Load Based Licencing Scheme

While coal mining is listed as an activity under the scheme, it has no "assessable pollutants" listed, so the coal mining industry is getting away with polluting, without penalty, with substances that many other industries must pay for.

- Coal mining is the largest contributor to particulate pollution in NSW, and a significant contributor to NSW's overall load of airborne volatile organic compounds and arsenic.

- It is the biggest contributor to water pollution of arsenic, selenium, Chromium III and a significantly contributor of other water pollution.

- Despite this, there are no "assessable pollutants" listed on the load based licencing scheme schedule for coal mining.

- The pollutants for which coal mining is a major contributor in New South Wales should be listed as assessable pollutants for coal mining: pollution to air by PM_{10}, $PM_{2.5}$, VOCs, arsenic, PAHs and NOX and pollution to water by chromium, selenium, arsenic and lead.

- The Government and the EPA must ensure that by this time next year there is a 50% reduction in human-made sources of particle pollution, which the EPA says is required to ensure Singleton and Muswellbrook meet national clean air standards, even if this means a reduction in coal production.

- The EPA should undertake management of the Hunter Valley as a "critical zone" under the load-based licensing scheme and coordinate of load based licensing of air pollution, salt discharge and other pollutants from coal mining with EPLs, pollution reduction programs and the development consent process to ensure national standards are being met.

- The particulate pollutants of size $PM_{2.5}$ should be included in the load-based licencing scheme and listed as an assessable pollutant for coal mining, petroleum exploration and production and electricity generation.

- The EPA should consider the addition of new metals as assessable pollutants to waters in the load based licencing scheme, particularly aluminum, cobalt and nickel.

- The fees for the load based licencing scheme need to be increased ensuring that they meet two core functions of the scheme, that the cost imposed on pollution is greater than the cost of pollution abatement and that the cost imposed on pollution internalises the cost burden that pollution imposes on the public.

- In the absence of a national economy wide carbon price, the EPA should consider the inclusion of carbon dioxide and methane as assessable pollutants for electricity generation, coal mining and petroleum exploration and production, imposing a per kilogram load-based licence to significant emitters of CO2 and CH4 and setting the fee rate at a level reflective of the social cost of carbon pollution, as well as complementary action to apply load limits on these greenhouse pollutants

The Woolcock Report included the following points:

- all PM, regardless of source, should be considered detrimental to health;
- the evidence that coal dust in ambient air is associated with specific health effects in coal mining communities is inconclusive. There is presently limited evidence that in a community setting (that is, non-occupational exposure), that coal dust is more hazardous to health than PM from other sources;
- there is considerably more evidence of health effects linked to exposure to PM from combustion-related emissions (coal-fired power stations, on-road vehicles, diesel exhaust)
- From this review of the evidence, we are highly confident that:
- increases in ambient PM2.5 and PM10 mass are associated with increases in mortality and, increases in cardiovascular and respiratory morbidity;
- exposure to PM from combustion-related sources (coal-fired power stations, on-road vehicles, diesel exhaust) is associated with impacts on cardiovascular and respiratory health.
- Long-term exposure to ambient PM contributes to the initiation and progression of disease over months or years.

Table 4.1 Health effects attributed to exposure to ambient PM

Long-term (months or years) PM exposure	Short-term (daily) PM exposure
All cause (non-accidental) mortality	*All cause (non-accidental) mortality*
Cardiovascular	*Cardiovascular*
Cardiovascular-related mortality	Cardiovascular-related mortality
Atherosclerosis	Ischaemic heart disease
Ischaemic heart disease	Ischaemic stroke
Complications of diabetes	Myocardial infarction
	Congestive heart failure
Respiratory	*Respiratory*
Respiratory-related mortality	Respiratory-related mortality
Asthma symptoms	Asthma symptoms
Reduced lung function in children	Respiratory infections
Reduced lung function in susceptible adults (elderly, people with COPD or asthma)	Bronchitis in children
	COPD symptoms
Respiratory infections in children	
Cancer	
Lung cancer mortality	
Neurological	
Neurological disorders in adults	
Impaired cognitive function	
Development	
Lung development	
Neurological development in children	
Reproduction	
Adverse birth outcomes	
Sperm quality and quantity	
Allergies	*Allergies*
Exacerbation of allergies	Exacerbation of allergies
Allergic sensitization	

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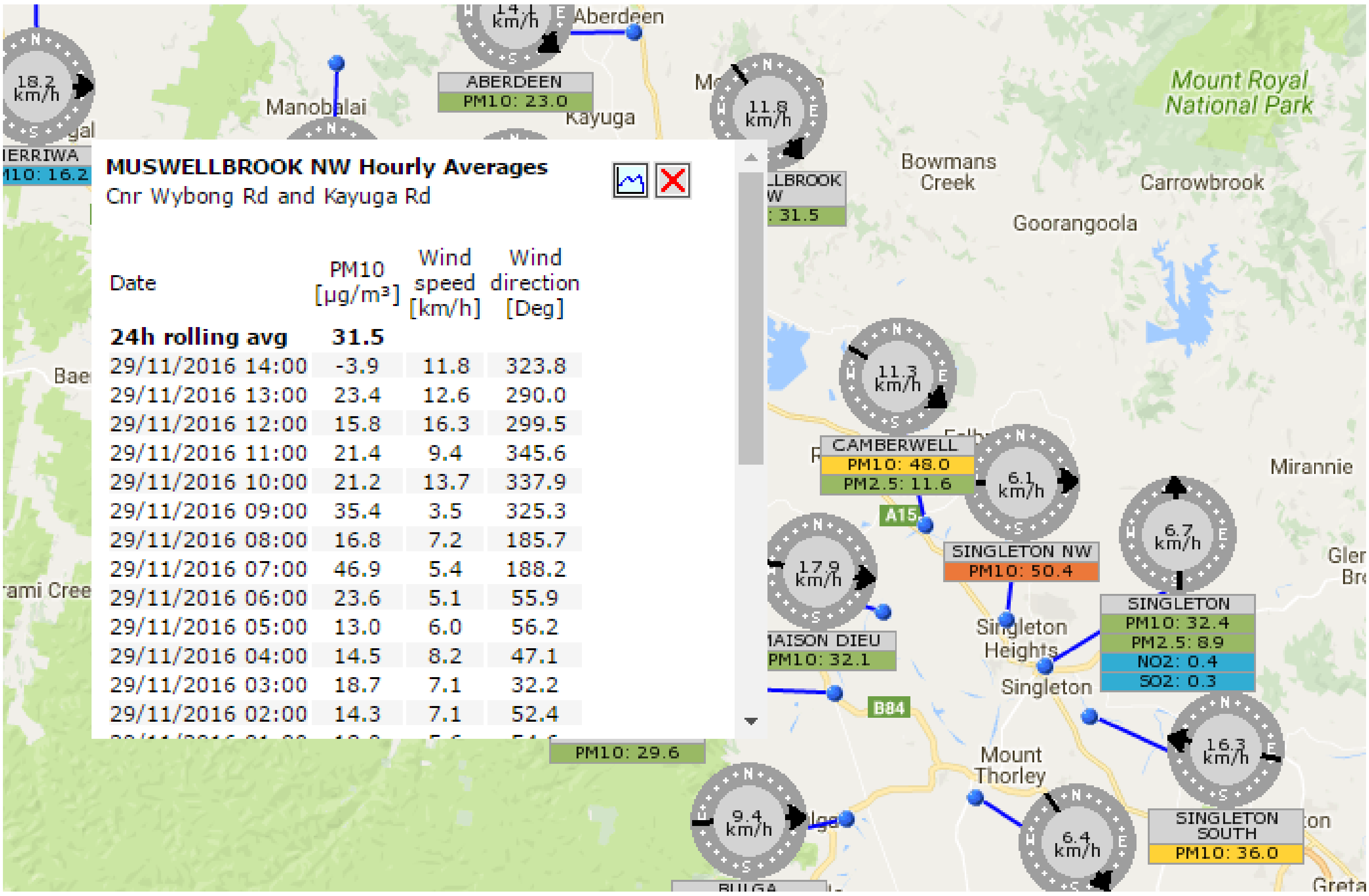
- Communities near to coal mining operations can be exposed to increased dust levels. A study conducted in the UK reported that PM10 levels in communities near to open-cut coal mines were, on average, 14% higher than in communities further from the mines (Pless-Mulloli et al. 2000). Mineral identification confirmed that the coal mines contributed to the increased PM10 load in the UK communities. However, coal dust was not specifically identified as a component of PM10 in the surrounding communities. Mineral matter from an open-cut coal mine in Wales has been found in airborne particles over a mile from the mine, supporting the view that exposure to coal dust extends well beyond mine boundaries (Jones et al. 2002). Coal transportation can be a significant source of coal dust. A study of PM emissions in a valley in India with three open-cut coal mines found that transportation of coal was the main source of suspended PM (Chaulya 2004). Mineral analysis of the suspended PM estimated that 78% of the dust in the valley was of coal origin. A study conducted in a rural community in the US, through which mined coal was regularly transported by truck, found that people who lived beside the road used for coal transport were exposed to coal dust (Aneja et al. 2012).
- In the NSW EPA Air Emissions Inventory 2008, *mining for coal* was the greatest source of both PM10 (42.5%) and PM2.5 (22.6%) in the GMR (NSW EPA 2012a). Sources of emissions covered under the *mining for coal* category in the emissions inventory include: coal extraction activities (*e.g*. blasting, drilling, crushing *etc.*), wind erosion of coal and overburden, loading trains, dumping coal and overburden and, wheel generated dust from paved and unpaved roads.
- The highest concentration of open-cut coal mines in NSW is in the Hunter Valley region. Open-cut mines, as opposed to underground mines, have a higher propensity to emit coal dust into the atmosphere since the coal is exposed to the open-air environment and blasting is used to remove the overburden (Lockwood et al. 2009).
- The current NEPM goal of not having more than five days per year above the PM10 24-hour average standard was not met in the Upper Hunter Valley in 2012 despite this goal being met in urban and regional sites throughout NSW in that same year (NSW EPA 2013b). The annual average PM2.5 concentration in the Upper Hunter Valley did not meet the NEPM advisory reporting standard (8 µg/m3) in 2011 and 2012 (NSW EPA 2013b). Monitoring of PM10 close to coal mining activities (*diagnostic sites3*) in the Hunter Valley clearly indicates that coal mining contributes significantly to ambient PM levels in the region (NSW EPA 2013a)
- No Australian studies have specifically examined the health effect of non-occupational exposures to coal dust.

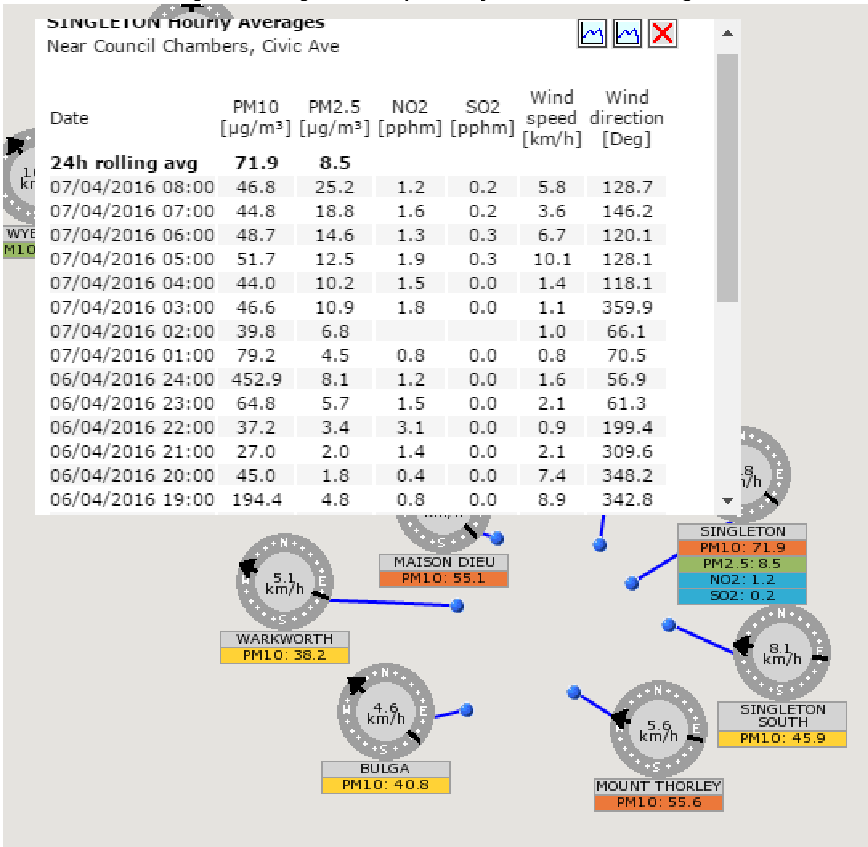
  Where increased rates of respiratory disease were detected, the Report cites "other factors" as possible contributors. Thus, the Report notes; "*there is no direct research evidence available on coal related disease clusters in the Hunter Region and the evidence from analyses of routine monitoring data shows variable and inconclusive results*" (Colagiuri et al. 2012*). It could be cynically noted that this is a Government commissioned report and, that when specific studies of health effects in pockets surrounded by mines are proposed they are refused on the basis of "insufficient population to provide statistically robust data" Common-sense would dictate that communities surrounded by several huge open-cut mines are obviously subject to more exposure and detrimental effects of coal-mining. Additionally they are exposed to significant ambient PM from the 24 hour daily operation of huge diesel machines.*

- Sources of non-road diesel exhaust emissions that make significant contributions to ambient PM include: railway locomotives, shipping and, stationary diesel engines and non-road vehicles in the mining, industrial, construction and agricultural sectors. In Australia, it has been estimated that greater than 87% of annual PM emissions from non-road diesel engines occur in the mining, construction and agricultural sectors (ENVIRON Australia 2010).

The Upper Hunter Air Quality Monitoring Network is set up to monitor levels of airborne pollutants in densely mined areas. Whilst this is an initiative to be supported there are occasions when it reports negative numbers indicating a need for more maintenance and rigorous calibration. E.G.



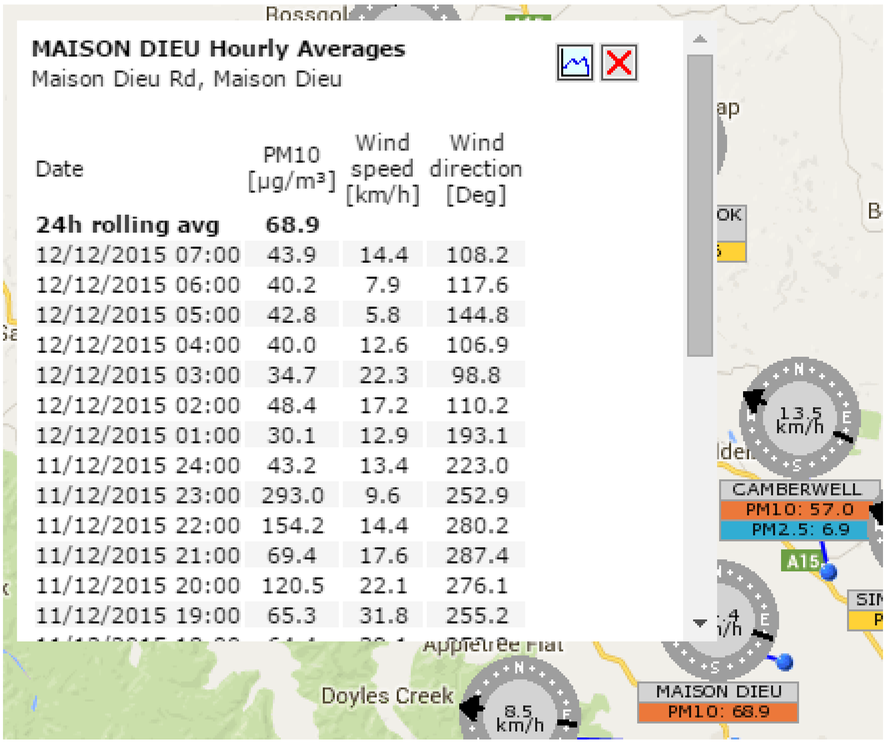
24 hour rolling averages frequently exceed 50 ug/m^2



SINGLETON Hourly Averages
Near Council Chambers, Civic Ave

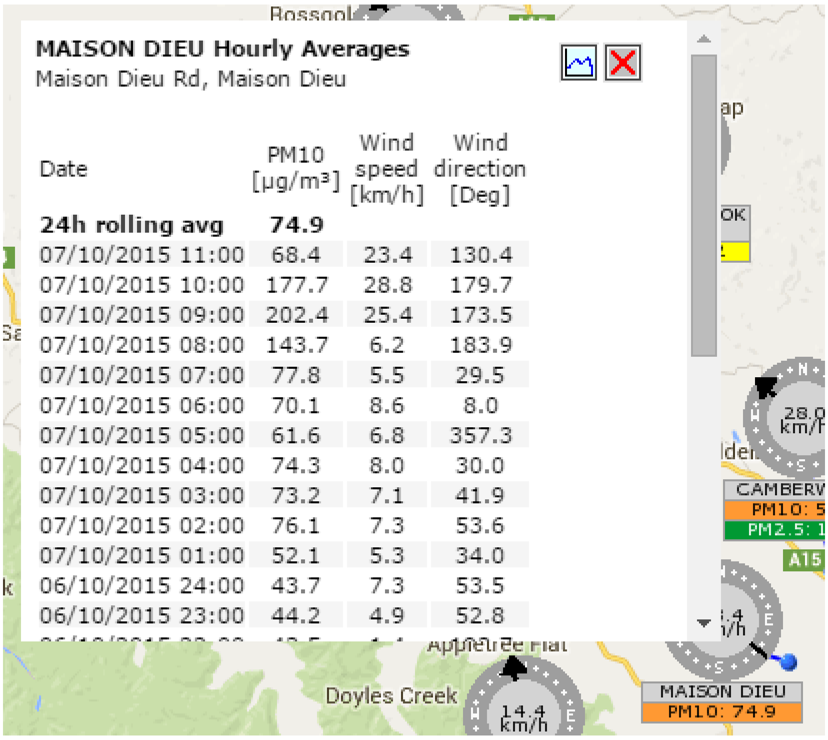
Date	PM10 [µg/m³]	PM2.5 [µg/m³]	NO2 [pphm]	SO2 [pphm]	Wind speed [km/h]	Wind direction [Deg]
24h rolling avg	**71.9**	**8.5**				
07/04/2016 08:00	46.8	25.2	1.2	0.2	5.8	128.7
07/04/2016 07:00	44.8	18.8	1.6	0.2	3.6	146.2
07/04/2016 06:00	48.7	14.6	1.3	0.3	6.7	120.1
07/04/2016 05:00	51.7	12.5	1.9	0.3	10.1	128.1
07/04/2016 04:00	44.0	10.2	1.5	0.0	1.4	118.1
07/04/2016 03:00	46.6	10.9	1.8	0.0	1.1	359.9
07/04/2016 02:00	39.8	6.8			1.0	66.1
07/04/2016 01:00	79.2	4.5	0.8	0.0	0.8	70.5
06/04/2016 24:00	452.9	8.1	1.2	0.0	1.6	56.9
06/04/2016 23:00	64.8	5.7	1.5	0.0	2.1	61.3
06/04/2016 22:00	37.2	3.4	3.1	0.0	0.9	199.4
06/04/2016 21:00	27.0	2.0	1.4	0.0	2.1	309.6
06/04/2016 20:00	45.0	1.8	0.4	0.0	7.4	348.2
06/04/2016 19:00	194.4	4.8	0.8	0.0	8.9	342.8

and hourly averages frequently exceed 100.



MAISON DIEU Hourly Averages
Maison Dieu Rd, Maison Dieu

Date	PM10 [µg/m³]	Wind speed [km/h]	Wind direction [Deg]
24h rolling avg	**68.9**		
12/12/2015 07:00	43.9	14.4	108.2
12/12/2015 06:00	40.2	7.9	117.6
12/12/2015 05:00	42.8	5.8	144.8
12/12/2015 04:00	40.0	12.6	106.9
12/12/2015 03:00	34.7	22.3	98.8
12/12/2015 02:00	48.4	17.2	110.2
12/12/2015 01:00	30.1	12.9	193.1
11/12/2015 24:00	43.2	13.4	223.0
11/12/2015 23:00	293.0	9.6	252.9
11/12/2015 22:00	154.2	14.4	280.2
11/12/2015 21:00	69.4	17.6	287.4
11/12/2015 20:00	120.5	22.1	276.1
11/12/2015 19:00	65.3	31.8	255.2



MAISON DIEU Hourly Averages
Maison Dieu Rd, Maison Dieu

Date	PM10 [µg/m³]	Wind speed [km/h]	Wind direction [Deg]
24h rolling avg	**74.9**		
07/10/2015 11:00	68.4	23.4	130.4
07/10/2015 10:00	177.7	28.8	179.7
07/10/2015 09:00	202.4	25.4	173.5
07/10/2015 08:00	143.7	6.2	183.9
07/10/2015 07:00	77.8	5.5	29.5
07/10/2015 06:00	70.1	8.6	8.0
07/10/2015 05:00	61.6	6.8	357.3
07/10/2015 04:00	74.3	8.0	30.0
07/10/2015 03:00	73.2	7.1	41.9
07/10/2015 02:00	76.1	7.3	53.6
07/10/2015 01:00	52.1	5.3	34.0
06/10/2015 24:00	43.7	7.3	53.5
06/10/2015 23:00	44.2	4.9	52.8

Thus, the UHAQMN shows that communities surrounded by mines are significantly impacted by particle pollution from coal-mining.

It is essential that coal pollutants and coal mines are included in the Load Based Licensing scheme.

Judith Leslie

[redacted] [redacted] [redacted] [redacted]