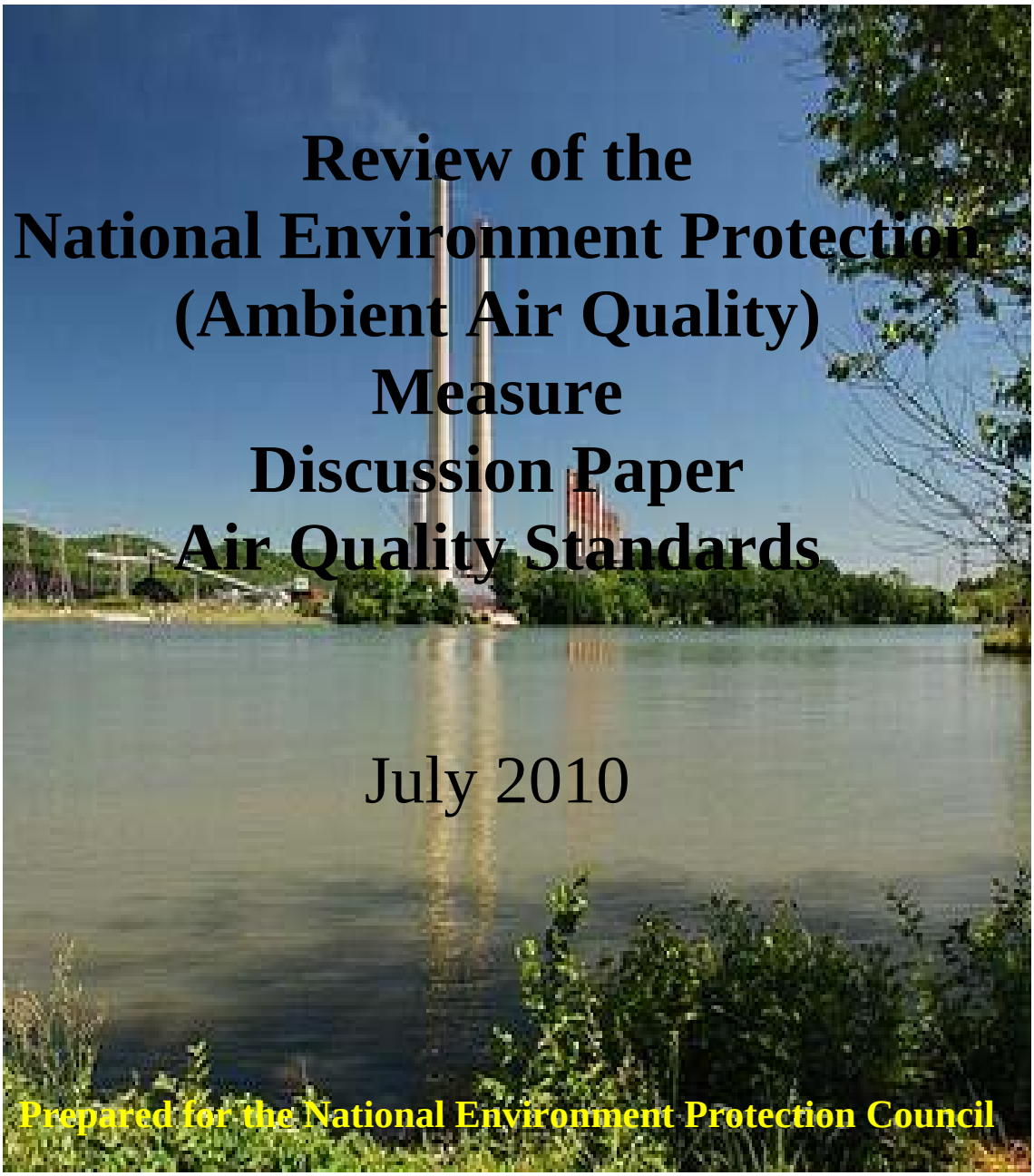
Submission



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Review of the National Environment Protection (Ambient Air Quality) Measure Discussion Paper Air Quality Standards

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Executive Summary:

Addressing the all the terms of reference in this 2010 Review NEPM Ambient Air Quality (AAQ) is a daunting task. Since the initial NEPM AAQ standards were first implemented in 1998 much has changed in requiring improved air quality standards & regulation, better management protocols and the use of more sensitive air monitoring equipment. And with mounting evidence of the effects of climate change (increasing temperatures) effecting ambient air quality, it is more important than ever to improve/refine our current air quality standards to a safer level in order to protect the health and well being of the community.

The submission will briefly address six current NEPM Ambient Air Quality Standards: Carbon Monoxide (CO), Nitrogen Dioxide (NO2), Sulphur Dioxide SO2, Ozone O3, Particulates: PM10 & PM 2.5 & Lead (Pb).

1.Carbon Monoxide (CO)

Most Carbon Monoxide (CO) emissions come from sources such as burning of fossil fuels (motor vehicles) and other sources such as power plants. Australian studies support by international evidence linking Carbon Monoxide exposure of concentration of 9.0 ppm to adverse health effects.

Support the retention of NEPM AAQ standard for CO and to keep the existing maximum concentrations of 9 ppm averaged over 8 hour period with a 1day/year exceedence.

2. Nitrogen Dioxide (NO2)

Although Australian monitoring data indicates otherwise overseas and Australian epidemiology studies support a recommendation for revising the current NO2 maximum concentration levels to a much tighter standard.

The results from several large U.S. and European multi-city studies and a meta-analysis study observed positive associations between short-term ambient NO2 concentrations and risk of all-cause (non-accidental) mortality, with effect estimates ranging from 0.5 to 3.6% excess risk in mortality per standardized increment. Australian studies have reported increases in mortality between 0.11% and 0.9% for every 1ppb increase in NO2

Recommend revising the current NEPM AAQ standard for NO2 by adopting the lower WHO standards for (1) NO2 maximum concentrations of 100ppm averaged over 1hour period with a 1 day/year exceedence & (2) NO2 maximum concentration of 20ppb concentrations with no allowable exceedences.

3. Sulphur Dioxide (SO2)

Although SO2 levels at NEPM sites located in Australian cities are low, key industrial areas/regions emit large amounts of SO2 into the atmosphere. Port Pirie smelters alone using SO2 NPI data, shows between 2004 -2008 that the total amount of SO2 emitted into to atmosphere was 236,000 tons and NEPM AAQ 1 hour standard of 200ppb for SO2 recorded # 28 exceedences. During same year at Mount Isa the levels of SO2 emissions were even worse with the NEPM AAQ 1 hour standard of 200ppb for SO2 recording #38 1 hour exceedences.

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***Executive Summary*:**

3. Sulphur Dioxide (SO2) (Cont)

These continued high levels of SO2 emission result in poor air quality (constantly exceeding NEPM AAQ standards) leading to poor health outcomes for the local community.

Whereas Australian regulators/Industry have been slow to accept that there is no safe level of exposure to SO2 in susceptible part of the population, others such as USA regulators are proposing enforcing even stricter SO2 standard which will effect key industries. US EPA Administrator Lisa Jackson stated ***"****--Short-term exposures to peak SO2 levels can have significant health effects – especially for children and the elderly - and leave our families and taxpayers saddled with high health care costs.----------We're strengthening clean air standards, stepping up monitoring and reporting in communities most in need, and providing the American people with protections they rightly deserve."*Source**:** ENS WASHINGTON, DC, November 17, 2009, Sulfur *Dioxide Air Quality Standards Going Up*

The NEPM AAQ for SO2 should be tightened with the aim of setting lower levels in keeping with current WHO/ International Standards. However, if a NEPM AAQ for SO2 Standards is be enforced, effective new measures needs to be implemented to vary the NEPM AAQ to include point source monitoring

Recommend: Review NEPM AAQ for SO2 with the aim of setting lower levels in keeping with current WHO/ International Standards by reducing averaging period one hour maximum concentration of 200ppb & setting a new SO2 standard maximum concentration level of 75ppb. (USA)
Special consideration given to lowering the 24 hour average period of the current maximum concentrations of 80ppb to the lower level 7ppb (WHO)
And consider revoking the annual SO2 Maximum Concentration level 20ppb

4.Ozone (O3)

With the advent of ever increasing temperatures in most Australian Cities Ozone levels are expected to increase even further. Urgent attention should be given to address Ozone concentration to a lower levels by revising NEPM AAQ as some cities are already experiencing levels of Ozone levels either at just below or above the standards level of maximum concentration of Ozone .At present increasing high levels of Ozone exposure result in:

- reduce lung function.
- > daily mortality
- effect vulnerable parts of population such as elderly, children and people with pre existing diseases such as asthma.

Ozone studies in Australia confirm adverse health effects of exposure to ozone during 1 to 8 hour periods. However, the present NEPM AAQ for Ozone does not cover an 8-hour averaging period and its introduction into the NEPM AAQ is proposed.

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Executive Summary:

4.Ozone (O3) (Cont)

This proposal is supported by WHO reports that "--- *health effects will even occur below this guideline*- [47ppb]--*levels in some sensitive individuals with an estimated number of attributable deaths increasing by 1-2% a day when Ozone concentrations reached this guide level, as opposed to remaining at the background level*

Recommend that NEPM AAQ for Ozone (O3) maximum concentrations be reviewed and to adopt the WHO standard for 8 hour O3 maximum concentration level of 50ppb with an exceedances 1 day /year). And support the retention of 1 hour O3 maximum concentration level of 100 ppb (exceedance 1 day /year. Consideration should be given to revoking the 4-hour O3 maximum concentration level 80-ppb exceedence 1 day per year.

5.Particulates (PM10 & PM 2.5)

Particle inhalation especially from sources such emission from motor vehicles can result in various health effects. Pope Dockery 2006 et al concluded that:

- there was no threshold in response
- the response was linear
- despite different geographic settings and different particle composition the response was similar

Moreover, the size and effects observed of particulates in Australian health studies were found to be higher compared to that was found in Europe & US.

The current NEPM AAQ standards maximum concentration levels for particulates PM 10 are supported but an additional averaging period is recommended. The present 2.5 advisory maximum concentrations need to be implemented with urgency

Recommend: Revision of current NEPM AAQ standard for PM 10

- **Introduce a new Annual averaging period for PM 10 standard with a maximum concentrations level of 20 ug/m3 (WHO) with maximum exceedence of 1 day/year. Goal to be achieved within 5 years.**
- **Retain the current 24 hour annual average maximum concentration of 50 ug/m3 with allowable exceedences of 5 days/year.**

Recommend: the current NEPM AAQ advisory reporting standards for PM 2.5 be adopted in a revised NEPM AAQ. They are :

- **A 24 hour average maximum concentration of 25ug/m3 allowable exceedences 5 days /per year. Goal to be achieved within 3 years**
- **A new annual average maximum concentrations of 8ug/m3. be established with 1 day exceedences per year .Goal achieved within 3 years**

6.Lead (Pb)

Based on a review of the full body of evidence I propose that the current lead level concentration of 0.5µg/m3 is not sufficient to protect public health with an adequate margin of safety. A revised standard would provide increased protection for children and others at risk populations against a variety of adverse health effects. The Australian EPA's method of approach of measuring lead in Total Suspended Particles (TSP) is additional evidence that all lead particles, regardless of size, pose a potential health risks

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***Executive Summary*:**

6.Lead (Pb) *(Cont)*

To retain the current NEPM AAQ standard for lead would constitute a rejection of mounting international evidence of these findings which found that in children "-- *between five and 10 microgramms per decilitre were associated with significantly poorer scores for reading (49% lower) and writing (51% lower".*

The proposal is to revise the NEPM AAQ standard for lead to lower maximum concentration levels of 0.15ug/m3 (10-year goal). This measure is to be done in two stages .The first stage is to set a maximum concentration of lead level of 0.30 µg/m3 (5 year goal. With the final lead standard set at a maximum lead concentrations of 0.15ug/m3 to implemented within another 5 years after phase 1 (Sum total 10 of years)

Appropriate changes will be required to the current NEPM AAQ schedules to ensure these new lead standards also apply to point source emission of lead

Revision of current NEPM AAQ standard for lead is recommend and that a new set of NEPM Standards & Goals for Lead be set in two stages.
The first stage will be to set (as an interim measure) a maximum lead concentration level of 0.30 µg/m3 (goal within 5 years) and in a second stage (final) implementation of a maximum lead concentrations lead level of 0.15ug/m3 (goal within 10 of years)

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1.Preamble

Paul Blanc: When asked on the ABC Radio *Heath Report* by the presenter Dr Norman Swan as to what are the key strategies that industry use to counter allegations that something is an environmental toxin or an environmental risk? He said "---*I refer to it as a variant of the Kuebler Ross stages of death and dying, only in this case it's industry denying that there is a problem at all and then, when they're forced to deal with the reality, either trying to minimise it or saying we need more data, or attacking those that are raising the problem as being anti-progress-------- finally, if they are forced to put controls into place it's a process of over time gutting the regulations or making sure that if there are regulations, there aren't enough people to enforce them".* Source: Paul Blanc:*"How Everyday Products Make People Sick - Toxins At Home And In The Workplace* .ABC Radio National Health Report 2/4/2007

Paul Blanc pointed criticism of USA Industry strategies is not dissimilar to the go-slow strategies used/enacted/practiced by industry in Australia in the past years, in reaction to a move towards tighter environmental regulations/standards. In Australia the role of a National Environment Protection (Ambient Air Quality) Measure should be to lead by example by promoting/enacting more stringent and workable air quality standards. A stronger (NEPM AAQ) would prevent many Industries and other vested interest using delaying strategies that may not in the public good.

One example of this go-slow tactics was in my response to 1997 draft NEPM Impact Statement for Ambient Air Quality. I was particularly critical of the then NEPM committee's failure to implement (fully) a particulate NEPM standard for PM 2.5 (25ug/m3) in conjunction with the then proposed NEPM PM10 standard of 50ug/m3. It's now twelve lost years since I first proposed this measure to include PM 2.5 into the NEPM AAQ standard. The current NEPM AAQ standard for PM2.5 is only advisory and is still to gain full approval for implementation as a new NEPM AAQ standard/goals. Another example of this is the reluctance in discussing further a NEPM standard AAQ for coarse PM10-2.5 and the ultrafine particles PM 1 "-- *we need more data-"* Paul Blanc et al.

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2.Introduction

In my 1997 submission to the 1997 draft NEPM Impact Statement for AAQ Quality, I said that a major issue of 21st Century for cleaner air would be particulates (PM's), Ozone (O3) Oxides of Nitrogen (NOx) and other Volatile Organic compounds (VOC's). The health studies and some monitoring data collected since 1997 has shown overwhelming evidence to support that maximum concentration levels/goals set in 1997 NEPM AAQ the six pollutants are now inadequate and need urgent revision

This submission seeks to address each of these six pollutant under this NEPM AAQ review by setting out the evidence where applicable for a change in current maximum levels and give recommendations for the setting of new standard concentration levels

3.Carbon Monoxide (CO)

Is there enough evidence to recommend revising the current carbon monoxide standards?

Yes **No X**

The current maximum concentration for Carbon Monoxide (CO) set at 9.0 ppm with average period 8 hours and one day per year should be maintained. Carbon Monoxide is one of the most investigated and studied of all the six measured NEPM standards.

However, I do support CO remaining as a NEPM standard AAQ, as there is a range of non-tangible benefits. Information from table 1 below shows the cost in a hospital admissions for respiratory illnesses estimated $47 /case, and an adverse health impacts such as premature death $76,000 /case from cardiovascular disease and death $7,100,00 /person Refer Appendix A *" Estimated of value of avoided effects*

Table 1. Estimated Value Avoided Effects $A 1997

Avoided Effects	Dollar Value $A(Mid Estimate)
Mortality	$7,100,00/person
Coronary heart Disease	$76,000/case
Respiratory Illness	$47/case

Source: Draft National Environment Protection Measure & Impact Statement for Ambient Air Quality 11/1997 Table 9.9 page 95

Recommend: Maintain the existing NEPM AAQ standard for Carbon Monoxide (CO) together with current Standard & Goals of 9.0 ppm an averaging period of 8 hours with one day exceedence /year

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4.Nitrogen Dioxide (NO2)

Is there enough evidence to recommend revising the current nitrogen dioxide standards?

Yes X No

The WHO health guidelines set for NO2 were for *itself* and not in combination with other pollutant products. This distinction is important as most abatement methods are for NOx emissions

So when considering a NEPM standard for NO2, not only the individual health effects specific to NO2 should be reviewed but other factors such as increasing emissions from other pollutants. For example the shift to very large gas fired power stations in large urban areas such as Pt Adelaide in South Australia has seen increased levels of NO2 emissions creating an environment for increase in ambient Ozone. Controlling lower levels of NO2 will also have significant health impact/benefit by reducing Ozone levels. Therefore NO2 should therefore be considered as a *sentinel- monitor* to indicate other ambient air pollutant mixtures.

If the cost apportionment for symptoms of acute respiratory symptoms is taken as $27 per unit . Refer to table Appendix A. These savings in health costs by a reduction of NO2 levels from 120ppb to 100ppb are significant to warrant a review (See Table 2 below). Even using this data (collected in 1990's) an estimated savings of between $11 -$16 million annually would be achieved on health cost and current savings on this amount would be ten fold. As a result the current NO2 NEPM value of 120ppb should be reviewed and a lower one hour value be set by adopting the 2005 WHO guideline of 100ppb (200ug/m3).

Table 2. Comparison of possible annual health savings (@1990's values) by adopting WHO NO2 Annual Standard of 100ppb in lieu of Aust NEPM 120ppb

One hour NO2 Standard	Population Exposed	Susceptible affected	Acute Respiratory Symptoms Value
120ppb Aust)	1.8 million	0.18-0.27 million	$4.8-$7.3 million
100ppb (WHO)	6 million	0.6-0.9 million	$16- $24 million

Source: Draft National Environment Protection Measure & Impact Statement for Ambient Air Quality 11/1997 Table 9.9 page 95 [3]

The results from several large U.S. and European multi-city studies and a meta-analysisstudy observed positive associations between short-term ambient NO2 concentrations and risk of all-cause (non-accidental) mortality, with effect estimates ranging from 0.5 to 3.6% excess risk in mortality per standardized increment. Australian studies have reported increases in mortality between 0.11% and 0.9% for every 1ppb increase in NO2[4]

Furthermore studies have found adverse health effects of NO2 at the WHO annual guideline of 20ppb (40ug/m3) [1,2.] Moreover, indoor air studies found children with respiratory problems at less than 20ppb (40ug/m3). In light of these findings consideration should be also given to reviewing the present NEPM AAQ NO2 annual standard of 30ppb to a lower WHO value of 20ppb. Refer Tables 3 & 4 on page 6

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4. Nitrogen Dioxide (NO2) *(Cont)*

Should any new NO2 NEPM AAQ standards be adopted, the time period allowed for jurisdictions to adjust to these new maximum NO2 concentration levels should kept to a minimum.eg 10 years

Table 3. Existing Australian /International Air Quality Standards for NO2

Averaging Time	Australia	USA	WHO
One Hour	120ppb	100ppb	100ppb
Annual	30ppb	53ppb	20ppb

Table 4. Proposed revised/new NEPM Standards/Goals for NO2

Averaging period	Maximum concentrations	Goal Maximum allowable exceedences
1 hour	**100 ppb**	1 day per year
Annual	**20 ppb**	none (5 years)

Conclusions

The number of hospital admissions in Australia is set to increase (presently amongst the highest in the world). The result of doing nothing will be escalating hospital fees/admissions. However, a more a prudent measure would be to adopt as a NEPM AAQ standard the current 2005 WHO[1,2] NO2 standards of a maximum concentrations of 100ppb with 1 day/year exceedences and adopt the 2005 WHO annual NO2 maximum concentration level of 20ppb No allowable exceedences

Recommend: That all NEPM AAQ for the NO2 maximum concentrations be reviewed. Special consideration should be given to adopting the WHO lower levels standards for:

- ***One hour WHO NO2 maximum concentration level of 100 ppb (exceedance 1 day /year)***
- ***Annual WHO NO2 maximum concentration level of 20ppb (exceedances -None)***

Reference

1. WHO 2005, *Guidelines for Air Quality*, Geneva, World Health Organisation.

2. WHO 2005, *Summary of risk assessment-Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide Global update.*

3. NEPM AAQ 11/1997**,** *Draft National Environment Protection Measure & Impact Statement for Ambient Air Quality.*

4. NEPM AAQ 6/2010, *Ambient Air Quality NEPM Review – DISCUSSION PAPER.*

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5. Sulphur Dioxide (SO2)

Is there enough evidence to recommend revising the current sulfur dioxide standards?

Yes X No

The WHO guidelines introduced in 2005[1] a SO2 10 Min Average 175 ppm. This was because significant new medicals evidence findings of the health effects of SO2. The reason for WHO adopting 10 Min SO2 175 ppm was *"--controlled studies exercising with asthmatic after short periods of less than 10 mins indicated changes in pulmonary function & respiratory symptoms. They considered the 10 min standard more Sulphur Dioxide (SO2) appropriate than a one hour standard because of very sharp peaks of concentrated SO2 depends on variability of the local source and natural terrain."*[2]

The 1998 NEPM[4] (together with later 2003 SO2 review) did not adopted the 10 minute goal for SO2 as it was considered that the "-- *the inconsistency that would be evident in the monitoring and reporting protocols for SO2 compared to the other pollutants*."[3]
Instead the 1998 NEPM committee selected a one-hour SO2 goal of 200ppb[4] (NHMRC guideline). Today the current one hour standard for SO2 in EU countries and the UK are set at 122 ppm. Moreover the US EPA (6/2010) have now set an even lower level for the SO2 one hour standard of 75 ppb[5]. This US SO2 level is much lower (~ 60% less) than the current Australian SO2 one hour standard of 200ppb. Refer Table 5 & 6 page 12

This new US one hour standard for SO2 is a reversal of an earlier US EPA policy which stated "*---there was insufficient evidence of widespread risk---of adverse health effects to justify a short term standard---*"[5]

The most recent US EPA Fact Sheet (page 1) on revised SO2 levels[5] states "*EPA's evaluation of the scientific information and the risks posed by breathing SO2 indicate that this new 1-hour standard will protect public health by reducing people's exposure to high short-term (5-minutes to 24-hours) concentrations of SO2—*"

The USA EPA have now revoked the previous 24 hour and the annual SO2 maximum concentration levels and opted for just a 1 hour concentration of 75 ppb

The Current 6/2010 NEPM AAQ Review3 (page 73) states'--- *exposure to SO2 and adverse health outcomes from overseas studies relate to a range of 24 hour average and daily one hour maximum exposure levels including very low levels, suggesting that there may be no threshold for the health effects associated with exposures to sulfur dioxide in sensitive subgroups of the population. The results of studies conducted since the NEPM was made in 1998 show adverse health outcomes below the current standards and Australia has a very large susceptible group---'*
So in hindsight the 1998 AAQ NEPM [4] in adopting the NHMRC guidelines for a SO2 one hour average maximum concentration level of 200 ppb and an annual average of 20ppm clearly made a wrong decision. And a later 2003 NEPM review ruled out a 10 min SO2 standard which was contrary to the WHO 2005 guidelines setting a 10 min Standard.

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5. Sulphur Dioxide (SO2) Cont

Since the introduction of the NEPM AAQ in 1998[5] standard concentrations for SO2 there have been many studies indicating adverse health effects below these levels set for SO2. There is now conclusive evidence that there may be no heath threshold level for populations that are sensitive to SO2 emissions (asthmatics). As a result the USA (June 2010) and WHO (2005) have made substantial downward revisions of SO2 with the USA EPA setting a new 1 hour standard of 75ppb and WHO a new 24 hour standard of 7ppb.

Significant industrial sources

There are two major SO2 emitters (located at Mt Isa and Pt Pirie. It is said some that an AAQ NEPM for SO2 is not the most effective way to managing impacts of health of a community but better protected by consultation with health agencies. I have found no credible measures by these industries to either reduce the current SO2 1 hour exceedences or any independent long-term health studies on effects of SO2 on the population of these towns. Examination of several years of data sets of SO2 1 hour exceedence from their monitoring sites tell a different story. In 2008 SO2 1 hour exceedences were for (1) Mount Isa-Menzies Site #38 (2) Pt Pirie -Oliver St # 28 . Refer Appendix B Chart:Pt Pirie SO2 I SO2 hour exceedences for 2008.

If NEPM AAQ SO2 standard is to be enforced a new measure needs to be implemented to vary the NEPM AAQ to include point source monitoring

Table 5.Current International Standards for SO2

Averaging period	Aust	USA	WHO	EU	UK
10 min			175ppb		
1 hour	200ppm	75ppm	-	122ppb	122ppb
24 hour	80ppb		7ppb	44ppb	44ppb
Annual	20ppb				

Table 6. Proposed New NEPM Standards/Goals for SO2

Averaging period	Maximum concentrations	Goal within 5 years Maximum allowable exceedences
1 hour	**75 ppb**	1 day per year
24 hour	7ppb	1 day a year

Recommend: review NEPM AAQ for SO2 with the aim of setting lower levels in keeping with current WHO/ International Standards.

- ***by reducing averaging period one hour maximum concentration of 200ppb & set a new SO2 standard maximum concentration level of 75ppb. (USA)***
- ***special consideration given to lowering the 24 hour average period the current maximum concentrations of current 80ppb to the lower level 7ppb (WHO)***
- ***consider revoking annual SO2 Maximum Concentration level 20ppb***

References

1. WHO (2005) "*Guidelines for Air Quality"* World Health Organisation Geneva
2. Lida Morawska QUT " *Adverse Health effects to Air pollution and Guidelines to prevent them*" Air Quality & Climate Change Journal Vol 44 No 1 February 2010
3. NEPC *"Ambient Air Quality NEPM Review – Discussion Paper* "June 2010- p22
4. US EPA *"Fact Sheet Revisions to the primaryNational Ambient Standard, monitoring Network, and data Reporting requirements of Sulfur"* 6/2010
5 NEPC." *Draft National Environment Protection Measure and Impact Statement for Ambient Air Quality 21st* "November 1997

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6. Particles (PM10 and PM 2.5)

6.1 Is there enough evidence to recommend revising the current PM10 standards?

Yes X No

Although I support the existing current PM 10 standard goal of a 24 hour average Maximum concentration of 50ug/m3 with 5 exceedences/year further consideration should be given to adopting the WHO guideline for a PM10 annual average maximum concentrations of 20ug/m3 with one maximum allowable exceedences/year (Goal 5 years). The need to set an annual average maximum concentration represents a significant end point for PM concentrations against daily mortality, hospital admissions as a function of PM concentrations Refer to Figure 1 below

Fig 1: Change in health endpoint's as a function of PM10 concentrations (WHO 2000)

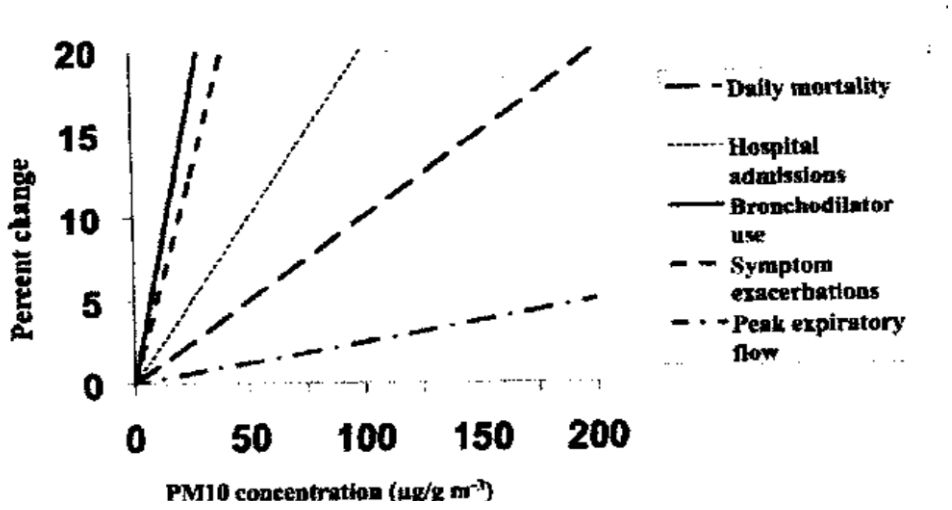
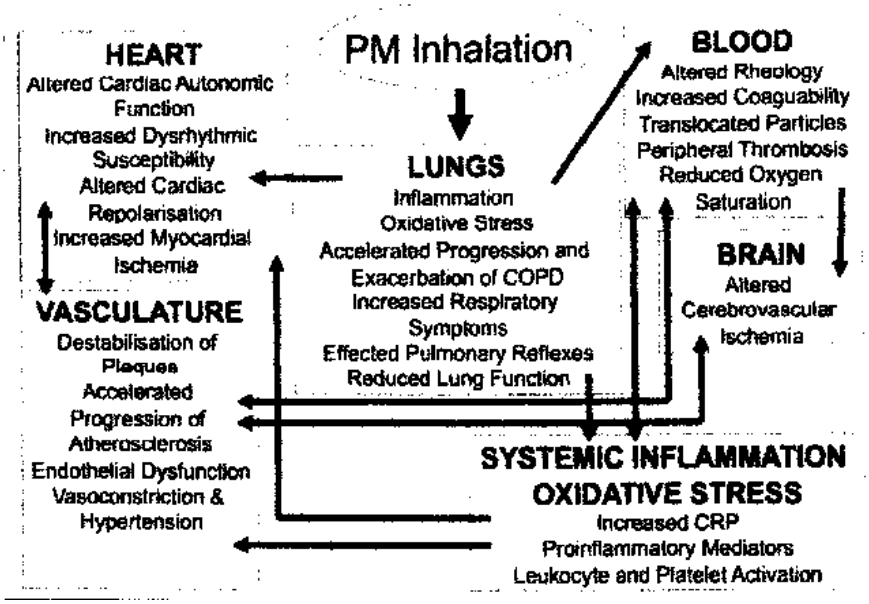


Figure 2. Mechanism by which inhalation of Particulate matter causes health effects (Pope & Dockery et al 2006)



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6: Particles (PM10 and PM 2.5) *(Cont)*

6.1: Is there enough evidence to recommend revising the current PM10 standards?

Figure 2 above (page 13) illustrates a complex picture of the various health effects of particle inhalation .It was concluded (Pope Dockery et al 2006) that:

- *there was no threshold in response*
- *the response was linear*
- *despite different geographic settings and different particle composition the response was similar*

'-susceptibility depends on specific end points as well as the level and lengths of exposure in particular those with chronic cardiopulmonary disease, asthma/ /influenza are effected by –moderate term exposures, while long term and repeated exposures resulted in an increased risk of mortality across a broad based cohort of adults and children'. Source Lidia Morawska QUT "Airborne Particles & health" Air Quality and Climate *Journal* Volume 44 no 2 May 2010 page 14

Table.7 Recommended Revised Standards/Goals for PM 10

Averaging period	**Maximum concentrations**	**Goal Maximum allowable exceedences**
1 day	50ug	5 days per year
Annual	20ug	1 day per year (5 years)

6.2. Is there enough evidence to recommend revising the:

(a) Current PM 2.5 advisory reporting standards Yes No X ; and / or

I support the current PM 2.5 standard goal of 24 hour average maximum concentration of 25ug/m3 and the annual average maximum concentrations of 8ug/m3

(b) Including PM2.5 as a compliance standard with goals? Yes **X** No

Health studies worldwide have provided overwhelming evidence that PM 2.5 are significant risk to human health and the need to set a stringent NEPM compliance standard. The American Cancer Society observed that the annual average PM 2.5 maximum concentration of 8ug/m3 for PM 2.5 (lower end of range) had effected significantly the survival (Pope et al 2002). And Parker et al 2009 *"—found that increased allergies and hay fever were associated with increased PM 2.5*

I proposed the number allowable maximum allowable for PM 2.5 exceedences to be set for 1 day averaging period for 25ug/m3 at 5 days per year and the annual averaging period 8ug/m3 be 1 day per year. See Table 8 below) All previous NEPM Air quality goals have been set with achievement maximum goal by a 10 year period. However as jurisdictions have already been reporting PM 2.5 for several years an advisory capacity the level PM 2.5 the new NEPM concentrations for the maximum goal should be set within 3 years

Table.8 Recommended NEPM Standard/Goals for PM 2.5

Averaging period	**Maximum concentration**	**Goal within 3 years Maximum allowable exceedences**
1 day	25ug/m3	5 days per year
Annual	8ug/m3	1 day per year

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6: Particles (PM10 and PM 2.5) *(Cont)*

Conclusions: Although a new NEPM standard maximum concentration for PM10 & PM 2.5 may seem adequate for now, future epidemiological studies may well find adverse health responses at much lower levels of PM10/PM 2.5. The result being another NEPM revision may be necessary for particulates (PM 10/PM 2.5 & PM 1?) with a likelihood of a set of lower values. As there is compelling evidence to set even low PM10/PM2.5 threshold. Pope et al 2009 *'found that a 10ug/m3 decrease in the concentrations of fine particulate matter was associated with an estimated increase in mean life expectancy of 0.61 years '*

Particulates: PM 10

Recommend: Revision of current NEPM AAQ standard for PM 10

- ***by adopting the WHO Annual averaging period of a maximum concentrations of 20 ug/m3 and 1 day/year exceedence..***

Goal to be achieved within 5 years

- ***Retain current 24 hour average maximum concentrations level of 50 ug/m3 with a allowable exceedences of 5 days/year.***

Particulate: PM 2.5

Recommend: that the current NEPM AAQ advisory reporting standards for PM 2.5 be adopted as the new standard in a revised NEPM AAQ. Standard being:

- ***A 24 hour average maximum concentration of 25ug/m3 allowable exceedences 5 days /per year. Goal to be achieved within 3 years***
- ***A new annual average maximum concentrations of 8ug/m3. be established with 1 day exceedences per year .Goal achieved within 3 years***

References

Who 2000. '*Guidelines for Air Quality'*. Geneva World Health Organisation

Who 2005. '*Guidelines for Air Quality'*. Geneva World Health Organisation

Parker.J, Akinbami.L and Woodruff.T.2009 '*Air pollution and child respiratory allergies in the United States.* ' Environmental Perspectives 117(1) 140-146)

Pope.C.A, Burnett. R.T, Thun.M.J, Calle. E.E, Krew. D and Ito.K, 2002. '*Lung cancer, cardiopulmonary mortality, and long term exposure to fine particulate air pollution'* Journal of the American Medical Association 287 (9): 1132-41

Pope.C.A and Dockery.DW .2006.'*Health effects of fine particulate air pollution: Lines that connect'* Journal of Air and Waste Management Association 56: 706-742

Pope.C.A, Ezzati.M and Dockery.D.W, *2009'Fine particulate air pollution and life expectancy in the United States'* New England Journal of Medicine 360 (4) 376-386.

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7. Ozone (O3)

Is there enough evidence to recommend revising the current ozone standards?

Yes X No

Overview

The ABC news headline[1] in March 11, 2006 *'Sydney chokes on the nations worst air pollution'* gave an early warning signal that all is not well and our major cities. There will be a need to further improve ambient air quality to *better protect public health* as proposals to increase urban infill in our cities will only exacerbate the current air quality levels.

The 2008 NEPM Ambient Air quality measure compliance reports published by the states indicated that Ozone (O3) levels measured in major Australia cities indicated levels of Ozone either exceeding or close to the current standards. Recent studies about the health effects of Ozone found little had materially changed that were made in many findings of the earlier scientific assessment on Ozone which has **"***no apparent threshold for the health of at-risk populations such as children, people with asthma, and older adults".*

The revised Ozone Standards that I propose is based on scientific evidence and its (Ozone) effects on people.

Rational

Key pieces of scientific evidence for adopting a new Ozone 8 hour standard.[2, 3,5]

- evidence from clinical studies showing effects in healthy adults even at 60ppb (2000 WHO [2]), including decreased lung function and respiratory symptoms
- evidence from clinical and epidemiological studies indicating that people with asthma are likely to experience larger and more serious effects than healthy people
- epidemiological evidence indicating associations for a wide range of serious health effects, including respiratory-related emergency department visits and hospital admissions and premature mortality, that extend below our current 4 hour standard Ozone level of 100 ppb.
- estimates from the risk and exposure assessment indicating that important improvements in public health could be achieved by a standard more stringent than our current 4 hour standard Ozone level of 100 ppb.

Therefore I believe there is a need to revise the current NEPM Standards & Goals for ambient air Quality measure for Ozone to a much lower concentration levels than that set in the current NEPM AAQ Ozone (O3) standards.

The 2000 WHO[2] Ozone guideline of 120ug/m3 (59ppb) for an 8 hour period was revised in 2005 WHO [3] and reduced to maximum concentration level of Ozone 100 ug/m3 (47ppb). It was noticed that: '--- *health effects will even occur below this guideline levels in some sensitive individuals with an estimated number of attributable deaths increasing by 1-2% a day when Ozone concentrations reached this guide level, as opposed to remaining at the background level'* [4]

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7. Ozone (O3)

New Ozone Standards for USA

The USA proposal to revise the current NAAQ 8 hour Standards [5] for Ground-level Ozone from 75ppb to a new level 60-70ppb states: *" -- in a Regulatory Impact Analysis of Ozone in USA, the EPA estimates the value of health benefits of reducing ozone to 0.070 ppm would range from about $13 billion to $37 billion per year in 2020. For a standard of 0.060 ppm, the value of benefits would range from about $35 billion to $100 billion per year in 2020.*

The costs of reducing ozone to 0.070 ppm would range from an estimated $19 billion to $25 billion per year in 2020. For a standard of 0.060 ppm, the costs would range from $52 billion to $90 billion.

The annual control technology costs in the USA of implementing known controls as part of a strategy to attain a standard in the proposed range of 60-ppb/ 70 ppb in 2020 would be approximately $3.3 billion to $4.5 billion. EPA used several statistical methods to provide a range of likely compliance costs for other, currently unknown technologies that would be needed to attain the proposed primary standards'.

Table 9 Ozone:

Estimated Number of Adverse Health Effects Avoided under Alternate Standard Levels in 2020*

	0.070 parts per million	0.060 parts per million
Chronic bronchitis	880	2,200
Nonfatal heart attacks	2,200	5,300
Hospital and emergency room visits	6,700	21,000
Acute bronchitis	2,100	5,300
Upper and lower respiratory symptoms	44,000	111,000
Aggravated asthma	23,000	58,000
Days when people miss work or school	770,000	2.5 million
Days when people must restrict their activities	2.6 million	8.1 million
Avoided premature mortality	1,500 to 4,300	4,000 to 12,000

*Includes benefits of reduced fine particle concentrations associated with illustrative ozone controls applied to meet a primary ozone standard in the proposed range

Source: US EPA Office of Air Quality Planning & Standards January 2010 *Proposal to Revise the National Ambient Air Quality Standards for Ground-level Ozone 1/2010* [5]

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7. Ozone (O3)

New Ozone Standards for Australian

In Australia a new 8 hour Ozone standard of 50ppb can be achieved by using a mixture of known/ unknown air pollution control technologies. In areas that do not meet the new standards, state and local governments will need to impose new regulations to reduce the pollutants that produce smog, using technologies designed to cut such emissions from smokestacks, tailpipes and manufacturing plants, or a new technology as yet to be invented. In implementing more stringent ambient air levels history has shown that science and the threat of costly penalties have given industry the tools and incentive to find ways to cut ozone producing gases.

Table10. Existing Australian /International Air Quality Standards -Ozone (O3)

Averaging period	Aust	WHO	USA	EU	UK	Canada	Calif
1 hour	100ppb		120ppb				90ppb
4 hour	80ppb						
8 hour		47ppb	**75 ppb***	56ppb	47ppb	65ppb	70ppb

* US EPA plans to revised downwards 8 hr Ozone levels 60-70ppb [5]

Table11. Proposed revised NEPM Standards/Goals for Ozone (O3)

Averaging Period	Maximum Concentrations	Goal* maximum exceedances
1 hour	**100ppb**	**1 day a year**
4 hour (optional)	**80 ppb**	**1 day a year**
8 hour	50 ppb (new)	1 day a year * within 5 yrs

Tables 10 & 11 further illustrate that Australia should now to adopt the 2005 Who Guidelines standard for Ozone [6] with a maximum concentration level 50ppb to averaging period of 8-hour. Goal 5 years.

Conclusions

It is evident from World health studies collected over many years that there is over-whelming evidence to justify revision. of the current NEPM AAQ standards for Ozone

Recommend: That NEPM AAQ Ozone (O3) maximum concentrations be reviewed:

- ***Special consideration should be given to adopting lower levels standards for 8 hour WHO O3 maximum concentration level of 50ppb exceedances 1 day /year)***
- ***retain 1 hour O3 maximum concentration level of 100 ppb (exceedance 1 day /year***
- ***consideration be given to revoking 4 hour O3 maximum concentration level of 80 ppb exceedence 1 day per year.***

Reference

1.ABC News March 11, 2006, *Sydney chokes on the nations worst air pollution*, http://www.abc.net.au/news/newsitems/200603/s1589284.htm

2.WHO 2000, *Guidelines for Air Quality*, Geneva, World Health Organisation

3. WHO 2005, *Guidelines for Air Quality*, Geneva, World Health Organisation

4.Lidia Morawska, QUT, Airborne *Particles & health* Air Quality and Climate *Journal* Volume 44 no 1 Feb 2010 page 18

5.US EPA Office of Air Quality Planning & Standards January 2010, Proposal *to Revise the National Ambient Air Quality Standards for Ground-level Ozone*

6 WHO 2005, *Summary of risk assessment-Air quality guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide. Global update*

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8. Lead (Pb)

8. Is there enough evidence to recommend revising the current lead standards?

Yes X **No**

Introduction

Although the decision by states to discontinue lead as part of NEPM AAQ monitoring. I believe it is still appropriate to maintain a NEPM AAQ standard for lead in Australia and need to set the lowest value of maximum concentrations of lead emissions to the atmosphere

Scientific evidence about lead and health has expanded dramatically since the first 1998 NEPM AAQ set a standard maximum concentration for lead 0.5 ug/m3.

It is estimated that more than 6,000 new studies on lead health effects, environmental effects and lead in the air have been published since 1990's. Evidence from various international health studies shows that adverse effects can occur at much lower levels of lead in blood (BLL) than previously thought of 10ug/dl

8.1 Health Studies:

(1). Bristol UK-Children[1]

A 2009 study from the University of Bristol Centre for Child and Adolescent Health found:"--*lead levels between* ***five and 10 microgramms per decilitre were associated with significantly poorer scores for reading (49% lower) and writing (51% lower).***

A doubling in lead blood levels to 10 microgrammes per decilitre was associated with a drop of a third of a grade in their Scholastic Assessment Tests (SATs).

And above 10 microgrammes per decilitre children were almost three times as likely to display antisocial behaviour patterns and be hyperactive than the children with the lower levels of lead in their blood.----"

(2): Boston USA: **The Elderly**[2, 3]

The Harvard School of public health study " *Lead, Diabetes, Hypertension, and Renal Function: The Normative Aging Study* [EHP 112:1178 -1182], assessed the relationship between low-level bone and blood lead levels and measures of kidney function in a general population sample: "--- *In contrast with blood lead,* ***bone lead makes up more than 95% of the adult body burden****. -------. Yet, as people age, bone loss often does take place, so lead that has long been held in bone* ***is released to soft tissue and can find its way to the kidneys. Thus, bone lead may be a better marker for studying the chronic toxicity of accumulate dexposure and lead burden****----The findings suggest* ***that long-term low-level lead accumulation, estimated by tibia lead, is associated with an increased risk of reduced renal function****. This is especially true for diabetics and hypertensives, who already are at risk for kidney impairment because of their disease. In addition, blood lead and tibia lead appeared to be associated with elevated SCr* (serum creatinine*) levels and* ***chronic kidney disease among hypertensives****.—"*

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8. Lead (Pb)

8.1 Health (Cont)

(3). Rochester US: Study low-level Environmental Lead Exposure [4,]

There is overwhelming evidence that low levels of BLL lead can be associated with people with intellectual deficits with a BLL < 10 µg/dL. In the Rochester Study it was found,"---- *there was an estimated reduc-tion of 7.4 IQ points associated with an increase in lifetime mean blood lead from 1 to 10 µg/dL (Canfield et al. 2003)* [5].

Respond Lanphear et al.[6] quotes "---- *Numerous studies have found evidence for adverse consequences of childhood lead exposure at BPb levels < 10 µg/dL).* ---- *These studies provide sufficient evidence that childhood lead exposure should be reduced even more by banning all none essential uses of lead and* ***further reducing the allowable levels of lead in air emissions****, house dust, soil, water, and consumer products"*[6]

(4). Comment:

The 2010 NEPM AAQ paper gives support to these Bristol/Harvard/ Rochester findings on lead by discussing in depth the health effect of exposure to lead. This 2010 NEPM AAQ paper places much greater emphasis on health effects of lead levels in the community of BLL < 10ug/dl. In contrast previous 2007 & 2009 NEPM AAQ papers largely focuses on a target BLL of 10ug/l as a safe measure for lead. by using the earlier 1998 NEPM AAQ maximum concentration levels set for lead of 0.5ug/m3 derived from the 1993 NHMRC value. Missing from all these NEPM AAQ papers was the detrimental health effects the elderly experiencefrom exposure to low levels of lead. [2,3].

8.2.Industry: Lead emissions

It is said by some that an AAQ NEPM used for lead monitoring is not the most effective way to managing impacts of health of a community an better protected can be achieved by consultation with industry and health agencies. In practice this type of measures has failed to deliver blood lead levels below 10ug/dl level at lead hot spots.

The smelters located at Mt Isa and Pt Pirie are two of the major contributors of lead emissions into the environment. These lead emissions are not all confined to a discrete area or boundary around these point sources.

Although the1997 draft NEPM impact statement AAQ did discuss Port Pirie as point source emissions for lead and the exposure estimates for number of person events to lead emissions ranging from 1.5—0.5ug/m3. (Refer Appendix C), The subsequent NEPM reviews/discussion papers on health effects of lead concentrations failed to address the important role that the lead industry has to play in further reducing lead emission into the atmosphere (reducing BLL in children) to a safe levels.

Clearly there is a need to examine better enforcement of the NEPM AAQ for lead .As children at Mt Isa and Pt Pirie are still being exposed to unacceptable levels of lead pollution Refer App C). Moreover, when one considers how small a dose lead is believed to harm a child's brain evidence now suggesting that in *fact there is no safe threshold of exposure* to lead.Emissions measured by the ton should concern anyone who is regularly exposed to lead.

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8. Lead (Pb)

8.2.Industry: Lead emissions (Cont)

Until recently Mount Isa lead emissions were regulated under a separate license, the monitoring done privately by the company and the emission standard for lead set at NHMRC level of 1.5 ug/m3. The National Pollutant Inventory (NPI) gave an indication of the magnitude of lead emission coming from this smelter The 2008 NPI estimate of lead emissions was 210 tons compared to early 2002 NPI estimate 217 tons in 2009. Clearly this is evidence showing that present strategies such as the alternative practice of endless consultation with industry and health agencies with communities has resulted/seen little or in no improvement/outcomes in overall reduction of lead emissions at Mount Isa from 2002 to 2009.

Similarly events at Port Pirie show current lead emission reduction strategies have not markedly reduced examination of the NPI data shows a reduction from 47 tons in 2004 to 43 tons in 2009 --< 10% reductions in 5 years of trying! (Refer Appendix C). Clearly the various measures taken by the company and local health agencies (at Pt Pirie in a highly publicised 10x10 programme) to reduce lead in blood lead levels (BLL) in children to a level well below 10ug/dl have not been successful.

What is of concern is paucity of any recent independent long-term health studies on effects of lead exposure the population of these two towns. And the 2010 NEPN AAQ paper cited very few recen*t independent* studies done on population exposure to lead emissions in Australian. Moreover, I could find no clear references to Port Pirie or Mount Isa in the any recently published independent papers on lead. Only a brief reference was a cohort study lead done at Port Pirie (pages 78,80) no author- no date. Similarly the other author of interest Peter Baghurst et al 1987 (page 25) was not found. None of the lead studies done by Brian Gulson that were quoted in this 2010 NEPM AAQ paper: for Broken Hill, Gulson et al 1996. North Lake MacQuarie, Gulson et al 2004 & Esperance, Gulson et al 2009 could not be found in References section. 9

Recent media statements on lead from experts in this field are not helpful in addressing the lead health issues. As they do nothing to advancing a case to convince Australian jurisdictions/Industry to seriously address the mounting evidence that adverse health levels on children below 10ug/ldl CAN BE MORE harmful than a BLL > 10ug/dl.

For example on ABC Radio World Today [7] a leading lead expert in commenting about continuing high BLL >10ug/dl in children at Port Pirie said " *---the link between lead and IQ is still being debated. ---It may be just a blip. The size of the increase that we're seeing in the blood lead concentration in these children is not such that it's going to have any devastating health effects that would be obvious to anybody in the near future—*".

Speculation such as this does not assist the case for a review of the present NEPM AAQ lead level of 0.5ug. Moreover, it is at odds with a Boston study Lanphear et al 2005 [4] whose findings state "--- ***that environmental lead exposure in children who have maximal blood lead levels < 7.5 µg/dL is associated with intellectual deficits***".

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8.Lead. (Pb)

8.3:Proposed New NEPM Lead Standards & Goals

Based on a review of the full body of evidence I propose that the current standard of 0.5µg/m3 is not sufficient to protect public health with an adequate margin of safety New measures need to be implemented to vary the current NEPM maximum concentrations levels goals for lead. These proposed changes are necessary as they will ensure better protection to the more vulnerable sections of the population and include a NEPM Standard for lead concentrations levels & goals to apply to point source monitoring.

A revised NEPM standard for lower lead concentrations would provide increased protection for children (reduce BLL <5ug/dl) and reduce other *at risk* populations against a variety of adverse health effects, most notably effects on the developing nervous system and the middle-aged and elderly men who have had no known heavy exposure to lead. (Shirng-Wern Tsaih et al)[2,3]

Table 12. Australian and selected international air quality criteria for Lead

Jurisdiction	Quarterly	Annual	Exceedences
Aust		0.50ug/m3	None
USA	0.15ug/m3		None
UK		0.25ug/m3	None
EU		0.50 ug/m3	None
WHO		0.50 ug/m3	None

The benefits of a reduction to maximum lead concentration of 0.30 ug/m3.using $4,437 per IQ point equates to an estimated health saving of between $340,000 to $ 681,000 whereas the 0.50 ug/m3 was calculated to be much less at between $245,000 to 491,000. The IQ points saved by further reduction to 0.15 ug/dl would result in further cost benefits[8]. Source The Draft NEPM Impact AAQ 11/1997 page. Also refer to Appendix A.

My proposal is to revise the level of the NEPM standards maximum concentration level for lead to a much lower level. To be done in two phases from the current the level of 0.50 ug/m3 to a final phase 0.15ug/m3 within 10 years with an interim phase being 0.30 ug/m3 within 5 years. Refer to Table 13

Table 13. Proposed New NEPM Standards & Goals for Lead (Pb)

Averaging Period	implementation	Maximum Concentrations	Goal: with maximum allowable exceedences
1 year	Phase 1 Interim	0.30 ug/m3	None (Goal 5 years)
1 year	Phase 2 Final	0.15 ug/m3	None (Goal 10 years)

Recommend: A New set of NEPM Standards & Goals for Lead
Phase 1 Implement Interim standard for maximum lead concentration of 0.30 µg/m3 setting a goal within 5 years
Phase 2: Final lead standard for maximum lead concentrations of 0.15ug/m3 with a goal of 10 of years)

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8.Lead. (Pb) *(Cont)*

References

1 *Safe lead levels harm children*, 16 September 2009 http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/health/8259639.stm? ad=

2.Shirng-Wern Tsaih ,Harvard School of Public Health "*Lead, Diabetes, Hypertension, and Renal Function: The Normative Aging Study Environmental*, Health Perspectives Volume 112, Number 11 August 2004 ,112:1178-1182].

3.*Measuring Lead Effects Blood and Bone Together Are Better Environmental* ,Health Perspectives Volume 112, Number 11 August 2004

4. LANPHEAR, B. P., HORNUNG, R., K 5 HOURY, J., YOLTON, K., BAGHURST, P., BELLINGER, D. C., CANFIELD, R. L., DIETRICH, K. N., BORNSCHEIN, R., GREENE, T., ROTHENBERG, S. J., NEEDLEMAN, H. L., SCHNAAS, L., WASSERMAN, G., GRAZIANO, J. & ROBERTS, R. (2005) *Low level environmental lead exposure and children's intellectual function: an international pooled analysis.* Environmental Health Perspectives, 113, 894–9.

5.Canfield RL, Henderson CR, Cory-Slechta DA, Cox C, Jusko TA, Lanphear BP. 2003. *Intellectual impairment in children with blood lead concentrations below 10 micrograms per deciliter*. N Engl J Med 348:1517–1526.

6.Lanphear et al Respond e2006, *Lead and IQ in Children*, Environmental Health Perspectives 114(2) Feb 2006 http://ehsehplp03.niehs.nih.gov/article/browseIssue.action?issue=info%3Adoi%2F10.1289%2Fissue.ehp.v114.i02

7.ABC Radio World Today, June 4, 2010 "*Parents worried about lead rise in children"*

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11. Comments Feed Back Form

11.1:Evaluation of performance

- **Does the current approach, which allows for a number of exceedences of the standard, meet the requirement for adequate protection?**

Yes X No

But a range of sustainability parameters (human health effects) could be introduced into future NEPM standards. Eg Precautionary Principle

11.2:Number of alternatives to the current approach is considered in the Review. Do you support*:*

- **Assessing compliance with the standard using a percentile form (not stating an**

allowable number of exceedences)

Yes No X

Not in favour. The number of exeedences for the six chosen pollutants was set in 1998 AAQ NEPM with a goal with a number of years for compliance. I see no advantage at this stage of adopting a brand new scheme based on a standard using a percentile form.

However some of the goals set in earlier NEPM AAQ of 10 year was far too generous. The present scheme (number allowable exceedences) has undergone 12 years of operation in Australia whereas this alternative proposal has not. As an example number of exceedance set for Ozone should remain in place.

- **Having a 'not to be exceeded' standard based on health protection and requiring reporting of cause of exceedences, progress toward meeting the standards and actions taken**

Yes ? No ?

On this issue I may need to do further research to give a definitive reply as my comment above in section 11.1 had assumed that the existing NEPM AAQ standards took into account health based evidence (including adoption of the precautionary principle) to set a maximum concentration level for these six pollutants. However, if this is not the case perhaps this proposed measure has merit. The following extract may assist your current NEPM AAQ Review. Morawska et al 2010* said

" *--more recent epidemiological studies (including hospital admissions for cardiac disease or daily /annual mortality) was a lack of evidence of threshold level within a concentrated range 5—40 ug/m3 (2- 14ppb. Therefore, it was concluded that if there an SO2 threshold for any of these effects it would have to be low—*" Source: Lida Morawska QUT " Adverse Health effects to Air pollution and Guidelines to prevent them" Air Quality & Climate Change Journal Vol 44 No 1 February 2010.

- **Allowing 'exceptional' or 'natural' events (such as bushfires or dust storms) to be excluded from the assessment of whether the air quality in a region is in compliance with the standards or not.**

Yes No X

The option of providing exemptions from air quality exceedences ,such as adverse events does has merit in light of climate change factors. However, in implementing a reporting protocol for the States to report these events would be complex and may provide wriggle room for them not to report the '*real'* poor air quality conditions in many regions.

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11.2 (Cont)

- **Are there alternative methods that are not provided above which offer a better or a more consistent level of health protection? Please detail.**

Yes No X

Whatever the current NEPM AAQ shortcomings, it's taken 12 long years to establish the present scheme. Further tinkering with it could not be support without some overwhelming evidence for a change. Moreover, to adopt any of the above alternatives schemes other than the current approach most jurisdictions may need additional resources/money to implement new measures.

11 3:Reporting protocols*

Should changes be made to the reporting protocols for exceedences?

Yes X **No**

More Trend data charts [simple] could be included. (see appendix B & C) If the level of an NEPM pollutant is just below NEPM exceedance it is not reported even though they just below reporting trigger value.This measure should be an essential part of better transparency in reporting by jurisdictions, in an annual report to NEPC. Voluntary reporting of results of local Air quality issues by jurisdictions is not favoured as additional costs of compliance will by cited as a reason not to participate. However this review should certainly consider a costings for NEPM ambient air monitoring sites to include provision of real time electronic data collection and placing these site result pollutant levels on a public Internet Qld site eg 1hr PM10.

- **Should states and territories be required to assess and provide clear justification for sources of exceedences?**

Yes X No

At present the State's Annual NEPM AAQ usually just report for any NEPM AAQ exceedences two event sources: *Industry & Dust* and any measures that are undertaken to remedy these exceedence events are not an easy to identify by the general public in the reporting literature. This current form of reporting exceedances is not acceptable and more effort should be done by jurisdictions to identify a source of pollutant.

A review of the NEPM AAQ should include a protocol requiring the states to specifically identify source and give a full explanation/information in a special report (easy for the public to read) of all exceedence events and any steps undertaken to minimise repeat events

- **Should states and territories be required to advise the public immediately in the event of an exceedence in addition to annual reporting requirements?**

Yes X No

It is my understanding the current NEPM does has not have a measures (standard procedure) in place to require a State jurisdiction to immediately report any exceedence of the NEPM AAQ either directly to the EPHC or into the public domain. At present this type of air quality reporting is done on an adhock basis by the states, only if it is deemed (judged) that an air quality exceedance warrants a public health alert. For example through a press release/radio /newsagency reports announcement etc from a Government Agency eg health department.

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11.3 Reporting Protocols* (Cont)

- **Should states and territories be required to report daily air quality results and/or predict future air quality through an Air Quality Index or similar?**

Yes X **No**

Each state EPA has altogether different web based air quality reporting schemes. The Air Quality Index supplied by most state EPA's although a useful tool is little understood by the public and at presently not particularly useful. When the SA EPA first established an AQ index daily results of the state of air Quality (Good /Bad Poor) was made available to the public in media (T/V). Today in South Australia this type public reporting of daily reporting the condition of local Air Quality is not observed at all by any media outlet or newsagency. So the suggestion of using Air Quality Index as a future-predicting tool for Air Quality may be desirable but getting correct systems in place to work properly may be difficult, as the existing Air Quality Index in the public arena is a non-event!

In regard to report on line daily air quality /NEPM pollutants. Some web sites are relative good (technically) at examining the daily standard air quality. They report air quality standards from various monitoring sites within the state. Some other EPA web air quality sites are just terrible and provide minimal funding to promote air quality.

Some state have on line real time monitoring Eg Qld Hourly Air Quality Data web page
http://www.epa.qld.gov.au/environmental_management/air/air_quality_monitoring/
Moreover this Qld EPA web site combines real time daily air quality data from the states monitoring sites with a colour coded air quality index associated with each monitoring station. These conditions are as follows: Not Available/Very Good/ Good/Fair/Poor/Very Poor

*Footnote**:** Many of the above questions raised are very similar to ones raised in the 2005 NEPM AAQ Scoping Paper

11.4: Overall comment

Please use the following space to provide any additional comments or suggestions on the Review of the National environment Protection (Ambient Air Quality) Measure.

11.4.1: Australian air quality standards for the protection of ecological values.

The question of developing an Australian Air Quality Standard (AAQ) for protection of ecosystems was raised on pages 39 –40 of the June 2007 "*Ambient Air Quality NEPM Review Discussion paper*", however there is no specific reference to this matter again in the June 2010 NEPM AAQ discussion paper. It is internationally agreed that climate change will affect air quality and with it bring an increase in temperatures resulting in higher pollution (ozone) levels in Australian capital cities.

In light of these predictions the decision not to discuss an Australian Air Quality Standard for *protection of ecological values* is contrary to that taken by many other countries and organisation. Most have decided to adopt ecological air pollutants; especially sulphur

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11.4: Overall comment

11.4.1: Australian air quality standards for the protection of ecological values.

Sulphur Dioxide, and Ozone in relation to crops and native vegetation. For example the US EPA National Ambient Air Quality Standards have ***Secondary standards set limits*** (NO2, O3, Pb, PM's & SO2) to protect public welfare, including the protection against decreased visibility, damage to animals, crops, vegetation, and buildings[1].

There is abundant scientific knowledge about the impacts of air pollution on the agricultural crops, plantation trees and on the natural vegetation and natural ecosystems[2].

And with imminent onset of climate change (rising temperatures), increased ozone concentrations on plants exposed to ozone will suffer lowers growth rates[3]. The agriculture areas exposed a higher ozone level is where crops will be worst effected with estimated crop yields would drop nearly 40% worldwide by the century 21st Century My view is the NEPM committee has erred in not at promoting more discussion on this important topic

Ozone and the Environment

Ground level ozone is absorbed by the leaves of plants, where it can: –Interfere with the ability of sensitive plants to produce and store food. This can lead to:

.• reduced growth, biomass production and yields.

- Make sensitive plants more susceptible to certain diseases, insects, harsh weather, other pollutants, and competition.
- Reduce or change plant species diversity in associated ecosystems.

damage to ecosystems dependent on those species.

- Visibly injures the leaves of plants, affecting the appearance of vegetation in national parks, recreation areas and cities.

References

1. US EPA 06/06/2007 "Report on the Environment (ROE): Science Report Ozone Injury to Forest Plant" http://www.epa.gov/
2. Science News – November 14, 2007 "*Increasing ozone will damage crops"* http://pubs.acs.org/journals/esthag/index_news.html
3. http://pubs.acs.org/subscribe/journals/esthag-w/2007/aug/science/ee_ozone.html

11.4.2: Adopting in a future NEPM Carbon Dioxide (CO2) Ambient Air Pollutant

Is CO2 a dangerous pollutant?

The June *2007 "Ambient Air Quality NEPM Review Discussion paper*" on page 48 made a brief reference of the association of CO2 contributing to climate change as a greenhouse gas. However, the 2007 paper chooses say "*given that CO2 and its impact on climate change is a global issue and not one that relates to regional air quality, monitoring and reporting on daily/yearly levels -----in urban areas in Australia, as required under the NEPM, may not provide the best information to assess and address the issue of climate change---*". I beg to differ with this statement. I believe all States in Australia have ambient air monitoring networks, which would adequately cater to measure/monitoring CO2 despite the papers claims. However, the will is missing by all jurisdictions to proceed with adopting a NEPM standard for CO2 a major pollutant. Offering up Cape Grimm, as Australia's only global contribution to CO2 monitoring is to sell Australia short

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11.4.2: Adopting in a future NEPM Carbon Dioxide (CO2) Ambient Air Pollutant

Is CO2 a dangerous pollutant? (Cont)

In contrast US EPA is ahead of the game and is likely to declare CO2 a dangerous pollutant (sfgate.com September 1, 2009)"--*EPA head Lisa Jackson expects a formal "endangerment finding" within months. ----------Carbon dioxide is likely to be declared a dangerous pollutant The EPA kick-started the regulatory process in April when it proposed declaring carbon dioxide and five other greenhouse gases as pollutants that jeopardize the public health and welfare. EPA scientists believe the greenhouse gases contribute to global warming by trapping heat in the Earth's atmosphere-------EPA Administrator Lisa Jackson told reporters that a formal "**endangerment finding,"** which would trigger federal regulations on greenhouse gas emissions, probably would "happen in the next months."*

To dismiss (out of hand) a NEPM measure of adopting in any future NEPM Carbon Dioxide (CO2) as an Ambient Air Pollutant is short sighted a I recommend further consideration to include carbon dioxide in AAQ NEPM should be given to my proposal

We need to do more by measuring our (locally) CO2 emissions and in doing so make a contribution to reducing the worlds CO2 emissions.

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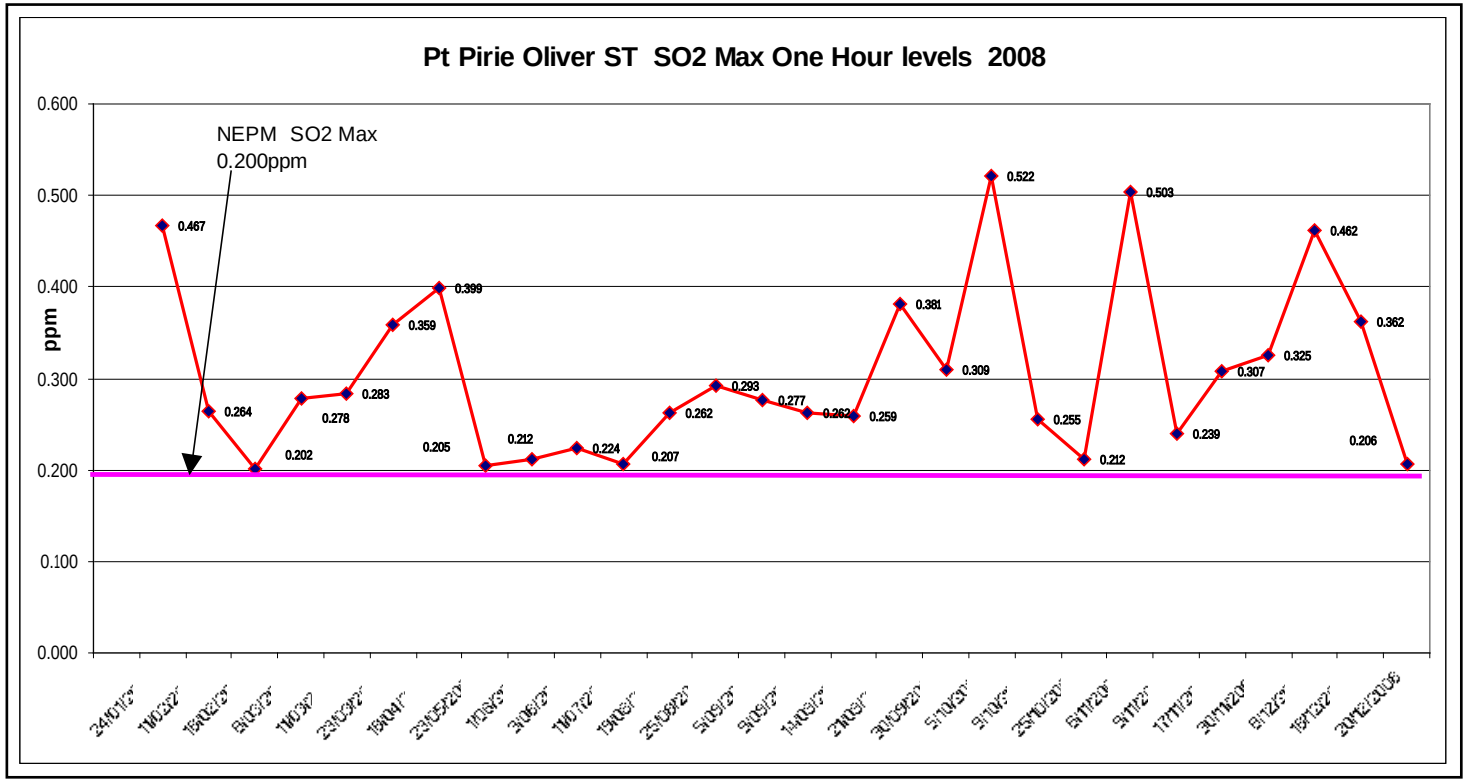
Appendix A

Table 8.5
1997 Australian Dollars from USEPA (1997)
Estimates of the Value of Avoided Effects

Avoided Effects	$ Value (mid estimate)	
Mortality	7,100,000	per case
Chronic Bronchitis	384, 540	per case
IQ Changes:		
Lost IQ points	4,437	per point
Incidence of IQ below 70	62,118	per case
Hypertension	1,005	per case
Strokes:		
Male	295,800	per case
Female	220,500	per case
Coronary Heart Disease	76,908	per case
Hospital Admissions:		
Ischaemic Heart Disease	15,234	per case
Congestive Heart Disease	12,276	per case
COPD	11,980	per case
Pneumonia	11,684	per case
All Respiratory	9;022	per case
Respiratory Illness and Symptoms		
Acute Bronchitis	67	per case
Acute Asthma Attacks	47	per case
Acute Respiratory	27	per case
Upper Respiratory	28	per case
Lower Respiratory	18	per case
Shortness of breath	8.13	per day
Work Days Lost	123	per day
Mild Restricted Activity Days	56	per day

Source: Draft NEPM & Impact Statement for Ambient Air Quality 11/1997 page 81

Review of the National Environment Protection (Ambient Air Quality) Measure
Discussion Paper Air Quality Standards
Appendix B



Review of the National Environment Protection (Ambient Air Quality) Measure Discussion Paper Air Quality Standards

Appendix C

Figure 1: Air Monitoring Report for South Australia 2008—Compliance with the National Environment Protection (Ambient Air Quality) Measure

Extract pages 32 & 36