.013	0.005	0.001	0.000
2005[(1)]	4.8	0	0.032	0.032	0.032	0.031	0.030	0.007	0.001	0.000
2006[(2)]	86.7	0	0.038	0.028	0.024	0.019	0.011	0.004	0.001	0.000
2007[(2)]	83.1	0	0.038	0.033	0.031	0.019	0.013	0.006	0.001	0.000
2008[(2)]	93.0	0	0.028	0.026	0.022	0.015	0.011	0.005	0.001	0.000
2009[(2)]	85.4	0	0.031	0.027	0.023	0.018	0.013	0.005	0.001	0.000

Table 91: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Warrawong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.8	0	0.110	0.077	0.039	0.028	0.020	0.010	0.003	0.000
2001	93.1	0	0.162	0.074	0.058	0.042	0.027	0.011	0.003	0.000
2002	94.0	0	0.046	0.031	0.029	0.023	0.019	0.011	0.004	0.000
2003	93.7	0	0.063	0.052	0.040	0.022	0.017	0.009	0.002	0.000
2004	91.4	0	0.088	0.039	0.029	0.021	0.013	0.006	0.002	0.000
2005	91.8	0	0.070	0.032	0.025	0.019	0.014	0.008	0.002	0.000
2006	37.9	0	0.022	0.022	0.020	0.015	0.010	0.004	0.001	0.000

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 92: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.3	0	0.031	0.025	0.022	0.017	0.014	0.009	0.005	0.003
2001	92.6	0	0.030	0.027	0.021	0.016	0.013	0.008	0.004	0.002
2002	91.1	0	0.039	0.033	0.025	0.019	0.015	0.009	0.005	0.002
2003	93.7	0	0.031	0.025	0.023	0.015	0.013	0.008	0.004	0.002
2004	92.8	0	0.053	0.024	0.018	0.014	0.011	0.006	0.003	0.001
2005	93.0	0	0.038	0.023	0.021	0.015	0.011	0.006	0.003	0.001
2006	94.5	0	0.035	0.020	0.018	0.015	0.012	0.007	0.004	0.001
2007	78.9	0	0.032	0.022	0.020	0.016	0.011	0.007	0.003	0.001
2008	78.2	0	0.021	0.019	0.015	0.012	0.009	0.006	0.002	0.000
2009	75.3	0	0.020	0.016	0.014	0.010	0.007	0.004	0.002	0.000

Table 93: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	72.6	0	0.037	0.035	0.029	0.020	0.015	0.008	0.005	0.002
2006	93.3	0	0.034	0.028	0.021	0.017	0.013	0.007	0.004	0.001
2007	44.5	0	0.043	0.032	0.025	0.021	0.014	0.008	0.005	0.003
2008	86.9	0	0.033	0.027	0.024	0.019	0.015	0.010	0.004	0.002
2009	69.7	0	0.039	0.033	0.027	0.021	0.015	0.008	0.005	0.002

Table 94: Statistical summary for SO_2 - Annual daily maximum 1-hour average concentrations
Station: Wallsend

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	92.0	0	0.041	0.033	0.031	0.024	0.019	0.012	0.006	0.003
2001	86.9	0	0.049	0.037	0.031	0.025	0.021	0.013	0.008	0.004
2002	80.2	0	0.045	0.036	0.028	0.024	0.019	0.012	0.007	0.003
2003	90.3	0	0.047	0.034	0.029	0.023	0.017	0.011	0.006	0.003
2004	90.1	0	0.067	0.042	0.033	0.022	0.016	0.010	0.005	0.002
2005	93.4	0	0.048	0.033	0.027	0.021	0.017	0.009	0.005	0.002
2006	94.5	0	0.058	0.027	0.025	0.021	0.016	0.011	0.005	0.002
2007	83.9	0	0.039	0.032	0.027	0.022	0.018	0.010	0.005	0.002
2008	91.3	0	0.044	0.032	0.026	0.021	0.018	0.011	0.006	0.002
2009	67.2	0	0.044	0.028	0.025	0.019	0.014	0.009	0.005	0.001

AAQ NEPM Standard - 0.20 ppm (1-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 95: Statistical summary for SO_2 - 24-hour average concentrations
Station: Blacktown[(1)]/Prospect[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	83.9	0	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2001[(1)]	98.1	0	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.001
2002[(1)]	96.4	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001
2003[(1)]	95.1	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2004[(1)]	40.7	0	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001
2005[#]										
2006[#]										
2007[(2)]	67.1	0	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2008[(2)]	89.9	0	0.004	0.003	0.003	0.002	0.001	0.001	0.000	0.000
2009[(2)]	96.4	0	0.003	0.003	0.002	0.002	0.002	0.001	0.000	0.000

Station closed pending relocation.

Table 96: Statistical summary for SO_2 - 24-hour average concentrations
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.8	0	0.004	0.002	0.001	0.001	0.001	0.001	0.000	0.000
2001	98.6	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2002	99.2	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2003	97.3	0	0.002	0.002	0.002	0.001	0.001	0.000	0.000	0.000
2004	94.8	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2005	95.3	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2006	95.3	0	0.002	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2007	86.8	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2008	92.3	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000	-0.001
2009	87.1	0	0.003	0.002	0.001	0.001	0.001	0.000	0.000	-0.001

Table 97: Statistical summary for SO_2 - 24-hour average concentrations
Station: Chullora

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	71.8	0	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2006	98.4	0	0.004	0.004	0.003	0.003	0.002	0.002	0.001	0.001
2007	89.3	0	0.004	0.004	0.003	0.003	0.002	0.001	0.001	0.000
2008	80.9	0	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.000
2009	94.5	0	0.005	0.004	0.003	0.003	0.002	0.001	0.001	0.000

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 98: Statistical summary for SO_2 - 24-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	55.3	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2006	97.3	0	0.003	0.003	0.002	0.002	0.001	0.001	0.000	0.000
2007	94.8	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000
2008	97.0	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000	0.000
2009	95.9	0	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.000

Table 99: Statistical summary for SO_2 - 24-hour average concentrations
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	89.3	0	0.004	0.003	0.002	0.001	0.001	0.001	0.000	0.000
2001	88.8	0	0.010	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2002	97.5	0	0.004	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2003	97.0	0	0.003	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2004	92.9	0	0.004	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2005	96.7	0	0.002	0.002	0.002	0.001	0.001	0.001	0.000	0.000
2006	95.9	0	0.003	0.002	0.002	0.002	0.001	0.001	0.000	0.000
2007	94.5	0	0.004	0.002	0.002	0.001	0.001	0.000	0.000	0.000
2008	74.9	0	0.003	0.002	0.001	0.001	0.001	0.000	0.000	0.000
2009	93.7	0	0.004	0.003	0.002	0.001	0.001	0.000	0.000	0.000

Table 100: Statistical summary for SO_2 - 24-hour average concentrations
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	98.4	0	0.014	0.011	0.008	0.006	0.004	0.002	0.000	0.000
2001[(1)]	98.1	0	0.013	0.009	0.007	0.005	0.003	0.002	0.000	0.000
2002[(1)]	60.0	0	0.009	0.009	0.007	0.006	0.004	0.001	0.000	0.000
2003[(1)]	98.9	0	0.009	0.008	0.006	0.004	0.003	0.001	0.000	0.000
2004[(1)]	97.0	0	0.009	0.007	0.006	0.004	0.003	0.001	0.000	0.000
2005[(1)]	4.9	0	0.011	0.011	0.011	0.010	0.007	0.002	0.000	0.000
2006[(2)]	89.3	0	0.010	0.008	0.007	0.004	0.003	0.001	0.000	0.000
2007[(2)]	83.8	0	0.014	0.011	0.008	0.004	0.003	0.001	0.000	0.000
2008[(2)]	97.0	0	0.008	0.006	0.005	0.004	0.003	0.002	0.000	0.000
2009[(2)]	88.5	0	0.012	0.009	0.008	0.006	0.004	0.002	0.000	0.000

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 101: Statistical summary for SO_2 - 24-hour average concentrations
Station: Warrawong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.7	0	0.009	0.007	0.006	0.005	0.003	0.002	0.000	0.000
2001	97.3	0	0.013	0.010	0.009	0.007	0.005	0.002	0.000	0.000
2002	98.6	0	0.009	0.006	0.006	0.005	0.004	0.002	0.001	0.000
2003	98.4	0	0.011	0.009	0.007	0.005	0.003	0.002	0.000	0.000
2004	95.4	0	0.012	0.007	0.006	0.004	0.003	0.001	0.000	0.000
2005	96.7	0	0.009	0.006	0.005	0.004	0.003	0.002	0.000	0.000
2006	39.2	0	0.007	0.006	0.005	0.003	0.002	0.001	0.000	0.000

Table 102: Statistical summary for SO_2 - 24-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	99.2	0	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.001
2001	95.9	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2002	95.3	0	0.008	0.007	0.006	0.004	0.003	0.002	0.001	0.000
2003	98.4	0	0.006	0.005	0.005	0.003	0.003	0.001	0.001	0.000
2004	97.0	0	0.015	0.007	0.005	0.003	0.002	0.001	0.001	0.000
2005	97.5	0	0.006	0.006	0.003	0.003	0.002	0.001	0.001	0.000
2006	98.9	0	0.007	0.005	0.004	0.003	0.002	0.001	0.001	0.000
2007	79.2	0	0.008	0.006	0.005	0.003	0.002	0.002	0.001	0.000
2008	79.8	0	0.007	0.004	0.003	0.003	0.002	0.001	0.000	-0.001
2009	73.4	0	0.004	0.003	0.003	0.002	0.002	0.001	0.000	-0.001

Table 103: Statistical summary for SO_2 - 24-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2005	75.3	0	0.008	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2006	97.3	0	0.009	0.005	0.005	0.004	0.003	0.002	0.001	0.000
2007	45.8	0	0.012	0.012	0.007	0.005	0.003	0.002	0.001	0.000
2008	90.2	0	0.008	0.006	0.006	0.004	0.003	0.002	0.001	0.000
2009	73.4	0	0.010	0.008	0.006	0.004	0.004	0.002	0.001	0.000

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 104: Statistical summary for SO_2 - 24-hour average concentrations
Station: Wallsend

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ppm)	Percentiles (ppm)						
				99th	98th	95th	90th	75th	50th	25th
2000	94.5	0	0.011	0.009	0.008	0.006	0.004	0.003	0.002	0.001
2001	89.6	0	0.013	0.009	0.008	0.006	0.004	0.003	0.001	0.001
2002	82.5	0	0.011	0.008	0.007	0.006	0.004	0.003	0.002	0.001
2003	93.7	0	0.010	0.008	0.005	0.004	0.003	0.002	0.001	0.001
2004	92.9	0	0.014	0.008	0.006	0.004	0.003	0.002	0.001	0.001
2005	97.5	0	0.007	0.006	0.005	0.004	0.003	0.002	0.001	0.000
2006	98.9	0	0.009	0.007	0.005	0.004	0.003	0.002	0.001	0.000
2007	83.6	0	0.007	0.006	0.006	0.005	0.004	0.002	0.001	0.000
2008	95.4	0	0.007	0.006	0.006	0.005	0.004	0.002	0.001	0.001
2009	68.2	0	0.007	0.006	0.006	0.004	0.003	0.002	0.001	0.000

AAQ NEPM Standard - 0.08 ppm (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Particles as PM_{10}

Statistical summary

Table 105: Statistical summary for PM_{10} - 24-hour average concentrations (2009)

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (ppm)	Percentiles ($\mu g/m^3$)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Bringelly	94.8	**1683.9**	**114.8**	47.4	37.1	31.9	22.8	17.0	12.4
Chullora	99.5	**1474.7**	**120.9**	**58.4**	38.0	32.8	25.1	20.0	14.9
Liverpool	93.7	**1579.8**	**114.8**	**59.5**	38.8	31.7	25.1	18.4	14.3
Macarthur	96.7	**1146.3**	**111.4**	**56.2**	35.5	29.6	21.2	15.5	10.5
Oakdale	91.2	**1528.3**	**130.2**	48.4	30.6	25.5	19.5	12.7	7.5
Prospect	96.4	**1680.3**	**135.3**	**60.7**	38.9	32.3	24.1	18.2	13.5
Richmond	95.9	**1637.3**	**121.7**	46.1	32.9	28.0	19.4	13.4	9.6
Rozelle	95.3	**1562.8**	**128.5**	**55.8**	36.1	31.0	24.3	17.8	13.1
Illawarra									
Albion Park Sth	99.5	**1359.6**	**73.0**	**50.7**	38.0	31.6	22.8	15.4	10.1
Kembla Grange	99.2	**1174.0**	**134.4**	**67.0**	42.5	34.3	25.5	18.1	11.5
Wollongong	95.9	**1145.4**	**107.0**	**49.5**	40.3	34.7	24.5	18.8	12.6
lower Hunter									
Beresfield	98.6	**1999.0**	**174.3**	**70.6**	47.7	35.3	26.2	18.4	14.2
Newcastle	93.2	**2426.8**	**119.5**	**71.2**	44.9	37.0	28.1	22.3	16.5
Regional									
Albury	96.7	**249.7**	**144.0**	**102.0**	39.0	28.5	19.3	14.0	10.1
Bathurst	97.8	**2114.4**	**122.4**	**69.8**	36.9	26.8	20.3	13.8	9.0
Tamworth	96.7	**1791.4**	**235.9**	**120.7**	47.0	33.8	22.8	15.7	11.4
Wagga Wagga	82.5	**297.4**	**214.4**	**112.3**	**55.9**	46.2	30.6	19.8	12.4

AAQ NEPM Standard – 50 $\mu g/m^3$ (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

PM_{10} 24 hour average

NEPM Annual Compliance reports prior to 2008 included 24 hour daily average calculations for PM_{10} using hours 0 to 23. Daily averages are now calculated using hours 1 to 24 as detailed in the NEPM Technical Paper No. 5, "Data Collection and Handling". Accordingly, in the following tables from Table 101 to Table 118, the calculation of the 24 hour daily averages for 2008, differs in comparison to previous years.

Trend analysis

Table 106: Maximum 24-hour average concentrations for PM_{10} (µg/m^3)

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Blacktown/ Prospect*	34.9	**127.4**	**117.7**	**187.8**	44.1			46.3*	41.8*	**1680.3***
Bringelly	37.4	**98.4**	**118.6**	**275.1**	**62.5**	**54.5**	**72.2**	**51.0**	**62.7**	**1683.9**
Chullora				**213.7**	**55.8**	**50.7**	**66.1**	**66.5**	44.3	**1474.7**
Liverpool	**66.0**	**63.2**	**126.3**	**283.3**	**62.1**	**55.5**	**75.2**	**53.1**	**53.8**	**1579.8**
Macarthur					**60.6**	**53.2**	**92.3**	**53.1**	**65.5**	**1146.3**
Oakdale					41.3	42.3	**56.5**	49.2	**68.2**	**1528.3**
Richmond	43.1	**120.5**	**127.3**	**196.4**	46.6	47.4	**63.1**	43.0	39.0	**1637.3**
Rozelle				38.1	**54.1**	46.8	**50.3**	**54.4**	43.1	**1562.8**
Illawarra										
Albion Park Sth							**61.4**	**53.8**	**96.1**	**1359.6**
Kembla Grange					**58.8**	**60.5**	**86.0**	**59.2**	**100.8**	**1174.0**
Wollongong	**57.9**	**68.1**	**75.6**	**280.5**	49.0	**56.5**	**63.3**	**58.5**	**78.3**	**1145.4**
lower Hunter										
Beresfield	**55.7**	**82.0**	**165.6**	**87.0**	**53.1**	**53.1**	**51.9**	**64.0**	**59.9**	**1999.0**
Newcastle					46.7	48.3	**51.2**	**58.1**	**54.4**	**2426.8**
Regional										
Albury		29.8	**86.2**	**940.2**	**56.0**	**56.9**	**213.0**	**212.8**	**124.8**	**249.7**
Bathurst	34.9	35.8	**256.7**	**622.3**	**68.5**	44.9	**59.6**	**162.8**	**63.0**	**2114.4**
Tamworth	21.5	32.6	**197.1**	**241.6**	**56.2**	**88.7**	47.8	48.8	**100.4**	**1791.4**
Wagga Wagga		**69.6**	**193.2**	**970.0**	**109.0**	**161.9**	**188.3**	**110.3**	**294.9**	**297.4**

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 107: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Blacktown[(1)]/Prospect[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000[(1)]	94.8	0	34.9	29.8	28.5	24.1	21.1	18.0	14.6	11.6
2001[(1)]	93.2	3	**127.4**	**51.7**	42.5	35.7	32.2	25.0	18.8	14.0
2002[(1)]	93.4	11	**117.7**	**89.2**	**66.9**	44.9	33.8	25.2	18.5	14.6
2003[(1)]	94.8	5	**187.8**	**69.4**	43.6	34.8	29.3	21.8	16.9	12.7
2004[(1)]	35.8	0	44.1	43.4	41.9	39.2	33.7	27.4	22.6	18.1
2005[#]										
2006[#]										
2007[(2)]	82.7	0	46.3	43.3	41.6	33.4	28.1	21.9	16.8	12.4
2008[(2)]	88.5	0	41.8	39.6	35.0	32.6	27.5	21.0	16.4	12.8
2009[(2)]	96.4	11	**1680.3**	**135.3**	**60.7**	38.9	32.3	24.1	18.2	13.5

Station closed pending relocation.

Table 108: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Bringelly

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	88.5	0	37.4	32.6	31.2	27.5	23.1	18.3	14.8	12.0
2001	96.4	5	**98.4**	**62.6**	34.4	28.2	24.7	20.2	16.2	12.5
2002	97.3	12	**118.6**	**76.9**	**66.3**	41.3	34.2	25.3	18.4	13.7
2003	97.0	6	**275.1**	**56.0**	44.3	34.1	28.7	21.7	16.6	11.8
2004	93.4	2	**62.5**	46.0	41.6	35.1	30.7	24.8	18.9	13.2
2005	92.1	2	**54.5**	46.5	43.5	35.7	30.8	23.8	18.4	13.7
2006	88.8	3	**72.2**	**52.3**	42.6	33.4	29.3	25.0	19.0	14.5
2007	99.5	1	**51.0**	48.5	42.4	33.5	30.3	23.7	16.6	12.0
2008	97.0	1	**62.7**	35.2	33.0	28.6	24.6	19.3	14.4	10.6
2009	94.8	6	**1683.9**	**114.8**	47.4	37.1	31.9	22.8	17.0	12.4

Table 109: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Chullora[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2003 [(2)]	85.2	11	**213.7**	**61.1**	**57.5**	47.2	36.0	28.8	21.0	16.3
2004 [(2)]	90.7	3	**55.8**	49.8	46.2	39.0	34.2	27.2	21.2	16.1
2005 [(2)]	88.8	1	**50.7**	46.1	43.8	38.3	33.6	27.4	20.4	16.3
2006 [(2)]	97.0	3	**66.1**	49.2	38.6	34.4	31.1	26.4	21.3	16.5
2007 [(2)]	97.5	2	**66.5**	39.4	37.7	34.2	29.2	23.1	18.8	13.4
2008 [(2)]	97.0	0	44.3	38.8	36.5	33.0	30.2	23.7	18.6	13.9
2009 [(2)]	99.5	9	**1474.7**	**120.9**	**58.4**	38.0	32.8	25.1	20.0	14.9

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 110: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Liverpool

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	92.1	2	**66.0**	43.6	36.6	31.0	27.4	20.8	16.4	12.8
2001	94.5	2	**63.2**	39.1	35.7	30.6	28.5	22.6	18.0	13.2
2002	91.0	14	**126.3**	**83.8**	**72.5**	46.0	37.6	27.3	20.0	15.1
2003	90.1	6	**283.3**	**62.5**	45.8	37.4	32.3	25.3	19.4	14.8
2004	91.5	1	**62.1**	46.6	44.7	36.8	32.9	26.3	20.6	14.8
2005	96.4	2	**55.5**	48.1	43.7	38.1	32.5	26.5	20.2	15.1
2006	95.9	3	**75.2**	**50.5**	40.8	35.0	31.6	26.3	20.5	16.0
2007	95.3	1	**53.1**	41.3	39.1	35.9	30.3	23.7	17.6	12.8
2008	92.9	1	**53.8**	36.2	33.6	30.1	26.6	21.7	16.9	12.2
2009	93.7	8	**1579.8**	**114.8**	**59.5**	38.8	31.7	25.1	18.4	14.3

Table 111: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Macarthur

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2004	14.5	1	**60.6**	**60.6**	**53.8**	42.8	38.0	30.9	21.8	15.6
2005	83.6	1	**53.2**	46.6	41.9	35.7	31.3	24.4	18.1	13.7
2006	100.0	4	**92.3**	**53.5**	34.5	31.0	26.2	22.4	15.6	11.5
2007	96.4	1	**53.1**	38.0	36.7	29.8	25.8	20.1	14.7	10.4
2008	99.5	1	**65.5**	33.2	30.7	27.6	23.3	17.5	13.7	9.9
2009	96.7	7	**1146.3**	**111.4**	**56.2**	35.5	29.6	21.2	15.5	10.5

Table 112: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Oakdale

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2004	56.8	0	41.3	36.3	28.7	23.8	19.2	15.7	10.1	6.4
2005	92.9	0	42.3	38.8	32.5	27.7	22.2	16.6	12.4	8.4
2006	96.4	1	**56.5**	35.8	33.9	28.6	23.6	17.8	12.6	8.5
2007	97.3	0	49.2	36.4	32.2	25.4	22.4	16.4	11.2	7.2
2008	96.7	1	**68.2**	33.9	31.0	27.0	21.3	15.5	10.7	7.2
2009	91.2	6	**1528.3**	**130.2**	48.4	30.6	25.5	19.5	12.7	7.5

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 113: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Richmond

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	95.4	0	43.1	33.0	32.4	25.3	22.9	17.7	14.0	10.8
2001	84.7	4	**120.5**	**84.4**	34.3	28.1	25.4	20.2	16.2	12.0
2002	94.5	16	**127.3**	**106.2**	**84.7**	49.4	35.3	24.4	17.2	12.3
2003	96.7	7	**196.4**	**76.0**	**52.8**	35.4	28.8	21.1	15.7	11.3
2004	96.2	0	46.6	41.1	38.4	33.7	29.8	22.5	17.4	12.1
2005	97.0	0	47.4	43.8	37.3	30.3	25.8	20.1	15.3	11.5
2006	97.0	2	**63.1**	44.9	38.0	30.8	27.1	21.5	16.0	12.2
2007	98.4	0	43.0	34.4	33.4	28.6	24.3	18.6	13.6	10.0
2008	98.4	0	39.0	30.9	28.1	24.9	20.2	16.0	11.9	8.9
2009	95.9	6	**1637.3**	**121.7**	46.1	32.9	28.0	19.4	13.4	9.6

Table 114: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Rozelle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2003	9.9	0	38.1	38.1	38.0	37.2	31.7	22.4	18.7	16.2
2004	92.3	1	**54.1**	43.8	38.8	34.0	30.1	24.6	19.3	14.0
2005	95.1	0	46.8	42.6	39.3	35.2	31.4	24.3	18.8	14.9
2006	94.0	1	**50.3**	45.0	38.8	33.6	29.3	24.7	19.4	15.4
2007	97.5	1	**54.4**	38.2	36.1	30.7	27.1	21.7	17.2	13.2
2008	96.4	0	43.1	34.0	32.6	28.7	26.0	20.6	16.7	12.9
2009	95.3	8	**1562.8**	**128.5**	**55.8**	36.1	31.0	24.3	17.8	13.1

Table 115: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Albion Park[(1)]/Albion Park Sth[(2)]

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2006	85.8	2	**61.4**	42.3	38.6	35.9	29.4	21.7	15.3	10.5
2007	88.5	1	**53.8**	42.6	37.8	33.4	28.4	20.8	13.6	8.7
2008	97.0	1	**96.1**	40.0	35.3	29.7	25.2	18.2	13.0	9.4
2009	99.5	9	**1359.6**	**73.0**	**50.7**	38.0	31.6	22.8	15.4	10.1

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 116: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Kembla Grange

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2004	57.4	1	**58.8**	46.8	43.3	37.0	30.3	21.8	14.9	10.5
2005	97.8	4	**60.5**	**50.8**	46.8	39.1	33.6	23.4	17.1	12.2
2006	99.2	9	**86.0**	**69.6**	**54.5**	40.4	34.5	26.0	18.7	13.0
2007	99.5	5	**59.2**	**50.5**	46.6	39.0	33.2	24.3	17.7	12.1
2008	98.6	4	**100.8**	**52.8**	42.0	33.3	30.3	23.3	16.7	11.1
2009	99.2	14	**1174.0**	**134.4**	**67.0**	42.5	34.3	25.5	18.1	11.5

Table 117: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Wollongong

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	93.2	3	**57.9**	48.2	42.0	33.9	27.1	20.9	15.5	11.7
2001	97.3	5	**68.1**	**52.0**	45.6	37.0	31.0	22.6	16.7	12.0
2002	94.2	11	**75.6**	**65.9**	**57.3**	44.6	34.4	25.6	18.3	13.7
2003	98.1	8	**280.5**	**61.8**	**51.3**	34.7	29.3	21.4	16.8	12.4
2004	97.0	0	49.0	46.2	42.3	36.7	30.6	23.4	17.4	12.2
2005	97.3	1	**56.5**	45.6	41.9	34.5	29.8	23.6	16.7	12.6
2006	96.4	4	**63.3**	**52.6**	46.7	37.5	32.3	25.1	18.5	13.0
2007	95.3	3	**58.5**	49.3	42.7	37.8	31.8	24.7	18.3	13.1
2008	94.5	1	**78.3**	41.0	36.8	31.2	28.7	21.5	16.3	12.1
2009	95.9	6	**1145.4**	**107.0**	49.5	40.3	34.7	24.5	18.8	12.6

Table 118: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Beresfield

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	90.4	1	**55.7**	43.4	40.9	33.3	27.6	20.6	15.9	12.7
2001	90.1	4	**82.0**	**51.6**	44.9	39.3	32.5	25.8	19.9	15.1
2002	80.5	25	**165.6**	**103.4**	**71.2**	**56.7**	47.3	33.2	21.7	16.1
2003	91.2	5	**87.0**	**60.7**	47.5	34.0	29.0	22.7	17.5	13.1
2004	87.2	1	**53.1**	47.2	43.8	39.2	33.1	24.9	19.3	14.0
2005	95.9	1	**53.1**	44.3	41.1	37.0	31.7	25.2	18.6	14.6
2006	96.4	2	**51.9**	44.5	43.2	36.8	34.2	26.7	18.7	14.6
2007	90.1	5	**64.0**	**55.1**	49.3	41.8	32.1	25.2	18.4	13.1
2008	95.4	5	**59.9**	**52.5**	38.3	32.3	27.3	21.5	16.9	13.4
2009	98.6	15	**1999.0**	**174.3**	**70.6**	47.7	35.3	26.2	18.4	14.2

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 119: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Newcastle

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2004	19.4	0	46.7	46.6	46.6	39.4	34.1	27.3	21.7	17.0
2005	81.6	0	48.3	41.7	39.3	35.7	31.8	26.4	20.9	16.5
2006	97.3	1	**51.2**	43.2	38.1	34.2	30.8	25.6	20.5	15.8
2007	47.1	3	**58.1**	**56.8**	49.9	39.5	33.6	26.8	21.5	17.2
2008	93.2	2	**54.4**	44.2	39.6	34.4	31.4	24.8	19.1	15.1
2009	93.2	13	**2426.8**	**119.5**	**71.2**	44.9	37.0	28.1	22.3	16.5

Table 120: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Albury

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2001	31.8	0	29.8	27.8	25.3	22.7	20.5	17.2	12.2	9.6
2002	82.5	5	**86.2**	**62.5**	45.2	38.9	31.0	22.9	16.0	12.9
2003	80.8	29	**940.2**	**272.5**	**201.3**	**95.2**	49.3	23.1	14.2	9.7
2004	77.3	2	**56.0**	45.0	41.0	36.7	32.2	18.6	13.2	9.9
2005	90.1	3	**56.9**	**50.4**	41.0	36.2	30.7	20.4	14.3	10.9
2006	87.9	14	**213.0**	**114.8**	**75.8**	48.1	35.4	24.0	17.8	13.3
2007	91.2	11	**212.8**	**117.3**	**91.5**	44.9	31.4	22.3	15.2	11.0
2008	96.4	8	**124.8**	**67.8**	**53.5**	40.2	29.5	20.5	14.3	9.9
2009	96.7	15	**249.7**	**144.0**	**102.0**	39.0	28.5	19.3	14.0	10.1

Table 121: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Bathurst

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	32.5	0	34.9	34.3	33.5	29.8	23.6	18.0	12.5	8.9
2001	29.9	0	35.8	35.5	34.9	32.2	28.7	22.5	16.5	12.3
2002	91.5	16	**256.7**	**98.3**	**71.9**	48.9	35.9	25.0	16.7	12.5
2003	90.4	12	**622.3**	**122.2**	**74.1**	34.8	27.9	17.2	13.0	8.9
2004	88.5	4	**68.5**	**54.9**	47.0	39.0	33.0	24.4	15.3	9.8
2005	93.2	0	44.9	40.8	36.3	30.4	25.4	18.6	12.9	8.9
2006	98.6	3	**59.6**	46.0	44.3	35.2	28.6	22.3	15.4	11.5
2007	95.1	2	**162.8**	48.6	38.9	32.0	26.6	19.2	13.5	9.2
2008	94.8	1	**63.0**	40.8	35.9	28.8	24.1	16.9	12.3	8.8
2009	97.8	12	**2114.4**	**122.4**	**69.8**	36.9	26.8	20.3	13.8	9.0

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Table 122: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Tamworth

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	21.0	0	21.5	21.3	20.2	19.2	18.5	15.3	11.5	8.5
2001	97.0	0	32.6	26.9	24.8	22.6	20.3	16.6	12.9	10.0
2002	99.2	7	**197.1**	**70.1**	**51.5**	41.3	33.7	23.2	17.5	13.0
2003	92.9	7	**241.6**	**70.7**	**51.4**	34.7	25.8	19.7	15.1	11.4
2004	79.2	2	**56.2**	47.0	40.4	34.8	31.0	24.8	19.4	15.4
2005	68.2	2	**88.7**	42.9	33.7	29.8	27.4	20.6	14.8	10.6
2006	79.2	0	47.8	39.0	36.7	29.3	26.7	21.3	15.0	11.0
2007	73.7	0	48.8	42.3	34.5	30.3	26.2	19.4	14.7	10.1
2008	85.8	3	**100.4**	**52.0**	40.7	30.5	23.8	18.7	14.0	10.5
2009	96.7	17	**1791.4**	**235.9**	**120.7**	47.0	33.8	22.8	15.7	11.4

Table 123: Statistical summary for PM_{10} - 24-hour average concentrations
Station: Wagga Wagga

Year	Data availability rates (%)	Number of Exceedances (days)	Maximum value (ug/m3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2001	31.2	2	**69.6**	**60.7**	43.0	32.6	29.0	22.7	17.0	12.2
2002	99.2	34	**193.2**	**123.3**	**101.9**	**60.7**	48.7	33.6	24.6	17.1
2003	87.4	21	**970.0**	**133.9**	**101.9**	**56.7**	44.6	28.9	19.3	12.8
2004	91.0	28	**109.0**	**70.5**	**68.5**	**61.3**	47.0	33.2	21.5	13.8
2005	90.7	27	**161.9**	**80.9**	**72.4**	**59.5**	46.4	30.4	19.8	14.1
2006	95.6	37	**188.3**	**110.0**	**86.8**	**61.1**	**50.7**	36.2	24.9	16.9
2007	97.5	34	**110.3**	**82.0**	**75.2**	**61.0**	47.5	33.0	21.7	14.8
2008	93.7	23	**294.9**	**70.6**	**62.6**	**53.2**	45.1	28.4	21.0	14.5
2009	82.5	21	**297.4**	**214.4**	**112.3**	**55.9**	46.2	30.6	19.8	12.4

AAQ NEPM Standard – 50 µg/m^3 (24-hour average)

Bold font indicates values that exceed the AAQ NEPM standard

Particles as $PM_{2.5}$

Statistical summary

Table 124: Statistical summary for $PM_{2.5}$ - Daily 24-hour average concentrations (2009) – continuous TEOM method

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (µg/m^3)	Percentiles (µg/m^3)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Chullora	98.6	**183.2**	18.9	17.2	14.0	11.1	8.5	5.9	3.9
Earlwood	75.6	**186.7**	22.5	18.9	13.9	11.3	8.2	5.2	3.4
Liverpool	95.1	**268.2**	**25.2**	19.9	15.0	12.9	9.7	6.7	4.2
Richmond	89.3	**192.3**	23.0	16.9	11.5	9.8	6.7	4.4	2.8
Illawarra									
Wollongong	96.2	**241.0**	23.0	19.3	15.0	12.0	8.3	5.6	3.4
lower Hunter									
Beresfield	94.0	**230.9**	**34.4**	21.5	16.3	13.6	9.6	6.6	4.7
Wallsend	90.7	**415.6**	**38.4**	20.3	14.3	12.5	8.1	5.4	3.8

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

Trend data

Annual averages and annual maximum 24-hour averages for all stations are given below.

Table 125: Maximum 24-hour average concentrations for $PM_{2.5}$ (µg/m^3) – continuous TEOM method

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Chullora				**81.2**	23.5	**25.4**	**32.8**	20.5	19.5	**183.2**
Earlwood	**31.4**	**76.4**	**50.5**	**35.3**	20.1	**26.8**	**29.0**	19.8	18.3	**186.7**
Liverpool	**42.7**	**112.2**	**78.7**	**45.9**	**38.9**	**30.8**	**48.1**	23.0	**32.1**	**268.2**
Richmond	13.6	**95.5**	**95.4**	**57.2**	23.3	22.7	**31.6**	21.1	17.7	**192.3**
Illawarra										
Warrawong	**30.8**	19.8	**83.5**	**152.6**	23.6	24.0	15.0			
Wollongong	**28.7**	**46.7**	**86.2**	**106.0**	22.6	22.0	**26.6**	22.5	14.7	**241.0**
lower Hunter										
Beresfield	**31.9**	**62.5**	**47.0**	**42.8**	**27.8**	19.5	24.9	23.0	16.9	**230.9**
Wallsend	**59.1**	**51.7**	**55.6**	**30.2**	23.5	18.0	**25.6**	18.0	22.7	**415.6**

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

$PM_{2.5}$ 24 hour average

NEPM Annual Compliance reports prior to 2009 included 24 hour daily average calculations for $PM_{2.5}$ using hours 0 to 23. Daily averages are now calculated using hours 1 to 24 as detailed in the NEPM

Technical Paper No. 5, "Data Collection and Handling". Accordingly, in the following tables, Table B4, B6, B7 and B9 to B14, the calculation of the 24 hour daily averages for 2009, differs in comparison to previous years.

$PM_{2.5}$ TEOM 24 hour daily averages reported in 2009 will differ from those reported in previous NEPM reports as the US EPA PM_{10} equivalence factor has been removed from all of the data, whereas in the past it has been left in.

Table 126: Annual average concentrations for $PM_{2.5}$ (µg/m^3) - continuous TEOM method

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Chullora				**11.0**	**8.6**	7.6	7.2	6.4	5.9	7.1
Earlwood	7.1	**8.3**	**9.5**	7.8	7.6	7.1	6.9	5.9	5.4	6.8
Liverpool	7.2	**8.5**	**11.8**	**10.3**	**9.2**	**8.3**	**8.8**	7.2	6.4	**8.2**
Richmond	3.8	7.1	**9.0**	6.8	6.4	5.8	5.9	6.4	7.3	5.8
Illawarra										
Warrawong	5.9	6.6	**9.4**	**8.7**	**8.1**	7.4	6.0			
Wollongong	5.1	6.1	**8.3**	7.3	6.6	6.3	6.3	5.9	5.2	7.0
lower Hunter										
Beresfield	5.6	**9.1**	**10.4**	6.1	7.7	6.8	6.8	6.3	5.9	**8.4**
Wallsend	5.2	6.9	**8.1**	6.6	6.7	6.5	6.4	5.8	5.8	8.0

AAQ NEPM advisory reporting standard - 8µg/m^3 (annual average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=0 and B=1.00

Statistical trends

Table 127: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method
Station: Chullora

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2003	70.4	7	**81.2**	**36.5**	**25.3**	19.2	16.8	13.1	9.7	7.6
2004	89.6	0	23.5	20.0	18.5	15.9	14.0	10.9	7.9	5.7
2005	93.2	2	**25.4**	19.5	17.2	15.1	12.9	9.2	6.7	5.0
2006	94.2	2	**32.8**	16.6	14.6	13.1	11.4	8.8	6.4	4.8
2007	65.5	0	20.5	17.4	16.8	13.4	11.9	8.1	5.4	3.7
2008	96.7	0	19.5	16.6	14.4	11.8	9.9	7.6	5.4	3.7
2009	98.6	3	**183.2**	18.9	17.2	14.0	11.1	8.5	5.9	3.9

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=0 and B=1.00

Table 128: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method
Station: Earlwood

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	84.7	2	**31.4**	20.3	17.2	14.8	13.4	8.6	6.1	4.2
2001	93.4	6	**76.4**	**48.7**	22.1	17.4	15.0	9.8	6.6	4.4
2002	98.9	9	**50.5**	**47.1**	**28.6**	19.9	17.3	11.7	7.8	4.9
2003	98.6	5	**35.3**	**30.4**	24.2	16.3	14.3	9.7	6.5	4.5
2004	96.2	0	20.1	19.5	18.0	15.1	13.1	10.1	6.8	4.5
2005	98.9	2	**26.8**	20.1	18.7	14.0	12.2	9.1	6.1	4.4
2006	98.6	2	**29.0**	17.8	15.1	13.1	11.6	8.3	6.4	4.4
2007	96.7	0	19.8	16.8	15.6	12.2	10.5	7.8	5.2	3.3
2008	98.6	0	18.3	15.3	14.7	11.3	9.6	7.2	4.9	3.2
2009	75.6	1	**186.7**	22.5	18.9	13.9	11.3	8.2	5.2	3.4

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=0 and B=1.00

Table 129: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Liverpool

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.8	2	**42.7**	22.2	19.3	14.4	12.0	9.0	6.3	4.4
2001	97.8	6	**112.2**	**52.4**	19.8	16.2	13.8	10.0	7.0	4.6
2002	96.7	19	**78.7**	**46.8**	**35.0**	**25.9**	22.2	14.6	9.6	6.3
2003	65.8	6	**45.9**	**42.9**	**29.4**	20.7	17.2	13.4	8.8	6.3
2004	85.5	4	**38.9**	**27.3**	23.3	17.2	15.8	11.8	8.5	5.1
2005	91.2	2	**30.8**	24.2	22.0	17.2	15.3	10.9	7.3	4.9
2006	98.6	3	**48.1**	22.2	18.5	15.8	14.1	11.0	8.3	5.9
2007	94.8	0	23.0	19.4	18.3	15.2	12.1	9.2	6.6	4.3
2008	92.6	1	**32.1**	16.6	14.9	12.2	10.6	8.3	5.8	3.9
2009	95.1	3	**268.2**	**25.2**	19.9	15.0	12.9	9.7	6.7	4.2

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=0 and B=1.00

Table 130: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Richmond

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	96.7	0	13.6	11.1	10.2	8.5	7.5	5.0	3.2	2.0
2001	58.9	3	**95.5**	**64.5**	18.4	13.4	10.9	7.6	5.6	3.4
2002	64.4	9	**95.4**	**56.0**	**41.6**	22.1	15.1	10.3	6.8	3.8
2003	95.9	6	**57.2**	**39.9**	24.5	15.7	11.7	7.8	5.2	3.4
2004	96.7	0	23.3	20.1	17.7	14.2	11.5	8.5	5.7	3.4
2005	83.8	0	22.7	15.7	14.5	12.4	10.8	7.3	4.9	3.3
2006	84.9	1	**31.6**	17.4	13.1	10.9	9.3	7.4	5.3	3.8
2007	12.9	0	21.1	18.6	16.0	13.6	9.5	7.7	6.0	4.3
2008	98.9	0	17.7	14.6	13.7	12.3	10.5	8.6	6.9	5.6
2009	89.3	3	**192.3**	23.0	16.9	11.5	9.8	6.7	4.4	2.8

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=0 and B=1.00

Table 131: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Warrawong

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.3	2	**30.8**	17.9	15.8	12.1	9.9	7.3	5.1	3.6
2001	95.1	0	19.8	18.1	17.2	14.5	11.7	8.8	5.7	3.6
2002	96.7	10	**83.5**	**42.4**	**30.3**	21.7	17.4	11.9	7.4	4.9
2003	98.4	4	**152.6**	**26.0**	21.4	17.7	14.4	10.9	7.5	5.0
2004	94.5	0	23.6	21.0	18.6	17.0	14.4	10.8	7.2	4.8
2005	94.5	0	24.0	21.0	18.7	15.7	13.2	9.7	6.5	4.3
2006	40.5	0	15.0	15.0	14.0	12.5	10.8	8.3	5.9	3.3

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

Table 132: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Wollongong

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	100.0	1	**28.7**	15.3	14.0	11.9	9.2	6.5	4.5	3.1
2001	96.2	2	**46.7**	17.8	16.1	14.0	11.4	7.7	5.0	3.2
2002	95.6	11	**86.2**	**46.4**	**26.1**	21.9	15.0	10.3	6.3	4.0
2003	97.0	5	**106.0**	**30.9**	20.8	15.2	12.6	8.6	6.0	4.2
2004	97.0	0	22.6	19.1	17.6	14.5	12.3	8.9	5.9	3.6
2005	97.8	0	22.0	18.0	16.6	13.0	11.9	8.2	5.5	3.8
2006	100.0	2	**26.6**	17.4	14.4	12.5	11.2	8.4	5.7	3.6
2007	98.4	0	22.5	18.5	16.3	13.7	10.8	7.7	5.2	3.2
2008	94.0	0	14.7	14.2	13.0	10.7	9.3	7.0	4.8	3.0
2009	96.2	3	**241.0**	23.0	19.3	15.0	12.0	8.3	5.6	3.4

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

Table 133: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Beresfield

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value ($\mu g/m^3$)	Percentiles ($\mu g/m^3$)						
				99th	98th	95th	90th	75th	50th	25th
2000	85.2	1	**31.9**	21.1	17.0	11.7	10.1	6.8	4.7	3.2
2001	68.8	5	**62.5**	**30.9**	**26.0**	18.1	15.4	11.8	7.9	5.0
2002	95.1	19	**47.0**	**42.8**	**36.3**	**26.1**	18.7	12.4	8.2	5.5
2003	90.7	3	**42.8**	**26.7**	19.8	14.3	10.7	7.7	5.1	3.1
2004	90.4	1	**27.8**	20.3	19.6	16.5	13.3	9.8	7.1	4.6
2005	93.7	0	19.5	17.8	16.3	14.9	12.2	8.8	5.9	4.1
2006	98.9	0	24.9	17.8	15.5	13.3	11.4	8.5	5.9	4.3
2007	86.0	0	23.0	17.2	15.9	13.6	11.5	8.4	5.5	3.5
2008	92.1	0	16.9	15.1	13.9	11.7	9.7	7.7	5.7	3.6
2009	94.0	5	**230.9**	**34.4**	21.5	16.3	13.6	9.6	6.6	4.7

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

Table 134: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Wallsend

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value ($\mu g/m^3$)	Percentiles ($\mu g/m^3$)						
				99th	98th	95th	90th	75th	50th	25th
2000	88.5	1	**59.1**	14.7	13.1	11.0	9.6	6.7	4.3	3.0
2001	94.8	4	**51.7**	**30.3**	22.3	14.6	12.2	8.3	5.4	3.9
2002	85.5	9	**55.6**	**40.5**	**29.4**	19.5	14.2	9.5	6.1	4.2
2003	88.2	2	**30.2**	22.9	18.5	13.4	11.1	8.7	5.5	3.8
2004	87.4	0	23.5	17.4	15.2	12.8	11.0	8.5	5.8	4.2
2005	95.9	0	18.0	16.5	15.3	13.3	11.3	8.3	5.8	4.1
2006	99.2	1	**25.6**	16.6	14.5	12.1	10.5	8.2	5.8	4.1
2007	92.3	0	18.2	15.2	14.9	12.3	10.0	7.5	5.1	3.3
2008	87.7	0	22.7	18.3	14.7	12.0	10.1	7.5	5.1	3.4
2009	90.7	5	**415.6**	**38.4**	20.3	14.3	12.5	8.1	5.4	3.8

AAQ NEPM advisory reporting standard - 25$\mu g/m^3$ (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data-uses USEPA factors of A=0 and B=1.00

Statistical summary

Table 135: Statistical summary for $PM_{2.5}$ equivalency study- Daily 24-hour average concentrations (2009) – FRM method

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (µg/m^3)	Percentiles (µg/m^3)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Chullora	87.6	**27.5**	**26.7**	19.1	13.1	11.3	9.1	5.4	3.8

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* data availability rates are based on a one day in three sampling regime.

** Please note that sampling at the Richmond site ceased at the end of 2007

Trend data

Annual averages and annual maximum 24-hour averages for all stations are given below. Please note that monitoring as part of this study did not begin until February 2005, and monitoring ceased at Richmond in September 2007 due to technical issues. Please note that the data availability rates are based on a one day in three sampling regime.

Table 136: Maximum 24-hour average concentrations for $PM_{2.5}$ equivalency study (µg/m^3) – FRM method

Region/ Performance monitoring Station	2005	2006	2007	2008	2009
Sydney					
Chullora	**27.8**	**30.0**	19.2	22.1	**27.5**
Richmond	**28.8**	**45.8**	18.3		

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* data availability rates are based on a one day in three sampling regime.

** Please note that monitoring at Richmond ceased in 2007

Table 137: Annual average concentrations for $PM_{2.5}$ equivalency study (µg/m^3) – FRM method

Region/ Performance monitoring Station	2005	2006	2007	2008	2009
Sydney					
Chullora	7.3	6.8	6.7	6.1	6.7
Richmond	6.4	6.5	6.6		

AAQ NEPM advisory reporting standard - 8µg/m^3 (annual average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* data availability rates are based on a one day in three sampling regime.

** Please note that monitoring at Richmond ceased in 2007

Table 138: Statistical summary for $PM_{2.5}$ equivalency study- 24-hour average concentrations – FRM method

Station: Chullora

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2005	72.1	1	**27.8**	19.1	17.6	13.0	11.7	9.2	6.7	4.6
2006	84.4	1	**30.0**	20.3	16.6	13.3	11.2	8.3	5.8	4.1
2007	80.3	0	19.2	15.5	14.6	13.8	11.4	8.2	5.8	4.0
2008	88.5	0	22.1	19.2	14.3	11.5	10.5	7.2	5.4	4.0
2009	87.6	2	**27.5**	**26.7**	19.1	13.1	11.3	9.1	5.4	3.8

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

- data availability rates are based on a one day in three sampling regime.

Table 139: Statistical summary for $PM_{2.5}$ equivalency study- 24-hour average concentrations – FRM method

Station: Richmond

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2005	69.7	2	**28.8**	**27.7**	21.3	13.3	11.5	7.5	5.0	3.3
2006	68.9	1	**45.8**	19.3	13.0	11.3	10.6	8.0	5.8	3.6
2007	49.2	0	18.3	16.8	15.7	15.4	11.8	8.8	5.6	3.6

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* data availability rates are based on a one day in three sampling regime.

** Please note that sampling at the Richmond site ceased at the end of 2007

References

Bureau of Meteorology, Monthly Weather Review NSW September 2009, Accessed on 05-05-2010
http://www.bom.gov.au/climate/mwr/nsw/mwr-nsw-200909.pdf

Appendix A

Historically, $PM_{2.5}$ data collected by TEOM and reported in NSW ANEPM Compliance Reports until 2008 were reported with the US EPA internal PM_{10} FEM adjustment factors applied.

In the case of PM_{10}, an internal linear correction of y = 3.0 + 1.03x is automatically applied to obtain US EPA equivalence against the PM_{10} Federal Reference Measure (FRM). In this adjustment, y is the adjusted PM_{10} TEOM value (the equivalent FRM value), x is the actual PM_{10} TEOM reading, 1.03 is the slope of the linear correction and 3.0 is the y-intercept. This internal correction is only intended to apply to PM_{10} particle data and with this internal adjustment, PM_{10}TEOMs are designated by the US EPA as a Federal Equivalent Method (FEM).

In the absence of any equivalency factors for $PM_{2.5}$, a conservative decision was made to retain the internal FEM adjustment factors until such time as equivalency issues for $PM_{2.5}$ TEOMs had been resolved. Thus, prior to the 2009 Annual ANEPM Compliance Report, all $PM_{2.5}$ TEOM data were reported with the US EPA internal PM_{10} adjustment factors included.

Recent work with collocated Federal Reference Method (batch lo-vol samplers) and continuous TEOM $PM_{2.5}$ instruments under the National $PM_{2.5}$ Equivalency Project has suggested that the unadjusted continuous TEOM $PM_{2.5}$ data closely approximates the $PM_{2.5}$ FRM data. This suggests that the application of the internal PM_{10} FEM adjustment factors is not required for TEOM $PM_{2.5}$ data.

However, until the findings of the national $PM_{2.5}$ Equivalence Project are analysed and reported, NSW will report both sets of data with and without the PM_{10} FEM internal adjustment factors.

This appendix therefore presents the $PM_{2.5}$ 24hr averaged TEOM data with the US EPA internal PM_{10} adjustment factors applied. These factors are A = 3 and B = 1.03 where y = A + Bx. The $PM_{2.5}$ 24hr averaged data presented in the main body of the report has factors of A = 0 and B = 1 applied. This additional data is included as a comparison and to highlight the affect of including the PM_{10} equivalency factors to the $PM_{2.5}$ data.

Section B

Particles as $PM_{2.5}$

Table A1: Summary of $PM_{2.5}$ concentrations in NSW (2009) – continuous TEOM method

Advisory Reporting Standard
25 µg/m^3 (24-hour average)
8 µg/m^3 (Annual average)

Region/ Performance monitoring station	Data availability rates (% of hours)					Days above ARS	Annual mean (µg/m^3)
	Q1	Q2	Q3	Q4	Annual		
Sydney							
Chullora	96.4	90.9	92.2	92.3	92.9	3	**10.3**
Earlwood	96.7	68.5	37.5	96.6	74.7	3	**10.0**
Liverpool	87.5	96.5	97.7	93.2	93.8	5	**11.4**
Richmond	84.6	83.7	71.6	91.3	82.8	4	**9.0**
Illawarra							
Wollongong	97.4	96.4	95.1	87.0	93.9	4	**10.2**
Lower Hunter							
Beresfield	95.2	96.0	95.9	79.2	91.5	8	**11.7**
Wallsend	86.7	97.0	81.7	88.2	87.6	5	**11.2**

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Section C

Particles as $PM_{2.5}$

Table A2: Summary for $PM_{2.5}$ – Maximum 24-hour average concentrations (2009) – continuous TEOM method

Region/ Performance monitoring Station	Data availability rates (%)	Number of valid days	Maximum values (ppm)			
			Highest Value	Highest Date	2nd Highest Value	2nd Highest Date
Sydney						
Chullora	89.3	360	**191.7**	23/09/2009	**31.7**	16/04/2009
Earlwood	75.6	276	**195.3**	23/09/2009	**27.0**	20/09/2009
Liverpool	95.1	347	**279.2**	23/09/2009	**44.5**	16/04/2009
Richmond	98.6	326	**201.1**	23/09/2009	**31.7**	16/04/2009
Illawarra						
Wollongong	96.2	351	**251.2**	23/09/2009	**33.7**	16/04/2009
lower Hunter						
Beresfield	94.0	343	**240.8**	23/09/2009	**63.5**	16/04/2009
Wallsend	90.7	331	**431.1**	23/09/2009	**55.1**	29/11/2009

AAQ NEPM advisory reporting standard – 25 µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Section D

Particles as $PM_{2.5}$

Statistical summary

Table A3: Statistical summary for $PM_{2.5}$ - Daily 24-hour average concentrations (2009) – continuous TEOM method

Region/ Performance monitoring Station	Data availability rates (%)	Maximum conc. (µg/m^3)	Percentiles (µg/m^3)						
			99th	98th	95th	90th	75th	50th	25th
Sydney									
Chullora	98.6	**191.7**	22.5	20.7	17.4	14.4	11.8	9.1	7.0
Earlwood	75.6	**195.3**	**26.2**	22.5	17.3	14.6	11.4	8.4	6.5
Liverpool	95.1	**279.2**	**29.0**	23.5	18.4	16.3	13.0	9.9	7.3
Richmond	89.3	**201.1**	**26.7**	20.4	14.8	13.1	9.9	7.5	5.9
Illawarra									
Wollongong	96.2	**251.2**	**26.7**	22.9	18.4	15.4	11.5	8.8	6.5
lower Hunter									
Beresfield	94.0	**240.8**	**38.4**	**25.1**	19.8	17.0	12.9	9.8	7.8
Wallsend	90.7	**431.1**	**42.6**	23.9	17.7	15.9	11.3	8.6	6.9

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Trend data

Annual averages and annual maximum 24-hour averages for all stations are given below.

Table A4: Maximum 24-hour average concentrations for $PM_{2.5}$ (µg/m^3) – continuous TEOM method

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Chullora				**86.6**	**27.2**	**29.2**	**36.8**	24.1	23.1	**191.7**
Earlwood	**35.3**	**81.7**	**55.0**	**39.4**	23.7	**30.6**	**32.9**	23.4	21.8	**195.3**
Liverpool	**47.0**	**118.6**	**84.1**	**50.3**	**43.1**	**34.7**	**52.5**	**26.7**	**36.1**	**279.2**
Richmond	17.0	**101.4**	**101.3**	**61.9**	**27.0**	**26.4**	**35.5**	24.7	21.2	**201.1**
Illawarra										
Warrawong	**34.7**	23.4	**89.0**	**160.2**	**27.3**	**27.7**	18.4			
Wollongong	**32.6**	**51.1**	**91.8**	**112.2**	**26.3**	**25.7**	**30.4**	**26.2**	18.1	**251.2**
lower Hunter										
Beresfield	**35.9**	**67.4**	**51.4**	**47.1**	**31.6**	23.1	**28.6**	**26.7**	20.4	**240.8**
Wallsend	**63.9**	**56.3**	**60.3**	**34.1**	**27.2**	21.5	**29.4**	21.7	**26.4**	**431.1**

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

$PM_{2.5}$ 24 hour average

NEPM Annual Compliance reports prior to 2009 included 24 hour daily average calculations for $PM_{2.5}$ using hours 0 to 23. Daily averages are now calculated using hours 1 to 24 as detailed in the NEPM Technical Paper No. 5, "Data Collection and Handling". Accordingly, in the following tables, Table B4, B6, B7 and B9 to B14, the calculation of the 24 hour daily averages for 2009, differs in comparison to previous years.

Table A5: Annual average concentrations for $PM_{2.5}$ (µg/m^3) - continuous TEOM method

Region/ Performance monitoring Station	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sydney										
Chullora				**14.3**	**11.9**	**10.8**	**10.4**	**9.6**	**9.1**	**10.3**
Earlwood	**10.3**	**11.6**	**12.8**	**11.0**	**10.8**	**10.3**	**10.1**	**9.1**	**8.6**	**10.0**
Liverpool	**10.4**	**11.8**	**15.2**	**13.6**	**12.5**	**11.6**	**12.1**	**10.4**	**9.6**	**11.4**
Richmond	6.9	**10.3**	**12.3**	**10.0**	**9.6**	**9.0**	**9.1**	**9.6**	**10.5**	**9.0**
Illawarra										
Warrawong	**9.1**	**9.8**	**12.7**	**12.0**	**11.3**	**10.6**	**9.2**			
Wollongong	**8.3**	**9.3**	**11.6**	**10.5**	**9.8**	**9.5**	**9.5**	**9.1**	**8.4**	**10.2**
lower Hunter										
Beresfield	**8.8**	**12.4**	**13.7**	**9.3**	**10.9**	**10.0**	**10.0**	**9.5**	**9.1**	**11.7**
Wallsend	**8.4**	**10.1**	**11.3**	**9.8**	**9.9**	**9.7**	**9.6**	**9.0**	**9.0**	**11.2**

AAQ NEPM advisory reporting standard - 8µg/m^3 (annual average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A6: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method
Station: Chullora

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2003	70.4	9	**86.6**	**40.6**	**29.1**	22.8	20.3	16.5	13.0	10.8
2004	89.6	2	**27.2**	23.6	22.1	19.4	17.4	14.2	11.1	8.9
2005	93.2	3	**29.2**	23.1	20.7	18.6	16.3	12.5	9.9	8.2
2006	94.2	2	**36.8**	20.1	18.0	16.5	14.7	12.1	9.6	7.9
2007	65.5	0	24.1	20.9	20.3	16.8	15.3	11.3	8.6	6.8
2008	96.7	0	23.1	20.1	17.8	15.2	13.2	10.8	8.6	6.8
2009	98.6	3	**191.2**	22.5	20.7	17.4	14.4	11.8	9.1	7.0

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A7: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method
Station: Earlwood

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	84.7	3	**35.3**	23.9	20.7	18.2	16.8	11.9	9.3	7.3
2001	93.4	7	**81.7**	**53.2**	**25.8**	20.9	18.4	13.1	9.8	7.5
2002	98.9	15	**55.0**	**51.5**	**32.5**	23.5	20.8	15.1	11.0	8.0
2003	98.6	9	**39.4**	**34.3**	**27.9**	19.8	17.7	13.0	9.7	7.6
2004	96.2	0	23.7	23.1	21.5	18.6	16.5	13.4	10.0	7.6
2005	98.9	2	**30.6**	23.7	22.3	17.4	15.6	12.4	9.3	7.5
2006	98.6	3	**32.9**	21.3	18.6	16.5	14.9	11.6	9.6	7.5
2007	96.7	0	23.4	20.3	19.1	15.6	13.8	11.0	8.4	6.4
2008	98.6	0	21.8	18.8	18.1	14.6	12.9	10.4	8.0	6.3
2009	75.6	3	**195.3**	**26.2**	22.5	17.3	14.6	11.4	8.4	6.5

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A8: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Liverpool

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.8	4	**47.0**	**25.9**	22.9	17.8	15.4	12.3	9.5	7.5
2001	97.8	6	**118.6**	**57.0**	23.4	19.7	17.2	13.3	10.2	7.7
2002	96.7	38	**84.1**	**51.2**	**39.1**	**29.7**	**25.9**	18.0	12.9	9.5
2003	65.8	11	**50.3**	**47.2**	**33.3**	24.3	20.7	16.8	12.1	9.5
2004	85.5	9	**43.1**	**31.1**	**27.0**	20.7	19.3	15.2	11.8	8.3
2005	91.2	7	**34.7**	**27.9**	**25.7**	20.7	18.8	14.2	10.5	8.0
2006	98.6	3	**52.5**	**25.9**	22.1	19.3	17.5	14.3	11.5	9.1
2007	94.8	2	**26.7**	23.0	21.8	18.7	15.5	12.5	9.8	7.4
2008	92.6	1	**36.1**	20.1	18.3	15.6	13.9	11.6	9.0	7.0
2009	95.1	5	**279.2**	**29.0**	23.5	18.4	16.3	13.0	9.9	7.3

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A9: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Richmond

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	96.7	0	17.0	14.4	13.5	11.8	10.7	8.2	6.3	5.1
2001	58.9	3	**101.4**	**69.4**	22.0	16.8	14.2	10.8	8.8	6.5
2002	64.4	13	**101.3**	**60.7**	**45.8**	**25.8**	18.6	13.6	10.0	6.9
2003	95.9	10	**61.9**	**44.1**	**28.2**	19.2	15.1	11.0	8.4	6.5
2004	96.7	2	**27.0**	23.7	21.2	17.6	14.8	11.8	8.9	6.5
2005	83.8	1	**26.4**	19.2	17.9	15.8	14.1	10.5	8.0	6.4
2006	84.9	2	**35.5**	20.9	16.5	14.2	12.6	10.6	8.5	6.9
2007	12.9	0	24.7	22.2	19.5	17.0	12.8	10.9	9.2	7.4
2008	98.9	0	21.2	18.0	17.1	15.7	13.8	11.9	10.1	8.8
2009	89.3	4	**201.1**	**26.7**	20.4	14.8	13.1	9.9	7.5	5.9

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A10: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Warrawong

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	97.3	3	**34.7**	21.4	19.3	15.5	13.2	10.5	8.3	6.7
2001	95.1	0	23.4	21.6	20.7	17.9	15.1	12.1	8.9	6.7
2002	96.7	18	**89.0**	**46.7**	**34.2**	**25.3**	20.9	15.3	10.6	8.0
2003	98.4	7	**160.2**	**29.8**	25.0	21.2	17.8	14.2	10.7	8.1
2004	94.5	3	**27.3**	24.6	22.2	20.5	17.8	14.1	10.4	7.9
2005	94.5	3	**27.7**	24.6	22.3	19.2	16.6	13.0	9.7	7.4
2006	40.5	0	18.4	18.4	17.4	15.9	14.1	11.5	9.1	6.4

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A11: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Wollongong

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	100.0	1	**32.6**	18.8	17.4	15.3	12.5	9.7	7.6	6.2
2001	96.2	2	**51.1**	21.3	19.6	17.4	14.7	10.9	8.1	6.3
2002	95.6	18	**91.8**	**50.8**	**29.9**	**25.6**	18.4	13.6	9.5	7.1
2003	97.0	7	**112.2**	**34.8**	24.4	18.7	16.0	11.9	9.2	7.3
2004	97.0	2	**26.3**	22.7	21.1	17.9	15.7	12.2	9.1	6.7
2005	97.8	1	**25.7**	21.5	20.1	16.4	15.3	11.4	8.7	6.9
2006	100.0	2	**30.4**	20.9	17.8	15.9	14.5	11.7	8.9	6.7
2007	98.4	1	**26.2**	22.1	19.8	17.1	14.1	10.9	8.4	6.3
2008	94.0	0	18.1	17.6	16.4	14.0	12.6	10.2	7.9	6.1
2009	96.2	4	**251.2**	**26.7**	22.9	18.4	15.4	11.5	8.8	6.5

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A12: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Beresfield

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	85.2	3	**35.9**	24.7	20.5	15.0	13.4	10.0	7.8	6.3
2001	68.8	8	**67.4**	**34.8**	**29.8**	21.6	18.9	15.2	11.1	8.2
2002	95.1	25	**51.4**	**47.1**	**40.4**	**29.9**	22.3	15.8	11.4	8.7
2003	90.7	5	**47.1**	**30.5**	23.4	17.7	14.0	10.9	8.3	6.2
2004	90.4	1	**31.6**	23.9	23.2	20.0	16.7	13.1	10.3	7.7
2005	93.7	0	**23.1**	21.3	19.8	18.3	15.6	12.1	9.1	7.2
2006	98.9	3	**28.6**	21.3	19.0	16.7	14.7	11.8	9.1	7.4
2007	86.0	1	**26.7**	20.7	19.4	17.0	14.8	11.7	8.7	6.6
2008	92.1	0	20.4	18.6	17.3	15.1	13.0	10.9	8.9	6.7
2009	94.0	8	**240.8**	**38.4**	**25.1**	19.8	17.0	12.9	9.8	7.8

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03

Table A13: Statistical summary for $PM_{2.5}$ - 24-hour average concentrations – continuous TEOM method

Station: Wallsend

Year	Data availability rates (%)	Days above advisory reporting standard	Maximum value (µg/m^3)	Percentiles (µg/m^3)						
				99th	98th	95th	90th	75th	50th	25th
2000	88.5	1	**63.9**	18.1	16.5	14.3	12.9	9.9	7.4	6.1
2001	94.8	7	**56.3**	**34.2**	**26.0**	18.0	15.6	11.6	8.6	7.0
2002	85.5	13	**60.3**	**44.7**	**33.3**	23.1	17.6	12.8	9.3	7.3
2003	88.2	4	**34.1**	**26.6**	22.1	16.8	14.4	12.0	8.7	6.9
2004	87.4	1	**27.2**	20.9	18.7	16.2	14.3	11.8	9.0	7.3
2005	95.9	0	**21.5**	20.0	18.8	16.7	14.6	11.6	9.0	7.2
2006	99.2	2	**29.4**	20.1	17.9	15.5	13.8	11.4	9.0	7.2
2007	92.3	0	21.7	18.7	18.3	15.7	13.3	10.7	8.3	6.4
2008	87.7	1	**26.4**	21.8	18.1	15.4	13.4	10.7	8.3	6.5
2009	90.7	5	**431.1**	**42.6**	23.9	17.7	15.9	11.3	8.6	6.9

AAQ NEPM advisory reporting standard - 25µg/m^3 (24-hour average)

Bold font indicates values in excess of the AAQ NEPM advisory reporting standard

* Please note that all $PM_{2.5}$ TEOM data uses USEPA factors of A=3 and B=1.03