

Dr Bob Vickers – Submission on supplementary material

Members of the IPC, please find the following points of consideration with regards to the supplementary material open for submissions.

- 1) Wood smoke variation between Singleton and Muswellbrook has never been adequately explained by the EPA. The “socioeconomic” reasons alluded to in the transcript of the meeting between EPA, DPIE, NSW Health and the IPC do not adequately give this conclusion.

What is more likely, is the Singleton monitor is 100m away from any residential buildings, whereas the Muswellbrook monitor is near a few houses. If even one of those houses relied entirely on wood fired heating, that would create a significant confounding contributor which would not necessarily be reflective of the overall particle characterisation for Muswellbrook. This is known issue with fixed site monitoring and the particle characterisation study has not been repeated recently or adequately reviewed to account for this error.

As you can see from the following figures, the Singleton monitor has no nearby chimney stacks, whereas the Muswellbrook site is surrounded by them.



Figure 1. Houses directly across the road from the monitor in Muswellbrook.



Figure 2. Monitor in the left of the image. 5 chimneys within 50m of the monitor.

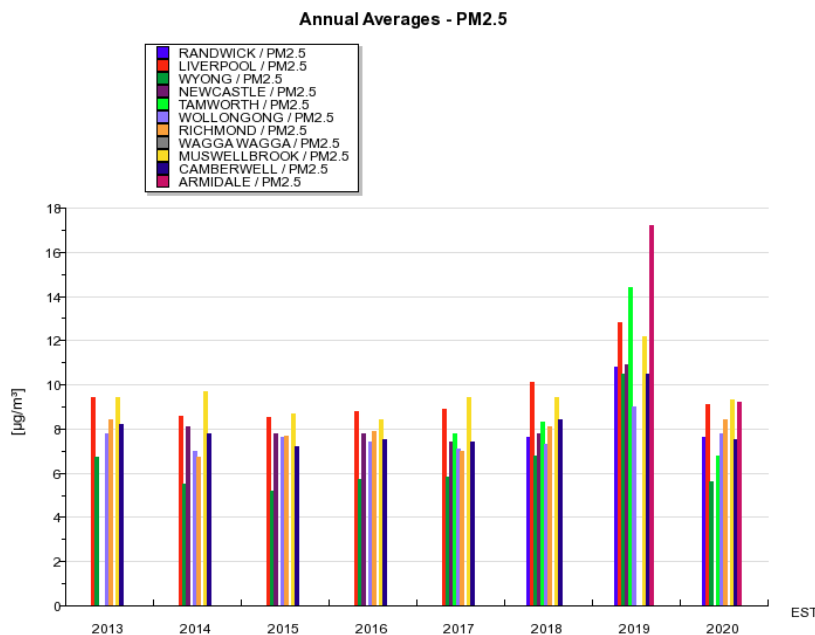


Figure 3. Singleton Monitor is centres, surrounded by day care centres, a pool/gym, council chambers and the library, none of which use wood fired heating.

- 2) Dr Broome correctly refers to the fact that health effects of air quality happen in both the short and long term.

The EPA and DPIE presentations both show PM10 and PM2.5 annual averages, but do not show the number of short-term exceedances, nor the daily maximums seen in Muswellbrook and Singleton.

These presentations compare Muswellbrook PM2.5 to Liverpool. This was a deliberate comparison choice of arguably the second worst air quality location in NSW. You can see in Table 1, that when the outlier bushfire of 2019 is removed, Muswellbrook and Liverpool have significantly higher annual average PM2.5 than any other monitoring site in NSW. The population density of Liverpool is significantly higher, and the socioeconomics of the two regions would be similar. Comparing Muswellbrook to Liverpool does not justify the high levels of PM2.5 in Muswellbrook.



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With regards to PM10, the DPIE has again been misleading in their presentation, selectively picking data that would have poor analysis.

You see from Figure 4 the location of the Wagga Wagga North monitoring station.

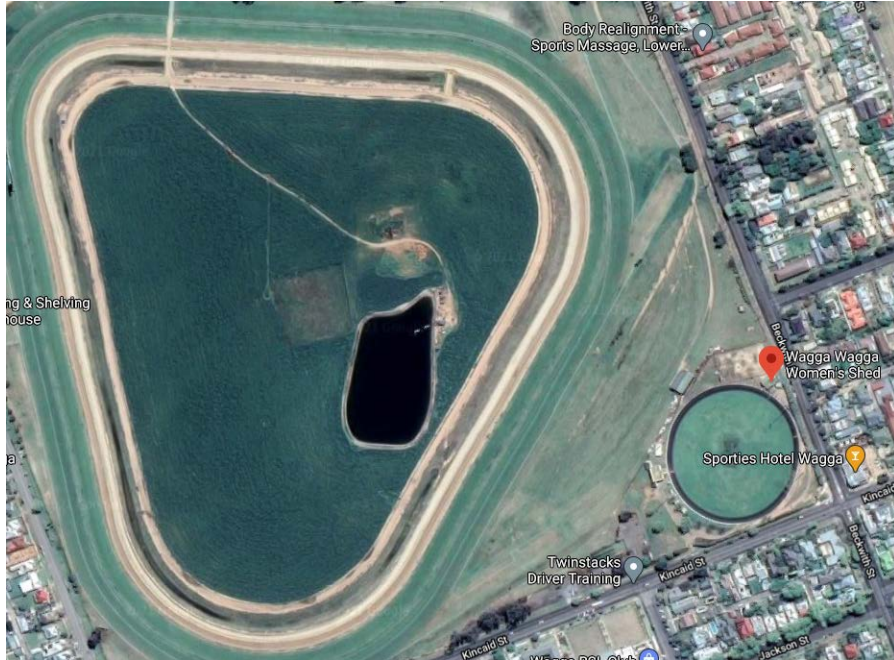
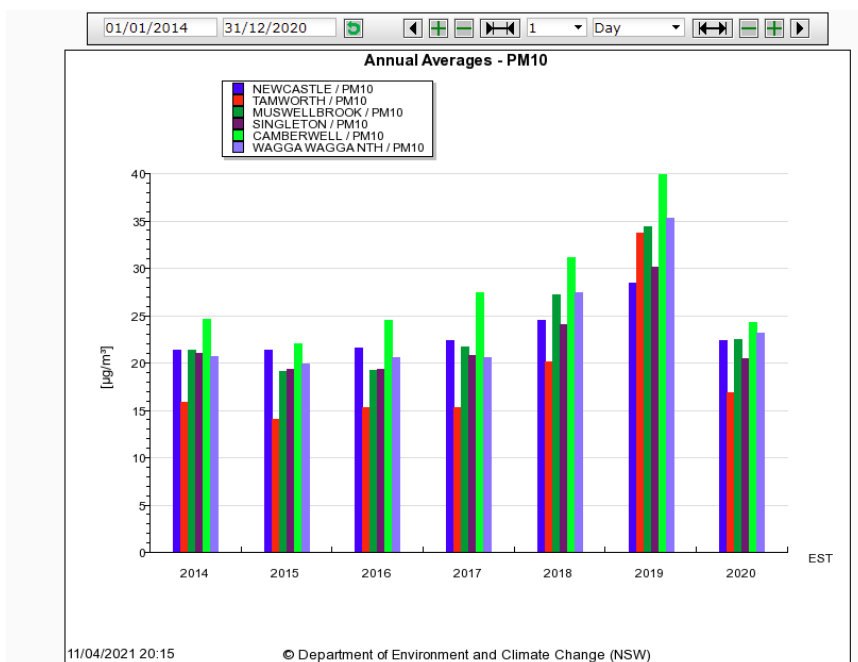


Figure 4. Wagga air monitor is situated right next to the Racetrack which has significant amount of unsealed dirt road.

The DPIE also failed to include the location with the consistently worst PM10 records, Camberwell, a small village 20 minutes away from Muswellbrook situated in the middle of the mining area.



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- 3) "...but as I say there are some fundamental limitations just due to the scale of and frequency of mining activity in this part of the world..."

Mr Gillian is sadly, 100% correct. The burden of exposed mining areas surrounding the Muswellbrook region has clearly led to a situation where any dry weather leads to an inability to control fugitive dust emissions from the mines, despite best practice and EPA oversight. The extreme dry weather is exacerbated by GHG emissions and climate change, the irony of which seems to be lost on the proponents when claiming the air quality was due to drought.

We have reached a point where the IPC should be reviewing plans for rehabilitation, not attempting to listen to cherry picked data from proponents and DPIE about how to minimise further air quality deterioration with additional projects.

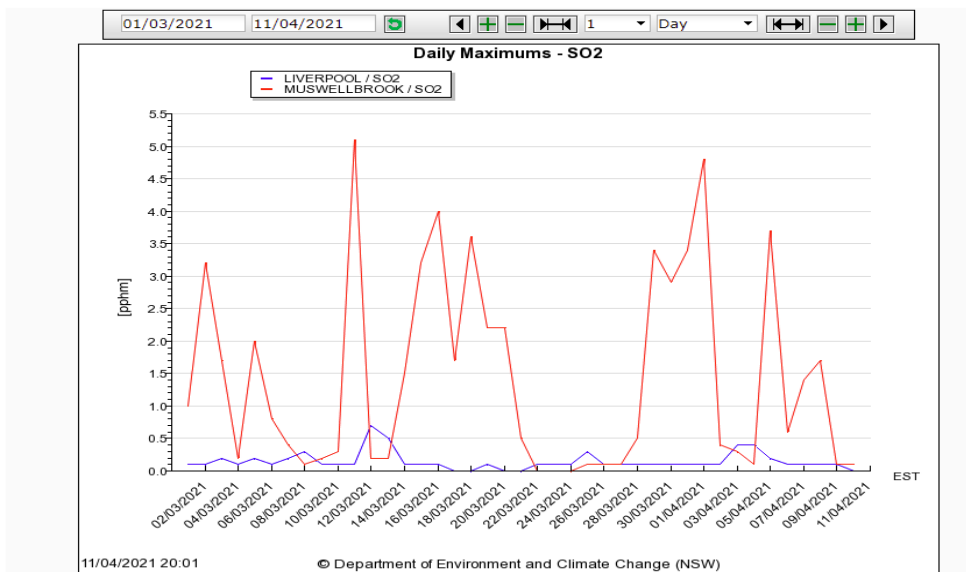
- 4) Compounded health effects are significantly important.

Dr Broome makes reference to the fact that "...but there are the short term effects which are predominantly likely to be in people who have pre-existing illness..."

The higher than acceptable air pollution in Muswellbrook increases the risk of additional cases of asthma and poor lung development in children. Regardless of comparison to other regions, this is modifiable risk attributable to increased mining activity in the region.

Now those children with pre-existing asthma in Muswellbrook are being exposed to significantly higher spikes of SO2 due to their proximity to the coal power stations. Now whilst the power stations are not owned or operated by the proponent, this collocated proximity of mines that are not providing coal to our power stations is relevant when considering cumulative health impacts.

Graph 1 shows the significance of the SO2 spikes seen in Muswellbrook.



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Smargiassi et al (<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2679612/>) showed that risk of asthmatic episodes are significantly higher on the same day when children are exposed to spikes in SO₂. The peak levels of SO₂ in that study were 31.6ppb. As you can see from graph 1 (converting pphm to ppb, ask Mr Gilligan why we don't just use ppb), Muswellbrook has exceeded this 9 times already this year. Children have a 42% higher risk of admission to hospital with asthma on these days. This has been a risk for Muswellbrook for many years now, and increasing mining activity exacerbates this risk cumulatively.

Conclusion:

- 1) The DPIE claims that wood smoke is the predominant issue with Muswellbrook air quality is on further analysis an incomplete assessment of contributing factors. The particle characterisation study can therefore not be considered adequate assessment with regards to industrial sources of air pollution around Muswellbrook.
- 2) The DPIE submission that Muswellbrook occasionally has better air quality than Liverpool is an attempt to down-play the level of pollution seen in Muswellbrook compared to most other areas in the state. They have done this with both PM_{2.5} and PM₁₀ pollution recording. They failed to include data on SO₂, which is clearly also reflective of how poor air quality is for Muswellbrook.
- 3) The EPA is in agreeance that conditions of consent and best practice from proponents is not an adequate safeguard against continuing unacceptable air pollution in Muswellbrook and the surrounding residential areas.
- 4) Coal power stations contribution to poor air quality, and the associated health costs (short term and long term) need to be included in cumulative risk assessments for any project in the region. Ambition should be to reduce pollution from it's current levels, rather than minimise any additional health burden.

Further information of the health costs of coal mining to the Upper Hunter can be found here:

https://www.caha.org.au/hunter_coal

<https://www.health.nsw.gov.au/surveys/child/Publications/child-health-survey-07-08.pdf> (Page 136 onwards)

<https://pubmed.ncbi.nlm.nih.gov/33396338/>

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