

## **DRAFT**

### **REGIONAL NRM STRATEGY DEVELOPMENT**

#### **AIR QUALITY**

#### **SOUTHERN REGION**

##### **1. Overview of the asset within the region**

The primary asset under consideration in this region is ambient air quality in the Hobart, Derwent River and other Southern Region NRN airsheds.

##### **2. Current asset condition**

Ambient air quality in Hobart, as with other urban centres within Tasmania can be heavily impacted by smoke from domestic woodheaters, with other contributions from sources such as industry and motor vehicles. Of particular concern is particles, notably PM10 and PM2.5\*. PM2.5 particles are especially able to penetrate the deep areas of the lungs, and so are believed to exert significant health effects on populations. Concentrations of PM10 have been measured in Australia for many years, but PM2.5 is now regarded as the most important fraction correlating with human health impacts, and so is increasingly being measured throughout the country. Monitoring of PM2.5 is now mandated under the Air NEPM (see below).

When very still (temperature inversion) conditions exist in the Derwent and other valleys, smoke and other pollutants emitted into the air are less able to escape. Hobart does not have the extreme meteorological conditions experienced in places such as Launceston, but has the potential for considerable build-up of pollution at times. While long term monitoring at the primary Hobart station has shown only infrequent exceedances of the PM10 standard, it is likely that there are pockets within the Derwent Valley that experience significant concentrations of particles from wood smoke under very stable weather conditions in winter.

Otherwise, motor vehicles are likely to be significant contributors to air pollution in Hobart under stable conditions, during peak hour when traffic jams occur.

There are areas where large industries have air emissions within this region. These include:

- Southwood Timber Mills, near Judbury, which is under development. A PM10 monitoring station has been established between Judbury and Glen Huon to obtain background air quality information, and to monitor the impact of this plant when it becomes operational, on air quality in these two population centres.
- Norske Skog paper mill at Boyer. At present there is no monitoring of this plant.

- Pasmenco Hobart Smelter at Risdon monitors sulfur dioxide as a requirement of their permit conditions. At present, concentrations remain low, when compared with national standards.
- \* PM10 refers to the range of particles of sizes 10 micrometres or less, while PM2.5 refers to the range of 2.5 micrometers or less (see below). These are termed “aerodynamic” sizes, because they refer to the way such particles are sampled in air, rather than actual physical size. Note that as PM2.5 particles are a subset of PM10, they are expected to be about 80% or less of the PM10 levels in this region.

### **3. Issues associated with, or threats to the asset**

As with elsewhere in the State a primary issue in urban areas within the region is the widespread use of woodheaters for domestic space heating, but beyond that, it is the manner of use of these appliances that generates smoke and other emissions.

Ideally, the complete combustion of wood will produce carbon dioxide, water and a small amount of inorganic ash. If used incorrectly, the wood may not burn completely, resulting in emissions of large quantities of partially burned products, including smoke, tars and a wide range of other volatile products. Smoke consists of fine particles of carbon (within the PM2.5 range), associated with many other organic (carbon-containing) products, many of which are highly irritating to delicate tissues such as eyes and lungs. For example, many people will shut down the dampers on a heater in the mistaken belief that this will use fuel efficiently overnight. However, because the wood smoulders rather than burning cleanly, most of its heat value is wasted as smoke and products of partial combustion. Even a heater which complies with design standards can be operated badly, so that it produces excessive emissions to the air.

Although conditions in Hobart are not as extreme as elsewhere in the State, woodheaters are very likely to cause localised problems for residents in some areas, if used incorrectly.

There are two important issues relating to woodheaters in urban areas in this region:

1. The need to encourage people to choose alternatives to woodheaters for domestic heating;
2. The need to educate woodheater owners to operate them correctly to minimise polluting emissions.

Results of monitoring of PM10 are summarised below.

#### **4. Current responses to issues and threats**

Responses to this problem are occurring at both State and Local Government level, and through the NRM process. DPIWE has established a monitoring station at Prince of Wales Bay under the requirements of the Air NEPM to assess long term trends in PM10 particulate concentrations. Carbon monoxide has also been measured at this site for some two years, and the program is currently in its third winter.

The Draft Environment Protection Policy, which is due to be made later in 2003, includes provisions that prohibit the manufacture, importing or sale of heaters that do not comply with the standard (AS/NZS 4013) within the State. It also requires that heaters and fireplaces be operated in a way that minimises smoke emissions, explicitly makes emission of smoke from these appliances an environmental nuisance and provides for penalties if smoke comes into contact with other premises. The Department has education programs in operation to encourage people to use wood-fired heaters effectively.

The issues of smoke management from planned burning associated with hazard reduction, agricultural and regeneration burning is currently being considered by a working group under the State Fire Management Council (SFMC). The draft EPP (Air Quality) also addresses smoke management associated with planned burning and includes requirements for the adoption of best practice management consisting of competency training, complaint management, monitoring, effective planning to minimise smoke management and the SFMC working group on smoke management is currently considering these issues. The planned burning industry is also involved at a national level in the development of better atmospheric prediction models to assist with fire management planning.

#### **5. Productive use and other opportunities in relation to the asset**

The draft EPP (Air Quality) requires the protection of the life, health and well-being of humans and other life forms, and of the integrity of ecosystems and ecological processes, now and in the future. Also to be protected are visual amenity and the useful life and aesthetic appearance of buildings, structures, properties and materials. In Tasmania, smoke emissions are an obvious cause of both direct health effects and the pall of haze that hangs over many areas of the State.

The increase in prevalence and severity of respiratory disease, due to air pollution, imposes costs on the community, both through human suffering and economic costs to the State's health system. Further, high pollution levels may affect Tasmania's clean, green image and adversely impact on tourism.

## 6. Available data and its usefulness

DPIWE has operated a monitoring station at Prince of Wales bay for about two years as a *GRUB station*\*\* under the Air NEPM. At present, this monitors for PM10 using both high volume samplers and TEOM monitors to give 24-hour averages.

In 2001-2002, there were only three exceedances of the PM10 standard. Data for 2002-2003 is still being processed at the time of writing, but it appears that there will be about two exceedances in this period. We can conclude from this that air quality at this site already meets the Air NEPM goal for PM10.

Carbon monoxide is also monitored at this location, although levels have been so low that it is likely that this program will probably be terminated after the 2003 winter and the equipment transferred to Launceston. On this basis, DPIWE also concludes that air quality meets the NEPM goal for carbon monoxide at this site.

Pasminco operates a sulfur dioxide monitoring network around the plant as part of its permit conditions, and is required to provide the Department with its results. It is intended that these results be incorporated into the DPIWE air quality database for reporting to the NEPC under the requirements of the Air NEPM. DPIWE is currently assessing the sulfur dioxide data but believes that sulfur dioxide does not constitute a major problem for the Derwent Valley at present.

\*\* Generally Representative Upper Bound Station – in other words, a station that aims to monitor what are believed to be the highest concentrations of a pollutant in a way that is representative of the likely exposure of the population in the region.

## 7. Information gaps and actions required to fill these gaps

An amendment to the Air NEPM was made recently, establishing a reporting standard for PM2.5 particles. As noted above, PM10 levels are low for the Prince of Wales site. As PM2.5 particles are a subset of PM10, they are expected to be about 80% or less of the PM10 levels, and are not regarded as a significant problem in terms of Air NEPM requirements. A PM2.5 monitoring program in Hobart may be considered at some time in the future, but at present, DPIWE is directing its monitoring towards areas such as Launceston, where particles are known to be a significant problem.

Also under consideration at the national level is a NEPM for “Air Toxics”, which includes proposed standards and goals for *formaldehyde*, the aromatic compounds *benzene, toluene and xylenes* (sometimes shortened to *BTEX*) and *polycyclic aromatic compounds (PAH)*. DPIWE believes that woodheaters are also likely to be the major sources of such compounds and that they are likely to correlate strongly with winter conditions that encourage high levels of PM10 and PM2.5. As PM10 levels have been found to be low in Hobart, DPIWE considers that these specific air toxics will also be low.

On this basis, resources are initially to be directed primarily to areas such as Launceston, where air quality is considered to be highly degraded in comparison to Hobart.

**8. Current Aspirational, Resource Condition, and Management Action targets for the asset (at the national, state and/or regional level) and any data on progress towards targets.**

The Air NEPM incorporates both standards, which specify maximum average concentrations, and goals, set for achievement by jurisdictions within ten years of the making of the NEPM, in this case, by 2008. For PM10, the goal is to have no more than five exceedances of the 24-hour standard per year.

The PM10 standard was written in terms of existing high volume sampling methods. The change of technology from high volume sampling to TEOM semi-continuous monitoring requires development of adjustment factors to match TEOM data to the PM10 standard. Tasmania is continuing to operate co-located TEOM and high volume sampling equipment at Prince of Wales Bay until sufficient data become available to establish credible local TEOM adjustment factors.

As part of its overall strategies for achieving improvements in environmental quality, the Government has partnership agreements in place with various councils and regions throughout the State. These require a cooperative approach to problems that exist within these areas. In the Southern Region, the bilateral partnership agreements with Glenorchy and Hobart City Councils have as an objective, improved air quality.

The *Tasmania Together* program provides an overarching framework for government activities. This is achieved by defining priority benchmarks for actions to improve performance over ten themes identified for 2003-2005, including environmental quality. Each benchmark is assigned to a coordinating agency who have the prime responsibilities for implementing the programs, and to other agencies who have supporting roles. The Air NEPM standards are included as one of the coordinating benchmarks for DPIWE under *Tasmania Together*.

**Table 1: AIR NEPM Standards and Goals**

<b>Pollutant</b>	<b>Averaging period</b>	<b>Maximum Concentration</b>	<b>Goal Within 10 Years Maximum Allowable Exceedances</b>
Carbon monoxide	8 hours	9.0 ppm	1 day a year
Particles as PM10	1 day	50µg/m <sup>3</sup>	5 days a year
PM2.5 (Reporting Standard <sup>#</sup> )	1 day 1 year	25 µg/m <sup>3</sup> 8 µg/m <sup>3</sup>	5 days a year

**Table 2: AIR TOXICS investigation Levels and goal for proposed NEPM**

<b>Pollutant</b>	<b>Averaging period</b>	<b>Investigation Level</b>
Benzene	1 year	0.003 ppm
Toluene	24 hours	2 ppm
Xylenes	24 hours	0.2 ppm
Formaldehyde	24 hours	0.015 ppm
Benzo(a)pyrene as a marker for PAH		0.3 ng/ m <sup>3</sup>
<u>Air Toxics Goal</u>	The 8-year goal for each of these Air Toxics Investigation Levels is to gather sufficient data nationally to facilitate development of a standard.	

Notes

$\mu\text{g}/\text{m}^3$  : micrograms (millionths of a gram) per cubic metre  
 $\text{ng}/\text{m}^3$  : nanograms (thousand millionths of a gram) per cubic metre  
ppm : parts-per-million

Reporting Standard: The Air NEPM will be reviewed in 2005, and on the basis of reported results, a national standard for PM2.5 will be set at that time.

**9. Proposed Management Action Targets for the asset (at the national, state and/or regional level)**

The draft EPP for Air Quality contains a commitment to develop a Tasmanian Air Quality Strategy, which will assess compliance with the Air NEPM standards and other relevant criteria extant in Tasmania. The strategy will provide a systematic framework to reduce emissions of pollutants in Tasmania to acceptable levels.

There is a Woodheater Replacement Scheme currently operating in Launceston and the Tamar Valley, which continues to encourage replacement of wood fired heaters. It is not clear at this stage whether this type of program will be extended to other regions of the State. It is noted that Councils can institute programs to notify owners of smoky woodheaters, providing advice on correct use, and where necessary, can apply the environmental nuisance conditions of the *Local Government Act, 1993* to enforce proper usage.

## 10. Relevant scientific publications

- EPPRP (2002). *Assessment of the Draft Environmental Protection Policy (Air Quality) September 2001*, Environment Protection Policy Review Panel: Hobart.
- *National Environment Protection Measure for Ambient Air Quality: Monitoring Plan for Tasmania* (May 2001). Dept of Primary Industries, Water and Environment, Tasmania.
- *National Environment Protection Measure for Ambient Air Quality (1998)*. National Environment Protection Council (Available at [www.ephc.gov.au](http://www.ephc.gov.au))
- *National Environment Protection Measure for Ambient Air Quality (1998): Variation to include PM2.5*. National Environment Protection Council. (Available at [www.ephc.gov.au](http://www.ephc.gov.au)).
- *National Environment Protection (Air Toxics) Measure: Draft NEPM for public consultation, May 2003*. National Environment Protection Council (Available at [www.ephc.gov.au](http://www.ephc.gov.au))

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