

**REPORT AGAINST THE
NATIONAL
ENVIRONMENT
PROTECTION MEASURE**

**FOR AMBIENT AIR
QUALITY FOR 2002**

BY TASMANIA

JUNE 2003

SECTION A – MONITORING SUMMARY

OVERVIEW OF REGIONS

1 HOBART

1.1 REGION BOUNDARIES

The extent to which pollutants emitted in a given area can impact on air quality elsewhere depends on a number of factors. These factors include topography, meteorology and the chemical and physical properties of pollutants. The term airshed is commonly used to refer to an area that is defined by natural or topographic features affecting air quality.

In the case of a secondary pollutant (ie. one that is formed by chemical reactions in the atmosphere, rather than being directly emitted, eg. O₃), the airshed may extend relatively large distances from the city centre. However, for a pollutant such as PM₁₀ in winter, the extent of influence may be more localised and perhaps confined to areas sharing common nocturnal-drainage airflows.

For Hobart, the availability of meteorological data tends to be relatively low. Moreover, complex atmospheric dispersion models have not been developed for the region. For these reasons, the extent of the Hobart airshed is unclear.

For the purpose of the Measure, the Hobart Region boundaries are defined as presented in Figure 1. Although there is no functional purpose served in exactly defining the boundary AMG co-ordinates, these may be taken to be defined by the south-west corner (Easting 500,000; Northing 521,000) and the north-east corner (Easting 550,000; Northing 5290,000).

Population and Topography

The population density and topography for the Hobart Region is presented in Figure 3-1. The majority of the population resides within approximately a 10 kilometres radius of the Central Business District (CBD). Moreover, significant satellite urban centres are located within a 30 kilometres radius of the CBD. These include Kingston-Blackmans Bay to the south (population 13,746), and Bridgewater-Gagebrook (population 7,451) and New Norfolk (population 5,286) to the north.

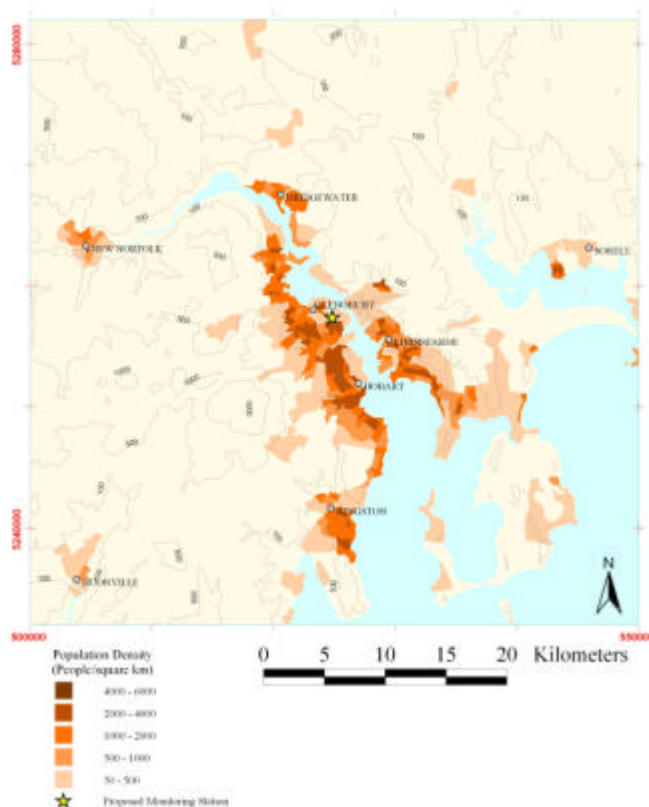


Figure 1: Map Of Hobart Region Including Population Density And Topography

Hobart, Prince of Wales Bay GRUB station:

Two indicators are routinely monitored at Prince of Wales Bay:

- ?? Carbon monoxide according to AS3580.7.1-1992, using a Monitorlabs 9830B analyser.
- ?? PM₁₀ is measured both by High Volume Air sampler (HVAS), is according to AS 3580.9.6-1990, sampled every second day
- ?? TEOM direct-reading instrument with a PM₁₀ head is collocated with the HVAS and data is being accumulated to develop site specific temperature-dependent correlation factors.

2 LAUNCESTON

2.1 REGION BOUNDARIES

Launceston and the Tamar Valley as a whole have been reasonably well studied in terms of the meteorology and atmospheric dispersion of the region. Results of three-dimensional atmospheric dispersion modelling have indicated that emissions from heavy industry at Bell Bay, some 40 kilometres north-west of Launceston, may in cases impact on air quality in Launceston (DPIWE, 1997).

For the purpose of the Measure, the Launceston Region boundaries are defined as presented in Figure 2 and cover an area approximately 40 kilometres wide and 60 kilometres long. This area has been selected for consistency with the Tamar Valley Airshed Study (DELM, 1995). Although there is no functional purpose served in exactly defining the boundary AMG co-ordinates, these may be taken to be defined by the south-most corner (Easting 501,250; Northing 5,389,750) and the north-most corner (Easting 498,750; Northing 5,467,250).

Population and Topography

The population density and topography of the Launceston Region is presented in Figure 3-6.

Launceston has a population of 67.7 thousand with the second largest urban centre in the region, George Town, having a population of 4.5 thousand. The majority of Launceston's population is located within approximately 5 kilometres of the city centre, with the highest densities located south-east of the city centre and significant densities on the banks of the Tamar River to the north and north-west of the city.

In total, the population of the Launceston Region defined in this Plan is approximately 95,000. Launceston is located on the upper reaches of the Tamar River, in a well defined valley that extends some 50 kilometres to Bass Strait. The valley axis is mostly aligned in a north-west to south-east orientation and is flanked by hills that reach heights of up to 400 m.

Meteorology

Northerly winds tend to prevail all year round in Launceston, with atmospheric calm conditions reported to be most frequent in the winter and autumn months (Power, 2000).

Available data for the Region clearly indicate that high concentrations of particles are frequently associated with light winds and highly stable atmospheric conditions. Moreover, because of night-time ground cooling and the formation of drainage flows, relatively high pollutant concentrations are likely to be found in topographic hollows and basins, and on low-lying land.

Launceston, Ti Tree Bend GRUB station.

- ?? PM₁₀ is measured by High Volume Air sampler (HVAS), according to AS 3580.9.6-1990, sampled every day.
- ?? TEOM direct-reading instrument with a PM₁₀ head is collocated with the HVAS and data is being accumulated to develop site specific temperature-dependent correlation factors.

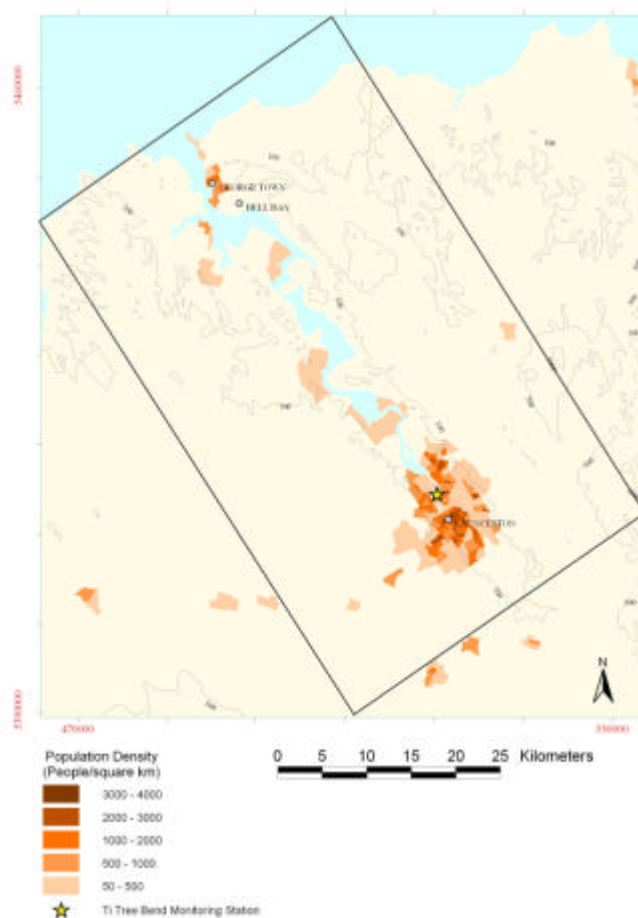


Figure 2: Map Of Launceston Region Including Population Density And Topography

3 DEVONPORT

3.1 REGION BOUNDARIES

For Devonport, the availability of meteorological data tends to be relatively low. Moreover, complex atmospheric dispersion models have not been developed for the Region. For these reasons, the extent of the Devonport airshed is unclear.

For the purpose of the Measure, the Devonport Region boundaries are defined as presented in Figure 3-12. Although there is no functional purpose served in exactly defining the boundary AMG co-ordinates, these may be taken to be defined by the south-west corner (Easting 441,000; Northing 5430,000) and the north-east corner (Easting 454,000; Northing 5444,000).

Population and Topography

The population density and topography for the Devonport Region is presented in Figure 3-12. The majority of the population resides within approximately a 5 kilometres radius of the

CBD. In total, the population of the Devonport Region defined in this Plan is approximately 30,000.

Devonport is located in a shallow coastal plain on the banks of the Mersey River. The Mersey connects the town of Latrobe with Devonport.

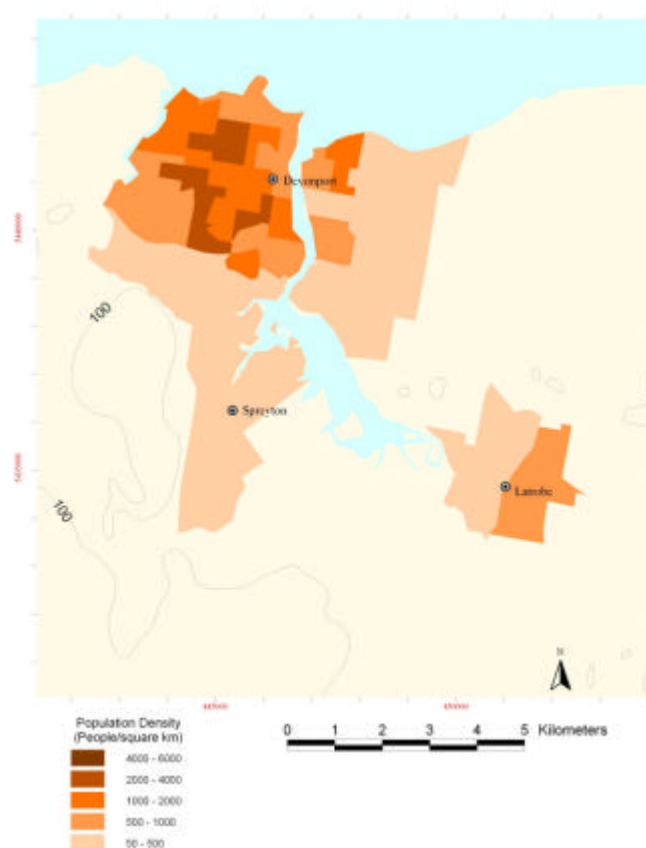


Figure 3: Map Of Devonport Region Including Population Density And Topography

Meteorology

Westerly winds tend to prevail in the Devonport Region, with atmospheric calm conditions most frequent in winter and autumn.

Strongly stable atmospheric conditions in Launceston are normally associated with southerly, south-easterly or easterly winds draining out of the Valley. This is especially evident in winter.

Devonport GRUB monitoring station

Particulate monitoring has commenced at Devonport in 2003 on a campaign basis, to assess the need for a permanent station. If results confirm that air quality warrants this, it is intended to install the station in 2004.

SECTION B – ASSESSMENT OF COMPLIANCE WITH STANDARDS AND GOAL

Results from monitoring at current Tasmanian Performance Monitoring stations is presented in Table 1. It is notable that the exceedance recorded at POW Bay was from HVAS data. The corresponding TEOM result, corrected using the site-specific temperature correlation factor, did not exceed the standard.

Table 1: Compliance summary for carbon monoxide and PM₁₀ at Tasmanian Performance Monitoring stations.

Region/Performance Monitoring Station	Data Availability Rates (% of days for sampling regime)					No. of Exceedances (days)		Performance Against Standard and Goal
	Q1	Q2	Q3	Q4	Annual	Period	No.	
Hobart, POW Bay								
Carbon monoxide	100	89	100	100	97	8 hour	0	MET
PM ₁₀ (alternate days), plus TEOM	100	100	100	100	100	24 hour	1	MET
Launceston								
Ti Tree bend								
PM ₁₀ (every day), plus TEOM	94	100	99	99	98	24 hour	13	NOT MET
Devonport								
PM ₁₀	-	-	-	-	-	24 hour	-	NOT DEMONSTRATED

SECTION C – ANALYSIS OF AIR QUALITY MONITORING

1 HOBART

Results for Hobart show that Air Quality, as measured at Prince of Wales Bay is well within compliance with the Standards for carbon monoxide and PM₁₀. Only one exceedance of the Standard was noted, as shown in Table 1.

Table 1: Exceedance of PM₁₀ Standard at Prince of Wales Bay, Hobart, with Attribution of Cause.

Date	HVAS (? g/m ³)	TEOM (? g/m ³)	Temp (°C)	Reason
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1. 19 May 2002	53	43	6.3	Low ambient temperatures & strong temperature inversion conditions.
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2 LAUNCESTON

Results for Ti Tree Bend show that winter Air Quality does not comply with the Standard and Goal for PM₁₀ (see Table 2). In 12 cases, this is attributed to the accumulation of woodsmoke particles in the Tamar Valley due to low ambient temperatures and strong temperature inversion conditions.

No direct cause has been found for the remaining exceedence on 8 May 2002.

Table 2: Exceedances of PM₁₀ standard at Ti Tree Bend, Launceston, with attribution of causes.

Date	HVAS (? g/m ³)	TEOM (? g/m ³)	Temp (°C)	Reason
2. 8 May 2002	59	43	13.3	Not able to attribute direct cause.
3. 27 May 2002	53	54	3.6	Low ambient temperatures & strong temperature inversion conditions.
4. 28 May 2002	76	79	4.3	
5. 29 May 2002	54	63	4.6	
6. 30 May 2002	73	67	4.8	
7. 31 May 2002	72	72	7.0	
8. 1 June 2002	51	41	5.1	
9. 4 June 2002	62	56	9.1	
10. 14 June 2002	62	66	5.2	
11. 29 June 2002	66	67	4.3	
12. 20 July 2002	54	50	6.3	
13. 27 August 2002	53	62	7.5	
14. 28 August 2002	52	49	8.7	

SECTION D – DATA ANALYSIS

1 HOBART:

Results at the GRUB site at Prince of Wales Bay complied with the standards for both carbon monoxide and PM₁₀. Levels of carbon monoxide are generally so low that no particular trend is discernible. Concentrations of PM₁₀ are also low on most occasions, with few exceedances recorded, so no trends are obvious in particle levels. It is intended that the status of this site will be reviewed after the 2003 winter season, in order to assess future needs for monitoring in Hobart.

2 LAUNCESTON

Air Quality in Launceston, as measured at Ti Tree bend has consistently been out of compliance with the PM₁₀ Standard since commencement of monitoring in 1997. However, monitoring results for the calendar years 1997 to 2002 demonstrate a reduction in the number of exceedances over this period, from 51 exceedances in 1997 to 13 in the current reporting year.

Caution must be exercised in interpreting the 2002 data, as the winter of 2002 was unusually mild. It is therefore likely that with colder average winter temperatures, further exceedances would have occurred.

Given that, there is a clear underlying trend in the data that indicates a steady improvement in air quality in the Launceston region (Figure 4).

Table 3: 2002 Summary Statistics for daily peak Carbon Monoxide
AQ NEPM Standard: 9.0ppm (8 Hour average)
Note: All hour timestamps are "hour ending"

Site	Number of Valid days	Highest		2 nd Highest		Percentiles		
		ppm	Date:Hr	ppm	Date:Hr	98 th	95 th	90 th
POW Bay, Hobart	358	2.0	20/5:01	1.9	30/5:23	1.6:	0.7	0.6:

Table 4: 2002 Summary Statistics for PM₁₀
AQ NEPM Standard: 50? g/m³ (24 Hour Average)

Pollutant	Number of Valid days	Highest		2 nd Highest		Percentiles ? g/m ³		
		? g/m ³	Date	? g/m ³	date	98 th	95 th	90 th
POW Bay, Hobart								
High Volume Air Sampler (alternate days)	182	53	19/5	42	29/5	36	32	27
TEOM	365	43	19/5	37	15/6	28	23	20
Ti Tree Bend, Launceston								
High Volume Air Sampler (every day)	355	76	28/5	73	30/5	58	47	39
TEOM	268	79	28/5	72	31/5	63	47	40

TEOM and high volume air samplers were collocated at Hobart station for the whole year, and at the Launceston station from March. The high volume sampler was taken as being the reference for determining compliance, this being the standard methodology cited in Schedule

3 of the Air NEPM. So, where results from the two methods differed on individual days at Launceston, high volume sampler data were used to determine exceedances.

Therefore, at Launceston, where daily sampling was undertaken, exceedances quoted in tables 1 and 3 are based exclusively on high volume air sampler results. Corrected TEOM results are included in Table 1 for comparison.

In Hobart, where the high volume air sampler was operated on alternate days, exceedances are based on data from both methods. As it happened, on no occasions did corrected TEOM data show an exceedance of the standard while the high volume air sampler was not operating.

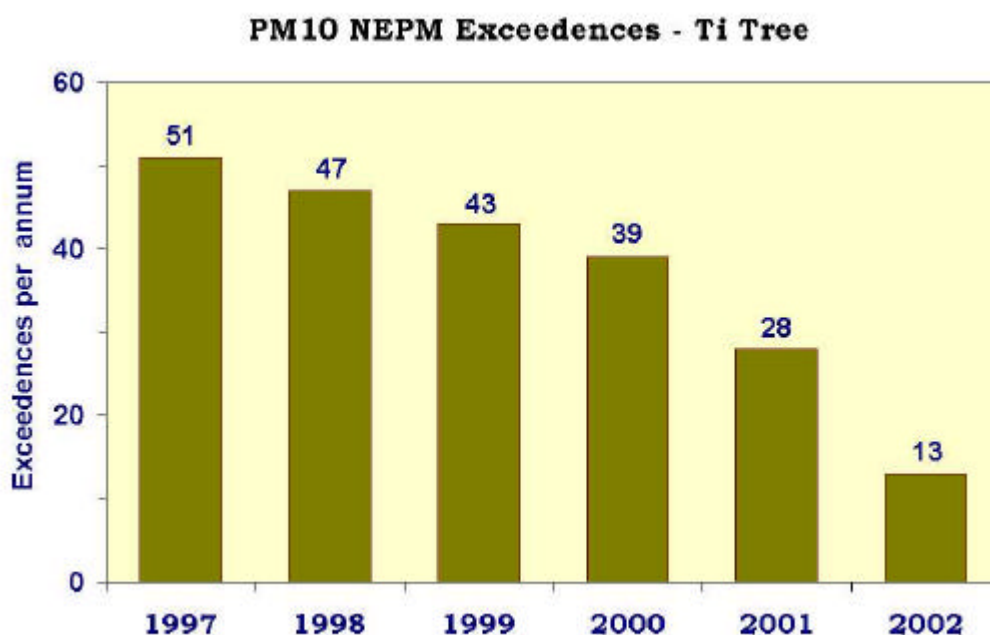


Figure 4: Annual exceedances of the PM₁₀ Standard at Launceston for 1997 to 2002

THE FUTURE

The Tasmanian Government has several programmes in place to assess compliance with the Air NEPM and to implement progressive improvement towards meeting the Air NEPM Goals.

These include:

- ?? Development of an Environment Protection Policy (Air Quality), which is in draft form at the time of writing and will hopefully go before Parliament in late 2003. The Draft Policy includes specific reference to meeting the requirements of the Air NEPM (cl. 7) through regulation of industry and the application of emission standards and operating conditions on the use of solid fuel burning domestic heaters.

- ?? Development of a Strategy to implement the Policy within 12 months of its being made, including programmes to further reduce wood heater emissions in critical regions of the State.
- ?? Support for the Launceston Woodheater replacement Scheme, which is continuing up to 2005, and has so far resulted in the removal of some 1500 woodheaters from the Tamar valley airshed.
- ?? Extension of PM₁₀ monitoring programs into Devonport.
- ?? Development of a monitoring capability for PM_{2.5} particles, as required in the amendment to the Air NEPM, made in May 2003.