Queensland Government

Department of
**Natural Resources and Mines**

*9 December 2016*

Mrs Jo-Ann Miller MP
Chair, Coal Workers' Pneumoconiosis select committee
Parliament House
Alice and George Streets
Brisbane QLD 4000

Dear Mrs Miller

Please accept the Department of Natural Resources and Mines' submission in the Coal Workers' Pneumoconiosis (CWP) select committee's inquiry into the re-emergence of CWP in Queensland's coal industry.

When I appeared before the committee on 14 October 2016 I said that addressing the reappearance of CWP in Queensland's coal mining sector is the department's top priority. Since mid-2015, the department has devoted significant effort to doing so.

The department has focussed on the prevention of coal mine dust lung disease (CMDLD) – including CWP – through stricter dust management and improving the coal mine workers' health scheme through its work to operationalise all 18 recommendations of the independent Monash Review.

In accordance with the Minister's action plan on this issue, the department is determined to take a forward-focussed approach, yet recognising the need to address systemic failings of the past.

The department has been extensively consulting with stakeholders including worker representative groups, industry, the medical profession and government with a view to achieving a system that is supported across all sectors and provides the best possible protection for coal workers.

The department has striven to maintain progress of this work while also devoting a substantial amount of effort to responding to the CWP select committee's inquiry.

As I have said from the outset, the department supports the work of the committee and is committed to assisting the committee as best it can.

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In preparing this submission, and in responding to the questions of the committee in hearings and the committee's other requests for information, the department has made best efforts to locate historical documents and information.

Some of the information that has been requested by the committee dates back over 30 years in time and exists in the records of entities other than the department, or its predecessors.

Accessing and interrogating this information to ensure it meets the committee's requirements necessarily involves significant time and effort. I therefore am grateful for the committee's understanding in receiving this information.

I note that the committee has taken an interest in matters of past policy or decision-making underpinning past policy – including decisions of the Queensland Coal Board and previous governments from the early 1980s.

Given the passage of time and intervening events, much of the decision-making and the reasons behind it are not within the personal knowledge of present departmental officers.

Although the department has endeavoured to shed as much light as possible where it can on these matters, consistent with the standing orders it can of course only provide factual and technical background to government legislation and administration.

Also, as recognised in the standing orders it is not for the department to defend or advocate government policy. In any event I consider this practically impossible in circumstances where the policy in question traverses a number of administrations.

I trust that the department's submission assists the committee in its consideration of the issues relevant to the inquiry's terms of reference.

The department will continue to support the important work of the committee and will continue to commit its attention to the prevention of CMDLD.

Should you have any further enquiries, please contact Robert Djukic, Director, Coal Workers' Pneumoconiosis Inquiry Unit, Department of Natural Resources and Mines

Yours sincerely,

**James Purtill**
**Director-General**

# Submission to the Coal Workers' Pneumoconiosis Select Committee

## Department of Natural Resources and Mines

9 December 2016

This publication has been compiled by the Coal Mine Workers' Health Scheme of Minerals and Energy Resources Division, Department of Natural Resources and Mines.

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Best efforts have been made by DNRM, within the limited time allowed for this submission, to ensure that the information it contains is accurate and comprehensive. DNRM reserves the right to make further submissions should further relevant information become available.

# Contents

# Introduction

The Department of Natural Resources and Mines (DNRM) is committed to the health and safety of all coal mine workers. It is actively working to prevent coal mine dust lung diseases (CMDLD) – including coal workers' pneumoconiosis (CWP) – through stricter dust management and improving the respiratory component of the Coal Mine Workers' Health Scheme (the Health Scheme) to ensure the early detection of diseases through effective health screening.

DNRM acknowledges the seriousness of CWP, is committed to implementing improvements to safeguard the health and safety of coal mine workers and welcomes the opportunity to make a submission to the Coal Workers' Pneumoconiosis Select Committee. The department fully supports the committee's work, and will continue to make all efforts to assist the committee.

DNRM also acknowledges the key findings of the independent expert review of the respiratory component of the Health Scheme undertaken by the Centre for Occupational and Environmental Health at Monash University (Monash review). DNRM supports all 18 recommendations from the review and is currently working to operationalise those recommendations.

While acknowledging that there is still much work to do, a number of key improvements have already been implemented. All chest X-rays taken under the Health Scheme are now dual read using the International Labour Organization (ILO) International Classification of Radiographs of Pneumoconioses (ILO classification). Recent regulatory amendments that take effect on 1 January 2017 will prescribe the reporting of respirable coal dust levels and ensure all coal mine workers, both underground and aboveground, are getting regular chest X-rays to screen for CMDLD.

This submission seeks to:

- address key issues relating to respirable dust management, the administration of the Health Scheme and how the department is working to operationalise the Monash review recommendations
- clarify a number of issues raised in written and oral submissions to the inquiry (a summary of the key issues from each written submission – with departmental comment – is provided in Annex A).

# Queensland coal industry

## Overview

Queensland has a rich endowment of high-quality coal – including both metallurgical and thermal coals. Since coal was first discovered in Queensland in 1825 by Major Edmond Lockyer in the Ipswich region the industry has grown to be globally significant. Currently, there are 50 operating coal mines, including 11 underground and 39 open-cut. The coal industry contributed $1.6 billion in royalties to Queensland in 2015-16 – representing 79 per cent of total royalties from mining, petroleum and gas sectors and over 10 per cent of the State's total taxation and royalty revenue.

Coal basins in the southeast of the state are sources of thermal coal for both export and domestic markets. There are seven open-cut mines currently operating in these basins.


90% of Queensland coal is produced from the Bowen Basin and is generally low in moisture, ash and sulphur content. Coal seams within the central and northern Bowen Basin often contain significant amounts of methane gas, which represents a hazard to mining operations and is removed to a safe level prior to mining.

## Historical context

In 1950 coal production in Queensland was just over 2.3 million tons (Mt) of which 80 per cent came from underground mines (virtually all worked by hand). Most of the mines operated in the Ipswich Coalfield west of Brisbane where there were 84 underground operations. The remaining production came from two open-cut mines – Blair Athol and Callide.

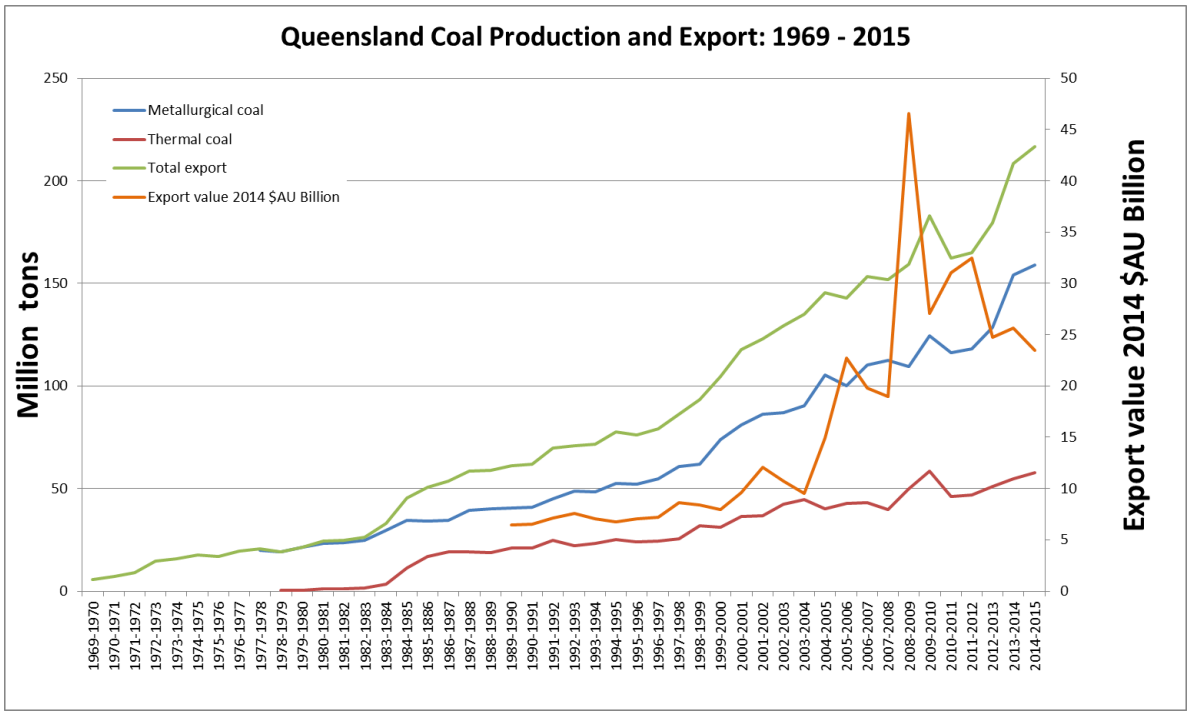
A period of major production growth began in 1959 with the establishment of large scale open-cut export mines in the south-east Bowen Basin. Underground mining was also initiated in the Blackwater district in the late 1960s and early 1970s. The first continuous mining machine to be used

underground in Queensland was installed at Box Flat No.5 Mine in the Ipswich Coalfield around 1960. In June 1986, the first mechanised longwall mining unit to operate in Queensland was installed underground at Central Colliery on the German Creek mining leases.

Mechanised longwall equipment is now the preferred technique and as it can deliver high production rates and has been installed in almost all underground mines developed in Queensland. Two mines additionally use the *top coal caving* method to extract thicker coal seams.

Mechanisation, driven by growth in coal-fired power generation and steel making has led to an increase in coal production. In 1975-76 coal exports were 16.4 Mt per annum compared to nearly 218 Mt exported in 2014 - 15 (160 Mt of metallurgical coal and 58 Mt of thermal coal). The figure below shows Queensland coal production and exports from 1969 - 2015.

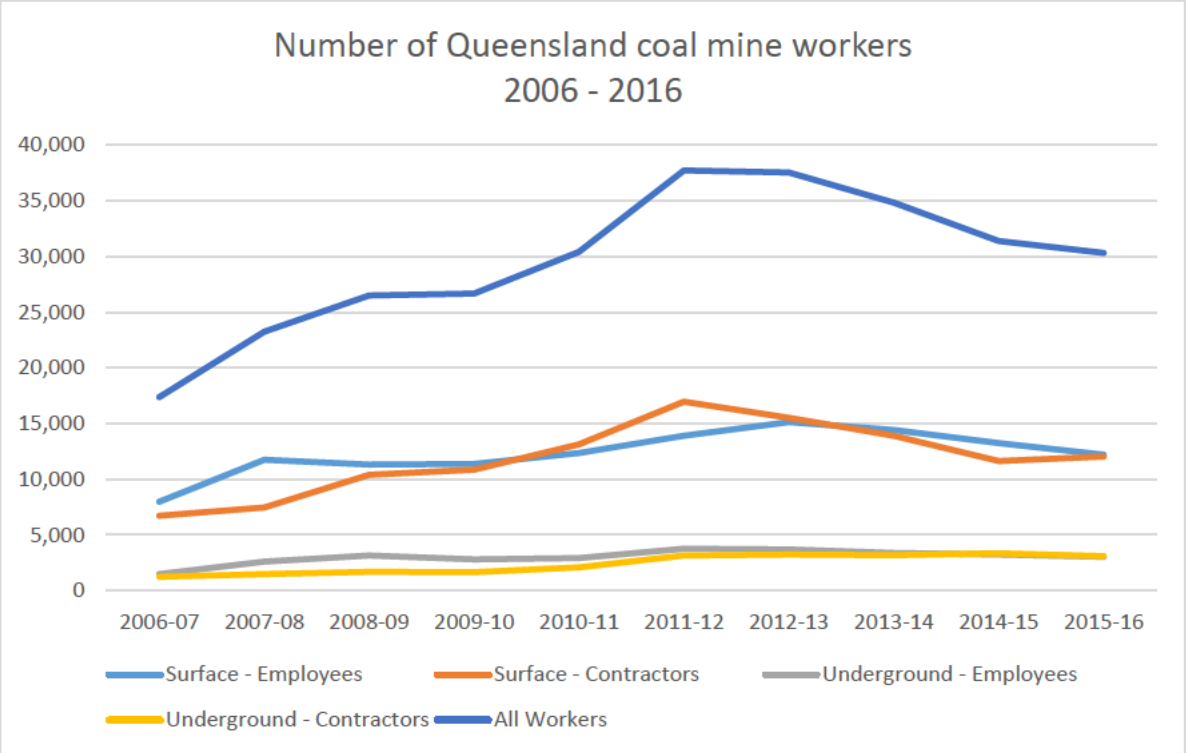
A more detailed summary of the Queensland coal industry and its history, geological context and production is provided in **Annex B.**




## Workforce

The coal mining workforce in Queensland is currently around 30,000 workers. Approximately 25,000 (83 per cent) work in surface mines and about 5,000 work underground. The total number of coal mine workers doubled in the six year period from 2006-07 to 2011-12, due to industrial growth in steel-making, before declining steadily. This decline is due to a combination of factors including a downturn in the industry and increased mechanisation of mining operations - resulting in fewer workers per unit of coal production. While the number of contractors has increased, the proportion of employees to

contractors has remained relatively stable over the decade across surface and underground mines as shown in the following figure.



# Coal Mine Dust Lung Diseases (CMDLDs)

Coal miners are at risk of developing a range of occupational dust lung diseases as a result of long term exposure to high levels of respirable coal and silica dust. Attributable conditions include coal workers' pneumoconiosis (CWP), mixed dust pneumoconiosis, silicosis, chronic bronchitis and emphysema or chronic obstructive pulmonary disease (COPD).

# Confirmed CWP cases

As at 8 December 2016, the DNRM has confirmed 17 cases of CWP – with the last case confirmed on 24 November 2016. The department confirms a case when the department's occupational physician confirms the diagnosis of a coal worker by an appropriately qualified medical practitioner – usually a respiratory or thoracic physician.

In summary:

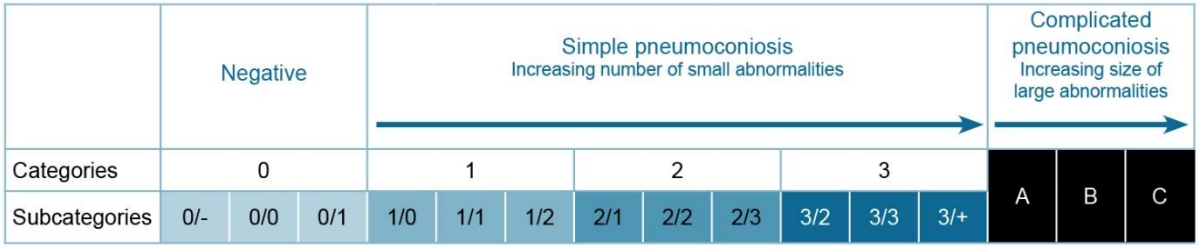
- 15 are described as simple pneumoconiosis
- 2 are described as complex (presenting with multiple conditions)
- Current ages range from 38 to 73 with an average age of 56
- 1 involves an aboveground worker with no underground experience
- 4 have substantial overseas coal mine experience (UK and USA)
- 2 worked in New South Wales as well as in Queensland
- 2 worked in the Ipswich coal fields
- All worked in Bowen Basin coal fields at some point in their careers.

**ILO classification**

The International Labour Organization (ILO) Classification of Radiographs of Pneumoconioses is a tool used globally to describe abnormalities in chest X-rays that indicate pneumoconiosis. The system includes guidelines and a set of 22 standard chest X-ray images. The radiologist compares the patient's chest X-ray with the 22 standard chest X-ray images in the set which show a gradation of severity in lung abnormalities (i.e. size and shape of nodules) in patients with pneumoconiosis. The radiologist uses the standard images to classify the pneumoconiosis present in the patient.

The ILO classification uses a scale of categories aligned to the standard images to describe the increasing concentration of small areas visible on the X-ray that may indicate an abnormality (opacities). As CWP can be a progressive disease, the ILO classification is used to identify and explain the progression of the disease.

**ILO international classification of radiographs**[1]




**Stages**

There are two stages of the disease: simple (early stage); and complicated CWP, also known as progressive massive fibrosis (PMF).

In the early stage of the disease, small scars called nodules between 1 – 2 millimetres in size, begin to form. A chest X-ray identifies the profusion of these round or irregular nodules to determine how advanced the disease is. It may be difficult to differentiate small nodules from other lung conditions, or even other normal structures in the lungs such as blood vessels. Small nodules from dust begin as Category 1 and over time and with enough dust exposure, they can increase in numbers to become a Category 2 and then Category 3. A higher category usually means more of the lung is damaged from these small nodules.

Individuals with early-stage CWP may show no symptoms, however typical symptoms can include cough, sputum production, wheezing, and shortness of breath. If the disease progresses it may become complicated CWP, which is also known as Progressive Massive Fibrosis (PMF). Areas of fibrotic or scar tissue in the lungs is observed to be greater than one centimetre in diameter. PMF may be debilitating and can be a life-threatening condition, and individuals may present with more severe symptoms.

**Treatment**

There is no specific treatment for CWP aside from managing the symptoms. The scarring of the lungs cannot be reversed. Workers diagnosed with the disease should avoid further exposure to high concentrations of coal dust.

[1] ILO classification table based on information provided by Professor Bob Cohen, Clinical Professor of Environmental and Occupational Health Sciences, University of Illinois at Chicago

# Prevention of disease

All forms of CMDLDs – including CWP – are caused by long term exposure to high levels of respirable dust. Effective control of respirable dust is the most effective way to prevent these diseases. Control of respirable dust in coal mines is regulated under the *Coal Mining Safety and Regulation 2001* through the mine's safety and health management system.

## Risk-based legislation

The *Coal Mining Safety and Health Act 1999* was the outcome of an extensive tripartite process between government, industry and union over the six years, following the 1994 Moura No. 2 mining disaster where it was agreed that the best legislative framework for mine safety and health was one that places responsibility and accountability for safety and health on the mining industry itself.

The new framework introduced a risk-based safety and health management system for each mining operation. These systems are central to the Queensland safety and health framework and incorporate risk management practices that ensure the safety and health of coal mine workers and persons who may be affected by mining operations.

Under the framework, mine operators are required to proactively review their safety and health management system to ensure the system is effective, and adapts to the changing environment and interdependencies of complex mining operations.

The Queensland framework enables statutory officers such as the mine's Site Senior Executive (SSE), Site Safety and Health Representative (SSHR), Industry Safety and Health Representative (ISHR), mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting or auditing the safety and health management system. This proactive review by a wide range of people with differing expertise and perspectives strengthens the integrity of the safety management system and safeguards against potential risk exposure not being addressed.

## Dust control

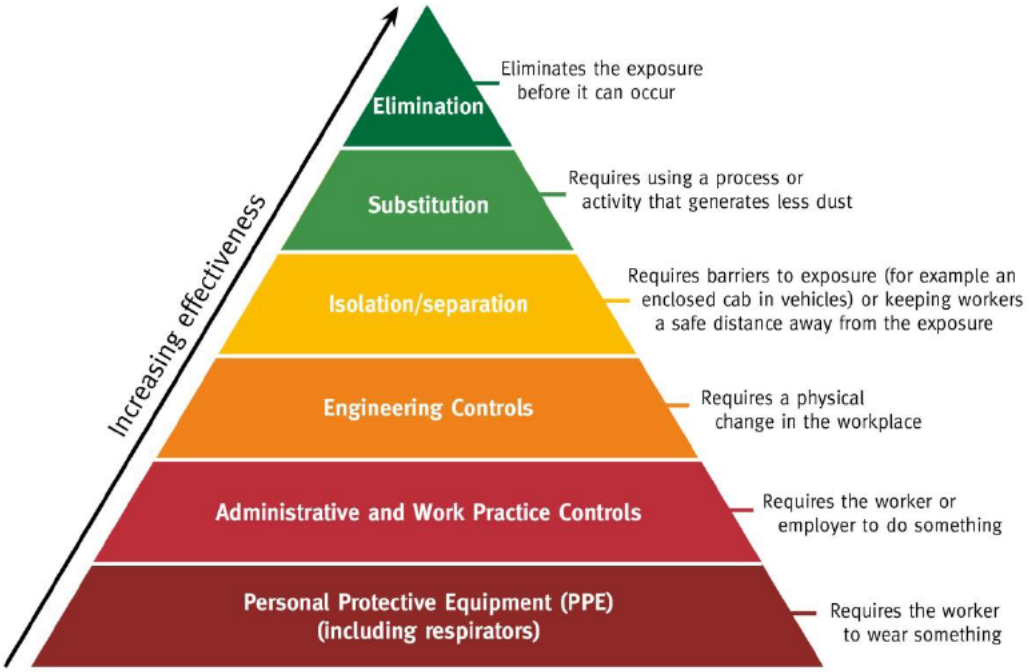
The best way to prevent CMDLD is to implement effective dust control procedures. Under section 89 of the *Coal Mining Safety and Health Regulation 2001,* mines must ensure each coal mine worker's exposure to respirable dust at the mine is kept to an acceptable level and the average concentration of coal and silica dust in the atmosphere in which the worker breathes does not exceed 3mg/$m^3$ air and 0.1mg/$m^3$ air respectively[2].

Effective dust control procedures can vary from mine to mine and it is the responsibility of the mine's SSE to determine the most effective method for dust control at that mine following risk assessment and ongoing monitoring. The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through *elimination* – that is by preventing the hazard from occurring in the first place. If

[2] The worker is not to breath an atmosphere at the mine containing respirable dust exceeding an average concentration, calculated under AS2985, equivalent for an 8-hour period – see section 89 of the Coal Mining Safety and Health Regulation 2001.

elimination is not reasonably practicable, risk must be minimised by working through the alternatives in the hierarchy, from the highest to the lowest.

**Hierarchy of control**




Below are examples of how a mine can apply the hierarchy of controls to effectively manage the risk of respirable dust and silica generation and exposure.

| Control measure | Example |
|---|---|
| Elimination | Automation of mining in areas of high risk of respirable dust and silica exposure |
| Substitution | Using mining methods that generate less respirable dust |
| Isolation/separation | Use of curtains, enclosures, containment |
| Engineering controls | Dust suppression sprays |
| Administration | Task rotation, use of procedures to limit exposure, including operator positioning |
| Personal protective equipment | Any use of respiratory personal protection, including self-contained or compressed air breathing apparatus |

While personal protective equipment is an important part of reducing exposure to dust, the mine's focus should be to ensure high level controls are implemented to ensure respirable dust levels are below prescribed levels. Mine operators determine personal protective equipment requirements on a site-by-site basis based on risk assessment under the coal mine's safety and health management

system. Respiratory protective equipment is an example of personal protective equipment that mines may use to protect the health of their workers. If respirators are used, it is essential that:

- the type of respirator selected is able to filter the size of dust particle and concentration of dust
- the facial seal of the respirator prevents dust from entering the breathing zone of the person
- respirators are regularly inspected and maintained
- the wearing of respirators is enforced by supervision
- should be used as part of a respiratory protection program established in accordance with *AS1715: 2009 Selection use and maintenance of respiratory protective equipment*.

The department's Mines Inspectorate works with industry and union representatives to ensure mines achieve an acceptable level of risk.

## Role of the Mines Inspectorate

The Mines Inspectorate's role is to ensure that acceptable safety and health standards are established and practiced within the mining and quarrying industries. The Mines Inspectorate works with industry and union representatives to regulate and improve safety and health at mine sites and to address issues that arise, such as workers being exposed to excessive respirable coal dust.

The functions and powers of coal mine inspectors are set out in the *Coal Mining Safety and Health Act 1999*. The Mines Inspectorate's compliance policy[3] explains how it promotes and achieves compliance with the legislation.

As part of its ongoing program of work, and in relation to respirable dust management and control, the Mines Inspectorate inspects and audits mine sites, their procedures and monitoring results, and presents to industry, workers and union representatives on the importance of dust control and monitoring (see page 16). Mines inspectors also issue directives to mines requiring them to rectify deficiencies identified through inspection and demonstrate an acceptable level of risk. The Mines Inspectorate has also used dust sampling data from mines to inform its regulatory activities.

**Resourcing**

There are 21 mines inspectors for the coal sector across four offices in central and southern Queensland, including staff who are qualified in electrical engineering (5), mechanical engineering (4) and occupational hygiene (1).

The department has an occupational physician who provides expert medical advice and is one of a number of inspectors and officers responsible for the identification and assessment of occupational health hazard at mine sites.

[3] https://www.business.qld.gov.au/industry/mining/safety-health/mining-safety-health/legislation-standards-guidelines

Appointed inspectors possess a range of vocational and tertiary qualifications, dependent on the need at the time they were recruited. Qualifications held by inspectors include; first or second class certificates of competency, underground mine managers certificate, open-cut examiner certificates, mining engineering degrees, electrical engineering degrees or diplomas, mechanical engineering degrees or diplomas, post graduate studies and professional certification in occupational hygiene or ergonomist qualifications.

To ensure inspectors develop their skills and understanding of the issues facing the industry, an ongoing program of continuous professional development is undertaken. During 2015-16, around 40 different training courses were delivered to inspectors.

Also within DNRM is the Safety in Mines Testing and Research Station (SIMTARS). It is a resource available to government, mining companies, mining equipment manufacturers and suppliers to the mining industry.

SIMTARS supports the Mines Inspectorate through provision of expert advice and assistance with accident investigations. It is also an accredited Registered Training Organisation and provides nationally recognised training and qualifications in mine safety to thousands of mine workers in Australia and overseas.

SIMTARS is a major provider of occupational hygiene sampling and monitoring services. These services include respirable dust sampling and monitoring for coal mines. In performing these services, SIMTARS operates as a commercial entity contracting with mine operating companies – separate and independent from the Mines Inspectorate.

**Independence**

Regulating the safety and health of the mining industry requires highly skilled and experienced inspectors. For this reason, all of the inspectors have significant industry experience appropriate to their field of expertise. Inspectors who have worked in industry, especially those with recent experience, have valuable knowledge and skills of mining operations including experience with the latest technology and mining practices and firsthand experience of the hazards in mining and how they can be effectively managed.

The Mines Inspectorate is aware that the requirement to have appropriately skilled and experienced inspectors can raise concerns of regulatory capture – defined as the undue influence of industry or other stakeholder priorities over those of the public good. This is a common risk for all regulators, and the department has strategies in place to manage this risk. A newly appointed inspector will not be assigned to inspect or audit the mine at which they previously worked for a period of at least six months. After this period it will be up to the regional inspectors to allocate the audit and inspection work as identified in the Inspectorate's Mining Inspection Planning System. Inspectors are not allocated responsibility for specific mines.

The Mines Inspectorate also provides training to inspectors to ensure awareness and mitigate the risk of regulatory capture. In addition to training for technical skills, inspectors are required to undertake code of conduct, complaints management and public sector ethics training. Some inspectors also

attend a course on ethical decision making. The courses dealing with complaints management, public sector ethics and ethical decision making are provided by the Queensland Ombudsman.

There are checks and balances built into the Act to ensure the regulator performs its role effectively. SSHRs and ISHRs are statutory positions provided for under the Act to help ensure the level of risk to coal mine workers is at an acceptable level. These roles assist the Inspectorate in fulfilling its obligations.

An SSHR is a coal mine worker who has been elected by fellow workers at the mine to carryout mine inspections, review procedures, detect unsafe practices and to investigate complaints from workers. If SSHRs identify a concern during an inspection he or she must notify the mine's SSE and send a report to the Mines Inspectorate. The Mines Inspectorate interviews the SSHR; conducts any necessary follow up which could include additional investigations; meets with site personnel; and records the resolution of issue in the Mine Record Entry.

An ISHR is appointed by the union to carry out safety and health functions at mine sites. In addition to the functions of SSHRs, ISHRs also participate in investigations into serious accidents and high potential incidents and help in relation to initiatives to improve safety and health at coal mines.

Both SSHRs and ISHRs are required to advise the SSE if they believe the mine's safety and health management system is inadequate or ineffective. If the representative is not satisfied the SSE is taking action to rectify the issue, the representative must advise an inspector who must investigate the matter and report the results of the investigation. Both SSHRs and ISHRs have the power to order the suspension of operations.

The Act also establishes a Commissioner for Mine Safety and Health. Acting independent of the inspectorate, the Commissioner's role is to:

- advise the Minister for Natural Resources and Mines of mine safety and health matters generally
- fulfil the roles of chairperson of the Coal Mining Safety and Health Advisory Committee (CMSHAC)
- monitor and report to the Minister and to Parliament on the administration of provisions about safety and health
- perform the functions given to the Commissioner under the *Coal Mining Safety and Health Act 1999*

The Coal Mining Safety and Health Advisory Committee is a statutory committee that provides advice to the Minister in relation to the safety and health of coal mine workers. The committee includes representatives of industry, unions and government and has been tasked with oversighting the reform of the Health Scheme and is actively engaged in the progress of these reforms.

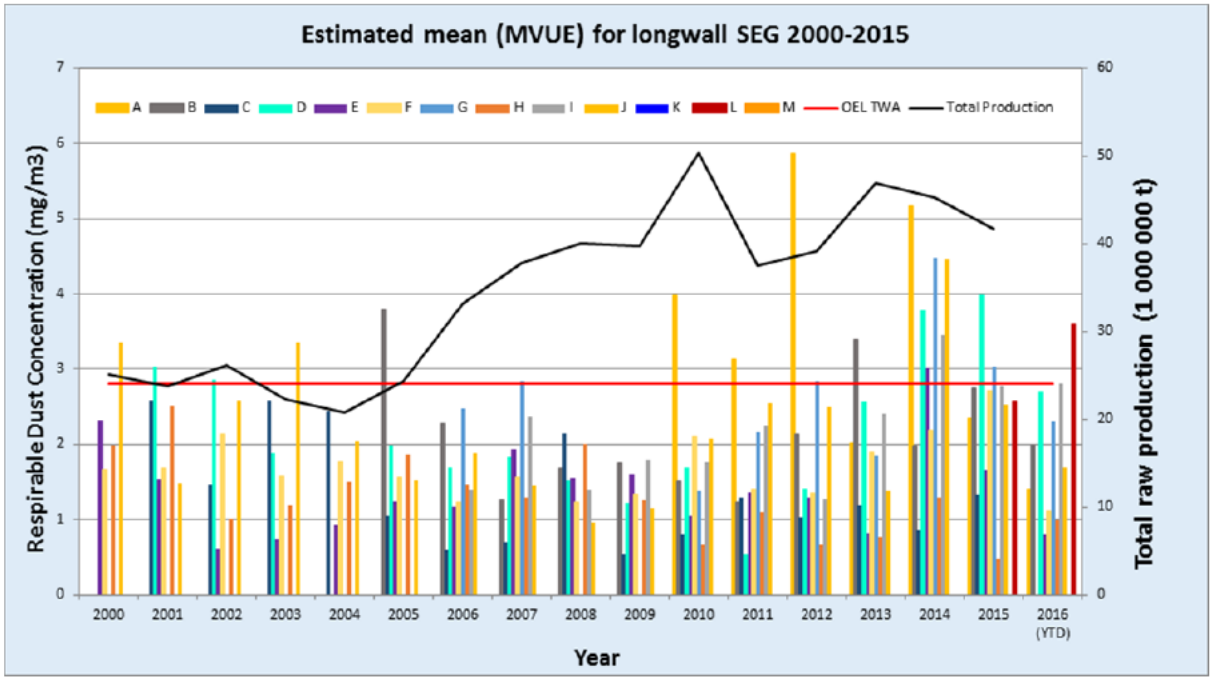
## Mines Inspectorate's activity in dust management

The Mines Inspectorate regulates respirable coal dust levels utilising a range of compliance tools. It also focuses on other important occupational health hazards including: exposure to diesel particulate matter, respirable crystalline silica dust and polymeric chemicals. Key activities in recent times are described in the following table.

The inspectorate issued its first directive relating to respirable coal dust in 2013. Prior to this date, there were no concerns raised with the Mines Inspectorate about respirable dust. This is despite concerns about cases of CWP in the United States being raised with CMSHAC in early 2013.

| Timeline | Activity |
|---|---|
| 2008 | Presentation to SSHRs on dust monitoring programs and the importance of dust monitoring. This was part of a training program for SSHRs to assist them in their roles. |
| 2009 | Co-ordinated an assessment of managing hazards associated with airborne dust and gathered information on reporting and monitoring programs. |
| 2010 | Released a report giving guidance on the control of airborne dust hazards, the reporting and monitoring programs and the establishment of similar exposure groups (SEGs). |
| | Presented to SSHRs on conducting inspections in surface coal mines pertaining to dust. Presented to SSHRs on dust control technology for mobile equipment cabins. This was part of a training program for SSHRs to assist in their roles. |
| 2013 | Presented a number of occupational health issues to CMSHAC including dust exposure in coal mines. A key message of the presentation was the need to remain vigilant in controlling dust. |
| | First Queensland mine introduced longwall top coal caving. |
| | Mines Inspectorate asked this mine to provide dust data due to concerns the new technology may generate more dust than conventional longwall mining. |
| | Mine unable to keep dust levels below adjusted regulatory limit and the Mines Inspectorate issued two directives to address the issue. |
| 2014 | Second mine introduced longwall top coal caving technology. |
| | Directive issued to this mine to reduce dust levels below adjusted regulatory limit. |
| | In September, all underground coal mines were requested to provide dust monitoring data covering the period 2012-14 after results at some conventional longwall mines showed respirable coal dust concentration levels were higher than the regulatory limit. |
| | Further directives were issued. |

| Timeline | Activity |
|---|---|
| | Chief Inspector of Coal Mines provided address to industry leaders raising Mines Inspectorate's concerns about respirable dust management. |
| 2015 | In October another review of underground dust data was completed. |
| | Further directives issued. |
| | At separate forums, dust monitoring data collected was presented to SSHRs and industry leaders where the importance of dust control and monitoring was emphasised and awareness on the compliance actions the Mines Inspectorate took. |
| | A safety alert was published regarding preventing dust-related lung diseases and recommended that mines audit and review their dust control measures. |
| 2016 | Inspectors provided information on respirable dust management at Explosion Risk Zone controller forums conducted at multiple locations across the Bowen Basin. |
| | In January all underground coal mines were requested to provide dust monitoring data for the period 2000-11. |
| | Following analysis the Mines Inspectorate combined this data with the data received for 2012-14 and presented it at the annual Queensland Mining Industry Health and Safety Conference in August 2016 (see below showing de-identified mine results for longwall worker exposure). |
| | Further directives issued. |




The Figure above shows the mean respirable dust concentration measured for workers in the longwall production area – termed the similar exposure group (SEG) over the sixteen year period 2000-15.

The data show that for the period 2000-13, 10 per cent of longwall SEGs were equal to or greater than the adjusted regulatory exposure limit. For the year 2014, 60 per cent of longwall SEGs were equal to or greater than the adjusted regulatory exposure limit. This number fell to 18 per cent of mines longwall SEGs equal to or greater than the adjusted regulatory limit, in the year 2015.

The longwall production area represents the highest risk group with respect to respirable coal dust exposure and as such has been the primary focus of the Mines Inspectorates field based inspection activities and compliance regime.

## Site inspections

Inspectors and inspection officers have the power to enter and inspect or audit mines under the *Coal Mining Safety and Health Act 1999*.

An inspection may be undertaken with or without prior notice depending on the purpose of the visit and the issue at hand. When notice is given, generally this is because it enables a mine site to make available key personnel and prepare necessary information about the safety and health management system for the inspector ahead of time to make the best use of time. It is also a requirement of the Mines Inspectorate's Mine Record Entry System to notify the workers' elected SSHR to provide them the opportunity to attend the inspection. Union representatives/ISHRs are also given the opportunity to accompany the inspector on inspections and they do frequently.

During the Select Committee's hearings, concerns have been raised that notifying the mine of an upcoming inspection will allow time for the mine to improve conditions of a mine in advance. While this could occur, in practice it is difficult for mines to achieve this. Inspectors are trained to identify risks, audit systems and to conduct interviews and investigations. When an inspector visits a mine they will review the safety and health management system and then test the system at the mine to look for evidence of the system being in place and to test its adequacy. Inspectors will also interview workers and management at the mine to learn about when the procedure was implemented or updated and how the procedure is implemented.

The following table summarises the number of inspections that have occurred during 2011 to 2016. [4]

| | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 |
|---|---|---|---|---|---|
| Inspections - announced | 1,387 | 1,451 | 1,487 | 1,431 | 1,598 |
| Inspections – unannounced | 136 | 127 | 135 | 102 | 162 |

[4] The figures for inspections have been taken from the Queensland Mines and Quarries – Safety Performance and Health Report 2015-16 (Safety Performance and Health Report). These figures may be different to the figures reported in the Commissioner for Mine Safety and Health – Queensland Mines Inspectorate Annual Performance Reports (Commissioner's report) as the Safety Performance and Health Report is finalised after publication of the Commissioner's report, based on an updated dataset. The figures for audits have been taken from the Commissioner's reports.

| | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 |
|---|---|---|---|---|---|
| Inspections – weekend or backshift | 8 | 13 | 12 | 10 | 17 |
| Inspections – unannounced weekend or backshift | 12 | 11 | 7 | 2 | 4 |
| Audits | 56 | 33 | 67 | 70 | 32 |

As detailed above, there were 1,781 inspections and 35 audits completed in 2015-16. The inspections undertaken included 103 inspections that related in some way to respirable dust in coal mines. Most of the 35 audits undertaken were concerning metalliferous mines or quarries, however four of the audits were of coal mines and three of these were to address dust concerns.

Audits are triggered from a number of sources ranging from the occurrence of high potential incidents or accidents through to scheduled audits that have arisen from site inspection outcomes. A reduction in audit numbers in 2015-16 from the previous year is largely due to Inspectors being focused on dust management. The reduction from the previous year is also due to 142 more inspection days, and 59 more complaint investigation days being utilised than in the previous financial year.

Site inspections may also occur as a result from notification of an issue, which is generally raised from union or workers. The timeframe for responding to such notifications varies depending on the issue. Serious matters are investigated immediately. Likewise, it depends of the severity of the issue as to whether the Mines Inspector will notify the mine site of the inspection when an issue has been brought to the Inspector's attention.

## Regulatory role and compliance action

DNRM's compliance policy identifies a range of compliance options the Mines Inspectorate can use to enforce compliance. Options include issuing a directive, directing the SSE and the company's senior management to attend a compliance meeting and prosecution. The Mines Inspectorate will determine the most appropriate course of action on a case-by-case basis and follow a number of steps as outlined in the policy.

Prosecutions have a place in compliance and enforcement however, in responding to dust issues immediate and definitive action is more effective in preventing worker exposure to respirable dust. Given the delays and uncertainty inherent to prosecutions, it is considered to be less effective than other compliance powers provided to inspectors under the Act. However, prosecution is always an option that is considered in determining what compliance action is appropriate to be taken in any particular instance of alleged non-compliance. The decision on which compliance option is more appropriate will always be made in consideration of the specific circumstances.

Since 2013, the Mines Inspectorate has issued 38 directives to nine underground coal mines in relation to dust, including requiring a mine to review its safety and health management system, review the effectiveness of dust controls, reduce cutting speed and suspend operations on two occasions.

Suspending operations may seem like an intuitive option to bring dust concentration levels below 3mg/$m^3$ but the Mines Inspectorate must consider the many other hazards present at a mine site, especially for longwall operations, such as gas management, spontaneous combustion and geotechnical/strata problems before directing a mine to suspend operations. In some cases the safest option may be to allow a mine to complete its production activities on a longwall panel before suspending the operation to address dust levels.

When the Mines Inspectorate issues a directive a mine will be required to address the matters outlined in the directive by a certain date. If a mine does not achieve compliance by the due date the SSE will attend a compliance meeting with the Mines Inspectorate to present data and explain why the directive could not been met. If an extension is provided, conditions may be placed on the mine, including increased monitoring frequency and regular updates to the District Inspector. This will include a review of respirable dust exposure data and the mines progress against key milestones. Extending a directive does not in any way reflect a relaxing of enforcement action; rather it is an escalation of the process.

If compliance has not been achieved by the extension date, the SSE and an operator's representative must meet with the Chief Inspector. The SSE must provide a commitment to the Chief Inspector to achieve compliance by an agreed date. The Chief Inspector will outline the options available to the Mines Inspectorate if compliance is not achieved by the due date. The options could include issuing a directive to reduce shearer speed, to reduce exposure time of key personnel and hours cutting (until compliance demonstrated) and to stop production until appropriate actions are implemented.

On other occasions the Mines Inspectorate may choose to extend the directive because the mine is not at full production and therefore cannot provide results to the Inspectorate showing dust levels at full production. For example, the Mines Inspectorate has kept a directive open even though the results of monitoring showed the dust levels at the mine was below 3mg/$m^3$. This is because the mine has not been in full production during this period.

There may be occasions where mines achieve compliance by the due date but the Inspectorate will keep the directive open to continue monitoring the mine's dust levels to ensure sustained compliance. The Mines Inspectorate will not close a directive based on one set of compliant data. Generally, the Mines Inspectorate requires sustained compliance dust data for three months before the directive is closed. In one case, a mine under a directive has provided data for two months demonstrating compliance but have not for the third month because there has been no production activity. In this case the directive remains open.

Directives and compliance meetings are demonstrated effective ways to achieve an immediate response from mines and to enforce compliance. While the Mines Inspectorate can also prosecute mines for breaching safety and health obligations, such as failing to ensure the occupational exposure limit is not exceeded, this option is not considered to be the most effective compliance tool in the case of managing dust. Prosecution is a lengthy process that does not address the immediate problem and will divert the Mines Inspectorate and the mines' resources from addressing the issue at hand.

Issuing directives and taking mines through a compliance process requires immediate response from the mine aimed at correcting the deficiency and changing behaviour. It requires the mine to focus its attention and resources on minimising risk to workers.

Issuing directives can be an effective means of deterring substandard safety practice as their implementation can have a significant financial impact on the mine. For example, a directive may call for engineering modifications requiring significant expenditure. The impacts on cash flow and lost revenue where operations are slowed or suspended can also be significant. By contrast, if a mine were to be prosecuted for breaching a safety and health obligation, the maximum penalty is currently $91,425.

## Dust monitoring

### Dust exposure levels

According to Safe Work Australia, "workplace exposure 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. Exposure standards are legal concentration limits that must be adhered to."[5]

Respirable dust, as outlined by Safe Work Australia, has a time-weighted average (TWA) occupational exposure standard. Safe Work Australia and the Australian Institute of Occupational Hygienists define that a TWA exposure standard is applied to long term exposure to a substance over an eight hour work shift (with a consequent 16 hour break between successive shifts), for a five-day working week, over an entire working life. It is these work patterns for which most epidemiological studies are available and upon which the exposure standards are determined.[6]

In Queensland, under section 89 of the Coal Mining Safety and Health Regulation, coal mines must ensure respirable coal dust in the atmosphere does not exceed an average concentration of 3 milligrams per cubic metre (3mg/$m^3$) for an eight hour period calculated under Australian Standard 2985: Workplace atmospheres – method for sampling and gravimetric determination of respirable dust. This is based on the workplace exposure standards set by Safe Work Australia.

Section 89 also requires mines to adjust the occupational exposure limit for longer shift cycles so that the person's dosage of respirable dust is not more than the equivalent dosage for a person working an eight hour shift. The most common adjusted exposure limit used in Queensland coal mines is 2.8 mg/$m^3$.

### Requirements for dust monitoring

Queensland has a risk based approach to determine sampling frequency but amendments to the regulation commencing on 1 January 2017, will prescribe the minimum frequency for two high risk

[5] http://www.safeworkaustralia.gov.au/sites/swa/whs-information/hazardous-chemicals/exposure-standards/pages/airborne-contaminants
[6] https://www.aioh.org.au/documents/item/14

similar exposure groups in the longwall and development production areas. The sampling represents leading practice in occupational health.

Legislation requires that Queensland mines must carry out respirable dust monitoring in accordance with Australian Standard (AS2985). This standard requires gravimetric sampling with size selective cyclone to capture only the respirable dust fraction, which is less than 10 microns in diameter. Gravimetric sampling require filters to be weighed in an accredited laboratory, the results of which may take up to two weeks to be received by the mine.

**Real time monitoring**

Real time monitoring is extensively used in underground mines in the United States and South Africa but the technology has not been deemed IECEx[7] approved as intrinsically safe for use in Australian mines. Before a piece of equipment, technology or machinery can be used in an underground coal mine in Queensland it must be deemed intrinsically safe. That is, it will not be a source of ignition either through creating a spark or a hot surface in an environment where the presence of methane can create an explosive atmosphere. As noted in the overview of the coal industry, many of the underground coal mines in the Bowen Basin contain methane gas, which must be removed in order to ensure safe mining operations. Removal of methane gas is achieved by de-watering (pumping water out of the coal seams). This has the effect of removing moisture from the coal, which can make it more prone to dust generation during production (cutting and transportation).

While there are benefits of real time monitoring, the limitations of real-time monitoring devices must be acknowledged and understood when employed to measure dust concentrations. The most important limitation of real-time monitoring relates to the way direct reading instruments calculate the mass of the particles being sampled. For example, a common direct reading instrument such as a laser photometer counts the number of aerosol particles in a sample of air. The mass of the aerosol particles is then calculated based on the properties of the calibration aerosol and converted to a dust concentration measurement based on the volume of the air sampled.

Another form of direct reading instrument is the tapered element oscillating microbalance (TEOM) which is now commonly used technology overseas for personal dust monitors. The mass of aerosol particles is calculated by monitoring the frequency changes in a vibrating tapered element. Again this mass is then converted to a dust concentration measurement based on the volume of air sampled.

Neither laser photometry nor TEOM determine mass gravimetrically in accordance with AS2985. Therefore, measurements from these devices cannot be used to assess compliance with exposure limits and are indicative only.

Manufacturers and mining companies are working with SIMTARS to review and test products for intrinsic safety. A new unit that meets IECEx standards is expected to be 2-3 years away.

[7] International Electrotechnical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres (IECEx System)

**Difference between Queensland and NSW**

Prior to 2005, NSW also had a respirable dust limit of 3mg/m3. In 2004, AS2985 adopted a new sampling curve which required a change in the required sampling flow rate from 1.9 L/min to 2.2 L /min. It is understood Coal Services NSW concluded that this increase in flow rate would result in a change to the measured dust concentration and potentially result in an underestimation of the actual airborne exposure. This prompted NSW mines inspectorate to reduce their coal dust exposure standard down to 2.5 mg/$m^3$. Unlike Queensland, NSW does not require the exposure limit to be shift adjusted.

Monitoring of respirable dust in Queensland and NSW must be conducted in accordance with AS2985 but there are differences in sampling methods, including the proportion of the shift for which the sampling device must be worn, the location where the sampling device is worn on the worker and the locations in the mine where sampling is to occur. Due to these differences direct comparisons between New South Wales and Queensland are misleading

**Reviewing workplace exposure standards**

In 2015, Safe Work Australia (SWA) commenced the process to review workplace exposure standards for more than 600 airborne contaminants. As part of early stakeholder consultation, the Queensland Mines Inspectorate completed an information request from SWA noting its support for the review and interest in contaminants present at mine sites.

In 2016, SWA engaged Golder Associates Pty Ltd to undertake the technical components of the review which includes respirable coal dust, crystalline silica, and diesel particulate matter. This review process is to ensure worker health and safety in Australia is comparable with latest evidence and international best practice. DNRM is supportive of this process and continues to work with SWA. Any changes to exposure standards in Queensland for respirable coal dust will be informed by SWA's findings.

**Reporting of dust monitoring results**

The regulation requires that a mine's safety and health management system must provide for the monitoring and recording of dust concentration levels. The results must be kept in a location that is easily accessible by each worker at the mine and the records must be kept for 30 years. Inspectors visiting a site often find the results posted on the mine's notice board and accessible by workers. The Mines Inspectorate has not been made aware of a situation where workers have not been notified of the dust monitoring results.

## Actions to prevent disease

DNRM is putting in place a number of measures to strengthen respirable dust management requirements. The department has focussed its immediate attention on ensuring existing mines' respirable dust levels are within occupational exposure limit and at an acceptable level of risk, using the range of compliance tools discussed earlier in this submission.

Other measures include amendments to the regulatory framework, developing recognised standards on monitoring and controlling respirable dust and developing an occupational exposure database to enable surveillance and reporting.

**Mandatory reporting**

Amendments to the regulation have been developed together with employee and employer representatives. The changes, commencing on 1 January 2017, will strengthen respirable dust management requirements by requiring all coal mines to:

- regularly report dust monitoring records to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months
- advise inspectors every time dust concentrations exceed prescribed levels.

The amendments also outline the procedure to follow if dust concentration exceeds prescribed levels.

**Respirable dust database**

In preparation for commencement of the regulatory amendments, DNRM is developing a respirable dust database to enable surveillance and reporting. All coal mines (open cut and underground) will be required to report its quarterly dust data to the Mines Inspectorate.

DNRM will provide guidance material on how to submit personal respirable dust to the Mines Inspectorate. The database will enable the Mines Inspectorate to view compliance and industry trends as well as generate reports. CMSHAC will facilitate the review of the analysed reports generated from the quarterly records.

While the Mines Inspectorate currently publishes dust data in its annual report, it will publish quarterly data to increase the transparency and frequency of dust reporting.

**Recognised standards**

The Mines Inspectorate has been working with employee and employer representatives to develop two recognised standards for dust monitoring and control. While recognised standards are not mandatory they provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Mine operators may adopt other ways of managing risk, however, the methods adopted must be equivalent to, or better than, the way stated in the recognised standard. Subject to ministerial approval, it is anticipated that the recognised standard for *Monitoring respirable dust in coal mines* will be published in December 2016 and the standard for *Underground respirable dust control* will be published early 2017.

The dust monitoring standard will provide a standardised method for collecting respirable dust data. This will improve data quality and integrity and enable the Mines Inspectorate to oversee compliance with dust levels at the individual level, at the similar exposure group level, across an entire coal mining operation and across the coal mining industry – and take corrective action where needed.

The dust control standard aims to establish a systematic approach to the ongoing management and control of airborne dust, with significant input from sites who have effectively managed their levels of airborne respirable dust. It incorporates known principles of risk management, with an emphasis on a combination of engineering controls that have been shown to reduce airborne dust at a number of Queensland underground coal mines. The standard will focus on reducing the generation of airborne dust at the source and includes a number of elements for an overall comprehensive system to ensure the effectiveness of the dust control measures, and ongoing maintenance of controls.

**Senate Select Committee on Health**

On 28 April 2016, the Senate Select Committee on Health released its report on CWP. The report made 20 recommendations a number of which, particularly those relating to NMAs, are effectively being addressed through implementation of the Monash review recommendations. Other recommendations are addressed by the government's action on dust management as described previously in this section.

# Early detection of disease

While the department is committed to ensuring that respirable dust levels are as low as reasonably possible, it is critical that the regulatory framework relating to dust management is supported by an effective respiratory screening program to ensure that any new cases of CMDLD are detected early and affected workers are removed from ongoing exposure to respirable dust.

## Coal Mine Workers' Health Scheme

The Health Scheme aims to protect the health of Queensland coal mine workers by ensuring that all coal mine workers undergo periodic health assessments. The Health Scheme is regulated under chapter 2, part 6, division 2 of the *Coal Mining Safety and Health Regulation 2001*.

## Historical context

In December 1982, the Queensland Coal Board authorised the development of a coal miners' health scheme. A program to survey, by chest X-ray and lung function test, all colliery employees in Queensland commenced on 1 January 1983.

The subsequent Rathus-Abrahams report recommended a permanent health scheme for coal miners, and based on this recommendation, the Queensland Coal Board introduced the new Coal Industry Employees Health Scheme in May 1993, which formed the basis of the current Health Scheme.

In 1983, health surveillance in the Queensland coal mining industry was focussed on pre-employment screening for respiratory conditions and lung disease. Chest X-rays were only compulsory for persons entering the industry.

The Queensland coal mining industry and the health monitoring of its workforce was managed by the Queensland Coal Board until its abolition in 1997-98. Responsibility for administering the health scheme was then assigned to DNRM.

Between 2002 and 2003, a tripartite working group was established, reporting to a steering committee of departmental executives, to investigate and make recommendations on future directions of health surveillance of mine workers.

This resulted in the preparation of a report[8] which made various recommendations about the coal mine workers' health scheme and the health surveillance unit (HSU). These included recommendations that:

- the principal role of the HSU be focussed on the collection and analysis of adverse health assessment data, reporting the findings to industry for preventive action and facilitating epidemiological and other research where appropriate

[8] Review of the Health Surveillance Unit, 2003 (attached)

- legislative amendments be progressed to facilitate this role and to impose duties on key personnel to ensure appropriate health surveillance
- medical practitioners be appointed with duties defined in regulation
- an occupational physician be appointed to support the HSU on a part-time basis, with a panel of medical practitioners with experience in the mining and quarrying industries to be appointed on a permanent part-time basis.

Although a part-time occupational physician was appointed in 2004, the other recommendations of the working group were not fully implemented.

The department is not aware, nor do departmental records explain, why the recommendations of the working group were not fully implemented.

## Proposed Improvements

In 2013, DNRM released a regulatory impact statement (RIS) for consultation, which among other things proposed changes to the coal mine workers' health scheme. Some key features of the proposal were consistent with what would later be recommended in the Monash report. In summary, the RIS proposed:

> *Refocusing the Coal Mine Workers' Health Scheme to address the hazards such as dust and noise. This will enable the Mines Inspectorate to focus its efforts towards health surveillance activities to determine whether the work or the work environment at particular mines is harming the health of coal mine workers. In this way measures can be taken to address a hazard harming workers' health before it results in chronic illness.*[9]

The RIS also proposed a review of the qualifications and experience for medical practitioners and specific hazards as a focus of health surveillance[10]:

> *DNRM proposes to return the scheme to its original purpose, which was the health surveillance of those employed in the coal industry to ensure their health was not materially affected by their employment.*
>
> *DNRM instead should be concerning itself solely with a more simple health surveillance scheme to determine whether the work or the environment worked within are harming the short and long term health of coal mine workers.*
>
> *The regulator's concern is with the potential impact of mining work on workers and this is monitored through health surveillance assessments. The proposed health surveillance assessment will address health issues that historically have been affected by health hazards common to the industry, such as noise and dust.*

[9] Queensland's Mine Safety Framework Consultation Regulatory Impact Statement p. xiii (https://www.dnrm.qld.gov.au/__data/assets/pdf_file/0008/197369/mine-safety-framework-ris.pdf)
[10] Queensland's Mine Safety Framework Consultation Regulatory Impact Statement pp. 104-5

*The assessment should include work history, a respiratory questionnaire, lung function tests, chest x-ray and audiometry.*

These changes did not progress due to a lack of tripartite support.

All published responses to the RIS can be accessed at https://www.dnrm.qld.gov.au/our-department/corporate-information/policies-initiatives/mining-resources/legislative-reforms/qld-mine-safety-framework.

## Screening requirements

The current Health Scheme requires all coal mine workers' (other than those workers employed for a low risk task) to undergo a health assessment prior to the start of their employment and then at least once every five years of their employment. These health assessments require lung function tests (spirometry) and, where there is a risk of dust exposure, chest X-rays. Medical examinations are performed under the supervision of a doctor engaged by the employer known as the Nominated Medical Adviser (NMA). Medical records are sent to DNRM for storage, and must be made available to the worker upon request.

NMAs ordering chest X-rays are expected to provide sufficient information to the radiologist, outlining the workers' coal dust exposure and the need to assess the X-ray for CMDLD to the ILO classification.

The Royal Australian and New Zealand College of Radiologists (RANZCR) has prepared a register of clinical radiologists who are available to report on chest X-rays for CWP in line with the ILO classification. The criteria for radiologists to be listed on the register include the following:

- experience in reporting screening radiographs for pneumoconiosis
- familiarity with the ILO classification and willing to report using the classification
- sufficient caseload of referrals to maintain their competence in this area.

Since 27 July 2016, all chest X-ray reports must be completed using the prescribed ILO reporting template.

In practice all underground coal workers receive a chest X-ray at least once every five years. Approximately 30 per cent of open-cut workers have had a chest X-ray under the Health Scheme.

From 1 January 2017, regulatory amendments will commence that clarify and broaden the health assessment requirements to ensure:

- all new coal mine workers receive a chest X-ray on entry to the coal mining industry
- chest X-ray examinations for aboveground coal mine workers occur at least once every 10 years
- chest X-ray examinations for underground coal mine workers (and former underground workers working aboveground) occur at least once every five years

- A retiring worker who has not had a medical examination (including a respiratory examination or chest X-ray) in the last three years, can request a retirement examination[11].

## Monash review

In January 2016, the Minister for State Development and Minister for Natural Resources and Mines released a five-point plan, including engaging Centre for Occupational and Environmental Health at Monash University to undertake a review. The review was commissioned to ensure that future actions were informed by evidence, data and relevant expertise.

The final report, released 13 July 2016, found structural failings in the design and operation of the respiratory component of the Health Scheme. In particular, the report identified concerns regarding the quality, reading and reporting of chest X-rays; the quality and reading of spirometry; failings in the handling of health assessment records; and the failure of the Health Scheme to adequately survey the respiratory health of the workforce.

## DNRM's response

DNRM supports all 18 recommendations of the Monash review in order to protect the health of coal mine workers and to restore workers' confidence in the Health Scheme.

In order to operationalise the recommendations, the department is working on five key areas:

- chest X-rays
- spirometry
- medical practitioners
- surveillance
- digital records management.

## Stakeholder engagement

A key feature of the mines safety and health framework, is a commitment to a tripartite approach between unions, industry and government to ensure all parties participate in developing strategies for improving safety and health. With this approach in mind, DNRM is working with industry, unions, government and medical professionals to implement the recommendations.

CMSHAC is the statutory committee that provides advice to the Minister in relation to the safety and health of coal mine workers. The committee includes representatives of industry, unions and government and has been tasked with oversighting the reform of the Health Scheme and is actively engaged in the progress of reforms.

The department regularly meets with union representatives to discuss proposed reforms and to discuss other issues related to the administration of the Health Scheme and the wellbeing of workers

[11] s. 49A, Coal Mining Safety and Health Regulation 2001

diagnosed with CWP. DNRM acknowledges the role that employee representative groups have had in raising awareness about CWP with workers and in working with other stakeholders in progressing solutions.

The department has also been working closely with coal operators and Queensland Resources Council (QRC) and would like to acknowledge the industry's commitment to the health and safety of its workforce and commitment to work with government to improve the Health Scheme and to the development of a best practice screening program.

On 12 July 2016, all underground coal operating companies committed, in a joint letter, to support the actions of government to address CWP (see **Annex C**). This included a commitment to support the recommendations of the Monash Review, to support government steps to implement reform and to provide voluntary chest X-ray re-screening to any underground worker concerned about their respiratory health.

Since this time individual companies have introduced programs to support retired workers who may also be concerned with their respiratory health and are covering the cost of health assessments and associated tests including chest X-rays.

The department also continues to engage closely with the peak medical bodies and regularly seeks advice from a range of medical specialists to assist the development of options to improve the respiratory screening program.

## Awareness

To raise awareness of CWP, the department provided materials to mine sites for display and distribution to workers. This included fact sheets with information about CWP, and posters and post cards encouraging miners to talk to their GP if they had any health concerns.

Materials were also distributed via professional medical peak bodies and key health industry stakeholders. Queensland Health facilitated the distribution of information about the disease to health professionals through its medical practitioner network.

In June and July 2016, these efforts were supported by a bi-weekly advertising campaign in regional newspapers throughout Queensland's coal mining regions. Further targeted campaigns are being planned to raise awareness amongst retired workers. These campaigns will encourage workers to obtain medical advice if they have any concerns. They will be supported by factsheets and information on the departments' website. Additionally, a number of mining companies are also engaging with their retired workers to offer health checks to those who are concerned about their respiratory health.

To ensure that medical professionals, including NMAs and general practitioners are supported and informed, the department has produced a number of fact sheets to provide guidance about the disease and to build their understanding of the ILO classification framework. Materials were distributed via professional medical peak bodies and key health industry stakeholders.

## Summary of key events

| Timeline | Event or action |
|---|---|
| 13 May 2015 | DNRM confirms case 1 |
| 14 January 2016 | Minister Lynham announces five point plan to address CWP including engaging Monash University's Centre for Occupational and Environment Health to conduct an independent review of the respiratory component of the Health Scheme |
| 4 March 2016 | RANZCR releases register of Radiologists experienced in reading for pneumoconiosis |
| 31 March 2016 | Interim report of the Monash Review of the Respiratory Component of the Coal Mine Workers' Health Scheme is released |
| 8 April 2016 | Minister Lynham commits to immediate actions in response to the interim report in regard to introducing minimum standards, training and experience requirements for nominated medical advisers |
| 26 April 2016 | Minister Lynham requests recognised standard on dust monitoring via CMSHAC |
| 28 April 2016 | Senate Select Committee release report: Black Lung "It buggered my life" |
| 10 May 2016 | Health Surveillance Unit changed chest X-ray requirements to be digital only to support ILO standard; and new requirement for spirometry to adhere to Queensland Health: Spirometry (Adult) Guideline |
| 12 July 2016 | All 8 underground coal mining businesses commit to offering workers concerned about their respiratory health new checks on current X-rays or fresh X-rays if the X-ray was taken more than two years ago |
| 13 July 2016 | Monash report released; Minister announces three key actions: prevention; early detection and safety net for workers with CWP |
| 27 July 2016 | Chest X-ray dual reading commences for all chest X-rays taken under the Health Scheme. As an interim measure, X-rays are dual read by US based NIOSH approved readers |
| 5 August 2016 | First X-ray sent to the US for dual reading |
| 18 August 2016 | Queensland Government commits to parliamentary CWP inquiry |
| 19 August 2016 | Minister discusses the re-emergence of CWP at the 5th COAG Energy Council Meeting. All ministers commit to the health of coal mine workers and agree to collaborate to raise awareness among at risk former coal mine workers |
| 30 August 2016 | CMSHAC agree to strategic principles for CWP policy reform |
| 15 September 2016 | Queensland Parliament appoints a six-person Parliamentary select committee to inquire into how CWP re-emerged and how to prevent it |
| 29 September 2016 | Mining Safety and Health Legislation (CWP and Other Matters) Amendment Regulation 2016 made by Executive Council |

| Timeline | Event or action |
|---|---|
| 12 October 2016 | WorkCover signs MOU with DNRM to ensure any cases of CMDLD are reported to DNRM |
| 27 October 2016 | DNRM releases a chest X-ray consultation paper including proposed delivery model |
| 7 November 2016 | DNRM appoints a new Occupational Physician |
| 17 November 2016 | Chest X-ray consultation period closed (16 submissions were received) |
| 1 January 2017 | Commencement of amendment regulation |

# Records management and surveillance

## Monash review

DNRM acknowledges that there is much to do to modernise the approach to data management and surveillance of worker health assessment. The department accepts the findings of the Monash review and the opportunity to significantly improve its' surveillance capability to ensure data from the Health Scheme is regularly analysed and used to inform future actions.

The review identified that the scheme is not being used for group health surveillance and recommended that DNRM monitor and analyse trends and communicate these with stakeholders. The report made a number of recommendations relating to surveillance. Broadly, these were:

- to include surveillance in the purpose of the Health Scheme
- improve the acquisition and archiving of digital chest X-rays
- maintain a register of workers at risk from dust exposure
- DNRM should conduct ongoing individual and group surveillance of health data collected under the scheme
- include current and former coal mine workers, including retirees

The Monash review also noted that there are very few models for comprehensive surveillance of occupational disease in Australia.

The Monash review highlighted that the current health assessment record management and transfer processes were inefficient and paper-based, that there was no medical audit of collected data, there were barriers to retrieval of records, and there was a backlog of "about 100,000" records awaiting entry into the DNRM database.

The review found that the HSU performs an administrative check of the health assessment forms for missing information, but there is no medical review or audit of the collected health data.

The review recommended a transition to an electronic system of data entry and storage, including the ability for NMAs to directly enter and retrieve health assessment data, and implementation of a regular audit function.

## Health Surveillance Unit

The HSU is responsible for collecting and maintaining the records for the Health Scheme. The HSU reports to the Executive Director, Mine Safety and Health and currently has 10.5 FTEs including temporary staff appointed to address data entry backlogs. The department engaged the additional staff to clear the backlog of health assessment forms to ensure all workers' health records are entered or scanned into the database by end of June 2017. Included within the HSU is the department's Occupational Physician.

## Worker records

As part of the Health Scheme, the department is responsible for holding or storing a copy of a workers' health record. Under the regulation, NMAs must provide DNRM with completed health assessments and any chest X-rays and other reports obtained in the course of the health assessment for storage. Importantly under the regulation, the department does not have a diagnostic role or function. It is the role of the NMA to identify and detect disease and where detected to work with an affected worker and other medical specialists to identify appropriate treatment pathways.

It is estimated that the department holds a total of 395,500 health records for 135,400 workers for the period commencing January 1983 up to and including 14 October 2016. This includes records of health assessments conducted under the current Health Scheme and under the Queensland Coal Board (QCB). Records held include health assessment forms, chest X-rays (digital and analogue), chest X-ray reports, spirometry reports and spirographs.

Currently the department receives on average 300-400 health assessment records each week (not including X-rays received for dual reading by the University of Illinois at Chicago).

DNRM has consolidated its storage of coal workers records. Records are now held by or on behalf of DNRM at four storage facilities in the greater Brisbane area at Eagle Farm; Redbank; Stafford and by an information management service provider, Recall, at their facilities at Geebung and Acacia Ridge. Each location is a secure facility.

While all records are not recorded in the department's database, all records in all facilities are indexed so that the department can determine if a record for a worker is held and at which site. This enables a worker to request a copy of their health records at any time and for DNRM to retrieve those records. It should also be noted that the Health Scheme specifically provides for workers to access their records, so workers do not need to lodge a Right to Information request to gain access.

As current health assessments are received, details of the respiratory assessment and other identifiers are added to the database and reports, digital X-rays and spirographs are also attached digitally to the file.

## Backlog

DNRM is well advanced in clearing the significant data entry backlog identified in the Monash review, which emerged during the period of the mining boom and covers a period of approximately 10 years.

Since May 2016, the department has entered key identifiers and respiratory data from over 80,000 worker records into the electronic database, prioritising underground workers. By July 2016, key identifiers and respiratory for all underground workers had been entered. The department is currently working to process the remaining unentered records and it is anticipated that key identifiers and respiratory data for all records will be entered by 30 June 2017.

## Rathus and Abrahams report

The 1983-84 Rathus and Abrahams survey assessed over 7,000 coal workers to "identify the incidence and severity of lung disorders which may be related to coal mining and to seek recommendations for future direction". 499 miners workers were identified with abnormal X-rays.

The Rathus and Abrahams report states that appropriate action was taken to notify each of the 499 workers with abnormal X-rays and indicates that 102 received a more complete follow up and 75 were classified as CWP. The Queensland Coal Board Annual Report for the year ended 30 June 1984 stated that all workers were contacted about their individual X-ray results. It should also be noted that the 1984-85 Queensland Coal Board Annual Report indicates on page 33, that workers who were advised of an abnormality were again contacted.

When the Queensland Coal Board was dissolved, its functions and records were transferred to the then Department of Mines and Energy. Since the CWP select committee's inquiry began, DNRM has been continuing investigations to attempt to identify complete details of the workers the subject of the Rathus and Abrahams survey.

The department has identified some workers who were the subject of the Rathus and Abrahams survey. Their records expressly indicate that the X-rays were provided to Queensland Health at the time of the survey. Queensland Health has advised that a check against the destruction register of the Metro South Clinical Tuberculosis Service shows that X-rays from this time have been destroyed. DNRM however does hold the health assessment records – apart from the chest X-rays – of all workers. DNRM continues to work with Queensland Health to better understand the circumstances of these workers' records.

A letter from the doctors Rathus and Abrahams to the then Director of Medical Services of the United Kingdom's National Coal Board, makes observations about the survey.

The letter outlines some limitations the doctors observed in the survey and states:

> "*We probably over-diagnosed the lower grades of pneumoconiosis and this was deliberate – to identify individuals requiring follow-up."*

## An improved electronic records management system

DNRM intends to manage coal worker health data and enable surveillance through an improved electronic records system that digitally holds a coal worker's records.

DNRM is already implementing interim improvements to its existing records management capability. Recent amendments have increased auditing and reporting capability particularly in regard to chest X-ray dual reading.

Longer-term, DNRM will invest in an improved system that enables improved records management and data analysis and maintains best practice security and privacy standards. To ensure that the improved system is fit for purpose, final design requirements will be determined once policy enhancements to the Health Scheme are finalised.

Work-to-date has identified a number of potential improvements. Work is already proceeding to enable a staged implementation – prioritising direct access by NMAs – to deliver the anticipated benefits of online transactions for worker health assessments. Work is also being done to explore the potential of linking an improved system to the MyHealth system – the Australian Government health record initiative - to allow health information gathered under the coal mine workers health scheme to be linked to their other personal health records.

DNRM is investigating options to allow NMAs to directly enter health data from their practice software, with auto-validation of data as it is entered to ensure completeness and consistency. This will reduce the manual handling requirements for NMAs and departmental staff and improve data quality. The system will also allow NMAs to compare and retrieve worker records including historical chest X-ray images and reports.

Data will be captured and presented in a manner that supports industry-wide health surveillance. For example, each coal worker will have a unique reference number so that their health can be tracked and monitored throughout their career, across multiple employers and medical practitioners, and into retirement.

Where possible, the improved system will be compatible with other relevant systems, such as X-ray service providers. It will also be flexible and scalable to ensure that it can adapt to and meet future requirements.

DNRM is currently identifying system implementation options, and is working towards an initial suite of system improvements by mid-2017, with the timing of further system improvements to complement enhancements to the broader Heath Scheme.

## A future surveillance model

DNRM is actively working to design an effective surveillance model for the Health Scheme that informs efforts to prevent CMDLDs. The surveillance model will complement the respiratory screening program by surveying the health of the entire workforce to monitor for emerging patterns and trends.

DNRM will apply an ‘enhanced surveillance’ approach whereby clinical results are combined with other data including dust monitoring and occupational history to better identify rates of occurrence, and any trends or common factors. This will be supported by a unique reference number for coal mine workers.

Recognition of a workers excessive exposure should not be an end in itself but a means to improve future preventative efforts. DNRM is focussed on applying the results of surveillance to CMDLD prevention. Surveillance results will guide future decision making regarding mine safety and health. It is anticipated that the department will develop a multi-disciplinary governance model to recommend appropriate responses to surveillance outcomes. Surveillance results and the actions taken in response to these results will be regularly reported.

Surveillance will be underpinned by valid, reliable data that is appropriately managed through an improved electronic records system. The system will contain all information necessary for surveillance, and have the capability to make this information available for analysis as required.

It is anticipated that the department may seek to partner with an external provider, such as a university school with a speciality in occupational health surveillance, to undertake best practice data analysis.

At this preliminary stage, it is anticipated that the future surveillance model will capture sufficient data to enable surveillance of all forms of CMDLD and will be sufficiently flexible to enable the scope to be extended to other health related worker data as appropriate.

# Chest X-rays

High quality chest X-rays are a key component of the respiratory screening program. Chest X-rays, along with spirometry, are two key tests that are used to screen workers and identify changes that may indicate CMDLD.

To restore worker confidence, the department has put significant focus on improvements to the chest X-ray component, with improvements being progressively implemented from May 2016 with the introduction of mandatory ILO reporting.

## Monash chest X-ray review

The chest X-ray component of the Monash review was undertaken by a team at the University of Illinois at Chicago (UIC) under the supervision of Professor Robert Cohen.

In setting the scope for the review the department deliberately sought to target the incidence of disease amongst those workers at greatest risk (those with the greatest length of potential exposure).

The review assessed chest X-rays from 248 coal mine workers with more than 10 years of underground experience and identified:

- 18 cases of possible simple CWP that required further investigation.
- Of these, only two of the 15 available original X-ray reports by radiologists identified features that could be interpreted as CWP. In neither of these two possible cases did the NMA record a finding of possible CWP, nor was any recommendation made regarding fitness for work from a respiratory point of view.
- A higher than acceptable portion of X-ray images had quality issues which could affect the accurate detection of small opacities characteristic of CWP (e.g. 20 per cent had issues resulting from poor positioning, poor contrast and excessive edge enhancement and 15 per cent had issues related to digital processing).

Following the receipt of the report, all 18 workers with possible simple CWP were contacted through either their NMA or by the department's occupational physician. To date, two of these workers have been confirmed as having simple CWP, 14 have been cleared of CWP, and two are progressively undergoing further testing in consultation with their medical practitioners.

## Monash recommendations

The Monash review recommended:

- Chest X-rays should be performed by appropriately trained staff (i.e. qualified radiographers) and read to the ILO classification
- Additional training and evaluation should be provided in the use of the ILO classification for radiologists and respiratory physicians who seek to classify chest X-rays – e.g. NIOSH B Reader program

- X-rays should be read by a selected group of medical practitioners and by at least two separate readers (a dual or two-reader process)
- Radiology clinics should be provided with technical guidelines detailing specifications for imaging equipment, software, image acquisition and display and quality control systems
- Ongoing clinical auditing or X-ray screening
- Ensure feedback is provided to coal mine workers on screening outcomes
- Improve the acquisition and archiving of digital X-rays by DNRM to facilitate surveillance.

## DNRMs immediate response

Several steps to improve the X-ray component of the Health Scheme have been taken by the department, industry and the medical profession:

- All new X-rays taken under the Health Scheme must be in a digital format – DNRM no longer accepts analogue X-ray films.
- NMAs must clearly identify when they refer workers for a chest X-ray that it is for screening under the Health Scheme.
- Radiologists must report on a prescribed ILO reporting form.
- RANZCR introduced a register of clinical radiologists who are available to report on chest X-rays for CWP in line with the ILO classification. The register currently has 40 clinical radiologists, with 24 based in Queensland.
- All of Queensland coal operating companies committed to provide voluntary X-ray re-screening to any underground worker concerned about their respiratory health.
- On 27 July 2016, an interim dual-screening process was introduced. All chest X-rays taken under the Health Scheme are first read by an Australian radiologist to the ILO classification and then assessed by NIOSH approved readers at the UIC.

As at 6 December 2016, the department has sent 1,920 chest X-rays to the United States for dual reading. This has included X-rays from:

- current workers going through regular screening
- those who are voluntarily seeking to have their chest X-rays re-read
- retired workers and those who have left the industry.

The process for coordinating the sending of X-rays to the United States is administered by DNRM through a secure electronic file transfer.

The dual read by the UIC is independent of the first read – in that the US based readers do not have knowledge of the first readers report (blind reading). US based reading sees all X-rays read by a minimum of two US readers and then a third if adjudication is required. One ILO report is subsequently issued from the US.

To ensure that no worker's health is disadvantaged by this process, the department has recommended that where a first read by an Australian radiologist identifies potential CMDLD, that a NMA should immediately refer the worker for a high resolution CT scan and not wait for the outcome of the dual read by the UIC. While further investigation continues for some workers, to date the dual reading process has not resulted in a new confirmed cases of CWP.

The cost of dual reading by US based readers is being met by the department.

## Queensland based X-ray screening

The department is committed to improving the quality of X-ray screening and ensuring the system is sustainable and effective.

Similar screening programs — BreastScreen Queensland, the Coal Workers' Health Surveillance Program in the United States and Coal Services NSW — have been analysed to compare features and determine what learnings can be applied in developing an improved X-ray screening program for Queensland coal mine workers.

This analysis suggests that a dual reading system by a small cohort of medical practitioners is optimal and would be consistent with the recommendations set out in the Monash review. It also identifies the importance of technical specifications and guidelines, along with quality assurance in ensuring consistency and proficiency.

DNRM is consulting with stakeholders on a proposed Queensland X-ray screening program that would be delivered by the private sector through a competitive tender process with technical requirements set by government. It is envisaged that this program would include a strong external audit component to ensure best practice in the taking and reading of X-rays is maintained. This service delivery model is consistent with the approach taken by Queensland Health, which frequently uses the private sector to deliver an array of health services.

The department is anticipates that under this model X-rays would be dual read to the ILO classification by radiologists who have successfully completed an ILO training program (such as the NIOSH B-reader program). Government would engage an independent external auditor to periodically review the quality of chest X-ray screening delivered by the service provider. Additionally the provider would be required to demonstrate a constant quality assurance program, including provision and training of staff regarding performance.

Preliminary feedback from company, worker and medical stakeholders is broadly supportive of the proposed model.

# Lung function testing (spirometry)

Spirometry is a lung function test that measures airflow from the lungs. All Queensland coal mine workers undergo spirometry administered by medical practitioners as part of their health assessments under the Health Scheme.

## Monash review

The Monash team reviewed a sample of 256 spirometry tests taken under the Health Scheme and also surveyed NMAs about their use of spirometry. Based upon this research, the final report identified significant issues with the spirometry screening.

The review team concluded that approximately 40 per cent of spirometry tests were poorly executed and did not enable meaningful interpretation. In addition, only 43 per cent of the spirometry results evaluated had been accurately interpreted and reported by NMAs.

The reviewers also concluded that respondents had a poor knowledge of the spirometry equipment, including quality control measures. For instance, 66 per cent of spirometers had not been calibrated in 2016, and only one-third of sites participated in ongoing quality assurance programs.

In relation to training, the reviewers concluded that spirometry training for testers was limited, with approximately two-thirds having completed a training course, but only one-third being able to specify the year of completion.

In summary, the report identified significant issues with the quality of the spirometry taken. This included the technical proficiency of those conducting tests and maintaining the equipment, and the ability of NMAs to interpret the data accurately.

The final report of the Monash review included a number of recommendations relating to spirometry:

- spirometry under the Health Scheme should be conducted at:
    - respiratory laboratories accredited by Thoracic Society of Australian and New Zealand (TSANZ) or similar bodies; or
    - medical facilities accredited specifically for spirometry
- scientists and technicians conducting tests under the Health Scheme should complete approved initial and on-going training in spirometry
- spirometry testing is undertaken as part of a quality control program consistent with the American Thoracic Society/European Respiratory Society standards
- the quality of spirometry tests should be regularly audited under the Health Scheme.

## DNRMs response

The department has taken several steps to improve the spirometry component of the scheme:

- A change was made to the health assessment form to clarify that spirometry must be undertaken by appropriately trained operators to the standard outlined in Queensland Health: Spirometry (Adult) Guideline[12]. This standard requires a comparative assessment with

- A change was made to require copies of spirometry reports to be provided to the department along with the health assessment form. The purpose of this change was to ensure medical practitioners can access previous spirograms, including those from other medical practices, in order to identify any changes in the individual's lung function over time.

In addition, amendments to the *Coal Mining Safety and Health Regulation 2001*, which are due to commence on 1 January 2017, will further clarify that:

- a health assessment must include an examination of the person's respiratory function (i.e. spirometry) on entry into the coal mining industry, at least every 10 years for aboveground workers, and at least every five years for underground workers

- respiratory function examinations undertaken as part of periodic health assessments will include a comparative assessment with previous respiratory function results where available

- all medical examinations will be performed by a person qualified and competent to conduct the examination.

Although spirometry standards and training programs are currently available for practitioners, the Monash review found inconsistent practice in the area of spirometry. This provides a compelling argument for further intervention to improve the testing and interpretation of spirometry undertaken for the Health Scheme, in order to assist in the early detection of CMDLDs.

The Monash review team recommended that spirometry under the Health Scheme should be conducted at either respiratory laboratories accredited by TSANZ or similar bodies, or medical facilities accredited specifically for spirometry.

Although the use of existing TSANZ accredited laboratories for spirometry would ensure that testing is carried out in accordance with rigorous scientific standards, DNRM notes that nine out of the 10 current accredited laboratories are found in the Brisbane and Gold Coast areas. In addition, this TSANZ accreditation program was established to accredit respiratory laboratories, which typically conduct 15 - 20 spirometry tests per day[13] as well as other advanced respiratory procedures.

There are currently around 29,000 coal mine workers in Queensland, working at 54 coal mines across Queensland. A proportion of these workers operate under Fly-In, Fly-Out arrangements, however, many live in regional Queensland close to the mine sites.

NMAs under the Health Scheme are similarly distributed across Queensland, as well and other states and territories, and provide convenient services to coal mine workers in their areas. Records held by the DNRM Health Surveillance Unit clarify that 165 different NMAs undertook health assessments under the Health Scheme in 2015-16. However, approximately half of the assessments

[12] https://www.health.qld.gov.au/qhpolicy/docs/gdl/qh-gdl-386.pdf
[13] Monash review final report, page 54.

in that year were undertaken by only 10 NMAs, who operated from locations around the greater Mackay and Brisbane areas.

This regional distribution of workers and their NMAs, along with the concentration of assessments at particular practices, suggests that a spirometry specific accreditation program for general medical practices and occupational health clinics is the most practical option for consideration by government.

Consequently, the department has been working with TSANZ to identify options for a practice-based, spirometry accreditation program for those NMAs in general medical practices and occupational health clinics – with a focus on improving quality of spirometry and interpretation of results.

A consultation paper is currently being prepared by the department that outlines a delivery model for a practice-based accreditation program for those seeking to undertake spirometry under the Health Scheme. The paper will cover matters such as training for those administering the tests, spirometry equipment and quality control, and clinical audit as part of the program.

Feedback from stakeholders on the paper will inform the further development of a preferred option that will be presented to CMSHAC and the Queensland Government for consideration.

# Nominated Medical Advisers

Nominated Medical Advisers (NMAs) are the medical practitioners who undertake the medical assessment of workers under the scheme.

## Coal Mine Workers' Health Scheme

Under the Regulation, NMAs are appointed by employers (mining operators and contractors) and must conduct a health assessment of coal mine workers in accordance with the provisions of the health scheme.

Whilst all NMAs must be registered and maintain registration with the Australian Health Practitioner Registration Agency there is currently no prescribed minimum qualifications for NMAs nor any requirements that NMAs must be experienced in occupational medicine or be familiar with coal mining operations.

All appointments of NMAs are notified to the department by employers (mining operators and contractors). The department maintains a list of NMAs but has no role under current legislation in approving the appointment of NMAs nor does it currently assess doctor's qualifications or experience.

The current legislative framework provides that the employer must contract the appointment of the NMA and that the contract must require that the NMA must discuss, and give advice about, appropriate duties for the worker. The legislation further requires that the employer must also include in the contract an obligation on the NMA, if asked by a worker, to discuss the worker's health assessment with another doctor nominated by the worker.

## Monash review

The Monash review identified that there were over 200 NMAs registered to undertake health assessments, with the majority located in Brisbane, Mackay, Rockhampton, Sunshine Coast and the Gold Coast. The number of registered NMAs increased during the mining boom of the 2000s. Prior to the boom, the average number of NMAs was 40.

The Monash review highlighted that, of the registered NMAs, 146 were general practitioners. There were 57 medical practitioners with general registration practising in both Occupational Health Service and General Practice clinics. Only 12 per cent of NMAs are specialist occupational physicians.

As at 2 December 2016, the department has 243 registered NMAs, however, the majority of health assessments are performed by a small cohort of NMAs.

Since the commencement of the chest X-ray dual reading process in late July 2016, the department has observed that 10 NMAs are currently completing approximately half of all health assessments, with 22 NMAs completing two-thirds of assessments.

The Monash review made a number of recommendations in relation to respiratory health assessments and the doctors who undertake the assessments including:

- there should be a much smaller pool of doctors approved by DNRM

- doctors should receive formal training and visit mine sites and have necessary experience to undertake respiratory health assessments
- the role of the doctor undertaking respiratory assessments should be specifically defined and distinguished from NMAs.

## DNRMs response

To date the department has actively worked to ensure medical professionals involved in the industry are informed about the disease and changes made to improve the Health Scheme – including the introduction of dual chest X-ray reading.

Materials were distributed directly to NMAs and through professional medical peak bodies and key health industry stakeholders. Additionally Queensland Health facilitated the distribution of information about the disease to health professionals (targeting general practitioners) through its medical practitioner network.

A consultation paper on issues related to medical practitioners and assessments is currently under development. It is anticipated that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit.

It is anticipated that under an improved Health Scheme:

- the number of NMAs will be rationalised
- all medical practitioners performing respiratory health assessments will be required to have minimum qualifications including a level of training in occupational medicine
- all medical practitioners performing respiratory health assessments will be required to complete an induction program that will include familiarisation with coal mining practice; the ILO classification; and the interpretation of spirometry; emerging trends and the administration of the scheme
- All medical practitioners performing respiratory health assessments will be subject to a regular audit process
- The department will maintain a register of all medical practitioners performing respiratory health assessments.
- Induction and training will include advice on administration of the Health Scheme, CMDLDs, ILO reporting, spirometry, emerging trends, mining practices and guidance on appropriate diagnostic pathways
- A multi-disciplinary panel of medical practitioners will be formed to advise the department and support periodic auditing, quality assurance and surveillance of the health scheme.

## Role of the occupational physician

The department's occupational physician provides information and advice to NMAs to support them in carrying out their responsibilities under the Health Scheme. The occupational physician is also the point of contact for NMAs. The position is neither a statutory nor a clinical role, and there is no involvement in the diagnosis of diseases or a role in the ongoing medical care or treatment of affected workers. The role does not review completed health assessments that are submitted by NMAs.

In confirming a case of CWP, the occupational physician:

- confirms the diagnosis of CWP
- checks the diagnosis has been made by an appropriately qualified medical practitioner – typically a respiratory or thoracic physician.

The occupational physician does not undertake a clinical review or assessment of the diagnosis, but ensures that the diagnosis has been made by an appropriately qualified medical practitioner, for example a respiratory physician.

DNRM has recently recruited an occupational physician who will provide advice on the development of an effective health surveillance scheme and health surveillance policy and the ongoing requirements of in-house medical expertise.

It is also anticipated that the position will support the establishment and ongoing governance of a suitable multi-disciplinary panel of medical practitioners that will provide assistance in supporting the clinical audit of cases and the audit of the scheme including the performance of doctors who perform health assessments.

The newly appointed occupational physician has experience in the practice of occupational and environmental medicine, including work site experience and strong research interest in health surveillance. This includes experience in hazardous substance health surveillance.

## Role of NMAs

NMAs oversee the health assessment of coal mine workers to assess their fitness to undertake the role for which they are appointed. While an NMA is a doctor the NMA is not normally the coal mine workers' personal physician. Should the NMA identify a worker has a condition – for example, high blood pressure – they should refer a worker to their general practitioner for management.

If a worker is diagnosed with CWP their ongoing treatment and management will not, generally, be managed by the NMA. This role will be undertaken by a workers' personal physician.

# Conclusion

The department acknowledges the seriousness of CWP and is focussed on preventing all forms of CMDLD.

To better understand the failings of the Health Scheme, the department engaged the Centre for Occupational and Environmental Health at Monash University to conduct an independent review of the respiratory component of the scheme.

The department supports all 18 recommendations of this independent review and is now working to immediately operationalise the recommendations across five key themes: chest X-ray, spirometry, surveillance, medical assessments and practitioners, and electronic records management.

Key deliverables will include:

- New delivery model for chest x-rays to deliver a Queensland based ILO dual reading program
- Accreditation model for spirometry
- Clinical pathway for the diagnosis and ongoing management of CDMLD
- Guidelines on the capabilities and clinical skills required for nominated medical advisers
- Integrated, digitally accessible data record system for worker health management
- Audit of data collected on the respiratory health of coal mine workers
- A multi-disciplinary panel of medical practitioners
- Further targeted awareness campaigns for retired workers

The Mines Inspectorate continues to monitor compliance in relation to respirable coal dust levels in coal mines and take action as necessary. It is also working to progress the development of a respirable dust database to enable surveillance and reporting. This database will complement new regulatory arrangements for dust commencing in 2017 and will provide information which can be used to improve approaches to dust management generally.

Key deliverables will include:

- New regulation and recognised standards for dust management
- Release of the respirable dust database
- Commencement of quarterly dust reporting and publication of data online
- Establishment of standing dust committee to oversight industry performance
- Implementation of outcomes of the Safe Work Australia review of occupational exposure limits

The department is consulting with a wide range of industry, worker and medical stakeholders, to ensure sustainable and practical solutions that will restore confidence amongst coal mine workers, their families and communities.

The department welcomes the work of the Parliamentary Inquiry and will continue to support the important work of the Select Committee. This is a complex, long term and far reaching issue that requires legislative changes, process and systems reforms, as well as the efforts of many stakeholder groups.

The health and safety of all coal mine workers is the continued priority of the department.

# Acronyms and abbreviations used in this submission

| | |
|---|---|
| ADB | Air-dried basis |
| CFMEU | Construction, Forestry, Mining and Energy Union |
| CHPP | Coal handling and preparation plant |
| CMDLD | Coal Mine Dust Lung Disease |
| CMWHS | Coal Mine Workers' Health Scheme |
| CMSHAC | Coal Mining Safety and Health Advisory Committee |
| CMSHA | *Coal Mining Safety and Health Act 1999* |
| CMSHR | *Coal Mining Safety and Health Regulation 2001* |
| $CO_2$ | Carbon dioxide gas |
| COAG | Council of Australia Government |
| COPD | Chronic obstructive pulmonary disease |
| CWP | Coal worker's pneumoconiosis |
| DDT | Dead-weight tonnage |
| FTE | Full-time equivalent |
| HGI | Hardgrove Grindability Index |
| HSU | Health Surveillance Unit |
| IECEx | International Electro technical Commission System for Certification to Standards Relating to Equipment for Use in Explosive Atmospheres |
| ILO | International Labour Organisation |
| L/Min | litres per minute |
| LTCC | Longwall top coal caving |
| $Mg/m^3$ | milligram per cubic metre |
| MOU | Memorandum of Understanding |
| Mtpa | million tonnes per annum |

| | |
|---|---|
| MVUE | Minimum-variance unbiased estimator |
| NIOSH | National Institute for Occupational Safety and Health |
| PCI | Pulverized coal injection |
| PMF | Progressive massive fibrosis |
| PPE | Personal Protective Equipment |
| QCB | Queensland Coal Board |
| QRC | Queensland Resources Council |
| RANZCR | Royal Australian and New Zealand College of Radiologists |
| SSE | Site Senior Executive |
| SSHR | Site safety and Health Representative |
| ISHR | Industry Safety and Health Representative |
| RIS | Regulatory Impact Statement |
| RV | reflectivity |
| SEGS | Similar Exposure Groups |
| SIMTARS | Safety in Mines Testing and Research Station |
| SWA | Safe Work Australia |
| TEOM | Tapered element oscillating microbalance |
| TSANZ | Thoracic Society of Australian and New Zealand |
| TWA | Time-weighted average |
| UG | Underground |
| UIC | University of Illinios at Chicago |
| YTD | Year to date |

# Annex A - Stakeholder submissions & DNRM comment

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 001 | David Cliff | Dust exposure | Concerns that information was available for many years highlighting level of dust exposure to workers and the availability of research into dust control. | It is recognised that dust control and worker exposure to dust has been an issue for the coal mining industry for many years. That is why the department has undertaken reviews of mines dust management and monitoring processes and provided industry guidance on dust management and monitoring.<br><br>In 2009 DNRM conducted a review of dust monitoring programs at all coal mines. In 2010, the department issued a report providing feedback of this review to all underground and open-cut mines on matters relating to dust management and monitoring. This report provided guidance on establishing a risk-based dust monitoring program that included the concept of similar exposure groups (SEGs). In 2014 DNRM undertook an extensive statistical review of personal dust exposures in all underground coal mines.<br><br>An important part of the risk-based management of dust exposure is to review the results of dust monitoring and implement controls. While mines generally were conducting monitoring it was a failure at some sites to review and implement controls.<br><br>The mines inspectorate has taken compliance action in respect of mines to address this issue. Directives issued to mines may remain open even after compliance is achieved, so that sustained compliance can be demonstrated.<br><br>DNRM is fully committed to dust management and reducing worker exposure to dust. For example, the development of recognised standards for dust control and monitoring will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease. In addition, DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 001 | David Cliff | Dust monitoring | Highlights the importance of an effective monitoring regime. Recommends use of real-time monitors and the public availability of monitoring data. | The department agrees that an effective monitoring regime is extremely important. That is why it commenced reviews of dust monitoring programs, audited coal dust exposure levels and took compliance action.<br><br>However, it is acknowledged that the system needs improvement. This will be made through the recognised standard for respirable dust monitoring and regulatory amendments due to commence on 1 January 2017 will require coal mining companies to:<br><br>• regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br><br>• advise inspectors every time dust concentrations exceed prescribed levels<br><br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data will also be available to the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament.<br><br>DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 001 | David Cliff | Surveillance | Recommends a surveillance program combining both dust monitoring and epidemiological data across different exposure groups, and expanding health surveillance to include other injury and illness types and other sectors of the mining industry. | The department supports all 18 of the Monash review recommendations. These include DNRM conducting ongoing individual and group surveillance of health data collected under the health scheme, detect early CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers.<br><br>A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account.<br><br>In addition, the department is currently developing a dust monitoring database that it anticipates will enable analysis of worker health data against respirable dust exposure data. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 001 | David Cliff | Doctors | Recommends that doctors carrying out health assessments have knowledge of the mining environment. | The Monash review recommends training for Nominated Medical Advisors (NMA) that includes providing an awareness of coal mining. DNRM is currently considering future NMA training and induction options. |
| 002 | Andrew Gray | Air filtering and personal protective equipment (PPE) | Suggests a range of options to enhance the effectiveness of PPE to minimise dust exposure and motivate use. This includes PPE design, colour, availability, education and feedback. | The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through elimination – that is by preventing the hazard from occurring in the first place. If elimination is not reasonably practicable, risk must be minimised by working through the alternatives in the hierarchy, from the highest to the lowest. PPE is the lowest form of control and does not remove the hazard.<br><br>PPE is an active control, as it requires active involvement by the wearer in understanding and following procedure (for example, donning PPE in presence of dust, ensuring a good fit, replacement if damaged etc.). Active controls are vulnerable to oversight by the person applying relevant procedure.<br><br>DNRM is focussed on ensuring higher level controls are implemented to ensure respirable dust levels are below prescribed levels.<br><br>If respirable dust masks are used, it is essential that adequate seal enforcement is achieved. This requires a worker to be clean shaven. DNRM provides a consistent message that respiratory protective equipment should only be used when it is a part of a respiratory protection program that has been established in accordance with AS1715. This requirement has been reinforced in the recognised standard for dust control due for release in early 2017. |
| 002 | Andrew Gray | Railways | Raised potential for dust exposure near rail lines and that monitoring should take place. | The Department of Environment and Heritage Protection (EHP) regulates non-occupational air quality under the *Environmental Protection Act 1994*. Information is available to the public on EHP's webpage: http://www.ehp.qld.gov.au/management/coal-dust/.<br><br>Notably in 2013, the then Department of Science, Information Technology, Innovation and the Arts commenced an investigation into coal dust levels along the Western and Metropolitan Rail Systems in South-East Queensland. The monitoring results showed |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | that ambient particle concentrations complied with ambient air quality objectives at all rail corridor monitoring sites during both the pre and post-veneering monitoring periods.<br><br>The major influence on the levels of particles was not rail transport emissions, but other urban particle emission sources. Further information on the study is available at www.ehp.qld.gov.au/management/coal-dust/monitoring. Ongoing air quality monitoring continues at Cannon Hill Railway Station in Brisbane, Jondaryan west of Toowoomba, and the Ports of Gladstone and Brisbane. |
| 003 | Bernard Corden | Approach to safety | Recommends that the focus be on preventative aspects, and signals for potential safety issues.<br><br>Suggests that, due to a result of a number of factors, a new approach to managing safety should be considered, such as 'risk and energy damage theory', which offers a process and evidence based approach. | The *Coal Mining Safety and Health Act 1999* (CMSHA) is based on a risk management approach that requires the anticipation and control of problems before they arise. This includes:<br><br>• the requirement for all mines to have a safety and health management system that provides for an acceptable level of risk<br>• proactive inspector's powers and interventionist powers where risk is not appropriately managed<br>• the requirement that operators have a safety-oriented management structure<br>• obligations applying to specified office holders to ensure an acceptable level of risk.<br><br>The development of the CMSHA was shaped by several coal mining disasters in Queensland. A key outcome of the inquiry into the 1994 Moura No. 2 mining disaster was the introduction of risk-based safety and health management systems for each mining operation. The government worked extensively with industry and union over six years to develop the current risk-based legislation. |
| 003 | Bernard Corden | Dust exposure | CWP cases is a result of new machinery producing excessive dust, rushed appointment of safety advisors and the prioritisation of production value over worker safety. Suggests the inquiry investigate past mine log books for dust complaints and if any action was taken. | Between 2014 and 2016 the department requested all underground coal mines to provide dust monitoring data covering the period 2000-14. The department analysed the results and found there was no clear correlation between production and dust exceedance rate. An important part of the risk-based management of dust exposure is to review the results of dust monitoring and implement controls. While |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | mines generally were conducting monitoring it was a failure at some sites to review and implement controls. |
| 004 | Emeritus Professor Odwyn Jones | Diesel engine exhaust exposure | Risks associated with diesel exposure in underground mines is highlighted and the contribution this could have on the respiratory health of mine workers.<br><br>Recommends improved ventilation and ensuring ventilation officers have appropriate qualifications, reviewing current exposure standards for disease exhaust pollutants and greater compliance. | The department is aware of the health risks associated with diesel exposure and has been working proactively to understand the current level of risk and the effectiveness of mines' diesel exhaust management plans. The department has also conducted three reviews of industry exposure data and audited every underground coal mine on three occasions to review diesel exhaust management plans. The department has issued directives based on the review of exposure data of various similar exposure groups.<br><br>The department has been coordinating a diesel particulate matter (DPM) steering committee made up of 25-40 industry representatives for over 10 years. The committee meets twice a year and it provides DNRM with the chance to update industry on the most recent technologies in reducing diesel exhaust emissions. The committee has drafted a guidance note for the control of diesel exhaust emissions in underground coal mines.<br><br>As a result of the department's work through the committee, industry has worked to reduce diesel emission across the industry through putting in place controls and reducing the source.<br><br>In December 2012, DNRM released a safety bulletin (No. 127) following the International Agency for Research on Cancer's declaration that diesel exhaust is carcinogenic to humans. The safety bulletin recommended the exposure limit to adopt and adjusting the exposure limit for DPM to account for extended shift lengths or non-standard rosters. |
| 004 | Emeritus Professor Odwyn Jones | PPE and ventilation | Suggests improving preventive measures by appointing experienced ventilation officers, providing workers with appropriate PPE and educating worker's about the importance of PPE in dusty environments. | The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through elimination – that is by preventing the hazard from occurring in the first place. If elimination is not reasonably practicable, risk must be minimised by working through the alternatives in the hierarchy, from the highest to the lowest. PPE is the lowest form of control and does not remove the hazard. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | PPE is an active control, as it requires active involvement by the wearer in understanding and following procedure (for example, donning PPE in presence of dust, ensuring a good fit, replacement if damaged etc.). Active controls are vulnerable to oversight by the person applying relevant procedure.<br><br>DNRM is focussed on ensuring higher level controls are implemented to ensure respirable dust levels are below prescribed levels.<br><br>If respirable dust masks are used, it is essential that adequate seal enforcement is achieved. This requires a worker to be clean shaven. DNRM provides a consistent message that respiratory protective equipment should only be used when it is a part of a respiratory protection program that has been established in accordance with AS1715. This requirement has been reinforced in the recognised standard for dust control due for release in early 2017.<br><br>In implementing the Monash review recommendations, the department will be developing information about CMDLDs for coal mine workers. |
| 004 | Emeritus Professor Odwyn Jones | Dust exposure levels | Current standards and guidelines relating to underground miners' exposure to respirable coal dust should be reviewed with the intention of bringing into line with new standards adopted in the USA (i.e. lowering exposure level to 1.5 mg/m$^3$). | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings.<br><br>DNRM has also reviewed the way that the current and future limit will be enforced. This moves away from a simple average and will require the upper confidence limit of the data set to below the limit. This will provide further protection to workers. |
| 004 | Emeritus Professor Odwyn Jones | Dust suppression systems | Efficient dust suppression systems should be installed and maintained on all power loading equipment with special attention being paid to longwall faces equipped with single or double-drum shearers. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease. |
| 004 | Emeritus Professor Odwyn Jones | Monitoring and screening programs | More stringent monitoring and recording regimes and screening programs should be introduced, including storage of data at a central repository accessible to workers, | The department supports all 18 recommendations of the Monash review that includes recommendations for the improvement of the respiratory component of the health assessment process. The Monash review recommendations also include that the department |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | government agencies and employers as recently recommended by Australian clinicians. | develop an electronic system of data entry and storage. Scoping of the requirements for such a system is currently underway, including aspects of its accessibility. |
| 004 | Emeritus Professor Odwyn Jones | X-rays | Digital radiography to ILO standards should be performed on miners exposed to coal or coal and silica dust at the commencement of employment, and at least every three years thereafter. These images should be assessed by Royal Australian and New Zealand College of Radiologists who can assess to ILO standards. | All new X-rays taken under the Coal Mine Workers' Health Scheme (CMWHS) must be in a digital format – DNRM no longer accepts analogue X-ray films. NMAs must also clearly identify when they refer workers for an X-ray that it is for screening under the CMWHS and radiologists must report on a prescribed ILO reporting form.<br><br>The Royal Australian and New Zealand College of Radiologists has prepared a register of clinical radiologists who are available to report on chest X-rays for CWP in line with the ILO Classification.<br><br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. |
| 004 | Emeritus Professor Odwyn Jones | Education and research | Encourage and assist with funding applied research into all aspects of respirable related health of mine workers | The Monash review recommends ongoing individual and group surveillance of health data collected under the scheme to detect early cases of CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers. The department is currently working on a surveillance consultation paper which considers contributing to occupational health research. |
| 005 | Bruce Ham | Longwall mining | Reports that respiratory function of workers from German Creek collieries was worse than other mines. German Creek was the oldest longwall mine as it commenced using this technology in 1986. | Between 2014 and 2016 the department requested all underground coal mines to provide dust monitoring data covering the period 2000-14. The department analysed the results and found there was no clear correlation between production and dust exceedance rate. The results showed general consistency across coal seams mined (German Creek, Goonyella and Leichardt and Newlands). |
| 005 | Bruce Ham | Health data recording | Concerned if worker health assessment records were simply scanned and not entered into a database that could be subsequently analysed. | As current health assessments are received, details of the respiratory assessment and other identifiers are added to the database and reports, X-rays and spirographs are attached digitally to the file.<br><br>DNRM acknowledges that there is much to do to modernise the approach to data management and to convert the current database |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | and paper-based approach to a modern interactive system that supports industry wide surveillance.<br><br>The Monash review recommends ongoing individual and group surveillance of health data collected under the scheme to detect early cases of CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers. The department is currently working on a surveillance consultation paper which also considers contributing to occupational health research. |
| 005 | Bruce Ham | Workers compensation and Health Department data | There is potential for data sharing between organisations to extract a more comprehensive data set.<br><br>As long as confidentiality protocols are agreed, the register of coal mines, can be matched by name and date of birth to extract health and health outcome data on miners from databases held by other authorities. | DNRM has recently entered into an arrangement with the Office of Industrial Relations to ensure it becomes aware of any coal mine dust lung disease compensation cases that may present.<br><br>The department has also been working with Queensland Health to determine if any cases have presented through the health system. Despite there being the code "J60 Coal Workers' Pneumoconiosis" in the hospital database for admissions, it is understood this code can be used for a number of conditions that may not be related to coal mine dust exposure. A review of individual charts of workers recorded both under the Coal Mine Workers' Health Scheme and coded as J60 in public patient records, found there was insufficient information in the patient records to definitively confirm the presence of the disease.<br><br>This exercise was limited to public hospital admissions. There may be cases that present through GPs and specialists or private health care providers that are unable to be identified under current arrangements.<br><br>DNRM's expectation is that in implementing the Monash review recommendation to make the Coal Mine Workers' Health Scheme readily accessible to former workers, any cases of coal mine dust lung diseases that may develop in the future will be identified under the scheme. |
| 005.2 | Bruce Ham | Maintaining professional competence | The Australasian Institute of Mining and Metallurgy (AusIMM) Chartered Professional development programs lack significant occupational health competency elements. This program includes senior | DNRM is working with various groups to ensure that appropriate knowledge on respirable dust monitoring and control exists across industry. As part of the new recognised standard on respirable dust monitoring, a competency and the accompanying training package to fulfil that competency will be required for those conducting dust |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | and operational managers and other professionals at coal mines. The program falls within the Queensland Board of Professional Engineers Program that regulates the supply of professional engineering services in Queensland.<br><br>The Queensland Government, through the Queensland Board of Professional Engineers has the opportunity to call in the AusIMM Chartered Professional program to ensure that there is an understanding of the requirements for a safety management system of occupational exposures such as coal dust. | monitoring on site. This training is planned to expand to those in statutory positions with responsibility for dust exposure starting with ERZ controllers and ventilation officers. The department will provide guidance to the Board of Professional Engineers Queensland on what competencies the department expects of practicing engineers in the mining industry in relation to occupational exposures.<br><br>DNRM is also interested in helping the industry maintain knowledge through continuing professional development at the local level. In September the Southeast Queensland branch of the AusIMM hosted a technical talk on respirable dust monitoring featuring technical speakers from SIMTARS and the Mines Inspectorate. This technical talk covered the health effects of respirable dust, current monitoring practices, analysis of historical data and real-time instruments. |
| 005.2 | Bruce Ham | Health database | The health database is an essential tool in identifying population health changes. Data needs to be current and the system made ready for data analysis.<br><br>Analysis of deteriorating respiratory function and cumulative dust dose needs to be conducted to identify trigger points where interventions are needed for current miners. | The Monash review recommends ongoing individual and group surveillance of health data collected under the scheme to detect early cases of CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers. The department is currently working on a surveillance consultation paper which also considers contributing to occupational health research.<br><br>In addition, the department is currently developing a dust monitoring database that it anticipates will enable analysis of worker health data against dust exposure data. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | X-rays | Does not believe X-ray images need to be sent off-shore for assessment by B-readers.<br><br>Supports the compilation of a register of clinical radiologists who are competent in reporting radiographs using the ILO classification of pneumoconiosis.<br><br>Regular updating of existing skills through continued medical education would enhance awareness of pneumoconiosis among radiologists. | The Royal Australian and New Zealand College of Radiologists has prepared a register of clinical radiologists who are available to report on chest X-rays for CWP in line with the ILO Classification.<br><br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | The screening of X-rays by US based B-readers at the University of Illinois at Chicago is an interim process until a new Queensland based program is established. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | History of dust exposure | A complete history of all dust exposures in all employments (including interstate exposures) needs to be recorded and made available to examining doctors, to allow estimation of total levels of dust exposure, which are strongly liked with development of disease. | The current health assessment form includes a requirement to outline occupational history and identify if the worker will be employed in an environment with higher risk of dust exposure.<br><br>The Monash review also recommended that a register of all coal mine workers at risk of dust exposure be created for the purposes of surveillance. The department is currently working on a surveillance consultation paper to address this recommendation.<br><br>In addition, the department is currently developing a dust monitoring database that it anticipates will enable analysis of worker health data against dust exposure data. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | Lung function testing and spirometry | Spirometry and standardised symptom questionnaires should also be obtained from the start of employment and regularly thereafter and should result in prompt referral to specialist respiratory services if any abnormality is detected.<br><br>Enhanced spirometry to include measurement of gas transfer factor (a surrogate for assessing oxygen transfer across the lungs) should be considered for screening, as new equipment is available to measure this in the field and this would enhance early disease detection. | The Monash review identified significant issues with the spirometry screening component of the Coal Mine Workers' Health Scheme. It made several related recommendations including that spirometry should be conducted only by accredited practitioners who undertake initial and on-going training and quality of tests regularly audited.<br><br>Following the Monash Review, changes were made to the health assessment form to clarify that spirometry must be undertaken by appropriately trained operators to the standard outlined in Queensland Health: Spirometry (Adult) Guideline, in order to improve the quality of spirometry. In addition, a change was made to require copies of spirometry reports to be provided to the department along with the health assessment form. The purpose of this change was to assist medical practitioners to identify a change in the individual's lung function over time.<br><br>DNRM has consulted with the Thoracic Society of Australia and New Zealand to scope options for a practice-based, spirometry accreditation program for those NMAs in general medical practices and occupational health clinics.<br><br>The department is currently developing a proposal for an accreditation program for the taking and reading of spirometry under the scheme. Consultation on this proposal will include ascertaining |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | stakeholder views on the merits of adopting gas transfer testing for screening. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | Mandatory screening | Strongly supports implementation of mandatory lifelong screening of all workers exposed to coal mine dust and silica. | The Monash review recommended that the Coal Mine Workers' Health Scheme be made available to former workers. The department will be developing proposals and consulting with stakeholders on how that recommendation can be implemented. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | Dust exposure limits | Concerned that occupational exposure limits are inconsistent between jurisdictions and recommends a thorough review of the limits. | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | Mandatory reporting | Mandatory reporting should be required of all occupationally acquired dust diseases of all types (not only CWP) to a national registry on occupational lung disease. | Regulatory changes that commence on 1 January 2017 will require a mining company to report a range of coal mine dust lung diseases to the department. In addition, enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations will also ensure diagnosis of coal mine dust lung diseases are reported to the department through NMA health assessment reports.<br><br>The data will be available and readily reportable to any national registry should one be established. |
| 006 | Thoracic Society of Australia and New Zealand and Lung Foundation Australia | Referral to specialists | GP training materials should be developed and all coal miners presenting with respiratory symptoms, new radiological abnormalities and/or a decline in lung function greater than that predicted using the NIOSH algorithm should be referred for assessment to a respiratory specialist physician; ideally with training and/or qualifications in occupational lung disease. | The department will be implementing the Monash review recommendation to develop clinical guidelines for follow-up investigation and referral to an appropriately trained respiratory or other relevant specialist of suspected coal mine dust lung disease in current or former coal mine workers.<br><br>In addition, the Monash review recommends doctors performing health assessments should undergo training to ensure a suitable standard of competence. The Monash University developed a fact sheet for GPs which was circulated via Queensland Health's Chief Health Officer Alert and via email to all NMAs. |
| 007 | Stanley William Wilson | Coal industry experience and lung condition | Did not receive regular chest X-rays during his 30 year career that ended in 1997. Referred to a specialist in 2013 and has | In 1982-83, health surveillance in the Queensland coal mining industry was focussed on pre-employment screening for respiratory conditions and lung disease. Chest X-rays were compulsory for all persons entering the industry, however ongoing health surveillance |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | emphysema caused by smoking and coal dust exposure. | was not compulsory before 1993. At that time, the Coal Board issued directives to mandate the ongoing health surveillance of the workforce at periods not exceeding five years.<br><br>The Monash review recommended that participation in the health scheme be offered to retired workers. DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended. As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide retiring coal workers with the opportunity to have a retirement examination within three months of their retirement. |
| 008 | Neil Whittaker | Longwall machinery | Increase in production has resulted in increased dust. Has observed very dusty longwall shearers.<br><br>Based on extensive experience as a fitter in underground mines internationally, recommends that dust suppression needs to be addressed in machinery design. | Between 2014 and 2016 the department requested all underground coal mines to provide dust monitoring data covering the period 2000-14. The department analysed the results and found there was no clear correlation between production and dust exceedance rate.<br><br>DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent coal mine dust lung disease. |
| 009 | Helen Gibson | Health monitoring of people at risk of coal dust exposure | Highlights the dust exposure risk for a range of occupations associated with coal. It is emphasised within this analysis that all personnel associated with the exploration, production, transportation and utilisation of coal is at some kind of risk and that the health of all these people needs to be checked and monitored on a regular timeframe. | Following a self-assessed survey conducted by DNRM on mines' dust management, the department identified that a comprehensive monitoring strategy should involve the concept of similar exposure groups (SEGs). SEGs are defined as a group of workers who have the same general exposure to risk. Such as the similarity and frequency of the tasks they perform, the materials and processes with which they work, and the similarity of the way they perform those tasks.<br><br>Since November 2010, employers have been required to specify a worker's SEG in the health assessment form. The purpose of this was to inform decisions about whether a miner is in a dust-exposed job. The recent Monash review has identified that this requirement was poorly completed, or in some case, not completed at all.<br><br>The Monash review recommended that the criteria to determine workers at risk from dust exposure should be based on past and |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | current underground coal mines and designated work categories in open-cut coal mines and coal handling and preparation plants. This recommendation includes the proposal that criteria to determine job categories at risk from dust exposure should be standardised across Queensland and reviewed regularly to reflect changes in level of risk. The department supports all of the Monash review recommendations and is taking necessary action to address these.<br><br>Occupational health and safety of workers in related operations not part of the coal mine such as transportation of coal by rail or exploration is not regulated by the *Coal Mining Safety and Health Act 1999* and those workers are not part of the Coal Mine Workers' Health Scheme. For these workers other regulatory frameworks apply such as the *Transport (Rail Safety) Act 2010* and the *Work Health and Safety Act 2011*. |
| 009 | Helen Gibson | Dust monitoring and reporting | Monitoring and control of dust levels in all aspects of the exploration, extraction (underground and open cut), treatment, transport and storage of coal be a strict requirement for all mine owner /operators with reporting on a weekly basis to the Queensland State mines inspectorate or more frequently if required. | DNRM is working with industry and unions to develop a recognised standard for respirable dust monitoring in addition to a new dust reporting database. The recognised standard for monitoring requires mines to conduct baseline monitoring and identify similar exposure group (SEGS) across the whole mine site (both surface and underground). The ongoing monitoring frequency will be risk based but it will include periodic sampling for all areas and locations.<br><br>All mine sites, both surface and underground will be required by law as of 1 January 2017 to report respirable coal and silica dust monitoring data at least once every three months for development and longwall operations, and as required under the standard for other areas at a coal mine.<br><br>Additionally, mine sites will be required to report single exceedances of the occupational exposure limit to a mines inspector and undergo a process of analysing and resampling the exceedance.<br><br>Monitoring and control of dust levels in relation to non-occupational dust exposure from coal mines or other related operations such as transport and off-site storage is not regulated under the *Coal Mining Safety and Health Act 1999*, therefore reporting to the Mines Inspectorate would not be appropriate. The Department of |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Environment and Heritage Protection (EHP) regulates non-occupational air quality under the *Environmental Protection Act 1994.* |
| 009 | Helen Gibson | Dust control | A code of practice for dust emissions and their control for surface mines, quarries and exploration sites should be developed if it is not already addressed. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent coal mine dust lung disease. |
| 009 | Helen Gibson | Independent dust monitoring | The Queensland State mines inspectorate should undertake independent monitoring of dust levels in all aspects of the coal industry on a regular basis (perhaps fortnightly) as a cross check on results obtained by the owner/operators and that all results and analysis being published. | Mine sites engage suitably qualified independent companies to conduct personal monitoring and report these results back to the mine. These reports are supported by field observations and recommendations to control exposure. It is the mines' responsibility to review these results, consider recommendations and control exposures.<br><br>The department is not aware of any evidence to suggest that the monitoring is biased or influenced by the mining companies. The results provided by monitoring companies have clearly identified exceedances. The department has acted on these exceedances during recent data reviews.<br><br>DNRM is working with industry to develop a recognised standard for dust control that will be implemented in 2017. |
| 009 | Helen Gibson | Training of medical practitioners | The medical practitioners who are used to provide health checks on coal workers should be specifically trained and skilled in diagnosis of CWP, through the use of appropriate radiological methods, interpretation, etc. in order to identify the early onset of CWP. | DNRM is currently considering future NMA training options as recommended by the Monash review. This would include processes for referring chest X-rays to radiologists or respiratory physicians as part of a CWP screening program. |
| 009 | Helen Gibson | Independence of medical practitioners | The medical practitioners who are used to provide health checks on coal workers should be entirely independent and not employed by the coal companies. | The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 009 | Helen Gibson | Research into dust control | Appropriate methods to suppress and eliminate dust (coal, and other) throughout the coal mining process be researched and implemented immediately as a matter of urgency. This would include processing, transport, stockpiles, loading at port facilities, etc. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent coal mine dust lung disease.<br><br>Industry will need to comply with the standard and demand for new solutions could drive research and development of new technologies. |
| 009 | Helen Gibson | Funding monitoring of coal mines | A levy per tonne (of coal produced) on mine owner/operators within Queensland should be considered to part fund the monitoring of the entire coal mining process by the State mines inspectorate. | The Mines Inspectorate is currently funded by a levy on the mining industry paid to the department annually based on the number of workers in the industry and the budgeted cost of services. |
| 009 | Helen Gibson | Facility to train personnel monitoring coal industry | An accredited, world recognised training facility should be established in Queensland to provide training of relevant staff to undertake the monitoring of the coal mine-to-end user process. | The department provides regular training and development to the mines inspectors to ensure they maintain the latest skills and understanding of the issues facing the industry. The courses and training programs undertaken by inspectors vary. During 2015-16, around 40 different training courses were delivered to inspectors.<br><br>Also within DNRM is the Safety in Mines Testing and Research Station (SIMTARS). It is a resource available to the government, mining companies, mining equipment manufacturers and suppliers to the mining industry.<br><br>SIMTARS supports the Mines Inspectorate through provision of expert advice and assistance with accident investigations. It is also an accredited Registered Training Organisation and provides nationally recognised training and qualifications in mine safety to thousands of mine workers in Australia and overseas. |
| 009 | Helen Gibson | Oversight CWP reference group | A CWP reference group should be established to oversee the development and implementation of a mining code of conduct, maximum permissible dust levels, monitoring of in-mine dust readings and analysis, the implementation of appropriate health monitoring and associated training of medical staff, monitoring of confirmed | The department is working closely with the Coal Mining Safety and Health Advisory Committee (CMSHAC) which is a statutory, tripartite group that provides advice and makes recommendations to the Minister to promote and protect the safety and health of coal mine workers. CMSHAC periodically reviews the effectiveness of legislation in controlling health and safety risk. It is also responsible for establishing the coal mining competencies required for statutory positions in mines. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | CWP sufferers and analysis of all records relevant to this medical condition. | Committee members are nominated and appointed by the Minister based on Queensland's tripartite consultative model for mining with the aim of ensuring key stakeholders are engaged in all aspects of mine safety and health management and the legislative framework. Members include representatives from the Mines Inspectorate, mine workers and mine operators and is chaired by the independent Commissioner for Mines Safety and Health.<br><br>Union, employer and departmental representatives from CMSHAC are currently working through a range of measures to tackle coal workers' pneumoconiosis. |
| 009 | Helen Gibson | Dust exposure in non-coal mining operations | Investigation should be extended to the impact of inhalation of rock dust by miners and other staff in open cut and underground mines within Queensland including quarries, metalliferous and non-metalliferous mines. | In addition to coal mine dust lung disease, the department is considering the recommendations of the Monash review in the context of workers in quarries, metalliferous and non-metalliferous mines regulated under the *Mining and Quarrying Safety and Health Act 1999.*<br><br>This consideration is currently being made in consultation with the Mining Safety and Health Advisory Committee which is the equivalent of CMSHAC for metalliferous and non-metalliferous mining and quarrying (albeit with different members).<br><br>In addition, regulatory changes that commence on 1 January 2017 will require a mining company to report a range of mine dust lung diseases to the department. |
| 009 | Helen Gibson | Dust exposure levels | Dust exposure levels should be as low as 1.5mg/cubic metre to align with USA standards in the interests of worker health and mine safety. | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 009 | Helen Gibson | Health and dust surveillance | Recommends establishment of a database which correlates dust monitoring results and health assessment data. | The department supports all 18 of the Monash review recommendations which includes that DNRM conduct ongoing individual and group surveillance of health data collected under the scheme, detect early CMDLD and analyse trends to disseminate to employers, unions and coal mine workers.<br><br>A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| | | | | In addition, the department is currently developing a dust monitoring database that it anticipates will enable analysis of worker health data against dust exposure data. |
| 009 | Helen Gibson | Automation | Advises that the introduction of automated longwall extraction methods could minimise coal dust exposure. | The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through elimination – that is by preventing the hazard from occurring in the first place. An example of an elimination control measure in relation to dust generation and exposure is the automation of mining in areas of high risk of respirable dust and silica exposure. |
| 009 | Helen Gibson | Coal dust risk to broader community | Discusses the risk of coal dust affecting communities in proximity to coal mines, coal transport corridors stockpiles and loading facilities. Recommends that these areas should also be monitored for dust exposure subject to regular inspections by Government. | The Department of Environment and Heritage Protection (EHP) regulates non-occupational air quality under the *Environmental Protection Act 1994*. Information is available to the public on EHP's webpage: http://www.ehp.qld.gov.au/management/coal-dust/.<br><br>Notably in 2013, the then Department of Science, Information Technology, Innovation and the Arts commenced an investigation into coal dust levels along the Western and Metropolitan Rail Systems in South-East Queensland. The monitoring results showed that ambient particle concentrations complied with ambient air quality objectives at all rail corridor monitoring sites during both the pre and post-veneering monitoring periods.<br><br>The major influence on the levels of particles was not rail transport emissions, but other urban particle emission sources. Further information on the study is available at www.ehp.qld.gov.au/management/coal-dust/monitoring. Ongoing air quality monitoring continues at Cannon Hill Railway Station in Brisbane, Jondaryan west of Toowoomba, and the Ports of Gladstone and Brisbane. |
| 010 | Jason Mathewson | No action on dust exposure threshold exceedances | There are coal mines that are knowingly exceeding dust exposure limits and no action has been taken. Not confident dust levels are reduced when coal mines with exceedances are issued directives to reduce dust levels. | The Mines Inspectorate has been active in regulating coal dust levels through the utilisation of a range of compliance tools and raising awareness. Since 2013 the Mines Inspectorate has issued 36 directives to nine underground coal mines. This included directing a mine to review its safety and health management system, review the effectiveness of dust controls, to reduce cutting speed and two to suspend operations. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Mines placed under directive are required to undertake onerous monitoring regimes and stringent reporting processes until they can demonstrate that exposures have been controlled to acceptable levels. This requires a minimum of three consecutive months of demonstrated compliance.<br><br>Notwithstanding this, the department acknowledges that more needs to be done and is implementing immediate regulatory amendments to strengthen respirable dust monitoring requirements. Regulatory amendments are due to commence in January 2017 which will introduce the new requirement for inspectors to be advised every time dust concentrations exceed prescribed levels. This new requirement also requires the site senior executive to ensure the cause of high average concentration is investigated and the results of the investigation are recorded and analysed to identify trends and issues with the coalmine's safety and health management system. |
| 010 | Jason Mathewson | Dust monitoring | Monitoring of coal dust levels are not reliable. Monitors are placed on workers in areas with little dust exposure.<br><br>Recommends independent dust monitoring that captures greater detail on the worker, task and focus on areas of the mine with higher risk of dust exposure.<br><br>All underground workers should continuously have a personal dust monitor that provides real time results. | DNRM is working with industry to develop a recognised standard for dust monitoring in addition to a new dust reporting database. As of 1 January 2017 all mines will be required to provide their exposure data to the department at prescribed intervals. The department will review and report this data. In addition a tripartite standing dust committee will meet quarterly to review the data and make recommendations to CMSHAC (as required).<br><br>DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 010 | Jason Mathewson | Workers pressured to skip safety checks | Was encouraged to skip or take short-cuts in pre-start checks when operating continuous miner. These checks are part of the mine's safety and health management system which ensure dust management systems like water sprayers, ventilation and filters are regularly checked. | The Mines Inspectorate takes any behaviour putting workers at risk very seriously.<br><br>On occasion, the Mines Inspectorate has issued directives to suspend or not commence operations to mines where pre-start checks have not been conducted and other procedures have not been followed.<br><br>In relation to respirable dust, the Mines Inspectorate has issued a directive to a mine to suspend operations where pre-start checks |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | have not been conducted. The inspectorate has also issued a directive not to re-commence operations where issues have been identified concerning water supply for dust management. |
| 010 | Jason Mathewson | PPE | Dust masks should not be relied upon for dust exposure mitigation. | The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through elimination – that is by preventing the hazard from occurring in the first place. If elimination is not reasonably practicable, risk must be minimised by working through the alternatives in the hierarchy, from the highest to the lowest. PPE is the lowest form of control and does not remove the hazard.<br><br>PPE is an active control, as it requires active involvement by the wearer in understanding and following procedure (for example, donning PPE in presence of dust, ensuring a good fit, replacement if damaged etc.). Active controls are vulnerable to oversight by the person applying relevant procedure.<br><br>DNRM is focussed on ensuring higher level controls are implemented to ensure respirable dust levels are below prescribed levels.<br><br>If respirable dust masks are used, it is essential that adequate seal enforcement is achieved. This requires a worker to be clean shaven. DNRM provides a consistent message that respiratory protective equipment should only be used when it is a part of a respiratory protection program that has been established in accordance with AS1715. This requirement has been reinforced in the recognised standard for dust control due for release in early 2017. |
| 010 | Jason Mathewson | Doctors | Supports health assessments by health professionals independent of industry appointed under the coal mining legislation. Doctors should complete an exam to participate in the scheme with refresher exams every five years. | The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit. |
| 010 | Jason Mathewson | Inspectors | Legislation needs to be amended so that Inspectors are not protected from being prosecuted. Concerned Inspectors don't | DNRM is not aware of any information that would suggest that inspectors have failed to take compliance action so as not to risk future job opportunities. Further, DNRM denies that inspectors are |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | want to take compliance action because they don't want to risk future job opportunities or are being pressured by government not to impact production. | pressured by government not to take compliance action that would impact production.<br><br>On numerous occasions, the Mines Inspectorate has taken compliance action, including issuing directives which significantly impact production and a mine's revenue.<br><br>In exercising their powers, inspectors are required to comply with the code of conduct applicable to government employees and to complete training relating to the code of conduct. Government employees who breach the code of conduct or their ethical obligations in exercising their duties are liable to disciplinary action. In some cases, this may involve referral to the Crime and Corruption Commission and prosecution. |
| 010 | Jason Mathewson | Procedure for dust level exceedances | Recommends that in areas of coal mines where dust levels exceed limits, operations are immediately ceased. All safety officers are to be informed and corrective actions taken before an inspector's approval is sought to restart operations. | The department's compliance policy provides for a range of compliance actions to bring a mine back into compliance, including issuing a directive or directing the SSE to attend a compliance meeting. Suspending operations may seem like an intuitive option to bring dust concentration levels below exceeded level, however the inspectorate must consider the full spectrum of hazards concerning the mine's operation. This is particularly evident for longwall operations which other hazards may include gas management, spontaneous combustion and strata problems.<br><br>All factors are considered before directing a mine to suspend operations. In some cases, the safest option may be to allow a mine to complete its production activities on a longwall panel before suspending the operation to address dust level.<br><br>Further, dust monitoring cannot be effectively carried out when a mine is not in production. Without ongoing monitoring it is impossible to assess the effectiveness of controls. The department is putting in place a number of measures to strengthen respirable dust management requirements. Regulatory amendments are due to commence in January 2017 which will introduce the new requirement for inspectors to be advised every time dust concentrations exceed prescribed levels. |
| 010 | Jason Mathewson | Risk management | Suggests every coal mine have its risk management of coal dust reviewed by a | Queensland's regulatory framework requires each mining operation to have a risk based safety and health management system. The |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | party of industry safety reps, coal inspector and independent party endorsed by industry safety and health reps, CFMEU and the Commissioner for Mines Safety and Health. | framework enables the site senior executive, site safety and health representatives, industry safety and health representatives, mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting and auditing the safety and health management system. |
| 010 | Jason Mathewson | Oversight of dust monitoring by panel | The Commissioner for Mines Safety and Health should form a dust monitoring and black lung review panel consisting of stakeholder representative from CFMEU, coal mines, inspectors, SIMTARS etc. | The department is working as part of the Coal Mining Safety and Health Advisory Committee (CMSHAC) which is a statutory, tripartite committee that provides advice and makes recommendations to the Minister to promote and protect the safety and health of coal mine workers. CMSHAC periodically reviews the effectiveness of legislation in controlling health and safety risk. It is also responsible for establishing the coal mining competencies required for statutory positions in mines.<br><br>Committee members are nominated and appointed by the Minister based on Queensland's tripartite consultative model for mining with the aim of ensuring key stakeholders are engaged in all aspects of mine safety and health management and the legislative framework. Members include representatives from the Mines Inspectorate, mine workers and mine operators and is chaired by the Commissioner for Mines Safety and Health.<br><br>Union, employer and departmental representatives from the CMSHAC are currently working through a range of measures to tackle coal workers' pneumoconiosis. |
| 010 | Jason Mathewson | Research | The Minister for Natural Resources and Mines must continually have SIMTARS and other relevant parties investigate new ways to greatly reduce the amount of dust in all areas of underground coal mines. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br><br>Industry will need to comply with the standard and demand for new solutions could drive research and development of new technologies.<br><br>SIMTARS does conduct research into mine safety. For example, SIMTARS is progressing the intrinsically safe certification of real time dust monitors for use in Queensland underground coal mines. |
| 010 | Jason Mathewson | X-rays | Chest x-rays should be taken every five years, immediately after retirement and then every five years after that. All x-rays | DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | should be reviewed by a trained and experienced radiologist to ILO standard. | also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis.<br><br>From 1 January 2017, all underground workers or workers who have worked underground will be required to have five yearly chest X-rays. Aboveground workers will be required to have a chest X-ray every 10 years and upon permanent retirement a worker is entitled to a chest X-ray, at the expense of the worker's employer, within three months before or after retirement. |
| 010 | Jason Mathewson | Reporting | All cases of CWP or other work related lung problems should be immediately reported to the mining company, safety and health representatives, CFMEU, Minister, Chief Inspector, Commissioner and other oversight panels. | Regulatory changes that commence on 1 January 2017 will require a mining company to report a range of coal mine dust lung diseases to the department. In addition, enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations will also ensure diagnosis of dust diseases are reported to the department through NMA health assessment reports.<br><br>The data will be available and readily reportable.. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |
| 010 | Jason Mathewson | Lung function - Spirometry | All lung / breathing tests must be conducted by personnel that a trained, assessed and certified. | The Monash review identified significant issues with the spirometry screening component of the Coal Mine Workers' Health Scheme. It made several related recommendations including that spirometry should be conducted only by accredited practitioners who undertake initial and on-going training and quality of tests regularly audited.<br><br>Following the Monash Review, changes were made to the health assessment form to clarify that spirometry must be undertaken by appropriately trained operators to the standard outlined in Queensland Health: Spirometry (Adult) Guideline, in order to improve the quality of spirometry. In addition, a change was made to require copies of spirometer reports to be provided to the department along with the health assessment form. The purpose of this change was to assist medical practitioners to identify a change in the individual's lung function over time.<br><br>DNRM has consulted with the Thoracic Society of Australia and New Zealand to scope options for a practice-based, spirometry |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | accreditation program for those NMAs in general medical practices and occupational health clinics.<br><br>The department is currently developing a proposal for an accreditation program for the taking and reading of spirometry under the scheme. Consultation on this proposal will include ascertaining stakeholder views on the merits of adopting gas transfer testing for screening. |
| 011 | Queensland Nurses' Union (QNU) | Regulatory framework | States that right of entry provisions enabling unions to inspect potential hazards on worksites are strictly enforced and that procedures preventing CWP are not strictly enforced. | DNRM acknowledges the important role of industry safety and health representatives in mine safety and health and recognises that the powers they have under the Act are a tool for ensuring safety and health standards are upheld in mining operations. Those union representatives are at liberty to exercise their powers within the limits of those powers. However, it is important that those powers are used appropriately and if it is considered that a union representative has exceeded their power, the Mines Inspectorate has a responsibility to address that. |
| 011 | Queensland Nurses' Union (QNU) | Regulatory framework | Notes concerns about the use of a self-regulation scheme. They suggest a lack of integrity in the system and a lack of concern for the workforce. | Queensland has a risk based-approach to mine site safety and health. Mine operators are required to proactively review their safety and health management system to ensure the system is effective and can constantly adapt to the changing environment and interdependencies of complex mining operations. The Queensland framework enables the site senior executive, site safety and health representatives, industry safety and health representatives, mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting or auditing the safety and health management system. |
| 011 | Queensland Nurses' Union (QNU) | Lung function testing and spirometry | Supports the implementation of the Monash Report recommendations. In particular, further training for registered nurses and other health practitioners on the spirometry equipment is recommended, as well as greater testing of this equipment as outlined in the Monash Review. | The Monash review identified significant issues with the spirometry screening component of the Coal Mine Workers' Health Scheme. It made several related recommendations including that spirometry should be conducted only by accredited practitioners who undertake initial and on-going training and quality of tests regularly audited.<br><br>Following the Monash Review, changes were made to the health assessment form to clarify that spirometry must be undertaken by appropriately trained operators to the standard outlined in |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Queensland Health: Spirometry (Adult) Guideline, in order to improve the quality of spirometry. In addition, a change was made to require copies of spirometer reports to be provided to the department along with the health assessment form. The purpose of this change was to assist medical practitioners to identify a change in the individual's lung function over time.<br><br>DNRM has consulted with the Thoracic Society of Australia and New Zealand to scope options for a practice-based, spirometry accreditation program for those NMAs in general medical practices and occupational health clinics.<br><br>The department is currently developing a proposal for an accreditation program for the taking and reading of spirometry under the scheme. Consultation on this proposal will include ascertaining stakeholder views on the merits of adopting gas transfer testing for screening. |
| 012 | Daniel O'Connor | Safety and health improvements to reduce dust exposure | Supports the hierarchy of control reduce exposure to coal dust, and in particular supports improved coal mine ventilation and dust suppression. Recommends improvements in both these areas, and promotes a focus on keeping coal workers informed on dust matters. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent coal mine dust lung disease.<br><br>DNRM understands that most companies regularly update workforce on dust results. Coal workers also ask questions of DNRM mine inspectors during their inspections. |
| 013 | Clean Air Wynnum | Coal dust risk to broader community | The regulation of coal dust should include coal dust in transport and storage, not just the mines.<br><br>Raises concerns regarding the transport of coal on rail lines through Brisbane and its storage at the port of Brisbane. In particular, they are concerned with the movement of airborne coal dust into residential areas and health impacts on the community. | The Department of Environment and Heritage Protection (EHP) regulates non-occupational air quality under the *Environmental Protection Act 1994*. Information is available to the public on EHP's webpage: http://www.ehp.qld.gov.au/management/coal-dust/.<br><br>Notably in 2013, the then Department of Science, Information Technology, Innovation and the Arts commenced an investigation into coal dust levels along the Western and Metropolitan Rail Systems in South-East Queensland. The monitoring results showed that ambient particle concentrations complied with ambient air quality objectives at all rail corridor monitoring sites during both the pre and post-veneering monitoring periods.<br><br>The major influence on the levels of particles was not rail transport emissions, but other urban particle emission sources. Further |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | information on the study is available at www.ehp.qld.gov.au/management/coal-dust/monitoring. Ongoing air quality monitoring continues at Cannon Hill Railway Station in Brisbane, Jondaryan west of Toowoomba, and the Ports of Gladstone and Brisbane. |
| 014 | Australian Institute of Occupational Hygienists, Inc. (AIOH) | Dust management plans | AIOH recommend that mine operators must develop and implement an evidence based dust management plan. They also support the introduction of personal fit testing requirements. | The *Coal Mining Safety and Health Act 1999* requires the site senior executive for each coal mine to develop a safety and health management system. In part, the safety and health management system includes the following (see section 89 of the Coal Mining Safety and Health Regulation 2001 for complete requirements with respect to dust):<br>• ensures workers' exposure to respirable dust is at acceptable levels and does not exceed an average concentration equivalent to an 8-hour period<br>• reviews dust control systems to minimise exposure if exposure is above acceptable levels<br>• monitors and records concentrations of respirable dust and silica<br>• makes records available to workers<br>• suppresses airborne dust so a person's safety is not threatened (e.g. reduced visibility).<br>DNRM is working with industry to develop a recognised standard for dust control and monitoring, which will support site senior executives to develop and implement safety and health management systems. |
| 014 | Australian Institute of Occupational Hygienists, Inc. (AIOH) | Monitoring | Dust monitoring is critical to reducing risk. Recommends including the application of quality assurance principles, feedback of monitoring results to industry and workers. Noted that fixed dust monitors cannot replace personal sampling devices. | DNRM is working with industry to develop a recognised standard for dust monitoring in addition to a new dust reporting database DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 014 | Australian Institute of Occupational Hygienists, Inc. (AIOH) | Health and dust surveillance | Health surveillance provides an important feedback loop. Fit for work assessments and health screening should be separate. | The department supports all 18 of the Monash review recommendations which includes that DNRM conduct ongoing individual and group surveillance of health data collected under the |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | Surveillance should compare health data and dust exposure for coal and silica. | scheme, detect early CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers.<br><br>A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account.<br><br>In addition, the department is currently developing a dust monitoring database that it anticipates will enable analysis of worker health data against dust exposure data. |
| 014 | Australian Institute of Occupational Hygienists, Inc. (AIOH) | Exposure limits | Support a review of Safe Work Australia dust exposure standards based on proper scientific review and relevant to the Australian mining context. | DNRM is supportive of Safe Work Australia's (SWA) review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings.<br><br>The Mines Inspectorate provided input to SWAs initial consultation and continue to support and provide feedback to the review. |
| 014 | Australian Institute of Occupational Hygienists, Inc. (AIOH) | Training requirements | Only independent, experienced, and Certified Occupational Hygienists (COH)® should design, plan and report on the assessment of workplace dust exposures. | The department is proposing to use this competency for the standard for the recognised standard for dust monitoring. |
| 015 | Dr Brian Plush | Prevalence of disease | Believes that many cases of CWP remain undiagnosed. | DNRM is committed to ensuring early detection of existing CWP cases.<br><br>As an interim measure, all underground coal mines are offering their workers new checks on current chest X-rays or new X-rays if the X-ray was taken more than two years ago. All chest X-rays are dual read, first by an Australian radiologist to the ILO Classification and then assessed by NIOSH approved readers at the University of Illinios at Chicago. DNRM encourages any coal mine worker who has concerns about their health to talk to their general practitioner<br><br>The Monash review recommended that participation in the health scheme be offered to retired workers. DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended. As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide retiring coal workers with the |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | opportunity to have a retirement examination within three months of their retirement.<br><br>To ensure a better understanding of CWP occurrences across the industry, regulatory changes will also require a mining company to report a range of coal mine dust lung diseases to the department. In addition, DNRM is investigating options to further improve reporting and implement enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations.<br><br>A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |
| 015 | Dr Brian Plush | Dust exposure limits | There is no proven 'safe' level of dust exposure. Research into what is a 'safe' level of exposure is required. | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 015 | Dr Brian Plush | Senate Select Committee on Health recommendations | Concerned that recommendations from the Senate Select Committee on Health have not been implemented.<br><br>Suggests further steps, including a broader focus on all particulate matter-producing industries, greater testing and research, and establishment of a particulate matter exposure register that financially supports those diagnosed with CWP. | On 28 April 2016, the Senate Select Committee on Health released its report on CWP. The report made twenty recommendations a number of which, particularly those relating to NMAs, are effectively being addressed through implementation of the Monash review recommendations.<br><br>Other recommendations are addressed by the government's action on dust management. |
| 016 | Vale Australia Pty Ltd | CWP cases | Note the four current cases of CWP and the measures undertaken by the company in relation to screening and prevention. Supports the recommendations of the Monash Review. | DNRM notes that the cases referred to by Vale are reflected in the 17 confirmed cases. |
| 017 | Royal Australian and New Zealand College of Radiologists (RANZCR) | Referral to radiologists | Notes that there has been inconsistent clinical history provided in the past as part of a referral to a radiologist. A diagnosis of CWP cannot be made solely on the basis of a screening X-ray. | RANZCR's comments and recommendations are consistent with the findings and recommendations of the Monash review in relation to X-rays (Recommendation 11).<br><br>Effective from 1 May 2016, DNRM amended the health assessment form to clarify that examining doctors must ensure the X-ray request |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | Recommend that appropriate clinical information be provided on referral forms, specifically past medical history including any respiratory illness, occupational history and smoking history. | form clearly states the subject is a coal mine worker and the film should be examined for pneumoconiosis under the ILO International Classification of Radiographs of Pneumoconioses. This issue of referral information will be considered further as part of the key focus on medical practitioners and assessments. |
| 017 | Royal Australian and New Zealand College of Radiologists (RANZCR) | X-ray imaging | Recommends that X-rays should be taken by a qualified radiographers or other appropriate persons. Equipment used to capture images must meet the appropriate standards including those under Diagnostic Imaging Accreditation Scheme (DIAS) and RANZCR Standards of Practice for Diagnostic and Interventional Radiology Version 10.1. | RANZCR's recommendations are consistent with those of the Monash review in relation to X-rays (Recommendation 11). DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would only be taken by qualified radiographers and the technical aspects of taking X-rays would be in accordance with Australian requirements and international best practice. |
| 017 | Royal Australian and New Zealand College of Radiologists (RANZCR) | X-ray reading | Suggests that X-rays were not always sent to a radiologist and may have been reviewed by other medical practitioners, such as NMAs. It is recommended that only a clinical radiologist should review an X-ray due to their specialist training. | Effective from 1 May 2016, DNRM amended the health assessment form to clarify that all chest X-rays under the scheme must be undertaken by a specialist radiology clinic and must be read by a specialist radiologist. |
| 017 | Royal Australian and New Zealand College of Radiologists (RANZCR) | Best practice screening program | Suggests BreastScreen program may serve as a model for best practice screening with additional features:<br>• training for participating radiologist on induction<br>• dual reading, and adjudication<br>• on-going clinical audit process to improve performance<br>• central collation of data and previous images for comparison purposes | RANZCR's comments are consistent with the recommendations of the Monash review in relation to X-rays (Recommendation 11). DNRM has been working closing with BreastScreen Queensland and is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that these noted features would be reflected in the new X-ray screening program. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | Also propose that ongoing clinical feedback to participating radiologists is the most important aspect of a property functioning screening program. | |
| 018 | Queensland Resources Council (QRC) | Cause of CWP cases | Suggests there are two main contributing factors to the 're-identification' of CWP:<br>• risk normalisation - when a workforce becomes so used to dealing with a hazards (dust exposure) that it is considered a normal part of the workplace and loses significance<br>• drift to failure - when events accumulate and go unnoticed because it is not recognised that together these events can result in a 'drift to failure'. | These comments are consistent with the Monash review, which concluded that there were major system failures at all levels of the design and operation of the respiratory component of the health scheme. The reviewers also noted that these and other deficiencies with this aspect of the scheme were confounded by the belief that CWP had been eliminated in Queensland, ultimately leading to a lack of rigor applied to detect such diseases. |
| 018 | Queensland Resources Council (QRC) | CWP Cases | Suggests there needs to be an available synopsis of these confirmed cases so that industry can learn as much as possible from them. DNRM should report summarised de-identified information to industry to inform the development of effective measures to address these conditions. Suggests there is also a need to improve the overall feedback of health information to the mine site, with appropriate privacy protections. | DNRM may disclose the content of a coal mine worker's record for research purposes, but only if the identity of the worker is protected. This disclosure of anonymised details of cases may unintentionally and indirectly identify workers. Consequently DNRM only currently publishes up-to-date figures on confirmed cases of CWP on the DNRM website at: www.business.qld.gov.au/industry/mining/safety-health/mining-safety-health/medicals/pneumoconiosis.<br>The department supports all 18 of the Monash review recommendations which includes that DNRM conduct ongoing individual and group surveillance of health data collected under the scheme, detect early CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers.<br>A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |
| 018 | Queensland Resources Council (QRC) | Dual reading of X-rays | Suggests dual-reading to the ILO classification appears to be resulting in a significant number of false positives. Also | The department is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | suggests it appears that HRCT has become necessary for certainty of diagnosis. Suggests a need to establish a clear diagnostic pathway, including quality analysis of the radiographs, to minimise the potential for incorrect diagnosis. | successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. It is also envisaged that as part of the new program, if a potential case is identified, an appropriate diagnostic procedure is undertaken before a diagnosis is given to provide greater assurance. |
| 018 | Queensland Resources Council (QRC) | NMAs | Notes that the Minister announced in March that changes to the NMA system would be progressed as a priority but industry in still yet to see a firm proposal. | Amendments to the Coal Mine Safety and Health Regulation 2001 will commence on 1 January 2017. These changes include clarifying that all medical examinations will be performed by a person qualified and competent to conduct the examination.<br><br>The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit. It is anticipated that improved programs for spirometry and x-rays will further inform the implementation of the recommendations around medical assessments and practitioners. DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. |
| 018 | Queensland Resources Council (QRC) | 2013 Regulatory Impact Statement (RIS) | Suggests there were reviews prior to that undertaken by the Monash Review that had raised concerns about the functioning of the Scheme, including the 2013 RIS. It is noted that the RIS identified problems with the experience and expertise of NMAs. QRC suggests that no changes were made, despite support from industry to do so. Suggests that it demonstrates that DNRM was concerned that the scheme was to some extent "broken".<br><br>Suggests that it may be instructional for the Committee to consider the reasons why the regulatory amendments were never progressed. | The 2013 Queensland's mine safety framework consultation regulatory impact statement (RIS) sought feedback on options to amend mining safety and health legislation, with a focus on the possible adoption of the Model Work Health and Safety Act (Model Act). However, the RIS also included a number of other proposals not related to the Model Act, which were based upon local issues identified by stakeholders. One proposal included in the paper related to the Coal Mine Worker Health Scheme, and the paper canvased problems with the current scheme, along with a proposed solution. The problems canvassed included:<br><br>• NMAs have little or no experience or expertise in occupational medicine, nor do they have knowledge of the mine conditions or the coal mining industry<br>• the appeal process is problematic - where assessments obtained from the NMA and the worker conflict, and DNRM is required to arrange and pay for the third medical |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | • employers avoiding paying for medicals by requiring workers to complete the health assessment before being considered for the job.<br><br>The solution in the paper was to refocus the scheme to address the hazards such as dust and noise by:<br><br>• making the decision about whether a coal mine worker is fit for work at a particular mine site the responsibility of the mine's SSE, based upon an assessment by a qualified medical practitioner<br>• requiring any future disputes about conflicting health assessment reports to be resolved under the *Fair Work Act 2009*<br>• requiring medical practitioners to have appropriate qualifications and/or experience to carry out health surveillance assessments<br>• requiring medical practitioners to have experience in the mining industry and if necessary appropriate training in audiometry and spirometry<br>• amending the approved form to focus on health surveillance concerns only.<br><br>These changes did not progress for lack of tripartite support. |
| 018 | Queensland Resources Council (QRC) | Fitness for work | Notes that the interrelationship of the Health Scheme with fitness for work issues was identified by DNRM as a significant issue in the 2013 RIS, and rectifying the situation was, and still is, supported by the QRC. | This proposal to separate fitness for work from the health surveillance scheme was included in the 2013 RIS. The Monash review recommended focussing on the early detection of CMDLD and group health surveillance. DNRM has accepted the Review's recommendations and is currently considering options to implement improved models for health screening and surveillance of coal mine workers. |
| 018 | Queensland Resources Council (QRC) | Clinical guidelines and referral | Suggests that follow-up investigation and referral is required if the screening program is to be fully effective, however, doing so may be inconsistent with the decision in *Edwards v North Goonyella Coal Mines Pty Ltd* (QSC 2005) without regulation amendment. Suggests the ruling restricted the ability of a doctor to seek expert | The department supports the Monash review recommendation to develop clinical guidelines for follow-up investigation and referral to an appropriately trained respiratory or other relevant specialist of suspected coal mine dust lung disease in current or former coal mine workers. It is envisaged that amendments will be made to the regulation as required to implement the Monash review recommendations. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| | | | opinion on any potential health issues faced by a worker. | |
| 018 | Queensland Resources Council (QRC) | Reporting of CMDLDs | Suggests the obligation to report CMDLDs should extend to NMAs and be extended to require any occupationally related condition that indicates there may be a significant risk to health and safety at a coal mine to be reported to DNRM. | Regulatory changes that commence on 1 January 2017 will require a mining company to report a range of coal mine dust lung diseases to the department. In addition, enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations will also ensure diagnosis of coal mine dust lung diseases are reported to the department through NMA health assessment reports. |
| 018 | Queensland Resources Council (QRC) | Health Surveillance Unit | Suggests that the lack of reporting, and the sheer extent of the information backlog in entering health assessments, was an indication that the Health Scheme has drifted to a point of failure, if possibly a contributor to the failure itself. Notes an optical character recognition project to read scanned health assessment forms into the database was suspended in the 2014/2015 year. Notes the QRC response to the 2013 RIS highlighted the need to address the backlog. | The Monash review identified the large backlog of health assessments that were awaiting entry into the database as hampering accessibility to the records. However, all of these health assessments were reviewed by a nominated medical adviser and a report provided to the mine worker concerned, prior to forwarding to the department for storage.<br><br>A project to use optical character recognition (OCR) software to automatically 'read' scanned health assessments into the CMWHS database was piloted in 2013–14. It was intended that the technology would reduce the backlog of un-entered health assessments. Despite the pilot, the project was unsuccessful and terminated in 2014-15 as there was no improvement to efficiency in comparison to the existing manual process.<br><br>The department subsequently engaged additional staff to clear the backlog of health assessment forms to ensure all workers' health records are entered or scanned into the database by end of June 2017.<br><br>The Monash review recommended that DNRM should conduct ongoing individual and group surveillance of health data collected under the scheme, to detect early CMDLDs and analyse trends to disseminate to employers, unions and coal mine workers. DNRM will invest in an improved system that enables improved records management and data analysis and maintains best practice security and privacy standards. To ensure that the improved system is fit for purpose, final design requirements will be finalised once policy enhancements to the health scheme are finalised. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 018 | Queensland Resources Council (QRC) | NMAs | Supports Monash recommendation for a smaller pool of doctors but the number of doctors need to remain manageable, and not cost prohibitive, particularly for smaller contractors, so it is sustainable over time. Operators should maintain a choice over which doctors undertake health assessments for their operation. Suggests requirements for doctors to be set through policy or standards so as to be adaptable to changing requirements for health assessments. | The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit. |
| 018 | Queensland Resources Council (QRC) | Screening program | Suggests CMSHAC should undertake the discussion to identify which workers, in addition to underground workers, should undergo screening for CWP, and the frequency. | The Monash review recommended that the criteria to determine workers at risk from dust exposure should be based on past and current underground coal mines and designated work categories in open-cut coal mines and coal handling and preparation plants. This recommendation includes the proposal that criteria to determine job categories at risk from dust exposure should be standardised across Queensland and reviewed regularly to reflect changes in level of risk. The department supports all of the Monash review recommendations and is taking necessary action to address these.<br><br>Regulatory amendments that commence on 1 January 2017 will require mandatory respiratory function and chest X-rays examinations on entry to the industry and at least every five years for underground workers and ten years for aboveground workers. The amendments will also provide retiring coal workers with the opportunity to have a retirement examination within three months of their retirement. |
| 018 | Queensland Resources Council (QRC) | Health Surveillance | Suggests DNRM should ensure any data collected under the Health Scheme is available for analysis and is reported to all of industry as part of a respiratory health surveillance program. | DNRM is investigating options to further improve reporting and implement enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 018 | Queensland Resources Council (QRC) | Health Assessment Form | Suggests allowing the ILO reporting requirement to lapse was a significant failure of the Health Scheme. | The health assessment forms used between 1993 and 2001 included a section where the ILO Classification could have been recorded.<br><br>The removal of this section from the form appears to have occurred when the Queensland Coal Board scheme transitioned to the existing scheme in place under the current legislative framework in 2001, following a revision of the form by a tripartite working group.<br><br>Since 27 July 2016 the form requires that all chest X-ray reports must be completed using the prescribed ILO reporting template. |
| 018 | Queensland Resources Council (QRC) | Implementation of the Monash Review | DNRM should present an implementation plan for the recommendations, and progress against it should be reported on a regular basis through bulletins to major stakeholders. | To facilitate implementation, the department has identified five key focus areas within the 18 recommendations. These are chest X-rays (CXRs), spirometry, medical assessments and practitioners, electronic records management and surveillance.<br><br>DNRM currently provides updates on the implementation of the recommendations to industry through the Coal Mine Safety and Health Advisory committee (CMSHAC), QRC safety and health meetings, SSE and other forums, and periodic communication to SSE and other stakeholders by the Chief Inspector of Coal Mines and Executive Director, Mine Safety and Health.<br><br>The department also provides updates on progress through the DNRM website. DNRM will continue to consult with, and update, stakeholders on the implementation of the Monash review recommendations. |
| 018 | Queensland Resources Council (QRC) | Dust monitoring | Notes QRC supports initiatives within CMSHAC to expedite the approval of real time dust monitoring devices for use in underground mines in Queensland. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 018 | Queensland Resources Council (QRC) | Dust control forum | Notes QRC is anticipating a best practice dust control forum in accordance with the Senate Health Committee recommendations. | Data reported from respirable dust monitoring at all mines sites on a quarterly basis will be reviewed by a respirable dust committee with a similar governance structure and operation to the Standing Dust Committee currently in operation in NSW. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 018 | Queensland Resources Council (QRC) | Retired workers | Suggests that retired workers should have access to industry funded full heath assessments but do not believe that there needs to be a separate industry wide fund for this to happen. | The Monash review recommended that participation in the health scheme be offered to retired workers. DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended.<br><br>As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide retiring coal workers with the opportunity to have a retirement examination within three months of their retirement.. |
| 018 | Queensland Resources Council (QRC) | Dust compliance | Suggests that QRC have long maintained that there is a need to modernise the enforcement approach and to improve the capacity of the inspectorate to undertake their duties, including being aware of potential for, and perception of regulatory capture. | The Mines Inspectorate Compliance Policy explains how the Mines Inspectorate promotes and achieves compliance with the legislation. It identifies a range of compliance options the Mines Inspectorate can use to bring a mine back into compliance such as issuing a directive, directing the SSE and the company's senior management to attend a compliance meeting and prosecution.<br><br>The Mines Inspectorate will determine the most appropriate course of action on a case by case basis and follow a number of steps as outlined in the policy. The Mines Inspectorate Compliance Policy Implementation guide also assists inspectors to adopt a consistent approach to implementing compliance action across inspectorates, regions and districts. It is anticipated that Mining Safety and Health will undertake a review of the Compliance Policy in 2017.<br><br>To ensure inspectors develop their skills and understanding of the issues facing the industry, an ongoing program of continuous professional development is undertaken. During 2015-16, around 40 different training courses were delivered to inspectors.<br><br>The Mines Inspectorate also provides training to inspectors to ensure awareness and mitigate the risk of regulatory capture. In addition to training for technical skills, inspectors are required to undertake code of conduct, ethical decision making and ethical conduct training. The courses dealing with ethical conduct and decision making are provided by the Queensland Ombudsman. |
| 019 | Caledon Coal | Regulatory framework | Caledon considers that, with the addition of regulatory amendments that will commence in January 2017, the legislative | The adequacy of the regulatory framework will continue to be assessed by the department in implementing the Monash review recommendations. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | framework relating to respirable dust is generally adequate and appropriate. | |
| 019 | Caledon Coal | Failure of the health scheme | Caledon notes that the failure of the Health Scheme to detect CWP was contributed by a belief that the risk of CWP was being appropriately managed. This was not the case and supports implementation of the Monash recommendations. | The department will continue to consult with stakeholders in the implementation of the Monash review recommendations. Part of the implementation will be to establish an adequate surveillance program that will continue to routinely monitor the effectiveness of the health scheme. |
| 019 | Caledon Coal | Increase focus on occupational hazards to align with principle hazards | Caledon acknowledges that the regulatory framework has been heavily influenced by several catastrophic events. This history contributed to a strong emphasis on the management of hazards that have the potential to cause disastrous outcomes, such as gas explosions. A focus by coal industry participants on the prevention of these events may have contributed to diminished emphasis on latent occupational health hazards, such as CWP. | Queensland has a risk based-approach to mine site safety and health. Mine operators are required to proactively review their safety and health management system to ensure the system is effective and can constantly adapt to the changing environment and interdependencies of complex mining operations.<br><br>Queensland's framework enables the site senior executive, site safety and health representatives, industry safety and health representatives, mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting or auditing the safety and health management system. |
| 019 | Caledon Coal | Reporting disease | Caledon highlights an issue with requirements for SSEs to report prescribed diseases, as there is no requirement for NMAs to advise the SSE of a CWP diagnoses. Recommend that the SSE and company are advised of prescribed diseases. | DNRM has progressed a number of regulatory amendments relating to the CMWHS, including requirements for SSEs to notify DNRM when cases of prescribed diseases are identified.<br><br>It should also be noted that the obligations on the SSE under section 198 of CMSHA to give notice of a disease only comes into effect if the SSE receives a report of a disease that is prescribed under the regulation. Section 52(2) of the Coal Mining Safety and Health Regulation 2001 also provides that a nominated medical advisor may disclose clinical findings obtained during the health assessment to the employer if the worker consents.<br><br>The department is currently in the process on addressing changes to improve the health surveillance system. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | are taken into account. This will include how and to whom information of diseases are reported to the department and stakeholders. Further changes to the regulatory framework may be required to streamline the reporting process for prescribed diseases. |
| 019 | Caledon Coal | Independence of Mines Inspectors | Caledon is not aware of issues with the independence of inspectorate and notes that the inspectorate has been active at the Cook mine.<br><br>Cook mine has benefitted from the Mines Inspectorate's advice including information on pick configuration that expedited the development and implementation of standards to reduce coal dust generation from cutting equipment. | As noted in Caledon's submission, DNRM made 18 visits to Cook Mine from January to October 2016 including two unannounced inspections. Cook Mine also received several directives that prescribe actions to reduce risk to an acceptable level. |
| 019 | Caledon Coal | Monash Review & Senate Select Committee on Health | Supports the QRC's response to the findings of the Senate Select Committee on Health and the Monash review. | The department is committed to implementing all Monash review recommendations. The Senate Select Committee on Health made twenty recommendations a number of which, particularly those relating to NMAs, are effectively being addressed through implementation of the Monash review recommendations. Other recommendations are addressed by the government's action on dust management. |
| 019 | Caledon Coal | Principal Hazard Management Plan for respiratory health. | Caledon notes that there is no statutory requirement for a Principal Hazard Management Plan (PHMP) that specifically addresses hazards relating to respiratory health. Caledon has developed a PHMP for airborne dust, and noted that this was a voluntary step based on their internal risk assessment. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br><br>A Principal Hazard Management Plan must identify, analyse and assess risk associated with principal hazards and include standard operating procedures and other measures to control risk. Defined under *Coal Mining Safety and Health Act 1999*, a principal hazard is a hazard at a coal mine with the potential to cause multiple fatalities. It can be argued that, by definition, this may include respiratory health, however there is some ambiguity as to whether it does. The Act was not intended to be prescriptive to capture a range of hazards. The original intent for principal hazard was to capture hazards that have an immediate consequence or imminent impact as opposed to one that has a latency. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 019 | Caledon Coal | Dust monitoring | Caledon provided information on their approach to dust management. Which includes both personal dust monitoring and static and real time monitoring. Caledon supports use of real time monitoring for its immediate feedback capability | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 019 | Caledon Coal | New technology to reduce dust exposure | Caledon recommends encouraging designers and manufacturers to develop and trial new engineering solutions to reduce dust exposure | SIMTARS is a resource available to the government, mining companies, mining equipment manufacturers, suppliers to the mining industry. SIMTARS supports the Inspectorate through provision of expert advice and assistance with accident investigations and also provides nationally recognised training and qualifications in mine safety to thousands of mine workers in Australia and overseas. |
| 019 | Caledon Coal | Education | Caledon delivered an education package to its workforce on CWP, training on this Trigger Action Response Plan, and established an Airborne Dust Committee from across the workforce. | The department encourages education on the risks and effects associated with coal mine dust lung disease. |
| 019 | Caledon Coal | Respiratory screening | Caledon has committed to ensuring all workers have current health assessments, and to an interim protocol for the conduct and review of chest X-rays for concerned mine workers. Noted that as of October, 5% of workers had taken up the voluntary option. | On 12 July 2016, all underground coal mines including Caledon give their support to offering their workers new checks on current chest X-rays or fresh X-rays if the X-ray was taken more than two years ago. All new x-rays taken under the Coal Mine Workers' Health Scheme will now be checked first by an Australian radiologist and, as an interim measure, by US-based B-readers.<br><br>Proposed changes to the health scheme will incorporate retired or former workers as per the Monash review recommendation. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Clinical guidelines | Supports the development of clinical guidelines for health surveillance in coal mines. These guidelines would cover matters such as processes, systems and pathways, and referral and investigation processes. Examples are provided. Submission notes some existing examples of well-established clinical guidelines in other areas. | DNRM has produced a number of factsheets to assist medical professionals to provide them with guidance about the disease and to build their understanding of the ILO classification framework. Materials were distributed via professional medical peak bodies and key health industry stakeholders. Queensland Health facilitated the distribution of information about the disease to health professionals through its general practice distribution network.<br><br>This proposal to develop detailed clinical guidelines is consistent with the Monash Review recommendations (Recommendations 2, 8.2.9). The department will be developing clinical guidelines for follow-up |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | investigation and referral to an appropriately trained respiratory or other relevant specialist of suspected coal mine dust lung disease in current or former coal mine workers. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Health surveillance | Recommend that any medical practitioner who performs health surveillance has the required training, skills, experience and competency. They suggest that training programs could be established for NMAs and that minimum standards and key competencies be established. | The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit.<br><br>Regulatory changes that commence on 1 January 2017 will clarify that each examination carried out as part of a health assessment must be performed by a person qualified and competent to conduct the examination.<br><br>This proposal is consistent with the Monash Review recommendations (Recommendations 8). These recommendations will be addressed as part of the key focus area on medical practitioners and assessments. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Spirometry | Suggests that for spirometry to be reliable a number of components are required around equipment, training, data storage, accreditation processes and quality control.<br><br>Notes that spirometry is a uniformly accepted screening test however it has its limitations.<br><br>Other medical tests, such as the diffusing capacity of the lungs for carbon monoxide (DLCO) may have a role to play, however further evaluation and research will be required before this would be more broadly adopted. | The Monash review identified significant issues with the spirometry screening component of the Coal Mine Workers' Health Scheme. It made several related recommendations including that spirometry should be conducted only by accredited practitioners who undertake initial and on-going training and quality of tests regularly audited.<br><br>Following the Monash Review, changes were made to the health assessment form to clarify that spirometry must be undertaken by appropriately trained operators to the standard outlined in Queensland Health: Spirometry (Adult) Guideline, in order to improve the quality of spirometry. In addition, a change was made to require copies of spirometer reports to be provided to the department along with the health assessment form. The purpose of this change was to assist medical practitioners to identify a change in the individual's lung function over time.<br><br>DNRM has consulted with the Thoracic Society of Australia and New Zealand to scope options for a practice-based, spirometry accreditation program for those NMAs in general medical practices and occupational health clinics. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | The department is currently developing a proposal for an accreditation program for the taking and reading of spirometry under the scheme. Consultation on this proposal will include ascertaining stakeholder views on the merits of adopting gas transfer testing for screening. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Radiology | Supports screening chest X-rays to be classified using the ILO classification system, and the use of HRCT before a diagnosis is made. Notes that there are no international standards for using HRCT as a screening test and suggest Australia could be at the forefront of the development of protocols. | DNRM will be implementing the Monash review recommendation to develop clinical guidelines for follow-up investigation and referral of a suspected coal mine dust lung disease to an appropriately trained respiratory or other relevant specialist.<br><br>All new X-rays taken under the Coal Mine Workers' Health Scheme (CMWHS) must be in a digital format – DNRM no longer accepts analogue X-ray films. NMAs must also clearly identify when they refer workers for an X-ray that it is for screening under the CMWHS and radiologists must report on a prescribed ILO reporting form.<br><br>The department is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. It is also envisaged that as part of the new program, if a potential case is identified, an appropriate diagnostic procedure is undertaken before a diagnosis is given to provide greater assurance. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Records management | Supports an electronic database for storing health surveillance records. | DNRM is investigating options to further improve reporting and implement enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Register for reporting CWP cases | Supports the establishment of a register for recording cases of CMDLD. | DNRM currently publishes up-to-date figures on confirmed cases of CWP on the DNRM website at www.business.qld.gov.au/industry/mining/safety-health/mining-safety-health/medicals/pneumoconiosis.<br><br>Regulatory changes that commence on 1 January 2017 will require a mining company to report a range of coal mine dust lung diseases to |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | the department. In addition, enhanced health surveillance and electronic data management to be implemented under the Monash review recommendations will also ensure diagnosis of dust diseases are reported to the department through NMA health assessment reports.<br><br>The data will be available and readily reportable through the department's annual Mines Safety and Health report and to the Commissioner for Mines Safety and Health. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. |
| 020 | Australasian Faculty of Occupational and Environmental Medicine (AFOEM) | Medical review panels | Supports the establishment of an expert medical review panel for the purposes of determining a diagnosis if there is uncertainty or disagreement about the clinical diagnosis. | DNRM will be implementing the Monash review recommendation to develop clinical guidelines for follow-up investigation and referral of a suspected coal mine dust lung disease to an appropriately trained respiratory or other relevant specialist (Recommendation 2). |
| 021 | Black Lung Victims Group | Cases of CWP | Notes that there are at least 30 workers with black lung disease in Queensland and many more unconfirmed. Suggests many are frightened to come forward for risk of losing their job. | As at 24 November 2016, DNRM has confirmed 17 cases of CWP. The department confirms a case when the department's occupational physician confirms the diagnosis of a coal worker by their relevant medical practitioner. DNRM encourages any coal mine worker who has concerns about their health to talk to their general practitioner. |
| 021 | Black Lung Victims Group | Victims' fund | Suggest a victims' fund through an industry levy of 10c per tonne on all coal produced in Queensland | The Mines Inspectorate is currently funded by a levy on the mining industry paid to the department annually based on the number of workers in the industry and the budgeted cost of services. |
| 021 | Black Lung Victims Group | Dust levels | Recommend a reduction in legal dust level to 2.5mg per cubic metre. | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 021 | Black Lung Victims Group | Dust reporting and monitoring | Suggests introduction of independent dust reporting and monitoring, including giving Check Inspectors the right to conduct spot checks on any mine, at any time, without | DNRM is working with industry to develop a recognised standard for dust monitoring in addition to a new dust reporting database. The dust monitoring standard will provide a standardised method for collecting respirable dust data. This will improve data quality and |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | notice; and recorded dust levels reported publically (identified, by mine) on a public website. | integrity and enable the Mines Inspectorate to oversee compliance with dust levels at the individual level, at the similar exposure group level, across an entire coal mining operation and across the coal mining industry.<br><br>The department is proposing that for the recognised standard for dust monitoring that only independent, experienced, and Certified Occupational Hygienists should design, plan and report on the assessment of workplace dust exposures.<br><br>The Mines Inspectorate, as part of its ongoing inspection and audit program, will provide regulatory oversight to ensure the activity meets these requirements and achieves an acceptable level of risk. Mines Inspectors currently hold wide ranging powers to conduct inspections.<br><br>Recent regulatory amendments due to commence on 1 January 2017 will require coal mining companies to:<br>• regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br>• advise inspectors every time dust concentrations exceed prescribed levels<br><br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data can be provided to the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament. |
| 022 | Peabody Energy | Dust management | Peabody Energy has listed the measures their mines have taken to mitigate dust and is happy to share these with other mines, including the information shared at the QRC dust workshop.<br><br>They suggest that the department should set dust compliance objectives for coal mine operators but allow for flexibility of how these objectives are met. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent coal mine dust lung disease.<br><br>Recognised standards provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Operators can manage the risk in a different way, but must be able to show that methods used are at least equivalent to the methods in the recognised standard and is within the regulated dust exposure limits. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| 022 | Peabody Energy | Privacy concerns | Peabody does not believe mine operators can adequately protect their employees without knowledge of their employee's health status. | The Monash Review made a number of findings and recommendations regarding the health assessment process and health surveillance. DNRM is currently considering opportunities to improve health screening and the collection, analysis and reporting of health data. DNRM will seek input of stakeholders including mine operators to inform any changes to requirements of the CMWHS. |
| 022 | Peabody Energy | Contractors and Labour Hire | Peabody has offered their employees, including above ground and former employees, free health assessments.<br><br>Peabody recommends that contractor and labour hire companies be responsible for their employees, as it is out of the mine operator's control. | Under the Coal Mine Workers' Health Scheme, it is the responsibility of the contractor to ensure health assessments are conducted for their employees.. However it is the department's expectation that through the safety and health management system, SSEs would ensure appropriate checks of contractor's health assessments are made as part of the authority for the contractor to work onsite.<br><br>The Monash review recommended that participation in the health scheme be offered to retired workers. DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended. As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide retiring coal workers with the opportunity to have a retirement examination within three months of their retirement. |
| 023 | Australian Medical Association Queensland (AMAQ) | Coal Mine Workers' Health Scheme (CMWHS) | AMAQ believes that the CMWHS was for many years successful in monitoring coal workers' exposure to known causes of CWP, causing complacency amongst stakeholders including medical practitioners.<br><br>AMAQ have highlighted a number of factors that they consider have contributed to limitations in the effectiveness of the CMWHS - such as an increase in coal worker numbers and pre-employment health assessments. | The Monash review concluded that there were major system failures at all levels of the design and operation of the respiratory component of the health scheme. The reviewers also noted that these and other deficiencies with this aspect of the scheme were confounded by the belief that CWP had been eliminated in Queensland, ultimately leading to a lack of rigor applied to detect such diseases. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| 023 | Australian Medical Association Queensland | NMAs | AMAQ identified a number of factors pertaining to nominated medical advisers (NMAs) that may have contributed to shortcomings within the Coal Mine Worker's Health Scheme. These include:<br>• a significant increase in the number of NMAs since 2005, with many new NMAs not in coal mining areas and/or not formally trained in occupational medicine and detecting CWP<br>• employers not properly completing Section 1 of the health assessment form, causing NMAs to not have a complete occupational picture<br>• issues with timeliness of X-rays being provided to radiologists, such as use of hard copy film X-rays and backlogs of data entry into DNRM systems.<br>AMAQ recommends that improvements to the health scheme should address the lack of training and lack of compliance with regulations by several NMAs, workers, employers, and large medical service providers.<br>AMAQ supports the recommendations of the Monash Review for a smaller pool of approved doctors undertaking the respiratory component of health assessments, and a formal training program. | The Monash review identified a number of deficiencies in the Coal Mine Worker's Health Scheme (CMWHS) including issues with the number of NMAs and the inadequacy of suitable training, maintenance of skills and quality control.<br>The Monash Review also found that Section 1 of the health assessment form was poorly completed and recommends that a separate respiratory health section be included in the health assessment form to ensure that respiratory health is properly considered during health assessments. It also recommends the inclusion of an occupational history component in the form.<br>The department is developing an improved model for nominated medical advisers. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit.<br>As a point of clarification, the AMAQ submission infers that the backlog of record entry by the department delayed provision of chest X-rays to radiologists. Under the CMWHS, NMAs provide the department's Health Surveillance Unit (HSU) with the health assessment forms, chest X-rays and associated reports at completion of the health assessment. The NMA engages with radiographers and radiologists directly to refer, take and read X-rays. That is, the HSU does not have a role in this process (noting that the HSU does facilitate transfer of chest X-rays to US readers as part of the recent interim two-reader process). |
| 023 | Australian Medical Association Queensland (AMAQ) | Radiology in Queensland | AMAQ supports Australian trained radiologists in their capability to appropriately read chest X-rays for CWP | In response to the findings of the Monash review regarding possible misreads of coal worker chest X-rays, DNRM, with support from underground coal companies in Queensland, implemented an interim two-reader process for coal worker CXRs. This includes |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| | | | and rejects suggestions that they are less well trained than USA B-readers.<br><br>AMAQ notes that:<br><br>• ILO classification and the NIOSH B-reader program were designed for consistent reporting and epidemiological purposes and cannot diagnose CWP alone<br>• ILO is based on film screen x-rays (FSR) and has a lower sensitivity compared to CT. Misdiagnosis of early CWP may occur due to the inherent limitations of chest radiographs, rather than any failing of Australian radiologists<br>• NIOSH B-readers could not definitively diagnose any cases of CWP from the Monash sample. A centralised system is needed for possible positive cases to be discussed by a multidisciplinary panel of Australian based specialists<br>• Australian radiologists are world class.<br>• RANZCR has taken appropriate steps to have chest X-rays read by radiologists on their CWP register while further training pathways are finalised. | underground coal mines offering their workers new checks on current chest X-rays or new X-rays if the X-ray was taken more than two years ago. All chest X-rays are dual read, first by an Australian radiologist to the ILO Classification and then assessed by NIOSH approved readers at the UIC.<br><br>This was done to restore the confidence of the coal industry workforce in the CWP screening program. Providing a second read of chest X-rays is consistent with practices under other screening programs such as BreastScreen Queensland and NIOSH. This is an interim measure until a Queensland based X-ray screening program is established that aligns with the Monash review recommendations.<br><br>DNRM has consistently recommended to NMAs that all cases where the chest X-ray indicates possible CWP should be referred to a respiratory physician for an appropriate diagnostic assessment.<br><br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. |
| 023 | Australian Medical Association Queensland | National standard | Recommends a single Australian standard for exposure limits and monitoring | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings.<br><br>DNRM is working with industry and unions to develop a recognised standard for respirable dust monitoring in addition to a new dust |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | reporting database. The recognised standard for monitoring requires mines to conduct baseline monitoring and identify similar exposure group (SEGS) across the whole mine site (both surface and underground). The ongoing monitoring frequency will be risk based but it will include periodic sampling for all areas and locations.<br><br>All mine sites, both surface and underground will be required by law as of 1 January 2017 to report respirable coal and silica dust monitoring data at least once every three months for development and longwall operations, and as required under the standard for other areas at a coal mine.<br><br>Additionally, mine sites will be required to report single exceedances of the occupational exposure limit to a mines inspector and undergo a process of analysing and resampling the exceedance. |
| 023 | Australian Medical Association Queensland | Health surveillance/ Data management | Recommends improved resourcing for HSU, specifically IT systems supporting the health scheme, or outsourced data storage and reporting. An improved system solution must support a central location for chest X-rays. | The Monash review recommendations include that the department develop an electronic system of data entry and storage. Scoping of the requirements for such a system is currently underway, including aspects of its accessibility. This system will be flexible and scalable to adapt to future requirements. |
| 023 | Australian Medical Association Queensland | Health screening | Recommends a national screening approach to address needs of FIFO workforce.<br><br>Spirometry and radiology should be supported by guidelines and undertaken with appropriately maintained equipment.<br><br>Screening for CWP should reflect other screening programs such as BreastScreen Queensland or NIOSH, with a coordinating central hub that facilitates engagement between NMAs and ongoing research into occupational lung disease. | On 19 August, Minister Lynham addressed the COAG Energy Council, raising the issue of a surveillance scheme for former coal mine workers and the potential for coal workers to move interstate. At that meeting all Ministers emphasised their commitment to the health of coal mine workers, and agreed they would collaborate in order to raise awareness among former coal mine workers who might be at risk.<br><br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. DNRM has proposed that technical aspects of taking and reading X-rays will be in accordance with Australian requirements and the NIOSH Guideline – Application of Digital Radiography for the Detection and Classification of Pneumoconioses. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | The proposed new Queensland X-ray screening program has been informed by analysis of programs in other jurisdictions. The proposed model is consistent with a number of features of the BreastScreen Queensland as well as NIOSH in the USA.<br><br>The department is currently developing a proposal for an accreditation program for the taking and reading of spirometry under the health scheme. |
| 023 | Australian Medical Association Queensland | Consultation | Recommends increased collaboration between DNRM and Queensland Health, and also with relevant medical colleges and associations to provide professional input into the CMWHS.<br><br>Highlighted the potential for the Queensland Health Promotion Commission to engage on coal workers' pneumoconiosis, once that Commission is established.<br><br>AMAQ is willing to assist in development and implementation of a new CMWHS. | DNRM has been working closely with Queensland Health since cases of CWP were first confirmed in 2015. The Chief Health Officer has provided advice and facilitated review of public health records and distributed information about the disease to health professionals.<br><br>Queensland Health experts continue to support DNRM in the implementation of the Monash review recommendations, for example with advice from the Chief Radiologist at BreastScreen Queensland and medical physicist advice from Biomedical Technology Services. |
| 024 | Breathe Safe Pty Ltd | Dust management | Recommends that CWP will be prevented through compliance with new regulatory standards and proper engagement of engineering control measures, administrative control measures and training for workers in order to evaluate their own safety. | DNRM is focussed on ensuring higher level controls are implemented to ensure respirable dust levels are below prescribed levels. Work is progressing with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease. |
| 024 | Breathe Safe Pty Ltd | Technology | Technology potential in the field of filtered, pressurised enclosed cabins to reduce risks of dust exposure to machine workers. It is noted that NSW and other jurisdictions have guidelines related to this. | DNRM already identifies the use of enclose cabins where possible, ensuring seals are well-maintained, providing inlet air filtration for respirable particles, and using positive pressure air inside cabs to prevent dust penetration as one of several potential engineering controls available to mine operators to assist in controlling worker exposure to dust. |
| 024 | Breathe Safe Pty Ltd | Dust exposure levels | Recommends a reduction in the maximum respirable coal dust level to a level comparable to NSW and the USA. They | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | note that there may be no safe level of prolonged exposure to coal dust and further research is required. | to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 025 | Anglo American | NMAs | Anglo American re-issued its NMA appointments in early 2016, and appointed a chief medical officer to liaise closely with NMAs and provide expert advice on occupational health processes. | These actions are consistent with Recommendation 7 of the Monash review which suggests that there needs to be a much smaller pool of approved doctors undertaking the respiratory component of health assessments.<br>DNRM has accepted the recommendations of the Monash review and will consider implementation options that will inform a discussion paper on health assessments, including NMAs, which is expected in early 2017. Feedback will be sought from key stakeholders. |
| 025 | Anglo American | Dust management | Provided a detailed list on the actions their mines have taken to mitigate dust levels. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br>Recognised standards provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Operators can manage the risk in a different way, but must be able to show that methods used are at least equivalent to the methods in the recognised standard and is within the legislated dust exposure limits. |
| 025 | Anglo American | Real time dust monitors | Have introduced Thermo PDM 3700 personal dust monitors into all its underground coal mines where its use is currently restricted to 'negligible explosion risk zones – where methane concentration less than 0.5%.<br>Whilst attempts to have these devices approved for general use in Anglo American group underground coal mines (and hence in the Queensland underground coal industry) has been sought, it would appear the approvals process is painstakingly slow. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 026 | Maurice Blackburn Lawyers | Regulatory framework – aim of the Scheme | Notes that the prevention of CWP is not a stated aim, nor the intended effect, of the regulatory framework. | These concerns and proposals regarding the stated objectives of the regulatory framework are consistent with Recommendation 1 of the Monash review. The department supports the Monash review recommendation to clarify that the main purpose of the respiratory component of the scheme should explicitly focus on the early detection of CMDLD. |
| 026 | Maurice Blackburn Lawyers | Regulatory framework – self-regulation | Suggests the current framework that mandates self-regulation has failed in managing the safety risks to mine workers. They suggest stronger provisions within both the Act and Regulation, including serious sanctions for breaches. | Queensland has a risk based-approach to mine site safety and health. Mine operators are required to proactively review their safety and health management system to ensure the system is effective and can constantly adapt to the changing environment and interdependencies of complex mining operations. The Queensland framework enables the site senior executive, site safety and health representatives, industry safety and health representatives, mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting or auditing the safety and health management system.<br><br>The Mines Inspectorate has been active in regulating coal dust levels through the utilisation of a range of compliance tools and raising awareness. Since 2013 the Mines Inspectorate has issued 36 directives to nine underground coal mines. This included directing a mine to review its safety and health management system, review the effectiveness of dust controls, to reduce cutting speed and two to suspend operations.<br><br>Mines placed under directive are required to undertake onerous monitoring regimes and stringent reporting processes until they can demonstrate that exposures have been controlled to acceptable levels. This requires a minimum of three consecutive months of demonstrated compliance.<br><br>Notwithstanding this, the department acknowledges that more needs to be done and is implementing immediate regulatory amendments to strengthen respirable dust monitoring requirements. Regulatory amendments are due to commence in January 2017 which will introduce the new requirement for inspectors to be advised every time dust concentrations exceed prescribed levels. This new requirement also requires the site senior executive to ensure the cause of high average concentration is investigated and the results |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | of the investigation are recorded and analysed to identify trends and issues with the coalmine's safety and health management system.<br><br>DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br><br>Recognised standards provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Operators can manage the risk in a different way, but must be able to show that methods used are at least equivalent to the methods in the recognised standard and is within the legislated dust exposure limits. |
| 026 | Maurice Blackburn Lawyers | Dust levels | Suggests permissible dust exposure should be 1.0mg/$m^3$. | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 026 | Maurice Blackburn Lawyers | Dust standard | Suggests a minimum standard created, which is constantly reviewed, that provides for operators to adopt best practice dust suppression techniques, technologies and PPE. | DNRM is working with industry to develop a recognised standard for dust control that will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br><br>Recognised standards provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Operators can manage the risk in a different way, but must be able to show that methods used are at least equivalent to the methods in the recognised standard and is within the legislated dust exposure limits. |
| 026 | Maurice Blackburn Lawyers | Inspectors powers | Suggests broadening powers of mine inspectors under Part 9, Division 4 of the Act, to undertake inspections without limitations (e.g. time, notice). | Mine Inspectors currently hold wide ranging powers to conduct inspections. Current powers enable them to fulfil their obligations under the Act. |
| 026 | Maurice Blackburn Lawyers | Real time dust monitoring | Suggests mandatory and continuous wearing of real time dust monitors by coal mine workers. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 026 | Maurice Blackburn Lawyers | Reporting of dust levels | Suggests mandatory reporting of dust levels at regular intervals to the Mines Inspectorate or Minister, with such results | DNRM is working with industry and unions to develop a recognised standard for respirable dust monitoring in addition to a new dust reporting database. The recognised standard for monitoring requires |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | to be made immediately available to the public at all times. | mines to conduct baseline monitoring and identify similar exposure group (SEGS) across the whole mine site (both surface and underground). The ongoing monitoring frequency will be risk based but it will include periodic sampling for all areas and locations.<br><br>All mine sites, both surface and underground will be required by law as of 1 January 2017 to report respirable coal and silica dust monitoring data at least once every three months for development and longwall operations, and as required under the standard for other areas at a coal mine.<br><br>Additionally, mine sites will be required to report single exceedances of the occupational exposure limit to a mines inspector and undergo a process of analysing and resampling the exceedance.<br><br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data can be provided to the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament. |
| 026 | Maurice Blackburn Lawyers | Dust compliance | Suggests further independent oversight by the Minister or Mines Inspectorate to require shut down of mines or imposition of penalties where dust levels exceed standards.<br><br>Suggests imposition of financial penalties where a worked develops CWP and exposure can be attributed to an employer (independent of any personal injury claim brought by a worker). | The primary purpose of the Mines Inspectorate is to ensure that persons with health and safety obligations manage and control risks effectively, thus preventing harm. Mines inspectors have a number of compliance and enforcement strategies available to them. In accordance with the Compliance Policy, five levels of administrative response for compliance and enforcement, which includes the power to issue a directive to suspend operations where a mine is exceeding dust levels. Under the current framework, a failure to comply with a directive under the Act is an offence, with a maximum penalty of 800 penalty units or two years imprisonment. |
| 026 | Maurice Blackburn Lawyers | Screening program | Support the introduction of mandatory HRCT scanning and the use of specialist respiratory physicians as early as possible. | DNRM is implementing the Monash review recommendation to develop clinical guidelines for follow-up investigation and referral of suspected coal mine dust lung disease to an appropriately trained respiratory or other relevant specialist. The department is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that as part of the new program, if a potential case is identified, an appropriate diagnostic procedure is undertaken before a diagnosis is given to provide greater assurance. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | DNRM will consider feedback from stakeholders to ensure all factors are taken into account. |
| 026 | Maurice Blackburn Lawyers | Adoption of measures from other jurisdictions | Suggests measures used in other jurisdictions, such as New South Wales, should not be adopted without adequate evaluation of the operation of respective measures. | DNRM has been reviewing coal mine worker' schemes used in other jurisdictions, such as New South Wales and the United States, to identify measures that may be effective for the new scheme in the Queensland context. DNRM will continue to consult with stakeholders through a series of consultation papers on proposed models. |
| 026 | Maurice Blackburn Lawyers | Scope of current investigations | Supports action to examine the health and safety of all types of mine workers who are at risk of dust-related disease. | In addition to coal mine dust lung disease, the department is considering the recommendations of the Monash review in the context of workers in quarries, metalliferous and non-metalliferous mines regulated under the *Mining and Quarrying Safety and Health Act 1999.*<br><br>This consideration is currently being made in consultation with the Mining Safety and Health Advisory Committee which is the equivalent of CMSHAC for metalliferous and non-metalliferous mining and quarrying (albeit with different members).<br><br>In addition, regulatory changes that commence on 1 January 2017 will require a mining company to report a range of mine dust lung diseases to the department. |
| 026 | Maurice Blackburn Lawyers | Costs of health assessments | Suggests that all workers who have concerns about their health, should be able to have tests paid for by coal mine operators, as currently workers may be out of pocket if there is no subsequent diagnosis, and therefore, no coverage by the workers' compensation scheme. | Health assessments under the current scheme are mandatory for all coal mine workers (other than low risk workers). Under the Regulation, the costs of health assessments and medical examinations undertaken under the scheme are met by employers.<br><br>Regulatory amendments that commence on 1 January 2017 will require mandatory respiratory function and chest X-rays examinations on entry to the industry and at least every five years for underground workers and ten years for aboveground workers.<br><br>The Monash review recommended that participation in the health scheme be offered to retired workers. DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended. As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide retiring coal workers with the |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | opportunity to have a retirement examination within three months of their retirement. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Training for radiologists | Recommends that State and Federal governments work with RANZCR to develop a certification system to the U.S. B-reader scheme (Recommendation 1). | DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | NMAs | Recommends NMAs should be a small group appointed by the government (Recommendation 2). | The Monash review recommends that a smaller pool of approved doctors, approved by DNRM, undertake health assessments under scheme. A consultation paper on issues related to medical practitioners and assessments is currently under development. It is intended that this paper will canvas a number of issues such as the role of doctors, training, minimum qualifications and experience, and on-going clinical audit. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Monash review | Recommends that the Monash review is found to be a partial response and that further measures are required around prevention and compensation and support (Recommendation 3). | In addition to implementing the recommendations of the Monash review, the department is putting in place a number of measures to strengthen respirable dust management requirements. This includes amendments to the regulatory framework, developing recognised standards on monitoring and controlling dust and developing a database to enable surveillance and reporting. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Aboveground coal mine workers | Recommends current and revised screening procedures should apply to surface and underground workers in the same way (Recommendation 4). | Regulatory amendments that commence on 1 January 2017 will require mandatory respiratory function and chest X-rays examinations on entry to the industry and at least every five years for underground workers and ten years for aboveground workers.<br><br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays for both underground and aboveground workers would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Retired workers | Recommends Australian states introduce a system for respiratory screening that includes workers that are no longer employed (Recommendation 5). | DNRM is currently considering options to ensure former and retired workers can access health assessments after their employment has ended. As an interim step, DNRM has progressed regulatory amendments that come into effect on 1 January 2017 that provide |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | retiring coal workers with the opportunity to have a retirement examination within three months of their retirement. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Rathus Report | Notes that the discovery of 75 cases in 1984 was an early warning in relation to that effectiveness of the regime - and that this was ignored (paragraph 3.10). | The Rathus-Abrahams report recommended a permanent health scheme for coal miners, and based on this recommendation, the Queensland Coal Board introduced the new Coal Industry Employees Health Scheme in May 1993, which formed the basis of the current Health Scheme. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Health surveillance | States that the DNRM Health Surveillance was responsible for reviewing chest X-rays on the basis that this was a requirement of the assessment form. Notes that the requirement was subsequently removed from the form somewhere between 1998 and 2001. | The health assessment forms used between 1993 and 2001 included a section where the ILO Classification could have been recorded.<br>The removal of this section from the form appears to have occurred when the Queensland Coal Board scheme transitioned to the existing scheme in place under the current legislative framework in 2001, following a revision of the form by a tripartite working group.<br>Since 27 July 2016 the form requires that all chest X-ray reports must be completed using the prescribed ILO reporting template. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | CXR Screening | States that the CFMEU in Queensland has resorted to sending chest X-rays of suspected cases to the United States for reading, which has resulted in new diagnoses (paragraph 4.11). | On 27 July 2016, an interim dual-screening process was introduced by DNRM. All chest X-rays taken under the Coal Mine Workers' Health Scheme (CMWHS) are first read by an Australian radiologist to the ILO Classification and then assessed by NIOSH approved readers at the UIC. The screening of X-rays by US based B-readers is only an interim process until a new Queensland based program is established.<br>DNRM is currently consulting with stakeholders on a new Queensland X-ray screening program. It is envisaged that X-rays would be dual read to the ILO Classification by radiologists who have successfully completed an ILO training program. Radiologists would also be required to undergo refresher training and have their performance monitored and audited on an ongoing basis. |
| 027 | Construction, Forestry, Mining | Support for workers diagnosed with CWP | Recommends that Queensland government establish a Coal Dust Disease board to provide lifelong assistance for | DNRM currently refers current and former coal mine workers with any health concerns to their general practitioner for on-going advice and assistance. All workers diagnosed with CWP can make a claim |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | and Energy Union (CFMEU) | | workers diagnosed with CWP and other lung diseases (Recommendation 7). | for compensation under Queensland's workers' compensation scheme or their employer's own insurance scheme, or they can make a common law claim for damages through the law courts. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Dust compliance | Recommends Queensland Mines Inspectorate develop and implement a clear compliance and enforcement program, with clear consequences for breaches (Recommendation 8). | The Mines Inspectorate Compliance Policy explains how the Inspectorate promotes and achieves compliance with the legislation. It identifies a range of compliance options the Inspectorate can use to bring the mine back into compliance such as issuing a directive, directing the SSE and the company's senior management to attend a compliance meeting and prosecution. The Inspectorate will determine the most appropriate course of action on a case by case basis and follow a number of steps as outlined in the policy. The Mines Inspectorate Compliance Policy Implementation guide also assists Inspectors to adopt a consistent approach to implementing compliance action across Inspectorates, regions and districts. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Dust reporting | Recommends full disclosure of names of mines inspected, their dust levels and any recommendations made or compliance action undertaken (Recommendation 9). | Recent regulatory amendments due to commence on 1 January 2017 will require coal mining companies to:<br>• regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every three months<br>• advise inspectors every time dust concentrations exceed prescribed levels<br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data can be provided to the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Standing dust committee | Recommends Mines Inspectorate establish a standing dust committee similar to that which operates in NSW (Recommendation 10). | Data reported from respirable dust monitoring at all mines sites on a quarterly basis will be reviewed by a respirable dust committee with a similar governance structure and operation to the Standing Dust Committee currently in operation in NSW. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Dust sampling | Recommends coal mine safety regulators take responsibility for dust sampling or supervise dust sampling (Recommendation 11). | DNRM is working with industry to develop a recognised standard for dust monitoring in addition to a new dust reporting database. The dust monitoring standard will provide a standardised method for collecting respirable dust data. This will improve data quality and integrity and enable the Mines Inspectorate to oversee compliance |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | with dust levels at the individual level, at the similar exposure group level, across an entire coal mining operation and across the coal mining industry – and take corrective action where needed. The department is proposing that for the recognised standard for dust monitoring that only independent, experienced, and Certified Occupational Hygienists should design, plan and report on the assessment of workplace dust exposures.<br><br>The Mines Inspectorate, as part of its ongoing inspection and audit program, will provide regulatory oversight to ensure the activity meets these requirements and achieves an acceptable level of risk. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Dust standards | Recommends existing State coal dust standards be reviewed, including a reduction in the current limit (Recommendation 12). | DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Dust sampling technology | Recommends coal dust sampling requirements be reviewed with a goal of adopting best practice technology including real time monitoring for all coal mine workers (Recommendation 13) | DRNM is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at QLD mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 027 | Construction, Forestry, Mining and Energy Union (CFMEU) | Directive issued by ISHRs | Suggests that as the CWP diagnosis crisis emerged, the role of the Queensland Inspectorate appeared to be to subvert action to prevent the mine site dust problem continuing. In support of this view, notes an email from the Chief Inspector to SSEs in relation to the validity of a directive issued by ISHRs. They state that the email advised the industry to ignore the direction from the ISHRs (paragraphs 8.2.8 to 8.2.10). | The department rejects the assertion that it has subverted action to address dust exposure in coal mines. The Mines Inspectorate has been active in regulating coal dust levels through the utilisation of a range of compliance tools and raising awareness. Since 2013 the Mines Inspectorate has issued 36 directives to nine underground coal mines. This included directing a mine to review its safety and health management system, review the effectiveness of dust controls, to reduce cutting speed and two to suspend operations.<br><br>DNRM acknowledges the important role of industry safety and health representatives in mine safety and health and recognises that the powers they have under the Act are a tool for ensuring safety and health standards are upheld in mining operations. Those representatives are at liberty to exercise their powers within the limits of the Act. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 028 | BHP Billiton | Dust exposure limits | Recommends a review of the current regulatory occupational exposure limit for coal dust in light of the latest science. | DNRM notes that BHP Billiton has voluntarily applied an occupational exposure level for respirable coal mine dust of 2.0 $mg/m^3$. Lowering the "safe allowable dust level" at Queensland mines – which operate at "the national standard"– is being considered by Safe Work Australia.<br><br>DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 028 | BHP Billiton | Dust monitoring | Recommend an expedited government accreditation for real-time dust monitoring devices for use in Queensland mines. Dust monitoring results to be entered into a centralised dust exposure records database. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia.<br>DNRM supports the development of a centralised point for dust exposure records. Recent regulatory amendments will strengthen respirable dust management requirements by requiring all coal mines to:<br><br>• regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br>• advise inspectors every time dust concentrations exceed prescribed levels.<br><br>In preparation for commencement of the regulatory amendments, the department is developing a respirable dust database to enable surveillance and reporting. The database will enable the inspectorate to view compliance and industry trends as well as generate reports. The Coal Mine Safety and Health Advisory committee (CMSHAC) will facilitate the review of the analysed reports generated from the quarterly records. |
| 028 | BHP Billiton | Health screening | Development of guidance on health screening and management of CWP, including a review of existing health surveillance frequencies and processes. | DNRM has previously provided guidance material to NMAs, mine companies and workers regarding CWP. Recent regulatory amendments that come into effect on 1 January 2017 will clarify health assessment requirements. Respiratory function and chest x-ray examinations must occur at least once every 10 years for |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | aboveground coal mine workers and at least once every 5 years for underground coal mine workers.<br><br>The Monash review made a number of findings and recommendations regarding the health assessment process and health surveillance. DNRM is currently considering opportunities to improve health screening and the collection, analysis and reporting of health data. DNRM will seek input of stakeholders including mine operators to inform any changes to requirements of the CMWHS. |
| 028 | BHP Billiton | Notification of a confirmed case | There is no requirement for employers to be notified of a diagnosis of CWP but the changes to the Regulation commencing on 1 January 2017 will make the employer and operator responsible for notifying DNRM. | DNRM has progressed a number of regulatory amendments relating to the Coal Mine Workers' Health Scheme, including requirements for SSEs to notify DNRM when cases of prescribed diseases are identified.<br><br>It should also be noted that the obligations on the SSE under section 198 of *Coal Mining Safety and Health Act 1999* to give notice of a disease only comes into effect if the SSE receives a report of a disease that is prescribed under the regulation. Section 52(2) of the Coal Mining Safety and Health Regulation 2001 also provides that a nominated medical advisor may disclose clinical findings obtained during the health assessment to the employer if the worker consents.<br><br>The department is currently in the process on addressing changes to improve the health surveillance system. A consultation paper on health surveillance is currently being prepared by the department to canvass a proposed model with stakeholders to ensure all factors are taken into account. This will include how and to whom information of diseases are reported to the department and stakeholders. Further changes to the regulatory framework may be required to streamline the reporting process for prescribed diseases. |
| 029 | Ian Nicholas | Mine Safety | Mr Nicholas identifies a number of incidents he believes indicate shortcomings in the safety of mine operations. | The *Coal Mining Safety and Health Act 1999* is based on a risk management approach that requires the anticipation and control of problems before they arise. This is evidenced by:<br><br>• the requirement for all mines to have a safety and health management system that provides for an acceptable level of risk<br>• proactive inspector's powers and interventionist powers where risk is not appropriately managed |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | • safety-oriented management structure<br>• a duty by all persons to ensure an acceptable level of risk.<br><br>The primary purpose of the Mines Inspectorate is to ensure that persons with health and safety obligations manage and control risks effectively, thus preventing harm. Mines inspectors have a number of compliance and enforcement strategies available to them. In accordance with the Compliance Policy, five levels of administrative response for compliance and enforcement, which includes the power to issue a directive to suspend operations where a mine is exceeding dust levels. Under the current framework, a failure to comply with a directive under the Act is an offence, with a maximum penalty of 800 penalty units or two years imprisonment.<br><br>In addition, mine workers, or their representatives, may make confidential complaints about safety and health matters to the Mines Inspectorate. These complaints must be investigated and the name of the person making the complaint must not be revealed. This investigation may involve a visit to the particular mine where the allegation took place. When the investigation is complete, the person making the complaint will be advised of the results of the investigation.<br><br>The Act also provides protection for persons who report or make complaints about safety matters. |
| 029 | Ian Nicholas | Dust monitoring | Mine operators should not be able to monitor their own dust levels. Monitoring should be completed by the department. | Mine sites engage suitably qualified independent companies to conduct personal monitoring and report these results back to the mine. These reports are supported by field observations and recommendations control exposure. It is the mines' responsibility to review these results, consider recommendations and control exposures. The department is not aware of any evidence to suggest that the monitoring is biased or influenced by the mining companies. The results provided by monitoring companies have clearly identified exceedances. The department has acted on these exceedances during recent data reviews.<br><br>In addition, recent regulatory amendments due to commence on 1 January 2017 will require coal mining companies to: |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | • regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br>• advise inspectors every time dust concentrations exceed prescribed levels<br><br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data can be provided to the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament<br><br>The Mines Inspectorate has also been working with employee and employer representatives to develop recognised standards for monitoring respirable dust and for respirable dust control. While recognised standards are not mandatory they provide an acceptable way of meeting safety and health obligations in relation to a particular risk when followed. Inspectors and inspection officers have the power to enter and inspect or audit mines under the *Coal Mining Safety and Health Act 1999*, and do so with and without notice to mine operators. An inspection may be undertaken with or without prior notice depending on the purpose of the visit and the issue at hand. |
| 029 | Ian Nicholas | Exposure risk | Mr Nicholas indicates that coal loaders and field service workers are potentially at risk of dust exposure. | Following a self-assessed survey conducted by DNRM on mine's dust management, the department identified that a comprehensive monitoring strategy should involve the concept of similar exposure groups (SEGs). SEGs are defined as a group of workers who have the same general exposure to risk. Such as the similarity and frequency of the tasks they perform, the materials and processes with which they work, and the similarity of the way they perform those tasks.<br><br>Since November 2010, employers have been required to specify a worker's SEG in the health assessment form. The purpose of this was to inform decisions about whether a miner is in a dust-exposed job. The recent Monash Review has identified that this requirement was poorly completed, or in some case, not completed at all. The Monash Review recommended that the criteria to determine workers at risk from dust exposure should be based on past and current in |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | underground coal mines and designated work categories in open-cut coal mines and coal handling and preparation plant. This recommendation includes the proposal that a criteria to determine job categories at risk from dust exposure should be standardised across Queensland and reviewed regularly to reflect changes in level of risk. The department supports all of the Monash Review recommendations and is taking necessary action to address these.<br><br>DNRM already identifies the use of enclose cabins where possible, ensuring seals are well-maintained, providing inlet air filtration for respirable particles, and using positive pressure air inside cabs to prevent dust penetration as one of several potential engineering controls available to mine operators to assist in controlling worker exposure to dust. |
| 030 | Ian Matthews | Risk of dust exposure is wider than underground coal workers<br><br>Self -regulation | Submission highlights that Dr Matthews is a GP who has long been concerned that the health impacts of coal dust extend well beyond those working underground.<br><br>Comments on concerns about self-regulation not working, based on what Dr Matthews has been told by workers.<br><br>Submission doesn't confirm whether Dr Matthews is a NMA or have any experience working in or around the mining industry. | The Department recognises that a comprehensive dust monitoring strategy should involve the concept of similar exposure groups (SEGs) – identifying and grouping workers in the health assessment form based on their level of exposure to dust.<br><br>The recent Monash review has identified that this requirement was poorly completed, or in some case, not completed at all. The Monash review recommended a number of improvements to this process, of which the department supports and is taking action to address this.<br><br>With regards to concerns about self-regulation, the Department's Mines Inspectorate provides an active role to ensure compliance. Notwithstanding this, the department acknowledges that more can be done and is implementing immediate regulatory amendments to strengthen respirable dust monitoring requirements. This includes the new requirement for inspectors to be advised every time dust concentrations exceed prescribed levels. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | DNRM's failure to enforce directives in relation to dust | According to the Senate Select Committee on Health, between 2012 and 2015 DNRM issued 23 directives in relation to coal dust monitoring and mitigation. Only nine were complied with by their due date and some took up to 12 months to reach compliance. | Since 2013 the Mines Inspectorate has issued 36 directives to nine underground coal mines in relation to dust. When the Mines Inspectorate issues a directive a mine will be required to address all matters outlined in the directive by a certain date. If a mine does not achieve compliance by the due date the Mines Inspectorate will escalate the compliance action, which could result in a directive to |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | Concerned mines did not respond to directives in a timely manner and there have not been any prosecutions for failing to comply.<br><br>Agrees with the Committee that interim measures such as formal warning, followed by the naming the mines in a public register would be an appropriate method of ensuring compliance.<br>In the long term the legislation should be amended to allow DNRM greater prosecutorial powers such as the ability to impose fines or seek a court order shutting down a mine for failing to comply with a directive. | the mine to reduce shearer speed or stop production until appropriate actions are implemented.<br><br>There may be occasions when the Mines Inspectorate will extend the directive or keep the directive open.<br><br>The Mines Inspectorate may choose to extend the directive because the mine is not at full production and therefore cannot provide results to the Inspectorate showing dust levels at full production. For example, the Mines Inspectorate has kept a directive open even though the results of monitoring showed the dust levels at the mine was below 3mg/$m^3$. This is because the mine has not been in full production during this period.<br><br>There may be occasions where mines achieve compliance by the due date but the Inspectorate will keep the directive open to continue monitoring the mine's dust levels to ensure sustained compliance. The Mines Inspectorate will not close a directive based on one set of compliant data. In fact, the Mines Inspectorate generally requires sustained compliance dust data for three months before the directive is closed. In one case, a mine under a directive has provided data for two months demonstrating compliance but have not for the third month because there has been no production activity. In this case the directive remains open.<br><br>Directives and compliance meetings are demonstrated effective ways to achieve an immediate response from mines and to enforce compliance. While the Mines Inspectorate can also prosecute mines for breaching a safety and health obligations, such as failing to ensure the occupational exposure limit is not exceeded, this option is not considered to be the most effective compliance tool in the case of managing dust. Prosecution is a lengthy process that will does not address the immediate issue problem and will divert the Mines Inspectorate and the mines' resources from addressing the issue at hand.<br><br>Issuing directives and taking mines through a compliance process requires immediate response from the mine aimed at correcting the deficiency and changing behaviour. It requires the mine to focus its attention and resources on minimising risk to workers. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Issuing directives can be an effective means of deterring substandard safety practice as their implementation can have a significant financial impact on the mine. For example, a directive may call for engineering modifications requiring significant expenditure. The impacts on cash flow and lost revenue where operations are slowed or suspended can also be significant. By contrast, if a mine were to be prosecuted for breaching a safety and health obligation, the maximum penalty is currently $91,425. Given the delays and uncertainty inherent to prosecutions, such an outcome is considered to be far less effective than the inspectorate's current approach to compliance. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Increase in work performed in returns | Concerned with increase in work performed in 'returns', traditionally the area of a mine with the greatest level of dust.<br><br>Suggests the following requirements for mines permitting workers to operate in returns:<br>• mandatory personal protective equipment and training in the proper fitting and use of the equipment,<br>• constant monitoring and reporting<br>• third party audit of dust mitigation systems | <u>Personal protective equipment</u><br><br>Effective dust control procedures can vary from mine to mine and it is the responsibility of the mine's SSE to determine the most effective method for dust control at that mine following risk assessment and ongoing monitoring. The accepted industry standard for achieving an acceptable level of risk is by working through the hierarchy of control. It stipulates that best and most effective protection from harm is through elimination – that is by preventing the hazard from occurring in the first place. If elimination is not reasonably practicable, risk must be minimised by working through the alternatives in the hierarchy, from the highest to the lowest - substitution, isolation/separation, engineering controls, administration and personal protective equipment.<br><br>While personal protective equipment is an important part of reducing exposure to dust, the mine's focus should be to ensure high level controls are implemented to ensure respirable dust levels are below prescribed levels. Mine operators determine personal protective equipment requirements on a site-by-site basis based on risk assessment under the coal mine's safety and health management system. Respiratory protective equipment is an example of personal protective equipment that mines may use to protect the health of their workers. If respirators are used, it is essential that:<br>• the type of respirator selected is able to filter the size of dust particle and concentration of dust |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | • the facial seal of the respirator prevents dust from entering the breathing zone of the person<br>• respirators are regularly inspected and maintained<br>• the wearing of respirators is enforced by supervision.<br><br>The Mines Inspectorate works with industry and union representatives to ensure mines achieve an acceptable level of risk.<br><br><u>Monitoring and reporting</u><br><br>Amendments to the Regulation commencing on 1 January 2017 will require mines to submit to the chief inspector will strengthen respirable dust management requirements by requiring all coal mines to:<br>• regularly report dust monitoring records to the Mines Inspectorate – for underground longwall and development operations, at least every three months<br>• advise inspectors every time dust concentrations exceed prescribed levels.<br><br>The amendments also outline the procedure to follow if dust concentration exceeds prescribed levels.<br>Further requirements for dust monitoring will be detailed in the recognised standard for dust monitoring, which the Mines Inspectorate is finalising. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Real time monitoring | Real time monitors will help deputies and other supervisors to justify their decisions to stop their shifts due to dust levels.<br><br>Suggests installing instantaneous dust monitors, locations and specifications of monitors to be prescribed in regulation. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Obligation on operator to ensure safety | Obligations should be placed on mine operator to ensure safety of contractors. | Under the CMSHA coal mine operators have an obligation to ensure the risk to coal mine workers while at the operator's mine is at an acceptable level. A coal mine worker includes a contractor. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Amending regulatory framework | The Mines Inspectorate is responsible for managing compliance with the Coal Mining Safety and Health Act and Regulation. The re-emergence of CWP indicates the current legislative and enforcement regime is inadequate in providing protection to mine workers.<br><br>Suggests immediate reform to Queensland mine safety legislation to:<br>• better address dust levels in mines and<br>• to specify dust monitoring and reporting requirements and frequency<br>• provide DNRM with greater prosecutorial powers such as to impose fines or seek court order to shut down a mine for failing to comply with a directive. | The Mines Inspectorate has worked with the industry and worker representatives through the CMSHAC to develop amendments to the Regulation. The changes, commencing on 1 January 2017, will strengthen respirable dust management requirements by requiring all coal mines to:<br>• regularly report dust monitoring records to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br>• advise inspectors every time dust concentrations exceed prescribed levels.<br><br>The amendments also outline the procedure to follow if dust concentration exceeds prescribed levels.<br><br>DNRM is fully committed to dust management and reducing worker exposure to dust. For example, the development of recognised standards for dust control and monitoring will set the benchmark for the way industry will meet its safety and health obligations to prevent dust lung disease.<br><br>The Mines Inspectorate Compliance Policy explains how the Mines Inspectorate promotes and achieves compliance with the legislation. It identifies a range of compliance options the Mines Inspectorate can use to bring a mine back into compliance such as issuing a directive, directing the SSE and the company's senior management to attend a compliance meeting and prosecution. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Independent body for dust | The mines are responsible for monitoring dust levels, investigating exceedances and implementing controls to mitigate those exceedances. There is no obligation on the mine to report unacceptable levels of dust to DNRM.<br><br>Suggests Queensland Government establish an independent body similar to Coal Services in NSW to monitor and enforce compliance with dust levels. | Recent regulatory amendments due to commence on 1 January 2017 will require coal mining companies to:<br>• regularly report dust monitoring results to the Mines Inspectorate – for underground longwall and development operations, at least every three months<br>• advise inspectors every time dust concentrations exceed prescribed levels<br><br>Results will be regularly reviewed by the Coal Mining Safety and Health Advisory Committee and can be reported publically through the Mines Safety & Health Annual Report. Data can be provided to |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | the independent Commissioner for Mines Safety and Health who provides an annual report to the Minister and Parliament.<br><br>Mine sites engage suitably qualified independent companies to conduct personal monitoring and report these results back to the mine. These reports are supported by field observations and recommendations to control exposure. It is the mines' responsibility to review these results, consider recommendations and control exposures. The department is not aware of any evidence to suggest that the monitoring is biased or influenced by the mining companies. The results provided by monitoring companies have clearly identified exceedances. The department has acted on these exceedances during recent data reviews. |
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Reporting of exceedances | Suggests workers should be informed when dust sample exceeds regulatory limit, require a review of the incident and a report be provided to DNRM, affected workers and the independent coal services body.<br><br>Suggests all instances of excessive dust levels noted in statutory reports should be reported to ISHRs, collated and reported to DNRM quarterly. | The Regulation currently requires that a mine's safety and health management system must provide for the monitoring and recording of dust concentration levels. The results must be kept in a location that is easily accessible by each worker at the mine and the records must be kept for 30 years. Inspectors visiting a site often find the results posted on the mine's notice board and accessible by workers.<br><br>Queensland has a risk based approach to determine sampling frequency but amendments to the regulation commencing on 1 January 2017 will require the reporting for two high risk similar exposure groups in the longwall and development production areas at least once every three months. The frequency for other areas will be stated in the recognised standard for dust monitoring.<br><br>In preparation for commencement of the regulatory amendments, DNRM is developing a respirable dust database to enable surveillance and reporting. All coal mines (open cut and underground) will be required to report its quarterly dust data to the Mines Inspectorate.<br><br>DNRM will provide guidance material on how to submit personal respirable dust to the Mines Inspectorate. The database will enable the Mines Inspectorate to view compliance and industry trends as well as generate reports. CMSHAC will facilitate the review of the analysed reports generated from the quarterly records. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| 031 | Association of Professionals, Engineers, Scientists and Managers Australia (APESA) | Confidential reporting | There are no provision for anonymous reporting of safety issues.<br><br>Staff who makes complaints or stop production due to safety or dust related incident should be protected.<br><br>Protection for employees should apply to contractors.<br><br>Suggests a confidential hotline for reporting of dust be established | The CMSHA allows mine workers or their representatives to make confidential complaints about safety and health matters to the Mines Inspectorate. These complaints must be investigated and the name of the person making the complaint must not be revealed.<br><br>The complaint will be logged on the Mines Inspectorate complaints database and will be investigated by an officer of the Mines Inspectorate. This investigation may involve a visit to the particular mine where the allegation took place. When the investigation is complete, the person making the complaint will be advised of the results of the investigation.<br><br>The CMSHA also provides protection for persons who report or make complaints about safety matters. |
| 032 | Glencore | QRC's submission | Glencore acknowledges points raised in QRC's submission and notes its support to these same points. | Response to matters are provided in the response to QRC's submission. |
| 032 | Glencore | Regulatory framework | Glencore notes that for a high hazard industry to operate with an acceptable level of risk, both good regulation and good governance is required. Glencore summarises the recent changes that have occurred to the framework and regards these changes as improvements to prevent CWP. | The adequacy of the regulatory framework will continue to be assessed by the department in implementing the Monash review recommendations. |
| 032 | Glencore | Confirmed cases of CWP at Glencore | Cases confirmed at Glencore consist of individuals whom has distinct differences in their work history and the time they have worked in the coal mining industry.<br><br>All cases had X-rays on commencement of employment with Glencore and regularly thereafter. CWP was not identified until recently.<br><br>Glencore highlight that, as documented in the Commissioner's report for 2015-16, the respirable dust levels of their operations | No specific trends have yet to be identified in the cases of CWP confirmed by the department.<br><br>Amendments to the regulation commencing on 1 January 2017 require the reporting for two high risk similar exposure groups in the longwall and development production areas at least once every three months will enable the Mines Inspectorate to continue to review coal dust levels in Queensland mines. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | have remained below OEL (with the exception of 2014 at its Newlands and Oaky mines).<br><br>Glencore explain that the 2014 Newlands experienced a period of extremely difficult strata related mining conditions where manual operation of the longwall face was required.<br><br>Oaky experienced one abnormal high result that when taken into the longwall SEG inflated the mean result to above OEL. Glencore explain that the individual involved was wearing RPE and that chest X-ray readings were conducted. | |
| 032 | Glencore | Actions taken since CWP | Glencore have taken steps to addressing employees and contractors concerns. This includes:<br><br>• conducting communication forums and presentations on airborne dust<br>• communication about respirable dust monitoring results<br>• all underground employees have been provided the opportunity of new X-ray or re-reading – taken in accordance with ILO<br>• a range of underground engineering initiatives have been implemented, of which is listed in the submission.<br><br>Glencore met with all of their major underground contractors (during Dec 15 to Jan 16) to discuss issues with CWP. Each of the companies have offered employees X-ray, of which all have undertaken this task | DNRM continues work with all stakeholders to implement Monash review recommendations and dust control and monitoring measures. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | and are continuing to schedule X-rays for employees. | |
| 032 | Glencore | Respiratory Protection Equipment (RPE) | Glencore note that, in accordance with Regulation, if the respirable dust cannot be reduced to prescribed levels that PPE is used and the submission lists the type of PPE Glencore uses. | If respirable dust masks are used, it is essential that adequate seal enforcement is achieved. This requires a worker to be clean shaven. DNRM provides a consistent message that respiratory protective equipment should only be used when it is a part of a respiratory protection program that has been established in accordance with AS1715. This requirement has been reinforced in the recognised standard for dust control due for release in early 2017. |
| 032 | Glencore | Coal Mine Workers Health Scheme | Glencore regard that legislative compliance with respect to mine workers undertaking a health assessment before a person starts work is well established. Glencore state that they are in compliance with this requirement.<br>Glencore note that, up until this point, open cut operations have not mandated the requirement for an X-ray. | Health assessments under the current scheme are mandatory for all coal mine workers (other than for workers carrying out low risk tasks – low risk tasks are shown by a risk assessment to create a risk that is so minimal it can managed effectively without requiring the worker to undergo a health assessment). Regulatory amendments that commence on 1 January 2017 will require mandatory respiratory function and chest X-rays examinations on entry to the industry and at least every five years for underground workers and ten years for aboveground workers. |
| 032 | Glencore | Health & hygiene Monitoring | Glencore have maintain monitoring regimes for personal dust exposure. Sampling and testing procedures have been contracted by external agencies with the relevant skills and qualifications to ensure NTA guidelines are adhered to. | DNRM is working with industry and unions to develop a recognised standard for respirable dust monitoring in addition to a new dust reporting database. The recognised standard for monitoring requires mines to conduct baseline monitoring and identify similar exposure group (SEGS) across the whole mine site (both surface and underground). The ongoing monitoring frequency will be risk based but it will include periodic sampling for all areas and locations. |
| 032 | Glencore | Dust committee | Recommends introduction of standing dust committee to provide a further level of governance. | As of 1 January 2017 all mines will be required to provide their exposure data to the department at prescribed intervals. The department will review and report this data. In addition a tripartite standing dust committee will meet quarterly to review the data and make recommendations to CMSHAC (as required). |
| 032 | Glencore | Dust levels | Recommend review of National Standard for dust exposure levels | The department is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 032 | Glencore | Dust monitoring | Recommends introduction of real time dust monitoring. | DNRM through SIMTARS is working with industry and a number of manufacturers of real time dust monitoring devices to understand their application at Queensland mine sites. While some devices are capable of measuring personal exposure to respirable dust, there is no device currently certified for safe use in Australia. |
| 033 | Coal Services | Regulatory model in NSW | Notes the 'collaborative model' used in NSW, the key stakeholders and the deliverables.<br><br>Also notes CS Health and the complimentary preventative services provided by Coal Services, which include approval of training schemes, fit testing of PPE, and the generic underground induction course.<br><br>Notes coal services also administers the Coal Mines Insurance scheme. | The Resources Regulator, created by the NSW Department of Industry, is responsible for compliance and enforcement functions across NSW's mining and energy sectors. This includes regulating safety and health performance in NSW mines. Coal Services is jointly owned by the CFMEU and NSW Minerals Council and carries out a number of statutory functions across workers compensation, health and hygiene, emergency response, training and industry statistics.<br><br>The Queensland Government oversees the coal mining safety and health framework in this state, advised by a tripartite committee of union, industry and government representatives. In Queensland, coal mining-related health services and dust monitoring are provided through the private sector.<br><br>Some of the services provided by Coal Services are also provided in Queensland by the Safety in Mines Testing and Research Station (SIMTARS) in DNRM. It is a resource available to government, mining companies, mining equipment manufacturers and suppliers to the mining industry. SIMTARS is a major provider of occupational hygiene sampling and monitoring, including respirable dust in coal mines. It is also an accredited Registered Training Organisation and provides nationally recognised training and qualifications in mine safety to thousands of mine workers in Australia and overseas. In performing this service, SIMTARS operates as a commercial entity contracting with mine operating companies and at arms-length from the Mines Inspectorate.<br><br>In NSW, it is mandatory for NSW coal mines to contribute to the Coal Mines Insurance Workers Compensation Scheme. Coal Mines Insurance is a specialised insurer and is required to provide a health and safety component to holders. A percentage of the premiums |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | received is used to fund, in part, health and safety initiatives, including the periodic health surveillance medicals and pre-employment medicals. Fees are also generated from the provision of other health services by Coal Services to industry. Any shortfall in the costs of providing these health services is covered by the investment income generated by Coal Services. In contrast, three of Queensland's largest coal miners, BHP Billiton Limited, Glencore Queensland and South32 Cannington Pty Ltd, are self-insured while the remainder pay into WorkCover Queensland. |
| 033 | Coal Services | Dust monitoring | Notes Coal Services inspectors conduct accompanied monitoring and work collaboratively to design, implement and monitor action. | Mine sites engage suitably qualified companies, including SIMTARS, to conduct personal monitoring and report these results back to the mine. These reports are supported by field observations and recommendations control exposure. It is the mines' responsibility to review these results, consider recommendations and control exposures. |
| 033 | Coal Services | Dust levels | Notes the current airborne dust exposure limits for respirable coal dust in a coal mine are 2.5 milligrams per cubic metre of air. | In Queensland, under section 89 of the Regulation, coal mines must ensure respirable coal dust in the atmosphere does not exceed an average concentration of 3 milligrams per cubic metre ($3mg/m^3$) for an eight hour period calculated under Australian Standard 2985: Workplace atmospheres – method for sampling and gravimetric determination of respirable dust. This is based on the workplace exposure standards set by Safe Work Australia.<br><br>In 2015, Safe Work Australia (SWA) commenced the process to perform a review of workplace exposure standards for more than 600 airborne contaminants. DNRM is supportive of Safe Work Australia's review of national standards for airborne contaminants such as coal dust. Any changes to exposure standards in Queensland for respirable coal dust will be informed by Safe Work Australia's findings. |
| 033 | Coal Services | Dust monitoring | Suggests the provider of statutory monitoring must be *independent* of the mine and must be licensed by the NSW Department of Industry (Division of Resources and Energy). | Coal Services Pty Limited conducts dust monitoring in accordance with Order 42 to comply with their duties outlined in the *Coal Industry Act 2001* (NSW). In addition, coal mine operators must use a licensed provider to sample and analyse airborne dust under Part 9 of the NSW Work Health and Safety (Mines) Regulation 2014. In practice, Coal Services, as a licensed provider, commonly undertake this sampling concurrently with Order 42 sampling. |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Currently, there are no licensing requirements for persons undertaking dust monitoring in Queensland. Mine sites engage suitably qualified companies to conduct personal monitoring and report these results back to the mine. These reports are supported by field observations and recommendations to control exposure. It is the mines' responsibility to review these results, consider recommendations and control exposures. The results provided by monitoring companies have clearly identified exceedances. The department has acted on these exceedances during recent data reviews.<br><br>DNRM is working with industry to develop a recognised standard for dust monitoring in addition to a new dust reporting database. The dust monitoring standard will provide a standardised method for collecting respirable dust data. This will improve data quality and integrity and enable the Mines Inspectorate to oversee compliance with dust levels at the individual level, at the similar exposure group level, across an entire coal mining operation and across the coal mining industry – and take corrective action where needed.<br><br>The department is proposing that for the recognised standard for dust monitoring that only independent, experienced, and Certified Occupational Hygienists should design, plan and report on the assessment of workplace dust exposures. |
| 033 | Coal Services | Longwall dust abatement approvals | Notes Order 40 which requires the consent of the Coal Services Board prior to the installation of a longwall or a shortwall unit underground and prior to its installation on a new longwall block or shortwall pillar or panel, as the case may be, including a review of previous results for the mine and the use of additional conditions as required. | In Queensland, there is no comparable requirement to obtain consent in these circumstances. Under the Queensland framework, mine operators are required to proactively review their safety and health management system to ensure the system is effective, and adapts to the changing environment and interdependencies of complex mining operations. The Queensland framework enables statutory officers such as the mine's Site Senior Executive (SSE), Site Safety and Health Representative (SSHR), Industry Safety and Health Representative (ISHR), mines inspectors, authorised officers and mine workers to play a proactive role in reviewing, inspecting or auditing the safety and health management system.<br><br>In Queensland, coal mines must ensure respirable coal dust in the atmosphere does not exceed an average concentration of 3 milligrams per cubic metre ($3mg/m^3$). Effective dust control |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
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| | | | | procedures can vary from mine to mine and it is the responsibility of the mine's SSE to determine the most effective method for dust control at that mine following a risk assessment.<br><br>As part of its program of work, and in relation to dust control, the Mines Inspectorate audits and inspects mines' safety and health management systems, presents to industry, workers and union representatives on the importance of dust control and monitoring, and direct mines to address issues identified by inspectors. For example, in 2013 and 2014 the Mines Inspectorate issued directives to reduce dust levels below 3mg/$m^3$ in relation to longwall operations.<br><br>Amendments to the regulation have been developed together with employee and employer representatives. The changes, commencing on 1 January 2017, will strengthen respirable dust management requirements by requiring all coal mines to:<br><br>• regularly report dust monitoring records to the Mines Inspectorate – for underground longwall and development operations, at least every 3 months<br>• advise inspectors every time dust concentrations exceed prescribed levels. |
| 033 | Coal Services | Dust monitoring | Notes Order 42, and specifically the use of gravimetric sampling, the requirement to monitor crews in separate work areas, and the process in the case of an exceedance. | Order 42 provides Coal Services Inspectors with power to enter coal mines to undertake monitoring. The Schedule to this order sets out the locations, frequencies and persons for sampling.<br><br>Legislation requires that Queensland mines must carry out respirable dust monitoring in accordance with AS2985. This standard requires gravimetric sampling with size selective cyclone to capture only respirable dust, which is less than 10 microns.<br><br>In Queensland the monitoring program requires that monitoring be conducted across all similar exposures groups and in all locations at the mine. This includes activities such as maintenance, secondary support, stone drivage and construction.<br><br>The regulation requires that a mine's safety and health management system must provide for the monitoring and recording of dust concentration levels. The results must be kept in a location |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | that is easily accessible by each worker at the mine and the records must be kept for 30 years.<br><br>Regulatory amendments are due to commence in January 2017 which will introduce the new requirement for inspectors to be advised every time dust concentrations exceed prescribed levels. This new requirement also requires the Site Senior Executive (SSE) to ensure the cause of high average concentration is investigated and the results of the investigation are recorded and analysed to identify trends and issues with the coal mine's safety and health management system. A notification of relevant persons is also required, including the Inspectorate. A sample of the atmosphere of the work environment take will be required to be taken within 2 weeks after the first trigger event with the view to identify whether the exceedance levels repeat. Should a repeat incident occur, under the new regulatory framework, the SSE must again ensure that the cause of the continued high average concentration is investigated, investigation is recorded and analysed and the persons notified |
| 033 | Coal Services | Dust committee | Notes the Airborne Contaminants and Diesel Particulate Sub Committee (also known as the Standing Dust Committee (SDC)) monitors results of the dust sampling program, reviews exceedances, evaluates hazards, undertakes research and provides education. It includes independent industry experts as well as the primary stakeholders. | Data reported from respirable dust monitoring at all mines sites on a quarterly basis will be reviewed by a respirable dust committee with a similar governance structure and operation to the Standing Dust Committee currently in operation in NSW. |
| 033 | Coal Services | Health surveillance requirements | Notes the Order 41 health assessment is required every three years. Notes chest X-rays are required every six years for underground miners and every 12 years for aboveground miners. | Requirements for health assessments in Queensland are similar to New South Wales. However, in Queensland, health assessments are required at least every five years. Recent regulatory amendments that come into effect on 1 January 2017 will clarify that respiratory function (spirometry) and chest X-ray examinations must occur at least once every 10 years for aboveground coal mine workers and at least once every five years for underground coal mine workers. DNRM is consulting with stakeholders on a new |

| Sub no. | Submitter | Topic | Summary | Departmental comments |
|---|---|---|---|---|
| | | | | Queensland X-ray screening program and is currently considering feedback on an improved screening program for coal workers. |

# Annex B- Queensland coal mining industry summary (December 2016)

**Geological context**

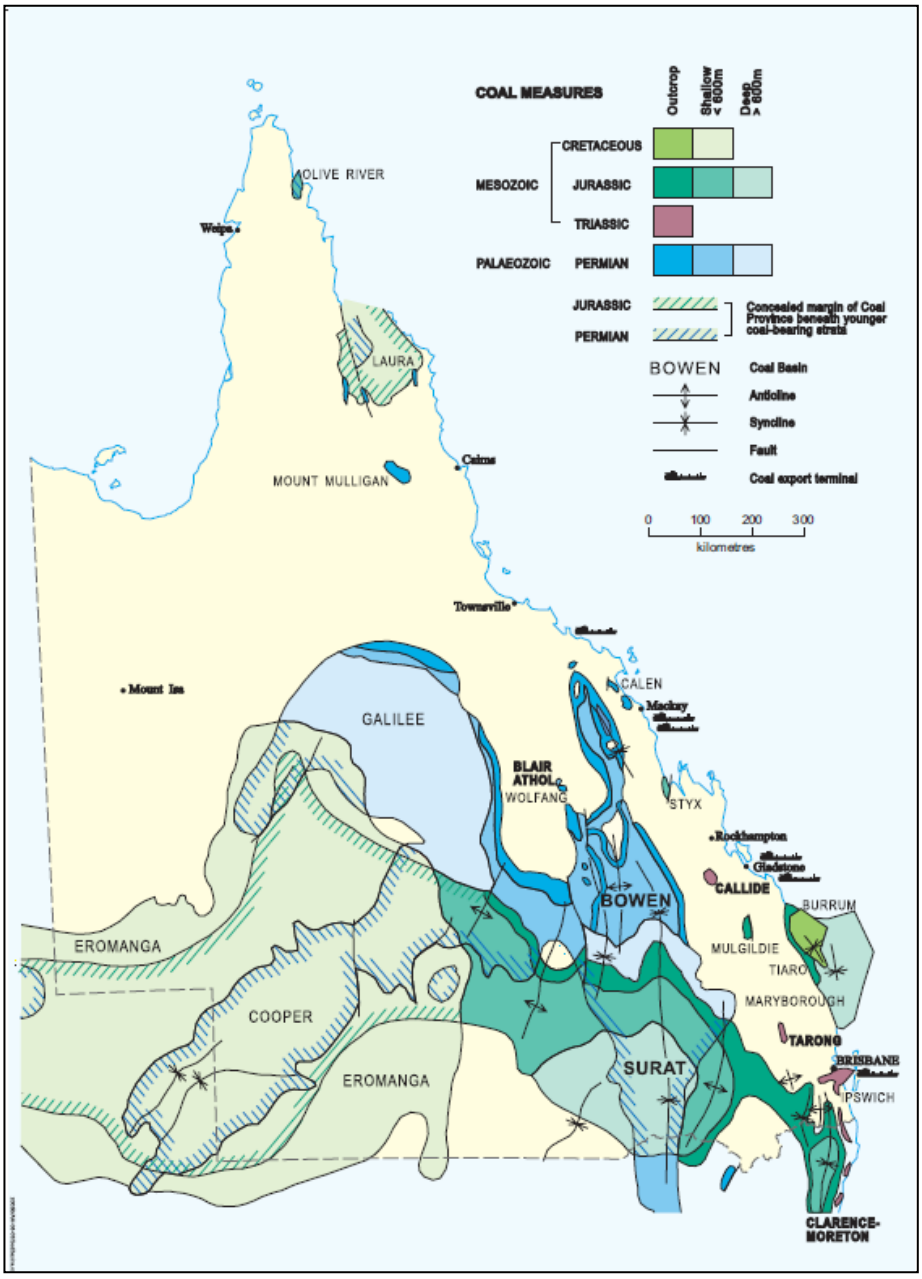
Queensland has 27 geological basins, many of which contain coal bearing formations. The largest formations of coal and associated mining activity occur in the Bowen and Surat Basins, with relatively smaller scale occurrences and mining activity in the Tarong, Callide and Ipswich Basins. Coal occurs in various other basins across Queensland where mining was or has not commenced (e.g. Galilee Basin), or else has ceased (e.g. Mt Mulligan).

The State's in-ground coal resources are vast, estimated to be at least 35 billion tonnes, of which about 25% (8.75 billion tonnes) are coking (or metallurgical coal used in steel making) and the remainder thermal coal (used primarily in electricity generation). Coking coal also includes a form used for injection into a blast furnace in pulverised form, with that coal termed "PCI" meaning "pulverised coal injection".

The Bowen Basin contains high quality coking coal and is the largest mining province in Queensland. It produced the vast majority (~90%) of the 244 million tonnes of coal produced in Queensland in 2015/16.

There are currently 43 coal mines in the Bowen Basin, of which 11 are underground operations. Of these 11 underground mines, all but two utilise longwall mining as their primary production methodology, with continuous miners used for roadway development to support longwall establishment.

**Figure 1**: Queensland Sedimentary Basins




The coal measure sequences present in the Bowen Basin are presented in **Table 1**. Underground mining is only undertaken currently in 2 of these 5 coal facies groups, being the Moranbah Coal Measures / German Creek Formation (Group III) and the Rangal Coal Measures and equivalents (Group V). Historically, underground mining was also undertaken within Group II coals at Blair Athol and at Collinsville. The coals of greatest commercial value are the high quality metallurgical coals produced from Group III coals whilst Group V coals provide a variety of metallurgical and thermal coal products.

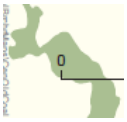



**Figure 2:** Bowen Basin Coal Mines and Projects

**Table 1**: Coal groups of the Bowen Basin[14]

| Coal 'group' | Coal Measures | Interpreted coal facies | Rv (%) | Mines | Under-ground Mine | Product Type |
|---|---|---|---|---|---|---|
| V | Rangal Coal Measures; Baralaba Coal Measures; Bandanna Formation | Fluvial, deltaic | 0.6-2.6 | Yes | Yes | Thermal, PCI, Coking |
| IV | Fort Cooper Coal Measures; Burngrove Formation; Fair Hill Formation; Burunga Formation; Tinowon Formation | Fluvial, deltaic | 0.5-2.5 | No | No | Coking properties but high inherent ash |
| III | Moranbah Coal Measures; German Creek Formation | Delta, delta plain | 0.6-3.5 | Yes | Yes | Coking |
| II | Collinsville Coal Measures; Blair Athol Coal Measures; Clermont deposit; Rugby 'Coal Measures' | Delta, back barrier, fluvial | 0.7-2.2 | Yes | No | Coking; Thermal |
| I | Reids Dome beds | Fluvial | 0.6-1.4 | Yes | No | Thermal |

Other coal basins in the southeast of the state are sources of thermal coal for both export and domestic markets. These include the Tarong Basin, the Callide Basin, the Ipswich Basin and the Surat Basin, all of which only have open-cut mining operations being undertaken at the present time (**Figure 3**). There are a total of 7 mines currently operating in these basins.

[14] Modified from Draper (2013)

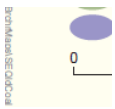



**Figure 3**: South East Queensland Coal Mines and Projects

Current operating coal mines are shown in Table 2 by the coal type produced and the coal measures they are extracting (by group for Bowen Basin mines and by basin for others). Mines in red text are underground operations. Grosvenor is highlighted as the newest mine having started production in April 2015. There are 15 coal mines operating in the Group III coal measures of which 8 are underground operations. The lower rank Group V coal measures have more mines (25) but fewer underground operations (3). All other mines (10) are open cut.

**Table 2**: Coal mines, product type and coal measures[15]

| COKING | group | THERMAL + COKING | group | THERMAL | group |
|---|---|---|---|---|---|
| Broadmeadow | III | Blackwater | V | Callide & Boundary Hill | Callide |
| Carborough Downs | V | Burton | V | Cameby Downs | Surat |
| Coppabella | V | Caval Ridge | III | Clermont | II |
| Daunia | V | Collinsville | II | Commodore | CM |
| German Creek - Grasstree | III | Cook | V | Ensham OC | V |
| Goonyella - Riverside | III | Curragh | V | Ensham UG | V |
| **Grosvenor** | **III** | Dawson | V | Jeebropilly | CM |
| Lake Vermont | V | Drake | III | Kogan Creek | Surat |
| Middlemount | V | Foxleigh | V | Meandu | Tarong |
| Millennium | V | German Creek - Lake Lindsay | V | Minerva | I |
| Moorvale | V | Hail Creek | V | New Acland | CM |
| Moranbah North | III | Isaac Plains | V | Rolleston | V |
| North Goonyella | III | Jellinbah East | V | | |
| Oaky Creek No 1 | III | Kestrel | III | | |
| Oaky North | III | Newlands | V | | |
| Peak Downs | III | Newlands Eastern Creek | V | | |
| Poitrel | V | Newlands Wollombi | III | | |
| Saraji | III | Sonoma / Jax | III | | |
| South Walker Creek | V | | | | |
| Yarrabee | V | | | | |
| | | | | | |

Saleable coal mined during 2014–2015 amounted to 243.6 million tonnes (Mt) of which 80% was contributed by 41 open cut mining operations. During this period, exports totalled 217.8 Mt, comprising 160.2 Mt of metallurgical coal (coking and PCI) and 57.6 Mt of thermal coal. Domestic sales of thermal coal within Queensland amounted to 22.2 Mt.

During 2014-2015, 13 underground mines contributed to production although in the past 18 months 3 underground mines have ceased production (Aquila, Crinum, Newlands Northern UG, the latter two being longwall operations), whilst 1 new underground longwall operation has commenced (Grosvenor) and another is in development (Eagle Downs). There are also open cut mines which have been depleted of economically recoverable coal (New Oakleigh, Suttor Creek, Gregory) or are on care and maintenance (Norwich Park, Blair Athol, Wilkie Creek).

[15] Based on information provided by industry to DNRM. Available at https://data.qld.gov.au/dataset/coal-industry-review-statistical-tables

**Current production**

The following tables show the production for each of Queensland's coal mines for the 2014-15 year. They also provide the name of the parent company and the geological basin in which the mine is located. Note that 'Coking' includes both coking and PCI coal.

**Table 3** shows the values for each mine in alphabetical order but separated into 'Open cut' and 'Underground'.

**Table 4** has the mines sorted by 'Principal Owner/Operator' with the totals provided for each one.

**Table 3**: Coal Production by Mine Type for 2014-15[16]

| | | | | Production |
|---|---|---|---|---|
| Mine | Mine Type | Company | Basin | Total |
| Baralaba | Open cut | Cockatoo | Bowen | 730,600 |
| Blackwater | Open cut | BHP Billiton | Bowen | 14,843,923 |
| *Burton Coal* | Open cut | Peabody | Bowen | 1,424,186 |
| Callide & Boundary Hill | Open cut | Anglo | Callide | 7,644,939 |
| Cameby Downs | Open cut | Yancoal | Surat | 1,927,518 |
| Caval Ridge | Open cut | BHP Billiton | Bowen | 10,659,832 |
| Clermont | Open cut | Glencore | Bowen | 12,213,010 |
| Collinsville Opencut | Open cut | Glencore | Bowen | 4,727,554 |
| Commodore | Open cut | Millmerran | Clarence Moreton | 3,478,022 |
| Coppabella | Open cut | Peabody | Bowen | 4,610,616 |
| Curragh | Open cut | Westfarmers | Bowen | 15,157,786 |
| Daunia | Open cut | BHP Billiton | Bowen | 5,670,173 |
| Dawson | Open cut | Anglo | Bowen | 11,399,332 |
| Drake Mine | Open cut | Qcoal | Bowen | 897,326 |
| Ensham OC | Open cut | Idemitsu | Bowen | 2,560,030 |
| Foxleigh | Open cut | Anglo | Bowen | 4,290,810 |
| German Creek | Open cut | Anglo | Bowen | 239,015 |
| German Creek - Lake Lindsay | Open cut | Anglo | Bowen | 6,920,827 |
| Goonyella - Riverside | Open cut | BHP Billiton | Bowen | 15,348,550 |
| Hail Creek | Open cut | Rio Tinto | Bowen | 11,614,548 |
| Isaac Plains | Open cut | Stanmore | Bowen | 1,670,180 |
| Jeebropilly | Open cut | New Hope | Clarence Moreton | 1,163,656 |
| Jellinbah East | Open cut | Jellinbah | Bowen | 5,147,167 |
| Kogan Creek | Open cut | CS Energy | Surat | 2,660,646 |
| Lake Vermont | Open cut | Jellinbah | Bowen | 10,391,608 |
| Meandu | Open cut | Stanwell | Tarong | 4,800,283 |
| Middlemount | Open cut | Peabody | Bowen | 5,303,681 |
| Millennium | Open cut | Peabody | Bowen | 4,496,724 |
| Minerva | Open cut | Sojitz | Bowen | 2,359,272 |
| Moorvale | Open cut | Peabody | Bowen | 4,171,469 |
| New Acland | Open cut | New Hope | Clarence Moreton | 10,144,139 |
| Newlands | Open cut | Glencore | Bowen | 825,917 |
| Newlands Eastern Creek | Open cut | Glencore | Bowen | 3,940,875 |
| Newlands Suttor Creek | Open cut | Glencore | Bowen | 522,164 |
| Newlands Wollombi | Open cut | Glencore | Bowen | 37,819 |
| Peak Downs | Open cut | BHP Billiton | Bowen | 18,721,080 |
| Poitrel | Open cut | BHP Billiton | Bowen | 4,665,752 |
| Rolleston | Open cut | Glencore | Bowen | 10,711,291 |
| Saraji | Open cut | BHP Billiton | Bowen | 13,656,529 |
| Sonoma Coal | Open cut | Qcoal | Bowen | 4,814,854 |
| South Walker Creek | Open cut | BHP Billiton | Bowen | 6,198,254 |
| Yarrabee | Open cut | Yancoal | Bowen | 3,578,484 |
| **Open cut total** | | | | **256,340,441** |
| Broadmeadow* | Underground | BHP Billiton | Bowen | 5,859,320 |
| Carborough Downs | Underground | Vale | Bowen | 4,108,925 |
| Cook | Underground | Caledon | Bowen | 1,544,576 |
| Crinum | Underground | BHP Billiton | Bowen | 7,303,683 |
| Ensham UG* | Underground | Idemitsu | Bowen | 2,263,302 |
| German Creek - Grasstree | Underground | Anglo | Bowen | 7,181,958 |
| Grosvenor | Underground | Anglo | Bowen | 224,074 |
| Kestrel | Underground | Rio Tinto | Bowen | 3,752,375 |
| Moranbah North | Underground | Anglo | Bowen | 7,062,973 |
| *Newlands Northern UG* | Underground | Glencore | Bowen | 2,045,141 |
| North Goonyella | Underground | Peabody | Bowen | 3,555,989 |
| Oaky Creek No 1 | Underground | Glencore | Bowen | 3,798,815 |
| Oaky North | Underground | Glencore | Bowen | 4,817,652 |
| **Underground total** | | | | **53,518,783** |
| **TOTAL** | | | | **309,859,224** |

*Relics* = now closed

* Coal from the below mines is transferred for processing and blended for sale

Broadmeadow to Goonyella Riverside CHPP (coal handling and preparation plant)

Ensham underground to Ensham open cut CHPP

[16] Based on information provided by industry to DNRM. Available at https://data.qld.gov.au/dataset/coal-industry-review-statistical-tables

**Table 4**: Coal Production by Principal Mine Owner/Operator for 2014-15[17]

| | | | | Production |
|---|---|---|---|---|
| Mine | Mine Type | Company | Basin | Total |
| Callide & Boundary Hill | Open cut | Anglo | Callide | 7,644,939 |
| Dawson | Open cut | Anglo | Bowen | 11,399,332 |
| Foxleigh | Open cut | Anglo | Bowen | 4,290,810 |
| German Creek | Open cut | Anglo | Bowen | 239,015 |
| German Creek - Grasstree | Underground | Anglo | Bowen | 7,181,958 |
| German Creek - Lake Lindsay | Open cut | Anglo | Bowen | 6,920,827 |
| Grosvenor | Underground | Anglo | Bowen | 224,074 |
| Moranbah North | Underground | Anglo | Bowen | 7,062,973 |
| **Anglo total** | | | | **44,963,928** |
| Blackwater | Open cut | BHP Billiton | Bowen | 14,843,923 |
| Broadmeadow* | Underground | BHP Billiton | Bowen | 5,859,320 |
| Caval Ridge | Open cut | BHP Billiton | Bowen | 10,659,832 |
| Crinum | Underground | BHP Billiton | Bowen | 7,303,683 |
| Daunia | Open cut | BHP Billiton | Bowen | 5,670,173 |
| Goonyella - Riverside | Open cut | BHP Billiton | Bowen | 15,348,550 |
| Peak Downs | Open cut | BHP Billiton | Bowen | 18,721,080 |
| Poitrel | Open cut | BHP Billiton | Bowen | 4,665,752 |
| Saraji | Open cut | BHP Billiton | Bowen | 13,656,529 |
| South Walker Creek | Open cut | BHP Billiton | Bowen | 6,198,254 |
| **BHP Billiton total** | | | | **102,927,096** |
| Clermont | Open cut | Glencore | Bowen | 12,213,010 |
| Collinsville Opencut | Open cut | Glencore | Bowen | 4,727,554 |
| Newlands | Open cut | Glencore | Bowen | 825,917 |
| Newlands Eastern Creek | Open cut | Glencore | Bowen | 3,940,875 |
| Newlands Northern UG | Underground | Glencore | Bowen | 2,045,141 |
| Newlands Suttor Creek | Open cut | Glencore | Bowen | 522,164 |
| Newlands Wollombi | Open cut | Glencore | Bowen | 37,819 |
| Oaky Creek No 1 | Underground | Glencore | Bowen | 3,798,815 |
| Oaky North | Underground | Glencore | Bowen | 4,817,652 |
| Rolleston | Open cut | Glencore | Bowen | 10,711,291 |
| **Glencore total** | | | | **43,640,238** |
| Ensham OC | Open cut | Idemitsu | Bowen | 2,560,030 |
| Ensham UG* | Underground | Idemitsu | Bowen | 2,263,302 |
| **Ensham total** | | | | **4,823,332** |
| Jellinbah East | Open cut | Jellinbah | Bowen | 5,147,167 |
| Lake Vermont | Open cut | Jellinbah | Bowen | 10,391,608 |
| **Jellinbah total** | | | | **15,538,775** |
| Jeebropilly | Open cut | New Hope | Clarence Moreton | 1,163,656 |
| New Acland | Open cut | New Hope | Clarence Moreton | 10,144,139 |
| **New Hope total** | | | | **11,307,795** |
| Burton Coal | Open cut | Peabody | Bowen | 1,424,186 |
| Coppabella | Open cut | Peabody | Bowen | 4,610,616 |
| Middlemount | Open cut | Peabody | Bowen | 5,303,681 |
| Millennium | Open cut | Peabody | Bowen | 4,496,724 |
| Moorvale | Open cut | Peabody | Bowen | 4,171,469 |
| North Goonyella | Underground | Peabody | Bowen | 3,555,989 |
| **Peabody total** | | | | **23,562,665** |
| Drake Mine | Open cut | Qcoal | Bowen | 897,326 |
| Sonoma Coal | Open cut | Qcoal | Bowen | 4,814,854 |
| **QCoal total** | | | | **5,712,180** |
| Hail Creek | Open cut | Rio Tinto | Bowen | 11,614,548 |
| Kestrel | Underground | Rio Tinto | Bowen | 3,752,375 |
| **Rio Tinto total** | | | | **15,366,923** |
| Cameby Downs | Open cut | Yancoal | Surat | 1,927,518 |
| Yarrabee | Open cut | Yancoal | Bowen | 3,578,484 |
| **Yancoal total** | | | | **5,506,002** |
| Baralaba | Open cut | Cockatoo | Bowen | 730,600 |
| Carborough Downs | Underground | Vale | Bowen | 4,108,925 |
| Cook | Underground | Caledon | Bowen | 1,544,576 |
| Curragh | Open cut | Wesfarmers | Bowen | 15,157,786 |
| Isaac Plains | Open cut | Stanmore | Bowen | 1,670,180 |
| Kogan Creek | Open cut | CS Energy | Surat | 2,660,646 |
| Meandu | Open cut | Stanwell | Tarong | 4,800,283 |
| Commodore | Open cut | Millmerran | Clarence Moreton | 3,478,022 |
| Minerva | Open cut | Sojitz | Bowen | 2,359,272 |
| **Other total** | | | | **36,510,290** |
| **TOTAL** | | | | **309,859,224** |

By

[17] Based on information provided by industry to DNRM. Available at https://data.qld.gov.au/dataset/coal-industry-review-statistical-tables

**Historical overview**

Coal was discovered in Queensland in 1825 by Major Edmund Lockyer while exploring the region of the Brisbane River in southeast Queensland. The first coal mine opened at Redbank near Ipswich in ~1845. Coal was also discovered near Blackwater (Bowen Basin) in 1845. Coal was probably exported via Brisbane soon after that.

Coal mining became prolific in the Ipswich and West Moreton districts due to their proximity to the major population centre of the greater Brisbane area. Within that area there were 84 underground operations. These coal mines were the largest coal producers until the development of large scale export mines commenced in the early 1960s. Coal production from the Ipswich coalfield ceased in mid-2003 having supported economic coal mining for a period of about 160 years.

Other early coal mining occurred at Howard–Torbanlea (1866), Rosewood–Walloon district (1877), the Darling Downs–Allora/Clifton (1870), Ogmore–Styx River (1890) Blair Athol (1890), Baralaba (1917), Tolmies – near Blackwater (1892), Mount Mulligan (1910), and Collinsville (1917).

The Geological Survey of Queensland (GSQ) started exploration in 1878. The new deposits discovered has resulted in more than 30% of all operating coal mines.

In 1913 the total annual coal production in Queensland surpassed 1.0 million tonnes per annum (Mtpa) for the first time. It then reached 2.0 Mtpa in 1949 and surpassed 10 Mtpa in 1971 (**Figure 4**).

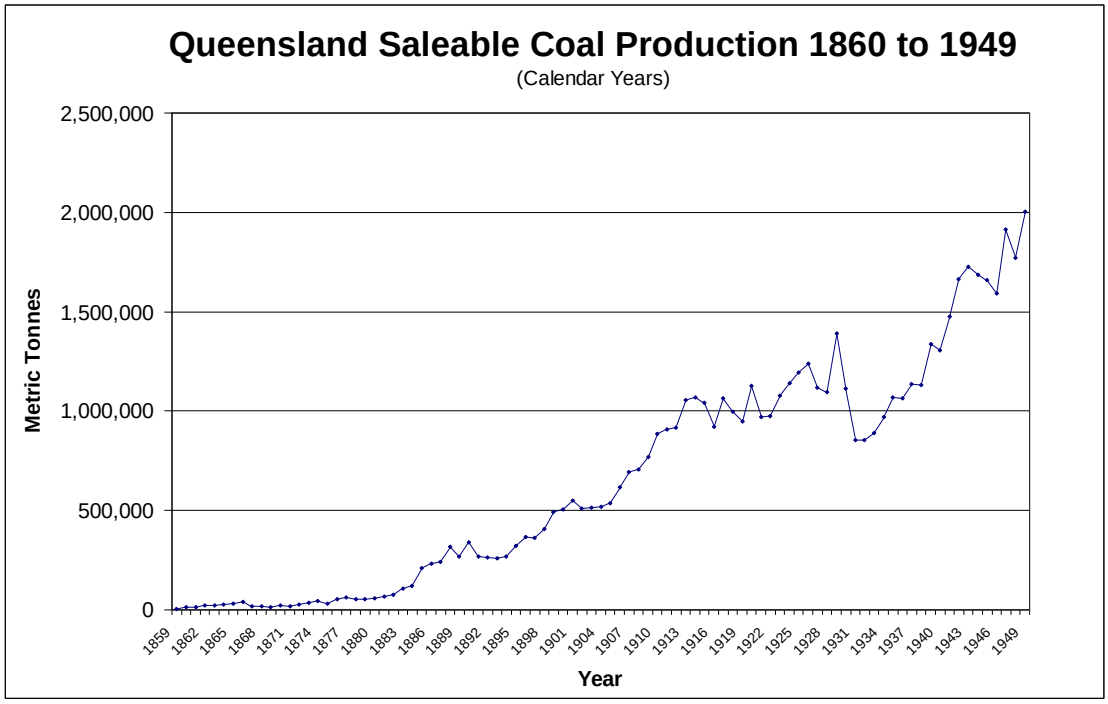



**Figure 4**: Queensland coal production and exports 1860 - 1949

The Queensland coal industry commenced a period of major growth in 1959 with the establishment of new export mines in the south-east Bowen Basin at Moura and Kianga in central Queensland. Both underground and open-cut operations were established and their total production was a mere 220,000 tonnes in 1961.

By 1965, coal exports from Queensland exceeded 1 Mtpa.

Large resources of high quality coking coal were discovered in the central and northern sectors of the Bowen Basin in the mid-1960s. Over the next 15 years numerous of large scale open-cut mining operations were developed in the region.

Underground mining was initiated in the Blackwater district in the late 1960s and early 1970s. Leichhardt Colliery commenced operations in 1971 and produced about 200,000 tonnes of coal over its 10 year life, closing in 1982.

Underground operations at Sirius Creek (1969 to 1972) produced a total of about 37,000 tonnes of coal. Both mines struggled with a combination of high seam gas levels and difficult mining conditions.

The South Blackwater mine started in 1969 with both open-cut and underground (Laleham No1) operations. The Laleham underground was operated as a continuous miner operation, undertaking secondary pillar extraction on retreat. Operations commenced in 1970 -71 and the mine was closed in early 2001.

Cook Colliery started in 1974 and remains in operation today using bord and pillar mining methods with continuous mining machines. For a brief period beginning in the latter part of 1988, the mine utilised mechanised longwall mining techniques, but due to very difficult mining conditions the equipment was subsequently decommissioned sometime between 1991/1992.

In 1970 trial open-cut mining commenced at Yarrabee. Mining at commercial scale did not occur until 1981-82 when 142,000 tonnes of semi-anthracite was produced for the export market.

In the period from 1971 to 1979 new open-cut mines were developed at Goonyella, Peak Downs, Saraji and Norwich Park.

During the period 1978 to September 1987 trial underground mining operations occurred at the Harrow Creek Colliery (which was located within the Peak Downs mining leases).

By 1975–76, coal exports had increased to 16.4 Mtpa and ten years later Queensland's coal exports surpassed 50 Mtpa. In the 1999-2000 financial year, coal exports from Queensland exceed 100 Mtpa for the first time (**Figure 5**).

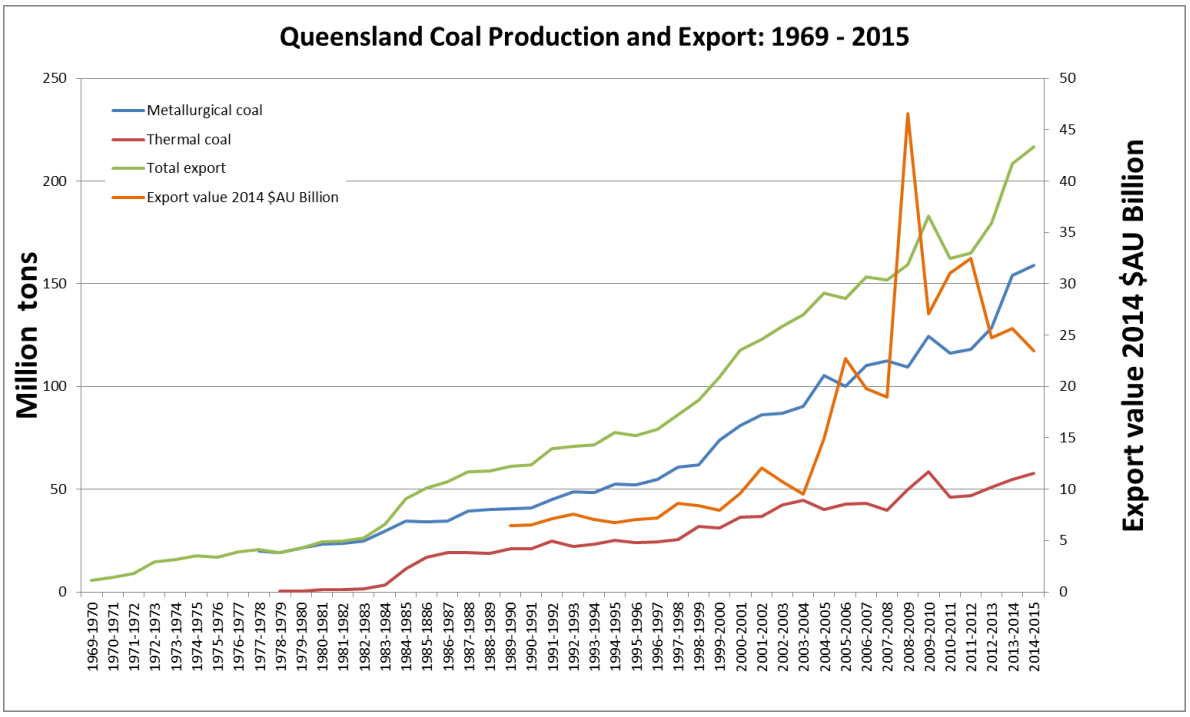



**Figure 5**: Queensland coal production and exports 1969 - 2015

Queensland coal production and exports were boosted from 2006 when a number of new mines commenced. These included open cut operations at Broadlea North, Isaac Plains, Kogan Creek (domestic supply only), Lake Lindsay, Millennium, Poitrel and Wollombi while new underground mines, Carborough Downs and Newlands Northern underground were established and the Grasstree underground mine commenced high productivity longwall mining. In 2007-08 coal exports from Queensland had increased to 153.3 Mt.

Queensland's coal exports set a new record of 183 Mt in 2009–10 but decreased to approximately 163 million tonnes in 2010–11 as a result of major flooding that disrupted open cut mines and caused major damage to coal transport and civil infrastructure.

**Mechanisation**

In 1950 coal production in Queensland amounted to little more than 2.3 Mt, of which 80% came from more than 80 underground mines which were virtually all worked by hand, with very little in the way of mechanisation (Mengel et. al., 1990). The remaining production came from two open-cut mines, Blair Athol and Callide. Most of the mines operated in the Ipswich Coalfield west of Brisbane and were run by working proprietors, individual and family owners, or small syndicates and owners.

The commencement of large scaled open-cut mining in the Bowen Basin commenced in the 1960s firstly at Moura, then at Blackwater (1969) with the first introduction of electric walking draglines for overburden removal, supported by large truck fleets for the transportation of raw mined coal to the coal preparation facility and railhead.

By 1985 more than 50 Mt of coal was produced in the State, with open-cut operations accounting for more than 90% of production. Thirty years later, production has increased nearly 5 times to more than 240 Mt with 15% coming from underground mines.

- 1985 5 Mt UG
- 2015 >40 Mt UG

The first continuous miner to be used underground in Queensland was installed at Box Flat No. 5 Mine in the Ipswich Coalfield around 1960. By 1963, three such machines (Le Norse) were being used in underground mines in southern Queensland.

A Marietta (borer-type) machine was brought into operation at Westfalen No. 3 (Collingwood Park area) on the Ipswich Coalfield in 1969 to develop an area of the mine where the coal seam thickened considerably.

By 1970, more than 95 per cent of the coal production from underground mines operating in Queensland was won using what was regarded as being 'completely mechanised' methods. About 2.5 per cent of production was still obtained using hand mining methods at this time with the remainder of mines using some form of mechanisation (Queensland Coal Board 20th Annual Report).

In June 1986, the first mechanised longwall mining unit to operate in Queensland was installed underground at Central Colliery on the German Creek mining leases (Queensland Coal Board, 36th Annual Report). The mine commenced operations in the 1982-1983 financial year and ceased operations during the 2006-2007 financial year.

Subsequently mechanised longwall equipment has been installed in almost all underground mines developed in Queensland. This mining method is now the preferred technique used by all but 2 of the underground mines operating in Queensland. Two mines (Broadmeadow, North Goonyella) are now also using the top coal caving method (LTCC) to recover more of the thicker seams.

The approximate chronologic order of the installation and commissioning of longwall equipment in Queensland coal mines is provided in Table 4 and described in the following text. Note that there are a total of 17 longwall operations of which 9 are still operating.

**Table 4**: Longwall Mines Opening and Closing Dates[18]

| Longwall Mine | Commenced Operations | Ceased Operations |
|---|---|---|
| German Creek - Central | June 4th, 1986 | December 31st, 2005 |
| German Creek - Southern | December, 1989 | June, 2006 |
| Oaky Creek - No. 1 | November, 1990 | |
| Kestrel / Gordonstone | April, 1993 | |
| North Goonyella | 1993 | |
| Kenmare | November, 1996 | April, 2002 |
| Crinum | June, 1997 | November, 2015 |
| Alliance | October, 1997 | February, 2002 |
| Newlands Underground | 1998 | September, 2005 |
| Oaky North | February, 1999 | |
| Moranbah North | January, 1999 | |
| Broadmeadow | August 24th, 2005 | |
| German Creek - Bundoora | 2005 | September, 2011 |
| German Creek - Grasstree | September, 2006 | |
| Newlands - Northern | February, 2006 | June, 2016 |
| Carborough Downs | September, 2009 | |
| Grosvenor | May, 2016 | |

Central – German Creek; Longwall commissioned June 1986 – mine commenced operations 1984. Mine cease production December 2005 – January 2006. Mine closed.

Cook Colliery; longwall commissioned mid 1988 – mine commenced as bord and pillar 1974. longwall operates briefly for about 7 to 9 blocks before reverting to bord and pillar operation due to difficult mining conditions. Mine still operating using bord and pillar only.

Southern – German Creek; December 1989 commences – mine closes with cessation of longwall operations in June 2006. Mine closed.

Oaky No1; Longwall commissioned November 1990. Mine still operating.

Kestrel; (originally Gordonstone under ownership of Arco, now Kestrel under changed ownership). First longwall began producing coal April 1993 – second longwall commissioned July 1994 – both under Arco ownership. Mine subsequently placed on care and maintenance due to long running industrial dispute. Mine changed hands and was renamed Kestrel with Rio Tinto as operator. Mine still operating.

North Goonyella; (recently LTCC equipment installed UG). Mine construction commenced in April 1992. Longwall commissioned 1993. Longwall top coal caving equipment installed sometime during 2013. Mine still operating.

Crinum; longwall commissioned June 1997. Mine ceased production in Q1 2016. Mine closed.

Oaky North; Roadway development commenced July 1996. Longwall commenced operations in 1998-99. Mine still operating.

Alliance Colliery; Operated as a contract 'punch longwall' operation at Oaky Creek. Operated from 1997 and closed February 2002.

Kenmare; mine worked in multiple seams. Commences production in June 1994 in the Pollux Seam – first longwall coal produced in November 1996. Third panel extraction begins July 1998. Mining in Pollux ceases in about 2000, due to

[18] Based on DNRM's historic mine records.

issues with faulting and other geological issues. Workings relocate to the overlying Aries Seam (Kenmare No 2) for a short while before mine closure in 2001-2002 – longwall face lost with equipment stranded underground- had to be recovered using dragline – refurbished and put into service at Broadmeadow. Mine closed.

Newlands Underground; longwall operations commenced 1998-99. Longwall operations cease September 2005. Replaced by production from Newlands Northern Underground. Mine closed.

Newlands Northern Underground; Longwall operations commence February 2006. Longwall operations ceased June 2016. Mine on care and maintenance pending closure.

Moranbah North; Roadway development commenced in July 1997. Longwall commenced operations in January 1999. Mine still operating.

Grasstree; German Creek Construction commences early 2001 with sinking of twin shafts. Full production commenced late 2006 with commissioning of longwall. Mine still operating.

Broadmeadow; August 2005 first longwall commissioned using reconditioned equipment from Kenmare – more recently LTCC equipment also installed- March 2013. Mine still operating.

Carborough Downs; September 2006, coal production commences using bord and pillar. Longwall commissioned September 2009. Mine still operating.

Grosvenor; longwall commissioned May 2016. Mine operating.

**Notes on geology, coal type and rank**

Coal is a sedimentary rock with a very complex and variable chemistry. It can be described and/or classified in a number of different ways.

These include categorisation by: geological age (e.g. Permian, Jurassic), rank or degree of coalification (e.g. high, low), class (e.g. bituminous, anthracitic), coal lithotype (e.g. vitrinite, inertinite), use (e.g. thermal coal, coking, pulverised coal injection (PCI)) and quality parameters or characteristics (e.g. high volatile, low ash, hard coking). These are also other classification schemes that are used based largely upon the chemistry of the coal (e.g. ASTM, Seyler's, Mott's).

Coal traded commercially is most commonly referred to and sold on the basis of its end use. This is generally simplified by dividing coals into two main groups as either coal used for its energy content (thermal coal) or coal used for steel making (metallurgical coal). The latter group includes coals used to make coke and coal used for PCI.

All coals may be used as thermal coal, although the ability of a coal to produce coke (coking coal) is a function of coal type and rank. At times PCI coal is sold into the thermal coal market, dependant on market conditions (usually when demand is down and prices are low).

Coal mines can be categorised in a number of ways including their mining method (open-cut, underground), coal measures (Group IV), coal seam geology (thick seam, multi-seam), or size (volume of production or sales) etc. Mining methods vary but are broadly categorised as either open cut (strip, open cast), or underground (longwall, bord and pillar). Other 'hybrid' methods may be used such as the use of 'highwall mining' (a method sometimes used when an open-cut mine reaches a depth beyond which further open-cut mining is commercially unviable). This method uses remotely operated mining equipment driven underground into the coal seam from the open cut pit.

For hard black coals (excludes lignite and other brown coals), the reflectance of the vitrinite maceral group (Rv max) in a coal is used internationally as a measure of its rank. The value is used as an indication of the rank (degree of coalification) of black coals. The higher the number the higher the rank of a coal. For a coal to have coking properties, Rv max values need to be in the range 0.9% to 1.7%. Optimum coking properties are developed in the range of about Rv max 1.1% to 1.3%.

## Coal measure descriptions

### Bowen Basin

The Bowen Basin is the most important of the Permian coal basins in Queensland, in terms of both coal resources and production. The coals present within it range in age from Early to Late Permian and exhibit significant variations in rank and quality, reflecting both the depositional and tectonic history of the basin.

Queensland coking coals produced for export from the Bowen Basin are generally low in ash (typically <12% adb), moisture and sulphur content (typically < 0.6% adb) (Mutton 2002, Table 16).

The main differences between the coals relate to their coal type (lithotype composition) rank and ash (or non-coal content). These factors influence dust particle size and dust make (concentration) of the coals mined in Queensland. Other coal property factors which influence dust generation include the in-situ moisture content and physical condition of the coal in-situ (e.g. blocky, massive, sheared, blasted etc.)

#### *Group III coals*

Coking coals produced from Group III seams (Moranbah Coal Measures & German Creek Formation, see Table 2) are typically medium to high volatile bituminous coals, have a high vitrinite content and comprise the best quality coking coals produced in Queensland (generally described as 'prime hard coking coals').

Physically, Group III coals mined in Queensland could generally be described as being relatively weak and friable. An analytical measure used to determine relative hardness or resistance to grinding, is the Hardgrove Grindability Index (HGI) which is determined through simulated milling in the laboratory. HGI values of the Group III coals are generally high indicating that they are relatively soft. By comparison, other types of coal mined in Queensland such as the thermal coals in the Surat Basin, are much harder.

Along the Collinsville Shelf of the western part of the northern Bowen Basin, the Moranbah Coal Measures contain from three to eight coal seams and host the seams currently mined at the large scale open-cut strip mines of Goonyella-Riverside, Caval Ridge, Peak Downs, and Saraji. The rank of the coal seams mined at these operations progressively decreases from the Goonyella-Riverside operation in the north southwards through the Caval Ridge, Peak Downs, Saraji and Norwich Park mines.

Other mines in the northern Bowen Basin extracting coal from the Moranbah Coal Measures include the Sonoma open-cut near Collinsville, the smaller open-cut operations at Eaglefield and Wollombi, as well as the Grosvenor, Moranbah North, Broadmeadow and North Goonyella underground mines. The Eagle Downs underground mine, currently under construction, will also extract coal from seams within the Moranbah Coal Measures.

Most of the coal seams of the Moranbah Coal Measures pass laterally into the upper part of the German Creek Formation (Koppe, 1978). The underground mines in the German Creek Formation include those the Grasstree Mine at German Creek, Oaky Creek (No. 1 and North), and Kestrel. The Crinum underground and Gregory open cut have recently closed whilst the Norwich Park open cut has been on care and maintenance since 2012.

Eight of the current 11 operating underground mines are in the Group III coal measures.

#### *Group V coals*

In comparison to the Group III coals, coking coals produced from Group V coal seams (Rangal / Baralaba / Bandanna, see Table 2) have a lower vitrinite content, and as a result, a duller visual appearance. These coals make softer coke and are often generally described as 'soft' or 'semi-soft coking coals', dependent upon the nature of the coke produced. A variety of coal products are derived from Group V coals ranging from PCI and semi-soft coking coal to a range of thermal coals of varying specifications.

HGI values of the Group V coals are often lower than those of the Group III prime hard coking coals, although not as low as the coals in the Surat Basin.

Three underground mines currently extract coal from Group V seams: Carborough Downs (longwall), Ensham (bord and pillar) and Cook Colliery (bord and pillar).

***Other coal groups***

Also mined in the Bowen Basin are coal seams from the Reids Dome beds (Group I coals) south of Emerald (Minerva open-cut) and Group II coal seams within the Blair Athol Coal Measures (Clermont Mine) and their lateral equivalents in the northern Bowen Basin, the Collinsville Coal Measures (Collinsville Mine).

The (Group II) coal mined at Blair Athol and at the Clermont Mine, with an equivalent age geologically as the coals mined at Collinsville, are significantly different in terms of their properties and end use. The coals at Blair Athol and Clermont are much lower in rank, have no coking properties and are used as thermal coals. The coal mined has been described as being low rank, medium to high volatile bituminous, durainous, and non-coking.

Large scale open-cut mining commenced at Blair Athol in 1984, although there had been much earlier initial attempts to mine coal using underground methods following the initial discovery of the field in the late Nineteenth Century, and subsequently, by small scaled open-cut mining methods (the best available at that time) in the early to mid-Twentieth Century. Mining ceased in late 2012.

The Group II coals mined at Collinsville however, at the northern extremity of the Bowen Basin, are strongly coking, much higher in rank and high in sulphur. Mining methods are currently only open-cut but historically, have included a number of underground mines, some State owned and operated at one time, working a number of different seams.

The coal seams at Collinsville are heavily intruded in places and at depth are known to contain high concentrations of carbon dioxide gas ($CO_2$) which is an issue that has resulted in loss of life underground (the Collinsville State Mine, No 1 Tunnel disaster in October 1954, 7 men killed. A Royal Commission followed). Hand mining underground at the Collinsville State Mines ceased in 1953 although horse haulage underground continued until 1989. The Collinsville State Mines were taken over by Dacon Collieries in 1961.

The last underground mining operation at Collinsville was the Bocum Mine (a conventional bord and pillar operation) which closed in December 1997.

**Mount Mulligan**

Mount Mulligan is located in northern Queensland about 100 km west of Cairns. The coals are of Permian age and occur as an isolated occurrence (approximately 18 km long) lying preserved beneath an overlying sandstone unit of Triassic age (the Pepper Pot Sandstone).

Coal was discovered there in 1907 and the Queensland Government commenced mining operations there in 1923. Three separate seams were mined at Mount Mulligan from a number of different mines during the period spanning 1914 and 1957, all by hand worked underground mining methods.

This was the site of Queensland worst coal mining disaster in September 1921, when 76 men were killed as the result of an explosion underground.

The coal has been described as being, of medium to low rank, medium to high volatile bituminous with medium to weak coking properties.

Although some coke was produced from the coal for local use, it was used almost entirely as thermal coal for steam raising.

**Ipswich Basin**

The Ipswich Basin was the source of the majority of coal produced in Queensland for more than a century during the formative times post colonisation. The seams of economic interest lie within the Triassic age Tivoli and Blackstone Formations of the Ipswich Coal Measures. More than twenty different seams were mined at various times during the history of the coalfield.

The seams are typically banded, and lenticular – frequently splitting and coalescing over relatively short distances. The coal mined at North Ipswich has been described having a high, as mined ash content due to the banded nature of the seams. The coal itself is described as being medium-high volatile bituminous, of medium rank and strongly coking.

The last underground mine to operate in the Ipswich Coalfield (New Hill Mine) closed in August 1997. Mining ceased in the coalfield in July 2003 after more than 150 years of mining. For most of this time, underground mining dominated.

**Callide Basin**

The Triassic age Callide Coal Measures contain four persistent seams, of which, the Callide Seam is the seam of principal economic importance. The seam ranges up to 26 metres in thickness and is quite banded. The open cut mine operates as a series of separate pits.

The coal is mainly used for domestic power generation in the nearby Callide Power Station. The coal is dull, non-coking, relatively low in rank and is classified as sub-bituminous, medium to high volatile.

**Tarong Basin**

The Tarong Basin is a small fault-bounded basin, situated about 190 km northwest of Brisbane. The Meandu open cut mine is the only mine operating in this basin. It supplies coal to the nearby Tarong Power Stations. The Triassic age Tarong Beds contain at least six coal seams, two of which, the King and Meandu seams are the main seams of commercial interest at Meandu Mine. These coals and are regarded as being similar in age to the lower part of the Ipswich Coal Measures (Tivoli Formation) and slightly older than the Callide Coal Measures. The seams have high raw ash values (25 to 45 % adb), and are of medium rank (Rv max 1%).

The mine commenced operation in 1983 just prior to the commissioning of the first of the Tarong Power Stations in early 1984.

**Surat and Clarence Moreton basins**

The Jurassic age coals of the Surat and Clarence Moreton basins are contained with the Walloon Coal Measures. Coal typically occurs in two thick intervals of interbedded mudstones, siltstones, sandstones with coal seams up to 3 to 4 metres in thickness, throughout each. The coal seams tend to be lenticular laterally. These two coal-bearing intervals are separated by up to 100 metres of relatively coal barren strata. The Rosewood Coalfield just to the west of Brisbane was mined for many years by small scaled underground operations and more recently by open-cut operations.

The last underground mine to operate in this coalfield, Oakleigh Colliery, closed in July 1997. The mine which commenced operations in 1929 as an underground operation, was one of the last small family owned operations in Queensland at that time, employing a small local workforce. The coalfield is located within the Clarence Moreton Basin.

In the far northern part of the adjoining Surat Basin, underground mining has been limited to a few operations between Warra and Injune. Maranoa (underground) Colliery near Injune operated for about 30 until it closed in 1963. Small workings were also operated near Warra during the period 1914-1919.

Coals within the Surat and Clarence-Moreton basin are described as being very high volatile, bituminous, of low rank and are non-coking. The coals are considerably harder than the coals in the Bowen Basin and are considered ideal for liquefaction due to their (coal lithotype) composition.

**Mulgildie Basin**

The coals once mined at the Selene underground mine just to the south of Monto, are considered to be age equivalents of the Jurassic coals of the Surat and Clarence-Moreton basins.

This underground mine operated between 1949 and 1966, during which time it extracted about 510,000 tonnes of coal.

**Maryborough Basin (Burrum Syncline)**

The Maryborough Basin is located on the east coast of Queensland, between Maryborough in the south to north of Bundaberg. It occurs both on and offshore.

The coal seams of potential economic significance occur in the Cretaceous age Burrum Coal Measures. The more important coal seams (historically) are grouped in about 500 m of strata near the middle of the Burrum Coal Measures. The most extensively exploited seams are contained in a stratigraphic interval of approximately 160 m. Seams are relatively thin (workable sections not exceeding 2 m) and lenticular in nature and historically have only been workable over limited areas.

Coal mining commenced in the basin in 1866 and has been limited entirely to underground extraction. Most of the underground mines were located in the Burrum Syncline in around the towns of Howard and Torbanlea. Nearing the end of mining in the Burrum Coalfield, Burgowan No13 was forced to close in December 1979 due to the closure of the Power Station at Howard in mid-1980 as it was the main market for the coal produced. The last mine to operate on the coalfield, Burgowan No.12, closed in June 1997.

The Burrum coals have been described as medium to high volatile, bituminous, of medium rank and strongly coking. Historically, the coal has been used for steam raising (thermal coal) and to a lesser extent, gas making.

**Styx Basin**

The Styx Basin is located on the east coast of Queensland about 130 km north of Rockhampton.

In 1918, after a program of exploratory drilling near Tooloombah Creek, the Queensland Government opened up an exploratory shaft at Bowman, to exploit a promising seam. Production began at the Styx No1. State Colliery the following year and continued until 1921. A series of other State owned underground mines followed with the largest of them, the Styx No 3. State Colliery, operating between 1923 and 1963.

The coal seams have been described as being thin and banded, with the coal described being medium to high volatile, bituminous, of medium rank and weakly coking.

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# Annex C – Coal companys' commitment to addressing CWP

Rob Bishop
**Vale**

Attachment to Sub No. 035

# Review of the Health Surveillance Unit

Queensland Government
Natural Resources and Mines

# TABLE OF CONTENTS

# 1 EXECUTIVE SUMMARY

Occupational illness and disease in mineworkers has been identified as a serious problem for many centuries. Agricola (1484–1555) wrote extensively about many of the occupational health problems he had identified in the local population of mineworkers in Germany. In particular, he identified several health hazards including those caused by various respirable dusts found in mines.

History records that respirable dust remained a significant cause of fatal or debilitating illness for the next four hundred years and has only been brought under control during the past fifty years.

In 2002, a report into an operational review of the Mines Inspectorate for the period 1996/97 to 2001/02, determined that the inspectorate's role in safety was well established but its role in health was less defined. The report received ministerial endorsement in April 2002 and included a recommendation to review the future role of the regulator in relation to health surveillance during 2002/03. A steering committee and a tripartite working group were selected to investigate and make recommendations on future directions for the regulator. This report records the result of those investigations

The Government's current activities in health surveillance of mineworkers were initiated in 1983 under the control of the Queensland Coal Board. Following the abolition of the Board, the health surveillance requirements for the coal industry were transferred into the coal mining legislation and became known as the *Coal Mining ( Industry Employee's Health Scheme) Regulation 1993.* With the introduction of the *Coal Mining Safety and Health Regulation 2001* the regulation included the *Coal Mine Workers' Health Scheme*.

There is no equivalent mineworker health surveillance system covering the metalliferous mining and quarrying industries.

The review included investigation into current health surveillance practices in Western Australia and New South Wales. It was found that the regulator in Western Australia conducts health surveillance on all mine and quarry workers, the industry consisting of primarily metalliferous mining activities. New South Wales were found to conduct their health surveillance of coal mine workers through a private company, Coal Services Pty Ltd, however no similar service was found to exist for the metalliferous and quarrying industries.

In general, the study found that the prime focus of mineworker health surveillance programs in New South Wales, Western Australia and Queensland concentrated on respiratory disease and noise-induced hearing loss. The Working Group determined that the prime objective was to focus on the elimination of occupational illness or disease currently affecting the workers in mines and quarries.

In order to be satisfied that a health surveillance program addressed health hazards affecting the current mining industry, information from a wide range of sources was reviewed. Workers' compensation data indicated that the major compensation costs in the mining industry were found to be heavily oriented towards musculoskeletal injury and psychological impairment with a relatively minor amount related to respiratory and auditory injury or illness.

This report identifies several shortcomings of the current system including that there are no records available on persons who have either retired from the mining industry early, or changed work tasks as a result of occupational injury or illness. This was found to be a particular omission where persons had suffered from an injury or illness caused by a long-term exposure to an occupational health hazard.

The report records the results of the investigation, consultations and findings and recommends an occupational health process suitable for adoption by the entire Queensland mining and quarrying industrys. The process includes a proposed model for health surveillance that addresses each of the identified shortcomings in the present system and provides a mechanism to address current mineworker health concerns.

This report addresses the deficiencies in the existing health surveillance process with a total of 21 recommendations that include:

- Replacement of the existing Coal Mine Workers' Health Scheme with a new Health Surveillance Unit (HSU) that meets the needs of the coal mining, metalliferous mining and quarrying industries in Queensland.
- The HSU to be part of the Mining Inspectorate and be based in Brisbane.
- The principal role of the HSU to be the collection and analysis of adverse health assessment data, reporting the findings to industry for preventive action and to facilitate epidemiological and other research where appropriate.
- Provisions required to be included in both mining acts and subordinate legislation to permit the proper functioning of the health surveillance process.
- Identification of duties of key personnel including "Site Senior Executives" and 'Employers", to ensure appropriate health surveillance of workers and the ongoing control of risk of disabling injury or disease.
- Appointment of medical practitioners to be known as "Appointed Medical Officers" whose duties will be defined by regulation.
- Establishment of medical practitioner support for the new HSU, initially by a part-time occupational physician and, on a permanent part-time basis, a panel of medical practitioners with experience in the mining and quarrying industries.

It is anticipated that the proposed new health surveillance model should be able to be implemented with the same staff numbers and only a moderate increase in the budget allocation that exists for the current Coal Mine Workers' Health Scheme. The significant change from the current system being that under the new process, only persons whose

occupational health has been adversely affected will be reported to the new HSU. All other medical records will be kept by the Appointed Medical Officers and be available to the HSU.

The proposed health surveillance model is consistent with the direction that several large mining houses have now embarked upon. The Minerals Council of Australia are actively developing an Australia-wide health surveillance model for the mining industry and have received two presentations on the proposed Queensland model as set down in this report. The NSW Mine Safety Council has also developed a strong interest in the proposed health surveillance system for Queensland after having received two presentations.

The Working Group members were unanimous in their desire to see mine operators and the regulator work in partnership to achieve a well-focused health surveillance program for all mine and quarry workers. It is confidently anticipated that such a partnership will result in mineworker health and safety being enhanced.

In addition, the review identified opportunities for further research and access to data where current practices and knowledge need further development. One of the important changes will be to obtain a wider range of health data from sources not currently accessed in either Queensland or the other states. This will require detailed attention with respect to the setting up of robust systems to ensure the Privacy Policy is implemented and complied with at all times.

The Working Group believes that the recommended process is practical and fulfils the Terms of Reference with an additional benefit of having the potential to be the best health surveillance process for mineworkers in any state of Australia.

Members of the Steering Committee and the Working Group were unanimous in their view that it is the collective responsibility of all industry stakeholders to identify and find solutions to causes of illness and injury in the mining and quarrying industries. Adoption of the report's recommendations should assist industry stakeholders in taking appropriate and systematic action to achieve a sustainable improvement in the health of mine and quarry workers.

Peter Dent
Executive Director – Safety and Health

Peter Minahan
Chief Inspector of Mines

Stewart Bell
Director – Simtars

# 2 BACKGROUND

## 2.1 Historic aspects of occupational health intervention

Miners of antiquity were slaves and their health was of no concern to their masters[1]. Legge reported that, in Roman times, miners were the first to use control measures, enveloping themselves in bags and sacks and using animal bladders covering their mouths as protection against dust inhalation[2].

Little is known about miners' health from then until Agricola's treatise on metal mining, *De Re Metallica,* in 1556. As official town physician of Joachimstal in Bohemia, he noted the terrible ravages of occupational disease on the mining community, making particular comment on the 'terrible consumption' that had caused some women to have had seven husbands. He said: 'Of the illnesses, some affect the joints, others attack the lungs, some the eyes and finally, some are fatal to men.'[1]

Around the same time, an Austrian physician, Paracelsus (1493-1541), wrote a monograph on the occupational diseases of mine and smelter workers, noting that if we wish to have gold, silver and other metals, '… we must risk life and body in a struggle with many enemies that oppose us'.[2]

As capitalism flourished during the Renaissance, various trades developed, creating new diseases associated with them. Bernardino Ramazzini (1633-1714), who has since become known as the father of occupational medicine, described these diseases of the trades in the first textbook on occupational medicine, *De Morbis Artificum Diatriba* in 1700. He was critical of doctors who would not visit the workplace to *see* the conditions their patients experienced.

The following century brought the massive social upheaval associated with the industrial revolution. Cottage industry gave way to large factories centred on the new industrial towns. Water power gave way to steam power, which created a coal mining industry hungry for labour. Conditions in the mines and mills were appalling, with no limitations on the age of workers or length of the working day. The accident and disease toll rose, both from the work and from the squalid conditions in the dormitories in which the workers were housed. As a result of public concern, Sir Robert Peel introduced a Bill into the British House of Commons, which became the *Health and Morals of Apprentices Act of 1802*, which required improved sanitary conditions and limited work to 12 hours per day. While it was largely ineffective, it is regarded as a benchmark, as it introduced the concept of government intervention to protect the health of the working population.[2]

A succession of Factory Acts over the ensuing century gradually introduced concepts that are an accepted part of modern occupational health and safety legislation. The *Factory Act of 1833* introduced the Factory Inspectorate and required certification that children were

nine years old before they could work. The Act of 1844 strengthened these powers and that of 1855 was notable for introducing certification of the health of working children and the empowerment of the Inspectorate to investigate work accidents.[2]

By the middle of the 19th century, outbreaks of cholera were significant causes of death in most cities. A remarkable investigation by Dr John Snow into one of these became the first formal epidemiological study recorded. This study pointed to the Broad Street pump as the source of infection of the local community.[3] In 1856, Dr Edward Greenhow, newly appointed Lecturer in Public Health at St Thomas's Hospital, London, examined death certificates for those dying of lung disease, and concluded that the major cause was the inhalation of dust and fume at work. This was most probably the first piece of epidemiological research into occupational health. As a result of Greenhow's findings, inspectors were empowered by the Factory Acts of 1864 and 1867, to require the control of dust by fans and other mechanical means.[2]

By the end of the of the century, the development of industrial and mining processes saw a an increasing problem with exposure of workers to hazardous substances. In an endeavour to overcome the problem the British Government introduced, in 1895, a requirement to notify occupational disease and followed this with the appointment of Dr Thomas Legge as the first Medical Inspector of Factories in 1898. Over the following two decades, the number of lead poisoning cases notified had more than halved, due largely to Legge's endeavours.[1]

These timely British innovations led the world at this time and continued to do so over the early 20th century. They could be regarded as world best practice for the time, and were gradually adopted by the British colonies, Europe and the Americas. Hence Australian legislation for most of the 20th century closely followed the British model and could be said to do so still, with the adoption of Roben's-style legislation by the Australian states in the 1980s and 1990s.

## 2.2 History of Health Surveillance in Queensland Mines

Health assessment and health surveillance schemes have been part of the Queensland mining industry since 1982 when the Queensland Coal Board issued two Health Orders under the *Coal Industry (Control) Act 1948*.

The first Order set up a program to survey, by chest x-ray and lung function test, all coal mineworkers in the State. The second Order required all entrants into the coal industry to meet a pre-employment medical standard. Retired coal industry employees were also invited to be part of the survey by chest x-ray.

The objectives of the survey by chest x-ray were primarily to identify prevalence and severity of lung disorders that may have been related to coal mining.

A total of 7907 persons were examined, comprising 7784 employees and 123 retired employees. A total of 499 individuals were identified as having an abnormality, including 75 cases of pneumoconiosis and suspected pneumoconiosis. Following the survey, doctors E.M. Rathus and E.W. Abrahams, who were medical consultants to the Queensland Coal Board, produced a report[4,] which supported the continuance of pre-employment medical examinations and chest x-rays.

From 1984 to 1993, pre-employment medical assessments and on-going health surveillance in the Queensland coal industry mainly focused on respiratory and lung diseases, with chest x-rays being compulsory for all persons entering the coal mining industry. However, ongoing health surveillance was not compulsory and was not widely taken up by industry.

In 1993, the Queensland Coal Board issued a new Order under the *Coal Industry (Control) Act* entitled the *Coal Industry Employees' Health Scheme Order 1993*. [5] This Order attempted to provide for both pre-employment and ongoing 'fitness for work' and health surveillance monitoring of the workforce. It provided for pre-employment health assessments and further health assessments at periods not exceeding five years. However, chest x-rays were no longer compulsory for all, but only for those at increased risk. It was also mandatory for a copy of all health assessments to be lodged with the Queensland Coal Board to enable the information to be electronically captured for future analysis.

In 1997 the Queensland Coal Board was abolished and responsibility for administration of the *Coal Industry Employees' Health Scheme Order 1993* was assigned to the then Department of Mines and Energy by amending the former *Coal Mining Act 1925*.

With the pending introduction of the new Coal *Mining Safety and Health Act 1999* and associated *Regulation* (and consequent repeal of the *Coal Mining Act 1925)*, a working party comprising coal industry employer and employee representatives and officers from the Department of Mines and Energy was established to review the 1993 Order. Numerous minor improvements were made to the Scheme, which remains in place today.

With regard to the history of health monitoring in the metalliferous mining industry, the *Mines Regulation Act 1964* included provisions for monitoring of the environment for known health risks, however there was no statutory requirement for occupational health monitoring other than the requirement to monitor for lead poisoning.

The *Mining and Quarrying Safety and Health Regulation 2001* (the MQSHR 2001), which came into force in March 2001, includes extensive provisions relating to the personal monitoring of the health of mineworkers.

## 2.3 Current arrangements and legislation

Current provisions for pre-employment and on-going health surveillance have been made in both the MQSHR 2001, for those employed in the metalliferous mining and quarrying industries, and in the *Coal Mining Safety and Health Regulation 2001* (the CMSHR 2001) for those employed in the coal mining industry.

The main differences between the health requirements in the two Regulations are outlined below:

| Coal | Metalliferous |
|---|---|
| The coal regulation requires that anyone undertaking work on a coal mine must have a health assessment conducted in accordance with an approved form unless they are employed in occupations identified by risk assessment as low risk tasks. Medical assessments must be conducted by a medical practitioner with knowledge of the operating environment and appointed by the employer. | The metalliferous regulation makes the site senior executive responsible for determining, by a risk assessment, the level of fitness required for specified duties. There is no approved form for health assessment in the metalliferous industry, as each site must develop its own health surveillance regime. |
| There is evidence that there is a 100 per cent compliance with the coal industry health surveillance requirements. | Anecdotal evidence suggests that the compliance rate in the metalliferous and quarrying sectors may be less than ideal |
| The coal regulation requires that a copy of the health assessment be lodged with and stored by the Department to enable research to be undertaken to improve the health of coal mineworkers. It should be noted that while the Department has undertaken some research, there are no measures in place which could demonstrate any improvement in the health of coal mineworkers from such research. | There is no such requirement in the metalliferous regulation for the centralised storage of health records. |

The two regulations are similar in the following areas:

- health assessments are to be done at both pre-employment and during the period of employment
- chest x-rays are only required for those at risk
- the employer is responsible for the cost of the health assessment
- provision for qualified medical practitioners to assess workers, when required; and
- provision for the notification of occupational diseases.

## 2.4 Mines Inspectorate Review and why Recommendation 19 was made

A review of the Mines Inspectorate was undertaken in late 2001 / early 2002 to coincide with the expiry of the majority of the initial five-year contracts of employment of Mines Inspectorate officers. The review also complied with a recommendation of the report *'Review of the Mining and Energy Inspectorate'* [6] that was noted by Cabinet in October 1996.

The 2001-02 review of the Mines Inspectorate resulted in the publication of a report entitled *'Review of the Mines Inspectorate Structure '.*[7] The recommendations in that Report were approved by the Director-General of the Department of Natural Resources and Mines and endorsed by the Minister for Natural Resources and Mines.

Recommendation 19 from the Report required:

> 'That the role of the Health Surveillance Unit of the Safety and Health Division should be reviewed within the next 12 months to consider:
> - the unit's ability to contribute to improved safety and health in the industry
> - location of the unit
> - health research needs of the industry
> - any requirements for medically qualified staff within the unit
> - administration costs of the coal industry health scheme to industry and government.'

The rationale for undertaking a Review of the Health Surveillance Unit is contained in section 6.2 of the Report. Section 6.2 advises *inter alia* that:

> 'The Coal Mine Workers' Health Scheme is managed by the Health Surveillance Unit of the Safety and Health Division. The Unit transfers the records onto a database, stores all records received and provides copies of those records as required. Some analysis of information is conducted on behalf of the nominated medical advisers and industry. One permanent officer and two temporary officers are employed in the Unit.
>
> The Health Surveillance Unit is not part of the Mines Inspectorate and is not included in the Review of the Mines Inspectorate Structure. Discussions within the Safety and Health Division suggest that it would be appropriate to review the functions of the Health Surveillance Unit to consider its ability to contribute to improved safety and health within the whole mining industry. Issues to be addressed in the review could include …'

## 2.5 Linkage to Government Strategic Outputs

An effective health surveillance scheme for the mining industry would be expected to deliver a reduction in debilitating occupational injuries and diseases resulting from excessive exposure to mining hazards.

Such an outcome has a direct linkage to the 'whole of Government' priority of *Safer and more supportive communities* as illustrated.

| | |
|---|---|
| ***Whole-of-Government Priority*** | ➢ Safer and more supportive communities |
| ***Key Outcome Measure*** | ➢ Accidental and preventable deaths, injury and/or loss |
| ***Departmental Strategy*** | ➢ Sustain Queensland's natural resources through assessment, planning and management |
| ***Safety and Health performance measure*** | ➢ A reduction in accidental death, injury and/or loss |
| ***Safety and Health Action*** | ➢ Development and implementation of an effective health surveillance scheme for the mining industry |
| ***Mining industry outcome*** | ➢ Reduction in mining accidents and incidents and a reduction in debilitating occupational diseases and injuries |

## 2.6 Objective and Terms of Reference

In order to implement Recommendation 19 of the *Review of the Mines Inspectorate Structure* - a Departmental Steering Committee and a tripartite Working Party of Departmental, employer and employee representatives was established. The Working Party included representatives from both coal and non-coal sectors of the mining industry.

The Working Party established and agreed to an *'Objective'* and *'Terms of Reference'* for the review process. The Objective and Terms of Reference were presented to, and subsequently approved by, a Steering Committee comprising the Executive Director of Safety and Health, the Chief Inspector of Mines and the Director of Simtars.

The Objective and Terms of Reference are:

**Objective**

To recommend a business model for health surveillance in Queensland in partnership with the mining industry, that will assist in the systematic identification, assessment and elimination/control of adverse occupational health risks to mineworkers.

**Terms of Reference**

1. Determine the opportunities for a revised Health Surveillance Unit within the Safety and Health Unit, to contribute to improving the occupational safety and health of mineworkers in the Queensland mining industry:
   - within the existing budget
   - with an additional resource allocation.
2. Develop a model for a Health Surveillance Unit for the mining industry that:
   - is responsive to occupational health risks to all mineworkers
   - monitors the health of mineworkers and identifies areas where a significant health risk may be present
   - identifies opportunities to reduce risks to the health of mineworkers
   - identifies industry health research needs to control or eliminate currently known short and/or long-term occupational health risks to mineworkers.
3. Make recommendations that will assist the mining industry achieve a sustainable reduction in occupational health risks to mineworkers by:
   - determining the role, structure, function and location of the Health Surveillance Unit
   - identifying competencies required within the Safety and Health organisational unit
   - identifying legislative amendments for health surveillance in the mining industry.
4. Report on the anticipated administration costs to both industry and government, including the Coal Mine Workers' Health Scheme, in implementing part or all of this report.
5. Report to be completed by end of October 2002*.

* The Steering Committee agreed to the Report's completion date being extended to 31 June 2003 owing to the level of metalliferous industry consultation required.

## 2.7 Steering Committee

The role of the Health Surveillance Steering Committee is to provide direction and advice to the Health Surveillance Working Party.

The Steering Committee comprised:

| Officer | Position |
|---|---|
| Peter Dent | – Executive Director – Safety and Health |
| Stewart Bell | – Director – Simtars |
| Peter Minahan | – Chief Inspector of Mines |

The Members of the Steering Committee held four formal meetings with the Chair and other members of the Working Group, as well as ongoing ad hoc discussions with individual Working Group members.

## 2.8 Working Group

### 2.8.1 MEMBERSHIP

The membership of the Health Surveillance Working Group comprised a tripartite grouping of departmental, industry and mining union representatives with an occupational health medical officer as the independent Chair. Both the metalliferous and coal sectors were represented on the Working Group. The Working Group held eight formal meetings and many informal meetings.

The members and their association are:

| Member | Association |
|---|---|
| Dr David Smith (Chair) | Occupational health specialist (consultant) |
| Mr Brian Lyne | Safety and Health, NR&M |
| Mr Roger Billingham | Safety and Health, NR&M |
| Mr Les Wynn (Secretary) | Safety and Health, NR&M |
| Ms Carmel Bofinger (alternative Ms Elizabeth Mahon) | Simtars, NR&M |
| Mr Andrew Vickers (alternative Mr Greg Dalliston) | CFMEU (representing coal industry workers) |
| Mr Peter Lewis | MIM Holdings Ltd (representing metalliferous industry employers) |
| Mr Alan Miskin (replaced Mr Mick Madden – BHP Billiton) | BHP Billiton Mitsubishi Alliance (representing coal industry employers) |
| Mr Ben Swan | AWU (representing metalliferous and quarry industry workers) |

# 3 STRATEGIC OVERVIEW

## 3.1 The Big Picture

One of the most famous medical practitioners in mining history was Georg Bauer, commonly known as Agricola, who died in 1555 after a lifetime serving a mining community in Bohemia. In his twelve-volume work *'De Re Metallica,'* he described the adverse occupational health effects of various respirable dusts. History records that another four hundred years would pass before the problem of pneumoconiosis was brought under control.

In 1972, Lord Robens changed the thinking of health and safety in the workplace with the incorporation of the common law principle of duty of care into statute law. Since that time major improvements have been achieved in mine safety, however improvements in mineworker health have been less obvious.

**National Occupational Health and Safety Commission Study**
A study commissioned by the National Occupational Health and Safety Commission (NOHSC) in 1995 to cover all industries established that the estimated number of deaths each year due to occupational exposure to hazardous substances was approximately 2200 persons, compared with between 500 and 600 workplace deaths from traumatic injury.[8] The report found that very few of these deaths were included in the nationally aggregated workers' compensation data.

The NOHSC figures quoted above are for work-related deaths, and only for deaths attributed to work-related exposure to hazardous substances. Non-fatal work injuries and diseases from all causes probably occur in a similar proportion, yet the actual number of each is not known. Emmett quotes figures of 160,000 workers on leave from work for at least one week with a compensated injury or disease, and 650,000 who suffer from an occupational injury or disease each year.[9]

The number of workers' compensation claims for work caused disease in Queensland is only approximately one tenth of the number of claims for injury, which suggests the existence of a large pool of unrecognised work-related disease.

Assuming this is so, there may be several reasons for a lack of recognition of work causality with disease. These include:

- the long latency period between exposure to the causative agent and the onset of disease in many cases
- the relationship of the disease with the work activity is not recognised by the person
- the relationship of the disease with the work activity is not recognised by the medical practitioner; and

- many of the diseases that can be caused by work exposures, such as lung cancer, can also be commonly attributed to non-work-related causes.

Hence there is almost certainly much more work-related disease than appears from the compensation data.

In relation to mining, recent statistics indicate that, for the 2001-02 report period, almost 19,000 people were employed in the Queensland mining industry, two people were fatally injured and 620 disabling injuries were sustained. Seven mineworkers were recorded as being permanently incapacitated, thus being unable to continue employment in industry.

The Investigative Team found anecdotal evidence from reliable sources indicates that these figures may significantly understate the real number as a result of mineworkers accepting financial incentives to retire early from the industry.

The high level of occupational injury and disease in Australian industry has been known for many years and unfortunately efforts to address the problem have had only limited success. The 1995 Industry Commission report on workplace health and safety [10], presents the following estimates for Australia in the 1992-93 period:

| | |
|---|---|
| Total cost of Damage to People from Work | $20 billion |
| Total cost of Fatalities | $ 0.3 billion |
| Total cost of Permanent Disabilities | $16.1 billion |
| Total cost of Temporary Disabilities | $ 3.6 billion |

The mining industry, with its relatively high injury rate, is a significant contributor to these figures. The total workers' compensation payout for mineworkers in Queensland in 2000-01 was $7.6 million. The monetary figures are an indicator of the level of pain and suffering being experienced in society, a significant amount being the result of work-related disease.

Using this as a background, a fundamental review was undertaken that disregarded many of the paradigms that currently exist in industry. Some of the information provided to the review group was confidential and therefore was not included in this report due to current privacy requirements.
Four prime matters were found to require immediate attention:

1. Insurance statistics should be more readily available for analysis.
2. A process to validate that all available information has been sourced before any analysis is conducted.
3. The level and detail of health statistics available requires expansion.
4. A review of the privacy policy and its potential to mask the occupational health risks due to the de-identification procedures.

One of the weaknesses found in occupational health management was the insular nature of most industries. There is a wealth of information from studies that have been made in various industries such as the transport industry, where studies into fatigue and ageing have taken place independently. What appears to be lacking is a clearly focused organisation to harness the enthusiasm and knowledge and use it wherever appropriate.

## 3.2 The Mining Industry

The mining industry is shackled by its past in many ways. Mine stakeholders still hold to the paradigm that their industry is different to others. The surface mining industry utilises many machines that are used in the broad earthmoving industry, moves the same type of material and operates the same machines with a workforce from the same communities.

During 2002, a large Queensland mining company reported that it had to conduct separate ergonomic studies on bulldozers used in their surface metalliferous mines and their surface coalmines due to senior management's belief that the hazards were different. Such attitudes are not unique to one company and are common across the industry.

The mining industry consists of three broad elements:

1. the mineral resource in a defined environment (surface or underground);
2. machinery to extract the mineral; and
3. people who are trained to operate the equipment.

For more than a century, the mining industry has operated under its own unique legislation in many countries throughout the world. The legislation in Queensland has recently moved from being very prescriptive to being risk based, enabling operators to develop mine specific standards. Traditionally the focus of mining legislation has been on safety with only a limited emphasis on mineworker health. Improvements in management and elimination of serious incidents have not been parallelled by improvements in the management of mineworker health other than the virtual elimination of lung disease caused by dust in mines. Respirable dust management was implemented in the 1950s and early 1960s and since 1982 has included medical monitoring of miners in the Queensland coal industry. A major review on health surveillance was undertaken in the coal mining industry in 1993 but since that time there have been few changes to the coal miners' medical assessments and there is still no formal industry-wide monitoring of mineworker health in the metalliferous mining and quarrying industries.

Bearing in mind the history of medical assessment in the mining industry and the current risk based legislation that it operates under, it is important to establish what is required to address the needs of the current mining industry. The current legislation requires all hazards associated with the mining operation to be identified, risks assessed and where necessary, controls put in place to ensure that all persons may work with an minimal level of risk.

Whilst most risks associated with mining operations are known, accident and health statistics confirm that more needs to be done in the current management of risks in mines and quarries.

## 3.3 Role of government

Following the Robens' Committee findings in the UK in the 1970s, governments in many western countries, including Australia, adopted the new Robens-style legislation, which placed the principal responsibility for health and safety on those who create the risk. Hence the predominant responsibility to manage risks rests with employers.

Thus the role of government changed from one of providing health and safety services, to one of ensuring the provision of such services by industry, mainly through legislation and advisory instruments.

Recent mining legislation in Queensland adopted this philosophy.

Having this responsibility requires the regulator to monitor the health and safety performance of employers through the collection of occupational injury and disease data. While individual mines collect their own data, only the regulator can assess the collective performance of the whole mining industry.

By collecting and analysing industry wide data, areas of poor performance become apparent indicating where greater effort in prevention need to be directed.

In this way, one sector of the industry can be compared to another, one mine compared to another, or one type of job compared to another, to enable the identification of areas of concern and the development of preventive strategies with industry involvement.

Prevention of work-related disease and injury should be a prime goal of every workplace. Workers should have a reasonable expectation that they will not suffer a work-related injury or disease during their working lifetime, and in the case of work-caused disease, even beyond work into retirement.

Industry needs to accept the philosophy that a healthy business has healthy workers. There is evidence that this is being accepted in many larger economies. W.Edward Demming is reported to have said that the 'individual worker is the company's most important asset and respect for individuals is paramount for business success'.[11]

Support of this philosophy suggests the need for an industry wide health surveillance program. In the words of the International Labour Organisation (ILO):

'Workers' health surveillance programs should be used for prevention purposes and in particular to:

(i) describe the health status of working populations and socio-economic groups, by estimating the occurrence of occupational injuries and diseases (frequency, severity and trends in mortality and morbidity);
(ii) stimulate occupational epidemiologic studies and explain the causes of occupational injuries and diseases, by identifying the physical, behavioural, organisational, psychosocial and occupational exposure factors that cause specific injuries and diseases or their respective risk factors;
(iii) predict the occurrences of occupational injuries and diseases and their distributions in working populations, in order to determine the specific focus for prevention;
(iv) prepare action-oriented research and intervention studies, to eliminate causal factors through prevention and to mitigate their consequences by curative and rehabilitative activities; and
(v) assess the effectiveness of previously implemented control measures.'[12]

The Working Group aims to achieve similar goals across the whole Queensland mining and quarrying sector.

# 4 INVESTIGATION AND FINDINGS

An analysis of the current legislation, namely CMSHR 2001 and MQSHR 2001 has found the regulations to have significant differences and also some deficiencies. For example, the current mining and quarrying regulation does not have a requirement for a formal health surveillance system whilst the coal regulation does. Differences in the two regulations were found regarding accountability for ensuring that mineworkers were fit for their duties. The mining and quarrying regulation s 85 requires the *site senior executive* (SSE) to ensure a person's fitness level is adequate before work commences while s 46 of the coal regulation requires the *employer* to ensure a medical assessment is carried out before commencing work. To highlight the differences in the two regulations, reference to 'fitness' in s 42(1)(b) of the coal mining regulation relates to alcohol, drugs, psychological impairment and fatigue, rather than to capacity to do the job. . Information gained during the consultation phase suggested that some employers had set very high standards of fitness for employees. The Investigative Team were involved in other discussions which indicated that some employees experienced a threatening environment should they report workplace conditions that were potentially adverse to their health.

## 4.1 Sources of relevant information on health hazards

Current mining legislation is based on management of risks to the safety and health of mineworkers. The Coal Mine Workers' Health Scheme collects medical reports from mines and has conducted limited analysis of this data.

During the investigation numerous other sources of data were found which were determined as being potentially relevant for use by any future work unit conducting surveillance of mineworker occupational health.

Twelve potential sources of health data were identified:

- Mine based reports
- Nominated Medical Advisor medical assessment reports
- Q-COMP, Queensland Workers' Compensation Regulatory Service
- QCOS, Queensland Coal and Oil Shale Superannuation Scheme
- CFMEU private database on injured coal mineworkers
- Inspectorate investigation / inspection reports
- Occupational health research bodies
- Other states' health schemes
- Other countries with mining industries
- Coal Mine Workers' Health Scheme database
- Police reports
- Employer organisations.

The current Coal Mine Worker's Health Scheme (CMWHS) database will be a major component of the data available for future analysis. Any new database for the entire Queensland mining and quarrying industry must be compatible with the existing CMWHS database.

Employer organisations such as the Queensland Mining Council and the Australian Minerals Council are potential sources of data. Linkage with these groups will be necessary in developing a partnership approach to eliminate mineworker occupational injury and disease.

Under the new mining and quarrying regulation, which has been in place since 2001, employers are not required to provide reports on the occupational health of their employees to the inspectorate. Coal industry medical assessment records are sent directly from the nominated medical advisors to the Health Surveillance Unit.

There are no provisions under either regulation requiring an exit medical examination or for an employer to provide reasons why a person's employment has been terminated due to ill health.

Other than in Western Australia, there is no readily available occupational health data from the metalliferous mining and quarrying industries other than those reported in workers' compensation data. In Queensland, Q-COMP data cover all sectors of the mining industry while QCOS data only cover the coal industry.

The Western Australian occupational health data for mineworkers relate almost entirely to auditory and respiratory function.

One of the challenging lessons learnt from this review was the limited amount of detailed occupational health data available for analysis. In general, the data is almost invariably in a condition that makes it very difficult to use in an effective way. The data is de-identified as a result of the privacy legislation to such an extent that an incident can neither be traced to a mine nor an individual. Privacy issues arise where mines usually operate in remote areas and accidents are infrequent. News of incidents in the mining and quarrying industries travels widely and a general reference to an injured mineworker may be readily identified by other mineworkers residing in the same district.

A good example of the difficulties created by the privacy provisions became apparent from the workers' compensation data provided to the Division of Workplace Health and Safety, which contracts Q-stats to undertake analysis of the data. The raw Q-COMP data only records the injured worker's home postcode and not the mine location. As a result it is almost impossible to determine what mine was involved, whether the mine was a surface or underground operation and what task was being undertaken at the time of any injury.

The QCOS (Queensland Coal and Oil Shale Superannuation Scheme) data present similar challenges to further analysis and interpretation.

A very credible database was found to exist within the CFMEU, the data from which could readily be de-identified and analysed. Discussions with experts in the privacy laws and rules, confirmed that, subject to proper controls being put in place, access to data from this source would be possible. Access to this data is seen of significant value in ensuring the accuracy and completeness of data used for analysis.

It is important to be aware of the occupational health data that is derived from other developed mining countries and from other states within Australia. The data collected by Coal Services, NSW, are very similar to those collected in Queensland. They only cover the coal mining industry and to date have not been cross-referenced to the risk profile of the industry as indicated by insurance data. The NSW database is very extensive and the company's senior management has offered access to the company's statistics to help provide a better indicator of mineworker health in coalmines. Again, the metals and quarrying industry in NSW does not appear to have an equivalent system to monitor the health of its workers.

The Mine Safety and Health Administration (MSHA) in the United States is active in monitoring mineworker health such as the effects of diesel particulates on mineworker cancer rates. It is vital that access to such databases where, in this case, the country has an industry at least 10 times larger than Queensland's, is not overlooked.

It is important not only to source data from other organisations but also, where appropriate, to be a source of data. As an example, recent studies that have involved the Canberra based Australian Institute of Health and Welfare (AIHW), to which the department supplies miners' health data, have confirmed that coal mineworkers do not have an increased risk of heart disease when compared to the general population. While this might be predictable, it is still a valuable tool in benchmarking aspects of coal minerworkers' health.

Clearly there will be a preference for data to be received in an electronic format to reduce the need for data entry and allow ready analysis of data from a wide range of health surveillance providers.

### 4.1.1 RISKS CURRENTLY EVIDENCED IN THE MINING INDUSTRY

The Q-COMP data on work-related disease claims by Queensland mineworkers was compared with data from the Queensland Coal and Oil Shale Superannuation Fund (QCOS) for the period 1988-2002. Evidence of the current health risks to mineworkers is thus revealed (Figure 1), though it must be remembered that the Q-COS data is for coal mines only and also includes persons retired because of non work-related disease.

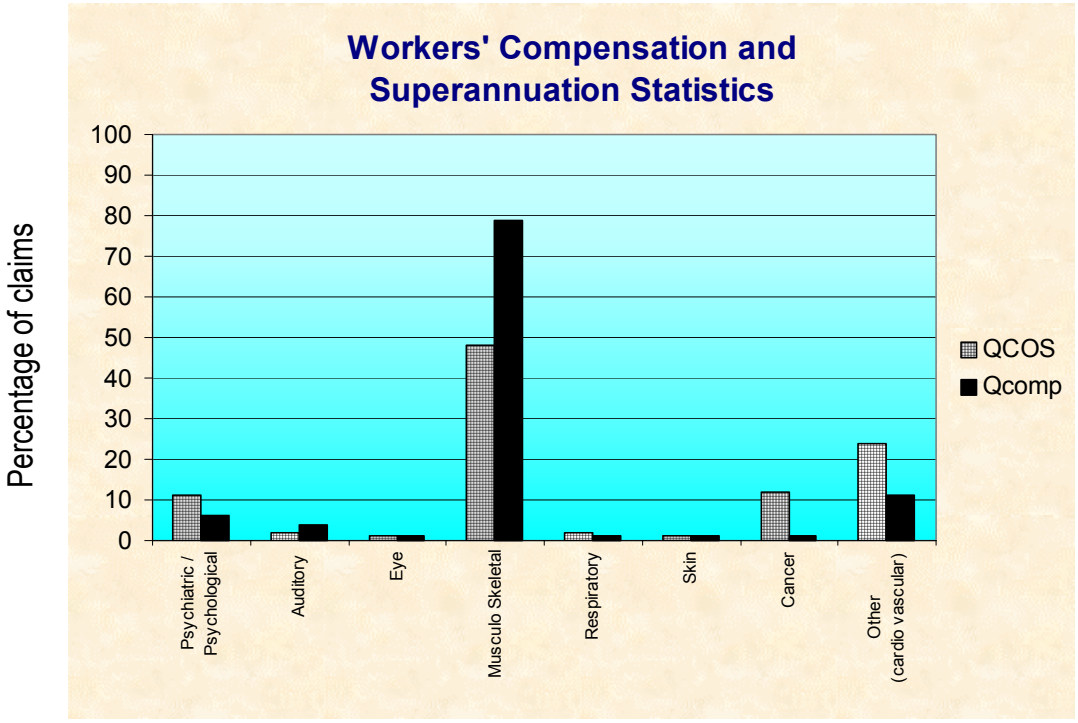


Figure 1 Comparison of workers' compensation data (percentage of total payments) against Q-COS claim numbers for specific disease groups.

The highest payment category for workers' compensation claims was for musculoskeletal disorders and the second highest for psychiatric/psychological impairment. The statistics also indicated that the payouts for the commonly monitored respiratory and auditory disorders were at much lower levels than the two just mentioned. One interesting fact that was found was the existence of two recent cases of silicosis in the Queensland mining industry. Unfortunately the database used was de-identified to the extent that the problem could not be sourced to a particular mine or employer and therefore workers may continue to be exposed to an unacceptable risk.

There is strong evidence to suggest that the current health surveillance conducted in the mining industries in Queensland, New South Wales and Western Australia is not focussing on the major occupational risks that are currently affecting the health of mineworkers. Part

of the reason for this may be that there are no well-accepted or easily applied indices that are readily available to measure impairment caused by musculoskeletal and psychiatric/ psychological disorders.

Another significant issue was the anecdotal evidence provided to the investigating team, which indicated that some mines were using the Coal Mine Workers' Health Scheme as a basis to terminate the employment of persons and offering little or no opportunity for accommodation of an impairment or disability. Indications were given, supported by confidential documentation, that upwards of 30 mineworkers in the coal industry were being terminated each year due to occupational injury or disease. These occurrences are not identified in the statistical data that is collected by the regulator from the industry, an important shortcoming that needs to be rectified. A similar situation may also be present in the metalliferous mining and quarrying industries, however as there are no sources of data similar to those in the coal industry, no indicators could be found to either confirm or deny this possibility.

## 4.2 Identification of Occupational Health Hazards

It is widely accepted that the initial step in the risk management approach to health and safety is the identification of hazards to which a worker might be exposed.

Hazards can be defined as things that have the potential to cause an adverse health and safety outcome. In other words, given a certain set of conditions they may cause an injury or an occupationally-related disease.

The Working Group agreed that the identification of hazards that have the potential to cause an acute injury is relatively straightforward, and is generally undertaken to a satisfactory level. Conversely, the identification of hazards to health is more problematic and evidence suggests that in most mines and quarries it is rarely done well for a variety of reasons.

One of the main problems is that, unlike injuries, there is a variable length of time between exposure to a hazardous agent and the onset of disease. This can be from as little as a few minutes (as in carbon monoxide poisoning) to decades (for lung and other cancers). Another complicating factor is the concept of a target organ, which is frequently remote from the point of contact with the hazard. Hence solvents that are inhaled do not generally affect the lungs but the brain, the target organ. The third factor is the concept of dose. It is rare that all exposure to a hazardous substance used in the workplace, can be totally avoided. Safe use of the substance depends on the ability to ensure that the dose absorbed by the worker is less than that which causes harm. In addition, for some substances, especially those with long biological half-lives, it is necessary to understand the cumulative effect of repeated small doses over time.[13] To add further complication,

many agents that cause work-related illness are in a form invisible to the naked eye and thus require sophisticated techniques to determine the extent of their presence and the degree of risk posed. Examples include fine dusts, gases, various forms of radiation, metal fume, solvent vapour and various biological agents.

In addition, there are other hazards that are not physical, chemical or biological in nature. These hazards include biomechanical hazards, associated with manual handling and workplaces of poor ergonomic design, and psychological hazards, which include workplace stress. It is recognised that stress can be due to multiple factors both work and non-work related, such as level of responsibility, workload, management style, sleep disruption from shiftwork or family and social disruption.

Numerous models exist for classifying work-related health hazards. The Working Group recognised the problem that exists in health hazard recognition, and considered a summary chart as a tool for use by mine and quarry personnel (Appendix 1). This model divides hazards into a number of major categories, namely physical, biomechanical, chemical, psychological and biological, each of which is further subdivided into practical elements and provided with mine-relevant examples.

## 4.3 Assessment of Health Risks

Once various hazards are identified in a workplace, it is necessary to make some determination of the degree of risk posed by each.

Risk can be defined as the risk of injury or illness to a person arising out of a hazard. Risk is measured in terms of consequences and likelihood. The Working Group recognised that determining the degree of risk posed by known hazards to health requires a significant level of expertise in specialised fields such as occupational health, occupational hygiene, occupational psychology or ergonomics.

For example, determining the level of risk posed by exposure to a hazardous substance requires knowledge of the actual level of exposure, the national exposure standard for the substance, the principal routes of absorption, the biological half-life of the substance, the associated disease and any time lag between exposure and onset of disease.

The Working Group accepted that the larger mining and quarrying companies are mostly well advanced in this area but found that for many smaller operations the risk assessment process needs to be improved.

Since the degree of risk is generally an indicator for the type and level of control required, a poorly conducted risk assessment can have serious consequences to health outcomes in that workplace.

The Investigative Team determined that the very high level of musculoskeletal injury apparent in the mining industry is an indicator of an inadequate risk management process. This may suggest the need for a greater professional input into the risk assessment process across the industry.

Much of the large equipment used in the metalliferous mining and quarrying sector is identical to that used by coalmines and would have a similar risk profile. This kind of information could be shared to avoid the need for multiple risk assessments by various mines and quarries on the same equipment. A central unit could facilitate such a process.

## 4.4 Control Hierarchy for Occupational Health Risks

When the hazard identification and risk assessment process confirms that a worker may be exposed to an unacceptable level of risk, there is a clear obligation on persons to ensure that the risk is controlled.

In particular, s 8(1) of the MQSHR 2001 addresses the type of controls required in the order of most to least desirable, the so-called 'hierarchy of controls'.

These are:

- Elimination of the hazard.
- Substitution with a less hazardous substance or process.
- Separation of the worker from the hazard or the hazard from the worker.
- Engineering controls such as exhaust ventilation or machine guarding.
- Administrative controls such as job rotation or standard work instruction.
- Personal protective equipment (PPE) such as respiratory protection, gloves and other work clothing.

The upper end of the hierarchy, the 'higher order controls', are more desirable because they are more effective and are less likely to be influenced by workers or workplace culture. Thus the highest order control measure, 'elimination', recognises that the hazard that is creating the risk can be disposed of completely through work or process redesign.

At the bottom of the list is PPE, which remains the most common form of control in most work places. While it may end up being the most suitable control for a given task, a lower order control should be selected only after all the higher possibilities cannot be practically achieved. PPE carries with it problems of worker compliance, selection of the correct type, poor matching to worker characteristics and the fact that PPE itself may create additional risk, such as increased risk of heat stress and restricted visibility.

The Investigative Team felt that this approach to risk control is not well implemented and that too often, reliance is placed on the easiest control method, commonly personal protective equipment.

## 4.5 Current mineworker health surveillance systems

The Working Group examined the existing legislative requirements for health surveillance and noted that there are marked differences between the various states in which mining is a major industry, while in Queensland there are marked differences between the health surveillance processes established for coal mineworkers and those for workers in metalliferous mines and quarries.

### 4.5.1 INTERSTATE MODELS

As part of the consultation process, visits were made to the administrators of health surveillance in both New South Wales and Western Australia. In both states there was considerable interest in the changes proposed in Queensland, particularly by New South Wales, whose own procedures are currently under review.

**New South Wales**

New South Wales, like Queensland, has had a health surveillance program for coal miners for some time under the Joint Coal Board. In January 2002, the Joint Coal Board and the Mines Rescue Board merged to become a single private company known as Coal Services Pty Ltd, which is jointly owned by the NSW Minerals Council and the CFMEU. The company offers workers' compensation, occupational health, rehabilitation and mines rescue services to the NSW coal industry.

There is no similar scheme for the quarrying and extractive industries.

Coal Services Pty Ltd employs its own medical and paramedical staff at four decentralised locations, Warner's Bay, Lithgow, Corrimal and Singleton, where various medical services, including fitness for duty, periodic health surveillance and functional capacity assessments are provided. The investigation team visited the Head Office of Coal Services in Sydney and received a detailed presentation on the company's role and operation and the workers' compensation claim history for the industry.

For the coal sector, workers' compensation occupational disease claims have been separated into seven major categories, namely deafness, musculoskeletal disease/disorder, anxiety/neurosis, skin infection/disorder, conjunctivitis, respiratory disease and other disease/disorder.[14] These were found to coincide reasonably well with the categories of mineworkers' disease claims identified by the Queensland workers' compensation system.

The Warners Bay office was visited the following day, with intensive discussions held on the practical operation of the coal industry health surveillance scheme in New South Wales.

The health assessment form used is in an electronic format and is delivered and completed on computer. It covers the normal medical history, with clinical assessment confined to

vision, hearing, respiratory and musculoskeletal function, examination for hernias and urine chemistry.

Ergonomic services are also available to the industry, and results of several studies of plant operation on mine sites were included in the discussions. These provided a clear indication of some of the problems inherent in the operation of some large equipment used in the industry and support the need for improved risk assessment processes.

The Warners Bay office was also equipped to enable occupational therapy and physiotherapy staff to undertake functional capacity assessments, which are an adjunct to the medical assessments in determining capacity to undertake physical work as well as monitoring the rehabilitation process of injured workers.

### Western Australia

The investigation team undertook a visit to Western Australia and discussed the operation of the WA health surveillance scheme with senior management, medical and inspectorate officers of the Department of Minerals and Energy.

The Western Australian model is quite different from that used in either New South Wales or Queensland.

This model assesses the health status of all mineworkers using only a restricted number of health surveillance devices, namely work history, a respiratory questionnaire, a lung function test and an audiogram. In addition, some cases that meet certain risk criteria for dust exposure, receive a chest x-ray. As such, it is limited to testing for deafness and lung disease and does not attempt to look for disorders of other systems.

In theory, the findings of the health surveillance conducted should be assessed against the findings of the Department's CONTAM program, which is an occupational hygiene program requiring the measurement of dust and other airborne contaminant levels at mines at a frequency determined for each mine by departmental inspectors.[15] In practice, the two sets of results seem rarely to be compared as intended, though in the event of a case of a pneumoconiosis being identified, some results of dust level monitoring should be available, and would be useful.

It appears that the overall function of the Western Australian program is not to provide for the regular health surveillance and follow-up of individuals, but to provide group data on which policy decisions and ultimately legislative change, can be based. There appears little likelihood of the program enabling early intervention in individual cases of disease, and indeed this is clearly not its intention.

However, the documentation and procedures prepared are of a high standard and will be useful in the development of aspects of the assessment process in Queensland.

### 4.5.2 THE COAL MINE WORKERS' HEALTH SCHEME (QUEENSLAND)

The scheme was originally based on the risk of pneumoconiosis, which was identified as a problem up until the 1950s. Since then measures to control this risk have been proven by various medical schemes to have been successful with no new cases of lung disease due to coal dust reported in recent years.

The Investigative Team noted that there were two successful claims for silicosis reported in recent workers' compensation data, neither of which was known to the regulator. Information necessary to identify the workplace concerned was not available through the workers' compensation system, and therefore precluded further investigation by the inspectorate.

The current medical form used by nominated medical advisers to assess mineworkers' health was derived from the form used by the Joint Coal Board. This was intentionally done to allow for reciprocity for workers working interstate. The form was modified to meet state needs and approved for use under the regulation. Historically, the primary areas of concern were auditory loss and lung function which were included in the medical surveillance scheme that also required regular chest x-rays. This has continued even though the incidence of pneumoconiosis has become extremely rare in both states.

The existing Coal Mine Workers' Health Scheme is centrally controlled with the Department having ownership of the medical records (s 51). The format of the health assessment is defined by an 'approved form' (s 46(2)(a)) (Appendix 2). Generally, this means that all coal mineworkers receive essentially the same health assessment, irrespective of their work tasks. While s 46(3) makes provision to vary the assessment to include matters not covered in the approved form, it does not appear to be a common practice and there is no formal process for reporting or recording the results of any additional assessment.

For example, a mine's workforce includes heavy vehicle drivers, other plant operators, surveyors, laboratory workers, maintenance fitters, cleaners and office personnel, all of whom are exposed to significantly different risks. This is an indication for task-specific health surveillance, which may, in some instances, require biological monitoring for exposure to hazardous substances. However, there is no provision for significant adjustment to the format and no means of reporting adverse biological monitoring results to the regulator.

Doctors appointed under the scheme are known as nominated medical advisers (NMA) and are appointed by the employer. Thus there is a capacity for contractors to appoint a doctor separately to mine SSEs. The standardised health assessment form is normally completed by the NMA. There is also allowance for another practitioner, known as the examining medical officer (EMO), to carry out the bulk of the assessment, usually in circumstances where the applicant is remote from the NMA's practice (s 46(5)). In such cases, this EMO forwards the assessment to the NMA for review, following which a report is sent, by the NMA, to the employer.

In regard to the appointment of a nominated medical adviser, there is no legislative provision requiring that person to have any practical awareness of hazards in the mining industry. In practice, most coalmines encourage nominated medical advisers to familiarise themselves with the operation and most doctors do so to varying degrees. However, the real weakness in this system lies with the examining medical officers who often have no knowledge of occupational medicine or of the nature of work undertaken at mines. At a recent meeting, the nominated medical advisers were unanimous in their concern about substandard assessments conducted by some of their general practitioner colleagues, who appear to be unaware of mine occupational health hazards.

Following the required assessment, the employer and employee both receive a summary report indicating the capacity of the applicant to work

A copy of the full medical assessment is sent to the department for analysis, and is retained, along with the chest x-ray. For the majority of coal mineworkers, the health assessment is conducted only every five years, as required by s 46(4)(c) of the CMSHR 2001. While the NMA may review any previous assessment at the time, there is no avenue for reporting any significant deterioration in health status since the last assessment, nor is there any system for trending results that gives an employee or employer a picture of any change. The Working Group supported the provision of a tool that enabled doctors to chart the worker's progress. This would not only improve the reporting process, but would also provide the worker with a clear indication of his or her medical status, which may provide some self-motivation for improvement. The Working Group reviewed a new form (Appendix 3) for this purpose.

For coal mineworkers, the department has a very large database containing health information on mineworkers and applicants for such positions. It is estimated that 95 per cent of these represent healthy workers about whom the department has no cause for concern. Even for some of the remaining five per cent, the reason for failing the assessment may not be work-related. The current process laboriously collects large amounts of information that leaves little capacity to analyse the key data required to enable a preventive response. The scheme does not provide an indication of harm occasioned to workers on the job, nor does it provide appropriate feedback to the mine or the industry in regard to the occurrence of occupational injury and disease. While there is a requirement for mine SSEs to notify the inspectorate of incidents that result in injuries that require treatment (s 16), it appears to relate to acute rather than gradual onset injury and ignores the existence of work-related illness altogether. Of particular concern, there is no requirement for the notification of significant disease or injury that causes a worker to no longer meet the standards required for employment.

It became apparent to the Working Group that the most important information requiring analysis is the adverse findings of the health surveillance process. The medical reports of

the majority of mineworkers do not contain adverse findings and are only of value for longer-term epidemiological studies. Provided they can be accessed by the HSU to conduct such studies in the future, there is no reason for the records to be sent to the HSU. The need for access to all health surveillance data could be addressed by requiring the health assessment records to be held by the appointed medical officer on behalf of the chief executive. This would require similar legislative provisions to those in the existing CMSHR 2001, which makes the records the property of the chief executive.

The Working Group also recognised that there is no possibility that all data could be collected for the entire mining and quarrying industry of 19,000 employees plus a large number of contractors, without the provision of additional personnel in the HSU. This would be well outside the terms of reference and therefore has not been progressed further.

### 4.5.3 MINING AND QUARRYING HEALTH SURVEILLANCE

In contrast, the MQSHR 2001 differs considerably to its coal industry counterpart, in that it establishes three different health assessments by a doctor, called the 'appropriate doctor'. The first assessment is to ensure fitness of workers, '… having regard to the nature of the work' (s 87). The second is where a hazard '… with potential to cause significant adverse effects on safety and health is identified...' (s 131) and the third is where the SSE is required to arrange health surveillance where a number of exposure criteria are met (s 138). This section allows for a much more risk-based approach which includes provision for biological monitoring.

An 'appropriate doctor' is defined as a doctor '… with demonstrated knowledge of the risks associated with activities performed by the mine's workers'. Hence there is a statutory requirement to engage a doctor with some industry experience. This overcomes some of the disadvantages previously discussed in relation to the coal industry, but there are some practical problems, which were raised during the consultation process with the metalliferous mines and quarries sector. The main concern was the difficulty encountered in finding doctors with mining industry experience. Small mines and quarries, in particular, cannot afford to subsidise practitioners to encourage them to remote areas and many comments were voiced regarding the reluctance of general practitioners in country centres to interest themselves in mine activities. Either way, some mines and quarries reported difficulties in complying with the current regulation.

The lack of any prescription for the medical assessment requires each doctor to determine the content for him or herself, and leads to a high risk of wide variations in the content, quality and value of the assessment process.

None of the health assessments required under the MQSHR 2001, results in any health information being supplied to the department, with the ownership of the records resting with the doctor and not, as in the Coal Mine Workers' Health Scheme, with the chief executive.

The current system lacks provisions to notify the Health Surveillance Unit of any adverse occupational health findings including adverse biological monitoring results. This is of particular relevance as the metalliferous sector contains a number of smelting and chemical processing operations on mining leases, where biological monitoring should be an essential component of the health surveillance process. However, it is recognised that the smaller size of many metalliferous mines makes it more difficult for them to procure the services of health professionals in both the risk assessment and health surveillance processes and makes the collection of data by them and from them more problematic.

As there is no system for reporting health surveillance results to the regulator, there is obviously no avenue for reporting deterioration in health status since the last assessment, nor is there any system for trending results that gives an employee a picture of his or her progress. The same tool described above for the coal industry would be equally useful for the metalliferous sector.

The similarities between coal mining and metalliferous mining and quarrying operations do not justify the current position where there are significantly different procedures for health surveillance in the two sectors. However, should the current centralised procedures for the Coal Mine Workers' Health Scheme be adopted for the metalliferous mining and quarrying sector the number of reports received by the already overloaded Health Surveillance Unit would be doubled. As stated above, most of the data is from normal healthy workers whose medical assessments require no further interrogation. The processing of data from both sectors that include only adverse health effect information or biological monitoring results that fall outside of recognised standards would probably be achievable with the existing staff levels.

### 4.5.4 RISK SPECIFIC HEALTH SURVEILLANCE

One of the major areas of criticism levelled at the operation of the existing Coal Mine Workers' Health Scheme is the 'one-size-fits-all' approach adopted by operators in applying the legislation. In such operations all workers undergo the same assessment process, regardless of the risks to which they are exposed. Hence, a shower room cleaner, a long-wall miner and a maintenance welder are all assessed to the same formula, where the different levels of risk are only taken into account if the assessment is undertaken by a conscientious practitioner who is knowledgeable of the different tasks and their inherent risk profiles.

As stated by the ILO, 'there should be no single form of pre-employment medical examination. Such examinations should be adapted to the type of work, vocational fitness criteria and workplace hazards'.[12] Ongoing health surveillance should continue in this mode.

Current legislation allows the health surveillance process for all mine and a quarry personnel to be sufficiently flexible to ensure that it is tailored to the risks associated with the task. Accordingly, workers may undergo a standard baseline assessment, to which additional components may be added, depending on the risks determined by the risk assessment process. For example, if a mineworker is likely to be exposed to significant levels of mineral dust from rock known to have a significant quartz content, the National Occupational Health and Safety Commission's 'Health Surveillance Guideline for Crystalline Silica'[16] would be added to the basic health assessment. Similarly, workers in a lead smelter or a gold assay laboratory should undergo regular health surveillance, including biological monitoring for lead, as required by *The Control of Inorganic Lead at Work*.[17]

Determining which components should be included in response to the risk assessment clearly requires a thorough knowledge of occupational medicine. There is a need to match the various hazards and their associated risks with available health surveillance guidelines and available biological exposure indices. This not only suggests the necessity to ensure the level of occupational medicine competency of practitioners in the field, but also suggests a need for a high level of expertise to be available to the regulator. There are various ways of achieving this end, including the appointment of an occupational physician to the Department, or through the creation of an advisory panel of external physicians.

### 4.5.5 SITE-SPECIFIC HEALTH SURVEILLANCE

The Working Group noted that many companies in the mining industry set certain health standards for their workers over and above those required by the mandatory health surveillance process. This may result from the geographic location of the mine, other conditions specific to that mine site, or from a company policy on issues such as drug and alcohol testing.

These site-specific health requirements are generally not required to be reported to the regulator.

### 4.5.6 ASSESSMENT OF PSYCHOLOGICAL HEALTH

In view of the high cost burden of psychological/psychiatric disorders to the industry, as indicated by the Q-COMP and Q-COS data, the Health Assessment Form for the Coal Mine Workers' Health Scheme was reviewed and found to include minimal content in regard to mental health. Discussion with NMA's and a consultant psychologist indicated possible avenues for improving the assessment forms, through the use of proprietary validated

questionnaires. One such model has been obtained and may prove to be a useful adjunct to the baseline assessment for persons considered to be at high risk of psychiatric disorder.[18] However, there are professional and ethical constraints which limit distribution of such test programs to appropriately qualified personnel. The Working Group considered that this was an area for future consideration by medical advisers to the HSU.

## 4.6 Role of Stakeholders in Health Management

### 4.6.1 Role of Employer

The Investigative Team found anecdotal evidence that some sub-contractors and self employed persons were not voluntarily advised by the SSE about the occupational health risks in their workplaces. The norm in the coal industry appeared to be that the SSE and employers were satisfied with meeting their obligations by using the approved form and conducting a medical assessment on a five-year time cycle or a period as determined by medical advisers.

### 4.6.2 Role of the Site Senior Executive

The Site Senior Executive (SSE) is a critical officer in the implementation of a health surveillance scheme. The current coal legislation includes a mixture of clauses involving either the SSE or the employer. The mining and quarrying legislation places this obligation on the SSE other than determining that it is the employer who is responsible to pay for any medical examination. The Working Group considered that this aspect of the mining and quarrying legislation could be adopted as the procedure in any new model that was developed.

The SSE was determined as the person who should have the key responsibility of putting in place a safety management system that identifies the occupational risks at a mine and ensures, as far as reasonably practical, that controls are put in place to ensure that the health of mineworkers at the site is not adversely affected by their duties.

The Working Group agreed that it is the SSE's role to ensure that:

1. the occupational health hazards associated with the duties of each work group at the mine are identified and subjected to a risk management process; and
2. where the occupational health risks associated with a task cannot consistently be subjected to high order controls, an appropriate medical assessment system is implemented.

Some large mining organisations were reported to be well advanced in developing task specific medical assessment requirements, however none were found in widespread operation. It was pleasing to find that much of the recent work relates to management of ergonomic risks, with a focus on addressing musculoskeletal injuries.

The resources required to develop such a program are likely to be beyond the capability of a small to medium sized mine and are well outside the capability of a small contractor. One large mining company and one large contractor indicated that the information that they had developed would be made available to other industry stakeholders after appropriate legal indemnity measures were in place.

### 4.6.3 ACCOMMODATION OF PERSONS WITH DIMINISHED WORK CAPABILITY

The consultation process uncovered considerable variation in the degree of accommodation afforded to impaired workers and applicants for positions. It was apparent that some mines require such high standards of fitness in their workers that there is little possibility of accommodating workers with anything more than a minor impairment. With these the rate of early retirement from the industry on health grounds is high. Officers from the CFMEU were able to provide numerous verified examples. Others mines appear to go to considerable lengths to employ or retain workers with quite significant impairment.

The Working Group was concerned to ensure that impaired persons are not excluded from a mine or quarry's workforce without reasonable consideration being given to providing some accommodation for their condition and identified at least four situations in which the opportunity for accommodation exists:

- when an applicant with impairment is considered for a position
- when an injured worker or one who has suffered an illness or injury, whether work-caused or not, returns to work with some residual impairment
- when an existing employee undergoes health surveillance and is found to have experienced an adverse health effect; and
- when biological monitoring or biological effect monitoring for exposure to a hazardous substance returns an adverse result indicating a need for short or longer-term modification of the worker's exposure.

The extent of accommodation provided, depends on what is reasonable in each case, having in mind the cost of the required accommodation, the ability of the person to do the job safely and in an acceptable way once the accommodation is effected, the risk of aggravation of the condition causing the impairment, and the risk of additional injury or ill health to the person or others.

There are clearly moral and social considerations, as well as legal obligations under the anti-discrimination legislation, which make this a complex issue that could readily create tensions within the workplace.

The Working Group agreed that the SSE should have the ultimate operational responsibility to adjudicate on the opportunity for accommodation, after having received adequate advice, or conducted appropriate research to determine whether risk is at an acceptable level.

### 4.6.4 APPOINTMENT OF A MEDICAL OFFICER INCLUDING COMPETENCIES

In both the coal and the metalliferous mining and quarrying regulations, there is a requirement for the SSE or the employer respectively, to appoint a medical officer to undertake health assessments for mineworkers.

As discussed in section 4.2, s 45 of the CMSHR 2001 requires the appointment of a NMA to '… carry out, supervise, and report on, health assessments …'.

In comparison, the MQSHR 2001 requires the appointment of an 'appropriate doctor' by the mine SSE, but seems to make no provision for contractors to do the same. This has the potential to create some confusion in regard to the roles of employers and SSEs in the health surveillance process.

In neither sector of the industry does the appointment process for a medical officer stipulate the competencies required to undertake the role, though the mining and quarrying regulation does require that the appropriate doctor has 'demonstrated knowledge of the risks associated with activities performed by the mine's workers'. The Working Group agreed that all mines and quarries have some risks that are not common in most workplaces. It is unrealistic to expect medical officers with little knowledge of occupational medicine, and mining in particular, to understand the hazards and associated risks experienced by workers under their care.

The Working Group noted that other jurisdictions have identified similar deficiencies in relation to the health surveillance of workers occupationally exposed to hazardous substances and have adopted various means of addressing the problem.

For general industry in Queensland, the Division of Workplace Health and Safety has established a set of information kits for general practitioners who wish to undertake health surveillance of workers exposed to designated hazardous substances. These are specific to one substance for which the practitioner has been requested by the employer to provide health surveillance.

In New South Wales, WorkCover was found to provide a course for practitioners, which is obligatory for those wishing to obtain approval to undertake health surveillance for hazardous substances.

At an advisory level, the National Occupational Health and Safety Commission's *General Statement of Competencies*, outlines recommended competencies for both general practitioners and occupational physicians who undertake health surveillance, but like the Queensland and New South Wales requirements, these also apply only to those exposed to hazardous substances.[19]

Thus, none of the existing programs for additional competency training in occupational medicine for general practitioners appears to encompass other issues of significant occupational health importance, such as the risks inherent in exposure to physical, biomechanical, biological and psychological hazards. Given the significance of musculoskeletal injury and related disorders to the mining industry, and the growing evidence of psychosocial problems, the Working Group felt that specific training should be established. It is envisaged that such training would be best developed by a panel of experienced practitioners.

It was apparent from the consultation process that one of the major barriers to the establishment of health surveillance systems in mines and quarries is the scarcity of experienced practitioners in the more remote areas where these industries are often found. All remote communities report problems in attracting and retaining practitioners.

## 4.7 Reporting of Health Surveillance results

### 4.7.1 SSE / Employer

Section 47(2) of the CMSHR 2001 requires the nominated medical adviser to provide a 'health assessment report' to the employer following the health assessment. Similarly, the MQSHR 2001 also requires a report to be furnished, but in this case in three situations; following assessment of fitness (s 87), after health assessment of workers (s 131) and following health surveillance (s 138). In all three, the report is directed to the SSE, not the 'employer' and not the regulator.

While the SSE has ultimate responsibility for health and safety on a mine site, it must create difficulties for contractors, as employers, if no report is provided to them in regard to their own workers, especially as the employer is required to pay in all three situations.

### 4.7.2 Employee

In all situations under both regulations, where a worker is required to undergo a health assessment, the regulation requires that the doctor *must provide* (coal), or is *asked to provide* (mining and quarrying), a copy of the report to the employee along with an explanation of the result.

The only difference is in the direction of nominated medical advisers under the coal regulation to provide, which requires a head of power under an Act, whereas the wording in

the mining and quarrying regulation is in the form of a request. Without an appropriate head of power to direct doctors, it may be necessary for mines to ensure that they incorporate duties and responsibilities of medical providers into their contracts of employment, as is already required for some duties under s 45 of the CMSHR 2001.

### 4.7.3 REGULATOR

As discussed previously, the records resulting from the health assessments of coal mineworkers belong to the Department (s 51) and are sent to and retained by the Department (s 50). There is no similar requirement for results from assessments of metalliferous miners and quarry personnel.

In neither case, is there any requirement for reporting adverse results and even where records are sent to the Department, adverse findings are not highlighted, nor does the Department have anyone competent to assess the findings.

Current analysis of records held by the Health Surveillance Unit is aimed more at obtaining an overall picture of coal mineworkers' general health, using a few health parameters like body mass index (BMI) and blood pressure. It is not able to follow up adverse findings in individuals or groups or by type of injury or disease.

# 5 CONSULTATION

One of the most important parts of the review was the extensive consultation process that was conducted. There is a high potential that most, if not all, mine and quarry workers will be affected by the outcomes of this review and as such, it is important that the outcomes of this report are both relevant to the needs of stakeholders and assist in eliminating the risk from occupational injury or disease during their working lives.

Health is a very personal and private matter that demands high levels of integrity and competence by practitioners. Unless the process has the confidence of those who are affected by any health surveillance program, the value of and the commitment to better management of occupational health matters will be compromised.

Health surveillance has not been consistently established across the Australian mining industry. As demonstrated in several sections of this report, there are significant differences between the coal and non-coal mining industries in both Queensland and New South Wales. Further, there are differences in the objectives and approach taken by Australia's largest mining state, Western Australia, to both New South Wales and Queensland.

For this reason, the Working Group went back to basics in an attempt to develop a health surveillance model that was relevant to the needs of the current mineworkers. A PowerPoint presentation was developed and used at each consultation phase. The presentation was subject to ongoing improvement and refinement in response to the feedback received from the stakeholders. Before any change to the PowerPoint presentation was finalised, the changes were first presented to, and accepted by, the Working Group. At times, this meant personal visits to members' offices.

## 5.1 Companies - Employers - Associations

Extensive consultation was conducted with the various employer groups across Queensland including mining company chief executive officers, site senior executives and senior management with meetings in Tieri, Mount Isa, Townsville, Gladstone and Brisbane and regional southeast Queensland. The PowerPoint presentations were of considerable interest to those present and the final product, which is attached to this report, received widespread endorsement.

Four of the largest mining companies in Australia – RioTinto, BHP, MIM and Anglocoal – have all initiated, or are developing, new health surveillance programs, some being implemented internationally.

Whilst each of these multinational organisations was at a different stage in the development of their programs, there was a consistent concern over the difficulty of obtaining and maintaining competent medical practitioners in the isolated mining areas.

Several operators gave clear indications of support for sharing much of their information, such as ergonomic assessments of machinery or plant, with the other mine operators.

The Minerals Council of Australia (MCA) Safety Committee received a presentation and has advised that MCA had also decided to focus on mineworker health as a priority in the coming years. Contacts have been established with members of this committee with the objective of minimising duplication of effort and having consistency between the states on the approach taken. As a direct result of this consultation, a large international mining company requested, and was granted permission, to circulate the draft 'baseline medical assessment form' to its occupational health specialists worldwide. The objective of the international review will be to identify areas of best practice that can be considered for inclusion into the Queensland assessment form. It is anticipated that responses will not be received until after the publication of this report.

Another important group that showed considerable interest in the subject were two large contractor groups, Thiess and Goldings, and several large quarry operators. Each of these operators has developed, or were developing, some level of health surveillance to meet their business needs. There was general agreement that the risks associated with operating mining machines in quarries, coal mines, metal mines and other large-scale earthworks were similar and that there was a willingness to share this company information.

Several small to medium mine operators expressed concern over the potential expense of conducting ergonomic studies on each of their machines. They expressed a dual problem:

1. Many small to medium mine operators employ fewer than 20 mineworkers and the cost of conducting ergonomic assessments on their machines was potentially prohibitive; and
2. Small operators commonly bought second-hand mining machinery from large operators and therefore their equipment may have had an ergonomic assessment conducted on it that was not provided to the purchaser.

## 5.2 General

One of the interesting observations made during the consultation with field operators was the lack of awareness of the risk environment at their mines. Whilst musculoskeletal injury was widely known, the term 'whole body vibration' and its effects were not so well known. For example, bulldozers are known to generate high levels of whole body vibration and a widely published study conducted on behalf of the coal industry compared measured vibration levels with international standards.[20] The international standards indicate a safe operator exposure time of up to four hours per shift. However, a number of mines advised that they were using or were proposing to use the 'bank push' process of overburden removal using large bulldozers to rip the overburden with dozer operators expected to work 12-hour shifts and up to 14 shifts in succession.

Another similar example was at a mine that could only be described as being very large. They had purchased a new super dozer fitted with radio remote control and used the dozer for ripping and pushing overburden. Although the machine had the capability of being operated from a location with direct line of sight and possibly outside of the mine excavation (thereby removing the operator from the hazard), the senior mine official appeared intent upon the dozer operator working in the air-conditioned cab on the dozer. As a result, the remote control was not used and operators continued to be subjected to high levels of vibration.

**Summary**

1. The large mining companies are already active in identifying how to improve mineworker health.
2. Broad support for the proposed Health Surveillance Unit (HSU) was received from the mining industry operators and employers.
3. Strong support was identified for the open sharing of information between mining companies, particularly with small operators.
4. Larger operators indicated a general acceptance that they would set the standards first and the lessons learnt would then be applied to the small operators.
5. Attracting and retaining competent medical practitioners to remote mining centres is an unresolved problem.
6. There is a major need for mine operators and supervisors to be trained in the identification and management of health risks in mines.
7. HSU could possibly assist in facilitating 3,4,5 and 6

## 5.3 Unions

The CFMEU is the principal union for coal mineworkers and employs three full time Industry Safety and Health Representatives (ISHRs). While they were supportive of a competent health surveillance program, they expressed some concern over what they saw as an abuse of the current coal legislation where mineworkers' employment was being terminated as a result of minor levels of ill health. Examples were quoted where mineworkers returning to work after one or more weeks of sick leave were being required to undergo a full medical assessment before being allowed to recommence duties. On occasions this had resulted in the mineworker's employment being terminated.

One of the most interesting and rewarding consultation sessions was with CFMEU staff in Emerald where one staff member's primary duties involve assisting union members in the courts seeking workers' compensation. They have a very detailed database that allows examination and provides results that are not devalued by an extensive de-identification process to comply with privacy requirements. The database readily identified a large number of mineworkers whose employment has been terminated for medical reasons. This information was unable to be obtained from other information sources viewed during the investigation.

The Mines Inspectorate's Lost Time Injury database for the past three years was compared with the CFMEU database for compensation claims and identified that only 46 per cent of the incidents had been reported to the Department as required by legislation. (Discussions with Coal Services NSW indicated that they had an even lower percentage of incidents reported to the inspectorate (quoted at 30 per cent).) Discussions with senior CFMEU officials indicated that they would seriously consider providing access to their database in accordance with effective privacy control measures being in place.

The CFMEU is strongly of the opinion that employers should not have the power to send employees for a medical examination at any time that they consider it reasonable. The current CMSHR 2001 has been interpreted by the Mines Inspectorate as giving that power to employers.

One area of concern was the use of numerical measures of impairment used in the current Coal Mine Workers' Health Scheme. Employers were reported as using these numbers to prove that the mineworker was no longer fit for duty and did not systematically look for opportunities to accommodate such impairment in the workplace.

Discussions were held with the AWU, the principal union in the mining and quarrying industries, who advised that they do not have an equivalent database but would probably have information in their offices. Information could be provided to the HSU if requested.

**Summary**

1. The health databases operated by the unions are a potentially important and useful source of data that would assist the HSU in analysing all available data.
2. Both the CFMEU and the AWU expressed concern that any future legislation should not be seen or be used as a threat to the legitimate employment of persons.
3. Unless required by another authority, the mineworker medical scheme should not state numerical values for fitness for work but should focus on identifying opportunities to provide work for employees with health problems.

## 5.4 Doctors

The CMSHR 2001 includes provision for the Coal Mine Workers' Health Scheme (CMWHS) which requires employers to appoint a NMA. The MQSHR 2001 requires the appointment of an 'appropriate doctor'.

The Department holds regular six monthly consultation sessions with the NMAs as part of the management of the Coal Mine Workers' Health Scheme. In the absence of equivalent provisions in the mining and quarrying legislation, no equivalent meetings of medical personnel are held. NMAs expressed a strong interest in participating on a medical panel with doctors involved in the metalliferous and quarrying industries.

The NMAs have been kept up to date with the development of this review and have expressed support for its expansion to the entire mining and quarrying industry. Numerous changes suggested at a recent meeting, where 13 doctors participated in a six-hour review of the draft medical assessment form, have been included in the proposed health surveillance process.

The NMAs identified that the existing system in the coal industry has a number of weaknesses including:

- Doctors who do medical assessments with little knowledge of the occupational health hazards in the mining industry. They are usually used by small contractors and do not understand the working environment in which persons will be required to operate.
- The practice of everyone being required to have a chest x-ray even though they have had little or no exposure to harmful dusts in the past.
- Workers' compensation claims require an incident date and do not adequately accommodate injury caused by long-term exposure. As a result, injury due to whole body vibration (WBV) over a period of years is often reported as being caused by a single incident such as dismounting machinery or plant.
- Indications that in excess of 30 persons are retired out of the coal mining industry each year as being medically unfit.
- A NMA is normally a general practitioner and as such does not have skills at a specialist level in evaluating musculoskeletal or psychological disorders. They suggested that the health assessment form should be used as a screening tool and be used to identify where further expert investigation was warranted.

The issue of the physiological changes occurring as part of the ageing workforce was discussed and a thesis "Medical Surveillance of the Aged Aircrew"[21] was provided for future reference.

## 5.5 Other medical advisors

Presentations were given to a leading occupational physiotherapist and a leading psychological consultant both of whom have extensive and current involvement in the coal mining industry. Detailed discussions were held with both parties and resulted in changes to the draft medical assessment form.

There is a need to develop appropriate training packages for medical personnel conducting musculoskeletal and psychological assessments on mineworkers.

## 5.6 Government bodies

### 5.6.1 Division of Workplace Health and Safety / Q-stats / Q-Comp

The Division of Workplace Health and Safety (DWHS) covers the majority of workers in Queensland and employs a full-time occupational physician. The DWHS is provided with de-identified workers' compensation insurance data from Q-COMP. The DWHS has contracted Q-stats, a Division of the state government Treasury Department to conduct analyses in accordance with the relevant Australian Standards.

The data provided by Q-COMP is separated into industry specific groups. The data for the mining industry includes statistics for the self-insured operators and therefore is an important source of data. As mentioned elsewhere in this report, the de-identification process to which the data has been subjected significantly reduces its value.

DWHS has demonstrated an interest in assisting the mining industry trial and may subsequently review what opportunities exist in the future for other industries. DWHS has offered to provide analysis on whatever data it can within the existing contract with Q-stats.

Meetings with Q-stats yielded copious amounts of data that would require a significant amount of further statistical interpretation before it would be of much use. An example of the problems found is that no mine, or type of mine, is easily identified from the data as most only relate to the postcode of the injured worker. From the information observed, Mackay would appear as a very unhealthy place to work as a miner, when in fact there are no mines in Mackay.

Q-COMP data was analysed and confirmed that the highest payout was for musculoskeletal disorder, followed by psychological/psychiatric impairment. Both of these matters are not well covered in the current approved medical assessment form.

An opportunity was identified where Q-COMP may have an advantage in financially supporting the HSU in its endeavour to improve mineworker health in the states' mining industry

**Summary**

1. Insurance data is available for analysis.
2. Current data are limited by privacy requirements.
3. Opportunities exist to improve the analysis process.
4. Opportunities exist to seek funding for the HSU.

### 5.6.2 NEW SOUTH WALES DEPARTMENT OF MINERAL RESOURCES

A presentation was given to senior officers of the NSW Department of Mineral Resources (DMR) on at least two occasions.

The DMR does not have a direct role in the health monitoring of mineworkers due to the legislation which gives that duty to Coal Services Pty Ltd (previously known as the Joint Coal Board).

No indications were given that the NSW metalliferous industry would move to introduce health surveillance in the medium term other than support any directions from the NSW Mine Safety Council.

### 5.6.3 NEW SOUTH WALES MINE SAFETY COUNCIL

Professor Denis Else chairs the NSW Mine Safety Council. It functions as a Ministerial Council and represents unions and mine operators in the coal, metalliferous and quarrying industries.

As a result of the presentation to the Council, the council members voted unanimous support for the Queensland initiative, and have formally requested direct involvement and inclusion of Queensland representatives at future meetings. Some of the council members are involved with a review of the health program currently conducted by Coal Services Pty Ltd and they expressed interest in having consistency with Queensland.

### 5.6.4 WESTERN AUSTRALIAN DEPARTMENT OF MINERAL AND PETROLEUM RESOURCES

Western Australia has the largest mining industry of any state in Australia. The industry is almost entirely metalliferous with only a small amount of open cut coal mining being conducted south of Perth.

At the time of the consultation visit to the Western Australian Department of Mineral and Petroleum Resources, a significant amount of restructuring was being discussed and the future of some of the programs was being reviewed. Staff in the department was particularly helpful and open in their response to questions.

In recent years the WA Department has reviewed the health surveillance requirements of the mining industry. Several innovative changes were made including:

- changing the medical requirements for chest x-rays to only be required by persons considered to be at risk (previously all mineworkers were required to have a chest x-ray)
- adopting a medical surveillance program that only monitored respiratory function and hearing loss
- monitoring of respiratory function by a standard lung function test
- setting up a database called CONTAM, which was designed to record respirable dust monitoring results for individual mineworkers and link them with the medical records of the individual.

At the time of the visit, the Department employed a contract occupational physician on a part-time basis. This individual's role was to review any trends in the overall health of mineworkers in the state and advise the government on legislative requirements to improve mineworker health if and when necessary. Lengthy discussions were held, and it became very apparent that the WA system is not meant to monitor individual mineworker health in a proactive sense nor to relate the medical scheme to the industry injury and compensation statistics.

As a general observation, the visiting Working Group members drew the conclusion that the WA model has a good basic process for determining lung function, including a system for determining who should receive chest x-rays, and for measuring hearing loss.

### 5.6.5 Mining and Quarrying Safety and Health Advisory Council and the Coal Mining Safety and Health Advisory Council

Presentations were given to both Advisory Councils and included a recommendation that the existing legislation for the broad mining industry be replaced with identical wording. Both councils indicated general agreement to a proposal that the legislation would be written by a small group within the inspectorate and circulated for comment to stakeholders.

## 5.7 Other organisations

Coal Services Pty Ltd (originally the Joint Coal Board (JCB)) was jointly set up by the Federal and NSW Governments in the late 1940s. Among its many powers and functions was the medical management of mineworker pneumoconiosis commonly called 'black lung disease'.

Coal Services Pty Ltd focuses on NSW coal mineworkers' health surveillance. It has a number of separate entities under its jurisdiction including an Insurance Division, a Medical Division and NSW Mines Rescue.

Separate meetings were held and presentations given to the Insurance and Medical Divisions. Considerable interest was shown by each of these groups, including their senior management. A short time after the visit, a formal review was announced into the future direction to be taken by the Medical Division.

There is a very strong argument to support the premise that the JCB Medical Division was the catalyst group that has seen the occurrence of mineworkers' pneumoconiosis virtually eliminated since the late 1990s.

For privacy and ethical reasons, the Insurance Division operates entirely separately from the Medical Division.

Coal Services Pty Ltd has arguably the best data sets of mineworker health in Australia and the opportunities that could come out of the current review are of immense relevance to the Australian mining industry.

Both the Insurance Division and the Medical Division offered direct assistance in setting up a new health surveillance scheme in Queensland. During the development of any new databases for the Queensland mining industry, due recognition should be taken of the opportunity to link it to the Coal Services figures.

The Medical Division visited was in Warners Bay near Newcastle. Apart from conducting individual health assessments for coal mineworkers, it has experience with ergonomic assessments for surface and underground coal mining activities.

Coal Services Pty Ltd also operates a research trust fund. Several years ago it funded a research study into whole body vibration and its effects on mineworkers. The report, titled 'Bad Vibrations' is a must read by all mine operators.[20] The information in the report indicates that some surface mines may be exposing some of their plant operators to levels of vibration well in excess of those identified as being liable to cause permanent disabling injury.

The trust fund issues contracts for research in coal mineworker health. Some projects have been awarded to Queensland researchers.

## 5.8 Townsville – Mining Industry Health and Safety Conference

A paper discussing the status of the health surveillance review progress was presented at the 2002 Queensland Mining Industry Health and Safety Conference in Townsville.

## 5.9 Mining Industry Safety and Health Centre

Professor Jim Joy from the Mining Industry Safety and Health Centre (MISHC) was given a presentation and invited to consider developing an appropriate model for conducting health risk assessments. Several discussions with Professor Joy have taken place since then, however, no model for conducting risk assessments on occupational risks is readily available at this time.

## 5.10 QCOS

The Queensland Coal and Oil Shale Superannuation Scheme was consulted and found to have statistical data relevant to the HSU needs. Claims information provided by QCOS was analysed against Q-COMP payments for a range of disease/injury groups. Interestingly, the data that covered the same three-year period, yielded similar profiles (see Figure 1 at 4.1.1)

QCOS indicated a willingness to participate by providing the HSU with their data on a regular basis. It needs to be recognised that due to the nature of their activities, QCOS data include matters not included in Q-COMP data. Q-COS data include non work-related medical conditions such as diabetes and rheumatoid arthritis. In addition, there is a relatively long delay in gathering QCOS statistics and therefore less reactive to emerging issues.

**Table 1: Comparative Table of Coal Industry Superannuation Scheme Claims and all Mining and Quarrying Compensation Payments**

| | Coal Industry Superannuation Claims | | All Coal, metalliferous and Quarries Workers' Compensation Payments | |
|---|---|---|---|---|
| | QCOS | 1988-2002 | Q-COMP | 2001 |
| Disorder | Claims | % | Payments | % |
| Musculoskeletal | 67 | 33 | 3,842,017 | 50.5 |
| Trauma | 31 | 15 | 1,784,046 | 23.5 |
| Cardiovascular disease | 27 | 13 | 16,044 | 0.2 |
| Cancer | 24 | 12 | 100 | 0.0 |
| Mental disorders | 22 | 11 | 636,546 | 8.4 |
| Respiratory | 4 | 2 | 275,026 | 3.6 |
| Hearing loss | 4 | 2 | 261,595 | 3.4 |
| Other injury / disease | 25 | 12 | 782,540 | 10.3 |
| Total | 204 | 100 | 7,597,914 | 99.9 |

# 6 LEGAL AND PRIVACY ISSUES

The existing Coal Mine Workers' Health Scheme contains medical records and chest x-rays of all coal mineworkers other than those working on low risk tasks. This information is gathered under the CMSHR 2001, and is disclosed to a very limited range of people under that regulation. This scheme has been assessed for its compliance under the Queensland Government Privacy Regime established under Information Standard 42 – Information Privacy (IS 42). The assessment concluded that the existing health scheme complied with IS 42.

Information Standard 42, along with most privacy regimes, regulates the collection, use, storage and disclosure of personal information. Personal information is any information or opinion, which may reasonably be used to identify a person.

The new system of health surveillance will gather information from many more sources than the current Scheme. These additional sources are:

- mine reports and NMA /AMO reports
- Q-COMP and QCOS
- employer organisations
- unions
- the Mines Inspectorate
- occupational health researchers
- other states
- Commonwealth Government agencies.

Each of these will produce different challenges by way of the restrictions placed on the movement and use of personal and health information in each jurisdiction.

## 6.1 Mine Reports and NMA Reports

NMA reports are provided to NR&M under the existing coal mine safety and health legislation, and are gathered for the purpose of conducting epidemiological research into the mining industry. Consequently, this collection and use of the information is compliant with IS42. However, there is an obligation to inform people who provide personal information to NR&M of the purpose the information is collected for, the lawful authority for the collection and whether the information is disclosed in the usual course of business of the Department, and this has been included in the approved health assessment form since September 2002.

## 6.2 Q-COMP

Q-COMP is a Queensland Government agency, and so is bound by IS 42. Such agencies are prohibited from disclosing personal information to other agencies unless they have the consent of the person to whom the information relates, or have informed the person

providing the information that it will be disclosed when the information was collected, or have a lawful authority or obligation to do so. Consequently, given the logistical difficulty of gaining consent, and informing people whose information was collected in the past, NR&M will not be able to obtain information from these agencies under the current privacy regime.

There are avenues available to circumvent this problem. The metalliferous mining safety and health legislation could be amended to incorporate an obligation on the chief executives of the agency to provide health information to the chief executive of NR&M, the agency administering the mine safety and health legislation. This would provide the necessary lawful authority to disclose the information. These two agencies would need to ensure that they informed people who provide personal information in the future so there would be resource implications for these agencies. Also the imposition of this obligation should be the subject of consultation with those agencies as part of the legislative review process.

A second option is to seek to have the Coal Mine Workers' Health Scheme covered by the National Privacy Principles (the NPP) contained in IS 42A, which currently only applies to the Department of Health. The NPP permit the disclosure of health information for research purposes. However, this option is far more problematic. Firstly, there are no guarantees that the CMWHS would receive covering under IS 42A. Secondly, NPP 2(d)(ii) permits the disclosure of personal information 'if it is conducted in accordance with guidelines approved for the purposes of [that] subparagraph'. These guidelines have not yet been issued. However, given the experience in the Commonwealth, it is likely that such approval would require the involvement of a Health Research Ethics Committee (HREC) (see section on QCOS below).

Both of these options would need to be canvassed in detail with Q-COMP as these proposals will involve resource issues, as well as changes to their business practices.

## 6.3 QCOS

QCOS, as a private sector organisation, is bound by the Commonwealth private sector regime under the *Privacy Act 1988*. The National Privacy Principles, which are at the heart of this scheme, permit the disclosure of personal information to allow for the compilation of analysis of statistics relevant to public health if:

- The individual concerned has consented to the disclosure;
- The disclosure is required or authorised by law; or
- The disclosure is conducted in accordance with guidelines approved by the Commonwealth Privacy Commissioner under s 95A of the *Privacy Act 1988*.

With regards the last dot point, the Privacy Commissioner issued guidelines in December 2001 requiring that any such proposal must be submitted to a Human Research Ethics

Committee (HREC) for approval. The HREC must then assess if the public interest in undertaking the proposed statistical compilation or analysis substantially outweighs the public interest in withholding that information from disclosure. Consequently, obtaining personal information from QCOS could involve significant complexity.

## 6.4 Employer organisations

No data was found to be kept by employer organisations at the time of writing the report. It is possible that such data may be available in the future as a result of the current interest being shown by the State and Federal employer organisations. It will be important that all stakeholders have the same opportunity to provide data to the HSU.

## 6.5 Unions

The unions that are active in the mining industry hold significant amounts of information about safety and health issues on mine sites. There would be considerable advantage to the Health Surveillance Unit if this information could be accessed for research purposes.

Unions, as private sector organisations, are bound by the Commonwealth private sector regime under the *Privacy Act 1988*. Consequently, obtaining personal information from this source could involve the same issues and complexities as were canvassed in the discussion on QCOS.

## 6.6 The Mines Inspectorate

The Mines Inspectorate will collect personal information in the course of its role in overseeing the operation of mines and quarries in Queensland. This activity will also monitor changes in the practices of mining and quarrying in the industry, as new techniques and new technologies are tested and used. Consequently there will be an important role for the flow of information from the Inspectorate to the Health Surveillance Unit. This information will contain limited personal information, except where specific incidents are raised as issues in mine safety. This use of the information is consistent with the purpose it was collected for, namely the investigation of an incident and the prevention of further injuries in the mining and quarrying industry. Consequently, the use of personal information from the Mines Inspectorate by the Health Surveillance Unit is compliant with IS 42.

## 6.7 Occupational Health Researchers

The information gathered from occupational health researchers will likely be de-identified information, so that it is not personal information and is not regulated by the various privacy regimes. Even if the information does identify an individual, the private sector privacy regime permits the disclosure of health information for research purposes. Consequently there is nothing preventing private health researchers providing health information to NR&M.

## 6.8 Other States in Australia

New South Wales public sector agencies are bound by the *Privacy and Personal Information Protection Act 1998*. Section 19 of that Act specifically prohibits the disclosure of personal information relating to an individual's health. It follows that the gathering of this personal information from New South Wales will not be possible. However, provided that the information is de-identified, this prohibition does not come into effect. Given that the information to be sought from other jurisdictions should not need to identify individuals it should be sought in a de-identified form. This approach will circumvent the prohibitions in New South Wales and will also facilitate the gathering of information from other states.

## 6.9 Commonwealth government agencies

The current Coal Mine Workers' Health Scheme shares information with the Australian Institute for Health and Welfare (the AIHW). One example of this sharing of information is to verify that various coal mineworkers are still alive, so that epidemiological research into their health may continue. This process requires the sharing of names, dates of birth, and whether these individuals have died. As this process involves the disclosure of personal information to the AIHW by NR&M, NR&M must rely on its legislation in order to do this, as the disclosure of personal information is generally prohibited. Consequently, when the legislation is reviewed, this capability must be preserved.

The AIHW is bound by the public sector provisions of the Commonwealth *Privacy Act 1988*. These provisions are the same as those in IS 42, and so the AIHW is prohibited from disclosing personal information unless it has consent of the individual concerned, or has a lawful authority for the disclosure. It is not certain how the AIHW discloses this information, as it has in the recent past, but the Health Surveillance Unit management should be aware that there are limitations on the AIHW and what it can disclose.

# 7 PROPOSED MINING INDUSTRY HEALTH SURVEILLANCE PROGRAM

Throughout the numerous meetings and face-to-face discussions between the Working Group members, a model for the whole process of Health Surveillance was developed and refined. The model was further improved in response to suggestions raised during the consultation phase.

Four main points were emphasised during the consultation program:

1. The health surveillance process would cover the entire mining industry, including quarrying.
2. It would address all occupational health hazards currently found in the mining industry.
3. The immediate focus would be to assist industry minimise the occurrence of disabling injuries and disease.
4. Compliance with privacy principles would be an absolute requirement.

As mentioned previously, high levels of support for a centralised health surveillance program were found throughout Queensland.

The Working Group determined that different wording in the two pieces of subordinate legislation covering the mining and quarrying industry creates unnecessary confusion and supported the adoption of identical provisions.

The review process found that the function of a Health Surveillance Unit could not be effective unless it was able to be an integral part of the safety and health management systems at mines and quarries. It could not and should not operate in isolation from the activities at the mines and quarries.

The Working Group developed a holistic program that included a requirement to:

- identify occupational health hazards at the mine
- assess occupational health risks
- encourage application of high order controls to eliminate the risk of disabling injury or disease even after long term exposure
- define the residual physical requirements and occupational health risks where high order controls are not possible
- determine appropriate medical assessment standards for both task and site specific needs at the mine
- assess mineworker health by competent medical assessors
- accommodate, where possible, to enable their ongoing employment, persons with diminished health capabilities in the workplace, including during rehabilitation

- conduct ongoing health assessments as required
- report the following matters to a centralised Health Surveillance Unit:
  - any significant change to health status which may diminish work capability requiring accommodation in the workplace for an extended period;
  - any termination of employment due to health reasons; and
  - the occurrence of adverse biological monitoring results.

## 7.1 Development of an Occupational Health Assessment Process

In order to implement the above holistic program, it was determined that each mine should be required to develop and implement an occupational health management process as part of the mine safety management system. This would be done by a process identified in Figure 2. The health hazards associated with each work task would need to be identified, subjected to a risk assessment and controls put in place.

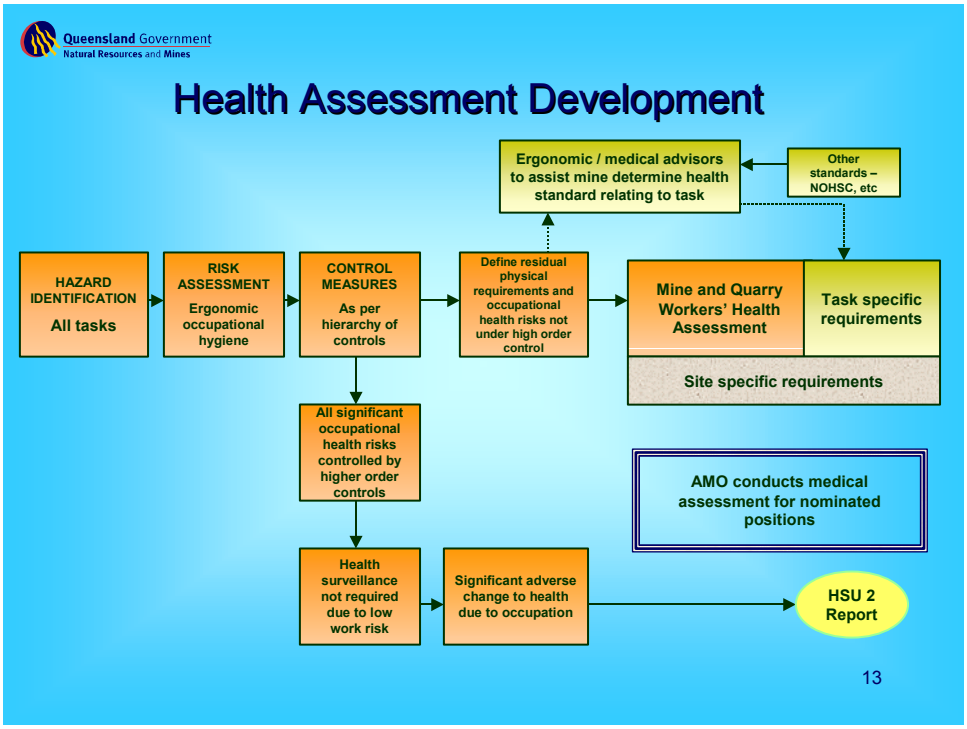


Figure 2: Steps in development of a Health Assessment Program

Where all significant health hazards were able to be placed under high order controls the task could be identified as not requiring workers to undertake a health assessment.
For work tasks that have a residual occupational health risk that is not able to be placed under a high order control, the worker would be required to undergo the baseline 'mine and quarry workers' health assessment' plus any task or site specific requirements.

### 7.1.1 MINE AND QUARRY WORKERS' HEALTH ASSESSMENT FORM

The Working Group determined that the information contained in the current reports from the Coal Mine Workers' Health Scheme should be kept as a resource for future analysis. It was subsequently agreed that the existing approved form used for the Coal Mine Workers' Health Scheme be modified to meet the needs of the new mining industry health surveillance process. The modified form is to include best practice procedures from similar forms used in New South Wales and Western Australia.

The Working Group also agreed to the adoption of a similar process to that used in Western Australia for determining if a chest x-ray should be included as part of the assessment. This system identifies those who are likely to have had significant exposure to pneumoconiosis-producing dusts in the past, or are entering a job with a risk for such exposure in the future, so that a chest x-ray can be included in their assessment. Otherwise, the chest x-ray will not be a mandatory requirement for health surveillance. This requirement for chest x-rays is also similar to the current requirement in the Queensland coal industry. The relevant form is found at section 7 of the revised Mine and Quarry Workers' Health Assessment Form (Appendix 3).

A draft form was developed and circulated to existing coal mine nominated medical advisers and to industry groups during the consultation process. Further modifications were made as a result of feedback from practitioners, leading to the current version (Appendix 3).

An interesting addition to the previous health assessment process is the proposed inclusion of the graphical representation of trends in specific health risks. It is anticipated that this information be provided to both the employer and the employee with the aim of encouraging proactive efforts from both parties to maintain good health. A typical trend form is found at Appendix 4. There are two versions, one for general health information, and the other for routine biological monitoring results.

### 7.1.2 ADDITIONAL TASK AND SITE SPECIFIC HEALTH REQUIREMENTS

There are tasks at mines and quarries that will have specific health requirements identified in order for the task to be completed safely. These may require additional assessments to the baseline medical assessment to be made.

#### 7.1.2.1 Task Specific requirements

Task specific issues occur where there is exposure to a specific hazard while carrying out a task that is not common across the whole workforce. Exposure of a dozer driver to significant whole body vibration, or exposure of a smelter worker to lead, are two examples of task specific exposures that would indicate a need for additional components to the health surveillance process. This might mean, in the first example, that the doctor would need to make a more thorough assessment of areas likely to be affected by whole body

vibration, such as the lumbar spine. Where there is additional risk from exposure to a designated hazardous substance, as in the second example, the requirements of the National Occupational Health and Safety Commission's *Health Surveillance Guidelines*,[16] including biological monitoring where appropriate, would become part of the health surveillance process.

The frequency of task specific assessments might vary from the normal health assessment, usually being more frequent, especially where biological monitoring is required.

Underground mining carries with it additional risks from catastrophic events such as fires, explosions and the development of dangerous gas levels. In the event of such an occurrence, the worker is required to escape as rapidly as possible, often on foot via ladders and steep passageways. As a result, a task-specific assessment may need to ascertain that the worker's level of physical fitness is sufficient to allow the mineworker to escape from the mine or to a place of safety. These specific requirements may be included under this section

Other risks, such as those from exposure to physical hazards such as heat, noise or various forms of radiation, or biomechanical, biological or psychological hazards may, once identified as significant, also be the subject of additional components to the health surveillance of that individual. Where possible, the use of standardised health surveillance procedures from competent authorities should be endorsed by a panel of recognised specialists.

#### 7.1.2.2 Site Specific requirements

The Working Group accepted that it remains the prerogative of the SSE/employer to set certain health standards for their workforce over and above those required by the mandatory health surveillance process. The additional health assessment requirements must relate to the management of hazards at the mine. This may result from the geographic location of the mine, other conditions specific to that mine site, or from a procedure on an issue such as drug and alcohol testing.

These site-specific health requirements will be additional to the normal health surveillance assessment required for that particular mine or quarry site, though results will not generally be reportable to the regulator.

## 7.2 Application of Health Assessment Process

The application process for the Occupational Health Management Plan is an important part of the proposed model. It provides the critical link between the operations at a mine and the Health Surveillance Unit. Figure 3 provides a schematic flow chart of how the health assessment process would be implemented into the mining industry. The flow chart also indicates the areas where information will be required by the regulator (Health Surveillance Unit).

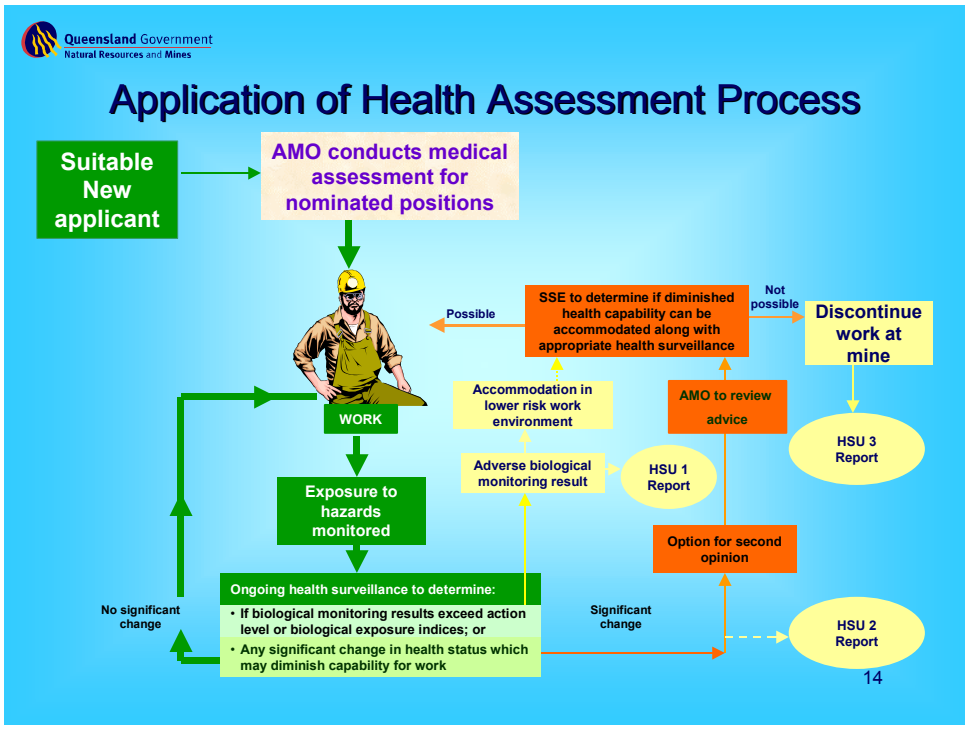


Figure 3: The medical assessment path for all mine and quarry workers from the time of application to cessation of duties at a mine or quarry

Having developed a relevant health assessment standard suitable for the work tasks at a mine, the SSE would be required to ensure that all medical assessments for either new applicants or existing workers are conducted in accordance with the mine standard.

### 7.2.1 Medical Assessments

All mine and quarry workers, who are to undertake tasks where there is an occupational health risk present that is not under a high-order control and which could reasonably be expected to cause a disabling injury or disease, will need to undergo a medical assessment. As a minimum, this will be in accordance with the Mine and Quarry Workers' Health Assessment Form. Task and site specific occupational health assessments will be conducted at a frequency determined by the risk level or the medical condition of the worker .

In the event that the assessment reveals a level of diminished health or physical capability, the medical summary report will be brought to the attention of the SSE who will determine if the person's diminished capability can be accommodated at the mine. The accommodation may include changes to the workplace, equipment or work design, appropriate health surveillance programs or limitations of the worker's activities being put in place.

### 7.2.2 WORKPLACE HAZARD EXPOSURE MONITORING

It is the responsibility of the SSE to ensure that the mine or quarry regularly monitors the level of occupational health hazards workers are exposed to in the workplace.

Ongoing medical assessments must be made at a frequency related to the potential health risk to the worker. The frequency should be such that the medical assessments are able to indicate any adverse trends in a person's health before a significant adverse change is found that requires their removal from the task.

It is mandatory that, for the system to be effective, mine and quarry workers must make themselves available to undergo a medical assessment and also agree for the data to be analysed by the regulator (Health Surveillance Unit).

The ongoing medical assessments have two separate elements, each of which may have different assessment cycle times.

1. The first type of assessment is to monitor exposure to hazardous agents through the use of biological monitoring or biological effect monitoring. In the event that a significant adverse result is found a HSU 1 report must be prepared and submitted.

2. The second is for other significant changes to health. In the event of a significant adverse change in health being confirmed, a HSU 2 report would need be prepared and submitted. Should the adverse change be of a level such that the worker may need to change duties at the mine, the worker must be given the opportunity to seek and obtain a second medical opinion. The second opinion must then be given to the mine AMO who must consider the second medical opinion before making a final report to the worker and the SSE.

### 7.2.3 ACCOMMODATION OF DIMINISHED WORK CAPABILITY

Where an adverse biological monitoring result or a significant change in health has been identified and causes a diminished capability to work, the SSE must determine if and how other workplace arrangements can be made to accommodate the changed health of the mine or quarry worker.

Where the SSE determines that accommodation is possible by changing duties on either a temporary or permanent arrangement, the worker must be assessed and confirmed as physically and psychologically able to undertake the new task with an acceptable level of risk.

Similarly, the SSE must ensure that duties given to accommodate injured workers during their rehabilitation program do not pose an unacceptable risk to the workers' health.

Should the SSE determine that accommodation of the person's diminished health capability is not possible, the SSE must ensure that appropriate action is taken and a HSU 3 report is prepared and submitted.

## 7.3 Responsible persons for implementation

Implementation of the health management process at the mine will be the primary responsibility of two persons; the Site Senior Executive and the employer.
At many mines these positions may be filled by the same person, other than the employer of a contract workforce.

### 7.3.1 SITE SENIOR EXECUTIVE

The Working Group determined that the Site Senior Executive (SSE) was the appropriate person to hold the overall accountability for the development of the process.

The SSE would be required to:

- ensure that all occupational health hazards at the mine are identified
- where the hazards are deemed to be capable of causing serious injury, disease or a permanent disabling injury, implement high order controls in the workplace where reasonably practical
- have appropriate health assessments developed for those tasks where high order controls are unable to be implemented in a practical way. This may include the involvement of ergonomists or other occupational health advisers
- provide the relevant medical assessment standards to the employers of mineworkers on site (the mineworker medical assessment documentation must include the (draft) Mine and Quarry Workers' Health Assessment Form as a baseline)
- ensure that the mineworker medical assessment is suitable for all current tasks
- ensure that as far as practicable, each mineworker is assessed in accordance with the appropriate mine medical assessment standard and is deemed fit to undertake the work tasks before starting work
- ensure the mineworkers are advised, before commencing work, and on a regular basis thereafter, of the occupational health risks present in their work place and the controls to be applied and maintained

- where possible, accommodate persons with diminished work capabilities including during periods of rehabilitation after injury or illness
- provide written HSU 1, 2 and 3 reports (section 7.7) to the Health Surveillance Unit as required
- continually improve the occupational health management process at the mine with the objective being to eliminate the occurrence of disabling occupational injury and disease at the mine.

### 7.3.2 EMPLOYERS

Employers of mineworkers would be required to:

- appoint a competent and qualified person to conduct the medical assessments hereinafter referred to as the Appointed Medical Officer (AMO);
- have mineworkers medically assessed in accordance with the standards advised by the SSE for the mine;
- pay for the medical assessments conducted;
- allow a mineworker to obtain a second medical opinion where the medical assessment determines that a person may not continue to be employed in a task (the second opinion will be at the mineworker's cost);
- give written notification to mineworkers stating the risk and hazard based reasons resulting in the need for additional medical assessments at the employer's expense.
- advise the SSE of persons whose medical assessment does not meet all criteria required by mine medical standards;
- make the summary health surveillance medical assessment report available to the SSE upon request.

## 7.4 Appointed Medical Officers (AMO)

The Working Group considered that because the two existing mining regulations have quite different health surveillance requirements and use different titles for the medical officers who undertake health surveillance, it would cause least confusion if an entirely new title was proposed for practitioners performing health surveillance under the proposed scheme. This is particularly important as the new process requires medical officers to have a range of competencies not formerly required. The title 'Appointed Medical Officer' is proposed. This has received acceptance by the Working Group, and by existing coal industry NMAs who attended a recent meeting in Brisbane.

The consultation program identified that there was concern in many sectors of the mining industry over the variability of standards in the competence of medical assessors. Comments were regularly made on the difficulty in getting country doctors to a mine to see the conditions under which people work.

The Working Group agreed that it was important for medical assessors to be aware of

conditions at mines, the occupational hazards and risks involved and the background to the medical forms that they are to complete. To achieve this on a consistent basis it was determined that the employer should appoint a medical officer, and that that officer should, when necessary, undertake a course of training and mine visits in order to be able to properly assess the occupational health of mine or quarry workers.

### 7.4.1 APPOINTED MEDICAL OFFICER'S DUTIES

The Working Group determined that the Appointed Medical Officers should be assigned the following duties and competencies:

- Maintain a practical awareness of the health hazards associated with the work tasks that mineworkers are required to undertake.
- Assess the health of persons either working or proposing to work in a mine in accordance with the health standards provided by the SSE.
- Provide the employer and workers with written reports on the workers' occupational health status.
- Provide to the regulator a written report including trend information showing the history of the mineworker's health since commencing in the industry.
- Provide the full medical assessment information to AMOs for other employers where the mineworker is seeking employment.
- Keep the records on behalf of the chief executive in an electronic format that can be accessed by the HSU.
- Complete and send to the HSU all HSU 1, 2 and 3 reports in an electronic format.
- Fulfil the contractual requirements set out with the employer.
- Advise the employer of general health trends that may be a concern to the employer.
- Maintain records for 30 years or as otherwise specified by the chief executive, or make other arrangements which are acceptable to the chief executive.
- Where applicable, transfer all records to a succeeding AMO.

### 7.4.2 APPOINTED MEDICAL OFFICER TRAINING

The Working Group accepted advice that most medical practitioners have received very little training in occupational medicine as undergraduates, and that the majority may not perceive a need to improve their level of skills in this field once they are actively practicing medicine.

Therefore, it is highly likely that some practitioners, on appointment, will not have the essential training necessary to undertake the role effectively.

The Working Group determined that Appointed Medical Officers should:

- be familiar with occupational health hazard identification relating to the mining

industry, including the identification of hazards associated with above ground separation, smelting and associated activities;
- be able to assess health risk in the mining industry, including above ground separation and smelting activities. This should include ability to interpret occupational hygiene and ergonomic assessment reports;
- be able to undertake health assessments of miners including the application of appropriate health surveillance guidelines and procedures to match the risk profile of mineworkers;
- be able to apply appropriate biological monitoring procedures for workers exposed to designated hazardous substances;
- be familiar with the application of control measures, including the use of the hierarchy of controls to determine appropriate control options; and
- be familiar with the statutory obligations of appointed medical officers under the mining legislation.

The Working Group therefore supported a provision in the regulation to require an appropriate level of training for Appointed Medical Officers.

It was accepted that, for appointed medical officers to achieve the abilities outlined above, most would need to undertake a program of training in aspects of occupational medicine related to mining activities. Such a program is not currently available, particularly in regional centres.

The Working Group recognised that the only practical method of training delivery would be to develop a format appropriate for self-paced learning by distance education. This would have the obvious advantages of being available whenever it is required, even for a single individual, while not needing to be presented by specialist professionals at regular intervals. To overcome some of the disadvantages of distance learning, for example the lack of professional discussion, the Working Group felt that a biannual meeting of appointed medical officers could be held, as currently occurs for the coal industry, which could include an in-service training component presented by one of the specialist groups.

The Working Group also recognised that some Appointed Medical Officers will already be specialist occupational physicians, or will at least have undertaken significant training elsewhere in occupational medicine. Therefore it is necessary to have a provision to recognise doctors who already hold an appropriate qualification in occupational medicine. An example of a similar provision can be found in the *Workplace Health and Safety Regulation 1997*, dealing with the approval process for doctors who desire to undertake health surveillance of workers exposed to hazardous substances in general industry.

## 7.5 The Full Medical Report

The full medical report will consist of the completed mine and quarry workers' health assessment form and any task specific additions required for the particular worker. These could typically include a more detailed respiratory questionnaire and chest x-ray for those exposed to silica dust, or biological monitoring results for those exposed to hazardous substances.

A current full medical assessment report will be maintained for use by an AMO conducting the assessment or an AMO for an employer with whom the mineworker intends to work in the future.

In the event of occupational injury or illness requiring a HSU 1, 2 or 3 Report, or where epidemiological research has been authorised, a copy of the full report will also be required to be sent to the HSU.

## 7.6 Summary Medical Report

This is a very important document for a number of reasons.

1. It is the written record provided by the AMO to both the mineworker and the employer.
2. It is to be made available for the SSE to evaluate if the person is fit to undertake duties at the mine.
3. It will contain trend data, where possible, on changes to key occupational heath matters such as hearing, respiration, musculoskeletal and psychological impairment.

It is this report that should initiate change, where required, in the mineworkers activities in order to minimise adverse occupational changes found as a result of the medical assessment. It may also be used as an indicator of where increased medical surveillance will need to occur.

## 7.7 Reporting of Adverse Findings

The health surveillance process proposed under section 7.1 may include a standardised medical assessment, additional task-specific components (depending on the risk profile for the worker's position), biological monitoring (where there is exposure to a designated hazardous substance) and site-specific components (such as drug and alcohol testing). As proposed above, the summary medical report must be sent to the employer, under both the coal and metalliferous regulations, with a copy in each case to the worker. This should preferably include trending information on health status.

The Working Group felt that the current health surveillance process is inadequate in that it fails to report where there has been deterioration in worker health and therefore fails to enable the regulator to assist industry to remedy health problems affecting workers.

Accordingly, a reporting process is proposed that requires the notification of the HSU of at least three situations where there has been a significant adverse change in health status.

The proposed three circumstances requiring reporting to the HSU are:

HSU 1 – Where there has been an adverse biological monitoring or biological effect monitoring result (that is, one that exceeds the action/alert level).

HSU 2 – Where the health surveillance assessment detects significant deterioration in an existing worker's occupational health, requiring the SSE to accommodate the change in the work capabilities of the worker.

HSU 3 – Where the health surveillance process detects significant deterioration in an existing worker's health or biological monitoring result and the SSE determines that the worker's diminished capability cannot be accommodated at the mine. The worker is to be removed from those activities.

## 7.8 The Health Surveillance Unit

Having established widespread support for a centralised health surveillance capability, the Working Group built up a composite structure that should meet the needs of the current and future mining and quarrying industry in Queensland.

Research conducted as part of this review indicated that the majority of coal mineworkers were able to complete their working careers without suffering a permanently disabling injury. It is anticipated that the mining and quarrying industries would have a similar injury profile.

Data collected by the HSU will largely consist of the HSU 1, 2 and 3 reports discussed above. The data is of little value without proper analysis. There are two main objectives for the HSU which are discussed in **7.8.1**.

### 7.8.1 OBJECTIVES

The first objective is to identify current occupational health risks at mines and quarries and to respond appropriately to adverse health outcome information. Such information includes acute injury data, occurrence of work-related illnesses of both an acute and chronic nature and adverse biological monitoring and biological effect monitoring results.

By focussing only on the adverse health monitoring results, the current resource allocation of two staff members in the Health Surveillance Unit is expected to be adequate to capture, analyse and report on behalf of the full Queensland mining and quarrying industry.

Due to the large financial resources potentially required to address many of the health hazards in the workplace, some of which were identified as needing research, the Working Group supported the proposal that, in the first instance, the major effort should focus on the larger organisations, with the lessons learnt then made available to smaller operators.

The second objective is to participate in epidemiological research into the health of mineworkers. This will be a long-term objective of the HSU, to be addressed after the most immediate health risks have been brought under control.

Epidemiology has been defined as '…the study of the distribution and determinants of disease frequency in man'.[22] Such studies compare the health outcomes of populations exposed to an agent suspected of causing disease, with other populations that are alike except for exposure to the agent under study.

The objective, in the case of mineworkers, would be to build up a picture of the ongoing health of the workers over the longer term, to identify disease trends that point to risks that lead to gradual deterioration in health or to disease with longer latency, such as various cancers, respiratory, cardiovascular or neurological disorders. One example would be to determine the risk of cardiac disease in miners exposed to diesel particulates. The focus of this type of study is prevention. Once a particular work exposure is identified as a risk for a particular disease, risk-reduction strategies can be developed that can be adopted across the industry as a whole. It is anticipated that studies of this nature will often link to other studies in other states and countries such as the USA.

The Working Group accepted that to address this objective, the current surveillance process that provides data from coal mineworkers would need to be extended to cover the total mining industry.

### 7.8.2 ROLE, STRUCTURE AND FUNCTION

The role, structure and functions of the HSU were refined during the extensive consultation program conducted. There are three basic elements to the activities required of the HSU as indicated in Figure 4.

1. Data Collection
2. Data Analysis; and
3. Report Findings.

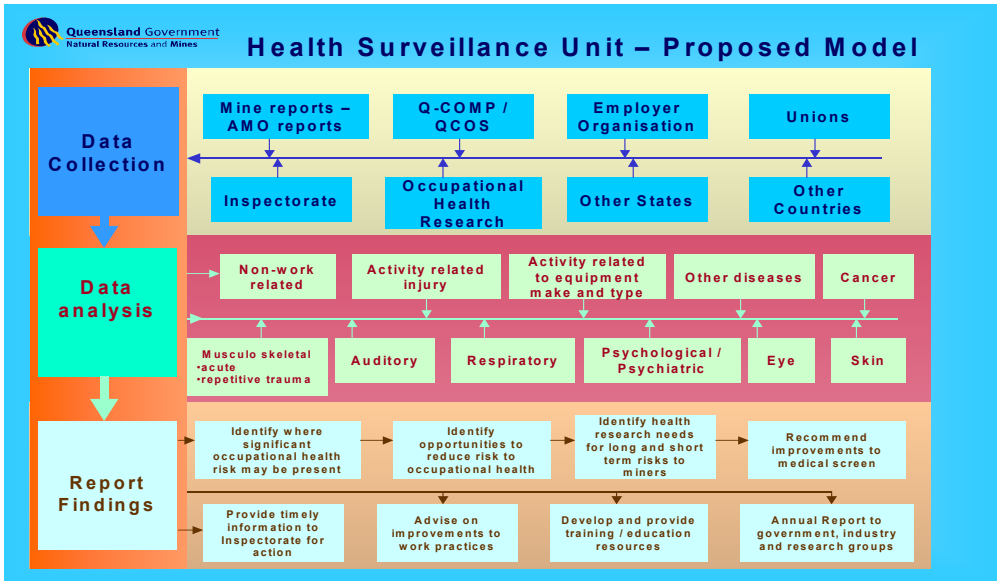


Figure 4: Proposed Model of the Health Surveillance Unit

#### 7.8.2.1 Role

The role of the HSU is to champion the issue of occupational health for all mine and quarry workers in Queensland. Its role is not to interfere with employers who act responsibly in ensuring their employees do not suffer any disabling occupational injury or disease.

Its role is, however, to identify activities or occupations at mine and quarry sites where there is firm evidence that occupational health hazards exist and are not adequately controlled. It is the role of the HSU to advise the inspectorate who in turn will ensure that the SSEs respond appropriately to minimise the risk to the health of workers at the mine or quarry.

It is the role of the HSU to establish and maintain contact with other professional bodies and benchmark best practice against HSU standards and practices.

The HSU will need to collect all available information on mineworker health and conduct statistical analysis on the data and report on its findings.

As a minimum, the data analysis will categorise the data into the following classifications:

- Non work-related injury
- Activity-related injury
- Injury related to equipment type or manufacturer
- Cancer
- Musculoskeletal disorders caused by both acute and repetitive trauma
- Auditory disorders
- Respiratory disorders
- Psychological / psychiatric impairment
- Eye disorders
- Skin disorders
- Other diseases

The HSU will be responsible for identifying where improvements can be made to the health assessment form and also where research into health matters may be required.

#### 7.8.2.2 Structure

A very simple organisational structure is proposed. The HSU should be a stand-alone unit within Safety and Health, be separate from the inspectorate and have its own budget. The Unit should have a manager, one data supervisor and part-time support from a statistician and an advisory panel of occupational physicians.

In general terms, the HSU manager will liase with industry stakeholders and AMOs, ensure that privacy protocols are maintained, implement training as required, develop and provide training resources and provide reports as required

The Data Supervisor will ensure that data is collected and analysed in accordance with Australian standards, maintain regular contact with suppliers of data, conduct regular checks on the integrity of the data and ensure data entry is up to date. The Data Supervisor will also ensure that the strict privacy protocols are maintained.

Part time assistance from the Safety and Health Statistician will also be required; who will conduct or oversee the analysis of the data and ensure it is done in compliance with Australian Standard 1885.1 (1990).

#### 7.8.2.3 Functions

In fulfilling its role to the mining industry, the HSU will have the following functions:

- be a centre of excellence where high ethical standards are maintained with special emphasis on privacy matters
- collect medical data relevant to the occupational health of mine and quarry workers and comply with privacy policy requirements. The data sources are detailed elsewhere in this report

- analyse information received in a manner which is relevant to the health needs of mine and quarry workers
- report results of data analysis
- advise the inspectorate on activities or other matters where significant health risks have been identified
- develop training resources and facilitate training in occupational health.
- provide statistical data to support research; and
- participate in epidemiological and occupational health benchmarking studies with other research groups, states and/or countries.

### 7.8.3 STAFFING REQUIREMENTS

To achieve the objective of having a health surveillance unit, which is capable of servicing the needs of the wider mining industry, a minimum of two permanent full-time staff persons would need be employed. One person would need to manage the day-to-day operation of the unit whilst the other employee would be responsible for the key duties of data supervisor.

**Manager's duties**

The Manager would be required to be responsible to:

- establish and maintain communications with stakeholders
- organise statistical analyses as required
- establish and maintain communication channels with information providers
- contribute to and operate within the budget
- be able to communicate with medical and occupational health personnel at a professional level
- co-ordinate meetings of the Medical Advisory Panel and AMOs
- implement process management into the HSU systems
- participate in internal and external audits; and
- facilitate the development and delivery of training programs
- prepare research proposals as required.

**Manager's competencies**

In order to achieve these duties, the manager would need to:

- have a competency in a recognised field of study relating to occupational health
- be competent in the processing and management of health data for analysis and research
- be competent in analytical procedures applied to health data
- be competent in the development and delivery of training programs
- be competent in the preparation of detailed reports
- be competent in the privacy requirements for handling personal health data.

**Data Supervisor's Duties**

The Data Supervisor would be responsible to:

- co-ordinate the development of computer programs
- organise and assist training of AMO staff in HSU computer programs
- review accuracy of information from data providers
- maintain security and ensure privacy principles are complied with at all times
- participate in and implement process management systems
- assist statistician analyse data
- provide data to HSU manager for reports
- ensure data entry is kept current
- input data as required
- establish and maintain professional relationships with data providers
- establish and maintain access to data that may be required for epidemiological studies

**Data Supervisor's Competencies**

To achieve these responsibilities, the Data Supervisor would need to have high-level competencies in:

- the operation of electronic data systems
- the storage and retrieval procedures for health related data
- the privacy protocols for storage and handling of personal health data.

## 7.9 Medical Records Management

Under the new Health Surveillance scheme, the Department of Natural Resources and Mines will only hold reports that reflect a reduction in the health of a mineworker. These reports should be retained in an environment which is as secure as the one in which the present reports are held. Given that these reports contain information about the health of individuals, which is obtained compulsorily, it must be stored so that there is no likelihood that it will be misused or accessed without authorization.

Management of medical records and data from other secure sources such as insurance and compensation information is vital to the operation of the HSU. The current HSU management of the Coal Mine Workers' Health Scheme data operates in compliance with the government's Privacy Regime and no problems are envisaged in continuing with the current level of security.

It will be a matter for ongoing auditing to confirm that adequate and effective security systems are in place for the data.

One of the first challenges will be to establish a system that allows the electronic transfer of data to the HSU from the appointed medical officers and other sources.

### 7.9.1 ELECTRONIC FORMATS

Funds will be required to develop computer programs that will meet the needs of both the HSU and the AMOs. This has been included in both the implementation timetable and the cost estimates.

Electronic capture of the data will not only minimise potential errors in the data input but will also make the analysis of the data easier. Security of the data that has been stored will be a high priority.

### 7.9.2 FEE FOR SERVICE

One of the consistent areas of feedback received during the consultation phase was the broad support for access to a fee for service facility that could provide previous medical assessment results to both mines and quarries or to an Appointed Medical Officer. The regular turnover of medical staff in the remote mining communities was identified as a matter of ongoing concern. Part of the concern was the difficulty in tracking down medical records after a doctor had 'moved on' to another area. Again, information would only be provided in accordance with the Privacy Regime protocols.

The Steering Committee determined that information could be made available with additional contract staff however this would need to be on a strictly cost recovery basis.

There may be an opportunity to extend fee for service availability to include the long-term storage of medical records when companies cease operation.

## 7.10 Location

A survey was conducted to determine the most suitable location for the Health Surveillance Unit. Possible alternatives included Safety and Health Head Office, Simtars, a regional office, Queensland Health and private providers such as the Queensland Mining Council. An analysis of the survey results is found at Appendix 5.

The results indicated that the Safety and Health Unit in Brisbane was favoured overall. Support for Simtars was limited by the perceived conflict of interest by mine operators concerned about contracting Simtars as a service provider. There was a high level of support for the unit to be operated by the government and having a direct linkage to the regulator was favoured to ensure legislative compliance.

## 7.11 Expert Medical Support

The Working Group recognised that the adoption of a health surveillance scheme as proposed, which collects information on adverse health changes, will require the

department to have access to expert advice on occupational medicine. The term Medical Advisory Panel (MAP) was generally supported as being appropriate for the duties envisaged

The MAP may be of significant assistance in gaining credibility for the operations of the Health Surveillance Unit. Areas of particular value are:

- the proposed scheme will result in considerable quantities of medical information (adverse health effects, unacceptable biological monitoring results, etc) being received by the Health Surveillance Unit.
- the MAP will advise on reports required and assist in determining an appropriate response by the HSU.
- the Mine and Quarry Workers' Health Assessment Form will need to be reviewed for its effectiveness from time to time. Expert advice from the MAP will be essential
- in order to assist inspectors to be satisfied that the response from the employer is appropriate, it will be necessary for the Department to have access to expert medical advice to assess individual cases
- to provide ongoing advice and support to appointed medical officers
- to provide medical input, from time to time, to such things as the development of health and safety legislation and in discussions with external organisations such as Work Cover and Q-COMP
- to assist facilitate the development and delivery of information/education programs/packages in occupational health topics for appointed medical officers; and
- to assist define and scope research studies into occupational health matters

The Working Group considered that these could be achieved most readily by the appointment of a panel of three or four occupational physicians who would represent a cross-section of the appointed medical officers in Queensland

The advantages of a medical panel are:

- there is wisdom in collective expert advice
- the advice given carries more weight than that from an individual; and
- issues such as setting competencies and health surveillance standards may not be given appropriate credibility by the mining and quarrying industries if they were established by a medical practitioner working in isolation.

The main disadvantage of a panel is that it meets relatively infrequently and is not available for on-the-spot decisions. For this reason it was agreed that the medical panel would need to elect a spokesperson that would be the contact point for the HSU manager.

## 7.12 Additional medical support for the first two years

During the initial establishment phase for the new system, perhaps for the first two years, the services of a part time occupational health physician will be necessary in setting up systems to achieve the outcomes required. One of those outcomes will be the establishment and co-ordination of the Medical Advisory Panel (MAP) discussed above, which will represent all sectors of the mining and quarrying industry.

Also, it is anticipated that there will be many issues that will require medical input during the establishment phase, prior to the full operation of the Panel, including the provision of competent medical advice to the HSU staff. An occupational health physician would also be a competent reference point for advice to appointed medical officers on the operation of the new system.

## 7.13 Research Opportunities

During their deliberations on the many subjects that were considered in the preparation of this report, a number of gaps in our knowledge base were determined to exist. Some of the more immediate needs included:

- how medical officers can identify and evaluate psychological impairment to determine if the person is a risk to themselves or others at a mine or quarry
- how an AMO could clinically evaluate the level of musculoskeletal injuries or impairment
- the effects of ageing on a mineworker's ability to work with duties that involve high levels of whole body vibration, shiftwork, 12-hour shifts, dusty and noisy environments and fatigue
- are the occupational health risks similar at each mine and if so can generic medical examinations be developed for tasks that are perceived as being high-risk tasks.
- how to obtain meaningful data from insurers and others and still comply with the privacy legislation.
- how to develop electronic data capturing processes that allow ready use of information from AMOs and other states.
- how to develop a credible risk assessment process that is applicable to occupational health.

# 8 COST OF IMPLEMENTATION OF PROPOSAL

## 8.1 Cost to Industry

Both the existing health provisions of the CMSHR 2001 and the MQSHR 2001 contain provisions for pre-employment health assessments and ongoing monitoring of the health of mine workers if there is a risk to the mineworkers' health. The proposals in this Report continue to adopt this philosophy for the mining industry.

However, as the recommendations are directed at the early detection, intervention (prevention) and correction of occupational health related problems, the proposed Mine and Quarry Workers' Health Assessment Form includes additional requirements to the current approved form. Those requirements relate to occupational health issues that are currently a major workers' compensation cost factor to the mining industry and include whole of body vibration and psychological/psychiatric impairment.

There may also be minor additional costs relating to the requirement for AMOs to track and graph any deterioration in the health of mineworkers due to occupational exposure, and provide health management advice to both affected employees and employers concerning those events. This feedback to mineworkers, which is not currently provided, will make the workers more aware of their occupational health status and of effective preventative action(s).

Given the large compensation health costs presently being paid by industry and the current cost of complying with existing legislative health provisions, it is estimated the cost to industry of implementing the proposed recommendations will be cost neutral in the interim, but in the longer term there will be a reduction in cost due to the early detection and prevention of occupationally-related high cost permanent and temporary disabilities and disease.

## 8.2 Cost to NR&M

The budget for the HSU for 2002-03 is $165,000. This budget includes the salary and on-costs for 2.4 officers and operating costs. The proposed staff will generally have higher qualifications than current staff and therefore command increased salary levels. Additional costs have been included for the initial HSU support by an occupational physician and the functioning of a medical advisory panel.

The cost to NR&M of implementation of the proposal will be $312,000 in 2003-04. This cost includes an estimated $50,000 one-off capital cost for the development of an IT application to allow for the electronic lodgment with HSU of health surveillance information by AMOs.

The cost to NR&M in 2004-05 will decrease to $295,000 with a further reduction to $232,000 for 2005-06 and onwards.

This will result in the following additional funding being required for the proposal:

- $147,000 for 2003-04
- $130,000 for 2004-05
- $67,000 for 2005-06 and following years.

# 9 RECOMMENDATIONS

The Working Group recognised that in order for the industry to benefit from the review that has been undertaken, a broad range of recommendations for action were required. For an occupational health surveillance system to assist in achieving the goal of an industry free from disabling injury and disease, the recommendations should integrate the actions taken by the mine operators, the occupational medical assessors and the regulator.

The 1995 Industry Commission Inquiry into Occupational Health and Safety stated '**Success will ultimately be determined *where* the current failures occur – in the workplace**'.

The report went on to suggest that governments should:

- *streamline but strengthen regulation* with fewer, simpler rules
- *allow greater flexibility* for workplaces to manage injury and disease
- *beef up enforcement* of the key legal responsibilities
- *overhaul co-operation arrangements* between Australian governments;
- *provide greater contestability and transparency* in research funding; and
- *make OHS agencies* more accountable for their performance.[10]

The following recommendations are consistent with the majority of these objectives.

The review found that although disabling occupational injuries and diseases were recognized as a problem in the mining industry, the current statistical information did not facilitate or assist industry in developing high order control strategies.

The mining industry employs approximately 19,000 people, half of whom are in the coal industry where the Coal Mine Workers Health Scheme provides a level of health surveillance. No statistical information is readily available for the metalliferous mining and quarrying industries.

The role and function of the regulator in health surveillance has to date been exclusively related to the coal industry. The Terms of Reference developed for this review identified the need to focus on the total mining and quarrying industry and the role of the regulator in the achievement of zero fatalities, injuries and diseases.

The Working Group developed a model for a Health Surveillance Unit that should meet the needs of the mining and quarrying industries (**Section 7.8**).

**Recommendation 1**

That the current Coal Mine Worker's Health Scheme be replaced and included in a new Health Surveillance Unit (HSU) that will be established to meet the needs of the coal mining, metalliferous mining and quarrying industries in Queensland. The unit to function in a manner consistent with the proposed model outlined in Figure 4 (section 7.8).

Broad consultation with all sectors of the mining and quarrying industry confirmed support for a single health surveillance program under the control of the regulator. A survey of stakeholders indicated a preference for the HSU to be located in Brisbane (see **Section 7.10**).

**Recommendation 2**

It is recommended that the regulator resource and structure the HSU to be an individual part of the Mines Inspectorate within the Bureau of Mining and Petroleum, and be located in Brisbane.

The proposed model for the HSU requires the performance of several functions, an important one being the collection of a wide range of information for further analysis **(Section 7.8)**.

**Recommendation 3**

It is recommended that the role and function of the HSU is to collect and analyse all reports of adverse medical assessments from mines and quarries and other data related to mine and quarry worker health, and report findings to stakeholders.

The minimum staff level for an effective health surveillance program capable of covering the Queensland mining and quarrying industry was determined as being two persons (**Section 7.8.3**)

**Recommendation 4**

It is recommended that the HSU has a staff level of two full-time positions – being one manager and one data supervisor.

In order to be able to respond to industry requests for access to medical records held by the HSU, this service will be made available to clients, subject to compliance with privacy requirements, on a full cost recovery basis (**Section 7.9.2**).Industry stakeholders do not have a position on the required number of persons to efficiently undertake the work load.

**Recommendation 5**

It is recommended that the HSU may provide additional information services to authorised industry stakeholders on a full cost recovery fee-for-service basis and in compliance with the Queensland Government Privacy Regime.

It was recognised that surveillance alone would not achieve ready success in systematically identifying, assessing, eliminating or controlling adverse occupational health risks unless the HSU worked in partnership with the mining and quarrying industry. The Working Group did not want to repeat history where recognised health hazards have taken four hundred years to bring under control. All stakeholders need to be involved and supportive of the entire health surveillance process in order to make real progress in the improvement of mine and quarry worker occupational health (**Section 2.5**).

**Recommendation 6**

That the mining and quarrying industry stakeholders to work in **partnership** with the regulator and other stakeholders for the purpose of achieving an industry free from fatalities, injuries and diseases by eliminating, or establishing effective controls over, identified occupational health risks.

An important part of the partnership will be the sharing of information between stakeholders. Some of the small mines, quarries and contractors will find it difficult to provide the resources to develop a health surveillance process. In addition, there is no value in each stakeholder doing essentially the same studies on machines and plant. Sharing and pooling of data will assist in accelerating the entire process and minimise inconsistencies between different mines and quarries. The matter was fully supported to throughout the consultation process (**Section 5.1**)

**Recommendation 7**

It is recommended that industry operators develop a protocol for sharing information on occupational health risks associated with materials, machinery, plant and processes and make information available to small miners and contractors.

To ensure the partnership is sustainable, a number of basic legislative requirements will need to be put in place. It is anticipated that the current wording in both mining acts would facilitate the necessary regulations necessary for the functioning of the HSU. Details would be determined by the Office of Parliamentary Counsel (**Section 5.6.5**).

**Recommendation 8**

It is recommended that adequate provisions are made in both mining acts to permit the proper functioning of the health surveillance process.

The Working Group formed a view that to remove misunderstandings it would be preferable to have similar provisions in both the coal and mining and quarrying regulations (**Section 7**).

**Recommendation 9**

That both the coal mining and mining and quarrying regulations be drafted to contain similar provisions requiring mines and quarries to develop and implement processes to systematically monitor and assess workers' occupational health in order to control the risk of disabling injury or disease to mine and quarry workers.

In order for a health surveillance scheme to be implemented, duties will need to be specified for key personnel such as the Site Senior Executives, employers, employees and the medical practitioner conducting the medical assessments. Many of the provisions already exist or are suggested in the current regulations however the full list of the minimum requirements is listed for completeness (**Sections 7.3.1, 7.3.2, 7.4, 7.5 and 7.8**).

The objective of the regulation changes will be to keep them minimal, specific and functional (**Section 7.1.1**).

**Recommendation 10**

That the mining regulations include provisions for the duties of the site senior executive to ensure:

- that occupational health hazards are identified for all work tasks and occupations at the mine or quarry
- that where hazards are identified the risk is assessed and appropriate control measures established
- that work activities which have been assessed as presenting a low or acceptable level of risk to occupational health, and that do not require a Mine and Quarry Worker's Health assessment, are identified
- that mine and quarry workers are made aware of the occupational health risks likely to be associated with the duties to be undertaken by the worker
- that where risks of occupational injury or disease exist but are not placed under high order controls, an appropriate mine medical assessment standard for the task/occupation, is developed and implemented

- that the mine medical assessment standard is appropriate to the task/occupation and includes, as a minimum, the Mine and Quarry Workers' Health Assessment Form
- that the frequency of medical assessments is sufficient to allow trends in any adverse change in the occupational health of an individual to be monitored and acted upon before a disabling injury or illness occurs
- that where a mine or quarry worker's duties are changed due to occupational injury or disease, the mine or quarry worker is given the opportunity to seek a second medical opinion which in turn is to be considered by the mine's appointed medical officer
- that all medical assessment reports that record adverse biological results or significant adverse change in occupational health are submitted to the regulator (and a copy given to the employee) in a timely fashion
- that medical assessments for all employees are current
- that a system is implemented where the SSE will review the opportunities to accommodate a worker's diminished health capability, either temporarily or permanently. This accommodation process should be consistent with the WorkCover rehabilitation process for an injured or ill mine or quarry worker; and
- that where it is determined that accommodation of the worker's injury or disease is not possible on an ongoing basis, a report is to be submitted to the regulator with a copy to the employee

Most of the provisions recommended for employers are already in the existing regulations however, again for completeness, the following recommendation is made (**Section 7.1.2**).

**Recommendation 11**

That the mining regulations include provisions for the duties of an employer to include:

- payment of the costs in assessing a mine or quarry worker in accordance with the mine medical assessment standard
- the appointment of one or more appointed medical officers to conduct medical assessments in accordance with the mine or quarry standards
- that where there is a perceived need, based on hazard identification and risk assessment, for an additional medical assessment on a worker, the employer is to advise the worker, in writing, of the reasons why the additional assessment is being sought

Employees are important stakeholders in the health surveillance process and will benefit directly from the ultimate success of the health surveillance process.

**Recommendation 12**

It is recommended that the mining regulations may require employees to undergo medical assessments.

The medical practitioners who will conduct the medical assessments will need to be familiar with the generic occupational health hazards that exist at a mine or quarry. The health risks at an underground mine have significant differences to those at a surface mine or quarry and therefore it is important for assessing doctors to have personally observed all types of worksites and tasks. This does not mean that a doctor will need to visit each mine or quarry site but at least one mine or quarry where similar activities take place. In order to differentiate between doctors conducting medical assessments and normal general practitioners, the Working Group agreed that the term appointed medical officer (AMO) be adopted (**Section 7.4**).

**Recommendation 13**

It is recommended that medical assessments for mine and quarry workers be conducted by or under the supervision of an Appointed Medical Officer as defined under the regulation.

Appointed medical officers have a vital role in the health surveillance process and therefore will need to be included in the regulation, possibly as a service provider. The duties of the AMO need to be clearly identified in the regulation (**Sections 7.4, 7.5 and 7.6**).

**Recommendation 14**

It is recommended that the mining regulations require Appointed Medical Officers to have the following duties or provide the following services:

- conduct medical assessments in accordance with the mine or quarry medical assessment standards
- provide a health assessment report to the employer and the employee
- maintain the records of all health assessments of persons permanently employed at the mine or quarry
- transfer the medical records to AMOs where the worker is to be, or is currently, employed
- keep all health assessment records in a safe place on behalf of the chief executive
- make all health assessment records available to the regulator for statistical analysis on an as required basis
- submit adverse health assessment reports to the HSU as defined by the regulator

- to return all medical records to the chief executive in the event of a mine or quarry permanently closing or the medical practice closing permanently and the mine or quarry has not advised of a replacement AMO
- to transfer all records to succeeding AMO.

The following definitions should be included in both mining regulations.

**Recommendation 15**

It is recommended that the following definitions be included in the regulation*:*

***Appointed Medical Officer,*** means a medical officer who has been appointed by an employer to conduct health assessments of a person at a mine or quarry and who has demonstrated knowledge of the occupational health risks associated with activities performed by the mine's or quarry's workers.

***Significant Change in Occupational Health*** means a change in a worker's occupational health status, determined by a formal medical assessment, that requires the worker to change some or all of their normal work duties.

***Accommodation*** means the provision of modified work duties that have been assessed as being suitable for the worker to perform with the risk of disabling injury or illness to the worker or other workers being at an acceptable level.

In order for the monitoring of occupational health of mine and quarry workers to integrate with the activities of the HSU, appropriate process management systems and procedures will need to be developed and implemented (**Section 7.8**).

**Recommendation 16**

It is recommended that the HSU develop suitable procedures and processes for health surveillance in mines and quarries and include:

- matters relating to learning materials for appointed medical officers
- the keeping and maintenance of medical assessment records
- require AMOs to provide to HSU health assessment records to an acceptable standard
- the provision of access to the medical records by the HSU
- formats for reports provided by the AMO to the HSU
  - where biological monitoring results exceed the alert or action level
  - where a mine or quarry worker suffers a significant adverse change to his or her health due to occupational injury or illness and

  - on each occasion that a mine or quarry worker is unable to continue employment at a mine or quarry due to health reasons (including non-work related injury or illness)
- models for health assessment reports to be provided to the employee and employer by the AMO (including guidelines to assist with consistency across industry) on such matters as trending graphs.
- provision of electronic formats for AMO medical assessment reports.

The HSU staff will require assistance from qualified medical practitioners to ensure the correct interpretation of medical assessment records along with appropriate follow up investigations and preventative action. Further support will be required in the development of training packages, provision of support for AMOs, reviewing the standard health surveillance approved form and the scoping of research recommendations. These tasks would be best achieved by a medical panel representing a broad cross-section of the mining and quarrying industry. In addition, there will be an ongoing requirement for medical advice to the HSU (**Section 7.11**).

**Recommendation 17**

It is recommended that a Medical Advisory Panel be appointed consisting of up to four medical practitioners who are experienced in the mining and/or quarrying industry and including at least two persons holding a specialist registration in occupational medicine.

For the first two years after a decision to implement this health surveillance system, it will be beneficial to employ an occupational health physician on a two day per week basis in order to facilitate and ensure credibility in the many systems and processes required to achieve the desired outcomes (**Section 7.12**).

**Recommendation 18**

It is recommended that an occupational physician be appointed on a part-time basis for up to two years after the decision to implement a full health surveillance program is made.

During the consultation with New South Wales and Western Australia, a number of potential improvements to the Coal Mine Workers' Health Scheme approved form were found. This report includes a draft 'Mine and Quarry Workers' Health Assessment Form' **(Appendix 3)** that contains many of the best practice elements found in other states. It is suitable to be used as the approved form for future use across the mining and quarrying industries. The opportunity exists for the current Coal Mine Workers' Health Scheme to use the revised form during the interim period.

**Recommendation 19**

It is recommended that the draft 'Mine and Quarry Workers' Health Assessment Form' be adopted for use across the mining and quarrying industries and lodged in an electronic format where possible.

The Working Group was supportive of maintaining the existing Coal Mine Workers' Health Scheme database for future reference and statistical use (**Section 4.1**).

**Recommendation 20**

It is recommended that the existing coal industry health surveillance database be integrated into the new health surveillance program.

Several matters were identified during the review that require further research to be conducted. There is a lack of defined and agreed procedures in assessment of the level of musculoskeletal impairment or psychological impairment of a worker. Some systems were found to be in limited use, however none was found to be immediately applicable in mines or quarries. As these are the two highest profile injury causes there is a need for further disciplined research (**sections 4.5.6 and 7.13**).

**Recommendation 21**

It is recommended that, in conjunction with industry stakeholders, the HSU define the scope and objectives for research into matters directly affecting the health of workers in mines and quarries with a priority given to developing musculoskeletal and psychological impairment assessment processes.

# 10 IMPLEMENTATION

It is recommended that this report be implemented in two stages. The first stage is to operate within the existing budget, as per the Terms of Reference and the second stage will both maintain the activities of the first stage and increase the level of epidemiological investigations.

The first stage will be subjected to extensive audit and review to assess the effectiveness of new initiatives currently being developed by mine operators.

From an operational and cost perspective, there is an advantage in modifying the existing CMWHS, developing and proving the systems and training before introducing the system into the mining and quarrying industries. The mining and quarrying industries would be on notice that the health surveillance system was imminent and proactive employers would be welcome to establish the new systems at their mining and quarrying operations. There is a reasonable expectation that some of the large mining companies would participate at an early stage.

A possible schematic Implementation Plan is depicted in Figure 5.

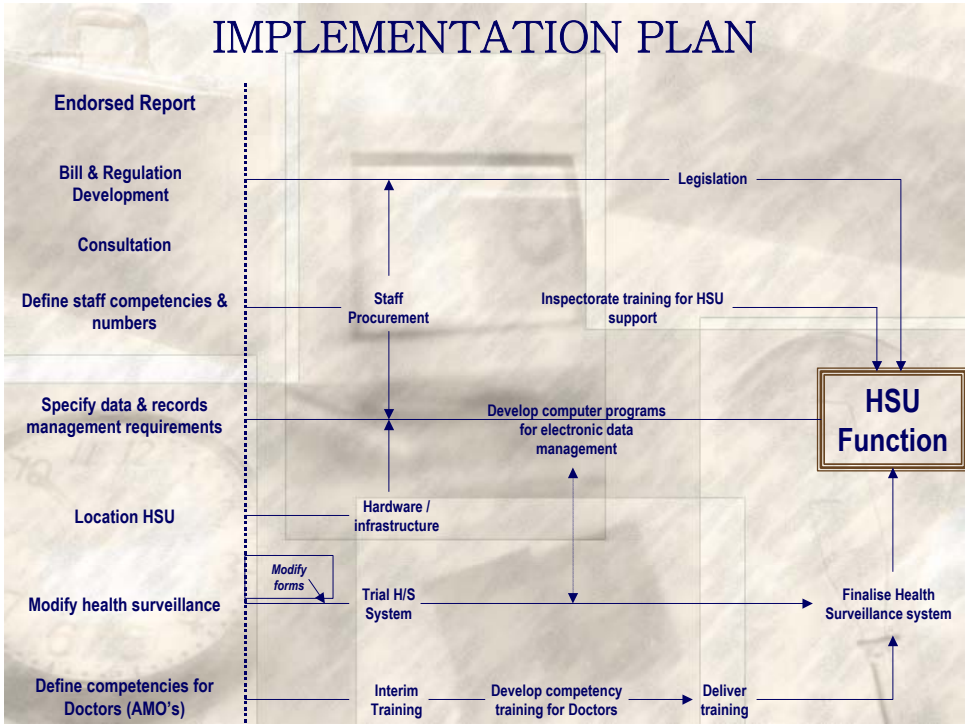


Figure 5

It is suggested that the coal mining industry implement the proposed health surveillance model in the 2003-04 period and the mining and quarrying industries implement the model in 2004-05 reporting period.

## 10.1 Political outlook

A factor, which would support the staged introduction of the proposed, scheme is the next state election, which is due on or before April 2004. From past practice, if there is a delay in implementing this report, it is likely that it will be difficult to have new legislation passed until after the election.

Changes to the current coal mining legislation are anticipated to be predominately to the regulation and therefore should be relatively achievable. It is possible that changes to the coal regulation could be in place before the current Parliament goes into election mode. On this basis, it would be the objective to have the mining and quarrying legislation ready to be submitted early into the new Parliament.

Due to the level of consultation required, this matter will be the critical path for the implementation program.

## 10.2 Legislation development

Tacit agreement has been given by all parties that the legislation will be drafted in the first instance, by the inspectorate and a consultant medical advisor. The draft legislation would then be submitted to the respective Advisory Councils for ratification. Changes to either of the mining acts or regulations are not expected to be major or require excessive development time.

## 10.3 Trial of draft medical assessment form

Upon endorsement of this report, it is proposed to update the current Coal Mine Workers' Health Scheme approved medical assessment form for use in the coal industry. This will allow time to fine-tune it before its implementation into the mining and quarrying industry.

## 10.4 Development of computer programs

Assuming agreement is reached in the outcomes of this report, the staff of the current Health Surveillance Unit would be engaged/retrained into the new system and start work on the new computer programs and training material.

## 10.5 Development of specifications and protocols for data inputs to the HSU

Extensive consultation will be required in order to gain the best quality data for use by the HSU and in a form that is in full compliance with the Privacy Policy.

## 10.6 Training

Training must be delivered to a wide range of stakeholders including the appointed medical officers, mines inspectors, mine or quarry operators and industry safety and health representatives. This will be one of the prime tasks of the manager and the part-time medical expert employed for the first two years.

## 10.7 HSU Consultation

The HSU will meet with industry stakeholders and the Medical Advisory Panel (MAP) to establish reporting standards sufficient to allow valid statistical analyses to be undertaken.

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# Appendices

# APPENDIX 1

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **PHYSICAL HAZARDS** | | | | | |
| **Noise** | | Noise induced hearing loss. 3dBA increase doubles risk and halves safe exposure time. | Audiometry as per AS 1269.4 | Noise levels (dosimetry) hearing conservation programs: noise mapping signage, training, PPE, audiometry and supervision – AS 1269, parts 1-4. | Using angle grinder on welded steel bucket > 105 dBA. Safe exposure of unprotected ear less than 4 minutes. |
| **Vibration**<br>**(a) whole body (WBV)** | | WBV affects balance and may cause nausea, digestive problems. Long term damage to spine. | Questionnaire re: relevant symptoms. Functional capacity evaluation if concern. Assessment of cervical and thoraco-lumbar spine. | WBV assessment to AS 2670.1 (2001).<br>Ergonomic assessment of workplace / workstation. | Back pain and lumbar disc degenerative change in dozer driver ripping overburden. |

## HAZARD IDENTIFICATION CHECKLIST

| HAZARD | HAZARD CHECK BOX | DISEASE RISK | HEALTH SURVEILLANCE | ASSOCIATED MEASURES | EXAMPLES |
|---|---|---|---|---|---|
| **Vibration**<br>**(b) hand – arm** | | ▪ Circulatory disorder to digits – (vibration white finger (VWF)).<br>▪ Joint damage to hand and wrist.<br>▪ Increased risk of carpel tunnel syndrome (CTS). | ▪ Questionnaire re: relevant symptoms.<br>▪ Look for signs of VWF.<br>▪ Look for signs of CTS and wrist joint abnormality. | Hand-arm vibration levels AS 2763 (1998). *Vibration and shock – hand transmitted vibration guidelines for measurement or assessment of human exposure.* | Hand held pneumatic chisel or rock drilling for extended periods. |
| **Non-Ionising Radiation**<br>**(a) U.V.** | | ▪ Welding 'flash'.<br>▪ Acute sunburn effects to skin and conjunctivae.<br>▪ Solar keratoses.<br>▪ Increased risk of cataract in long-term.<br>▪ Increased risk of pterygia.<br>▪ Increased risk of skin damage / cancer. | ▪ Identify susceptible personnel on entry.<br>▪ Assess skin for damage / cancer.<br>▪ Assess eyes for U.V associated conditions.<br>▪ Education re: protection. | ▪ Appropriate PPE for welders.<br>▪ Sun, skin and eye protection program for outdoor workers.<br>▪ Provision of sunscreen and clothing design to minimise reflection and transmission of U.V.<br>▪ Sunglasses. | ▪ Outdoor workers especially in high reflection (roof, concrete, water).<br>▪ Arc-welders. |
| **Non-Ionising Radiation**<br>**(b) Infra-red (IR)** | | Infra-red is heat radiation and increases risk of heat stress (see below) and increased risk of cataract. | ▪ As for heat stress.<br>▪ Assess for cataract / slit lamp examination. | As for heat stress. | IR is a major concern in furnace operators. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Non-Ionising Radiation**<br>**(c) Laser** | | Eye damage including damage to retina class 2 and above, burns and amputation risk for class 4. | Nil routine. | Provision of laser safety officer as per Australian Standard. | Risk to operators and to other personnel in building and survey equipment and particularly in industrial cutting equipment using higher class lasers. |
| **Non-Ionising Radiation**<br>**(d) Radiofrequency (RF)** ***(including microwave)*** | | ▪ RF radiation causes burns and tissue heating effects.<br>▪ Increased risk of cataract. | Initial assessment to exclude persons with metal pins, plates and joint prostheses and pacemakers.<br>No other specific health assessment. | Measurement of field strength around equipment. | Radiofrequency used for plastic welders.<br>Industrial microwave for various purposes including: timber laminated beam manufacture, high power radar and telecommunication equipment. |
| **Non-Ionising Radiation**<br>**(e) Low frequency electromagnetic radiation** | | No specific disorders with proven association. | Nil specific. | Field strength measurement. | ▪ Concern re: cancer risk with power line exposure.<br>▪ Many epidemiological studies with conflicting outcomes. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Radiation – Ionising**<br>**x-ray, alpha, beta and gamma** | | Radiation burns, radiation sickness mutagenic and carcinogenic effects long term. | Specific testing not usually undertaken. | ▪ Radiation safety officer.<br>▪ Badge monitoring of exposed personnel as required by Qld Health.<br>▪ Provisions of Radiation Act apply. | Operators of x-ray equipment, radio-active sources in mining industry. |
| **Heat** | | Heat Stress<br>(i) prickly heat<br>(ii) heat faints<br>(iii) heat fatigue<br>(iv) heat exhaustion<br>(v) heat stroke | ▪ Assess general fitness and renal function.<br>▪ Establish regime for acclimatisation of new workers. | ▪ Assess work exposure to radiant and convected heat by WBGT index.<br>▪ Other physiological measures as required.<br>▪ Education of workers and provision of water.<br>▪ Assess metabolic heat load associated with physical work.<br>▪ Apply ACGIH TLVs. | ▪ Heat stress can occur in a wide variety of work from external heat, eg boilers, furnaces and sunlight, or from work in hot underground mines.<br>▪ Also from Internally generated heat from heavy physical work – so-called metabolic heat. Beware excess clothing and PPE which reduces heat loss. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Cold** | | ▪ Frostbite and cold 'burns' from cold objects and dry ice.<br>▪ Cold stress (hypothermia) from work in cold environment. | ▪ Examine extremities for frostbite.<br>▪ Nil else specific. | Assess environmental conditions – wind chill factor important so assess air movement *(also consider $CO_2$ levels).* | ▪ Freezer operation and packing foodstuffs in dry ice (where dry ice is used). |
| **Abnormal Atmospheric Pressure** | | ▪ Barotrauma – ears, sinusus and lungs – the 'bends'.<br>▪ Chronic bone and joint damage. | Health assessment as required for diving medicals. | Worker training re risk and recognition of symptoms. | Diving, caisson and tunnel boring. |
| **BIOMECHANICAL HAZARDS** | | | | | |
| **Manual handling the use of force for heavy and / or frequent lift, carry, push, pull** | | Musculo-skeletal injury (acute) or disease. | ▪ General musculo-skeletal assessment.<br>▪ Functional capacity assessment if required.<br>▪ Other general fitness measures, eg CV and respiratory. | ▪ Identify manual handling tasks and conduct ergonomic assessment.<br>▪ WH&S Manual Handling Advisory Standard. | Heavy vehicle maintenance requiring manual handling of heavy vehicle parts, chain blocks, etc. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Ergonomic – poor work postures, lighting, seating design, workstations design, access / egress heavy vehicles and psychological demand** | | Multiple disease risk dependent on nature of the hazard:<br>▪ Musculo-skeletal risk is a large component due to poor match between work demand and operator capability.<br>▪ Fatigue.<br>▪ Eye strain, headache and neck / shoulder conditions due to posture and lighting issues.<br>▪ Psychological 'stress' and psychiatric disorders due to heavy cognitive demand and work pressure. | ▪ Relevant musculoskeletal assessment.<br>▪ Psychological and psychiatric assessment where indicated. | ▪ Ergonomic assessment of plant operations on minesite.<br>▪ Ergonomist input into design and purchase of plant. | ▪ Chronic neck and lower back pain in dozer operator engaged in ripping operations requiring excessive neck rotation while exposed to WBV.<br>▪ Smelter control room operator suffers stress related disorder after causing plant shutdown due to poorly designed control panel. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **PSYCHOLOGICAL HAZARDS** | | | | | |
| **Shiftwork and FIFO** | | ▪ Fatigue.<br>▪ Sleep disorders.<br>▪ Gastro intestinal disorders, dyspepsia and increased risk of ulceration.<br>▪ Social life disruption.<br>▪ Increased heart disease risk. | ▪ Questionnaire re: symptoms, sleep pattern, fatigue and coping strategies.<br>▪ CV assessment and general fitness. | ▪ Expert input into shift patterns to minimise health problems.<br>▪ Fatigue management guideline.<br>▪ Employee assistance program. | Increased accident rate in miners late in shift due to fatigue. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Stress** | | ▪ Various psychological and psychiatric disorders including anxiety and depression.<br>▪ Critical incident stress disorder. | ▪ General health assessment.<br>▪ Psychiatric assessment.<br>▪ Early and vigorous rehabilitation; and<br>▪ Recognition of strong psychological component after physical injury. | ▪ Workplace bullying policy.<br>▪ Employee assistance program including critical incident management policy. | |
| **CHEMICAL HAZARDS** | | | | | |
| **Confined Space Atmospheres**<br>**(a) low oxygen tension**<br>**(b) general confined space entry** | | ▪ Partial or total asphyxia due to consumed or displaced $O_2$.<br>▪ Poisoning by gases and vapours and heat exposure in some situations. | ▪ Access / egress issues re fitness for duty.<br>▪ Assess capacity to wear respiratory protection including SCBA.<br>▪ Consider also likely hazardous substances exposures including CO, $H_2S$, solvents, etc. | ▪ Confined space entry by trained personnel only as per AS 2865 (1995 – *Safe working in a confined space*). | ▪ Asphyxia of workers entering confined space where oxygen has been chemically consumed by rusting.<br>▪ Worker overcome by solvent vapour while painting the interior of a tank. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Hazardous Substance Exposure**<br><br>**(a) airborned dusts, mists, gases, fumes, vapours** | | Disease risk as per NOHSC hazardous substances classification system.<br>▪ Toxic – by inhalation; ingestion; dermal absorption.<br>▪ Irritant – to eyes; to skin; to respiratory system. | ▪ General health assessment plus specific health surveillance as per NOHSC.<br>▪ Health Surveillance Guidelines where available. | | ▪ Poisoning due to inhalation of lead dust and fume in smelter.<br>▪ Many chemicals including solvents, dilute acids and alkalis are skin irritants.<br>▪ Sulphur dioxide in copper smelting is a powerful eye and respiratory irritant. |

## HAZARD IDENTIFICATION CHECKLIST

| HAZARD | HAZARD CHECK BOX | DISEASE RISK | HEALTH SURVEILLANCE | ASSOCIATED MEASURES | EXAMPLES |
|---|---|---|---|---|---|
| **Hazadous Substance Exposure**<br>**(b) by skin and mucous membrane contact** | | ▪ Corrosive – to eyes and skin<br>▪ Sensitiser – to skin and respiratory system.<br>▪ Teratogenic – cause birth defects in developing foetus.<br>▪ Mutagenic – causes mutations and birth defects that are inheritable.<br>▪ Carcinogenic – cause cancer with frequent or long-term exposures. | ▪ Other guidelines from Division of Workplace Health and Safety, ACGIH, etc. | | ▪ Strong acids, alkalis and phenol are corrosive to skin.<br>▪ Acid mist is a powerful respiratory and eye irritant and is corrosive to teeth.<br>▪ Epoxy compounds are potent to skin sensitisers and cause allergic dermatitis.<br>▪ Many chemicals at high doses can affect a developing foetus, eg alcohol.<br>▪ Many cytotoxic drug used for cancer treatment are mutagenic and pose a risk to nursing staff.<br>▪ Polycyclic aromatic hydrocarbons in diesel emissions are carcinogenic. Also found in coal and pose a high lung and bladder cancer risk to coke oven workers. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **BIOLOGICAL HAZARDS** | | | | | |
| **Venomous animals** | | Envenomation | Nil | Ensure at-risk personnel, eg surveying, prospecting, etc, trained to treat snake bite and have appropriate communication equipment. | |
| **Infective agents**<br>**(i) bacterial** | | Local and systemic infection low occupational risk in mining situation. Consider Legionella as example. | Nil specific. Personnel responsible for air conditioning systems should be trained and provided with appropriate PPE – blood testing for Legionella antibodies of little use for health surveillance as half the population has them. | Cooling towers should be drained and cleaned on regular basis as per WH&S Advisory Standard. | |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **(ii) viral** | | No specific disease risk associated with mining. Consider hepatitis A and B and HIV as examples which pose the same risk in the general community. | Nil specific – NMA should ensure at-risk personnel are vaccinated against Hep A and Hep B. | Vaccination policy for all workers exposed:<br>▪ Hep A – personnel including plumbers, waste water maintenance (and child care workers where applicable).<br>▪ Hep B – personnel trained in first aid and rescue.<br>All workplaces should have a HIV policy. | |
| **(iii) fungal** | | Skin infection most likely fungal problem. Tinea an issue, particularly where rubber boots are worn. | Assess foot-care where tinea is an issue. | Hygiene program for workers' showers and education re footcare. | |
| **(iv) parasitic** | | Lice and other parasitic skin infections, various parasitic worm infestations of the gut, other organs and blood. | Nil routine. | Nil | Headlice in schools. Hookworm in 'barefoot communities' with poor hygiene. Malaria in visitors and residents of tropical countries. |

| HAZARD IDENTIFICATION CHECKLIST | | | | | |
|---|---|---|---|---|---|
| **HAZARD** | **HAZARD CHECK BOX** | **DISEASE RISK** | **HEALTH SURVEILLANCE** | **ASSOCIATED MEASURES** | **EXAMPLES** |
| **Non-infective agents of biological origin** | | Nil specific to mining.<br>Allergic respiratory conditions in personnel exposed to fungal spores, animal dander, grain dust and other allergens of biological origin. | Assess respiratory function by questionnaire and respiratory function tests | Nil | Asthma and allergic alveolitis (lung inflammation) in animal house workers and personnel handling mouldy produce. |

# APPENDIX 2

## Confidential Health Assessment Form
## Coal Mine Workers' Health Scheme

**(Form approved under section 281 of the *Coal Mining Safety and Health Act 1999)***

| Name (Full Given Name(s) and Family Name) | Date of Birth |
|---|---|
| | |

**Privacy Obligations**

Health surveillance information is collected by the Department of Natural Resources and Mines for the purpose of conducting research on the identification of conditions which are present in coal mine workers. This work will enable further research into the causes and management of these conditions. It is collected under the authority of Part 6 – Division 2 of the *Coal Mining Safety and Health Regulation 2001*.

The Department will not disclose this information to any person except in accordance with the Regulation. The Regulation requires that your identity be protected when information is disclosed for research purposes.

The results of research assist in improving the occupational health of coal mine workers.

**Guidance Notes for completion of Health Assessment**

**Employer**

- ❑ Must arrange for the Health Assessment of Coal Mine Worker.
- ❑ Must complete Section 1 on page 2 (which includes informing the Examining Medical Officer if a colour vision test and/or chest x-ray is required).
- ❑ Must meet the cost of the Health Assessment.

**Coal Mine Worker**

- ❑ Must bring photo identification to have identity checked by the Examining Medical Officer.
- ❑ Must complete Section 2 on pages 106 to 107.
- ❑ In relation to Section 2 - Work History:
  - ***if the coal mine worker is commencing work*** – full work history must be provided; or
  - ***if the coal mine worker is already employed in the industry*** – only work history since last Health Assessment is required.
- ❑ Should request the Nominated Medical Adviser provide a copy of the Health Assessment Report and an explanation if necessary.

**Examining Medical Officer**

- ❑ Must check photo identification provided by the Employee.
- ❑ Must review Section 2 (pages 2 to 4) with the coal mine worker and comment on any abnormality.
- ❑ Must complete Section 3 on pages 108 and 6.
- ❑ Must attach a separate statement if space on Form is insufficient.
- ❑ Must take advice from the employer on the requirements for a colour vision test and/or chest x-ray.
- ❑ Must **not** complete 'Report on Health Assessment'.
- ❑ Must forward the completed Health Assessment Form (intact) to Nominated Medical Adviser.

**Nominated Medical Adviser**

- ❑ Must review Sections 1, 2 and 3.
- ❑ Must assess whether the Health Assessment provides adequate information to make a report on the fitness for duty of the coal mine worker.
- ❑ If the coal mine worker has an abnormal colour vision and/or hearing result affecting fitness for duty, a practical test should be arranged.
- ❑ Must complete Section 4 - Report on Health Assessment.
- ❑ Must provide an explanation of the copy of *'Report on Health Assessment'* to the Coal Mine Worker and where practical secure the signature of the Coal Mine Worker on the Health Assessment Report:
- ❑ Must provide a copy of *'Report on Health Assessment'* to:
  - the coal mine worker at the address shown on page 2; and
  - the employer.
- ❑ Must forward a copy of '*Health Assessment*' and '*Report on Health Assessment*' to the Health Surveillance Unit of the Department of Natural Resources and Mines.
- ❑ Must maintain secure records of the Health Assessment and associated documentation.

**Approved Sept 2002**

## Section 1 – Employer to complete

**Name of Nominated Medical Adviser**

**Employer**

**Coal Worker's Position - (provide generic job title)**

**Mine (eg Southern Colliery if applicable)**

| | | |
|---|---|---|
| (a) Is the coal mine worker at risk from dust exposure (x-ray needed)? | ❑ Yes | ❑ No |
| (b) Will the coal mine worker be working underground? | ❑ Yes | ❑ No |
| (c) Does the coal mine worker require colour discrimination? | ❑ Yes | ❑ No |
| (d) Is the worker at risk from occupational noise? | ❑ Yes | ❑ No |
| (e) Is the worker at risk from hazardous chemicals? (comment) | ❑ Yes | ❑ No |
| (f) Are there hazardous duties requiring a specific fitness assessment? (comment) | ❑ Yes | ❑ No |

Comment

## Section 2 – Coal Mine Worker to complete

### 2.1 Coal Mine Worker

(a) Family Name | Given Name (s)

(b) Date of Birth | (d) ❑ Male ❑ Female | (e) Telephone:

(c) Address:

### 2.2 Work History (coal mine worker to refer to Guidance Notes on the coversheet)

| Year | | Job Title or Description | Employer |
|---|---|---|---|
| From | To | | |
| | | | |
| | | | |
| | | | |
| | | | |

### 2.3 Health-related History

| | | Yes | No |
|---|---|---|---|
| (a) | Have you previously had a medical examination under this scheme? | ❑ | ❑ |
| (b) | If Yes, when was the last examination? | | |
| (c) | Have you been admitted to a hospital or undergone surgery or an operation? | ❑ | ❑ |
| (d) | Have you ever had an illness or operation that has prevented you from undertaking your normal duties for more than two weeks? | ❑ | ❑ |
| (e) | Have you ever had an injury that has prevented you from undertaking your normal duties for more than two weeks? | ❑ | ❑ |
| (f) | Are you taking any medication? | ❑ | ❑ |
| (g) | Do you use hearing protection whilst in noisy areas? | ❑ | ❑ |
| (h) | Do you currently smoke, or have you ever smoked? | ❑ | ❑ |

(Supply details) START..... STOP ..... TYPE ... ... ... ..... QUANTITY/ DAY .....

Examining Medical Officer's comments on Questions 2.1 to 2.3

**2.4 Have you ever suffered from, or do you now suffer from, any of the following?**

| | | Yes | No | | | Yes | No |
|---|---|---|---|---|---|---|---|
| (a) | Heart disease or heart surgery | ❑ | ❑ | (n) | Diabetes | ❑ | ❑ |
| (b) | Chest pain, angina or tightness in chest | ❑ | ❑ | (o) | Sciatica, lumbago, slipped disc | ❑ | ❑ |
| (c) | High blood pressure | ❑ | ❑ | (p) | Neck injury or whiplash | ❑ | ❑ |
| (d) | Asthma, bronchitis or other lung diseases | ❑ | ❑ | (q) | Back or neck pain which has prevented you from undertaking full duties | ❑ | ❑ |
| (e) | Abnormal shortness of breath or wheezing | ❑ | ❑ | (r) | Knee problems, cartilage injury | ❑ | ❑ |
| (f) | Deafness, loss of hearing or ear problems | ❑ | ❑ | (s) | Fractures or dislocations | ❑ | ❑ |
| (g) | Ringing noises in your ears | ❑ | ❑ | (t) | Shoulder, knee or any other joint injury | ❑ | ❑ |
| (h) | Other hearing difficulties | ❑ | ❑ | (u) | Hernia | ❑ | ❑ |
| (i) | Disease or disorder of the nervous system | ❑ | ❑ | (v) | Arthritis or rheumatism | ❑ | ❑ |
| (j) | Episodes of numbness or weakness | ❑ | ❑ | (w) | Dermatitis, eczema, or skin problems | ❑ | ❑ |
| (k) | Psychiatric illness | ❑ | ❑ | (x) | Allergies | ❑ | ❑ |
| (l) | Blackouts, fits or epilepsy | ❑ | ❑ | (y) | Allergic reaction or reaction to chemicals or dust | ❑ | ❑ |
| (m) | RSI, tenosynovitis, over-use syndrome or wrist strain | ❑ | ❑ | | | | |

**2.5 Previous vaccinations and blood tests**

(a) When were you last immunised against Tetanus? Year ☐

(b) When were you last immunised against Hepatitis A? Year ☐

(c) When were you last immunised against Hepatitis B? Year ☐

(d) When was your last cholesterol test? Year ☐

Examining Medical Officer's comments on Questions 2.4 and 2.5 .....

.....

.....

.....

**Coal Mine Worker's Declaration (to be witnessed by Examining Medical Officer)**

I certify to the best of my knowledge that the above information supplied by me is true and correct. I understand that if any of the information given is knowingly false, my employment may be terminated.

Signature ..... Date / /

Witness ..... Date / /

## Section 3 – Clinical Findings – Examining Medical Officer to complete

| | | |
|---|---|---|
| **3.0** | **ID Check** | Type |
| **3.1** | **Height** | cm |
| **3.2** | **Weight** | kg |

Comment

**3.3 Vision**

**Visual acuity**

| | | Uncorrected | | | Corrected | |
|---|---|---|---|---|---|---|
| | | Right | Left | | Right | Left |
| (a)-(b) | Distant | 6/ | 6/ | (e)-(f) | 6/ | 6/ |
| (c)-(d) | Near | N | N | (g)-(h) | N | N |

**3.4 Visual fields** (by confrontation) Abnormal ❑ Normal ❑

**Colour Vision Test** (if indicated by employer)

**3.5 Ishihara** (if abnormal, the NMA to arrange practical test) Abnormal ❑ Normal ❑

**3.6** Work-related colour vision practical test (if Ishihara test abnormal) Unsatisfactory ❑ Satisfactory ❑

**3.7 Hearing**

| Audiogram | | 500 Hz | 1000 Hz | 1500 Hz | 2000 Hz | 3000 Hz | 4000 Hz | 6000 Hz | 8000 Hz |
|---|---|---|---|---|---|---|---|---|---|
| (a)-(h) | Left | | | | | | | | |
| (i)-(p) | Right | | | | | | | | |

(q) Time since last high noise exposure? hours

(r) Audiogram result Abnormal ❑ Normal ❑

(s) Were hearing aids used Yes ❑ No ❑

(t) Auditory canals Abnormal ❑ Normal ❑

(u) Tympanic membranes Abnormal ❑ Normal ❑

The result is normal if hearing threshold is 40dB or less in the better ear at 500, 1000, 1500 and 2000 Hz. If an abnormal result impacts on a coal mine worker's 'fitness for duty', the NMA should consider a practical test.

Examining Medical Officer's comments on Questions 3.1 to 3.7 (Note any abnormality, including past noise exposure, workers' compensation claims and tinitus)

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**3.8 Cardiovascular System**

| | | Systolic | Diastolic |
|---|---|---|---|
| (a) | Blood Pressure | | |
| (b) | (Repeated if necessary | | |
| (c) | Pulse rate | /min | |

(d) Peripheral pulses Absent ❑ Present ❑

(e) Heart sounds Abnormal ❑ Normal ❑

(f) Evidence of cardiac failure or oedema Yes ❑ No ❑

(g) Varicose veins Yes ❑ No ❑

(h) E.C.G. (if indicated by some abnormality) Abnormal ❑ Normal ❑

Examining Medical Officer's comments on Questions 3.8

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### 3.9 Respiratory system

| Litres | Observed | | Predicted | | Observed/Predicted % | |
|---|---|---|---|---|---|---|
| **Forced exp. Vol. 1 sec- $FEV_1$** | (b) | | (e) | | (h) | |
| **Forced vital capacity - FVC** | (c) | | (f) | | (i) | |
| **$FEV_1$/FVC%** | (d) | | (g) | | | |

**3.10** Spirometry *(abnormal includes FEV1/FVC<70%)* Abnormal ❑ Normal ❑

**3.11** Auscultation of chest Abnormal ❑ Normal ❑

**3.12** (a) Was chest x-ray undertaken (as advised by employer) Yes ❑ No ❑

(b) Date x-ray was taken / / ❑ ❑

(c) Quality of film? Unsatisfactory ❑ Satisfactory ❑

(d) What was the result? (Also attach x-ray film to this Report) Abnormal ❑ Normal ❑

### 3.13 Musculo-skeletal system

| | Abnormal | Normal |
|---|---|---|
| (a) **Lower back** | | |
| (i) Range of movement | ❑ | ❑ |
| (ii) Posture and gait | ❑ | ❑ |
| (iii) Straight leg raising | ❑ | ❑ |
| (b) **Neck** – range of movement | ❑ | ❑ |
| (c) **Joint movements** | | |
| (i) Upper Limbs | ❑ | ❑ |
| (ii) Lower Limbs | ❑ | ❑ |
| (iii) Reflexes | ❑ | ❑ |

### 3.14 Urinalysis and Blood Sugar

| | Present | Absent |
|---|---|---|
| (a) Sugar | ❑ | ❑ |
| (b) Protein/albumin | ❑ | ❑ |
| (c) Blood | ❑ | ❑ |
| (d) Blood sugar analysis (optional) | ❑ | ❑ |

### 3.15 Abdomen

| | | |
|---|---|---|
| (a) Abdominal scars | ❑ | ❑ |
| (b) Abdominal mass | ❑ | ❑ |
| (c) Hernia | ❑ | ❑ |

### 3.16 Skin

| | | |
|---|---|---|
| (a) Eczema, dermatitis or allergy | ❑ | ❑ |
| (b) Skin cancer or other abnormality | ❑ | ❑ |

Examining Medical Officer's comments on Questions 3.9 to 3.16 (where applicable include result of additional testing)

**3.17 Is the coal mine worker's fitness for duty is likely to be affected by any of the following?**

| | | Yes | No |
|---|---|---|---|
| (a) | Dietary Habits | ❑ | ❑ |
| (b) | Exercise routine | ❑ | ❑ |
| (c) | Stress Level | ❑ | ❑ |
| (d) | Alcohol Consumption | ❑ | ❑ |
| (e) | Drugs or medication not prescribed by a doctor | ❑ | ❑ |

**3.18 Is there any reason why the coal mine worker may be not fit for duty in relation to work:**

| | | Yes | No |
|---|---|---|---|
| (a) | As an operator of (or working around) around heavy vehicles | ❑ | ❑ |
| (b) | Underground (including use of self-rescue breathing devices and escape) | ❑ | ❑ |
| (c) | Shift work | ❑ | ❑ |
| (d) | Performing heavy manual handling | ❑ | ❑ |
| (e) | In wet or muddy conditions | ❑ | ❑ |
| (f) | In dusty conditions | ❑ | ❑ |
| (g) | At height or on ladders | ❑ | ❑ |
| (h) | In confined spaces | ❑ | ❑ |
| (i) | While wearing safety footwear or other personal protective equipment such as ear plugs, glasses and respirators | ❑ | ❑ |
| (j) | Another capacity – define …….. | ❑ | ❑ |

Examining Medical Officer's comments on Questions 3.17 and 3.18 ----------

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| **Examining Medical Officer's name and address**<br><br>**Please print or stamp** | **Signature**<br><br>**Date / /** |
|---|---|

# Coal Mine Worker's Health Scheme

## Section 4 - Report on Health Assessment – Nominated Medical Adviser to complete

### Coal Mine Worker's Details

| Family Name | Given Name(s) |
|---|---|
| | |

| Employer | Mine(s) (if applicable) |
|---|---|
| | |

## Examination Details

| Date of Examination by EMO | Position (eg job title (generic)) | Is the assessment for Underground work? |
|---|---|---|
| | | Yes ❑ No ❑ |

**As at the date of this examination, the coal mine worker :**

❑ Is fit to undertake any position

❑ Is fit to undertake the proposed / current position

❑ The coal mine worker has a condition which results in the following restriction(s) (if necessary, outline management program)

---

---

The duration of the restriction is: ---

Is a further review necessary? Yes ❑ Date / / No ❑

Specify full or type of review required: ---

Was a chest x-ray taken? Yes ❑ Date / / No ❑

**As Nominated Medical Adviser, I have explained the restriction / additional assessment to the Coal Mine Worker.**

| I have been advised of the outcome of this assessment. (Practical constraints prevent this from being a compulsory item) | **Coal Mine Worker's Signature** | **Date / /** |
|---|---|---|

| **Nominated Medical Adviser's name and address**<br>**Please print or stamp** | **NMA Signature** | **Date / /** |
|---|---|---|

**Distribution of Report on Health Assessment:**

(a) copy to coal mine worker at address shown on page 2;
(b) copy to employer;
(c) copy of Health Assessment Form to Health Surveillance Unit, Department of Natural Resources and Mines, GPO Box 2454, Brisbane 4001

APPENDIX 3

# MINE AND QUARRY WORKERS' HEALTH ASSESSMENT FORM

**Section 1** This page to be completed by employer

## EMPLOYER DETAILS (CURRENT OR INTENDED)

Company: .....

Site / Mine: .....

Contact person: .....

Address .....

.....

## EMPLOYEE'S PERSONAL DETAILS

Surname: .....

(include former name, if name change has occurred)

Given names: ..... Date of birth: ……/……/……

Contact address: .....

..... Postcode: .....

Name and address ..... ☐ male ☐ female

of private doctor: .....

Workers' position .....

Will the worker be regularly required to work underground? ☐ yes ☐ no

## RISK EXPOSURE DETAILS

A hazard identification / risk assessment has / has not been completed for the above position. There is / will be significant exposure to the following occupational health risks:

| | | | | | |
|---|---|---|---|---|---|
| Noise | ☐ | Ergonomic risks | | | ☐ |
| Vibration | ☐ | Confined space atmospheres | | | ☐ |
| Radiation – non-ionising | ☐ | Hazardous substances: | | | |
| Radiation – ionising | ☐ | – | airborne dusts | | ☐ |
| Heat | ☐ | – | mists, gases, metal fume and vapours | | ☐ |
| Abnormal atmospheric pressure | ☐ | – | skin contact | | ☐ |
| Manual handling risks | ☐ | Infective agents | | | ☐ |
| Shift work | ☐ | Others – attach details | | | |

Signed .....

SSE / Employer

Signed .....

Employee

**Section 2** **(To be completed by applicant / mine or quarry worker)**

## WORK HISTORY

Note:

i. Complete a full work history for initial health assessments or only jobs in the past five years for periodic health assessments.
ii. Include both mining and non-mining jobs (if outside of Queensland indicate state). Duration is important, please record from / to dates as precisely as possible.
iii. For employees who work in the same job for short periods of time (less than three months) at a number of minesites or other workplaces, 'various' may be substituted for the employer or minesite.
iv. Indicate whether or not a job is underground (u/g), if not obvious in job description.
v. Avoid general descriptions such as 'operator', 'mineworker', 'miner', 'technician', 'maintenance' or 'student'.

Usual occupation / trade: _____

| Proposed / Current job | Period of time (fill in either of the following) | | Current / New Employer | Mine or other work site |
|---|---|---|---|---|
| | Duration (yy/mm) | From – To (mm/yy – mm/yy) | | |
| | …… / …… | …… / …… | | |
| **Previous jobs** (most recent first) | **Period of Time** | | **Employer** | **Mine or other work site** |
| | Duration (yy/mm) | From – To (mm/yy – mm/yy) | | |
| 1. | …… / …… | …. /…. – …. / …. | | |
| 2. | …… / …… | …. /…. – …. / …. | | |
| 3. | …… / …… | …. /…. – …. / …. | | |
| 4. | …… / …… | …. /…. – …. / …. | | |
| 5. | …… / …… | …. /…. – …. / …. | | |
| 6. | …… / …… | …. /…. – …. / …. | | |
| 7. | …… / …… | …. /…. – …. / …. | | |
| 8. | …… / …… | …. /…. – …. / …. | | |

(if insufficient space, please attach list)

## SPORTING AND LEISURE ACTIVITIES

Do you regularly undertake any of the following activities:

| | | | |
|---|---|---|---|
| Shooting | ☐ | Driving farm or heavy equipment | ☐ |
| On or off-road motor sport | ☐ | Rodeo activities | ☐ |

## MEDICAL HISTORY

Name: ..... DOB: ..... Today's date: .....

Have you previously had a medical examination under this scheme or the Coal Mine Workers' Health Scheme? ☐ yes ☐ no

If yes, when was the last examination?

Have you ever been diagnosed with diabetes? ☐ yes ☐ no

Have you ever suffered from epilepsy or narcolepsy? ☐ yes ☐ no

Details of other illnesses, operations or injuries: .....

.....

.....

Comment by examining medical officer:

Are you taking any medication prescribed by a doctor?

Or over the counter medication not prescribed by a doctor?

**Do you smoke?** ☐ yes ☐ no

If yes – how many cigarettes per day?

– for how many years?

If no – have you ever smoked? ☐ yes ☐ no

– when did you stop?

– how many cigarettes did you smoke per day?

– or grams of tobacco per week?

**Alcohol**

Current consumption

– non-drinker

– full-strength beer (cans / stubbies / week)

– light beer (cans / stubbies / week)

– spirits (nips or mixed cans / week)

– wine (glasses / week)

## HEALTH QUESTIONNAIRE

### Respiratory System

Do you usually cough when you first get up or during the day? ☐ yes ☐ no

If yes do you cough up phlegm on most days for as much as three months of each year? ☐ yes ☐ no

Have you noticed a wheeze in the chest in the past three years? ☐ yes ☐ no

If yes was it:

(1) associated with a cold? ☐ yes ☐ no

(2) associated with an asthma attack? ☐ yes ☐ no

(3) present on more than three occasions in a year? ☐ yes ☐ no

Do you experience abnormal shortness of breath? ☐ yes ☐ no

If yes, do you notice it:

- only when walking up hill? ☐ yes ☐ no
- on level walking at own pace? ☐ yes ☐ no
- on level hurrying? ☐ yes ☐ no
- at rest? ☐ yes ☐ no

Have you ever been diagnosed with sleep apnoea? ☐ yes ☐ no

### Cardiovascular system

Do you suffer from hypertension (high blood pressure)? ☐ yes ☐ no

Have you ever suffered from, or do you now suffer from, chest pain or discomfort? ☐ yes ☐ no

If yes, did you see a doctor? ☐ yes ☐ no

If you did was the diagnosis any of the following?

| | | | |
|---|---|---|---|
| ☐ | Angina | ☐ | Pleurisy |
| ☐ | Possible angina | ☐ | Chest wall pain |
| ☐ | Heart attack | ☐ | Dyspepsia or reflux |
| ☐ | Abnormal hearth rhythm | | |

### Gastro Intestinal Tract

Have you noticed any regular change in appetite? ☐ yes ☐ no

Indigestion? ☐ yes ☐ no

Dyspepsia? ☐ yes ☐ no

Abdominal pain? ☐ yes ☐ no

Have you noticed any change in your weight recently (more than 5 kg up or down)? ☐ yes ☐ no

Have you vomited any blood or noticed your bowel motions were dark coloured or blood stained? ☐ yes ☐ no

**Urinary Tract**

Have you suffered from kidney or bladder infections in the past? ☐ yes ☐ no

Do you notice any pain or burning when passing urine? ☐ yes ☐ no

Have you ever had renal colic or kidney stones? ☐ yes ☐ no

**Musculo-skeletal system**

(a) Have you ever had any pain in your back that has kept you off work or caused you to be assigned alternative duties? **[if no go to (b)]** ☐ yes ☐ no

If yes: How many times within the past three years? ☐

Did you have pain in either leg associated with it? ☐ yes ☐ no

Did you lose more than two consecutive weeks away from normal duties? ☐ yes ☐ no

Did you see a specialist or a physiotherapist or chiropractor? ☐ yes ☐ no

Have you had an operation on your back? ☐ yes ☐ no

(b) Have you ever had neck pain that has kept you off work? **[if no go to (c)]** ☐ yes ☐ no

If yes: How many times in the last three years? ☐ yes ☐ no

Did you have pain, pins and needles or numbness in the arms? ☐ yes ☐ no

Did you lose more than two consecutive weeks work? ☐ yes ☐ no

(c) Have you ever had a shoulder, arm or hand injury that has kept you off work? **[if no go to (d)]** ☐ yes ☐ no

If yes: Were you off work for more than two weeks? ☐ yes ☐ no

Did you see a specialist? ☐ yes ☐ no

Have you had an operation to correct the problem? ☐ yes ☐ no

(d) Have you ever had an injury to a knee that has kept you off work or caused you to be assigned alternative duties? **[if no go to (e)]** ☐ yes ☐ no

If yes: Have you had a cartilage removed? ☐ yes ☐ no

Have you had a ligament injury? ☐ yes ☐ no

Have you had any other operation on a knee? ☐ yes ☐ no

Does your knee give way, lock-up or 'come out of joint'? ☐ yes ☐ no

(e) Have you ever had any other problem with your legs, ankles or feet requiring professional treatment and/or two weeks or more absence from normal duties? ☐ yes ☐ no

Examining medical officer's comment:

**Nervous system**

Have you ever been diagnosed with a disease or disorder of the nervous system? ☐ yes ☐ no

If yes, describe condition and approximate date of diagnosis:

Have you ever suffered blackouts or fits? ☐ yes ☐ no

Have you ever suffered episodes of numbness or weakness? ☐ yes ☐ no

Have you ever been diagnosed with a psychiatric illness? ☐ yes ☐ no

If yes, what was the diagnosis?

Are you still receiving treatment? ☐ yes ☐ no

**Hearing**

Do you suffer from poor hearing in either or both ears? ☐ yes ☐ no

Do you ever notice ringing, hissing or humming noises in the ear(s)? ☐ occasionally ☐ always ☐ no

Do you wear hearing protection in a noisy environment? ☐ no ☐ sometimes ☐ always ☐ n/a

What type of protection do you wear? ☐ Muffs ☐ Plugs ☐ Both

**Skin**

Have you had any skin problems? ☐ yes ☐ no

If yes what was the nature of the problem?

☐ Solar keratoses ☐ Skin cancers ☐ Eczema ☐ Dermatitis

☐ Bacterial (eg boils) or fungal infection (eg tinea) ☐ Other

Did you see a specialist? ☐ yes ☐ no

Was the condition caused by your work? ☐ yes ☐ no

**Allergies**

Do you suffer from any allergies? ☐ yes ☐ no

If yes, what is the nature of the allergy?

Have you ever suffered an allergic reaction to chemicals or dust? ☐ yes ☐ no

If yes, describe:

**Vaccinations**

Have you been fully immunised against:

| | | |
|---|---|---|
| Tetanus? | ☐ yes | ☐ no |
| Hepatitis A? | ☐ yes | ☐ no |
| Hepatitis B? | ☐ yes | ☐ no |
| Q-Fever? | ☐ yes | ☐ no |

Other vaccinations (describe): .....

**Shiftwork**

Have you worked shiftwork in the last two years? ☐ yes ☐ no

If yes, please indicate if you believe that shiftwork has caused you any health problems, including:

| | |
|---|---|
| ☐ Excessive fatigue | ☐ Sleep problems |
| ☐ Change in appetite | ☐ Dyspepsia (pain or discomfort after meals) |
| ☐ Mood change | ☐ Drowsiness at work |
| ☐ Other (describe) | |

Worker's Declaration (to be witnessed by Examining Medical Officer)

I certify to the best of my knowledge that the above information supplied by me is true and correct. I understand that if any of the information given is knowingly false, my employment may be terminated.

Signature ..... Date / /

Witness ..... Date / /

Examining Medical Officer's comments on sections 3 and 4 – medical history and health questionnaire

Section 5

## CLINICAL FINDINGS

ID Check Licence ☐ Passport ☐ Other ☐ (No of licence or passport)

Height | Weight | BMI

**Vision** **Visual acuity**

| | Uncorrected | | | Corrected | | Abnormal ☐ | Normal ☐ |
|---|---|---|---|---|---|---|---|
| | Right | Left | | Right | Left | | |
| Distant | 6/ | 6/ | | 6/ | 6/ | | |
| Near | N | N | | N | N | | |

Colour Vision Test

Ishihara (if abnormal, the EMO to arrange practical test) Abnormal ☐ Normal ☐

Work-related colour vision practical test (where applicable) Unsatisfactory ☐ Satisfactory ☐

Visual fields Abnormal ☐ Normal ☐

**Urinalysis and blood sugar**

Blood Negative ☐ Positive ☐ Blood sugar level (where indicated)

Glucose Negative ☐ Positive ☐

Protein Negative ☐ Positive ☐

**Cardiovascular system**

| | **Systolic** | **Diastolic** | |
|---|---|---|---|
| Blood pressure | | | |
| (Repeated if necessary) | | | |
| Pulse rate | | / min | |
| Peripheral pulses | Absent ☐ | Present ☐ | |
| Heart sounds | Abnormal ☐ | Normal ☐ | |
| Evidence of cardiac failure or oedema | Yes ☐ | No ☐ | |
| Varicose veins | Yes ☐ | No ☐ | |
| E.C.G. (if indicated by history or clinical findings) | Abnormal ☐ | Normal ☐ | |

Comment:

**Respiratory system**

Auscultation of chest — Abnormal ☐ Normal ☐

Chest x-ray indicated **(see section 7)** — Yes ☐ No ☐

Date of x-ray / /

X-ray taken by

X-ray reported by

X-ray result (please attach report) — Abnormal ☐ Normal ☐

**Lung function (spirometry)** **Room temperature** _____ °C

Make: of spirometer: _____

Date of last volume (syringe) calibration: _____

Measurement results (please attach graph to this form):

*Two acceptable, reproducible results (within ± 5% or 0.2L) to be obtained*

| | Test 1 | Test 2 |
|---|---|---|
| $FEV_1$ | | |
| FVC | | |

Using best result (maximum $FEV_1$ and maximum FVC from any test)

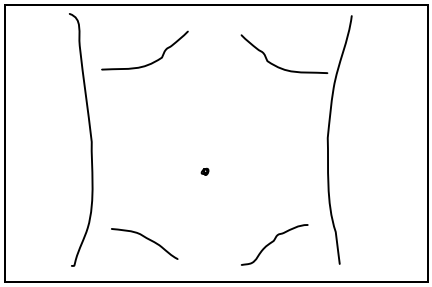
| | Measured | Predicted | % Predicted |
|---|---|---|---|
| $FEV_1$ | | | |
| FVC | | | |
| $FEV_1$ / FVC (%) | | | |

Bronchodilator use? Yes ☐ No ☐

If yes, how long before test? _____ minutes / hours

Comments:

**Abdominal examination**



| | | |
|---|---|---|
| Abdominal viscera | Abnormal ☐ | Normal ☐ |
| Abdominal mass | Present ☐ | Absent ☐ |
| Hernia | Yes ☐ | No ☐ |

**Musculoskeletal system**

| | Comments if abnormal | Tick box if normal |
|---|---|---|
| Cervical spine | | |
| i. neck / head posture | | ☐ |
| ii. musculature | | ☐ |
| iii. range of movement | | |
| Thoraco – lumbar spine | | |
| i. posture / gait | | ☐ |
| ii. range of movement | | ☐ |
| iii. musculature / strength | | ☐ |
| iv. straight leg raising (L) | | ☐ |
| (R) | | ☐ |
| Upper limbs – (L) | | |
| i. musculature / strength | | ☐ |
| ii. range of movements: | | |
| a. shoulder | | ☐ |
| b. elbow | | ☐ |
| c. wrist | | ☐ |
| d. hand | | ☐ |
| iii. reflexes | | ☐ |
| Upper limbs – (R) | | |
| i. musculature / strength | | ☐ |
| ii. range of movements: | | |
| a. shoulder | | ☐ |
| b. elbow | | ☐ |
| c. wrist | | ☐ |
| d. hand | | ☐ |
| iii. reflexes | | ☐ |

| | Comments if abnormal | Tick box if normal |
|---|---|---|
| Lower limbs – (L)<br>i. musculature / strength | | ☐ |
| ii. range of movements: | | |
| a. hip | | ☐ |
| b. knee | | ☐ |
| c. ankle | | ☐ |
| iii. reflexes | | ☐ |
| iv. gait | | ☐ |
| Lower limbs – (R)<br>i. musculature / strength | | ☐ |
| ii. range of movements: | | |
| a. hip | | ☐ |
| b. knee | | ☐ |
| c. ankle | | ☐ |
| iii. reflexes | | ☐ |
| iv. gait | | ☐ |

**Hearing**

| Audiogram | 500 Hz | 1000 Hz | 1500 Hz | 2000 Hz | 3000 Hz | 4000 Hz | 6000 Hz | 8000 Hz |
|---|---|---|---|---|---|---|---|---|
| Right | | | | | | | | |
| Left | | | | | | | | |

| High frequencies repeated (AS 1269.4 [1998]) | | | | |
|---|---|---|---|---|
| | Right | | | |
| | Left | | | |

| **Calculation** (AS 1269.4 [1998]) | Right | | | Left | | |
|---|---|---|---|---|---|---|
| | 3000 Hz | 4000 Hz | 6000 Hz | 3000 Hz | 4000 Hz | 6000 Hz |
| 1st test | | | | | | |
| 2nd test | | | | | | |
| **Mean** | | | | | | |
| Average of 6 tests | | | | | | |

| | | |
|---|---|---|
| Time since last high noise exposure? | | |
| Audiogram result | Abnormal ☐ | Normal ☐ |
| Were hearing aids used? | Yes ☐ | No ☐ |
| Auditory canals | Abnormal ☐ | Normal ☐ |
| Tympanic membranes | Abnormal ☐ | Normal ☐ |

Examining Medical Officer's comments on hearing (note any abnormality, including past noise exposure and tinnitus)

**Skin**

| | | |
|---|---|---|
| Eczema, dermatitis or allergy? | ☐ yes | ☐ no |
| Skin cancer | ☐ yes | ☐ no |
| Other abnormality | ☐ yes | ☐ no |

Examining Medical Officer's comments on Section 5 – Clinical Findings and Recommendations

Examining Medical Officer: .....

Signature ..... Date ...../……../……..

Practice stamp

Telephone ……..

Appointed Medical Officer's comment:

**Section 6**

## MINE OR QUARRY WORKER'S HEALTH ASSESSMENT REPORT

Appointed Medical Officer to complete

**Mine or quarry worker's details**

| Family Name | Given Name(s) |
|---|---|
| | |

| Employer | Mine (or other work site) |
|---|---|
| | |

**Examination Details**

| Date of examination by AMO | Position (eg job title (generic)) | Is the assessment for underground work? |
|---|---|---|
| | | |

As at the date of this examination, the mine worker:

☐ 1. Is capable of undertaking all work activities as indicated in the risk assessment information for the proposed position

☐ 2. Is capable of most work activities but has a medical condition for which some accommodation may be appropriate in the following areas:

- _____
- _____
- _____

☐ 3. Is capable of most work activities but has a medical condition which results in the following restrictions:

- _____
- _____
- _____

☐ 4. Is capable of some work activities but has a medical condition which results in the following restrictions:

- _____
- _____
- _____

☐ 5. Currently has a medical condition for which any work activity is inappropriate

☐ 6. Biological monitoring for .....[hazardous substance] exceeds action level / removal level

.....

.....

.....

The duration of the restriction is: .....

Recommendations for review, additional assessment or ongoing health surveillance .....

.....

.....

.....

**As Appointed Medical Officer, I have explained the restriction / additional assessment to the mine/quarry worker**

| | | |
|---|---|---|
| I have been advised of the outcome of this assessment | Applicant's / Mine Worker's Signature | Date / / |

| | | |
|---|---|---|
| I hereby give permission for the appointed medical officer to request further information from<br><br>(Insert practitioner's name) | Applicant's / Mine Worker's Signature | Date / / |

*Authorisation*
I agree to the release of a full copy of this medical assessment to the Department of Natural Resources and Mines for the purposes of occupational health research or where, as an existing mine or quarry worker, the Health Assessment Report places me in categories 3, 4, 5 or 6.

Existing mine or quarry worker's signature

| | | |
|---|---|---|
| Appointed Medical Officer's name and address<br><br>Please print or stamp | AMO Signature | Date / / |

Distribution of Health Assessment Form (section 6):
(a) copy to applicant / mine or quarry worker at address shown in section 1
(b) copy to employer
(c) where an existing mine or quarry worker falls into categories 3, 4, 5 or 6, a complete copy of Health Assessment form to Health Surveillance Unit, Department of Natural Resources and Mines, GPO Box 2454, Brisbane 4001.

## REQUIREMENTS FOR CHEST X-RAY

A chest x-ray should be included in the assessment where:

1. The work history includes a collective exposure of five years or more in any one or more of the categories listed below.
2. As a baseline record where a newly appointed mine or quarry worker is likely to be exposed to significant dust levels (see risk exposure details – **section 1**).
3. Where clinical assessment indicates the need.

### Designated work categories

#### Underground mining work categories

Foreman / shift boss

Production / development

Longhole drill and blast

Diamond drillers / raise borers

Loading / transport

Ground / roof support

Service occupations

#### Surface mining and quarrying work categories

Blast hole drilling

Charging and blasting

Exploration activities – drilling / sampling

Open cut service occupations (eg dump spotters)

Sample preparation

Sampler

Sampler plant operator

Crushing / screening operator

#### Non-mining work categories

Sandblasting with silica sand (beach sand, white sand or river sand)

Stone masonry

Tunnelling

Rock drilling (construction)

Foundry work

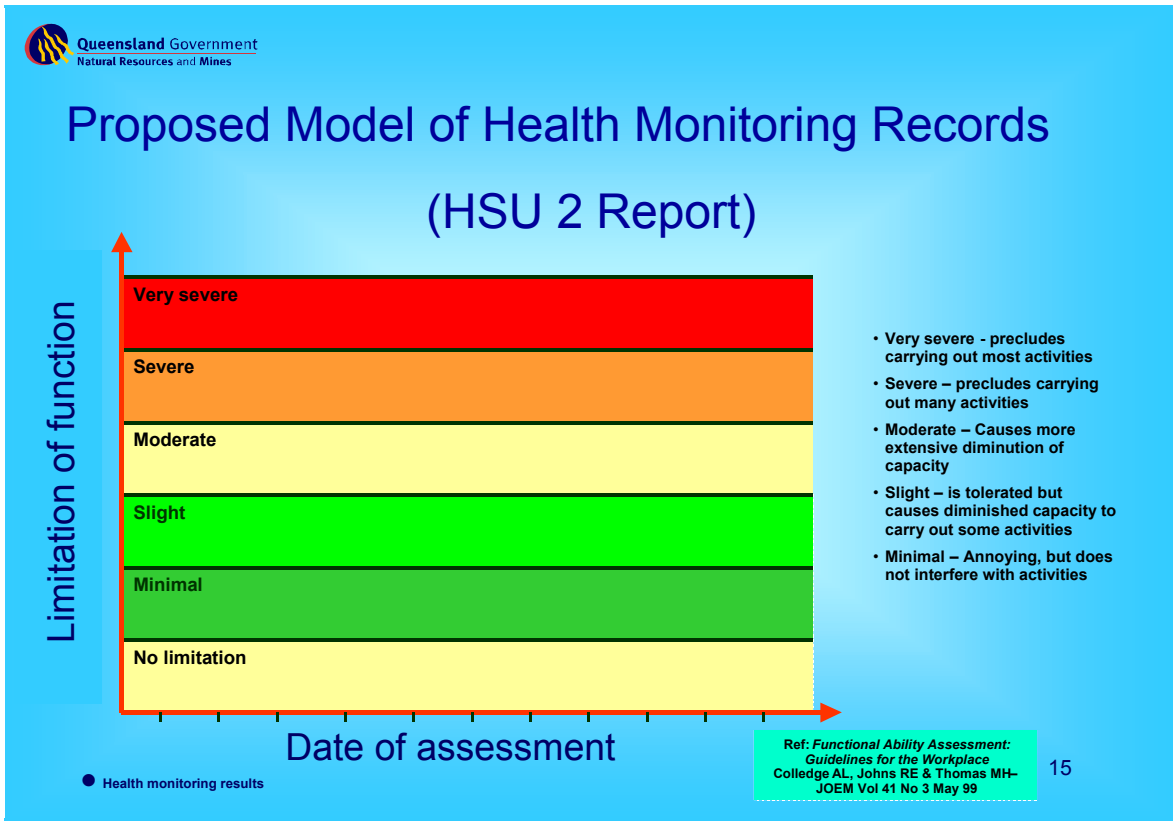
Concrete chasing and grinding

Any occupations involving potential significant exposure to asbestos

(eg asbestos removal occupations)

Cadmium smelting

# APPENDIX 4


Queensland Government
Natural Resources and Mines
Proposed Model of Health Monitoring Records
(HSU 2 Report)
Limitation of function
Very severe
Severe
Moderate
Slight
Minimal
No limitation
Date of assessment
Health monitoring results
• Very severe - precludes carrying out most activities
• Severe – precludes carrying out many activities
• Moderate – Causes more extensive diminution of capacity
• Slight – is tolerated but causes diminished capacity to carry out some activities
• Minimal – Annoying, but does not interfere with activities
Ref: Functional Ability Assessment: Guidelines for the Workplace
Colledge AL, Johns RE & Thomas MH–
JOEM Vol 41 No 3 May 99
15

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Natural Resources and Mines

## Health Surveillance Unit - Location

| Location | Advantages | Disadvantages | Comment |
|---|---|---|---|
| Brisbane Safety and Health - Head Office | • Centralised<br>• Already similar functions and some staff with existing networks<br>• Centralised database – could be easily modified<br>• Simplifies annual reporting<br>• Readily available to management<br>• Ready access to other government information departments – QCOS, Qcomp, etc<br>• Close liaison with inspectorate to follow-up on adverse findings<br>• Acceptable to stakeholders<br>• Can access Sintars staff readily | Cost<br>• Expanded function may need additional staff at professional level – this would be a cost in any location | |

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### Health Surveillance Unit – Location *(cont)*

| Location | Advantages | Disadvantages | Comment |
|---|---|---|---|
| Simtars | • Already existing health and safety professionals – others, eg ergonomist would fit in readily<br>• Some staff already involved in analysis of data<br>• Extensive familiarity with mines – both coal and metalliferous<br>• Training expertise for inspectorate competencies<br>• Accepted by industry | • Possible conflict of interest as private provider of occupational hygiene / safety services<br>• May require funding if officers primarily now involved in commercial activities are used for non-commercial activities<br>• Not recognised as regulator (nor should it be) | |

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Health Surveillance Unit – Location *(cont)*

| Location | Advantages | Disadvantages | Comment |
|---|---|---|---|
| Regional offices | • Regional development in line with government policy<br>• Enable closer ties with the industry at site level<br>• Local inspectorate may gain better overall view of health in their industry<br>• Closer to health providers<br>• Ability for health and mining staff to share local knowledge | • Staff / information not readily available to management would require electronic "meetings" and report development<br>• Difficult to choose which regional office (the largest Rockhampton for coal – not suitable metalliferous)<br>• Not centralised, would require increased support staff and possible transfer of existing personnel<br>• Few specialist occupational health providers in regions<br>• More difficult to maintain networks with external providers of data (Q Comp, etc)<br>• Away from stakeholders<br>• Database will require regionalising (networking) some security issues<br>• Some health issues would need to be considered on a non-regional locality owing to reducing sampling numbers | |

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Health Surveillance Unit – Location *(cont)*

| Location | Advantages | Disadvantages | Comment |
|---|---|---|---|
| QMC / Private provider | • Take responsibility for day to day running from department<br>• Allows staff down-sizing<br>• More consistent with "duty of care" principles | • QMC is employer organisation unlikely to find support with unions<br>• Finding a private provider who could handle confidential medical information may not be easy or acceptable<br>• Would require constant liaison for annual report preparation<br>• Private providers have profit motive rather than health and safety outcome<br>• QMC unlikely to want follow-up on adverse findings / results<br>• Would probably need supervision from department which counteracts many of the advantages<br>• Requires increased auditing by Safety and Health to ensure compliance<br>• May cost more than in-house proposal | |

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**Health Surveillance Unit – Location *(cont)***

| Location | Advantages | Disadvantages | Comment |
|---|---|---|---|
| Queensland Health | • Keeps confidential medical information in acceptable way<br>• Existing epidemiological data collected – would readily fit existing system – public health if there is a will<br>• Would probably be acceptable to social partners – seen as independent | • Queensland health has no occupational health expertise<br>• It is unlikely to want to marry its own data with health surveillance<br>• Not always an easy department to work with<br>• Resources consumed by the hospital system<br>• Access by Safety and Health to data will be restricted | |

# APPENDIX 6

## COST to NRM to IMPLEMENT PROPOSAL for HEALTH SURVEILLANCE UNIT

| Element | Cost $ 2003-04 | Cost $ 2004-05 | Cost $ 2005-06 | Comments |
|---|---|---|---|---|
| **OPERATIONAL COSTS** | | | | |
| Manager – Salary and on-costs | 94,000 | 98,000 | 102,000 | |
| Data Administrator – Salary and on-costs | | 55,000 | 57,000 | |
| Data Entry Officer (part-time) | 25,000 | Nil | Nil | |
| Occupational Health Specialist (part-time) | 90,000 | 94,000 | 25,000 | |
| Medical Panel | 8,000 | 8,000 | 8,000 | |
| Travel Expenses | 10,000 | 10,000 | 10,000 | |
| Printing | 10,000 | 5,000 | 5,000 | |
| Telephones | 4,000 | 4,000 | 4,000 | |
| Computer desktop charge | 6,000 | 6,000 | 6,000 | |
| Miscellaneous | 15,000 | 15,000 | 15,000 | |
| **Total Operational Costs** | **262,000** | **295,000** | **232,000** | |
| | | | | |
| **CAPITAL COSTS** | | | | |
| Computer – Contractor | 50,000 | Nil | Nil | Development of facilities for the electronic lodgment of health reports |
| **Total Capital Costs** | **50,000** | **Nil** | **Nil** | |
| **TOTAL COST** | **312,000** | **295,000** | **232,000** | |