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Submission: Inquiry into the impacts of air quality on health

Thank you for undertaking this important inquiry into the impacts of air quality on health. I hold grave concerns for the health of my family and the nearby community who live in close proximity to large coal producers in the Central Queensland area. Worldwide there is much evidence of the long-term dangers of exposure to ultra-fine dust particles released by coal production, but unfortunately no Australian authority is prepared to take the matter seriously. I sincerely hope the Committee will be responsible for positive steps to clean up the industry and provide a safe environment for adjacent landholders and communities.

The terms of reference are broad, and there are many aspects of air quality that impact on human health. The focus in this submission will be on particulate pollution from coal mining, transport and handling activities. There is also, however, genuine concern about the health impacts of other air pollutants, including nitrous oxide, which occurs during coal mine blasting, and particulate and other pollution from coal fired power stations.

Introduction

There has been little research in Australia that has quantified the impact of coal mining, transport, handling and burning on human health. More broadly, there are no Australian studies on the long-term health impacts of air pollution. Research from other countries indicates that it may be significant, and people and health professionals living in coal-affected communities are increasingly voicing their stories about the impact of coal on their lives. In the absence of specific and targeted research, and of health considerations having statutory standing in the development approval processes for coal mines, rail lines and export terminals, communities are funding their own investigations, and anecdotal evidence is driving doctors and even government health agencies, to engage in advocacy against new coal projects.

Many communities in several locations in NSW and Queensland that are funding and designing their own studies into the health effects of coal dust and its small particulate pollution because of a systemic failure of legislation, regulation, processes and Government agencies to address these issues.

Such studies are being undertaken or planned in Newcastle, Gloucester and Maules Creek in NSW, and communities in the Bowen Basin and Mackay in Queensland have expressed interest in launching similar work, due to the failure of Governments to do so.

The impacts of particulate pollution from coal mining and handling are localised to the communities that live alongside the industry, and little known in capital cities – with the exception of Brisbane. For that reason, and because hearing stories, and witnessing the extent of particulate pollution from coal will help inform the Committee – many of whom may not be familiar with coal operations – understand the impact this problem is having on human health in affected regions.

This submission outlines observations of the impact of coal dust on health in coal affected communities, and the standard of monitoring and enforcement of existing air quality policies in NSW and Queensland.

Summary of recommendations

- That the committee travel to coal-affected regions, particularly the Hunter Valley and Bowen Basin, where there is a high concentration of very large open-cut coal mines, and significant anecdotal evidence of the impact of particulate pollution on nearby communities.
- That the committee recommends immediate independent monitoring and reporting of all coal handling facilities to determine the level of ultra fine dust particulates leaving the site and potentially causing long-term harm to nearby communities who are unaware of the hazards of these ultra fine dust particles.
- That the Committee examine pollution data from the following sources: open cut coal mines in the Hunter Valley, NSW; open cut coal mines in the Bowen Basin, Queensland; Bayswater, Lidell, and Eraring power stations in NSW; Collinsville and Gladstone power stations in Queensland; Hazelwood and Loy Yang power stations in Victoria.
- That the Committee examine the quantity of particulate, nitrous oxide and other air pollutants released by open-cut coal mines and coal-fired power stations in the Hunter Valley and Lake Macquarie in NSW, the La Trobe Valley in Victoria and the Bowen Basin in Queensland and seek advice from regional medical practitioners, and experts in the field on the impact this pollution is having on the health of surrounding communities.
- That the committee travel to coal-affected regions, particularly the Hunter Valley and Bowen Basin, where there is a high concentration of very large open-cut coal mines, and significant anecdotal evidence of the impact of particulate pollution on nearby communities.
- That the inquiry particularly visit the communities of Camberwell, Warkworth, Jerry's Plains, and Newcastle (particularly the suburbs of Mayfield, Carrington and Stockton) in NSW, and Collinsville, Moranbah, Dysart, Blackwater, Acland and Louisa Creek in Queensland to hold hearings and gather testimony about the impact of particulate pollution.

- That the approvals processes for all proposed open cut coal mines within 8km of a dwelling be suspended pending the outcome of the inquiry and full investigation by State and Federal authorities of the health impacts of coal production and handling.

- The Federal Government should develop a comprehensive set of national standards on air quality and incorporate them into the *Environment Protection Biodiversity Conservation Act 1999* or another piece of legislation. The standards should be binding on States and provide the Federal Government with a compliance role in enforcing them.

- The Committee should investigate the lack of transparency, consistency and precaution in the Queensland system for establishing, reporting and enforcing conditions and standards for particulate pollution in Environmental Authorities for open cut coal mines.

- That a national standard for $PM_{2.5}$ be adopted of 24 hour average concentration of 25μgm^3.

- That the Committee seek information from the Queensland Department of Environment and Heritage Protection and Department of Natural Resources and Mines, and from coal companies operating in the Bowen Basin to determine the degree of compliance with Environmental Authorities and enforcement of conditions by government agencies. We believe this information should be made more accessible to the public.

Sources and effects of particulate matter

For the effects of particulate pollution, Kolbe and Gilchrist undertook a literature review for the Riverina Air Quality group in 2011, which summarised research into the health effects of particulate pollution. They found that "While early studies focused on the acute respiratory effects, more recent studies have examined the long term and chronic effects of air pollution on the cardiovascular and respiratory systems. An increasing body of evidence suggests that air pollution also has an adverse effect on pregnancy outcomes." More than one study reviewed by Kolbe and Gilchrist concluded that there is a causal link between exposure to $PM_{2.5}$ and cardiovascular morbidity and mortality.

They also concluded that there is no identified effect threshold for particulate pollution: health effects are considered to be a function of both duration and intensity of exposure.[1]

It seems very likely that the duration and intensity of exposure to particulate pollution is uneven, but that there is little data on the health impacts that exposure to continual, repeated and high levels of particulate pollution has had on communities living close to coal mining, transport and handling facilities.

Some of these communities live not only with coal mining, but with coal fired power stations in close proximity. Burning coal for heat or power is known to be a chief source of particulate pollution, and the particulate pollution from these facilities poses a compounded health risk for surrounding residents as it can also contain selenium, mercury and other metals. A report by Physicians for Social

[1] Kolbe and Gilchrist (2011).

Responsibility on *Coal's Assault on Human Health* outlines the health impacts that have been associated with the air pollutants produced by coal-fired power stations. In addition to the well-known respiratory illness, they write that "Recent research suggests that nitrogen oxides and Pm2.5, along with other pollutants, are associated with hospital admissions for potentially fatal cardiac rhythm disturbances. The concentration of Pm2.5 in ambient air also increases the probability of hospital admission for acute myocardial infarction"[2]

In 2010, the CSRIO undertook work examining the selenium, lead, molybdenum, nickel and mercury content of Australian exported thermal coal, but it does not appear that action was taken to study the effects of burning this coal in Australia, or if there is any release of these substances from the mining and handling of the coal before it is exported. The National Pollution Inventory reveals that coal mines are also releasing selenium and its compounds into the air and sometimes water in their vicinity. As for other pollutants, the quantity of selenium being released by coal mines varies hugely. The NPI reveals that in 2011, the Newlands, Coppabella, Ravensworth and Collinsville mines all released more than 50kg of selenium. For mercury, nine of the top ten highest mercury-polluting coal mines are in Queensland's Bowen Basin. The top ten, according to the NPI, are The Dawson Mines (Moura, Qld), Goonyella Riverside Broadmeadow (Moranbah, Qld), Foxleigh (Middlemount, Qld), Hunter Valley Operations (Singleton, NSW), Ensham (Emerald, Qld), Blackwater (Blackwater, Qld). Peak Downs (Moranbah, Qld), German Creek Coal Mine (Middlemount) and Saraji (Dysart, Qld).

There seems to be significant variation in the degree of particulate pollution from open cut coal mines, and so we encourage the Committee to investigate the data available through the National Pollution Inventory to focus on not just the towns affected by several mines, but the towns nearest the mines that produce the greatest quantities of small particulate pollution.

Table 2 shows the coal mining operations that produce more than 100 tonnes of PM2.5 pollution in 2011, according to the NPI.

Table 1: Coal mines that produced more than 100 tonnes $PM_{2.5}$ in 2011 (source: NPI 2011)

Mine	Nearest town	State	$PM_{2.5}$ (kg)
Bulga Coal Mine	Singleton	NSW	367,787
Glendell and Ravensworth East	Ravensworth	NSW	215,453
Mt Owen Mine	Ravensworth	NSW	195,928
Curragh Mine	Blackwater	Qld	193,348
Newlands Coal	Glenden	Qld	172,000
Liddell Coal Operations	Muswellbrook	NSW	161,217
Goonyella Riverside Broadmeadow Mine	Moranbah	Qld	160,609
Rix's Creek	Singleton	NSW	144,126
Wambo Mine	Warkworth	NSW	136,965

[2] Physicians for Social Responsibility. (2009) *Coal's Assault on Human Health*. http://www.psr.org/assets/pdfs/coals-assault-executive.pdf

Lake Vermont	Dysart	Qld	131,111
Rolleston Coal Mine	Rolleston	Qld	130,473
Peak Downs Mine	Moranbah	Qld	128,454
North Goonyella/Eaglefield Coal Mine	Glenden	Qld	120,760
Saraji Mine [Dysart-QLD]	Dysart	Qld	116,781
Mt Arthur Coal Mine	Muswellbrook	NSW	114,399
Yarrabee Mine	Blackwater	Qld	110,357
Collinsville Coal Mine	Collinsville	Qld	110,140
Coppabella Coal Mine	Nebo	Qld	102,549
Blackwater Mine	Blackwater	Qld	101,599

A review of the NPI records for PM_{10}, for which there is a national standard in the NEPM, reveals that many of the mines with the highest volumes of particulate pollution are in Queensland. Indeed, as Table 3 shows, the eleven most heavily polluting coal mines, by tonnage of PM_{10} released in 2011, are in Queensland.

Table 2: Highest PM10 emitting coal mines in 2011 (source: NPI 2011)

Mine	**PM_{10} (kg)**	**Nearest town**
Goonyella Riverside Broadmeadow Mine	14,945,855	Moranbah
The Dawson Mines	14,017,467	Moura
Blackwater Mine	11,781,101	Blackwater
Foxleigh Mine	11,190,574	Middlemount
Peak Downs Mine	10,177,790	Moranbah
Burton Coal Mine	9,851,000	Nebo
Ensham Coal Mine	9,416,950	Emerald
Newlands Coal	9,200,000	Glenden
North Goonyella/Eaglefield Coal Mine	9,036,900	Glenden

Comparing these emissions quantities to the conditions set in Environmental Authorities provided by the Queensland Department of Environment and Heritage Protection is not simple, as the EA conditions are expressed as volume and area limits (micrograms per cubic metre and milligrams per square metre deposition). However, we encourage the Committee to investigate whether there is a lower standard of control and enforcement of NEPM policy on particulate pollution in Queensland coal industry than in NSW. The Environmental Authority for the Peak Downs mine, as once example, has a PM_{10} emission limit three times the NEPM standard (see comments below on standards for more detail) and the report from the NPI indicates that this mine could be producing an average of over 27,000kg of PM_{10} per day. This is not to say that there are not significant PM_{10} problems from NSW coal mines, but it appears, from the available data, that there may be serious consequences of unregulated and uncontrolled particulate pollution from Bowen Basin coal mines.

Given all of the above, and the need for dedicated research to properly understand the impact of particulate and other air pollution on human health, the specific sources of particulate pollution that we urge the committee to examine are:

- Open cut coal mines in the Hunter Valley, NSW
- Open cut coal mines in the Bowen Basin, Queensland
- Bayswater, Lidell, Eraring and Mount Piper power stations in NSW
- Collinsville, Stanwell and Gladstone power stations in Queensland
- Hazelwood and Loy Yang power stations in Victoria

Recommendation: That the Committee examine pollution data from the following sources: open cut coal mines in the Hunter Valley, NSW; open cut coal mines in the Bowen Basin, Queensland; Bayswater, Lidell, and Eraring power stations in NSW; Collinsville and Gladstone power stations in Queensland; Hazelwood and Loy Yang power stations in Victoria.

Recommendation: that the Committee examine the quantity of particulate, nitrous oxide and other air pollutants released by open-cut coal mines and coal-fired power stations in the Hunter Valley and Lake Macquarie in NSW, the La Trobe Valley in Victoria and the Bowen Basin in Queensland and seek advice from regional medical practitioners, and experts in the field on the impact this pollution is having on the health of surrounding communities.

Populations most at risk and causes putting them at risk

Any family or community that lives in close proximity to coal mining, transport and handling, and may be, therefore disproportionately impacted by particulate pollution, should be informed of the risks and have suitable protection available.

NSW

In the Hunter Valley, standards for PM_{10} are regularly exceeded, and high levels of pollution are particularly concentrated in areas that are surrounded by coal mines.

According to the air quality monitoring report from the NSW EPA, there were 22 days in Camberwell village when the average daily measurement of PM10 exceeded the 50µg/m^3, and the highest measured concentration of PM_{10} last year in Camberwell was 81.6µg/m^3. The residential growth area outside Singleton called Maison Dieu is surrounded on three sides by open-cut coal mines, as close as two kilometres from residents and had an even higher maximum reading. There are several towns and settlements in the Hunter Valley in this situation, with coal mining in close proximity on more than one side of the settlement, such as Jerry's Plains, Warkworth and Camberwell, and we encourage the Committee to focus some attention on these areas.

In Newcastle, there are populous suburbs within hundreds of metres of coal rail lines that service the six coal loaders currently operating in the port and their stockpiles. Intense community concern about the health effects of coal dust from the rail and the coal piles led to a study by the Australian Rail Track Corporation last year, which found that coal trains are significantly increasing the total suspended particulates, and the fine particle pollution in the adjacent suburbs. The Hunter Community Environment Centre (HCEC) has surveyed residents in suburbs adjacent to the coal rail

line and the coal terminal and published the results. They found that 68% of residents in those suburbs feel "very" or "somewhat" affected by the three existing coal terminals in Carrington and Kooragang Island and that 69% of residents were "very" (46%) or "somewhat" (23%) concerned about the impact of coal trains passing through Newcastle suburbs. Over a third (39%) of respondents said that that they or a member of their household suffered from a respiratory ailment and one-third of these people consider that the ailment is caused by coal[3]. After this survey, the HCEC installed dust monitoring stations around the affected suburbs. The results from this investigation are due to be released in time to make a submission to this inquiry.

The Hunter New England office of NSW Health made a submission in relation to the proposed fourth coal terminal in Newcastle raising concern that local particle pollution levels already exceed the NEPM standard, and questioning the adequacy of the air quality modelling undertaken for the environmental assessment of the project, which claimed that there would be no additional 24 hour average PM_{10} concentration exceedances. The office noted that they receive complaints from residents in Carrington, Mayfield and Stockton about the deposition of coal dust and the impact of particulate matter.

Queensland

In Queensland, access to data on air quality is more difficult, and is only available for a limited number of areas. The Bowen Basin, like the Hunter Valley, has reached saturation point with open-cut coal mines, and yet both areas have proposals for extensive new mining activities—either extensions of existing mines or new mines entirely.

As shown above, open cut coal mines in the Bowen Basin in Queensland populate the list of the facilities releasing the highest volumes of PM_{10} in Australia, and high volumes of other pollutants, including $PM_{2.5}$, mercury and selenium. Of the top ten point sources of PM_{10} in the country in 2011, six were Queensland coal mines.

Some results from a Moranbah-based air quality monitoring station are available in an *Air Quality Bulletin* that was published in January 2012. That document reveals that for four months between October 2011 and January 2012, the monthly maximum 24 hour average PM_{10} concentrations exceeded the NEPM limit of 50µg/m^3.[4]

I believe that any communities living adjacent to coal mining in the Bowen Basin may be being exposed to significant concentrations of particulate pollution beyond the NEPM standard, but systematic research and investigation is needed to determine if this is the case, and the impact it is having on health. This is likely to be compounded for those communities where coal-fired power stations are also situated, like Collinsville.

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[3] Hunter Community Environment Centre (2012). "Sick of Coal" http://www.hcec.org.au/content/household-survey-reveals-newcastle-community-rejects-coal-terminal

[4] *Air quality bulletin: Central Queensland January 2012*. http://www.ehp.qld.gov.au/air/documents/air-bulletins/cq12jan.pdf

Recommendation: That the committee travel to coal-affected regions, particularly the Hunter Valley and Bowen Basin, where there is a high concentration of very large open-cut coal mines, and significant anecdotal evidence of the impact of particulate pollution on nearby communities.

Recommendation: That the inquiry particularly visit the communities of Camberwell, Warkworth, Jerry's Plains, and Newcastle (particularly the suburbs of Mayfield, Carrington and Stockton) in NSW, and Collinsville, Moranbah, Dysart, Blackwater, Acland and Mackay in Queensland to hold hearings and gather testimony about the impact of particulate pollution.

Recommendation: That the approvals processes for all proposed open cut coal mines within 5km of a dwelling be suspended pending the outcome of the inquiry and full investigation by State and Federal authorities of the health impacts of coal production and handling.

Standards, monitoring and regulation of air quality at all levels of government

Current air pollution standards in Australia are implemented by an agreement under the Council of Australian Governments - the National Environment and Protection Measure for Ambient Air Quality ("NEPM") -- an arrangement put in place under the *National Environment Protection Council Act 1994.* Under this scheme the States are responsible for implementing measures to regulate six different air pollutants.

I believe that the standards set under NEPM for small particulate pollution may be inadequate to protect the health of communities living with particulate pollution. Further, implementation of the national standards is the responsibility of the States and there is no way of enforcing compliance at the national level. In the Hunter Valley, air quality standards are regularly exceeded due to coal mining without any penalties being imposed. In Queensland, there is no uniform dust monitoring and reporting requirements applied to coal mines.

There is an urgent need for a $PM_{2.5}$ limit to be implemented across the country, and applied consistently to coal mining.

The World Health Organisation has recommended a set of "interim targets" for particulate pollution with a diameter of 2.5 micrometres or less ($PM_{2.5}$), the most stringent of which is a 24 hour average concentration of 25µgm^3. This is the limit inscribed in Queensland's *Environmental Protection (Air) Policy 2008* but we cannot find evidence that this target or measure is being applied to coal mines in Queensland.

Standard of regulation and transparency in Queensland

The standard of control and measurement of particulate pollution from coal mining, transportation and handling in Queensland generally must be strengthened. The standard of transparency of air (and water) pollution regulation and reporting in Queensland also needs to be significantly improved. There does not appear to be any consistent approach to establishing, reporting and enforcing conditions and standards for particulate pollution in Environmental Authorities for open

cut coal mines by the Queensland Department of Environment and Heritage Protection or the Department of Natural Resources and Mines.

It is difficult to definitively analyse the standard of conditions and their enforcement as there is no requirement for free public access to Environmental Authorities in Queensland, nor is there a public register of compliance with those Authorities.

In my experience, Queensland Government Departments are reluctant to provide the general public – particularly neighbouring landholders – any information that may be damaging to the coal industry. I find that both the coal mining companies and the Government departments treat me like the common enemy if I ask for information about the Environmental practices of the mining operation. It is clear to me that mining revenues heavily outweigh the health and environmental concerns of neighbouring landholders.

I believe in addition that the air quality conditions proposed in Environmental Authorities for coal mines are not sufficient to protect the public and ensure transparent implementation of the NEPM. The draft Environmental Authority for the Sonoma open cut coal mine, for example, states that "When requested by the administering authority or as a result of a complaint (which is neither frivolous nor vexatious nor based on mistaken belief in the opinion of the authorised officer), dust and particulate monitoring must be undertaken." The EA imposes the national PM_{10} limit of 50µg/m^3 average daily concentration, but states that in the event that the mine exceeds this limit, the company must "address the complaint including the use of appropriate dispute resolution if required" and "immediately implement dust abatement measures so that emissions of dust from the activity do not result in further environmental nuisance." These conditions are loose, but are starkly contrasted to the conditions for air quality in the new draft Environmental Authority for the Peak Downs mine, which stretches between Moranbah and Dysart. For that mine, the conditions are worded similarly, but the limit imposed for daily average PM_{10} concentrations of 150µg/m^3 – three times the NEPM standard.

The draft Environmental Authority for the recently approved Alpha mine has more detail about the expected location of monitoring stations and monitoring frequency. I provide these examples as evidence of the lack of consistency in the application and standards for controlling, monitoring and reporting on particulate pollution from coal mines in Queensland. It is difficult for community groups to access any information about the compliance and enforcement regime (if it occurs) for air quality standards for Queensland coal mines, so these remarks have been limited to the standards for pollution limits and monitoring. I encourage the Committee to seek information from the Queensland Department of Environment and Heritage Protection and Department of Natural Resources and Mines, and from coal companies operating in the Bowen Basin to determine the degree of compliance with Environmental Authorities and enforcement of conditions by government agencies. We believe this information should be made more accessible to the public.

Recommendation: The Federal Government should develop a comprehensive set of national standards on air quality and incorporate them into the *Environment Protection Biodiversity Conservation Act 1999* or another piece of legislation. The standards should be binding on States and provide the Federal Government with a compliance role in enforcing them.

Recommendation: The Committee should investigate the lack of transparency, consistency and precaution in the Queensland system for establishing, reporting and enforcing conditions and standards for particulate pollution in Environmental Authorities for open cut coal mines.

Recommendation: That a national standard for $PM_{2.5}$ be adopted of 24 hour average concentration of $25\mu gm^3$.

Recommendation: That the Committee seek information from the Queensland Department of Environment and Heritage Protection and Department of Natural Resources and Mines, and from coal companies operating in the Bowen Basin to determine the degree of compliance with Environmental Authorities and enforcement of conditions by government agencies. We believe this information should be made more accessible to the public.

Other matters

I would like to encourage the Committee to also examine the impact of nitrous oxide from coal mining blasting. I have witnessed many occasions of large orange clouds leaving the mining lease and travelling many kilometres over neighbouring land. One neighbour and his family became violently ill following such a cloud passing over his house. On contacting the mine responsible for the release an investigation was conducted with no results. A private discussion I had with one of the mine employees revealed that the internal investigation decided that the neighbour must have had "his nose too close to his arse".
This shows the attitude of this industry after a long period of either 'self regulation' or regulation of a body with a vested interest – such as a government which relies on coal royalties and employment numbers – not the long-term health of a community and its environment.
It would be good if the regulation of these large and damaging industries were really done independently and not influenced by the economic might of vested interests at the expense of community and environmental wellbeing.

Thank you for your effort to understand and assist in this issue.

Paul Murphy.