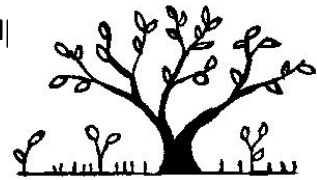


Port Adelaide Residents Environment Protection Group
PO Box 3122
Port Adelaide SA 5015



The Committee Secretary
Senate Standing Committees on Community Affairs
PO Box 6100
Parliament House
Canberra ACT 2600
Australia
e: community.affairs.sen@aph.gov.au

Dear Sir/Madam

Response to the Draft State Public Health Plan

The Port Adelaide Resident's Environment Protection Group (PAREPG) has been active in air quality issues on a local level for over two decades. The group is currently represented on two industry groups, the Adelaide Brighton Cement and Penrice Soda Community Liaison Groups both of which deal with air quality and the corresponding effects on local residents, and believe we have a contribution to make within the committee's terms of reference:

The impacts on health of air quality in Australia, including:

- (a) particulate matter, its sources and effects;
- (b) those populations most at risk and the causes that put those populations at risk;
- (c) the standards, monitoring and regulation of air quality at all levels of government; and
- (d) any other related matters.

Some history

We have a particular interest in particulate pollution. Over the 20 years we have been concerned with this issue, we have seen knowledge and the scope of the health effects expanded considerably.

Initially particulate pollution was considered as a respiratory irritant, and also a possible contributor to lung cancer. More recently the APHEA (Air Pollution and Health - A European Approach) project considered particulate levels across the major cities of Europe.

Critically, findings from the project identified a linear response between particulate levels and mortality [Samoli 2005]. Our thoughts were that a linear response between particulate levels and health effects implies that:

- People living closer to particulate sources are exposed to higher particulate levels and hence a higher risk relative to the general population. That meant people in our area who live closer to arterial roads or to industrial facilities emitting large volumes of particulates.
- An ethical policy approach would adopt policies which reduce particulate levels and hence mortality.

Since that time we understand that further work has started to refine causes of mortality and morbidity and that increased in cardiovascular disease has been linked to increased particulate levels. Indeed a recent Adelaide study described as “the first study to investigate the effects of ambient air pollution on population health in metropolitan Adelaide” identified acute effects, linking increases in cardiovascular hospital admissions to days of high average particulate levels. [Hansen 2012].

Where we live

A good proportion of our group live around the suburbs of Port Adelaide and Semaphore. Part of that area is adjacent to Adelaide Brighton Cement's cement factory at Birkenhead, and also adjoins the major heavy vehicle transport corridor (Victoria Rd) to the Outer Harbour container terminal. Close by is South Australia's primary fuel storage area, all of which impact on the South Australian government's plans to increase population in an urban renewal project at Port Adelaide.

Evidence is emerging to confirm resident's long held views that this area is one of the highest areas of particulate pollution in metropolitan Adelaide.

Perhaps we should explain

The EPA collects particulate monitoring data (PM₁₀) from five sites in the metropolitan area on a regular basis. A summary of those results is presented to quarterly meetings of the Adelaide Brighton Cement Community Liaison Group. Appendix 1, Fig 2 shows an example of those results. The monitoring site for this area is located at the LeFevre Primary School in the suburb of Birkenhead, approximately 1km from the Adelaide Brighton Cement plant.

Fig 1 (below) summarises the results over the last 18 months and shows two plots of the proportion of days in a month where the average daily particulate levels at Birkenhead are higher than or equal to any other metropolitan site.

- The first is the proportion of days expected if levels at Birkenhead were the same as any of other five sites (ie one day in 5 or 20%).
- The second shows the proportion of days that Birkenhead levels are actually equal to or greater than any other site (ie if average daily particulate levels were greater than

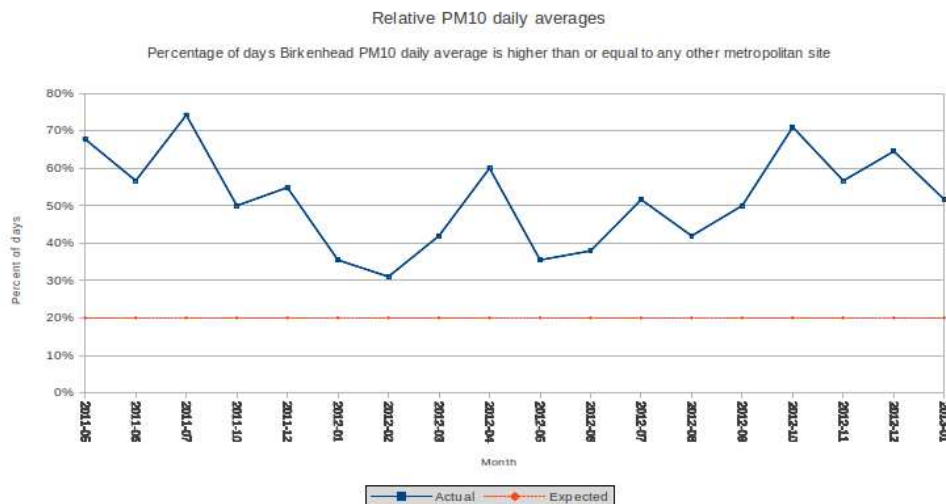


Fig1: Proportion of days where Birkenhead daily averages are greater than or equal to any other metropolitan site

any other site for 15 of 30 days in a 30 day month the proportion would be 50%).

In summary, Birkenhead particulate levels are consistently greater than any other Adelaide site. We believe that this is an intolerable state of affairs for current residents, and should be remedied prior to considering urban development designed to increase population levels in the area.

The situation is likely to get worse before it gets better. South Australian government policy is to industrialise the northern part of the peninsula adjacent to port facilities. Further development implies an increase in road freight to and from those facilities along Victoria Rd with consequent increases in particulate emissions.

A recent ABC investigation [Background Briefing 2007] reported that road transport vehicles with better fuel economies and tighter emission limits were being introduced to long haul routes, providing small operators on short haul routes the opportunity to purchase older equipment at a lower cost and with lower emission standards. It's our observation that this is very much the case in Port Adelaide.

Appropriate measurement

PM_{2.5} data is not collected in South Australia (with the exception of the EPA's Netley site). Our group has requested that PM_{2.5} data should be collected to provide a better correlation

with adverse health risks. The EPA's response has been that the relationship between PM_{2.5} and PM₁₀ is simply linear, and no imperative for change exists.

However we would like to draw your attention to the conclusions of the Adelaide paper

"This study has demonstrated an effect of PM on morbidity in Adelaide, SA. Fine particulate pollution was found to be more harmful than PM₁₀; and exposure during the cool season posed a greater risk to cardiovascular health than during the warm season. These findings suggest that despite air pollution levels generally being relatively low, reducing PM_{2.5} exposure would have benefits for population health."

[Hansen 2012]

Are other interactions possible?

Living adjacent to an industrial area, one of our concerns is the likelihood of adsorption of other pollutants onto the surface of particles. We understand that during the production of cement calcium carbonate and other materials are ground to particles of the order of 10 microns. Of course 10 microns is a nominal figure and the distribution of cement particles includes much finer particles (Appendix 1 Fig 3). These particles and then heated to high temperatures, resulting into transformation into very small particles of calcium oxide (lime).

We presume the particle surface would be highly reactive, and would adsorb other compounds with which they had contact. We'd like to stress that we do not have specialist knowledge in adsorption chemistry, but would very much like to know of any propensity for benzene and other chemicals emitted from fuel storage depots to adsorb onto particulate surfaces

Possible action

The group's view is that the only ethical solution is for a reduction in particulate levels. We believe a number of opportunities exist for improving health outcomes for people exposed to particulate pollution.

1. Introduce national particulate measuring protocols that align with public health goals. Currently the EPA protocol is to count the number of days which the average daily PM₁₀ levels exceed 50 µg/m³ and declare the situation satisfactory if a threshold has not been exceeded. Our understanding is that this reflects a national approach. Clearly such a binary OK-notOK approach does not reflect the findings of a linear response between particle concentration and health. Indeed it is misleading as it provides a false sense of public security
2. Introduce standards for monitoring PM_{2.5} levels nationally. The relevant literature is increasingly indicating that PM_{2.5} levels provide a better indicator of risk.

3. Increase public awareness of the use of highly polluting vehicles, with a view to decreasing their use. We're particularly concerned with the increased proliferation domestic diesel vehicles. While these vehicles may consume fuel more economically, widespread use is likely to increase metropolitan particulate levels.
4. Provide more information on the likely combination of particulates with other chemical compounds, and probable adverse health risks.
5. Encourage an evidence based approach to transport planning and Australian government funding of infrastructure. Currently the public are assured that major road improvements will result in a reduction in pollution as a by-product of fuel efficiency gains. Critics maintain that any efficiency gain is rapidly eroded by increased traffic volumes.

Such a reduction is certainly not borne out by the Birkenhead particulate record. The recent construction of a bridge across the Port River doesn't appear to provide any evidence of beneficial changes in particulate level at Birkenhead.

An evidence based approach would monitor particulate levels before and after any major traffic intervention, allowing a body of knowledge to be developed on design techniques.

Our group is not sure that the committee will be holding public hearings, but if this is the case we would be happy to appear before the committee to further respond to the views presented above.

Yours Sincerely

Tony Bazeley

Port Adelaide Resident's Environment Protection Group

15 March 2013

References:

Background Briefing 4 Feb 2007 "Freight about to crash"

<http://www.abc.net.au/rn/backgroundbriefing/stories/2007/1837792.htm>

Hansen A, Peng B, Nitschke M, Pisaniello D, Ryan P, Sullivan P, Barnett A. 2012. Particulate air pollution and cardiorespiratory hospital admissions in a temperate Australian city: A case-crossover analysis. *Science of the Total Environment* 416 (2012) 48–52

Horiba Scientific < URL: <http://www.horiba.com/scientific/products/particle-characterization/applications/cement/> viewed 13 March 2013

Samoli E, Analitis A, Touloumi G, Schwartz J, Anderson HR, Sunyer J, et al. 2005. Estimating the exposure-response relationships between particulate matter and mortality within the APHEA multicity project. *Environ Health Perspect* 113:88–95.

Appendix 1

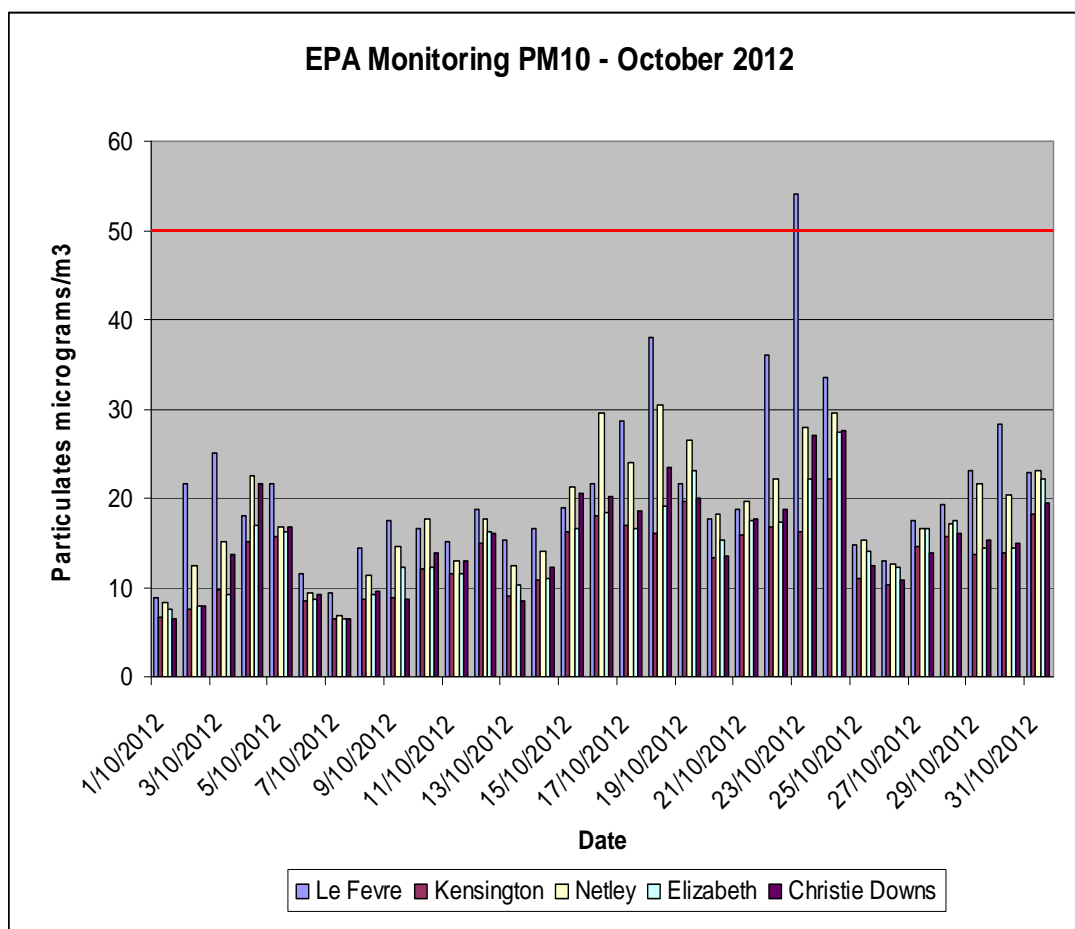


Fig 2: EPA monitoring data supplied to the Adelaide Brighton Cement Community Liaison Group showing average daily PM10 levels at Adelaide metropolitan sites. LeFevre is the name of the monitoring site at LeFevre Primary School ~ 1km from the Adelaide Brighton Cement plant at Birkenhead

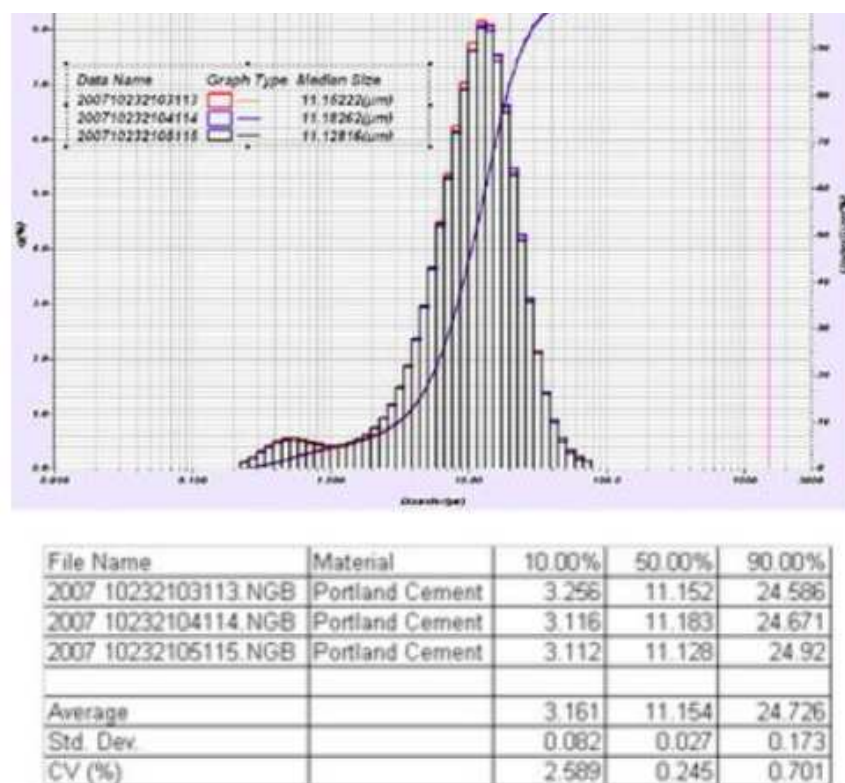


Fig 3: Particle size distribution of Portland Cement [Horiba 2013]