Inquiry into the Re-identification of Coal Workers' Pneumoconiosis Amongst Coal Mine Workers in Queensland – Extended Terms of Reference

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Dr Brian Plush

Particulate Matter Scientist

Visiting Fellow University of Wollongong

Introduction

"Black lung/White Lies" describes the failure of an entire regulatory system which was designed to protect workers from a fatal lung disease.

It must be noted that although this inquiry has identified significant issues in the entire coal mining industry, nothing has currently changed to prevent workers contracting black lung since the first confirmed case over two years ago. The legislative framework remains the same, the regulator remains the same, respirable dust testing remains the same, the people taking the tests remains the same, the engineering controls remain the same, the tonnes cut remains the same and the risk potential for all workers in and around respirable dust production remains the same. New workers into the industry in the last 2 years have been exposed to the same risk of black lung as those workers already in the industry.

Who is responsible if a worker contracts black lung in the future and they commenced work during the period where it was known that black lung was evident and they were in the same working environment with the same known risk?

The report states:

"The evidence so far suggests that there has been a massive systemic failure across the entirety of the regulatory and health systems intended to protect coal industry workers. Prior to the re-identification of CWP in 2015, there was an absolute failure by the DNRM, its Mine Inspectorate, SIMTARS and its Health Surveillance Unit (HSU) to properly regulate air-borne dust and to look for or identify CWP or CMDLD. The evidence suggests that Queensland Health, WorkCover and self-insurers have played a role in this failure". *Inquiry into the re-identification of Coal Workers' Pneumoconiosis in Queensland - Interim Report, Report No. 1, 55th Parliament Coal Workers' Pneumoconiosis Select Committee March 2017*

It also provided detailed solutions to these failures which include reducing the exposure levels of respirable dust to 1.5mg/m^3 and silica dust to 0.05mg/m^3, (recommendation 19), better qualified practitioners for the correct identification of the disease at a much earlier stage (recommendation 39) and a more measurable and accountable process for reporting, recording and supporting those that have been and will be diagnosed with lung disease in the mining

industry (recommendations 58, 59, 60 and 62). It also suggests the establishment of one single body, the Mines Safety and Health Authority (recommendation 1), which will be established as a statutory authority and body corporate, with the responsibility of ensuring the safety and health of mining and resource industry in Queensland.

Whilst the report is a significant step forward in the early identification, correct diagnosis and management of black lung, it has failed to provide direction and leadership in the very thing that will prevent black lung, and that is, removing the respirable dust before it becomes airborne. Further, lowering the exposure levels for respirable and silica dusts not provide a safe level of exposure to these harmful particles, as no such level exists.

The existing testing regime focusses on exposure of respirable dust to the worker, however, it is does not provide any other details. It is unknown where the respirable dust has originated. It does not provide information on the efficiency of installed controls in mitigating respirable dust production and it does not assist mine personal to remove as much respirable dust from the atmosphere as possible.

Recommendation 25 proposes the use of real time monitors, however, there are known operational limitations to this equipment, being that they provide exposure levels as a time weighted average and not respirable dust loads, and they cannot distinguish between dust and water particles.

At the source measurement has been discussed throughout the inquiry with both professionals and workers agreeing that respirable dust must be removed at the individual source of generation thus preventing the harmful particles from becoming airborne and creating a hazard to workers, resulting in a significant reduction in the risk of fatal lung disease in workers.

To accomplish this scientifically, empirically and to quantify the results, the measurements must be taken at the source of generation and in mg of respirable dust collected per tonne of coal cut or transported (mg/tonne).

This process will give the only quantifiable measurement for dust load production at the sampled source of respirable dust production. If controls are turned off, and the mg/tonne are measured, then the controls are turned back on and another measurement is taken, then the difference between the two will proved a quantifiable efficiency of the installed control at preventing respirable dust from entering the atmosphere.

This process can be utilised in all respirable and silica dust producing activities and industries as detailed in the extended terms of reference for this inquiry.

“Black lung/White Lies” extended the terms of reference for the inquiry to include:

(a) occupational respirable dust exposure for:

(i) coal port workers

(ii) coal rail workers

(iii) coal-fired power station workers

(iv) other workers

(b) the legislative and other regulatory arrangements of government and industry which have existed in Queensland to prevent or reduce the harm caused by occupational respirable dust exposure to port, rail, power station, and other workers

(c) whether these arrangements were adequate, and have been adequately and effectively maintained over time

(d) the roles of government departments and agencies, industry, health professionals and unions in these arrangements

(e) the efficacy and efficiency of adopting methodologies and processes for respirable dust measurement and mitigation, including monitoring regimes, engineering measures, personal protective equipment, statutory requirements, and industry policies and practices, including practices in jurisdictions with similar industries

(f) other matters the committee determines are relevant to occupational respirable coal or silica dust exposure.

Extended Terms of Reference

Through this inquiry, many professionals and non-professionals have all expressed concerns that many above ground industries have been neglected and overlooked as possible sources of lung disease through particle exposure. As a result of this continued, and correct argument, the CWPSC has extended the terms of reference to include additional industries that may pose significant risk of lung disease to workers in those industries and the community surrounding those industries during coal transportation and other processes that produce respirable dust and silica.

This submission will look at each of these extended terms.

(a) Occupational respirable dust exposure for:

(i) coal port workers

Coal loading facilities have been identified as possible sources of risk to employees and surrounding communities as the transported coal is unloaded from coal trains, stacked and then loaded on to ships for export.

For each coal loading facility in Queensland and around Australia, to ascertain the risk potential for lung disease from coal dust to workers and surrounding communities, the following research must be undertaken to quantify the existing risk, and understand the risk to past workers.

- Identify sources of high risk of exposure to harmful respirable dust for employees;
- establish a benchmark respirable dust production per tonne of coal handled from the identified source; and

- Quantify the efficiencies of installed controls or processes implemented to mitigate respirable dust production.

  Once the research has been completed and analysed a comprehensive report detailing findings, results and recommendations can be created which will include the following:

- Identification of respirable dust hazardous zones during the coal transportation process on the site;
- Establishment of a benchmark respirable dust production at each identified source of respirable dust generation;
- Quantification of the efficiency of installed engineering controls for the mitigation of respirable dust;
- development of a Respirable Dust Management Plan (RDMP) for the Coal Terminal, which will include, but not be limited to the following:

  - Identification of respirable dust hazardous zones relative to the coal handling process;
  - development of a risk matrix for each of the identified sources which will include the risk potential based on the benchmark respirable dust production, the risk potential with installed controls operating and the risk potential if improved engineering controls are installed;
  - recommended improvements if installed engineering controls are not mitigating respirable dust as designed;
  - recommended continual dust measurement strategy;
  - development of TARPS (Trigger Action Response Plans) in case of identified increases in respirable dust production at any identified hazardous dust zone; and
  - recommended documents for continual measurement and data harvesting of respirable dust production during the transport cycle.

(ii) coal rail workers and open cut mining

It has been identified that the Hunter Valley is an environmental cluster that could potentially experience greater lung problems in the general community than that experienced in non-mining communities according to an International Longwall News article dated Thursday 1st November 2012, a report written by the University of Sydney's Associate Professor Ruth Colagiuri regarding the Hunter Valley.

Among the problems identified in children and infants in coal communities were impaired growth and neurological development, high blood levels of heavy metals, higher prevalence of birth defects and a greater chance of being of low birth weight.

Adults have been shown to have higher rates of death from lung cancer and chronic heart, respiratory and kidney diseases. They also have increased chances of developing other cancers and hypertension. Some studies also show higher rates of miscarriages and stillbirths.

"Although there are differences in mining practises and standards across countries that may account for some of this excess death and illness, it is hard to imagine that at least some of this evidence would not apply to Australia," Colagiuri said.

Production from coal mining in Australia has increased remarkably over the last several years. This increased productivity has meant that more dust is being produced and controlling respirable and inhalable dust continues to present the greatest ongoing challenge for coal mine operators and the surrounding environment. A report by the Director of Mine Safety Operations Branch of Industry and Investment NSW, Rob Reagan, has found that there is an increasing level of inhalable dust being produced in New South Wales, potentially leading to long-term health problems (ILN, 2010). This increased exposure level can be directly attributed to the increase in coal production and the continued development of mines in Australia.

Queensland communities surrounding open cut mining activities will be facing the same issues identified in these articles. The inquiry has also heard supporting evidence by members of North Queensland communities.

These communities require quantifiable measurement of the respirable dust that they are exposed to, and this can only occur through at the source measurement of dust production, before it gets in to the atmosphere and can disperse over hundreds of kilometres.

(iii) coal-fired power station workers

Coal fired power stations will have the same potential risk of lung disease for workers as other coal industries due simply to the fact that coal is handled by workers. It is transported, it is stacked, it is moved, it is pulverised and it is injected into furnaces to create energy. During all these process, testing should be undertaken to quantify the risk. The testing should be undertaken at the source of the dust generation throughout the entire coal transportation process.

If the risk potential is high, then controls will be required to mitigate the risk to as low as reasonably practicable to ensure the safety of the workers.

Comprehensive site testing will underpin the development of respirable dust management plans as described in this submission.

(iv) other workers

Lung disease has been well known and documented for centuries. We are all aware of the major lung conditions such as asbestosis, mesothelioma, silicosis and CWP. These lung diseases have unfortunately made headlines over many years and will continue to do so in the future.

What many people may be unaware of is the many other forms that fatal lung disease can take. An article by Dr Subash Srikantha, respiratory and sleep specialist, in private practice, St Leonards, Liverpool and the Woolcock Clinic, Glebe, NSW; and conjoint lecturer, school of medicine, University of NSW and Dr Michael Hibbert, senior respiratory and sleep specialist, department of respiratory and sleep medicine, Royal North Shore Hospital, St Leonards; and lecturer, Northern Clinical School , University of Sydney, NSW, details what industries,

occupations and particles significantly increase the risk of lung disease if a person is exposed to these particles.

Table 1 below details the particle that causes the lung disease and the occupation that is at risk.

Table 2: Agents responsible for occupational lung diseases

Agent	Industry/occupations	Lung condition
Asbestos	Mining and milling, building and construction, transport equipment manufacturing (shipbuilding, railway locomotive building and maintenance), asbestos product manufacture, power generation, carpenters and joiners, metal fitters, boilermakers	Pleural plaques, pleural thickening, pulmonary fibrosis (asbestosis), mesothelioma
Beryllium	Aerospace, nuclear power, computer, automotive electronics	Pulmonary fibrosis (berylliosis), emphysema, lung cancer
Barium	Petroleum industry	Pulmonary fibrosis
Coal	Coal mining	Pulmonary fibrosis Centrilobular emphysema
Cadmium	Electronics, metal plating and batteries	Emphysema, lung cancer
Cotton dust	Cotton, flax and hemp workers	Bronchitis, byssinosis, hypersensitivity pneumonitis
Isocyanates	Spray painting	Asthma, hypersensitivity pneumonitis
Irritant gases (ammonia, sulphur dioxide, chlorine)	Chemical industry, agriculture, fertilisers	Bronchitis, asthma
Ionising radiation	Radiology, nuclear industry	Pneumonitis, pulmonary fibrosis, lung cancer
Mouldy hay (thermophilic actinomycetes)	Agriculture (farmers)	Bronchitis, hypersensitivity pneumonitis
Silica	Sandblasters, miners, tunnelers, millers, potters, glassmakers, foundry and quarry workers	Simple silicosis, silicoproteinosis, progressive massive fibrosis, COPD
Talc	Paint, ceramics, leather, paper	Pulmonary fibrosis
Wood dust	Milling, construction	Hypersensitivity pneumonitis, asthma

Table 1 – Agents responsible for occupational lung disease (*Australian Doctor, 8 March 2013,* www.australiandoctor.com.au)

Each of the above listed occupations are at risk of lung disease through particles created during from the working process.

To understand and quantify the risk potential for these occupations, comprehensive at the source measurement of respirable sized particles must be undertaken as detailed above.

(b) the legislative and other regulatory arrangements of government and industry which have existed in Queensland to prevent or reduce the harm caused by occupational respirable dust exposure to port, rail, power station, and other workers

According to the Queensland mining legislation, exposure to dust particles must not exceed exposure limits. Workplace exposure limits or standards are airborne concentrations of a

particular chemical or substance in the workers' breathing zone that should not cause adverse health effects or cause undue discomfort to nearly all workers.

It must be noted that the legislation highlights that exposure limits do not identify a dividing line between a healthy or unhealthy working environment. The legislation further notes that natural biological variation and the range of individual susceptibilities mean some people might experience adverse health effects below the exposure standard. Therefore, the legislation warns, exposure limits establish a legal or advisory maximum upper limit only, and does not provide a safe level for workers.

The legislation explains that where exposure cannot be eliminated, all reasonable steps should be taken to minimise exposure to as low as reasonably practicable. To ensure compliance to the legislation, respirable dust measurements must be taken as detailed in this submission. (https://www.business.qld.gov.au/industries/mining-energy-water/resources/safety-health/mining/hazards/dust/exposure-limits - accessed 10th April 2017)

(c) whether these arrangements were adequate, and have been adequately and effectively maintained over time

The existing legislation and regulatory regime has failed. Black Lung/White Lies addresses many of these failures, however, more changes are required. Significant changes are required in relation to the statutory respirable and silica dust testing and exposure levels. Quantifiable dust measurement and scientifically underpinned exposure levels are urgently required.

(d) the roles of government departments and agencies, industry, health professionals and unions in these arrangements

Black Lung/White Lies adequately addresses where the failures have occurred throughout the regulatory regime. These will be implemented over time, assuming a positive passage through Parliament. Legislation has been addressed in relation to exposure levels by lowering the existing exposure levels, however, as has been widely reported and agreed throughout this inquiry, it is unknown whether or not these new exposure levels lower the risk potential for lung disease to workers.

Until exposure levels can be scientifically proven to be safe, the levels of respirable dust and silica should be removed to as low as reasonably practicable to ensure the risk potential to workers is as low as it can possibly be. This will require the most efficient engineering controls be used at all known sources of dust generation in all dust producing activities known to create occupational diseases.

(e) the efficacy and efficiency of adopting methodologies and processes for respirable dust measurement and mitigation, including monitoring regimes, engineering measures, personal protective equipment, statutory requirements, and industry policies and practices, including practices in jurisdictions with similar industries

It is well agreed that the best way to prevent black lung, or any occupation disease, is to ensure the particles are not allowed to enter the atmosphere, significantly reducing the risk potential for workers in and around the source of the particle generation.

For this process to be successful, particle generation must be removed through engineering controls. The problem with this is that it is unknown how efficient the installed controls are at removing these particles.

Comprehensive testing of these controls is required to ensure the most efficient control is installed. This will require testing the control to quantify the number of particles they remove during operation. The controls that remove the highest amount of particle will be the most efficient, therefore they should be installed.

To quantify the efficiency of controls, a process will be required to test the controls operationally in a testing facility. This facility can be similar to NIOSH, NIOSH itself or a smaller facility that can provide a test chamber that will create a benchmark dust particle production and then quantify the efficiency of the tested control.

Controls can then be rated and certified so mine operators can be confident that the control is the most efficient available for a specific source of generation.

(f) other matters the committee determines are relevant to occupational respirable coal or silica dust exposure.

It is absolutely critical that a safe level of respirable dust and silica dust exposure be determined through robust scientific research. This research has to identify at what point interstitial fibrosis commences in the lung and this can only occur by replicating the amount of respirable dust and silica dust that enters the lungs during a normal operating shift. This can only occur through a quantifiable and empirical process which is linked to production, as dust is mainly produced during production. All sampling, measurements, testing and research should be linked to tonnes of coal, not a time weighted average.

Once the mg/tonne of respirable dust and silica dust is known, rodent trials can be commenced to expose the rodents to this dust load. The rodents will inhale the dust and it will be possible to determine when fibrosis commences. This will be related directly to the amount of coal dust they have been exposed to, which will in term identify the number of tonnes that a worker can be exposed to before lung damage occurs.

References

Australian Doctor, 8 March 2013, www.australiandoctor.com.au

Ruth Colagiuri; *International Longwall News* article dated Thursday 1st November 2012

Rob Reagan; *International Longwall News* 2010

https://www.business.qld.gov.au/industries/mining-energy-water/resources/safety-health/mining/hazards/dust/exposure-limits - accessed 10th April 2017