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Western Australia Air Monitoring Report

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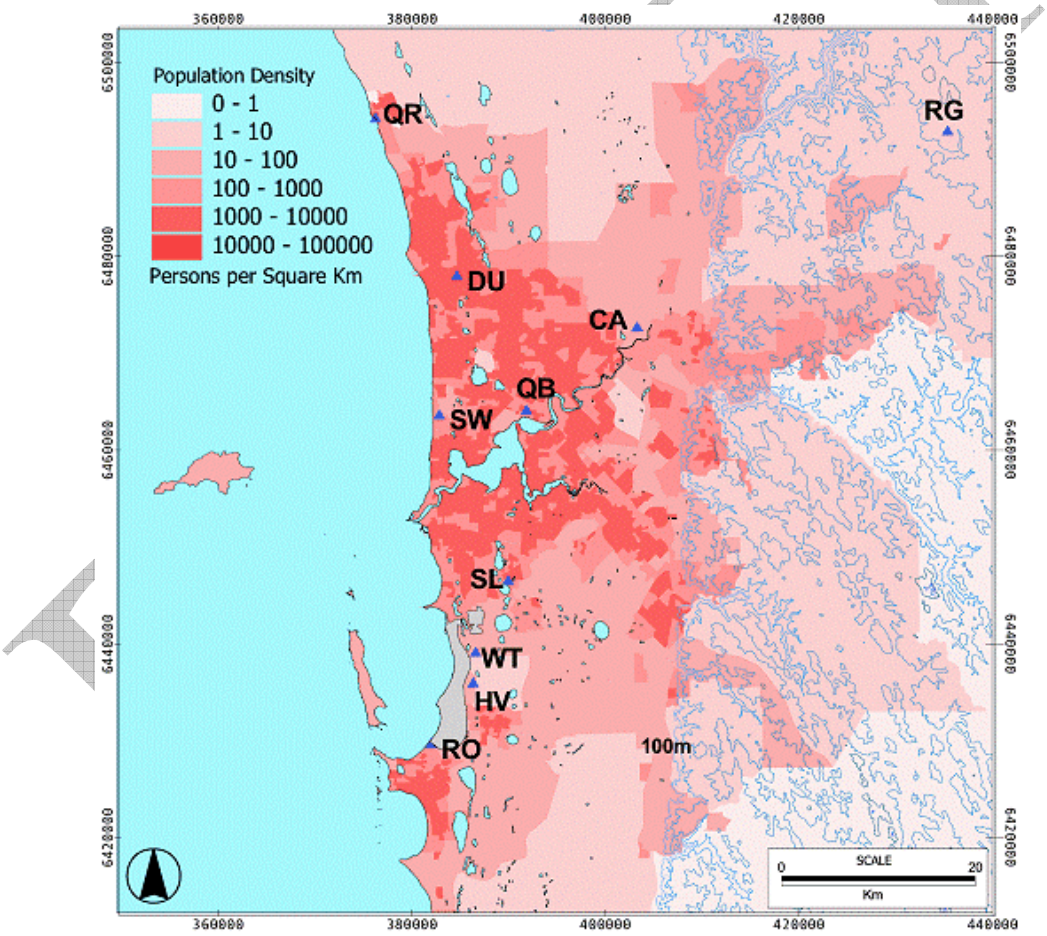
SECTION A – MONITORING SUMMARY

Current Monitoring Stations

The Department of Environment and Conservation (DEC) monitoring network shown in Figure A1 was the subject of careful design for the purposes of the Perth Photochemical Smog Study, the Perth Haze Study and the management of sulfur dioxide in the Kwinana area. The network's design was based on the knowledge of emissions sources, pollutant chemistry and important features of the meteorology. CSIRO Atmospheric Research provided advice on monitoring site locations for the Perth Photochemical Smog Study and Perth Haze Study. The Bunbury station shown in Figure A2 was established in the southwest of the state to monitor fuel reduction burns, and a station in Busselton is also in operation. The Geraldton station shown in Figure A3 was established in the mid-west of the state to monitor wind blown crustal material and smoke from bushfires, hazard reduction or stubble burning and possibly wood-fired home heaters. A particle monitoring station was also recently established in Albany (Figure A4). Table A1 indicates the pollutants monitored at each site.



CA Caversham	**RO Rockingham**
DU Duncraig	**RG Rolling Green**
HV Hope Valley	**SL South Lake**
QB Queens Building	**SW Swanbourne**
QR Quinns Rock	**WT Wattleup**

Figure A1 - DEC air quality monitoring stations which are currently operating in the Perth metropolitan region.

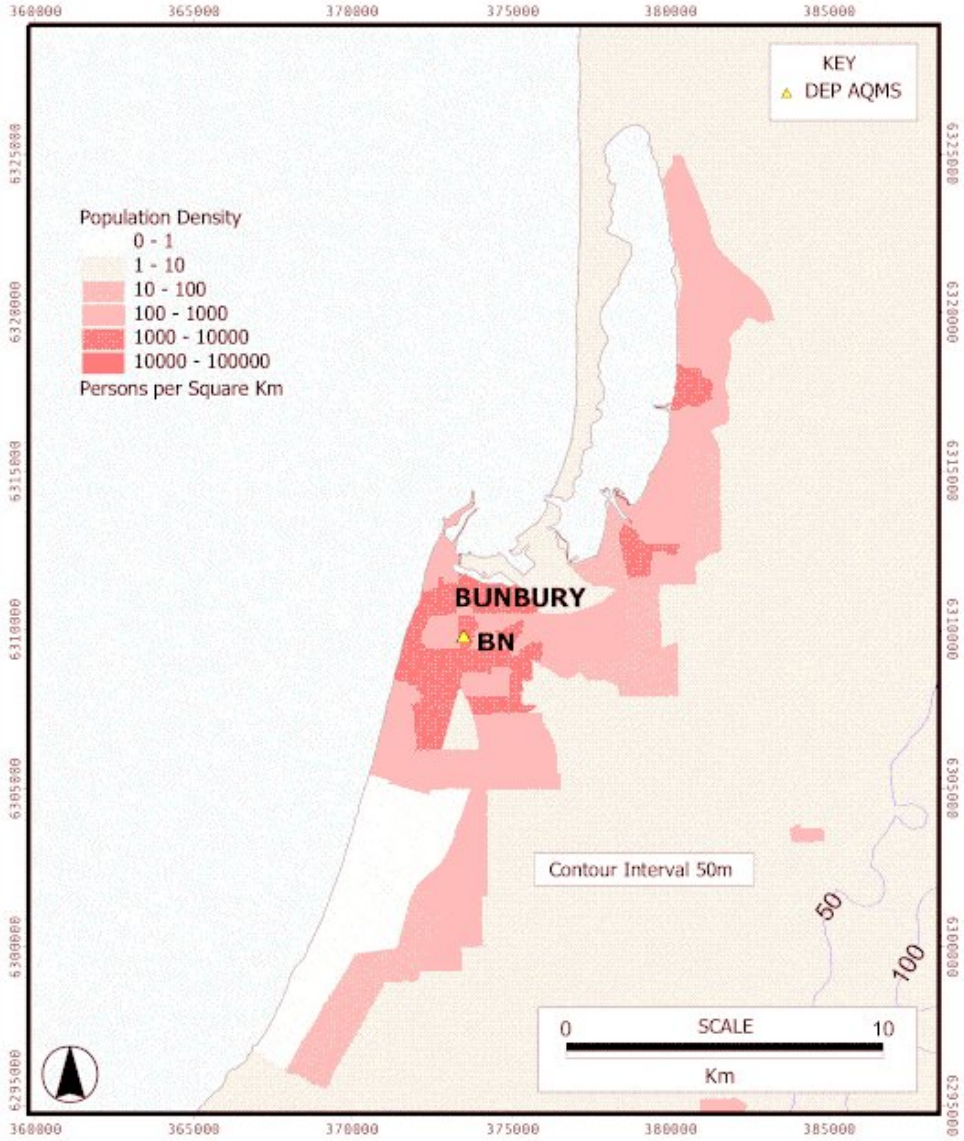


Figure A2 - DEC air quality monitoring station which is currently operating in Bunbury

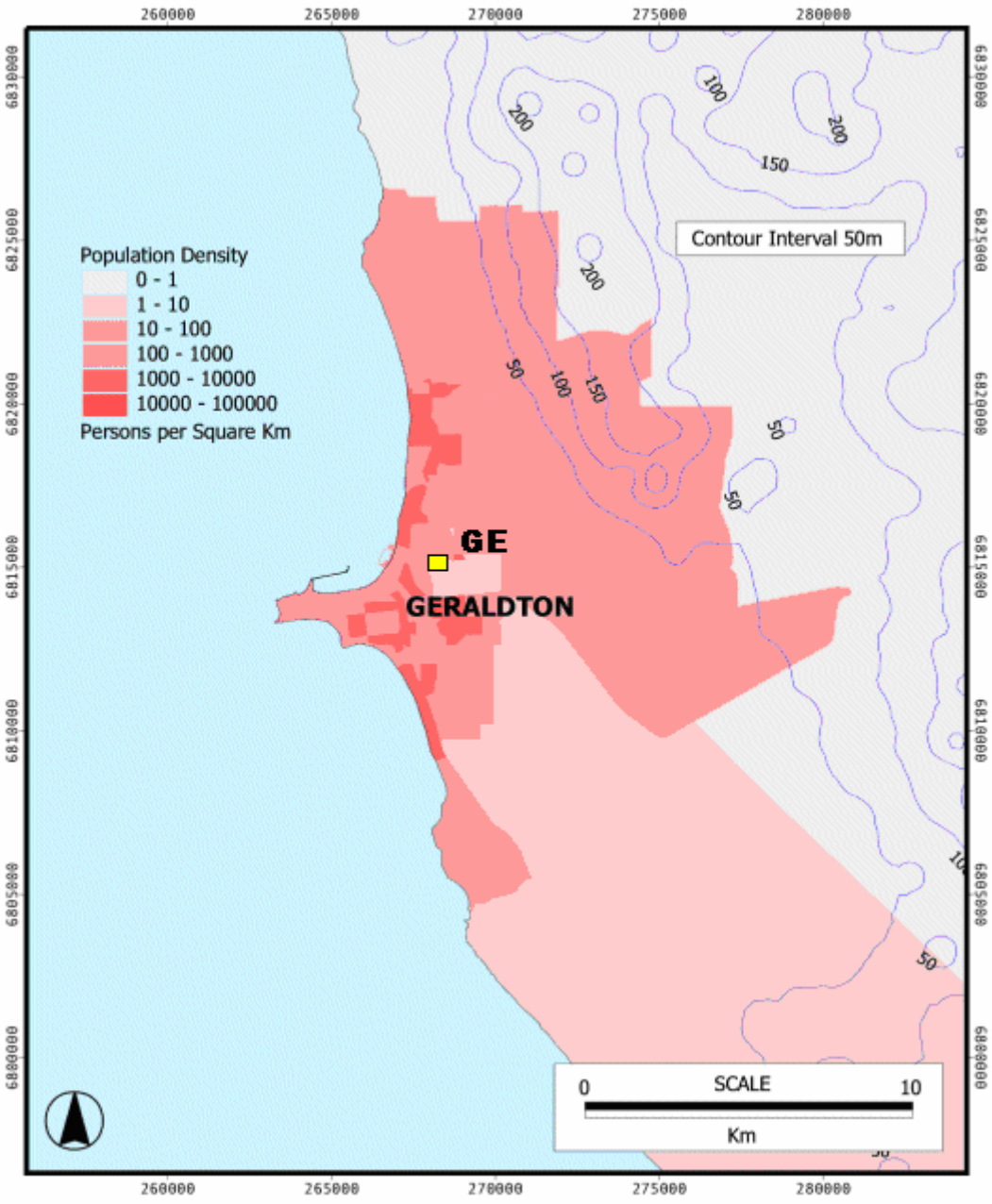


Figure A3 - DEC air quality monitoring station which is currently operating in Geraldton

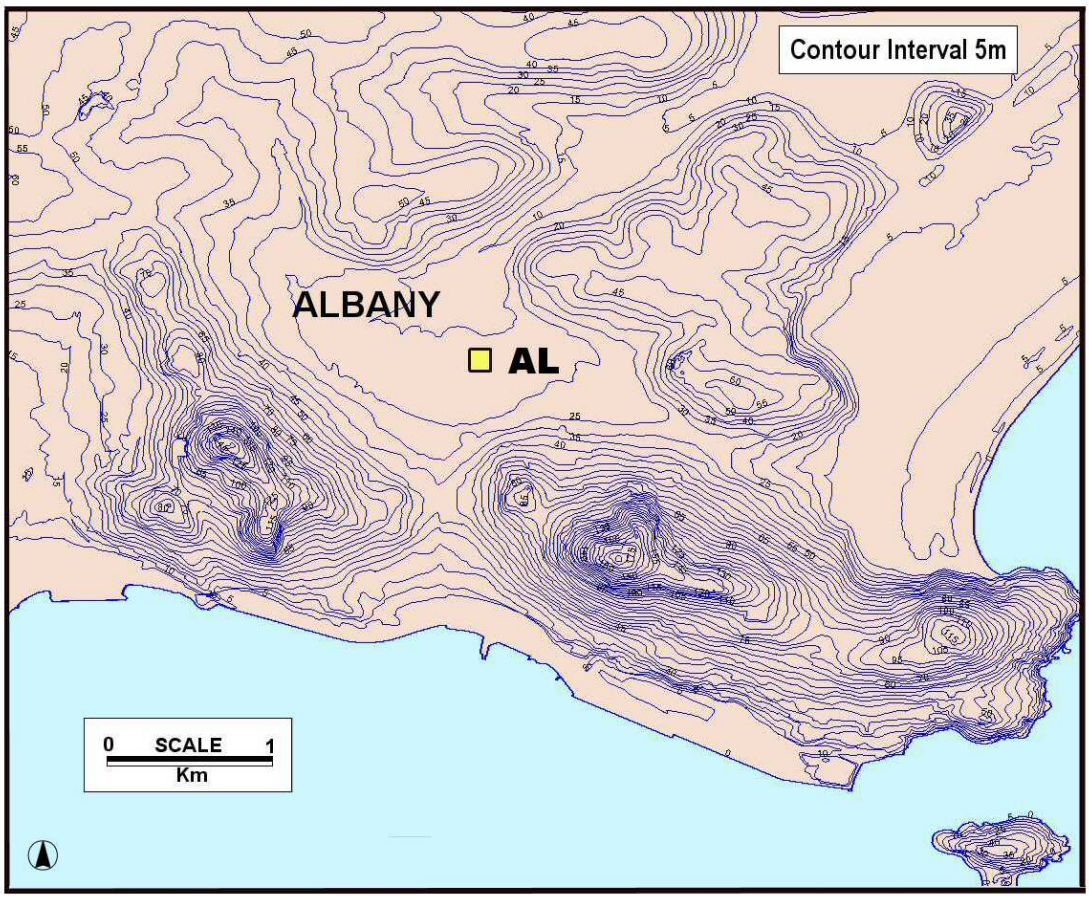


Figure A4 - DEC air quality monitoring station which is currently operating in Albany

Table A1. Air quality parameters measured at DEC monitoring stations.

Monitoring Site	CO	O_3	NO_2	SO_2	lead	PM_{10} Hi-Vol	PM_{10} TEOM	$PM_{2.5}$ TEOM	Visibil-ity
AL Albany							07/06 to present		
BN Bunbury	03/99 to 04/02						06/99 to present	04/97 to present	02/97 to 06/05
CA Caversham	08/93 to present	11/89 to present	09/90 to present			05/93 to 08/05	01/04 to present	03/94 to present	12/89 to 05/06
DU Duncraig	08/95 to present		08/95 to present			09/94 to 01/05	06/96 to present	01/95 to present	03/94 to 07/05
GE Geraldton							09/05 to present		
HV Hope Valley	01/90 to 03/91		12/89 to present	12/89 to present					01/89 to 09/05
QB Queens Building	08/89 to present		01/90 to present		01/90 to 12/01	01/90 to present			01/90 to 07/05
QR Quinns Rock		11/92 to present	11/92 to present					07/06 to present	12/95 to 06/06
RO Rockingham		12/95 to present	12/95 to present	07/88 to present					
RG Rolling Green		01/93 to present	01/93 to present						
SL South Lake	03/00 to present	03/00 to present	03/00 to present	03/00 to present			03/00 to present	04/06 to present	03/00 to 09/05
SW Swanbourne	01/93 to 05/95	01/93 to present	03/93 to present			03/94 to 04/06		06/94 to 07/95	06/94 to 07/03
WT Wattleup				01/88 to present					

The grey font indicates those pollutants that are no longer monitored at that site.

Table A2. Monitoring in Western Australia.

Site:	CO	O_3	NO_2	SO_2	Pb	PM_{10}	$PM_{2.5}$
AL – Albany						C	
BN – Bunbury						C	DEC
CA - Caversham	DEC	T	T			P	DEC
DU - Duncraig	P/T		DEC			T	DEC
GE – Geraldton						C	
HV – Hope Valley			DEC	DEC			
QB - Queens Building	P		DEC		$P^{(1)}$	DEC	
QR - Quinns Rock		DEC	DEC				DEC
RG - Rolling Green		DEC	DEC				
RO - Rockingham		DEC	DEC	DEC			
SL - South Lake	P	P	P	T		P	DEC
SW - Swanbourne		P	P			DEC	
WT - Wattleup				DEC			

Key to symbols:
P – performance monitoring station
$P^{(1)}$ – performance monitoring for lead was removed on 31 December 2001 after the annual average concentration reduced to less than 10% of the NEPM standard in accordance with the WA Monitoring Plan.
C – Campaign Monitoring
T – trend performance monitoring station
DEC – station will be maintained by DEC for the foreseeable future

Table A3. Stations site compliance with AS 2922 - 1987

	Height above ground	Min. distance to support structures	Clear sky angle of 120°	Unrestricted airflow of 270°/360°	20m from trees	No boilers or incinerators nearby	Minimum distance from road or traffic	Sample line material	Sample line length	Comments
Perth Region										
Caversham	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Duncraig	☑	☑	☒	☑	☒	☑	☑	☑	☑	6 metres to medium sized trees and presence of power pole.
Hope Valley	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Queens Building	☑	☒	☒	☒	☑	☑	☒	☑	☑	City canyon with high traffic volume.
Quinns Rocks	☑	☑	☑	☑	☒	☑	☑	☑	☑	15 metres to small to medium size trees. Surrounding area dominated by low scrub.
Rockingham	☑	☑	☑	☑	☒	☑	☑	☑	☑	12 metres to trees. Northern vector dominated by grain storage facility.
Rolling Green	☑	☑	☑	☑	☑	☑	☑	☑	☑	
South Lake	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Swanbourne	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Wattleup	☑	☑	☑	☑	☒	☑	☑	☑	☑	10 metres to medium to large eucalyptus trees.
Southwest Region										
Albany	☑	☑	☑	☑	☑	☑	☑	☑	☑	
Bunbury	☑	☑	☑	☑	☒	☑	☑	☑	☑	15 metres to small to medium eucalyptus trees.
Midwest Region										
Geraldton	☑	☑	☑	☑	☑	☑	☑	☑	☑	

Carbon Monoxide

Duncraig is an upper bound site for monitoring the combined effects of emissions from vehicles on the nearby Mitchell Freeway and domestic wood fires. The site is about 200 metres from the freeway; hence it is well beyond the distance of roadside measurement. By Perth's standards the site is representative of dense population. The site lies in a dunal depression through which the freeway passes, hence the effect of stable air pooling in the depression is likely to lead to elevated concentrations. This feature would be found in many other places across the coastal plain.

South Lake lies in a growing urban area and is likely to see increasing levels of CO from wood fires in particular. It is not as close as Duncraig to major roads and is therefore more typical of a population-average site.

Caversham is located in a region of low population density and so is not considered as a performance monitoring station.

The DEC maintains the Queens Buildings station as a performance monitoring station to provide an upper bound measurement of motor vehicle emitted CO, and to track the improving compliance with the NEPM. It is not nominated as a trend site since it does not fit the normal pattern of a generally representative upper bound for community exposure (GRUB) or population-average monitoring site.

In summary, WA maintains performance monitoring of CO at Duncraig, South Lake and Queens Buildings. Duncraig and South Lake are also nominated as trend stations.

Photochemical Oxidants as Ozone

Statistics for the coastal sites of Quinns Rocks, Swanbourne and Rockingham indicate there is little difference between each station over the long term. Swanbourne was selected as a performance monitoring station while maintaining monitoring stations at Quinns Rocks and at or near Rockingham for the foreseeable future, as resources allow.

Given its location, there is reason to be confident that Caversham represents an upper bound, middle distance, inland site. Accordingly Caversham was selected as a performance monitoring station site.

South Lake is the third performance monitoring station. It has the following desirable attributes:

- it provides spatial spread of stations (it will measure ozone returning on shore in the southern part of the metropolitan area);
- it is a moderate distance inland in a growing urban area, hence it is well classed as a population average station;
- it may occasionally detect the interactions of O_3-rich air with the NO_x-rich plumes from Kwinana industry (potentially giving elevated NO_2 concentrations);

Caversham, Swanbourne and South Lake are all nominated as trend stations.

The DEC also maintains the stations at Quinns Rocks and Rolling Green for the foreseeable future as part of its wider ozone network.

Nitrogen Dioxide

The Queens Buildings site located within the CBD provides an upper limit for NO_2.

For purposes of scientific understanding, NO_x is currently being monitored at all stations where O_3 is monitored. Caversham, Swanbourne and South Lake were therefore chosen as performance monitoring stations for NO_2 as these provide a good spatial distribution.

Caversham, Swanbourne and South Lake are also trend stations.

The DEC will continue to measure NO_2 at Quinns Rocks, Rolling Green and Duncraig for the foreseeable future as part of its wider network. The DEC will also continue to measure NO_2 at Queens Buildings in order to determine the long-term trend.

Sulfur Dioxide

WA operates one performance monitoring station at South Lake for sulfur dioxide, while maintaining a source management network which includes Hope Valley, Wattleup and Rockingham.

South Lake is an upper bound performance monitoring station for sulfur dioxide, and a trend station. The South Lake site is near the southern extent of the main urban population and downwind of Kwinana in sea breeze conditions.

Lead

Since 1995, lead levels at Queens Buildings in the Perth CBD have been below 60 % of the NEPM standard of 0.5 ug/m^3. In 2001, the average lead level in Perth was 0.022 ug/m^3 representing less than 5% of the NEPM standard. In accordance with NEPM (Ambient Air Quality) Technical Paper No. 4, Screening Procedures, and the WA Monitoring Plan, a performance monitoring station for lead has not been maintained since 2001.

Particles as PM_{10}

Duncraig is an upper bound performance monitoring station site for PM_{10} caused by the combination of vehicle and home fire emissions during strongly stable meteorological conditions. Likewise, the site at South Lake measures significant PM_{10} concentrations from wood fires.

Duncraig and South Lake are all nominated as trend stations.

Campaign monitoring that commenced in Geraldton during September 2005 continued throughout the whole of 2006.

A campaign monitoring station was also established in Albany during 2006.

Particles as $PM_{2.5}$

To make further assessments against the advisory standard, four additional PM2.5 TEOMs were installed during 2006. There is now a total of 6 such devices in use in WA; four in the greater Perth metropolitan area, and one each in Bunbury and Busselton. All will remain in use at these locations indefinitely with the intention of developing trend data.

Status of NATA Accreditation

WA is still working towards achieving NATA accreditation as discussed in the WA Monitoring Plan, and hence the data within this report only meets Department of Environment and Conservation quality standards.

SECTION B – ASSESSMENT OF COMPLIANCE WITH STANDARDS AND GOALS

Table B1. 2006 compliance summary for carbon monoxide

AAQ NEPM Standard
9.0 ppm (8-hour average)

Regional Performance Monitoring Station	Data availability rates (% of hours)					Number of exceedances (days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
Perth Region							
Caversham (North East Metro)	99.6	99.9	99.6	99.5	99.7	0	met
Duncraig (North Metro)	99.7	98.2	99.5	99.7	99.3	0	met
Queens Building (CBD)	99.8	99.8	99.7	99.6	99.7	0	met
South Lake (South East Metro)	99.5	97.6	99.5	97.8	98.6	0	met

Performance against the standards and goal: "met", "not met", "not demonstrated"

Table B2. 2006 compliance summary for nitrogen dioxide

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

Regional Performance Monitoring Station	Data availability rates (% of hours)					Annual mean	Number of exceedances	Performance against the standards and goal	
	Q1	Q2	Q3	Q4	Annual	(ppm)	(days)	1-hour	1-year
Perth Region									
Caversham (North East Metro)	93.9	99.8	99.6	99.6	98.3	0.007	0	met	met
Duncraig (North Metro)	99.7	99.3	99.5	99.7	99.5	0.007	0	met	met
Hope Valley (South Metro)	96.6	99.9	99.4	86.5	95.6	0.005	0	met	met
Queens Building (CBD)	99.8	99.8	99.7	99.5	99.7	0.016	0	met	met
Quinns Rocks (Outer North Coast)	88.8	99.4	99.7	99.6	96.9	0.004	0	met	met
Rockingham (South Coast)	99.7	99.7	96.7	99.5	98.9	0.006	0	met	met
Rolling Green (Outer East Rural)	99.8	97.3	99.7	95.4	98	0.002	0	met	met
South Lake (South East Metro)	93.2	99.9	99.5	99.5	98	0.008	0	met	met
Swanbourne (Inner West Coast)	98.7	100	99.6	99.7	99.5	0.005	0	met	met

Performance against the standards and goal: "met", "not met", "not demonstrated"

Table B3. 2006 compliance summary for ozone

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

Regional 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
Perth Region									
Caversham (North East Metro)	99.5	99.6	99.6	99.6	99.6	0	0	met	met
Quinns Rocks (Outer North Coast)	97.1	99.4	99.7	99.7	99	0	0	met	met
Rockingham (South Coast)	99.7	99.8	96.7	99.4	98.9	0	0	met	met
Rolling Green (Outer East Rural)	99.5	99.7	99.7	95.4	98.6	0	0	met	met
South Lake (South East Metro)	99.5	99.9	99.5	99.7	99.6	0	0	met	met
Swanbourne (Inner West Coast)	99.5	99.9	99.7	99.7	99.7	0	0	met	met

Performance against the standards and goal: "met", "not met", "not demonstrated"

Table B4. 2006 compliance summary for sulfur dioxide

AAQ NEPM Standard
0.20 ppm (1-hour average)
0.08 ppm (24-hour average)
0.02 ppm (1-year average)

Regional Performance Monitoring Station	Data availability rates (% of hours)					Annual mean	Number of Exceedances (days)		Performance against the standards and goal		
	Q1	Q2	Q3	Q4	Annual	(ppm)	1-hour	24-hour	1-hour	24-hour	1-year
Perth Region											
Hope Valley (South Metro)	98.3	99.9	99.4	99.6	99.3	0.001	0	0	met	met	met
Rockingham (South Coast)	99.7	99.8	96.7	99.5	98.9	0.001	0	0	met	met	met
South Lake (South East Metro)	99.6	99.9	99.5	99.1	99.5	0.001	0	0	met	met	met
Wattleup (South Metro)	96.6	99.9	99.8	99.6	99	0.001	0	0	met	met	met

Performance against the standards and goal: "met", "not met", "not demonstrated"

Table B5. 2006 compliance summary for particles as PM_{10}

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

Regional Performance Monitoring Station	Data availability rates (% of days)					Number of exceedances (Days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
Perth Region							
Caversham (North East Metro)	99.2	92	99.6	98.4	97.3	0	met
Duncraig (North Metro)	98.9	98.9	99.2	99.5	99.1	0	met
South Lake (South East Metro)	89.9	98.7	99.7	99.5	97	0	met
Southwest Region							
Albany	0	8.2	99.9	98.7	52.1	0	not demonstrated
Bunbury	99.1	99.3	99.5	98.8	99.2	3	met
Midwest Region							
Geraldton	99	99.8	99.5	99.5	99.4	4	met

Performance against the standards and goal: "met", "not met", "not demonstrated"

Table B6. 2006 compliance summary for particles as $PM_{2.5}$

AAQ NEPM Advisory Standard
25 ug/m^3 (24-hour average)

Regional Performance Monitoring Station	Data availability rates (% of days)					Number of exceedances (Days)	Performance against the standards and goal
	Q1	Q2	Q3	Q4	Annual		
Perth Region							
Caversham (North East Metro)	0	55	99.2	99.5	63.8	1	n/a
Duncraig (North Metro)	98.5	98.9	99	99.6	99	2	n/a
Quinns Rocks (Outer North Coast)	0	20.3	99.6	99.5	55.3	1	n/a
South Lake (South East Metro)	7	98.8	99.7	99.8	76.7	1	n/a
Southwest Region							
Bunbury	99.4	99.2	99.2	99.2	99.3	8	n/a

Performance against the standards and goal: "met", "not met", "not demonstrated"

SECTION C – ANALYSIS OF AIR QUALITY MONITORING

Carbon Monoxide

The NEPM standard for carbon monoxide of 9.0 ppm averaged over 8 hours was not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C1 contains the summary statistics for daily peak 8-hour CO in Western Australia.

Table C1. 2006 summary statistics for daily peak 8-hour carbon monoxide

AAQ NEPM Standard
9.0 ppm (8-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Caversham (North East Metro)	99.7	1.8	07/06/2006	0900	1.0	14/05/2006	0400
Duncraig (North Metro)	99.3	3.4	20/07/2006	0400	3.2	17/06/2006	0500
Queens Building (CBD)	99.7	2.9	06/06/2006	2400	2.3	17/06/2006	0400
South Lake (South East Metro)	98.6	2.5	17/06/2006	0200	2.4	18/06/2006	0300

Nitrogen Dioxide

The NEPM standard for nitrogen dioxide of 0.12 ppm averaged over 1 hour and the 0.03 ppm annual average were not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C2 contains the summary statistics for daily peak 1-hour NO_2 in Western Australia.

Table C2. 2006 summary statistics for daily peak 1-hour nitrogen dioxide

AAQ NEPM Standard
0.12 ppm (1-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Caversham (North East Metro)	98.3	0.084	04/05/2006	1300	0.044	09/05/2006	1900
Duncraig (North Metro)	99.5	0.056	11/05/2006	2100	0.047	12/05/2006	2200
Hope Valley (South Metro)	95.6	0.045	11/05/2006	1800	0.032	10/05/2006	1900
Queens Building (CBD)	99.7	0.068	11/05/2006	1800	0.062	26/11/2006	1500
Quinns Rocks (Outer North Coast)	96.9	0.065	11/05/2006	1900	0.063	10/05/2006	2100
Rockingham (South Coast)	98.9	0.054	11/05/2006	1900	0.051	12/05/2006	1900
Rolling Green (Outer East Rural)	98	0.026	05/10/2006	2000	0.023	06/12/2006	2000
South Lake (South East Metro)	98	0.045	11/05/2006	1800	0.044	06/01/2006	1800
Swanbourne (Inner West Coast)	99.5	0.043	11/05/2006	2000	0.042	12/05/2006	2100

Photochemical Smog as Ozone

The NEPM standard for ozone of 0.10 ppm averaged over 1 hour was not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C3 contains the summary statistics for daily peak 1-hour O_3 in Western Australia.

Table C3. 2006 summary statistics for daily peak 1-hour ozone

AAQ NEPM Standard
0.10 ppm (1-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Caversham (North East Metro)	99.6	0.080	08/03/2006	1300	0.076	15/12/2006	1400
Quinns Rocks (Outer North Coast)	99	0.085	05/03/2006	1500	0.083	13/02/2006	1500
Rockingham (South Coast)	98.9	0.072	07/03/2006	1400	0.068	07/01/2006	1700
Rolling Green (Outer East Rural)	98.6	0.093	18/12/2006	1500	0.090	17/01/2006	1700
South Lake (South East Metro)	99.6	0.066	06/01/2006	1500	0.064	04/02/2006	1600
Swanbourne (Inner West Coast)	99.7	0.075	05/03/2006	1400	0.072	13/02/2006	1500

The NEPM standard for ozone of 0.08 ppm averaged over 4 hours was not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C4 contains the summary statistics for daily peak 4-hour O_3 in Western Australia.

Table C4. 2006 summary statistics for daily peak 4-hour ozone

AAQ NEPM Standard
0.08 ppm (4-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Caversham (North East Metro)	99.6	0.072	08/03/2006	1500	0.065	17/12/2006	1400
Quinns Rocks (Outer North Coast)	99	0.074	05/03/2006	1600	0.070	13/02/2006	1700
Rockingham (South Coast)	98.9	0.067	07/03/2006	1600	0.064	07/01/2006	1700
Rolling Green (Outer East Rural)	98.6	0.079	18/12/2006	1700	0.072	23/11/2006	1700
South Lake (South East Metro)	99.6	0.063	06/01/2006	1700	0.060	04/02/2006	1700
Swanbourne (Inner West Coast)	99.7	0.069	13/02/2006	1600	0.065	07/01/2006	1500

Sulfur Dioxide

The NEPM standard for sulfur dioxide of 0.20 ppm averaged over 1 hour was not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C5 contains the summary statistics for daily peak 1-hour SO_2 in Western Australia.

Table C5. 2006 summary statistics for daily peak 1-hour sulfur dioxide

AAQ NEPM Standard
0.20 ppm (1-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Hope Valley (South Metro)	99.3	0.105	03/03/2006	1300	0.090	17/01/2006	1500
Rockingham (South Coast)	98.9	0.040	10/09/2006	0900	0.039	07/11/2006	1000
South Lake (South East Metro)	99.5	0.060	08/03/2006	1600	0.053	12/12/2006	1200
Wattleup (South Metro)	99	0.062	15/12/2006	1500	0.054	27/03/2006	1600

The NEPM standard for sulfur dioxide of 0.08 ppm averaged over 24 hours was not exceeded at any site during 2006. The NEPM goal of no more than 1 exceedance at each site was met. Table C6 contains the summary statistics for daily peak 24-hour SO_2 in Western Australia.

Table C6. 2006 summary statistics for 24-hour sulfur dioxide

AAQ NEPM Standard
0.08 ppm (24-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ppm)	Highest (date)	Highest (time)	2nd Highest (ppm)	2nd Highest (date)	2nd Highest (time)
Perth Region							
Hope Valley (South Metro)	99.3	0.012	17/01/2006	2400	0.009	03/03/2006	2400
Rockingham (South Coast)	98.9	0.007	24/07/2006	2400	0.005	06/06/2006	2400
South Lake (South East Metro)	99.5	0.009	12/12/2006	2400	0.007	20/01/2006	2400
Wattleup (South Metro)	99	0.009	22/02/2006	2400	0.007	06/12/2006	2400

Particles as PM_{10}

The NEPM standard for particles as PM_{10} of 50 μg/m^3 averaged over 24 hours was exceeded during 2006 three times at Bunbury (50.7 μg/m^3 on 16/06/2006, 123.5 μg/m^3 on 17/06/2006 and 54.6 μg/m^3 on 18/06/2006) and four times at Geraldton (57.1 μg/m^3 on 22/01/2006, 50.5 μg/m^3 on 29/03/2006, 78.0 μg/m^3 on 21/11/2006 and 58.8 μg/m^3 on 11/12/2006). Attachments 2, 4, 7, 10 and 11 contain descriptions of the circumstances that led to each exceedance. The NEPM goal of no more than 5 exceedances was met at all sites except Swanbourne where the goal was not demonstrated due to a lack of data. Table C7 contains the summary statistics for daily peak 24-hour PM_{10} in Western Australia.

Table C7. 2006 summary statistics for 24-hour particles as PM_{10}

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

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ug/m^3)	Highest (date)	Highest (time)	6th Highest (ug/m^3)	6th Highest (date)	6th Highest (time)
Perth Region							
Caversham [2] (North East Metro)	97.3	42.6	21/10/2006	2400	35.8	18/06/2006	2400
Duncraig [2] (North Metro)	99.1	40.6	07/06/2006	2400	31.5	09/05/2006	2400
Queens Buildings [1] (CBD)	98	39.4	19/12/2006	2400	32.9	08/10/2006	2400
South Lake [2] (South East Metro)	97	45.3	21/01/2006	2400	37.5	14/03/2006	2400
Swanbourne [1] (Inner West Coast)	26	27.8	22/02/2006	2400	17.4	12/03/2006	2400
Southwest Region							
Albany [2]	52.1	39.4	07/12/2006	2400	32.8	27/11/2006	2400
Bunbury [2]	99.2	123.5	17/06/2006	2400	42.4	14/05/2006	2400
Midwest Region							
Geraldton	99.4	78.0	21/11/2006	2400	46.6	29/01/2006	2400

1 – High volume samplers operating 1 day in every six.
2 – Tapered Element Oscillating Microbalance (TEOM) operating continuously (unadjusted)

Particles as $PM_{2.5}$

The NEPM advisory standard for particles as $PM_{2.5}$ of 25 micrograms per cubic metre averaged over 24 hours was exceeded once at Caversham (34.0 ug/m^3 on 07/06/2006), twice at Duncraig (33.4 µg/m^3 on 07/06/2006 and 26.8 µg/m^3 on 18/06/2006), once at Quinns Rocks (63.9 µg/m^3 on 19/06/2006) once at South Lake (30.5 µg/m^3 on 18/06/2006) and eight times at Bunbury (31.2 ug/m^3 on 24/01/2006, 26.4 ug/m^3 on 10/05/2006, 34.6 µg/m^3 on 11/05/2006, 27.4 µg/m^3 on 12/05/2006, 28.8 µg/m^3 on 14/05/2006, 39.9 µg/m^3 on 16/06/2007, 113.5 µg/m^3 on 17/06/2006 and 37.6 µg/m^3 on 18/06/2006). Attachments 3, 5, 6, 7, 8 and 9 contain descriptions of the circumstances that led to the exceedances. Table C8 contains the summary statistics for daily peak 24-hour $PM_{2.5}$ in Western Australia.

Table C8. 2006 summary statistics for 24-hour particles as $PM_{2.5}$

AAQ NEPM Advisory Standard 25 ug/m^3 (24-hour average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	Highest (ug/m^3)	Highest (date)	Highest (time)	6th Highest (ug/m^3)	6th Highest (date)	6th Highest (time)
Perth Region							
Caversham[1] (North East Metro)	63.8	34.0	07/06/2006	2400	15.3	17/06/2006	2400
Duncraig [1] (North Metro)	99	33.4	07/06/2006	2400	17.3	19/06/2006	2400
Quinns Rocks [1] (Outer North Coast)	55.3	63.9	19/06/2006	2400	13.6	13/12/2006	2400
South Lake [1] (South East Metro)	76.7	30.5	18/06/2006	2400	17.3	17/06/2006	2400
Southwest Region							
Bunbury[1]	99.3	113.5	17/06/2006	2400	28.8	14/05/2006	2400

1 - Tapered Element Oscillating Microbalance (TEOM) operating continuously (unadjusted)

The NEPM advisory standard for particles as $PM_{2.5}$ of 8 micrograms per cubic metre averaged over one year was exceeded during 2006 at Caversham (8.1 µg/m^3), Duncraig (8.2 µg/m^3), South Lake (8.7 µg/m^3) and Bunbury (8.7 µg/m^3).

Table C9. 2006 summary statistics for annual particles as $PM_{2.5}$

AAQ NEPM Advisory Standard 8 ug/m^3 (annual average)

Regional Performance Monitoring Station	Data Recovery Rates (%)	annual average (ug/m^3)
Perth Region		
Caversham[1] (North East Metro)	63.8	8.1
Duncraig [1] (North Metro)	99	8.2
Quinns Rocks [1] (Outer North Coast)	55.3	7.8
South Lake [1] (South East Metro)	76.7	8.7
Southwest Region		
Bunbury[1]	99.3	8.7

1 - Tapered Element Oscillating Microbalance (TEOM) operating continuously (unadjusted)

SECTION D – DATA ANALYSIS

Maxima and Percentiles by Pollutant in 2006

Table D1. 2006 percentiles of daily peak 1-hour carbon monoxide concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Caversham (North East Metro)	99.7	1.8	0.9	0.9	0.6	0.5	0.3	0.2
Duncraig (North Metro)	99.3	3.4	2.8	2.3	1.8	1.3	0.6	0.2
Queens Building (CBD)	99.7	2.9	1.8	1.5	1.2	1.1	0.8	0.6
South Lake (South East Metro)	98.6	2.5	2.4	2.2	1.6	1.0	0.6	0.2

Table D2. 2006 percentiles of daily peak 1-hour nitrogen dioxide concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Caversham (North East Metro)	98.3	0.084	0.037	0.034	0.031	0.028	0.024	0.019
Duncraig (North Metro)	99.5	0.056	0.037	0.036	0.032	0.030	0.026	0.020
Hope Valley (South Metro)	95.6	0.045	0.030	0.029	0.026	0.024	0.018	0.012
Queens Building (CBD)	99.7	0.068	0.057	0.051	0.047	0.043	0.037	0.031
Quinns Rocks (Outer North Coast)	96.9	0.065	0.051	0.042	0.035	0.029	0.023	0.014
Rockingham (South Coast)	98.9	0.054	0.040	0.036	0.034	0.031	0.025	0.015
Rolling Green (Outer East Rural)	98	0.026	0.020	0.019	0.017	0.015	0.012	0.007
South Lake (South East Metro)	98	0.045	0.039	0.037	0.032	0.029	0.025	0.020
Swanbourne (Inner West Coast)	99.5	0.043	0.034	0.033	0.031	0.028	0.023	0.016

Table D3. 2006 percentiles of daily peak 1-hour ozone concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Caversham (North East Metro)	99.6	0.080	0.072	0.067	0.058	0.049	0.036	0.030
Quinns Rocks (Outer North Coast)	99	0.085	0.065	0.063	0.052	0.045	0.037	0.033
Rockingham (South Coast)	98.9	0.072	0.061	0.056	0.050	0.041	0.035	0.031
Rolling Green (Outer East Rural)	98.6	0.093	0.075	0.072	0.060	0.053	0.040	0.033
South Lake (South East Metro)	99.6	0.066	0.057	0.054	0.045	0.040	0.032	0.028
Swanbourne (Inner West Coast)	99.7	0.075	0.066	0.060	0.050	0.044	0.038	0.033

Table D4. 2006 percentiles Percentiles of daily peak 4-hour ozone concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Caversham (North East Metro)	99.6	0.072	0.063	0.058	0.049	0.043	0.034	0.029
Quinns Rocks (Outer North Coast)	99	0.074	0.059	0.055	0.046	0.041	0.035	0.032
Rockingham (South Coast)	98.9	0.067	0.056	0.051	0.046	0.038	0.033	0.030
Rolling Green (Outer East Rural)	98.6	0.079	0.065	0.059	0.053	0.046	0.038	0.032
South Lake (South East Metro)	99.6	0.063	0.051	0.049	0.041	0.036	0.031	0.027
Swanbourne (Inner West Coast)	99.7	0.069	0.060	0.052	0.045	0.040	0.036	0.032

Table D5. 2006 percentiles of daily peak 1-hour sulfur dioxide concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Hope Valley (South Metro)	99.3	0.105	0.054	0.044	0.032	0.024	0.012	0.003
Rockingham (South Coast)	98.9	0.040	0.031	0.022	0.013	0.008	0.004	0.001
South Lake (South East Metro)	99.5	0.060	0.044	0.032	0.028	0.022	0.011	0.003
Wattleup (South Metro)	99	0.062	0.046	0.043	0.035	0.028	0.016	0.006

Table D6. 2006 percentiles of daily peak 24-hour sulfur dioxide concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)	75th percentile (ppm)	50th percentile (ppm)
Perth Region								
Hope Valley (South Metro)	99.3	0.012	0.007	0.005	0.004	0.003	0.002	0.001
Rockingham (South Coast)	98.9	0.007	0.004	0.004	0.002	0.002	0.001	0.000
South Lake (South East Metro)	99.5	0.009	0.006	0.005	0.004	0.003	0.002	0.001
Wattleup (South Metro)	99	0.009	0.007	0.006	0.004	0.004	0.002	0.001

Table D7. 2006 percentiles of daily peak 24-hour particles as PM_{10} concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)	75th percentile ($\mu g/m^3$)	50th percentile ($\mu g/m^3$)
Perth Region								
Caversham (North East Metro)	97.3	42.6	38.4	35.3	29.3	26.4	20.8	15.9
Duncraig (North Metro)	99.1	40.6	32.9	30.5	27.3	24.0	19.0	15.3
South Lake (South East Metro)	97	45.3	39.8	37.0	34.4	29.0	23.1	17.8
Southwest Region								
Albany	52.1	39.4	35.4	33.0	26.6	24.6	20.2	15.0
Bunbury	99.2	123.5	45.6	38.8	28.3	25.8	21.7	17.4
Midwest Region								
Geraldton	99.4	78.0	48.6	45.8	40.0	35.4	27.6	20.4

Table D8. 2006 percentiles of daily peak 24-hour particles as $PM_{2.5}$ concentrations

Regional Performance Monitoring Station	Data availability rates (%)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)	75th percentile ($\mu g/m^3$)	50th percentile ($\mu g/m^3$)
Perth Region								
Caversham (North East Metro)	63.8	34.0	18.6	15.6	13.4	12.0	9.2	7.2
Duncraig (North Metro)	99	33.4	18.7	16.2	13.4	11.9	9.4	7.6
Quinns Rocks [1] (Outer North Coast)	55.3	63.9	17.0	14.3	13.2	11.0	8.5	6.8
South Lake [1] (South East Metro)	76.7	30.5	21.5	17.2	14.6	12.8	10.2	8.1
Southwest Region								
Bunbury	99.3	113.5	32.4	26.0	14.8	13.0	10.1	7.7

Maxima and Percentiles by Site 1997 to 2006

Table D9. Daily peak 8-hour carbon monoxide at Caversham (1997-2006)
Trend station/region: Caversham AAQ NEPM Standard 9.0 ppm (8-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	97.6	0	2.3	1.6	1.3	1.0	0.9
1998	98.0	0	1.7	1.3	1.2	1.0	0.8
1999	99.6	0	1.6	1.2	1.1	0.8	0.6
2000	99.3	0	1.4	1.0	1.0	0.8	0.6
2001	99.6	0	1.5	1.3	1.2	1.0	0.9
2002	98.1	0	1.3	1.0	0.9	0.8	0.7
2003	95.7	0	1.1	0.9	0.8	0.7	0.6
2004	96.2	0	1.3	0.9	0.9	0.7	0.5
2005	98.3	0	1.3	0.9	0.8	0.7	0.6
2006	99.7	0	1.8	0.9	0.9	0.6	0.5

Table D10. Daily peak 8-hour carbon monoxide at Duncraig (1997-2006)
Trend station/region: Duncraig AAQ NEPM Standard 9.0 ppm (8-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	98.0	0	6.8	5.2	4.8	3.9	2.4
1998	98.4	0	6.1	4.9	4.3	3.0	2.0
1999	96.9	0	6.6	4.5	4.2	2.8	2.0
2000	98.7	0	4.8	3.5	3.0	2.3	1.6
2001	99.5	0	5.9	4.7	4.2	3.1	2.6
2002	96.6	0	5.4	3.7	3.6	2.6	1.8
2003	97.8	0	4.1	3.1	2.8	2.0	1.5
2004	99.1	0	4.5	3.2	2.7	2.1	1.2
2005	98.5	0	3.3	2.7	2.2	1.7	1.2
2006	99.3	0	3.4	2.8	2.3	1.8	1.3

Table D11. Daily peak 8-hour carbon monoxide at Queens Building (1997-2006)
Trend station/region: Queens Building

AAQ NEPM Standard
9.0 ppm (8-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.2	0	5.6	5.0	4.8	4.2	3.8
1998	98.5	0	6.1	5.3	4.7	3.9	3.6
1999	99.4	0	5.0	4.3	4.0	3.6	3.1
2000	98.7	0	4.3	3.5	3.3	3.0	2.7
2001	99.6	0	4.8	3.9	3.1	2.5	2.4
2002	96.8	0	4.7	2.7	2.5	2.2	2.0
2003	95.9	0	2.8	2.2	2.2	2.0	1.8
2004	99.5	0	2.8	2.1	2.0	1.7	1.6
2005	99.7	0	4.2	2.7	2.0	1.6	1.4
2006	99.7	0	2.9	1.8	1.5	1.2	1.1

Table D12. Daily peak 8-hour carbon monoxide at South Lake (1997-2006)
Trend station/region: South Lake

AAQ NEPM Standard
9.0 ppm (8-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	82.3	0	3.6	2.2	2.1	1.8	1.6
2001	99.6	0	4.0	3.5	3.1	2.3	1.7
2002	97.6	0	3.2	2.8	2.4	1.9	1.3
2003	98.9	0	3.1	2.5	2.3	1.7	1.3
2004	99.5	0	3.5	2.3	2.1	1.5	1.0
2005	96.9	0	2.9	2.5	2.0	1.6	1.1
2006	98.6	0	2.5	2.4	2.2	1.6	1.0

Table D13. Daily peak 1-hour nitrogen dioxide at Caversham (1997-2006)
Trend station/region: Caversham

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.3	0	0.051	0.041	0.034	0.028	0.026
1998	99.0	0	0.051	0.038	0.034	0.031	0.028
1999	99.6	0	0.038	0.031	0.030	0.028	0.025
2000	99.3	0	0.044	0.035	0.033	0.030	0.028
2001	99.4	0	0.045	0.037	0.033	0.029	0.027
2002	99.5	0	0.055	0.035	0.033	0.031	0.028
2003	95.7	0	0.043	0.037	0.034	0.031	0.028
2004	98.9	0	0.046	0.036	0.033	0.029	0.028
2005	98.3	0	0.048	0.040	0.034	0.031	0.027
2006	98.3	0	0.084	0.037	0.034	0.031	0.028

Table D14. Daily peak 1-hour nitrogen dioxide at Duncraig (1997-2006)
Trend station/region: Duncraig

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	98.3	0	0.046	0.039	0.035	0.029	0.027
1998	98.5	0	0.065	0.040	0.037	0.031	0.028
1999	93.5	0	0.049	0.035	0.032	0.030	0.027
2000	98.7	0	0.050	0.035	0.033	0.031	0.029
2001	99.5	0	0.041	0.038	0.035	0.032	0.030
2002	97.1	0	0.049	0.040	0.037	0.034	0.031
2003	97.4	0	0.057	0.042	0.037	0.033	0.031
2004	94.5	0	0.043	0.037	0.035	0.031	0.029
2005	96.7	0	0.051	0.039	0.036	0.032	0.030
2006	99.5	0	0.056	0.037	0.036	0.032	0.030

Table D15. Daily peak 1-hour nitrogen dioxide at Hope Valley (1997-2006)
Trend station/region: Hope valley

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.0	0	0.033	0.028	0.027	0.024	0.021
1998	97.0	0	0.044	0.029	0.027	0.024	0.020
1999	98.8	0	0.032	0.028	0.026	0.024	0.022
2000	99.6	0	0.033	0.030	0.028	0.025	0.023
2001	99.6	0	0.033	0.031	0.030	0.027	0.025
2002	99.6	0	0.039	0.033	0.030	0.028	0.024
2003	94.6	0	0.039	0.034	0.028	0.024	0.021
2004	99.6	0	0.034	0.032	0.028	0.024	0.021
2005	99.2	0	0.035	0.030	0.027	0.025	0.023
2006	95.6	0	0.045	0.030	0.029	0.026	0.024

Table D16. Daily peak 1-hour nitrogen dioxide at Queens Building (1997-2006)
Trend station/region: Queens Building

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.4	0	0.098	0.077	0.074	0.063	0.056
1998	99.5	0	0.093	0.085	0.077	0.068	0.058
1999	99.4	0	0.073	0.063	0.061	0.054	0.047
2000	98.6	0	0.073	0.068	0.065	0.056	0.049
2001	99.5	0	0.082	0.065	0.064	0.058	0.055
2002	99.0	0	0.091	0.077	0.072	0.060	0.055
2003	95.9	1	0.121	0.075	0.067	0.058	0.055
2004	99.5	0	0.075	0.070	0.064	0.058	0.050
2005	89.2	0	0.113	0.072	0.058	0.051	0.045
2006	99.7	0	0.068	0.057	0.051	0.047	0.043

Table D17. Daily peak 1-hour nitrogen dioxide at Quinns Rocks (1997-2006)
Trend station/region: Quinns Rocks AAQ NEPM Standard 0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.5	0	0.039	0.028	0.026	0.024	0.022
1998	96.7	0	0.041	0.033	0.029	0.026	0.024
1999	98.5	0	0.034	0.030	0.029	0.025	0.023
2000	98.7	0	0.045	0.032	0.031	0.028	0.025
2001	96.4	0	0.036	0.033	0.031	0.027	0.026
2002	99.5	0	0.037	0.031	0.030	0.028	0.026
2003	97.4	0	0.035	0.032	0.030	0.027	0.025
2004	90.8	0	0.041	0.032	0.030	0.028	0.025
2005	96.9	0	0.041	0.031	0.030	0.027	0.024
2006	96.9	0	0.065	0.051	0.042	0.035	0.029

Table D18. Daily peak 1-hour nitrogen dioxide at Rockingham (1997-2006)
Trend station/region: Rockingham AAQ NEPM Standard 0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	85.1	0	0.033	0.030	0.029	0.026	0.024
1998	99.2	0	0.043	0.031	0.028	0.026	0.024
1999	93.5	0	0.030	0.029	0.028	0.025	0.024
2000	99.4	0	0.048	0.041	0.039	0.036	0.032
2001	98.9	0	0.046	0.040	0.038	0.035	0.033
2002	99.6	0	0.042	0.039	0.038	0.035	0.032
2003	98.4	0	0.051	0.040	0.036	0.034	0.032
2004	99.4	0	0.055	0.043	0.039	0.035	0.031
2005	99.1	0	0.045	0.038	0.036	0.032	0.030
2006	98.9	0	0.054	0.040	0.036	0.034	0.031

Table D19. Daily peak 1-hour nitrogen dioxide at Rolling Green (1997-2006)
Trend station/region: Rolling Green AAQ NEPM Standard 0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	64.1	0	0.035	0.019	0.018	0.017	0.014
1998	95.7	0	0.029	0.021	0.019	0.017	0.014
1999	98.7	0	0.024	0.017	0.016	0.015	0.012
2000	97.1	0	0.027	0.021	0.019	0.015	0.014
2001	99.1	0	0.026	0.021	0.020	0.017	0.015
2002	97.6	0	0.025	0.022	0.020	0.017	0.015
2003	94.0	0	0.032	0.020	0.017	0.016	0.015
2004	95.6	0	0.025	0.023	0.021	0.018	0.016
2005	97.9	0	0.029	0.025	0.023	0.020	0.017
2006	98.0	0	0.026	0.020	0.019	0.017	0.015

Table D20. Daily peak 1-hour nitrogen dioxide at South Lake (1997-2006)
Trend station/region: South Lake

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	81.3	0	0.041	0.035	0.032	0.031	0.029
2001	99.2	0	0.039	0.032	0.030	0.029	0.027
2002	95.5	0	0.048	0.035	0.032	0.030	0.028
2003	98.9	0	0.048	0.039	0.038	0.030	0.028
2004	98.4	0	0.043	0.038	0.036	0.032	0.029
2005	87.1	0	0.052	0.043	0.039	0.033	0.028
2006	98.0	0	0.045	0.039	0.037	0.032	0.029

Table D21. Daily peak 1-hour nitrogen dioxide at Swanbourne (1997-2006)
Trend station/region: Swanbourne

AAQ NEPM Standard
0.12 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	98.4	0	0.040	0.034	0.031	0.029	0.027
1998	93.5	0	0.051	0.036	0.033	0.030	0.028
1999	95.3	0	0.037	0.034	0.033	0.031	0.028
2000	98.0	0	0.045	0.038	0.036	0.034	0.030
2001	87.4	0	0.037	0.034	0.032	0.031	0.030
2002	92.1	0	0.051	0.040	0.036	0.031	0.029
2003	99.2	0	0.048	0.036	0.034	0.031	0.029
2004	70.2	0	0.042	0.039	0.035	0.032	0.028
2005	96.2	0	0.039	0.037	0.033	0.029	0.026
2006	99.5	0	0.043	0.034	0.033	0.031	0.028

Table D22. Daily peak 1-hour ozone at Caversham (1997-2006)
Trend station/region: Caversham

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.1	0	0.100	0.095	0.083	0.058	0.047
1998	99.2	1	0.112	0.085	0.076	0.058	0.049
1999	99.5	1	0.101	0.083	0.075	0.061	0.048
2000	99.3	0	0.084	0.069	0.064	0.054	0.046
2001	99.6	0	0.099	0.072	0.067	0.051	0.044
2002	99.6	0	0.091	0.074	0.065	0.057	0.048
2003	93.8	0	0.083	0.070	0.062	0.052	0.044
2004	98.9	0	0.079	0.070	0.062	0.052	0.045
2005	99.3	0	0.094	0.078	0.063	0.054	0.043
2006	99.6	0	0.080	0.072	0.067	0.058	0.049

Table D23. Daily peak 1-hour ozone at Quinns Rocks (1997-2006)

Trend station/region: Quinns Rocks

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.4	1	0.106	0.076	0.067	0.060	0.052
1998	98.5	0	0.080	0.072	0.070	0.058	0.049
1999	98.6	1	0.105	0.070	0.068	0.058	0.046
2000	98.7	0	0.078	0.069	0.067	0.055	0.045
2001	99.5	0	0.073	0.065	0.058	0.049	0.042
2002	99.5	0	0.079	0.069	0.060	0.055	0.046
2003	86.1	0	0.086	0.060	0.057	0.049	0.045
2004	97.9	0	0.079	0.064	0.060	0.056	0.046
2005	98.0	0	0.095	0.068	0.063	0.055	0.045
2006	99.0	0	0.085	0.065	0.063	0.052	0.045

Table D24. Daily peak 1-hour ozone at Rockingham (1997-2006)

Trend station/region: Rockingham

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	83.8	0	0.078	0.063	0.056	0.045	0.039
1998	99.0	0	0.082	0.065	0.060	0.051	0.043
1999	99.0	0	0.076	0.067	0.060	0.050	0.040
2000	99.4	0	0.083	0.077	0.063	0.050	0.040
2001	99.1	0	0.076	0.057	0.050	0.042	0.037
2002	99.6	0	0.079	0.067	0.057	0.050	0.043
2003	98.4	0	0.064	0.053	0.050	0.045	0.039
2004	99.1	1	0.102	0.067	0.059	0.048	0.040
2005	99.1	0	0.081	0.064	0.056	0.044	0.040
2006	98.9	0	0.072	0.061	0.056	0.050	0.041

Table D25. Daily peak 1-hour ozone at Rolling Green (1997-2006)

Trend station/region: Rolling Green

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	63.9	1	0.134	0.091	0.077	0.069	0.059
1998	99.5	1	0.109	0.085	0.077	0.063	0.056
1999	98.8	0	0.096	0.080	0.073	0.064	0.052
2000	97.1	0	0.092	0.072	0.065	0.058	0.049
2001	99.0	0	0.097	0.080	0.068	0.051	0.044
2002	99.6	0	0.091	0.080	0.068	0.059	0.049
2003	94.3	0	0.087	0.076	0.071	0.059	0.049
2004	97.9	1	0.101	0.076	0.071	0.060	0.049
2005	97.9	0	0.079	0.071	0.064	0.058	0.050
2006	98.6	0	0.093	0.075	0.072	0.060	0.053

Table D26. Daily peak 1-hour ozone at South Lake (1997-2006)
Trend station/region: South Lake

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	83.3	0	0.077	0.061	0.053	0.043	0.038
2001	99.6	0	0.079	0.062	0.054	0.044	0.038
2002	99.5	0	0.067	0.062	0.054	0.049	0.043
2003	99.1	0	0.071	0.061	0.055	0.048	0.041
2004	99.0	0	0.076	0.061	0.057	0.047	0.041
2005	97.0	0	0.080	0.062	0.056	0.049	0.041
2006	99.6	0	0.066	0.057	0.054	0.045	0.040

Table D27. Daily peak 1-hour ozone at Swanbourne (1997-2006)
Trend station/region: Swanbourne

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	98.1	1	0.109	0.069	0.064	0.056	0.046
1998	98.4	0	0.081	0.070	0.064	0.052	0.046
1999	96.6	0	0.088	0.069	0.064	0.054	0.042
2000	98.0	0	0.079	0.069	0.064	0.053	0.043
2001	98.7	0	0.074	0.064	0.059	0.048	0.040
2002	95.9	0	0.081	0.063	0.057	0.051	0.046
2003	99.7	0	0.082	0.060	0.052	0.045	0.041
2004	99.4	0	0.077	0.065	0.059	0.049	0.042
2005	96.4	0	0.076	0.066	0.061	0.051	0.043
2006	99.7	0	0.075	0.066	0.060	0.050	0.044

Table D28. Daily peak 4-hour ozone at Caversham (1997-2006)
Trend station/region: Caversham

AAQ NEPM Standard
0.08 ppm (4-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.1	3	0.084	0.071	0.063	0.050	0.042
1998	99.2	2	0.087	0.068	0.061	0.050	0.043
1999	99.5	0	0.080	0.071	0.064	0.052	0.043
2000	99.3	0	0.058	0.056	0.054	0.047	0.041
2001	99.6	0	0.079	0.062	0.055	0.045	0.039
2002	99.6	0	0.068	0.065	0.058	0.049	0.042
2003	93.8	0	0.069	0.058	0.054	0.046	0.039
2004	98.9	0	0.067	0.057	0.052	0.047	0.040
2005	99.3	0	0.069	0.055	0.052	0.046	0.039
2006	99.6	0	0.072	0.063	0.058	0.049	0.043

Table D29. Daily peak 4-hour ozone at Quinns Rocks (1997-2006)

Trend station/region: Quinns Rocks

AAQ NEPM Standard
0.08 ppm (4-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	99.4	1	0.100	0.065	0.060	0.053	0.044
1998	98.5	0	0.077	0.061	0.060	0.050	0.042
1999	98.6	1	0.083	0.061	0.057	0.051	0.042
2000	98.7	0	0.072	0.064	0.059	0.048	0.041
2001	99.5	0	0.066	0.057	0.051	0.044	0.039
2002	99.5	0	0.069	0.057	0.053	0.048	0.041
2003	86.1	0	0.071	0.055	0.051	0.043	0.040
2004	97.9	0	0.068	0.059	0.055	0.048	0.041
2005	98.0	0	0.070	0.058	0.057	0.047	0.041
2006	99.0	0	0.074	0.059	0.055	0.046	0.041

Table D30. Daily peak 4-hour ozone at Rockingham (1997-2006)

Trend station/region: Rockingham

AAQ NEPM Standard
0.08 ppm (4-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	83.8	0	0.069	0.055	0.050	0.042	0.035
1998	99.0	0	0.074	0.062	0.051	0.046	0.039
1999	99.0	0	0.067	0.060	0.055	0.045	0.038
2000	99.4	0	0.078	0.069	0.059	0.046	0.037
2001	99.1	0	0.071	0.053	0.045	0.039	0.036
2002	99.6	0	0.071	0.058	0.050	0.047	0.039
2003	98.4	0	0.059	0.049	0.048	0.041	0.037
2004	99.1	0	0.079	0.060	0.052	0.045	0.038
2005	99.1	0	0.075	0.061	0.052	0.042	0.038
2006	98.9	0	0.067	0.056	0.051	0.046	0.038

Table D31. Daily peak 4-hour ozone at Rolling Green (1997-2006)

Trend station/region: Rolling Green

AAQ NEPM Standard
0.08 ppm (4-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	63.9	2	0.124	0.077	0.070	0.058	0.051
1998	99.5	2	0.095	0.069	0.066	0.052	0.048
1999	98.8	0	0.077	0.070	0.059	0.055	0.046
2000	97.1	0	0.075	0.059	0.055	0.047	0.041
2001	99.0	2	0.094	0.067	0.058	0.046	0.038
2002	99.6	0	0.071	0.065	0.061	0.052	0.043
2003	94.3	0	0.075	0.063	0.060	0.053	0.043
2004	97.9	0	0.077	0.064	0.061	0.051	0.042
2005	97.9	0	0.068	0.060	0.058	0.049	0.044
2006	98.6	0	0.079	0.065	0.059	0.053	0.046

Table D32. Daily peak 4-hour ozone at South Lake (1997-2006)
Trend station/region: South Lake

AAQ NEPM Standard
0.08 ppm (4-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	83.3	0	0.067	0.051	0.045	0.037	0.035
2001	99.6	0	0.076	0.053	0.048	0.039	0.035
2002	99.5	0	0.058	0.053	0.050	0.044	0.039
2003	99.1	0	0.063	0.052	0.048	0.043	0.037
2004	99.0	0	0.064	0.053	0.049	0.042	0.035
2005	97.0	0	0.070	0.053	0.052	0.042	0.037
2006	99.6	0	0.063	0.051	0.049	0.041	0.036

Table D33. Daily peak 4-hour ozone at Swanbourne (1997-2006)
Trend station/region: Swanbourne

AAQ NEPM Standard
0.10 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	98.1	1	0.104	0.060	0.055	0.049	0.041
1998	98.4	0	0.078	0.060	0.054	0.047	0.040
1999	96.6	0	0.074	0.060	0.056	0.048	0.039
2000	98.0	0	0.073	0.065	0.057	0.047	0.039
2001	98.7	0	0.069	0.055	0.049	0.041	0.037
2002	95.9	0	0.066	0.056	0.054	0.047	0.041
2003	99.7	0	0.066	0.054	0.047	0.041	0.037
2004	99.4	0	0.067	0.057	0.054	0.044	0.038
2005	96.4	0	0.066	0.058	0.052	0.044	0.039
2006	99.7	0	0.069	0.060	0.052	0.045	0.040

Table D34. Daily peak 1-hour sulfur dioxide at Hope Valley (1997-2006)
Trend station/region: Hope Valley

AAQ NEPM Standard
0.20 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	97.4	0	0.047	0.040	0.031	0.023	0.016
1998	97.5	0	0.061	0.035	0.031	0.024	0.017
1999	98.7	0	0.064	0.036	0.029	0.019	0.014
2000	99.4	0	0.079	0.051	0.036	0.020	0.014
2001	99.6	0	0.044	0.029	0.025	0.019	0.013
2002	99.6	0	0.058	0.048	0.032	0.024	0.017
2003	94.1	0	0.060	0.041	0.031	0.024	0.017
2004	99.6	0	0.061	0.045	0.040	0.031	0.022
2005	99.2	0	0.074	0.047	0.036	0.027	0.019
2006	99.3	0	0.105	0.054	0.044	0.032	0.024

Table D35. Daily peak 1-hour sulfur dioxide at Rockingham (1997-2006)
Trend station/region: Rockingham

AAQ NEPM Standard
0.20 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	88.1	0	0.039	0.028	0.018	0.013	0.008
1998	96.9	0	0.047	0.029	0.022	0.017	0.010
1999	99.0	0	0.047	0.027	0.024	0.016	0.011
2000	98.8	0	0.034	0.021	0.017	0.010	0.006
2001	99.2	0	0.028	0.023	0.019	0.010	0.006
2002	99.6	0	0.035	0.021	0.017	0.009	0.006
2003	98.3	0	0.026	0.020	0.016	0.010	0.006
2004	99.4	0	0.039	0.021	0.018	0.011	0.006
2005	99.2	0	0.041	0.024	0.022	0.017	0.010
2006	98.9	0	0.040	0.031	0.022	0.013	0.008

Table D36. Daily peak 1-hour sulfur dioxide at South Lake (1997-2006)
Trend station/region: South Lake

AAQ NEPM Standard
0.20 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	82.5	0	0.042	0.027	0.024	0.019	0.013
2001	99.6	0	0.046	0.027	0.023	0.018	0.013
2002	97.4	0	0.043	0.036	0.026	0.020	0.015
2003	98.9	0	0.038	0.028	0.026	0.020	0.015
2004	99.5	0	0.042	0.028	0.024	0.019	0.013
2005	96.9	0	0.046	0.033	0.030	0.022	0.017
2006	99.5	0	0.060	0.044	0.032	0.028	0.022

Table D37. Daily peak 1-hour sulfur dioxide at Wattleup (1997-2006)
Trend station/region: Wattleup

AAQ NEPM Standard
0.20 ppm (1-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	91.9	0	0.065	0.047	0.039	0.026	0.018
1998	94.4	0	0.061	0.043	0.040	0.027	0.020
1999	99.3	0	0.060	0.033	0.030	0.022	0.017
2000	99.7	0	0.046	0.034	0.027	0.022	0.016
2001	99.7	0	0.074	0.032	0.027	0.021	0.017
2002	99.0	0	0.081	0.039	0.030	0.023	0.019
2003	97.5	0	0.062	0.032	0.028	0.023	0.018
2004	97.7	0	0.076	0.044	0.041	0.030	0.021
2005	99.7	0	0.120	0.058	0.045	0.037	0.026
2006	99.0	0	0.062	0.046	0.043	0.035	0.028

Table D38. Daily peak 24-hour sulfur dioxide at Hope Valley (1997-2006)
Trend station/region: Hope Valley AAQ NEPM Standard 0.08 ppm (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	97.4	0	0.005	0.005	0.004	0.003	0.002
1998	97.5	0	0.008	0.006	0.004	0.003	0.002
1999	98.7	0	0.007	0.004	0.003	0.003	0.002
2000	99.4	0	0.007	0.005	0.003	0.003	0.002
2001	99.6	0	0.004	0.004	0.003	0.002	0.002
2002	99.6	0	0.007	0.006	0.004	0.003	0.002
2003	94.1	0	0.006	0.005	0.004	0.003	0.002
2004	99.6	0	0.009	0.006	0.006	0.004	0.003
2005	99.2	0	0.011	0.007	0.005	0.004	0.003
2006	99.3	0	0.012	0.007	0.005	0.004	0.003

Table D39. Daily peak 24-hour sulfur dioxide at Rockingham (1997-2006)
Trend station/region: Rockingham AAQ NEPM Standard 0.08 ppm (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	88.1	0	0.014	0.005	0.004	0.003	0.003
1998	96.9	0	0.009	0.006	0.005	0.003	0.002
1999	99.0	0	0.016	0.008	0.006	0.004	0.002
2000	98.8	0	0.012	0.003	0.003	0.002	0.001
2001	99.2	0	0.009	0.004	0.003	0.002	0.001
2002	99.6	0	0.006	0.002	0.002	0.002	0.001
2003	98.3	0	0.005	0.003	0.003	0.002	0.001
2004	99.4	0	0.006	0.003	0.003	0.002	0.001
2005	99.2	0	0.009	0.006	0.004	0.003	0.002
2006	98.9	0	0.007	0.004	0.004	0.002	0.002

Table D40. Daily peak 24-hour sulfur dioxide at South Lake (1997-2006)
Trend station/region: South Lake AAQ NEPM Standard 0.08 ppm (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	82.5	0	0.004	0.003	0.003	0.003	0.002
2001	99.6	0	0.006	0.004	0.003	0.002	0.002
2002	97.4	0	0.006	0.005	0.004	0.003	0.002
2003	98.9	0	0.006	0.005	0.004	0.003	0.002
2004	99.5	0	0.005	0.004	0.004	0.003	0.002
2005	96.9	0	0.007	0.006	0.004	0.004	0.002
2006	99.5	0	0.009	0.006	0.005	0.004	0.003

Table D41. Daily peak 24-hour sulfur dioxide at Wattleup (1997-2006)
Trend station/region: Wattleup AAQ NEPM Standard 0.08 ppm (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. (ppm)	99th percentile (ppm)	98th percentile (ppm)	95th percentile (ppm)	90th percentile (ppm)
1997	91.9	0	0.010	0.006	0.005	0.004	0.003
1998	94.4	0	0.008	0.006	0.005	0.004	0.003
1999	99.3	0	0.007	0.005	0.005	0.004	0.003
2000	99.7	0	0.006	0.004	0.004	0.003	0.002
2001	99.7	0	0.009	0.005	0.004	0.003	0.003
2002	99.0	0	0.008	0.005	0.005	0.004	0.003
2003	97.5	0	0.006	0.005	0.005	0.004	0.003
2004	97.7	0	0.009	0.007	0.005	0.004	0.003
2005	99.7	0	0.014	0.008	0.006	0.005	0.004
2006	99.0	0	0.009	0.007	0.006	0.004	0.004

Table D42. Daily peak 24-hour particles as PM_{10} at Caversham (1997-2006)
Trend station/region: Caversham AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	0.0	0	-	-	-	-	-
2001	0.0	0	-	-	-	-	-
2002	0.0	0	-	-	-	-	-
2003	0.0	0	-	-	-	-	-
2004	93.2	1	58.0	39.0	34.4	29.7	25.4
2005	98.2	1	76.8	41.4	37.1	32.2	28.1
2006	33.5	0	41.7	38.2	35.5	29.0	24.0

Table D43. Daily peak 24-hour particles as PM_{10} at Duncraig (1997-2006)
Trend station/region: Duncraig AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	60.8	4	56.2	50.2	46.5	37.3	30.7
1998	98.4	1	68.9	39.2	35.8	29.7	26.5
1999	97.2	0	35.2	32.0	29.3	25.3	22.4
2000	76.5	0	29.8	28.0	25.2	24.0	22.2
2001	99.5	1	53.6	34.3	31.9	27.5	23.4
2002	97.6	1	54.0	37.5	30.8	26.4	24.2
2003	99.1	1	66.7	33.7	31.0	28.3	25.5
2004	99.0	0	45.1	30.9	30.2	27.6	24.1
2005	98.5	1	59.2	34.8	30.7	26.7	23.9
2006	99.1	0	40.6	32.9	30.5	27.3	24.0

Table D44. Daily peak 24-hour particles as PM_{10} at South Lake (1997-2006)
Trend station/region: South Lake AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	82.7	0	39.6	33.2	30.6	29.3	26.0
2001	99.1	1	56.7	37.3	33.2	27.7	25.3
2002	99.3	2	82.6	45.8	38.8	32.8	27.9
2003	95.8	0	44.5	40.1	36.3	32.4	28.2
2004	98.8	1	50.5	35.8	32.8	30.2	26.2
2005	98.8	3	98.8	46.1	39.6	33.6	28.7
2006	97.0	0	45.3	39.8	37.0	34.4	29.0

Table D45. Daily peak 24-hour particles as PM_{10} at Bunbury (1997-2006)
Trend station/region: Bunbury AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	52.3	0	40.0	33.8	30.8	27.7	24.6
2000	99.5	0	42.4	33.8	31.0	28.4	24.8
2001	99.6	1	57.6	41.0	37.5	29.3	26.8
2002	99.5	0	42.5	38.9	32.9	29.5	27.1
2003	99.2	1	54.5	34.2	33.3	30.2	26.3
2004	92.4	4	99.5	51.8	38.2	29.9	26.3
2005	99.1	3	63.3	37.9	33.3	27.5	24.9
2006	99.2	3	123.5	45.6	38.8	28.3	25.8

Table D46. Daily peak 24-hour particles as PM_{10} at Albany (1997-2006)
Trend station/region: Albany AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	0.0	0	-	-	-	-	-
2001	0.0	0	-	-	-	-	-
2002	0.0	0	-	-	-	-	-
2003	0.0	0	-	-	-	-	-
2004	0.0	0	-	-	-	-	-
2005	0.0	0	-	-	-	-	-
2006	52.1	0	39.4	35.4	33.0	26.6	24.6

Table D47. Daily peak 24-hour particles as PM_{10} at Geraldton (1997-2006)
Trend station/region: Bunbury AAQ NEPM Standard 50 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	0.0	0	-	-	-	-	-
2001	0.0	0	-	-	-	-	-
2002	0.0	0	-	-	-	-	-
2003	0.0	0	-	-	-	-	-
2004	0.0	0	-	-	-	-	-
2005	27.7	2	61.3	52.9	47.0	34.8	31.6
2006	99.4	4	78.0	48.6	45.8	40.0	35.4

Table D48. Daily peak 24-hour particles as $PM_{2.5}$ at Caversham (1997-2006)
Trend station/region: Caversham AAQ NEPM Advisory Standard 25 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	92.1	1	28.1	22.1	18.0	14.2	12.5
1998	97.6	0	21.2	16.5	14.9	12.8	10.9
1999	98.2	0	20.3	14.3	13.6	12.4	10.9
2000	93.7	0	20.1	16.5	14.8	11.9	10.5
2001	97.2	1	31.8	15.9	15.1	12.9	11.3
2002	99.6	1	25.7	16.2	15.0	13.4	12.0
2003	98.6	1	27.3	16.3	14.4	13.4	11.6
2004	5.3	0	16.5	15.7	14.9	12.6	10.4
2005	0.0	0	-	-	-	-	-
2006	63.8	1	34.0	18.6	15.6	13.4	12.0

Table D49. Daily peak 24-hour particles as $PM_{2.5}$ at Duncraig (1997-2006)
Trend station/region: Duncraig AAQ NEPM Advisory Standard 25 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	86.1	15	44.2	39.2	35.6	24.0	18.2
1998	98.2	3	31.8	23.9	21.2	17.1	15.2
1999	96.9	2	26.3	21.3	17.3	14.5	12.4
2000	79.2	0	22.2	17.1	15.0	13.4	11.5
2001	93.8	4	27.0	25.5	22.6	16.1	13.4
2002	98.9	1	28.3	20.3	17.4	15.7	13.3
2003	98.4	1	25.2	19.2	16.1	14.9	13.1
2004	99.2	0	24.4	17.9	15.6	14.1	11.6
2005	98.6	3	40.6	17.3	15.0	13.1	11.4
2006	99.0	2	33.4	18.7	16.2	13.4	11.9

Table D50. Daily peak 24-hour particles as $PM_{2.5}$ at Quinns Rocks (1997-2006)
Trend station/region: Quinns Rocks AAQ NEPM Advisory Standard 25 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	0.0	0	-	-	-	-	-
2001	0.0	0	-	-	-	-	-
2002	0.0	0	-	-	-	-	-
2003	0.0	0	-	-	-	-	-
2004	0.0	0	-	-	-	-	-
2005	0.0	0	-	-	-	-	-
2006	55.3	1	63.9	17.0	14.3	13.2	11.0

Table D51. Daily peak 24-hour particles as $PM_{2.5}$ at South Lake (1997-2006)
Trend station/region: South Lake AAQ NEPM Advisory Standard 25 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	0.0	0	-	-	-	-	-
1998	0.0	0	-	-	-	-	-
1999	0.0	0	-	-	-	-	-
2000	0.0	0	-	-	-	-	-
2001	0.0	0	-	-	-	-	-
2002	0.0	0	-	-	-	-	-
2003	0.0	0	-	-	-	-	-
2004	0.0	0	-	-	-	-	-
2005	0.0	0	-	-	-	-	-
2006	76.7	1	30.5	21.5	17.2	14.6	12.8

Table D52. Daily peak 24-hour particles as $PM_{2.5}$ at Bunbury (1997-2006)
Trend station/region: Bunbury AAQ NEPM Advisory Standard 25 ug/m3 (24-hour average)

Year	Data Recovery (%)	No. of exceedances (days)	Max conc. ($\mu g/m^3$)	99th percentile ($\mu g/m^3$)	98th percentile ($\mu g/m^3$)	95th percentile ($\mu g/m^3$)	90th percentile ($\mu g/m^3$)
1997	78.9	5	35.4	26.4	24.3	20.7	17.1
1998	99.5	3	33.2	22.8	20.0	16.1	13.6
1999	88.9	1	30.0	21.7	18.4	15.0	12.9
2000	99.6	3	29.2	23.3	20.4	16.0	13.7
2001	92.7	2	47.3	19.6	17.4	15.4	13.1
2002	99.5	4	36.1	24.5	20.2	15.7	14.0
2003	98.9	3	37.6	20.7	18.3	15.7	13.1
2004	98.0	5	94.8	31.7	21.5	15.8	13.2
2005	99.0	5	64.2	26.9	19.1	15.4	12.1
2006	99.3	8	113.5	32.4	26.0	14.8	13.0

Maxima by Pollutant 1997 to 2006

Table D53. Annual daily peak 8-hour carbon monoxide concentrations (ppm) for 1997-2006

AAQ NEPM Standard
9.0 ppm (8-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	2.3	1.7	1.6	1.4	1.5	1.3	1.1	1.3	1.3	1.8
Duncraig (North Metro)	6.8	6.1	6.6	4.8	5.9	5.4	4.1	4.5	3.3	3.4
Queens Building (CBD)	5.6	6.1	5.0	4.3	4.8	4.7	2.8	2.8	4.2	2.9
South Lake (South East Metro)	-	-	-	3.6	4.0	3.2	3.1	3.5	2.9	2.5

Highlighted cells indicate NEPM exceedances.

Table D54. Annual daily peak 1-hour nitrogen dioxide concentrations (ppm) for 1997-2006

AAQ NEPM Standard
0.12 ppm (1-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	0.051	0.051	0.038	0.044	0.045	0.055	0.043	0.046	0.048	0.084
Duncraig (North Metro)	0.046	0.065	0.049	0.050	0.041	0.049	0.057	0.043	0.051	0.056
Hope Valley (South Metro)	0.033	0.044	0.032	0.033	0.033	0.039	0.039	0.034	0.035	0.045
Queens Building (CBD)	0.098	0.093	0.073	0.073	0.082	0.091	0.121	0.075	0.113	0.068
Quinns Rocks (Outer North Coast)	0.039	0.041	0.034	0.045	0.036	0.037	0.035	0.041	0.041	0.065
Rockingham (South Coast)	0.033	0.043	0.030	0.048	0.046	0.042	0.051	0.055	0.045	0.054
Rolling Green (Outer East Rural)	0.035	0.029	0.024	0.027	0.026	0.025	0.032	0.025	0.029	0.026
South Lake (South East Metro)	-	-	-	0.041	0.039	0.048	0.048	0.043	0.052	0.045
Swanbourne (Inner West Coast)	0.040	0.051	0.037	0.045	0.037	0.051	0.048	0.042	0.039	0.043

Highlighted cells indicate NEPM exceedances.

Table D55. Annual daily peak 1-hour ozone concentrations (ppm) for 1997-2006

AAQ NEPM Standard
0.10 ppm (1-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	0.100	0.112	0.101	0.084	0.099	0.091	0.083	0.079	0.094	0.080
Quinns Rocks (Outer North Coast)	0.106	0.080	0.105	0.078	0.073	0.079	0.086	0.079	0.095	0.085
Rockingham (South Coast)	0.078	0.082	0.076	0.083	0.076	0.079	0.064	0.102	0.081	0.072
Rolling Green (Outer East Rural)	0.134	0.109	0.096	0.092	0.097	0.091	0.087	0.101	0.079	0.093
South Lake (South East Metro)	-	-	-	0.077	0.079	0.067	0.071	0.076	0.080	0.066
Swanbourne (Inner West Coast)	0.109	0.081	0.088	0.079	0.074	0.081	0.082	0.077	0.076	0.075

Highlighted cells indicate NEPM exceedances.

Table D56. Annual daily peak 4-hour ozone concentrations (ppm) for 1997-2006

AAQ NEPM Standard
0.08 ppm (4-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	0.084	0.087	0.080	0.058	0.079	0.068	0.069	0.067	0.069	0.072
Quinns Rocks (Outer North Coast)	0.100	0.077	0.083	0.072	0.066	0.069	0.071	0.068	0.070	0.074
Rockingham (South Coast)	0.069	0.074	0.067	0.078	0.071	0.071	0.059	0.079	0.075	0.067
Rolling Green (Outer East Rural)	0.124	0.095	0.077	0.075	0.094	0.071	0.075	0.077	0.068	0.079
South Lake (South East Metro)	-	-	-	0.067	0.076	0.058	0.063	0.064	0.070	0.063
Swanbourne (Inner West Coast)	0.104	0.078	0.074	0.073	0.069	0.066	0.066	0.067	0.066	0.069

Highlighted cells indicate NEPM exceedances.

Table D57. Annual daily peak 1-hour sulfur dioxide concentrations (ppm) for 1997-2006

AAQ NEPM Standard
0.20 ppm (1-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Hope Valley (South Metro)	0.047	0.061	0.064	0.079	0.044	0.058	0.060	0.061	0.074	0.105
Rockingham (South Coast)	0.039	0.047	0.047	0.034	0.028	0.035	0.026	0.039	0.041	0.040
South Lake (South East Metro)	-	-	-	0.042	0.046	0.043	0.038	0.042	0.046	0.060
Wattleup (South Metro)	0.065	0.061	0.060	0.046	0.074	0.081	0.062	0.076	0.120	0.062

Highlighted cells indicate NEPM exceedances.

Table D58. Annual daily peak 24-hour sulfur dioxide concentrations (ppm) for 1997-2006

AAQ NEPM Standard
0.08 ppm (24-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Hope Valley (South Metro)	0.005	0.008	0.007	0.007	0.004	0.007	0.006	0.009	0.011	0.012
Rockingham (South Coast)	0.014	0.009	0.016	0.012	0.009	0.006	0.005	0.006	0.009	0.007
South Lake (South East Metro)	-	-	-	0.004	0.006	0.006	0.006	0.005	0.007	0.009
Wattleup (South Metro)	0.010	0.008	0.007	0.006	0.009	0.008	0.006	0.009	0.014	0.009

Highlighted cells indicate NEPM exceedances.

Table D59. Annual daily peak 24-hour particles as PM_{10} concentrations (ug/m^3) for 1997-2006

AAQ NEPM Standard
50 ug/m3 (24-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	-	-	-	-	-	-	-	58.0	76.8	41.7
Duncraig (North Metro)	56.2	68.9	35.2	29.8	53.6	54.0	66.7	45.1	59.2	40.6
South Lake (South East Metro)	-	-	-	39.6	56.7	82.6	44.5	50.5	98.8	45.3
Southwest Region										
Albany	-	-	-	-	-	-	-	-	-	39.4
Bunbury	-	-	40.0	42.4	57.6	42.5	54.5	99.5	63.3	123.5
Midwest Region										
Geraldton	-	-	-	-	-	-	-	-	61.3	78.0

Highlighted cells indicate NEPM exceedances.

Table D60. Annual daily peak 24-hour particles as $PM_{2.5}$ concentrations (ug/m^3) for 1997-2006

AAQ NEPM Advisory Standard
25 ug/m3 (24-hour average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	28.1	21.2	20.3	20.1	31.8	25.7	27.3	16.5	-	34.0
Duncraig (North Metro)	44.2	31.8	26.3	22.2	27.0	28.3	25.2	24.4	40.6	33.4
Quinns Rocks (Outer North Coast)	-	-	-	-	-	-	-	-	-	63.9
South Lake (South East Metro)	-	-	-	-	-	-	-	-	-	30.5
Southwest Region										
Bunbury	35.4	33.2	30.0	29.2	47.3	36.1	37.6	94.8	64.2	113.5

Highlighted cells indicate NEPM exceedances.

Table D61. Annual averaged particles as $PM_{2.5}$ concentrations (ug/m^3) for 1997-2006

AAQ NEPM Advisory Standard
8 ug/m3 (annual average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Caversham (North East Metro)	7.6	7.0	7.2	7.4	7.6	8.1	8.0	7.6	-	8.1
Duncraig (North Metro)	12.3	10.4	8.6	8.0	8.6	9.2	8.9	7.9	7.8	8.2
Quinns Rocks (Outer North Coast)	-	-	-	-	-	-	-	-	-	7.8
South Lake (South East Metro)	-	-	-	-	-	-	-	-	-	8.7
Southwest Region										
Bunbury	10.5	9.2	9.3	9.3	8.7	9.0	8.6	9.2	8.6	8.7

Highlighted cells indicate NEPM exceedances.

Table D62. Annual averaged lead concentrations (ug/m^3) for 1997-2006

AAQ NEPM Advisory Standard
0.50 ug/m3 (annual average)

Regional Performance Monitoring Station	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Perth Region										
Queens Building (CBD)	0.13	0.10	0.08	0.03	0.02	-	-	-	-	-

Monitoring for lead ceased at the end of 2001.

ATTACHMENT 1 – Graphical Trends

This attachment provides graphical representations of tables D8 to D44 of Section D. Each graph show the maximum, 99th percentile, 98th percentile, 95th percentile and 90th percentile of daily maximum concentration for all pollutants monitored by the Department of Environment and Conservation in Western Australia. The nominated percentiles can also be expressed as an Nth highest concentration. Based on 100% data recovery and a normal year (i.e. 365 days), the following table gives each percentile an equivalent Nth highest ordinal value. The bracketed numbers represent the exact (as calculated) value of the ordinal number.

Percentile	Nth highest
100	1 (maximum)
99	5 (4.65)
98	8 (8.3)
95	19 (19.25)
90	38 (37.5)

Carbon Monoxide

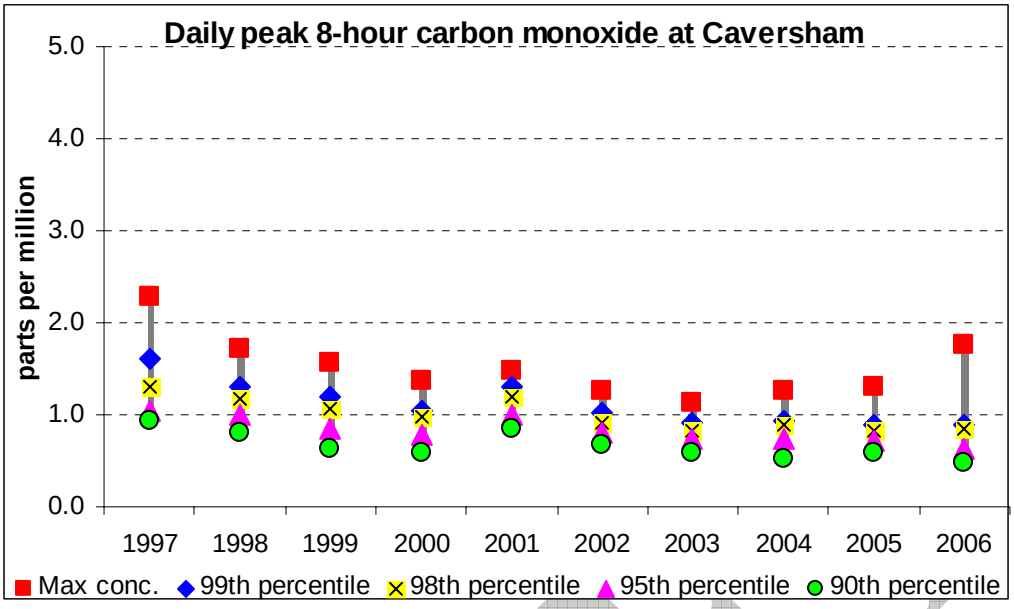


Figure A1-1 - 8-hour carbon monoxide at Caversham

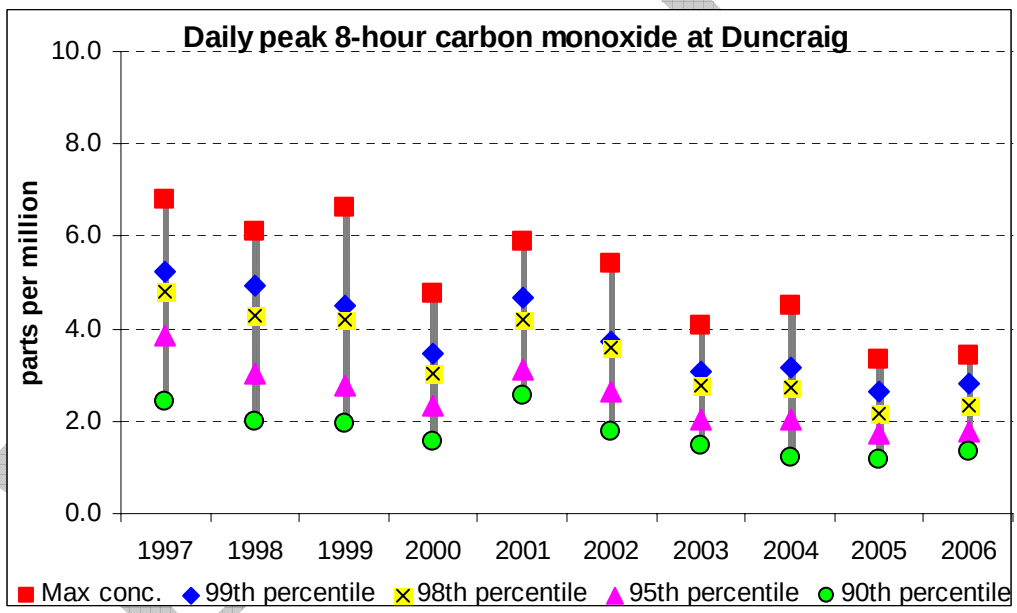


Figure A1-2 - 8-hour carbon monoxide at Duncraig

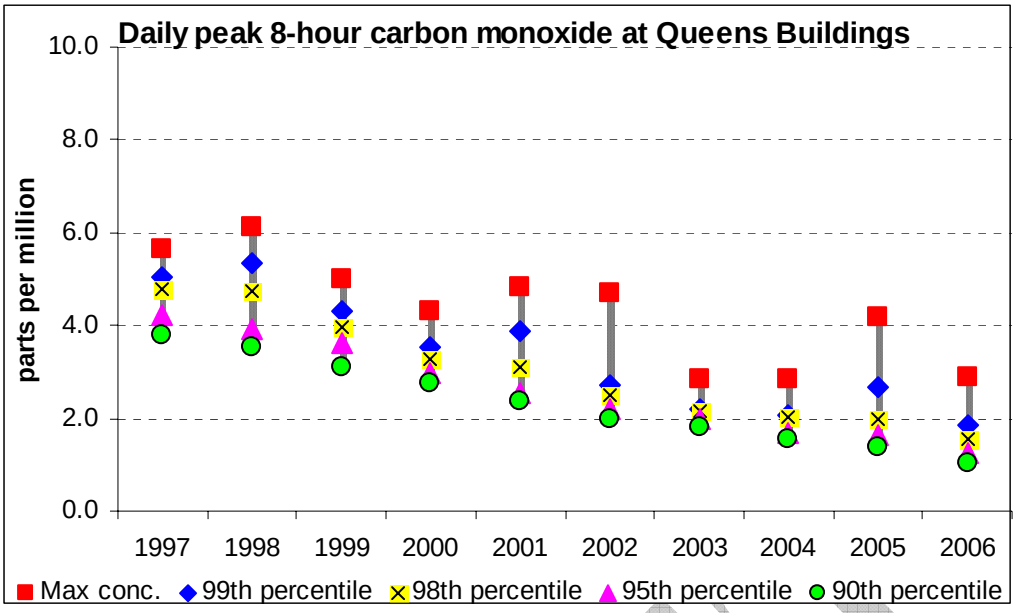


Figure A1-3 - 8-hour carbon monoxide at Queens Buildings

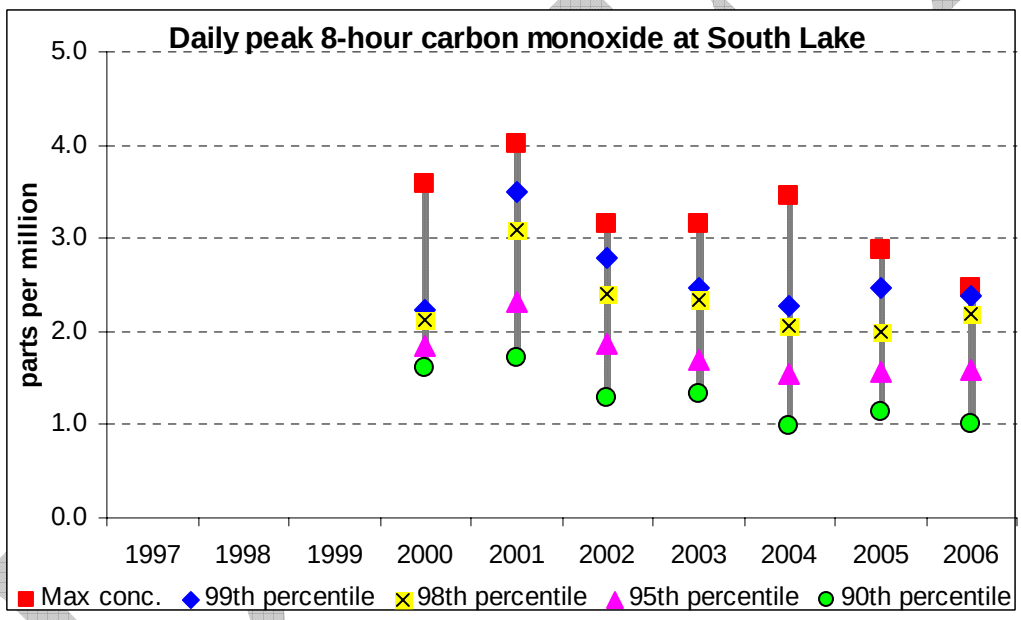


Figure A1-4 - 8-hour carbon monoxide at South Lake

Nitrogen Dioxide

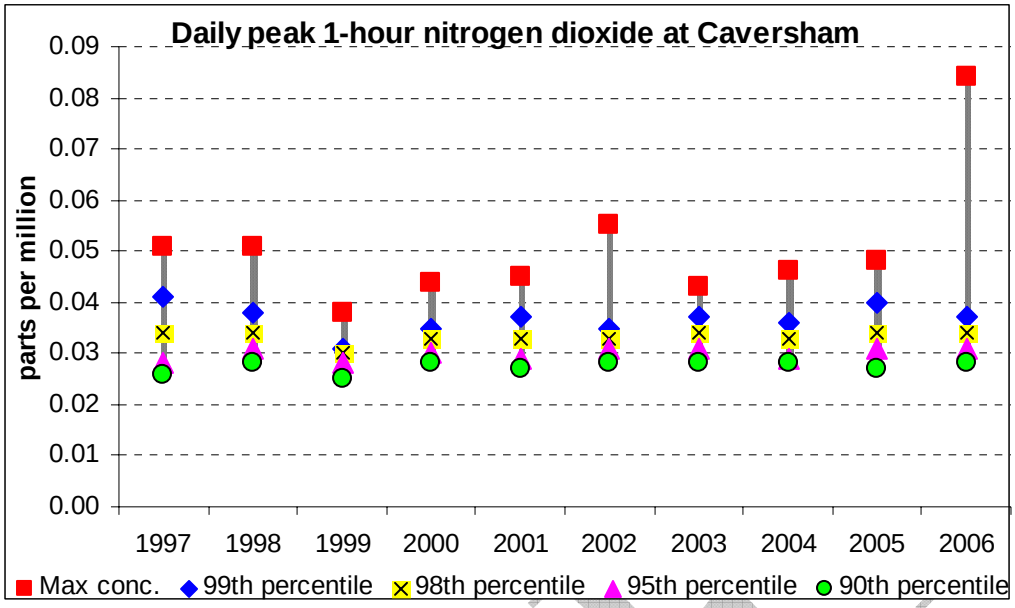


Figure A1-5 - 1-hour nitrogen dioxide at Caversham

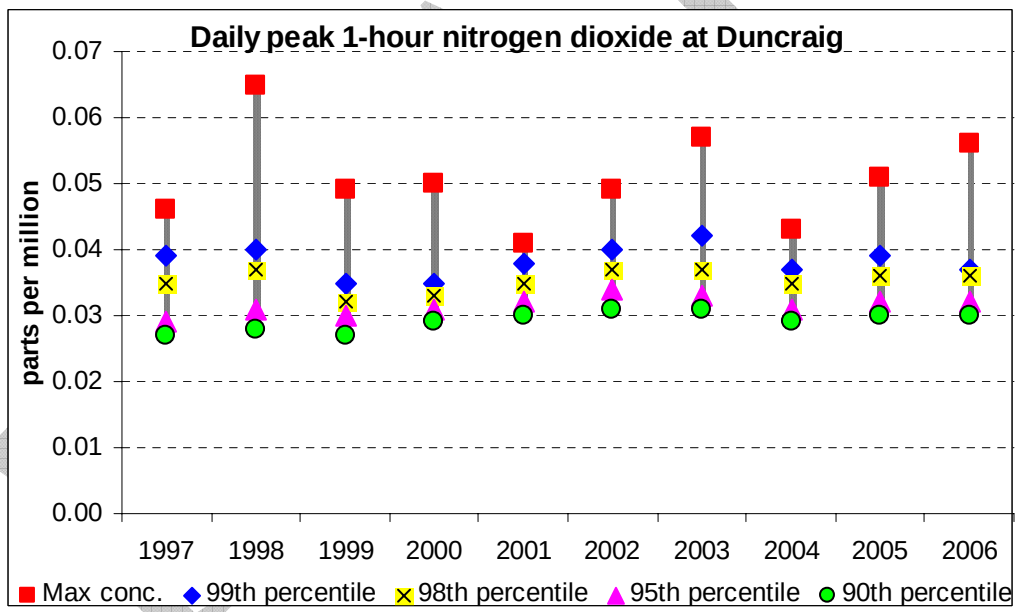


Figure A1-6 - 1-hour nitrogen dioxide at Duncraig

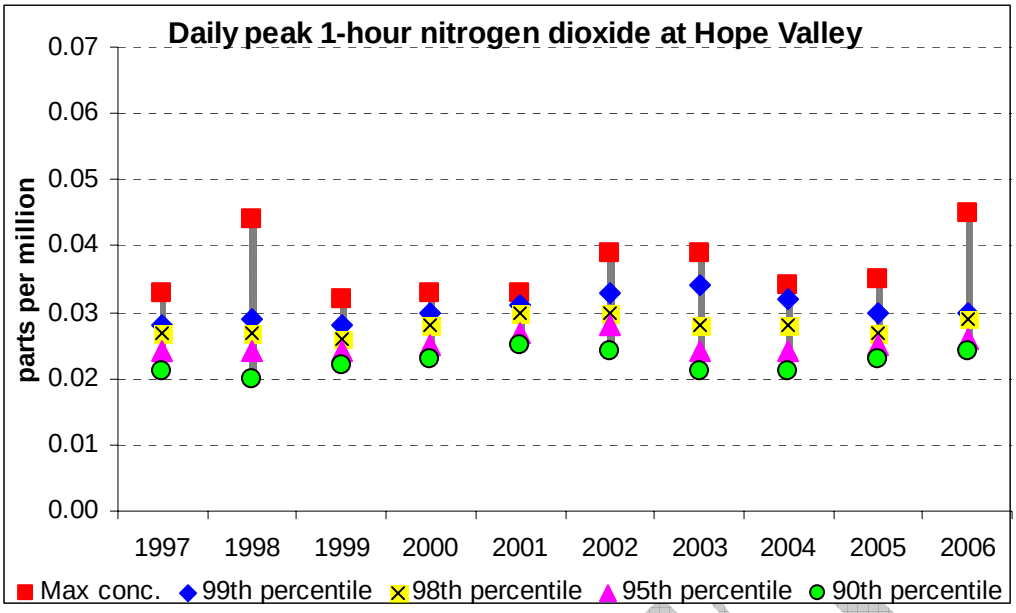


Figure A1-7 - 1-hour nitrogen dioxide at Hope Valley

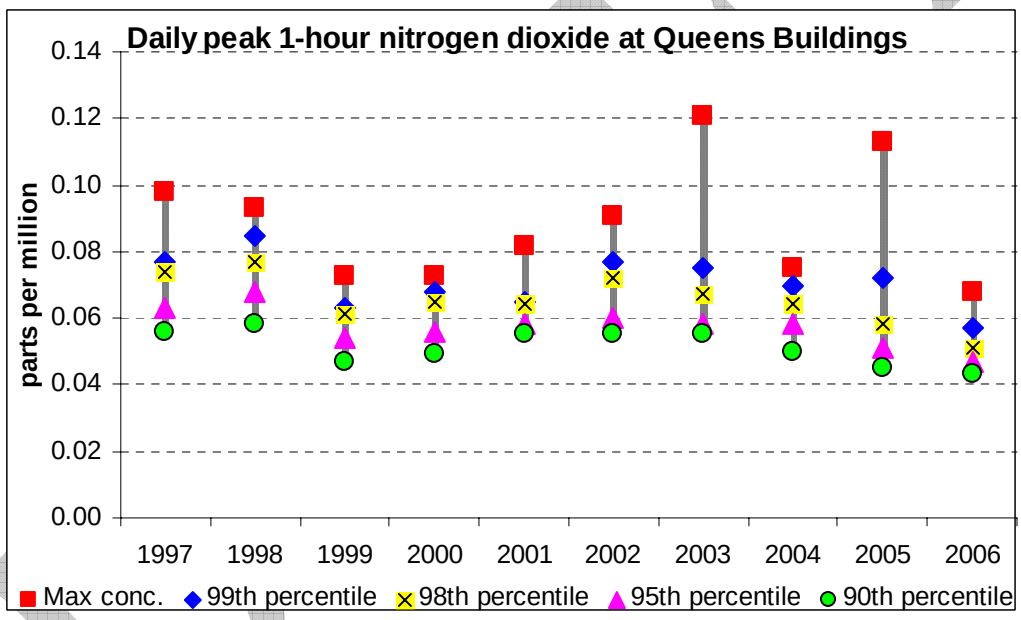


Figure A1-8 - 1-hour nitrogen dioxide at Queens Buildings

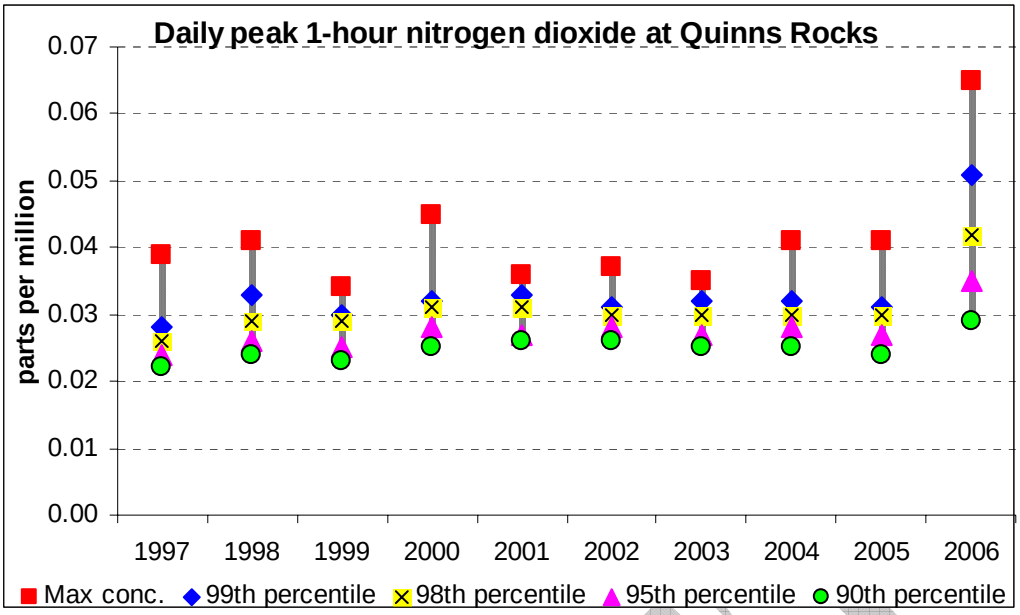


Figure A1-9 - 1-hour nitrogen dioxide at Quinns Rocks

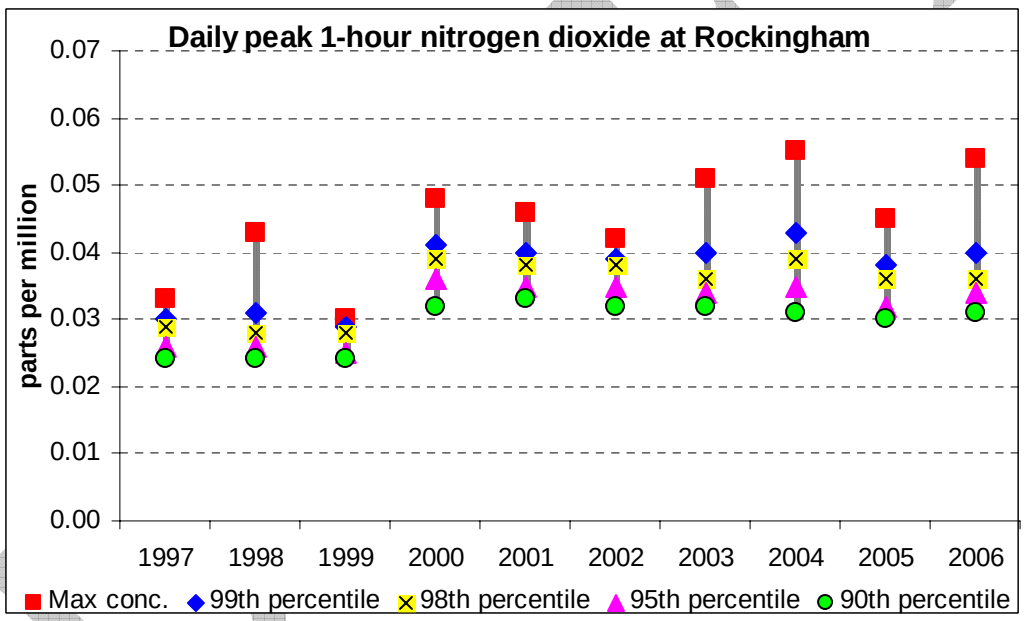


Figure A1-10 - 1-hour nitrogen dioxide at Rockingham

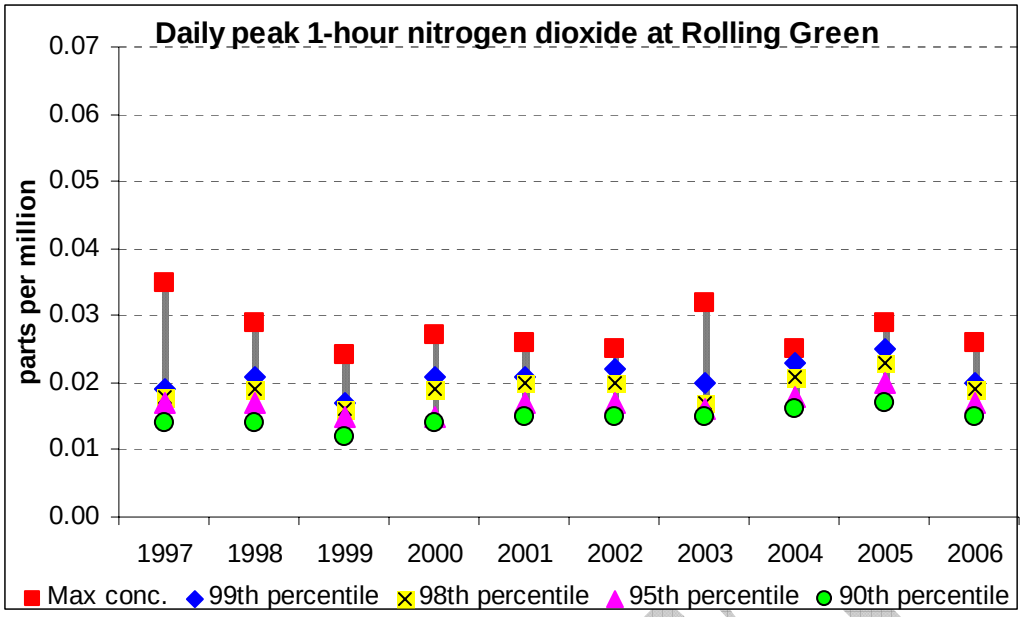


Figure A1-11 - 1-hour nitrogen dioxide at Rolling Green

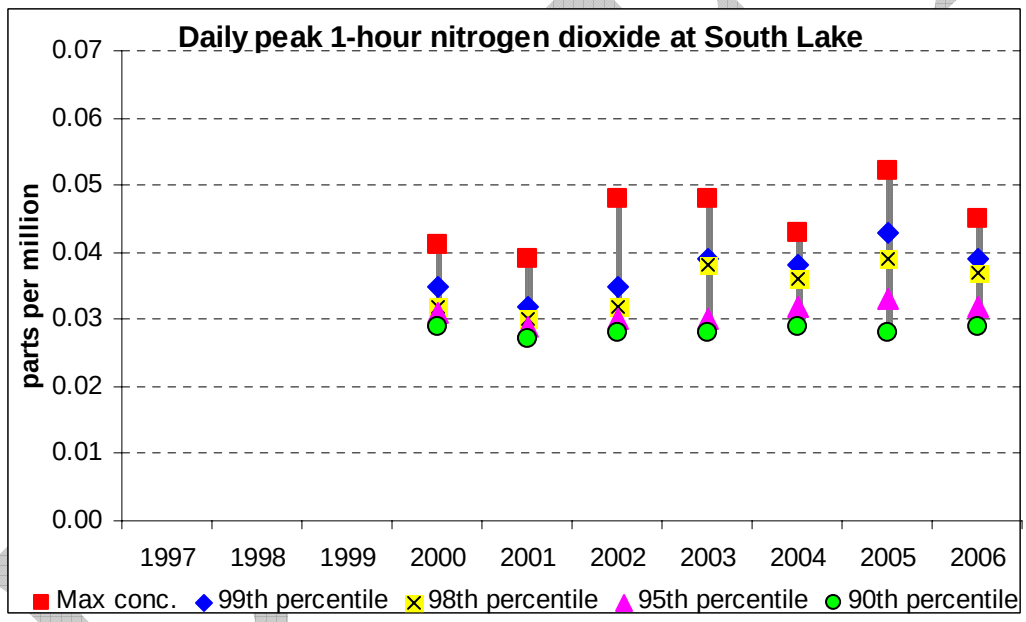


Figure A1-12 - 1-hour nitrogen dioxide at South Lake

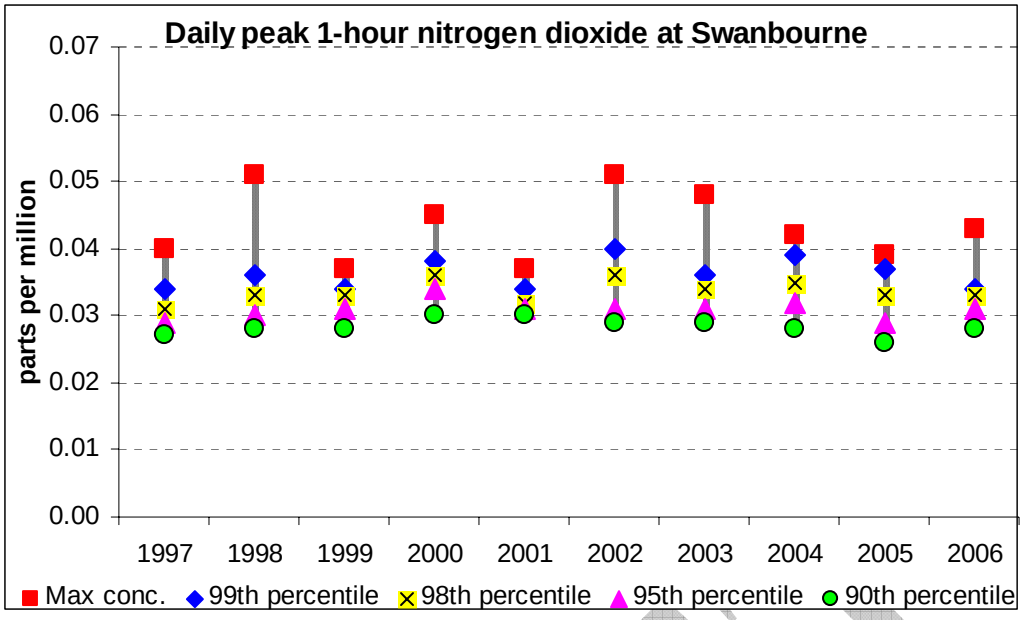


Figure A1-13 - 1-hour nitrogen dioxide at Swanbourne

Ozone

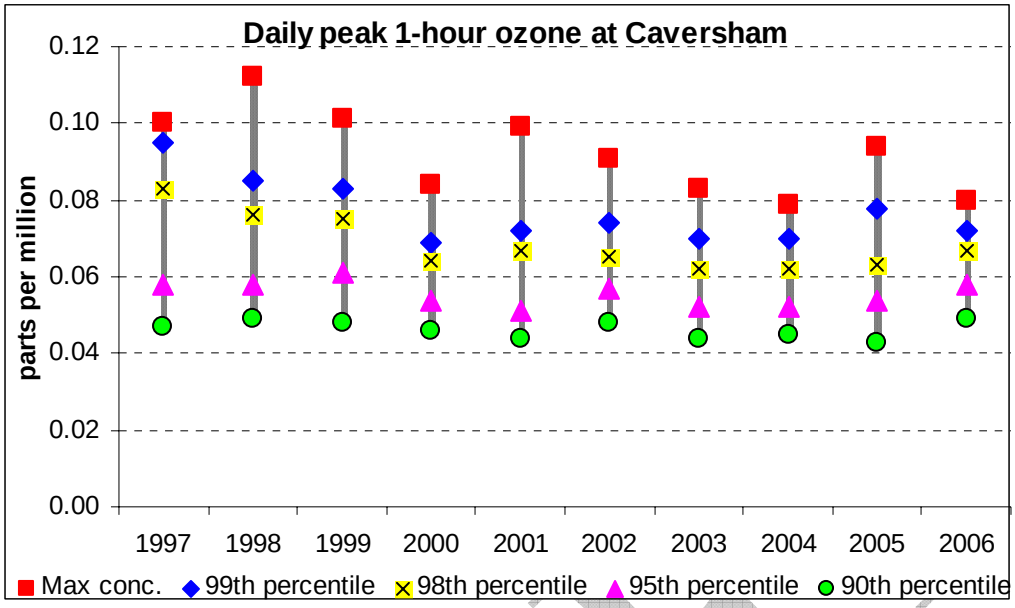


Figure A1-14 - 1-hour ozone at Caversham

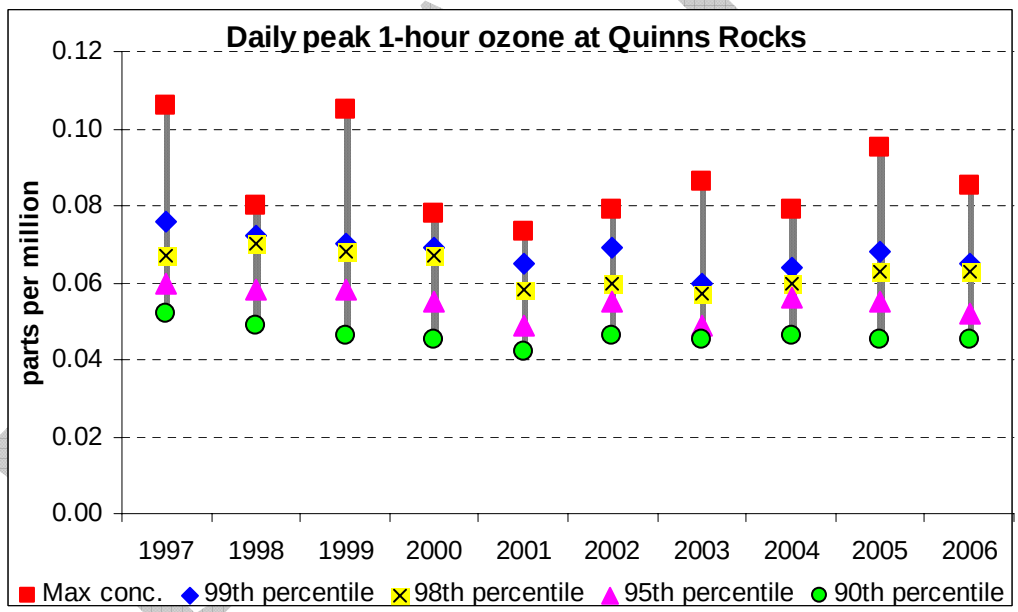


Figure A1-15 - 1-hour ozone at Quinns Rocks

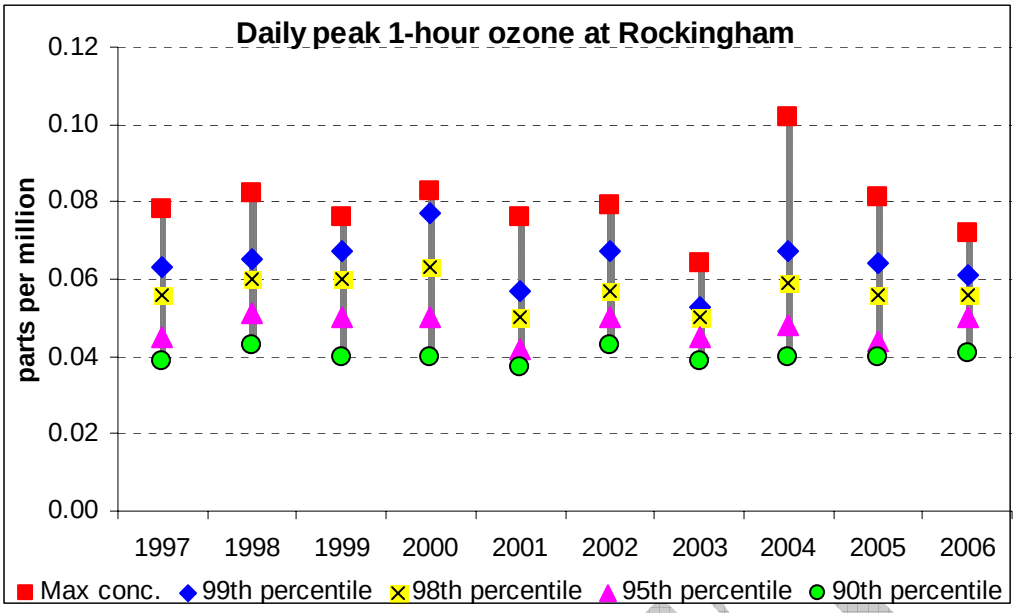


Figure A1-16 - 1-hour ozone at Rockingham

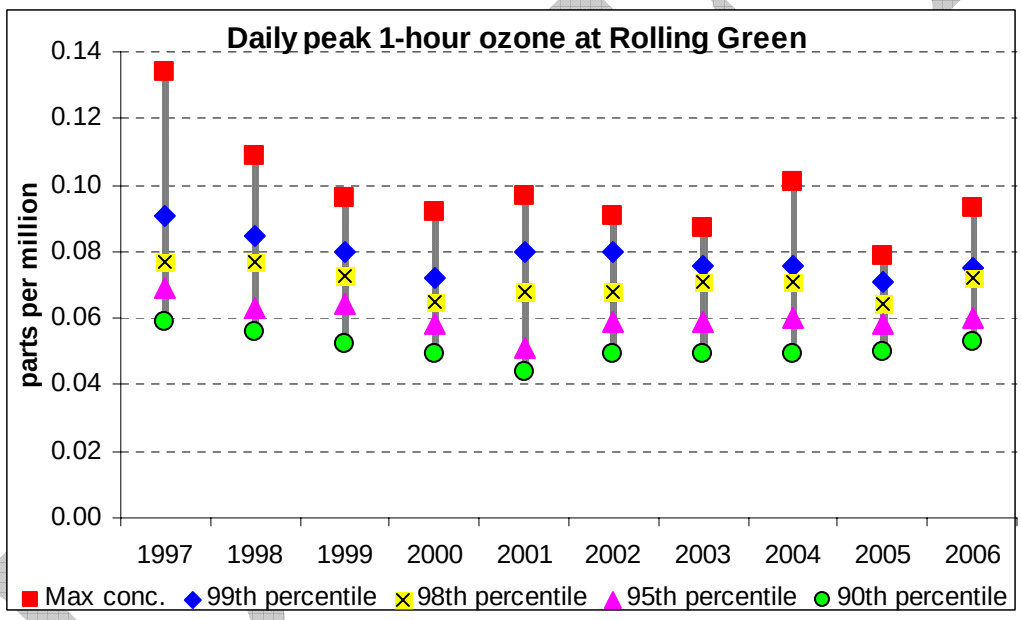


Figure A1-17 - 1-hour ozone at Rolling Green

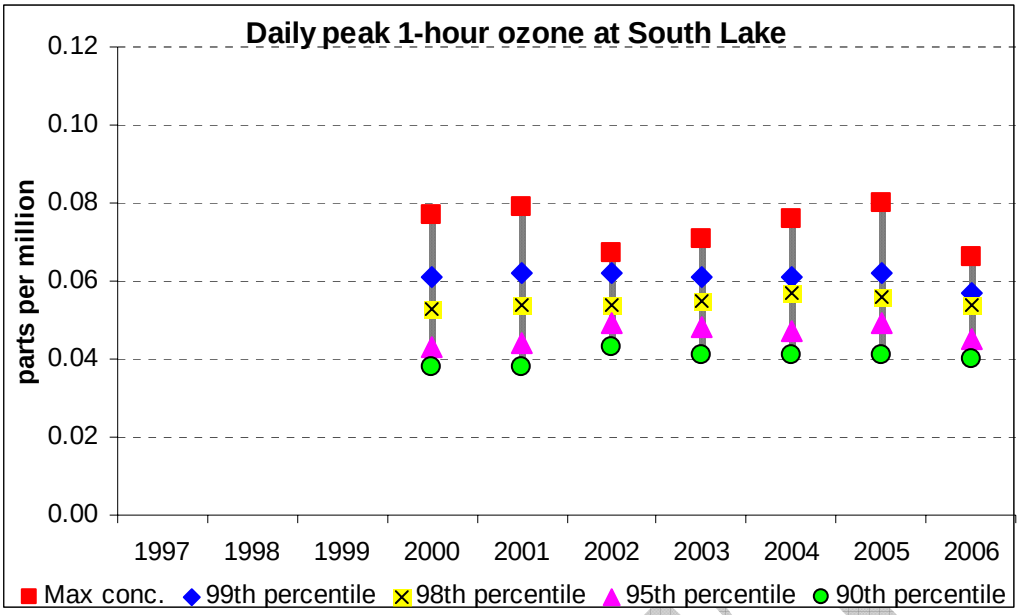


Figure A1-18 - 1-hour ozone at South Lake

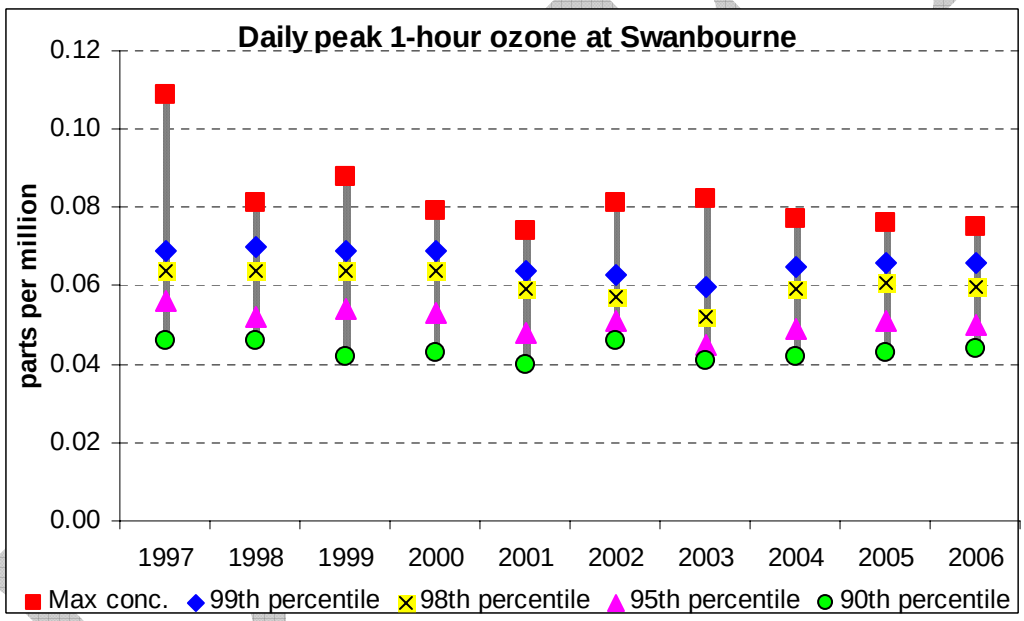


Figure A1-19 - 1-hour ozone at Swanbourne

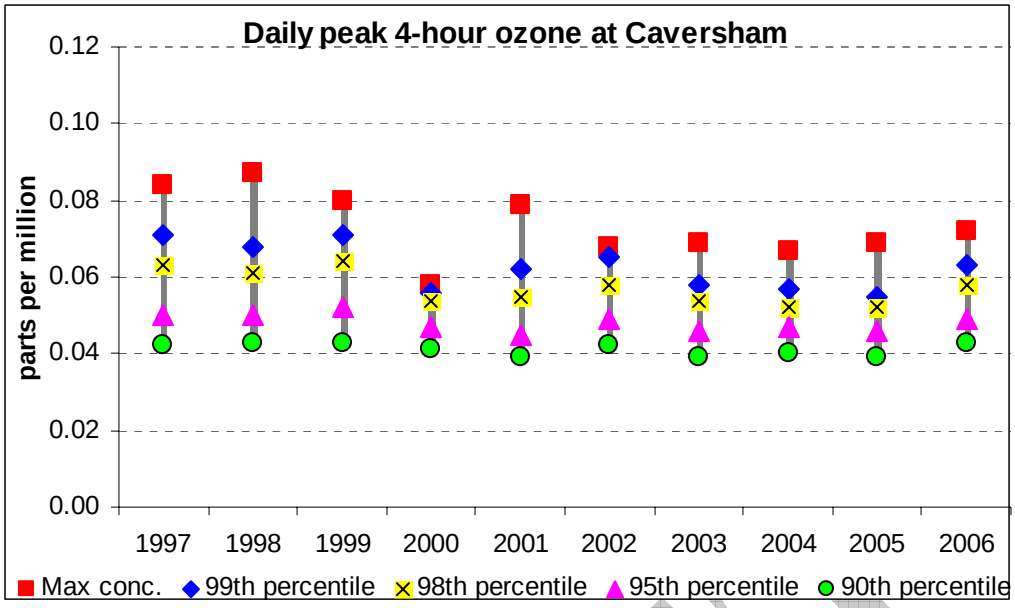


Figure A1-20 - 4-hour ozone at Caversham

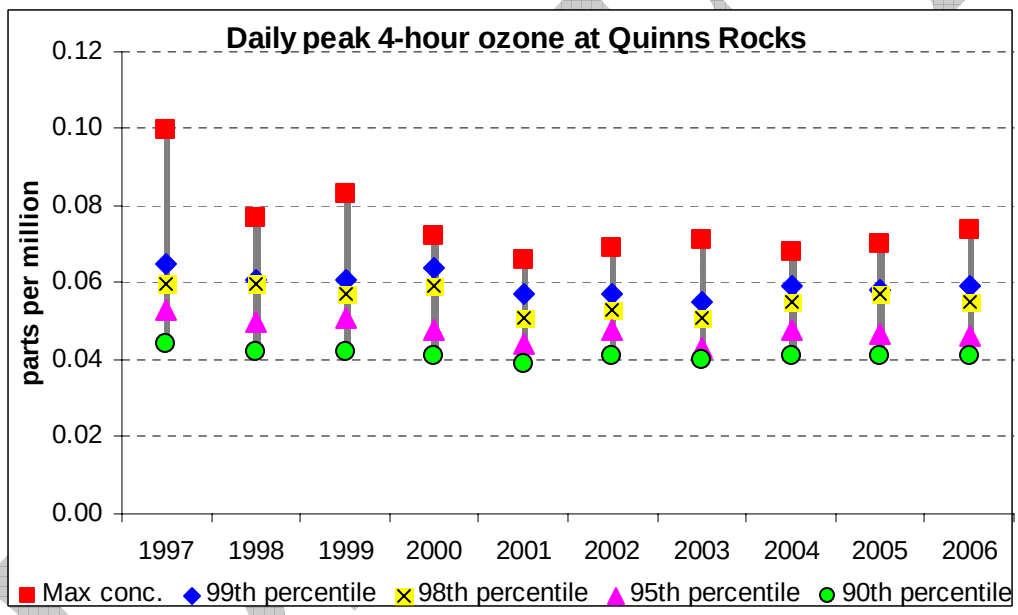


Figure A1-21 - 4-hour ozone at Quinns Rocks

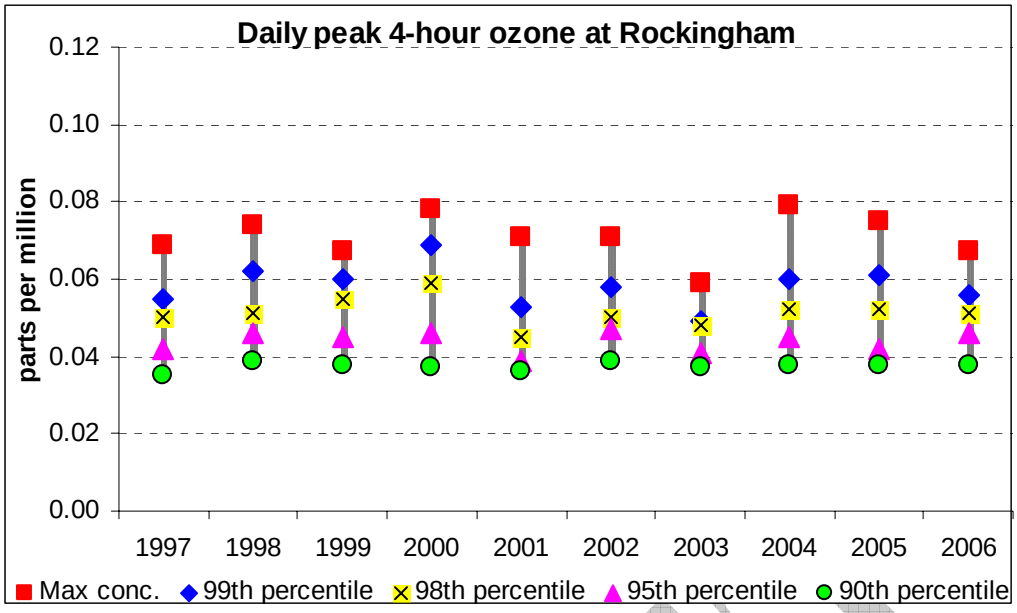


Figure A1-22 - 4-hour ozone at Rockingham

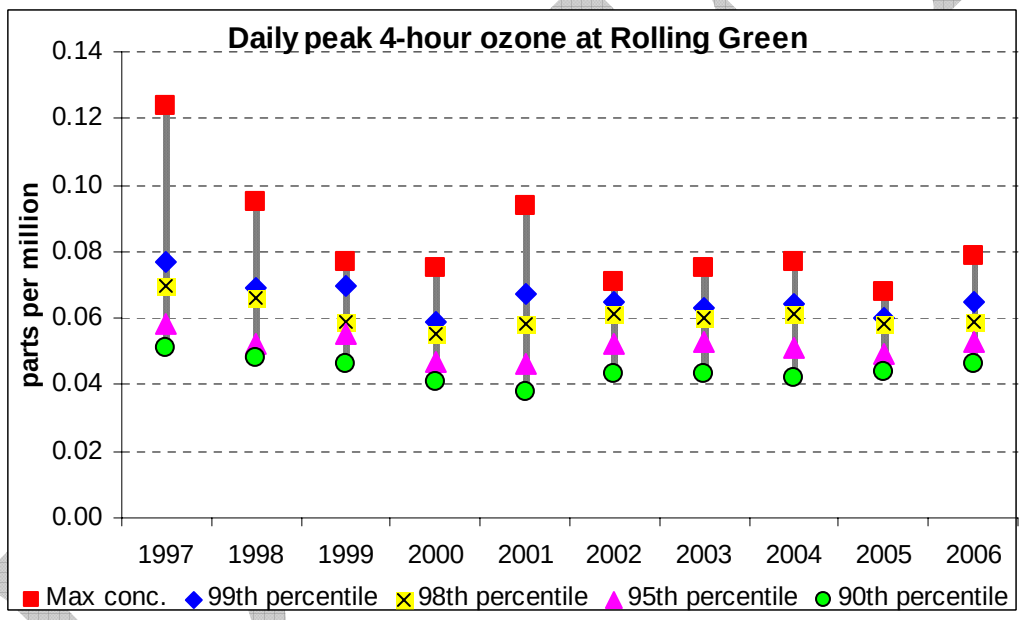


Figure A1-23 - 4-hour ozone at Rolling Green

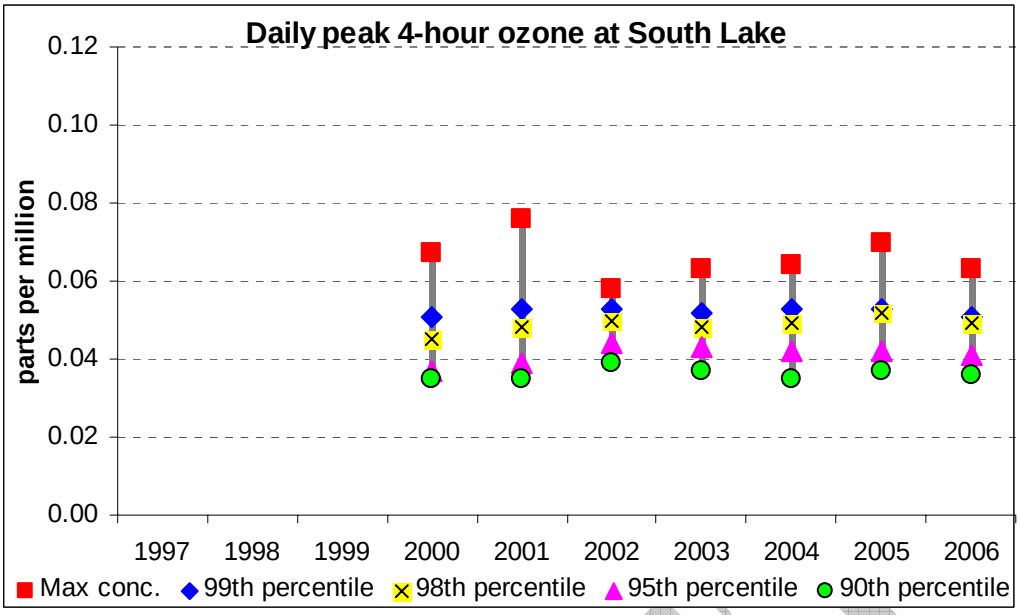


Figure A1-24 - 4-hour ozone at South Lake

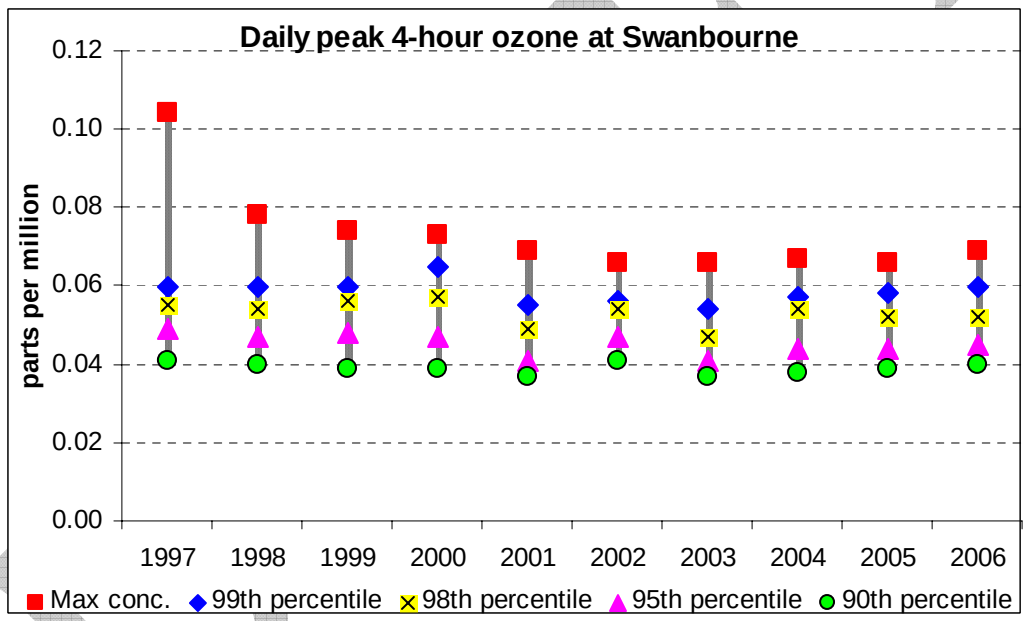


Figure A1-25 - 4-hour ozone at Swanbourne

Sulfur Dioxide

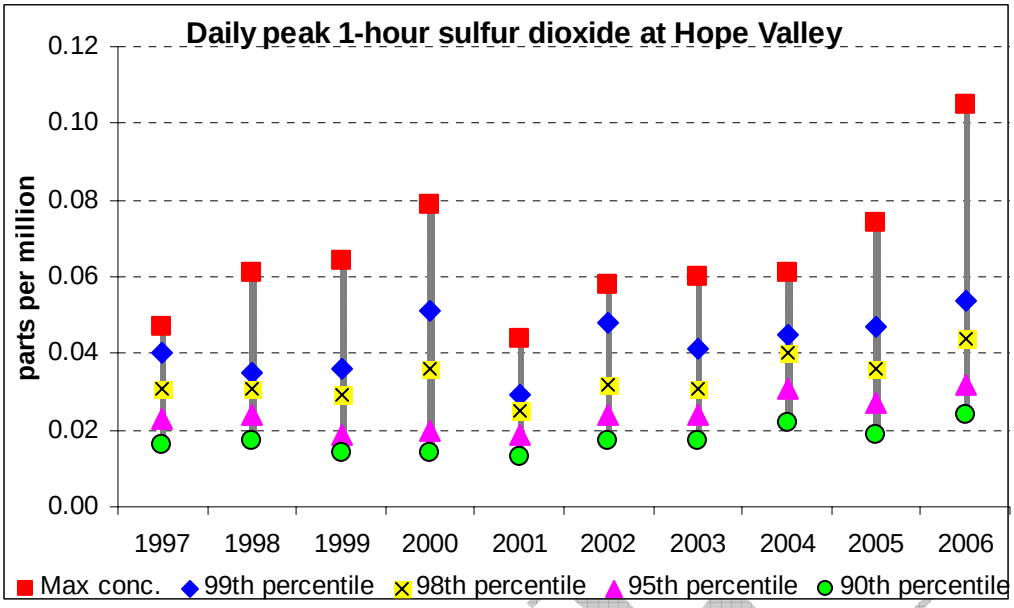


Figure A1-26 - 1-hour sulfur dioxide at Hope valley

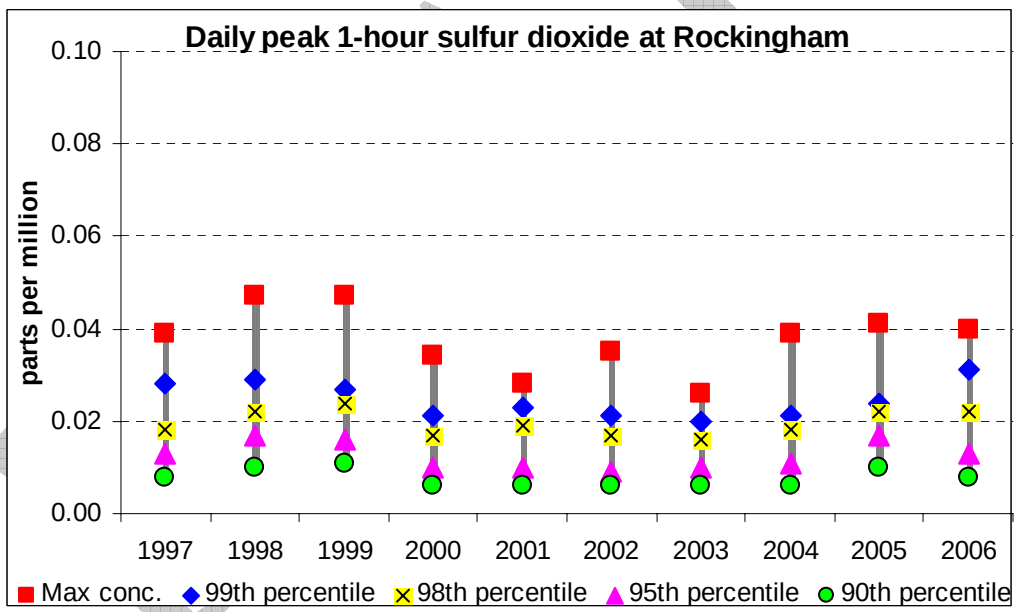


Figure A1-27 - 1-hour sulfur dioxide at Rockingham

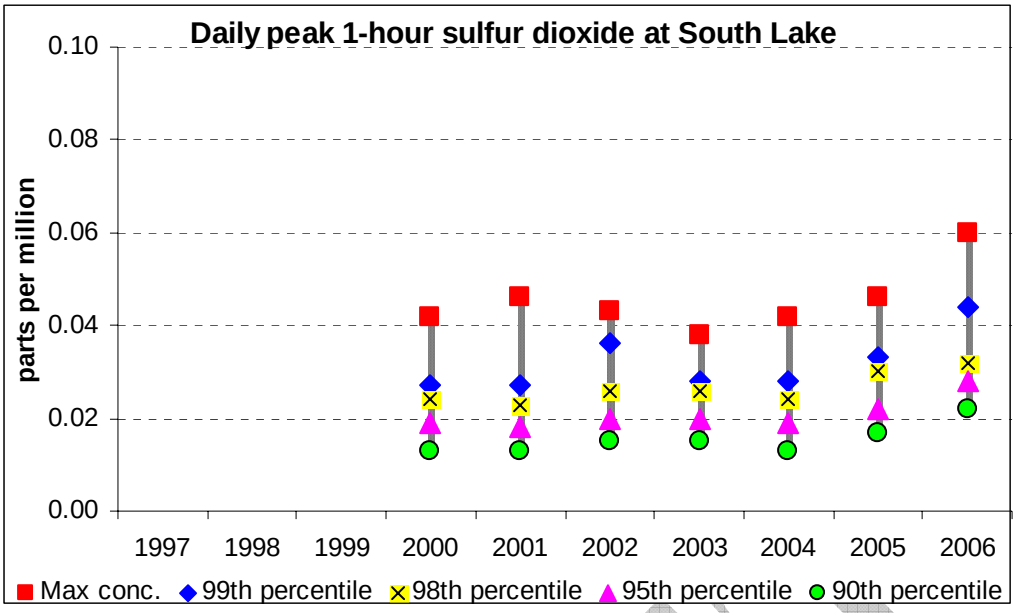


Figure A1-28 - 1-hour sulfur dioxide at South Lake

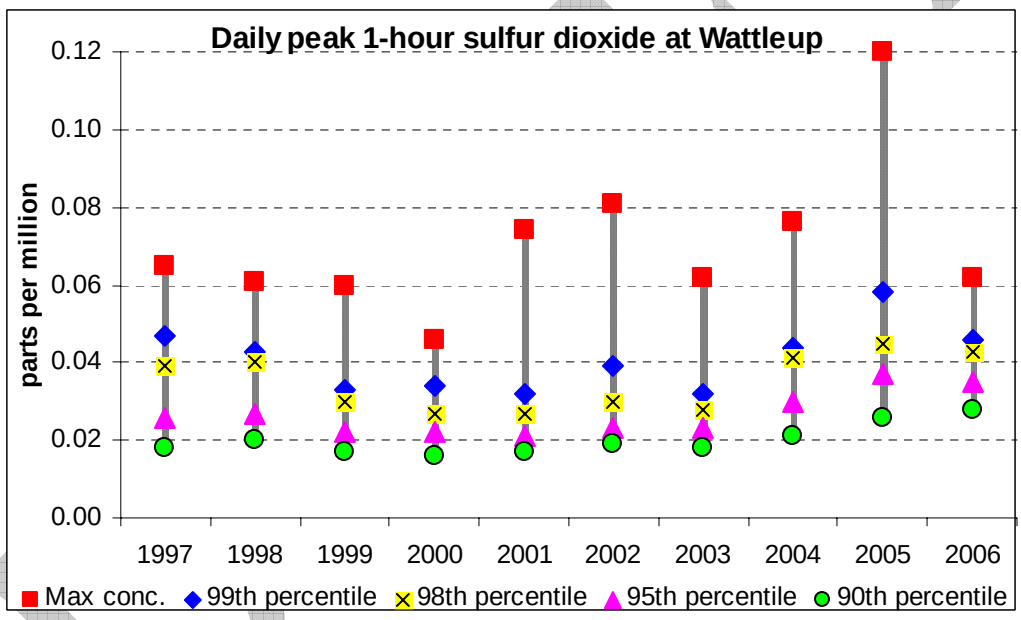


Figure A1-29 - 1-hour sulfur dioxide at Wattleup

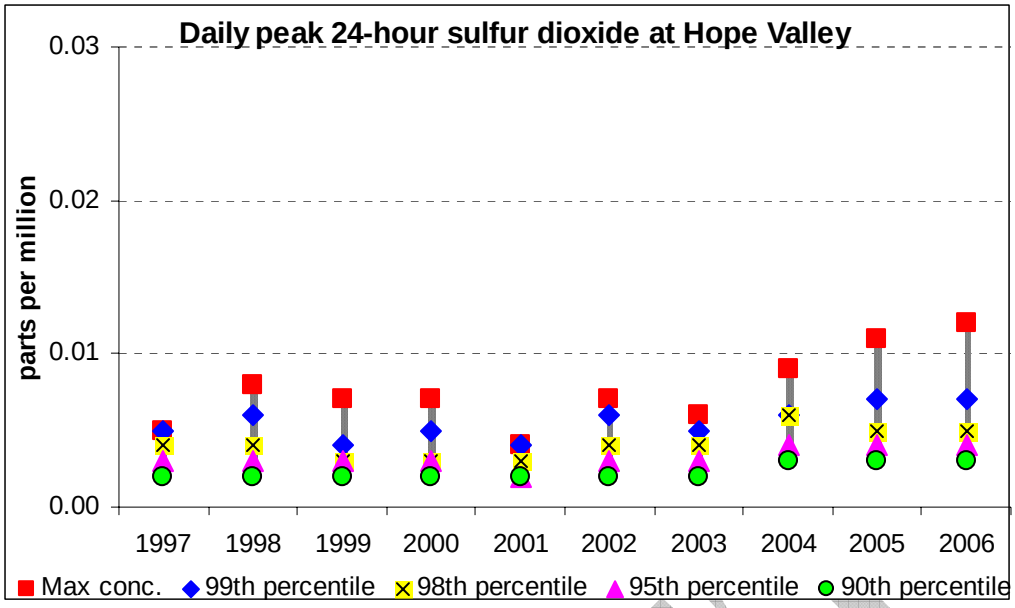


Figure A1-30 - 24-hour sulfur dioxide at Hope Valley

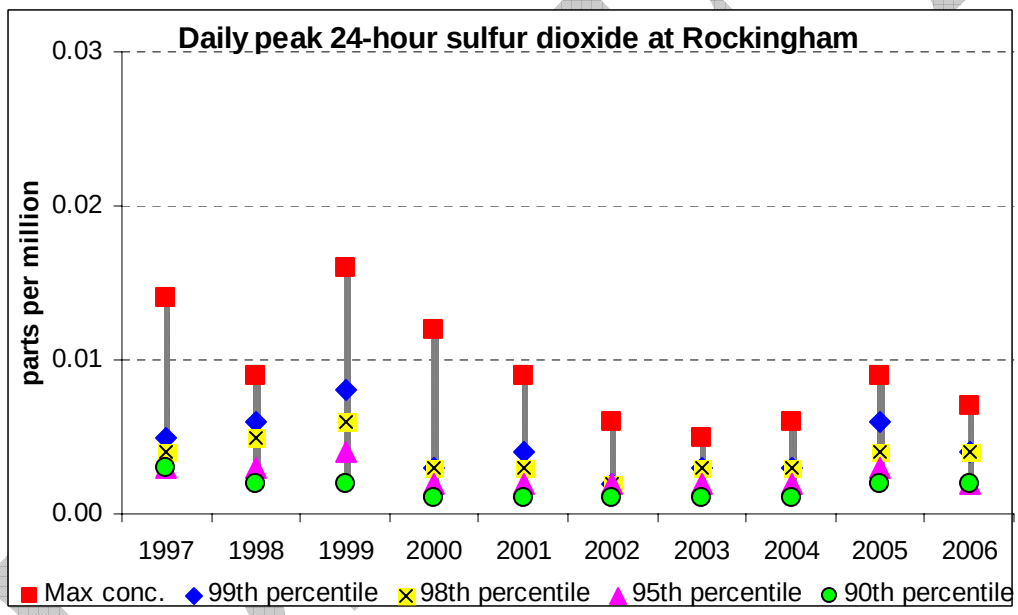


Figure A1-31 - 24-hour sulfur dioxide at Rockingham

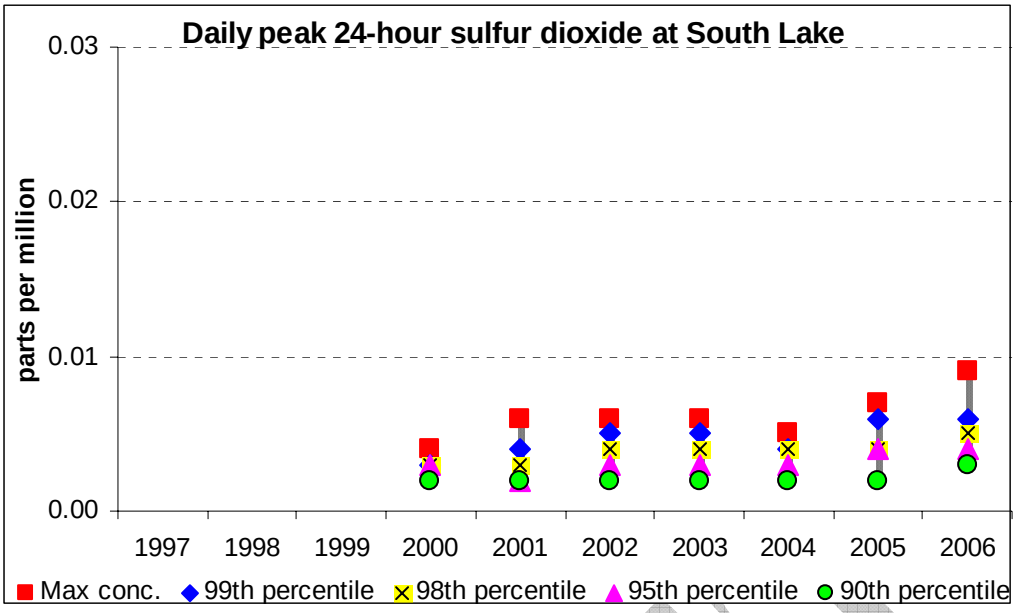


Figure A1-32 - 24-hour sulfur dioxide at South Lake

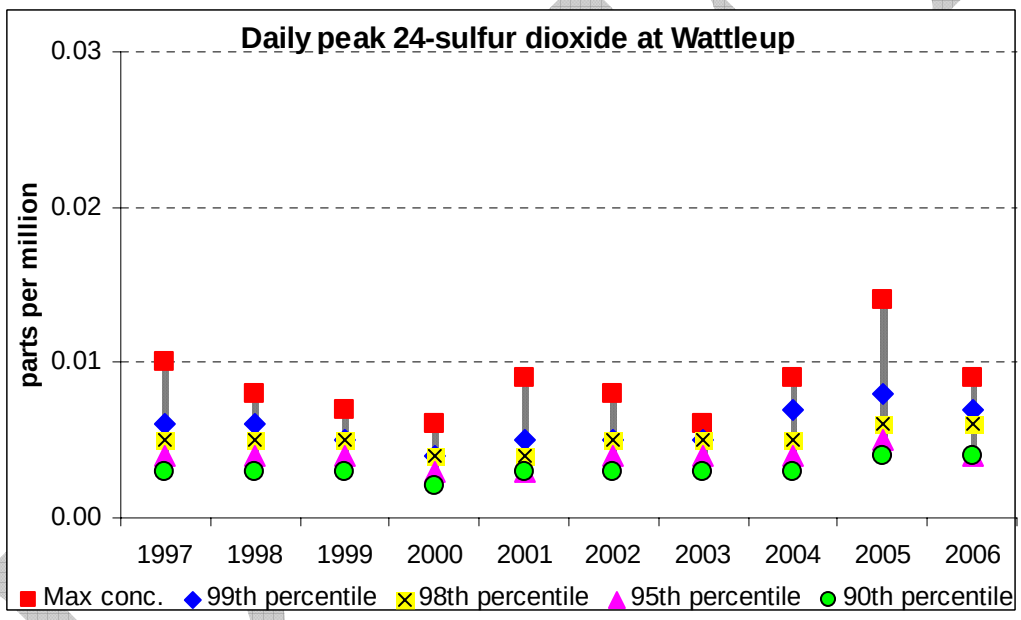


Figure A1-33 - 24-hour sulfur dioxide at Wattleup

Particles as PM_{10}

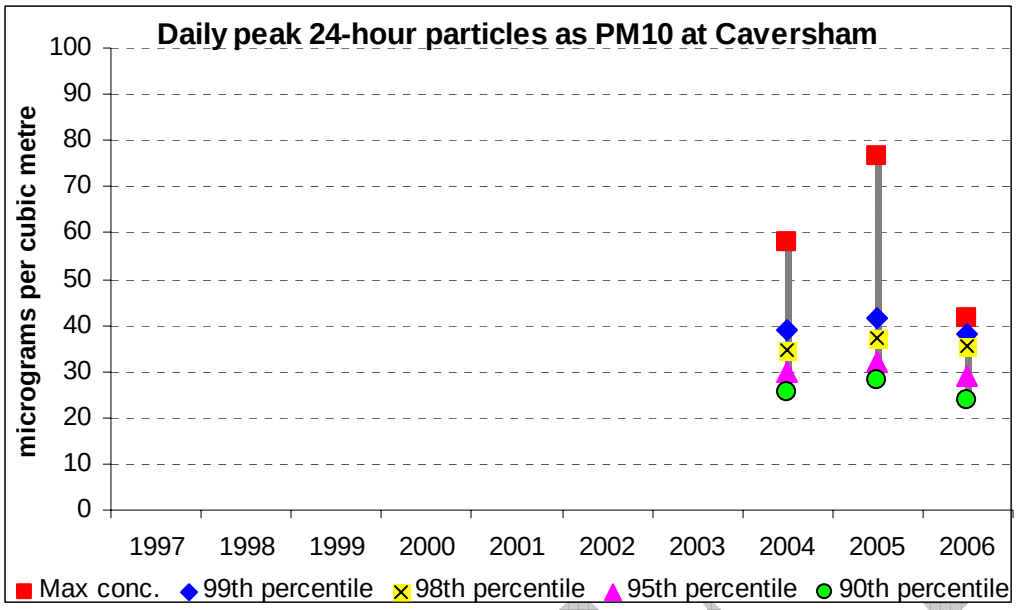


Figure A1-34 - 24-hour PM_{10} at Caversham

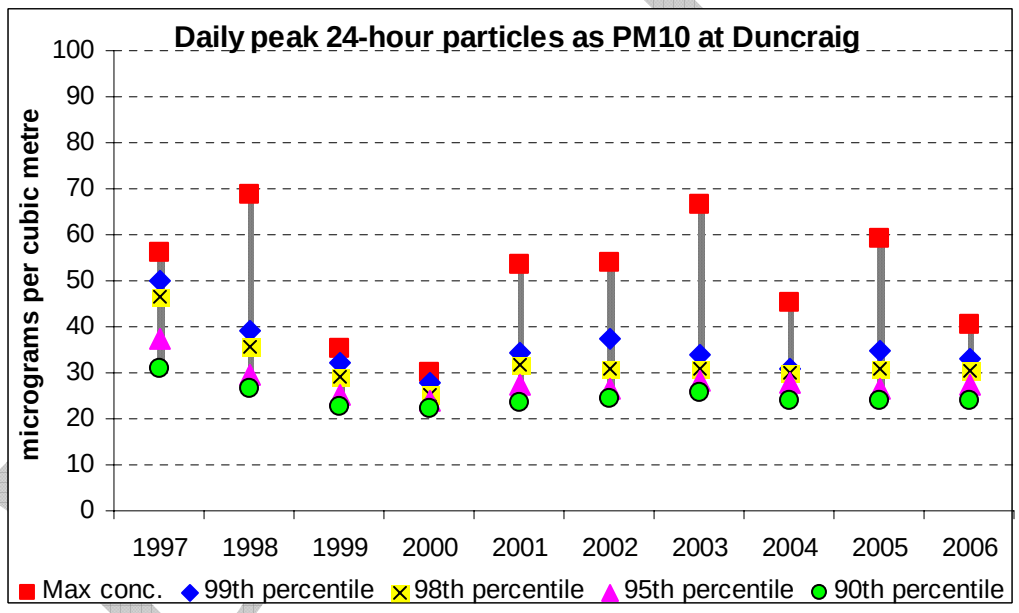


Figure A1-35 - 24-hour PM_{10} at Duncraig

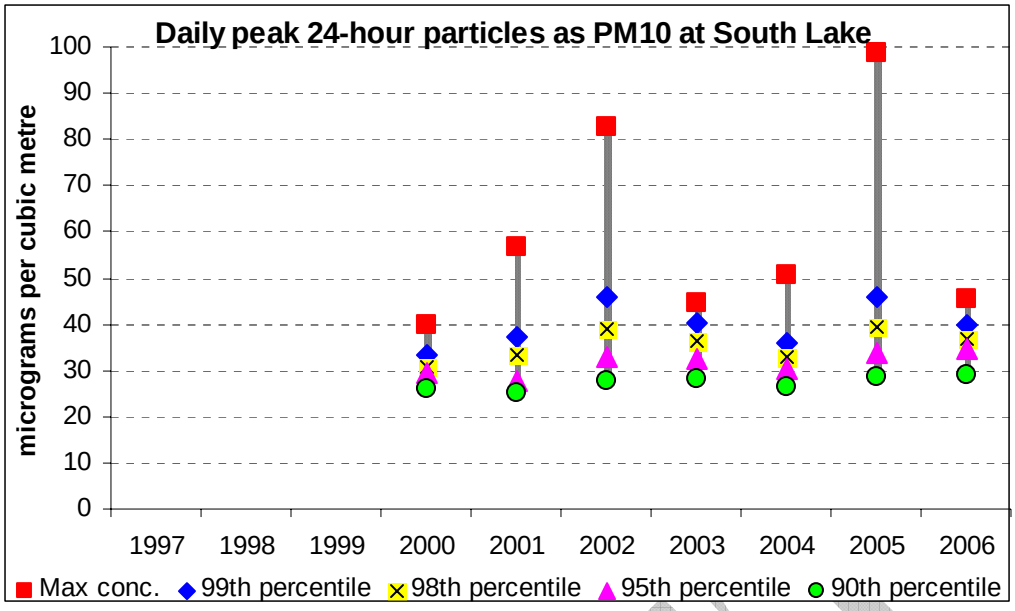


Figure A1-36 - 24-hour PM_{10} at South Lake

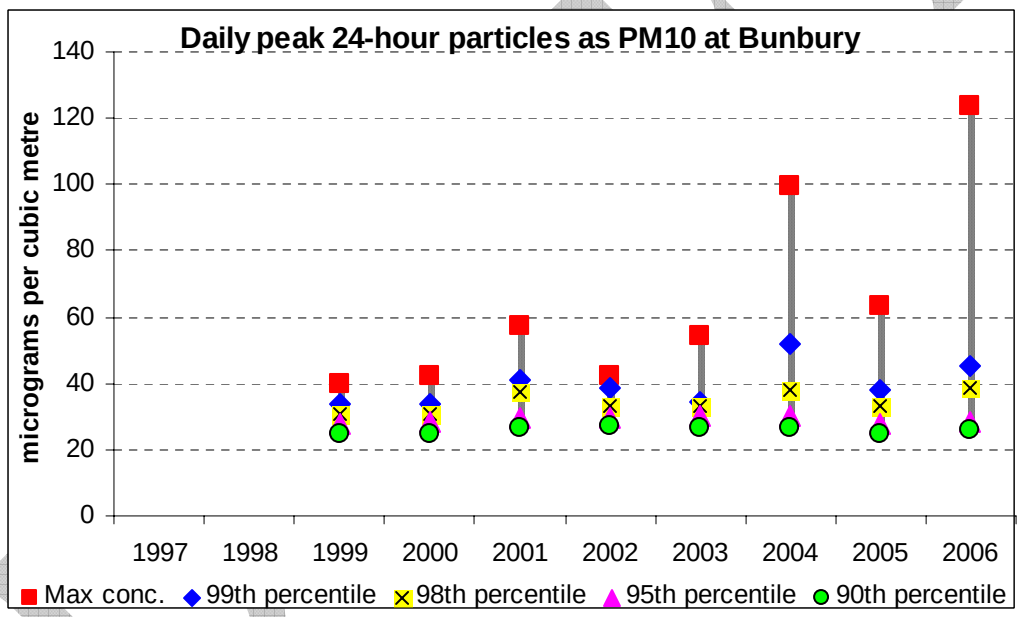


Figure A1-37 - 24-hour PM_{10} at Bunbury

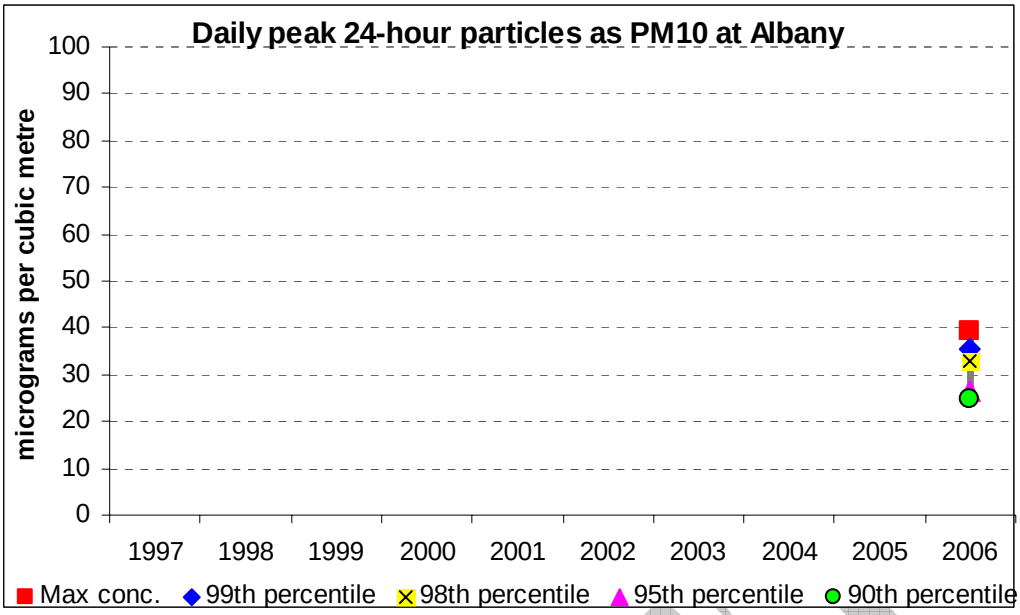


Figure A1-38 - 24-hour PM_{10} at Albany

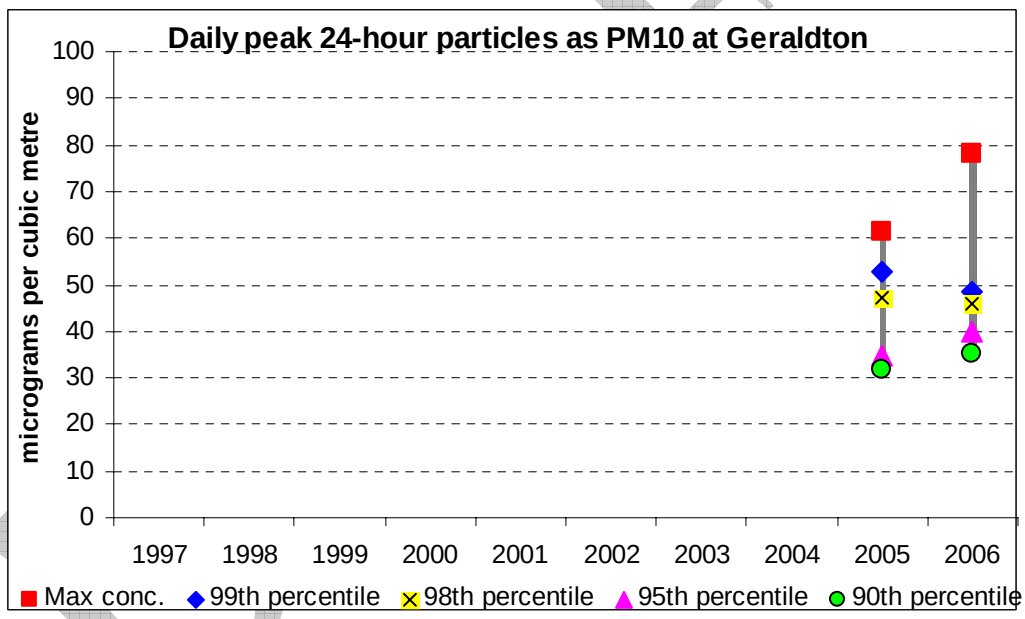


Figure A1-39 - 24-hour PM_{10} at Geraldton

Particles as $PM_{2.5}$

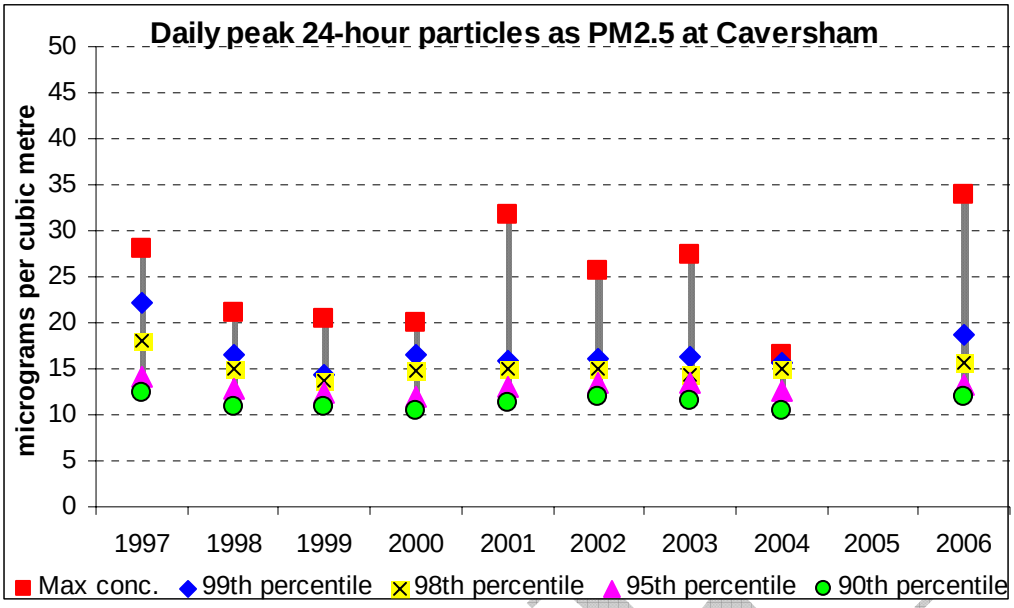


Figure A1-40 - 24-hour $PM_{2.5}$ at Caversham

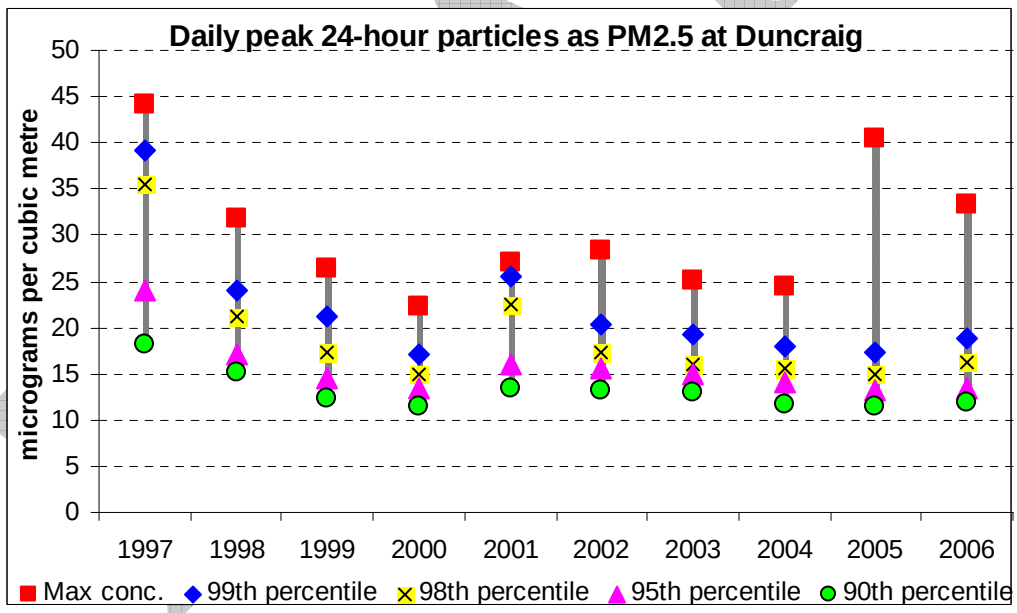


Figure A1-41 - 24-hour $PM_{2.5}$ at Duncraig

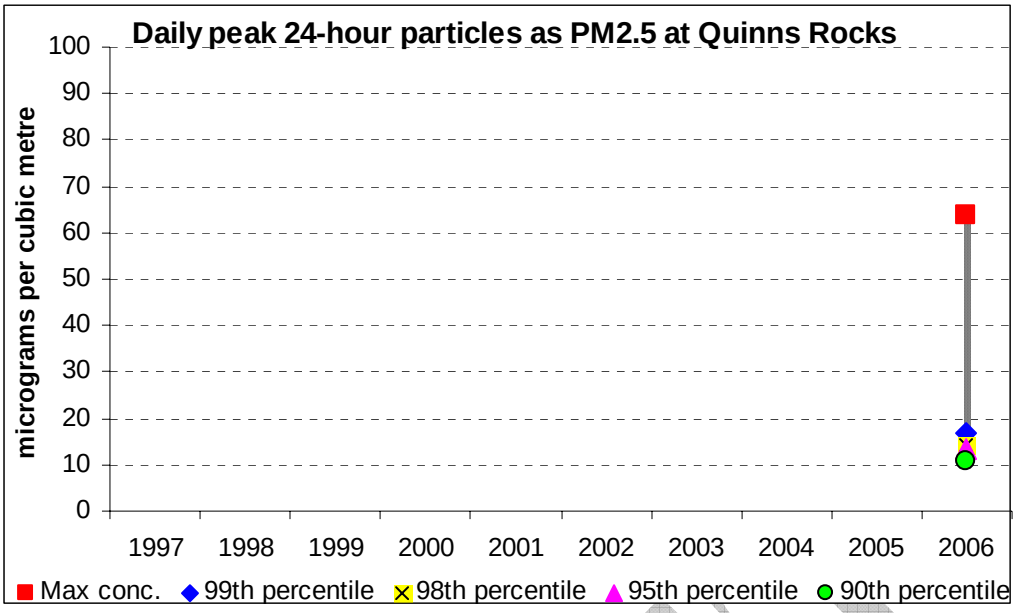


Figure A1-42 - 24-hour $PM_{2.5}$ at Quinns Rocks

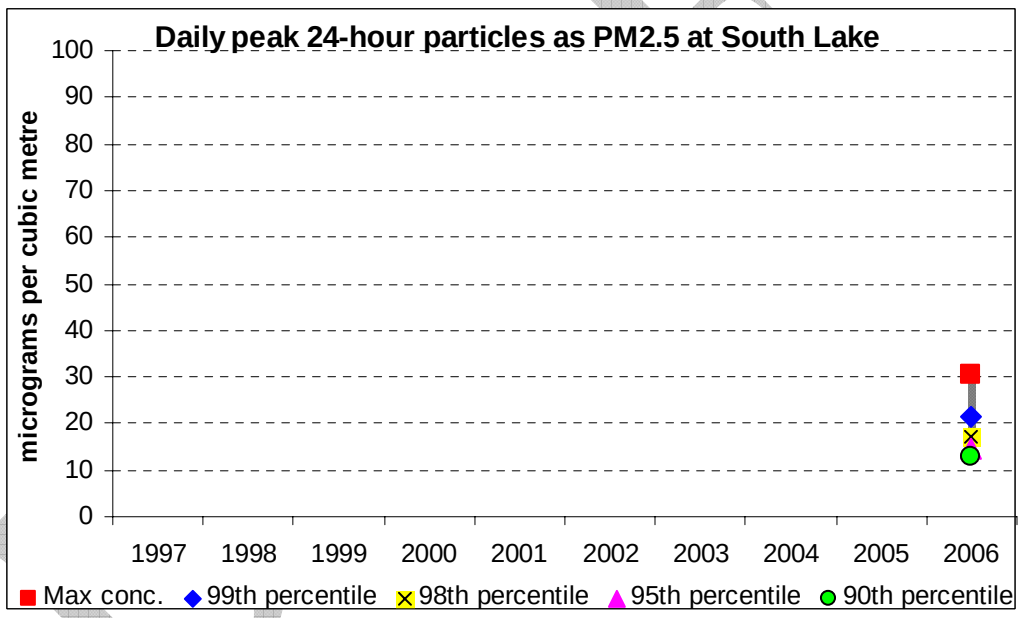


Figure A1-43 - 24-hour $PM_{2.5}$ at South Lake

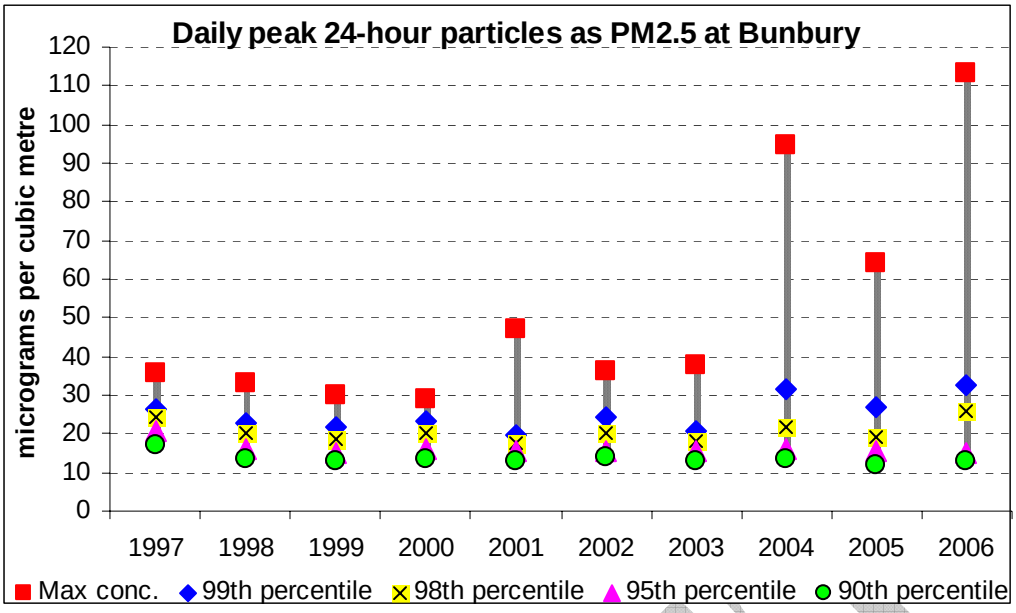
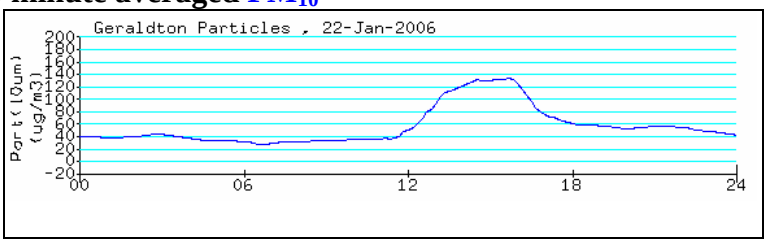


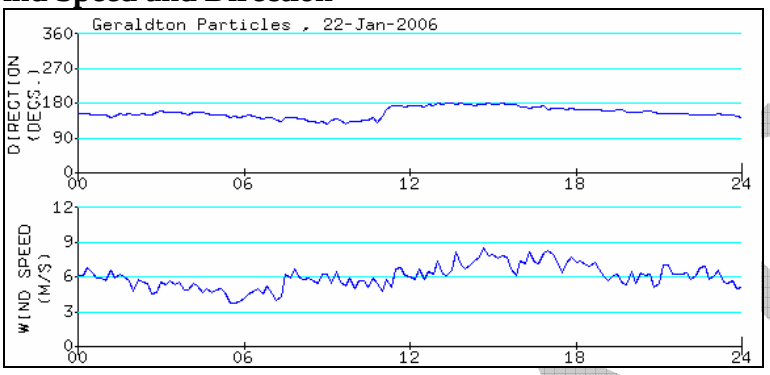
Figure A1-44 - 24-hour $PM_{2.5}$ at Bunbury

Attachment 2 – PM_{10} Exceedance on 22nd January 2006

60 minute averaged PM_{10}



Wind Speed and Direction



Pollutant

PM_{10}

Monitoring Site

Geraldton

Highest Concentration

57.1 µg/m^3.

Averaging Period

24 hours

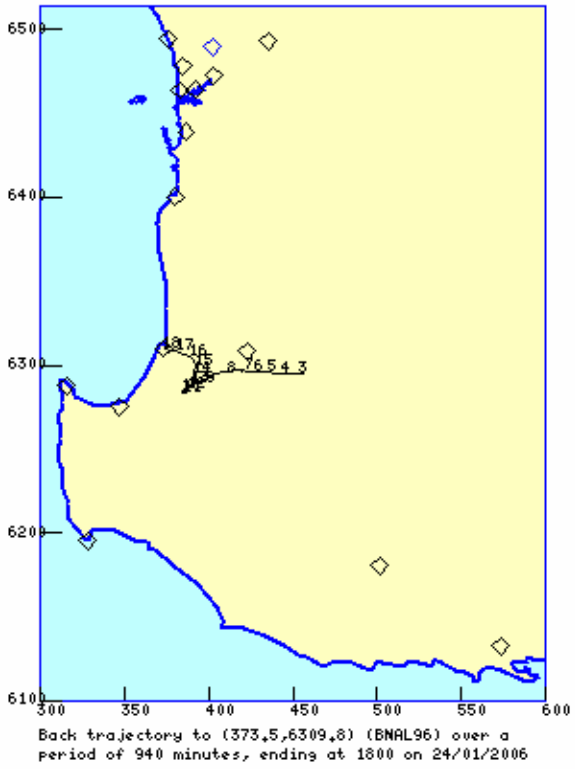
NEPM Standard

PM_{10} – 50.0 ug/m^3

Description of Event

Some burning-off / bushfires in the region contributed to high particle levels.

Attachment 3 –$PM_{2.5}$ Exceedance on 24th January 2006



Pollutant

$PM_{2.5}$

Monitoring Site

Bunbury

Highest Concentration

31.2 µg/m^3.

Averaging Period

24 hours

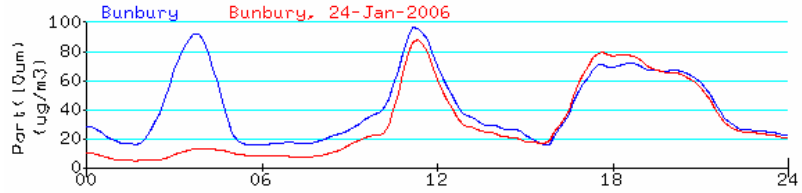
NEPM Standard

$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

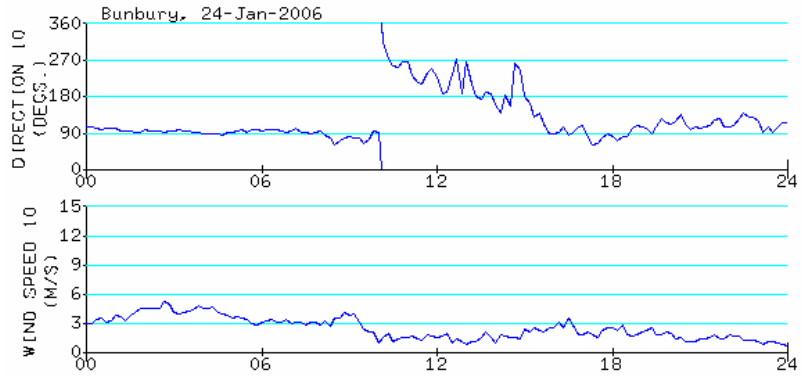
Description of Event

Some burning-off / bushfires in the region contributed to high particle levels.

60 minute averaged PM_{10} and $PM_{2.5}$

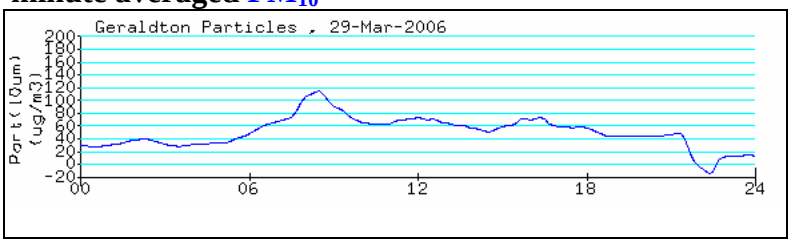


Wind Speed and Direction

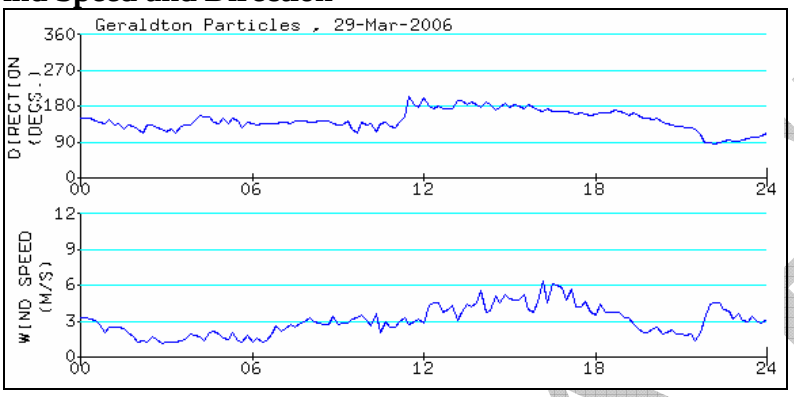


Attachment 4 - PM_{10} Exceedance on 29th March 2006

60 minute averaged PM_{10}



Wind Speed and Direction



Pollutant

PM_{10}

Monitoring Site

Geraldton

Highest Concentration

50.5 µg/m^3.

Averaging Period

24 hours

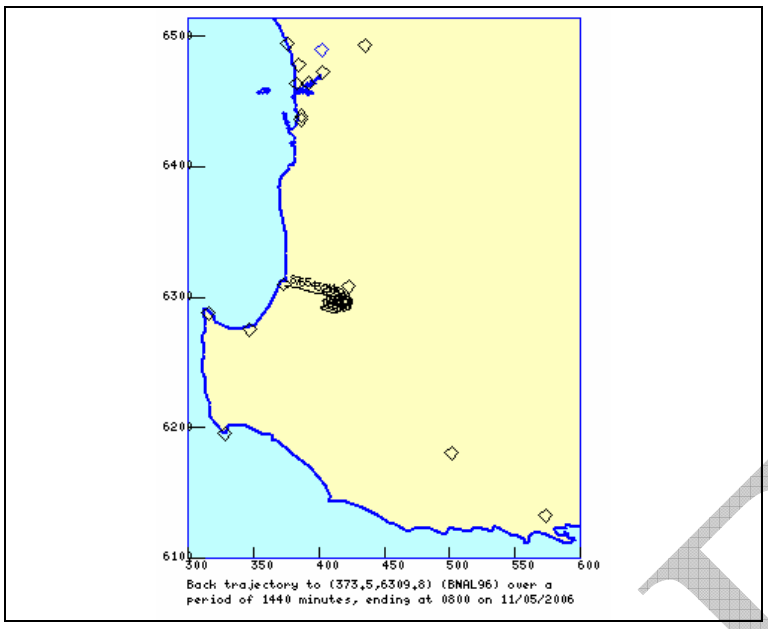
NEPM Standard

PM_{10} – 50.0 ug/m^3

Description of Event

Some burning-off / bushfires in the region contributed to high particle levels.

Attachment 5 – $PM_{2.5}$ Exceedances on 10th, 11th, 12th and 14th May 2006



Pollutant

$PM_{2.5}$

Monitoring Site

Bunbury

Highest Concentration

Date	PM_{10}	$PM_{2.5}$
10/05/06	39.6	26.4
11/05/06	49.7	34.6
12/05/06	43.0	27.4
14/05/06	42.4	28.8

Concentrations given in $\mu g/m^3$.

Averaging Period

24 hours

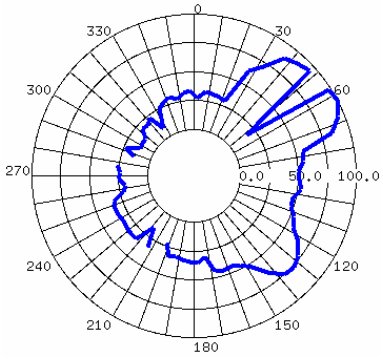
NEPM Standard

$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

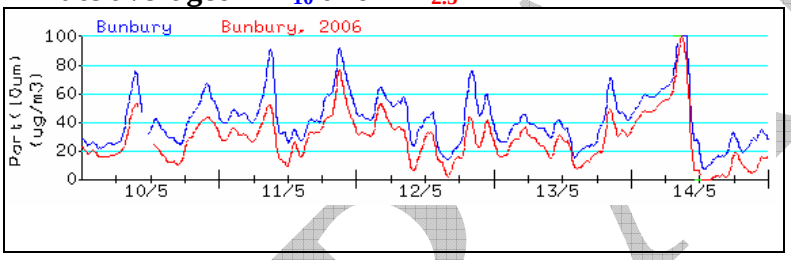
Description of Event

Low wind conditions caused an accumulation of wood smoke within the airshed.

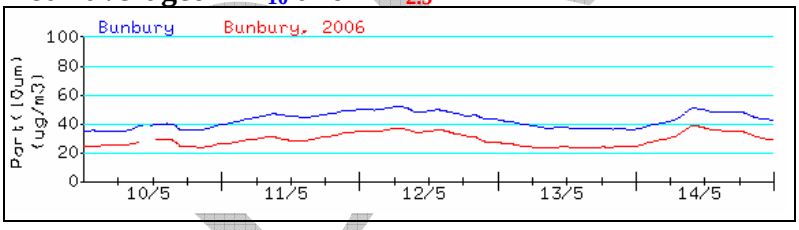
Bunbury pollution rose for 10^h-14^h May 2006.



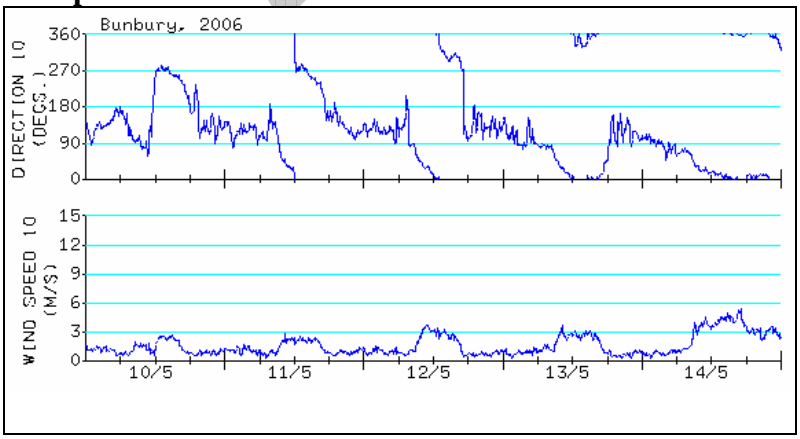
60 minute averaged PM_{10} and $PM_{2.5}$



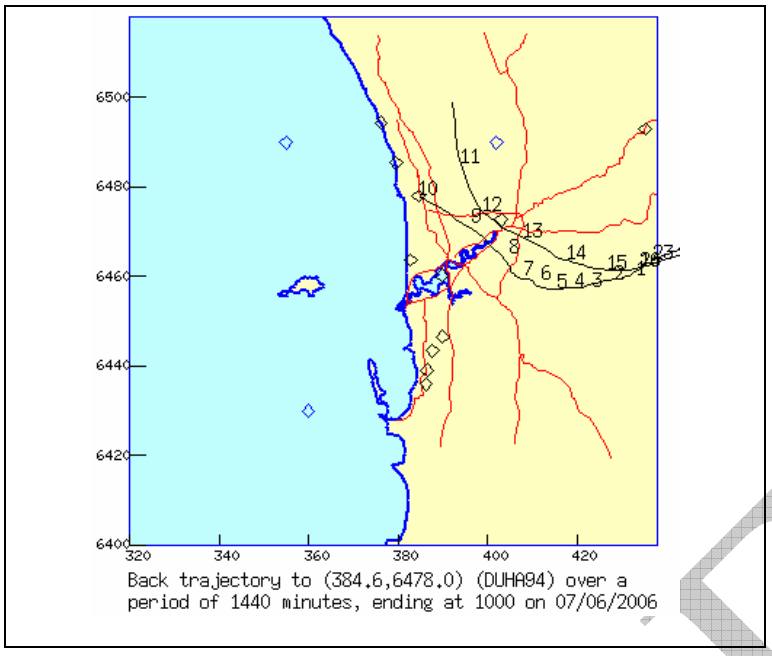
24 hour averaged PM_{10} and $PM_{2.5}$



Wind Speed and Direction



Attachment 6 –$PM_{2.5}$ Exceedances on 7th June 2006



Pollutant

$PM_{2.5}$

Monitoring Site

Caversham & Duncraig

Highest Concentration

Caversham - 34.0 µg/m^3.
Duncraig – 33.4 µg/m^3.

Averaging Period

24 hours

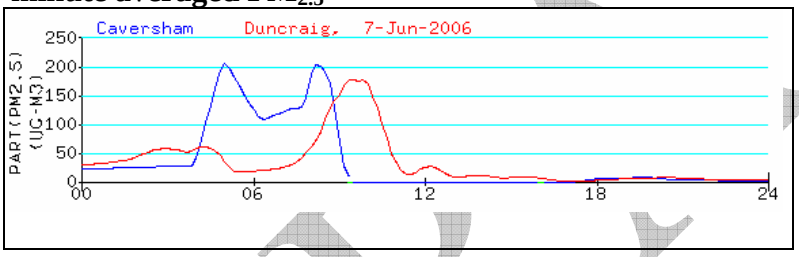
NEPM Standard

$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

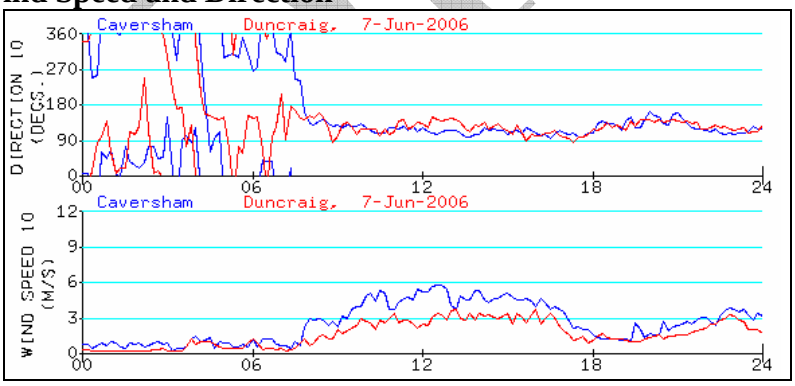
Description of Event

Some burning-off in the region contributed to high particle levels.

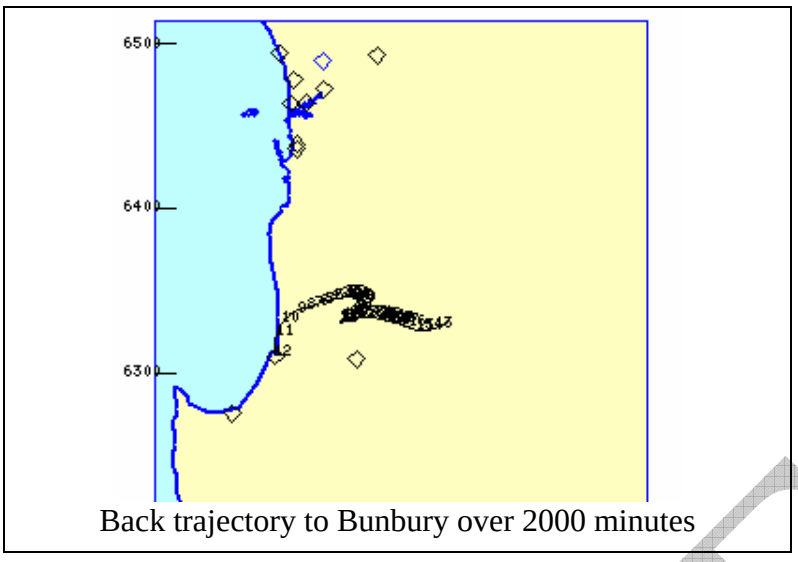
60 minute averaged $PM_{2.5}$



Wind Speed and Direction

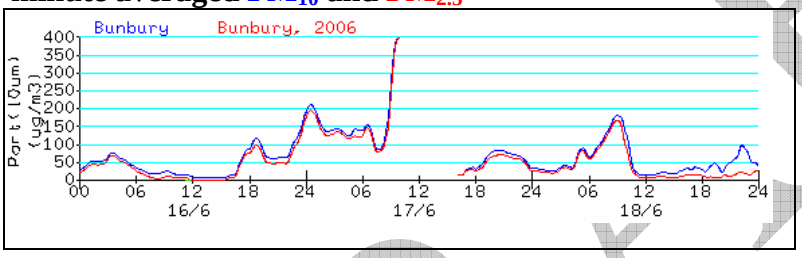


Attachment 7 – PM_{10} and $PM_{2.5}$ Exceedances on the 16th, 17th and 18th June 2006

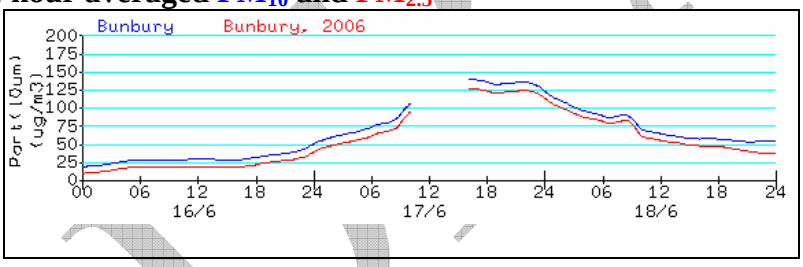


Back trajectory to Bunbury over 2000 minutes

60 minute averaged PM_{10} and $PM_{2.5}$



24 hour averaged PM_{10} and $PM_{2.5}$



Wind Speed and Direction

Pollutant

PM_{10} and $PM_{2.5}$

Monitoring Site

Bunbury

Highest Concentration

Date	PM_{10}	$PM_{2.5}$
16/06/06	50.7	39.9
17/06/06	123.5	113.5
18/06/06	54.6	37.6

Concentrations given in $\mu g/m^3$.

Averaging Period

24 hours

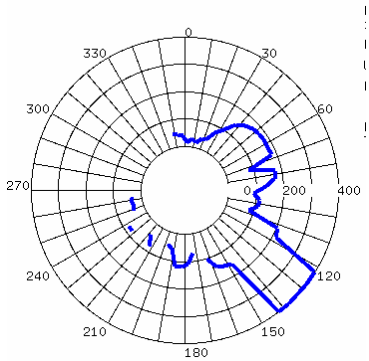
NEPM Standard

PM_{10} – 50.0 ug/m^3
$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

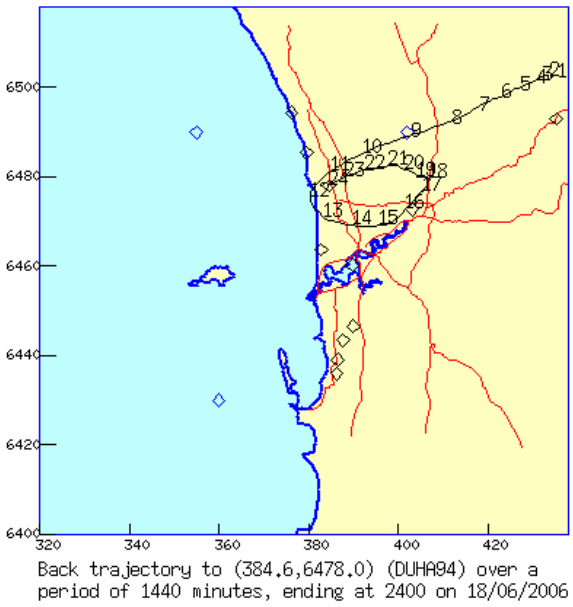
Description of Event

Low wind conditions caused an accumulation of wood smoke within the airshed.

Bunbury pollution rose for 16th-18th June 2006.



Attachment 8 – $PM_{2.5}$ Exceedance on 18th June 2006



Pollutant

$PM_{2.5}$

Monitoring Site

Duncraig & South Lake

Highest Concentration

Duncraig - 26.8 µg/m^3.
South Lake – 30.5 µg/m^3

Averaging Period

24 hours

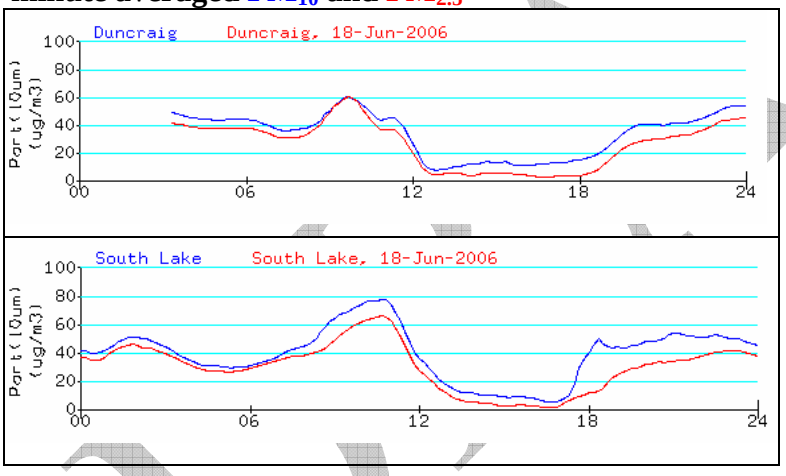
NEPM Standard

$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

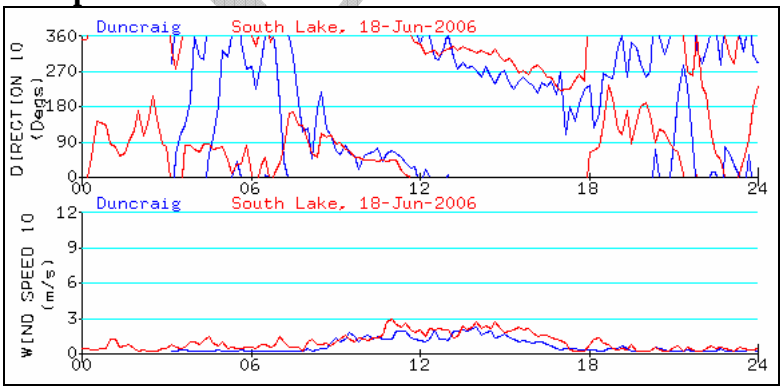
Description of Event

Low wind conditions and recirculation of air caused an accumulation of wood smoke within the airshed.

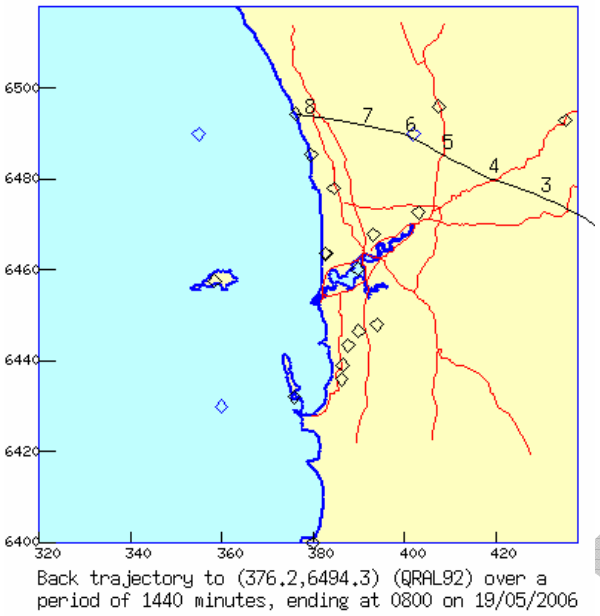
60 minute averaged PM_{10} and $PM_{2.5}$



Wind Speed and Direction



Attachment 9 – $PM_{2.5}$ Exceedance on 19th June 2006



Pollutant

$PM_{2.5}$

Monitoring Site

Quinns Rocks

Highest Concentration

63.9 µg/m^3.

Averaging Period

24 hours

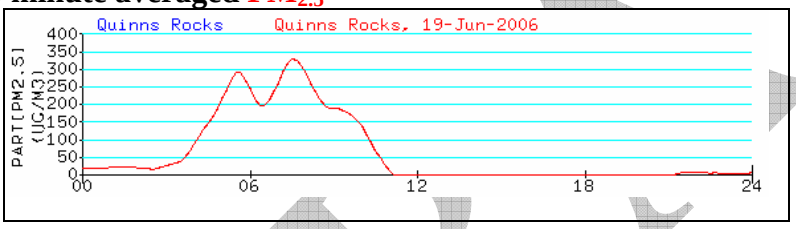
NEPM Standard

$PM_{2.5}$ – 25.0 ug/m^3 (advisory)

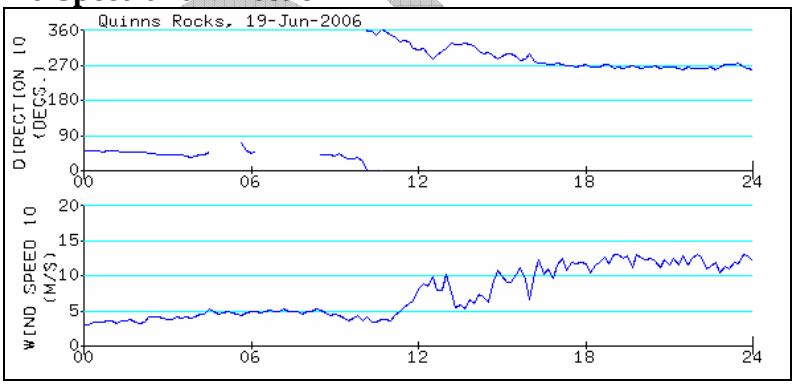
Description of Event

Some burning-off in the region contributed to high particle levels.

60 minute averaged $PM_{2.5}$

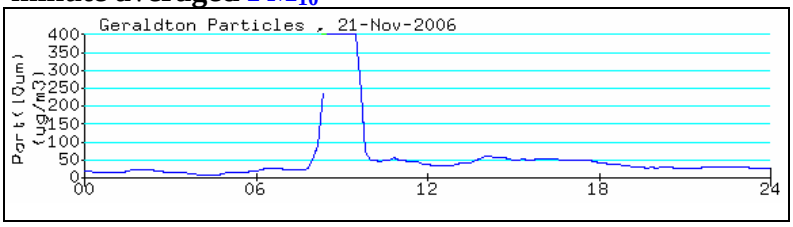


Wind Speed and Direction

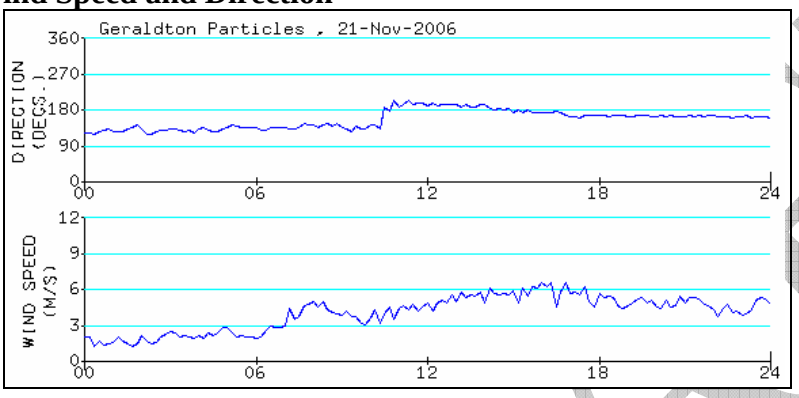


Attachment 10 – PM_{10} Exceedance on 21st November 2006

60 minute averaged PM_{10}



Wind Speed and Direction



Pollutant

PM_{10}

Monitoring Site

Geraldton

Highest Concentration

78.0 µg/m^3.

Averaging Period

24 hours

NEPM Standard

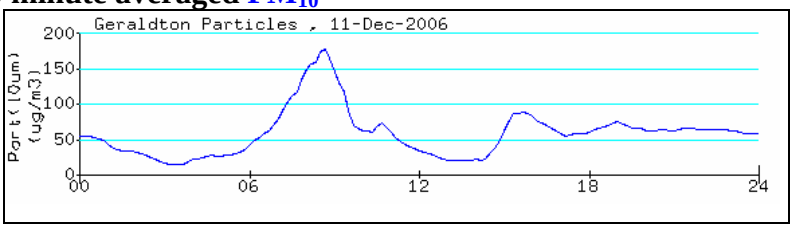
PM_{10} – 50.0 ug/m^3

Description of Event

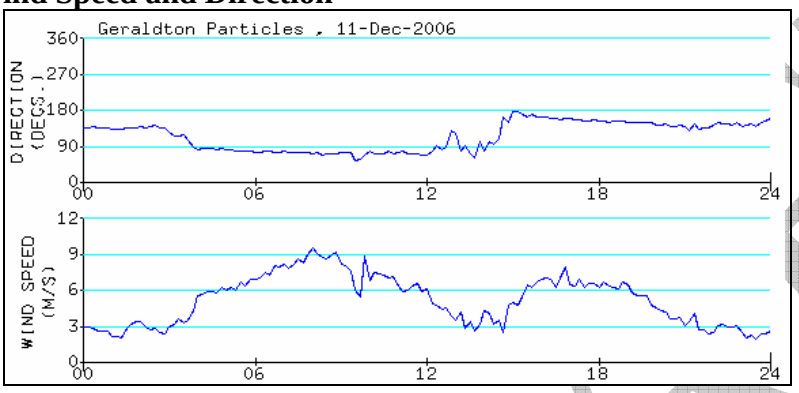
Some burning-off / bushfires in the region contributed to high particle levels.

Attachment 11 – PM_{10} Exceedance on 11th December 2006

60 minute averaged PM_{10}



Wind Speed and Direction



Pollutant

PM_{10}

Monitoring Site

Geraldton

Highest Concentration

58.8 µg/m^3.

Averaging Period

24 hours

NEPM Standard

PM_{10} – 50.0 ug/m^3

Description of Event

Some burning-off / bushfires in the region contributed to high particle levels.