Lynette L. MacBain

Senate Inquiry "The impacts on health of air quality in Australia"

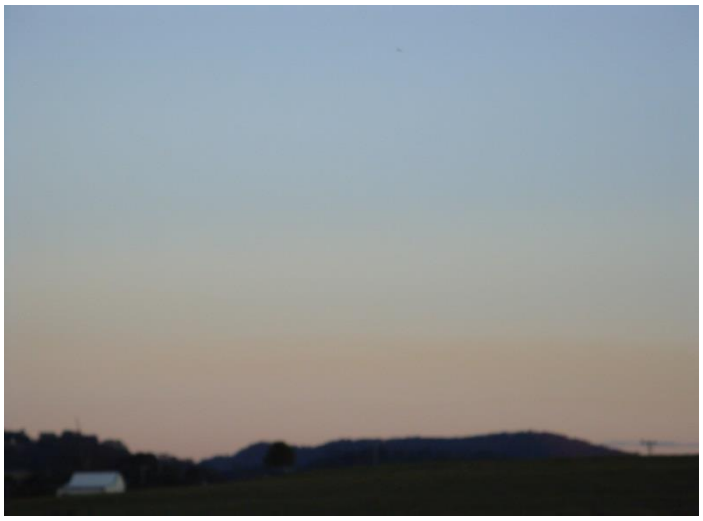
Thank you for the opportunity to make comment.

I and others have for many years, attempted to raise awareness of the full extent of cumulative effects of various industries and more to the mining and power industries influence on the health of air quality in Singleton, the Upper Hunter and the wider Hunter Valley.

This is not a blast it is just rising from a mine site and please note the colour of skyline behind the power station.

I believe that there is sufficient evidence that confirms this issue is a major concern for the residents of this area; they have struggled to have their voice heard. It is only in more recent times that public pressure has some authorities starting to listen but it needs a holistic government approach. Air quality impacts require more controls and legislative standards which meet World Health recommendations, support human rights and protect Australians. The health of our Air should not be deemed any less important than any other life sustaining entity.

Communities under pressure of industrial impacts and expansion cannot fight Multi Nationals and certainly the mining industries huge financial resources and benefits to the State and Federal government coffers strongly influence the contestation. Many in the community feel that their health and in fact their lives and that of their families are being put at risk and their inherent right to be protected by all levels of Government is diminished under the catch cry of 'the overall benefit'. It is short sighted to think that these impacts will not have an adverse, economic effect in the future.



Singleton Images depicting air quality issues

There are at least 42 known pollutants in the air shed of our area as identified on the National Pollution Inventory and the quantities of each will only keep rising with continued expansion of open cut mining and other industries. Looking at the post codes of both Singleton Shire 2330 and Muswellbrook Shire 2333 gives insight into what is going into the air shed. [1] We are experiencing high levels of emissions compared to other areas. Through publicity and public pressure an air quality monitoring network has been established in the Upper Hunter. It is a data collection model and its relevance to health in the short term is questioned by some. All monitoring stations report on particles as PM_{10} (particles with a diameter of 10 micrometres (μm) or smaller), wind speed and wind direction. Three of these stations (Muswellbrook, Singleton and Camberwell) also report on particles 2.5 μm or smaller ($PM_{2.5}$) and some also measure sulphur dioxide (SO_2) and oxides of nitrogen (NO_x). It could have the potential to alert residents to emanating health impacts if exceedences were reported in real time and not averaged over a 24hr period. The data could assist residents especially those greatly compromised by not only the long term effect but the immediate and short term exposures. [2]

Camberwell Village and Ashton Mine

The NEPM standards are supposed to give confidence but they are so often used inconsistently as the basis for the regulation of industry. Is NEPM 'the standard' or is it still a draft Standard? Let me tell you there is so much confusion surrounding it that its desired affect is compromised.

The voice of the NSW Department of Health is struggling to be heard against the dollars of industry, the Department's submission into Ashton South East Open Cut coal mine development gives reason why there should be no more open cut mines allowed until there are closures of existing mining areas. I believe NSW Department of Health's opinion has similarly been expressed on other mining industry application before NSW Planning but to no avail. Mines are too close to residential populations, the closest mine to the town of Singleton is less than 2.5kms.

When things go wrong at the closest mine to Singleton and the irony of the sign on the access road

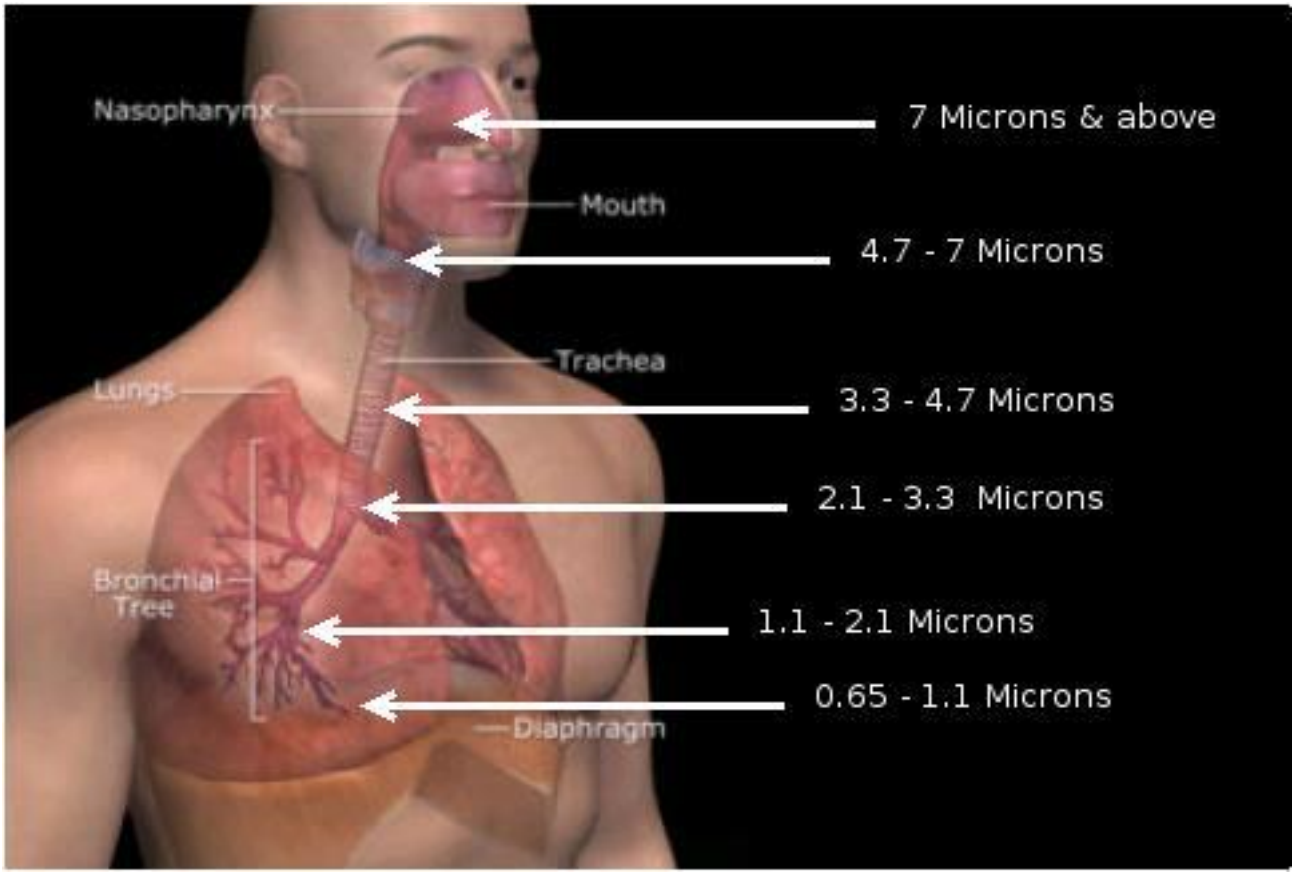
There is a simple solution to mitigate some of these effects now! A moratorium on further expansion of the open cut mining industry in our area and return to underground mining; no doubt this will be met with complete opposition from the mining industry because it would reduce their profits but continue at this pace, exposing more land, more blasting, using more diesel and what the cost to our air, health and the environment.

This picture I believe is from a mine less than 13klms from Singleton

While not discounting nor diminishing my real concern about the cumulative effects of the other various harmful emissions, I would draw your attention to the health effects and potential synergistic effects of Diesel Fuel emissions. Diesel fuel emissions are an acknowledged carcinogen and health risk. Health studies reveal that those working closely and in close quarters are at imminent risk but the risk extends to the general population when particulate concentrations become atmospheric.

In June 2012 the World Health Organization bought down a finding that “Diesel exhaust fumes are 'major cancer risk' and as deadly as asbestos and mustard gas” [1]. It is my understanding that the main particulate fraction of diesel exhaust consists of fine particles. Their small size may easily penetrate deep into the lungs. The jagged surfaces of these particles makes it easy for them to bind with other toxins in the environment creating a synergistic effect, thus increasing the hazards of particle inhalation.

The fine particles [PM1] penetrate deep into the lungs but particles less PM10 still have potential harmful effects.



It is acknowledged that “exposures have been linked with acute short term symptoms such as headache, dizziness, light-headedness, nausea, coughing, difficult or labored breathing, tightness of chest, and irritation of the eyes and nose and throat. Long-term exposures can lead to chronic, more serious health problems such as cardiovascular disease, cardiopulmonary disease, and lung cancer.” [3]

Despite Diesel being raised by residents as a real issue of concern for many years and here in an area of known air quality issues, temperature inversions and other environmental factors; Governments are continuing to allowing industry expansion which rely on huge resources of diesel fuel in off road vehicles and plant without stringent standards and monitoring to protect health of humans and the environment.

There has been no completed investigation into the amount diesel fuel used in our area and the emissions generated nor the synergistic effect with other known emissions; there is however plenty of evidence worldwide of the health impacts and the stringent standards that must apply in the use of diesel fuels or derivatives.

Off road vehicle emissions are not covered by the same standard as on road vehicles, I do not believe a standard exists at all after trying to research the standards. I have been told that there are different fuels used for mining equipment. Without standards, fuel is more likely to be less 'clean' and cheaper and produce more emissions.

It is not only off road plant that is impacting, it is trains the majority uncovered coal trains; with increased potential of a train every 8-10 minutes though our community is of further concern. While there are standards for on- road diesel fuelled vehicles the volume traversing daily throughout our community adds to the cumulative effect of emissions and all modes are on the increase with projected expansion.

It has been difficult to acquire specific information that tells just how much Diesel Fuel is used off road but if I can quantify it by saying one mine in our area is using at least 56,000 liters of diesel per day. That's 392,000 liters per week and 20,384,000 per annum and this is from a mine less than 2.5 kilometers from Singleton residents; multiply that conservative estimate by the number of mines in the area and at the very least it has to be conceded that the diesel emission impact is influencing our air quality.

Another unknown is the amount of diesel and chemicals used in Agriculture and Viticulture and the potential for adhesion to the generated 'dust' particles and at the School of infantry site; what is the amount of diesel and blasting emissions derived from exercises and companies such as Orica testing explosives on site.

The question is " are we different from other areas arises;

The answer is a resounding yes!

Our health must be compromised when our airshed is compared to a person living in an area without the emissions and cumulative effects and not limited to from the following

- Three Power Stations
- Over 19 mines
- Agriculture and Viticulture
- School of Infantry
- 42 known pollutants in the air shed
- Undeterminable acreage of exposed and derogated land
- Extremely higher proportions of Diesel fueled plant, vehicles and trains trans versing the area daily.
- High proportion of days with temperature inversions.
- The anomalies of the Hunter Valley environment

All of the above play a part in determining the air quality of our shire. I am an Asthmatic, I am not alone in my community, many people I know suffer from respiratory complaints and other illness'. I control my asthma by medication and lifestyle changes depending on environment and weather conditions. Should I have to spend my days inside because the air quality impacts won't allow me to venture out? Does anyone else see the absurdity in me being advised by the Department of Health 'Mine Dust and You' to stay indoors with an air condition on, when that requires electricity and electricity is fueled by coal.[4] Why should I and others have the burden of electricity cost on top of what we already contribute. Enough is Enough!

Community antidotal information compels me to put pen to paper and implore you to look at our areas with sincere scrutiny. Apart from respiratory issues many believe we have high incidents of other illness' and disease although confirmation of this we are told requires years and years of data collection and investigation to determine if true, too late for some.

This brings me to plea to the Senate Inquiry to visit Singleton so you can

- See firsthand the devastating effects to the once great food producing region and the impacts on community and individuals.
- Hear firsthand the concerns and dilemmas of residents.
- Give some confidence to our community that concerns are being listened to.

The cumulative impact of emissions is visible in our sky, in our workplaces and on every exposed surface of our homes and property. We hear residents cough, wheeze and clear their throats, NSW Planning Compliance Officers are continue to identify non-compliance and exceedences. The plumes of blasting still rise into the skies, the power stations still emit and all other impacts remain. Our daily lives are impacted by the lack of a healthy air quality and a compelling history and evidence alone should be enough to warrant a visit to the Singleton Shire.

Sincerely Lyn MacBain

Further Information

[1] National Polution Inventory

http://www.npi.gov.au/

[2] Upper Hunter Air Quality Network

http://www.environment.nsw.gov.au/aqms/uhaqmnfaq.htm

[3]

World Health Organization Says Diesel Exhaust Causes Cancer

Article date: June 15, 2012

By Stacy Simon

A group of experts from the World Health Organization (WHO) has classified diesel engine exhaust as a carcinogen – a substance that causes cancer. The International Agency for Research on Cancer (IARC), which is part of the WHO, based its decision on what it calls “sufficient evidence” that exposure to diesel exhaust causes lung cancer and “limited evidence” that it increases the risk of bladder cancer. The new classification moves diesel fuel from the category of “probably carcinogenic” to “carcinogenic.”

Studies have raised concerns over the years about the connection between diesel exhaust and cancer in workers with heavy exposure to exhaust from diesel engines. Men with the heaviest and most prolonged exposures, such as railroad workers, heavy equipment operators, miners, and truck drivers, have been found to have higher lung cancer death rates than unexposed workers. For example, in March 2012, the National Cancer Institute and National Institute for Occupational Safety and Health published results of a large study that showed an increased risk of death from lung cancer in underground miners exposed to diesel exhaust.

People can also be exposed to diesel exhaust in areas where they live and play, although typically at lower levels than in the workplace. Exposures are highest where diesel traffic is heaviest, such as along major highways and in cities. Large engines, including those used in many trucks, buses, trains, construction and farm equipment, generators, ships, and in some cars, run on diesel fuel.

The United States and other developed countries have responded to environmental and health concerns over diesel and gasoline exhaust by tightening emission standards. For example, changes in requirements for diesel engines have led to designs that burn fuel more efficiently, decrease the sulfur content, and reduce emissions. In less developed countries, however, regulations are less strict or don’t exist.

Dr. Christopher Wild, Director, IARC, said “Today’s conclusion sends a strong signal that public health action is warranted. This emphasis is needed globally, including among the more vulnerable populations in developing countries where new technology and protective measures may otherwise take many years to be adopted.”

Read more: http://www.dailymail.co.uk/health/article-2158574/Diesel-engine-exhaust-fumes-major-cancer-risk.html#ixzz2NkRjz7Wt

[4]

Factsheet

Mine dust and you

People living near mine sites often ask about the effects of dust emissions in the air as a result of mining activities.

Last updated: 13 July 2010

What is this fact sheet?

People living near mine sites often ask about the effects of dust emissions in the air as a result of mining activities. This fact sheet has been prepared to explain the type of dust that is generated from mine sites and the potential risks from mine dust to health.

What is particulate matter?

Commonly called "dust," scientists and regulators refer to the term particulate matter (or PM) to describe the range of particles that exists in the air we breathe.

PM exists naturally in the atmosphere, eg sea-salt spray and pollens. PM can be increased due to human activities such as vehicle exhaust, industrial processes, power stations, mining, farming and wood heaters, or smoke from bushfires.

Exposure to PM can be associated with health and amenity impacts. The likely risk of these impacts depends on a range of factors including the size, structure and composition of the PM and the general health of the person.

Sizes of particulate matter

Just as the size of balls we can see ranges from marbles to basketballs, PM can be thought of as microscopic balls of varying sizes. Instead of measuring PM in centimetres as we do with balls, scientists use micrometres (sometimes called "microns") to measure the diameter of particles. A micrometre is one-millionth of a metre and its symbol is μm.

For environmental health purposes, particles are usually described by their size:

Particle size	Description
TSP	Total Suspended Particulate Matter (TSP) refers to the total of all particles suspended in the air. Even the largest of these particles is barely half the width of a human hair.
“larger than” PM10	A subset of TSP, and refers to all particles of size 10 μm in diameter and greater.
PM10	Also a subset of TSP, and includes all particles smaller than 10 μm in diameter (smaller than 1/7th of a hair width). Particles in the size range 2.5 μm to 10 μm in diameter are referred to as **coarse particles** (PM 2.5-10).
PM2.5	A subset of both PM10 and TSP categories and refers to all particles less than 2.5μm in diameter. PM2.5 is referred to as *fine particles* and is mainly produced from combustion processes such as vehicle exhaust.

Particles levels in air are measured by the weight (micrograms) of particles per cubic metre of air (μg/m3). One (μg/m3) equals one millionth of a gram in a cubic metre of air. TSP can also be measured as the weight of dust falling on a given area over time ("dust deposition").

Particulate matter from mining

The vast majority of dust from mining activities consists of coarse particles (around 40 per cent) and particles larger than PM10, generated from natural activities such mechanical disturbance of rock and soil materials by dragline or shovel, bulldozing, blasting, and vehicles on dirt roads. Particles are also generated when wind blows over bare ground and different types of stockpiles. These larger particles can have amenity impacts as well as health impacts.

Fine particles from vehicle exhausts and mobile equipment are also produced at mine sites, though they only account for about 5 per cent of the particles emitted during the mining process. Fine particles produced at mine sites are manly from

vehicle and mobile equipment exhausts.

Potential health impacts from PM

The human body's respiratory system has a number of defence mechanisms to protect against the harmful effects of PM. PM is often trapped in sticky mucus on the walls of the airways and can be removed by cilia, small hair-like objects which line the surface of the airways. This mucus can then be swallowed or coughed up.

PM exposure can leas to a variety of health effects. For example, numerous studies link particle levels to increased hospital admissions and emergency room visits and even to death from heart or lung diseases. Both long (over years) and short term (hours or days) particle exposure have been linked to health problems.

Generally, it is thought that fine particles below 2.5 μm in diameter may be of a greater health concern than larger particles as they can reach the air sacs deep in the lungs. However, coarse particles (PM 2.5-10) could also be associated with adverse health effects.

People who may be more susceptible to the health effects of fine and coarse particles are:

- infants, children and adolescents
- elderly
- people with respiratory conditions such as asthma, bronchitis and emphysema
- people with heart disease
- people with diabetes.

If health effects arise from exposure to coarse particles, such as from mining activities, the symptoms are likely to be:

- cough
- wheeze, or worsening of asthma
- increased need for medications (eg: puffers, antibiotics)
- increased breathlessness.

Some recent research suggests that heart problems, such as angina and heart attacks may also be associated whith coarse particle pollution.
High levels of TSP may also cause coughing, sneezing or sore eyes.

Potential amenity impacts

Amenity impacts from dust are usually associated with coarse particles and particles larger than PM10. The impact of dust from a nearby mine on local amenity depends on the distance from the mine site and climatic conditions such as wind.

Concerns about amenity from mine site dust often relate to "visibility" of dust plumes and dust sources. Visible dust is usually due to short-term episodes of high emissions, such as from blasting.

Other amenity impacts include dust depositing on fabrics (such as washing) or on house roofs, and the transport of dust from roofs to water tanks, during rain. NSW Health's Rainwater Tanks brochure provides advice on how to maintain water tanks for safe drinking. Strategies to reduce dust in water tanks include first flush devices and desludging.

Government Regulations

In New South Wales, outdoor air quality is governed by both State and Commonwealth regulations. The National Environmental Protection Measure (Air NEPM) provides air quality standards that are applied in cities and large towns across Australia. NEPM standards apply to average concentrations across a region.

The NSW Department of Environment Climate Change and Water (NSW DECCW) also has regulatory criteria for assessing ambient air quality. Although consistent with the Air NEPM, these criteria are more comprehensive. NSW DECCW Impact Assessment Criteria are used to assess PM in localised areas, close to the mine itself.

The standards imposed by the regulatory authorities take into account what we know about health effects on people with asthma, lung conditions, and heart disease. PM standards and criteria are set to control short (daily) and long term (average) levels. The table below summarises the relevant air quality standards and criteria for mines.

Table 1 Air Quality Standards and Criteria for Particulate Matter

Pollutant	Averaging Period	Concentration Standard

		μg/m3	Agency
TSP	Annual	90	NSW DECCW Impact Assessment Criterion
PM10	1 day (24 hr)	50	NSW DECCW (NEPM allows exceedance 5 times/year)
	Annual	30	NSW DECCW
PM2.5	1 day (24 hr)	25	NEPM advisory standard
	Annual	8	NEPM advisory standard
Dust deposition	Annual (total)	4 grams/m2/month	NSW DECCW
	Annual (increase)	2 grams/m2/month	NSW DECCW

How can you avoid mine dust?

Provided that mines are operated with proper dust controls it is unlikely that healthy adult residents would suffer any serious health effects from the expected exposure to partiucate matter.

If you notice that dust levels are high, try to keep your windows and doors closed. People who have asthma or lung conditions should avoid outdoor activities at these times. An air-conditioner can reduce PM levels inside, but it is important to regularly clean the intake filter.

Residents experiencing the health symptoms outlined in this fact sheet should see their local doctor. For futher information about potential health effects from PM see the related link on Air Pollution.

Related links

- Air Pollution http://www.health.nsw.gov.au/PublicHealth/environment/air/air_pollution.asp
- More on air quality http://www.health.nsw.gov.au/publichealth/environment/air/index.asp
- Air quality index fact sheet http://www.health.nsw.gov.au/factsheets/environmental/air_quality.html
- Bushfire smoke fact sheet http://www.health.nsw.gov.au/factsheets/environmental/bushfire.html
- Dust storms fact sheet http://www.health.nsw.gov.au/factsheets/environmental/dust_storms.html
- Rainwater tanks brochure http://www.health.nsw.gov.au/pubs/2007/rainwater_tanks.html