



ANGLO AMERICAN METALLURGICAL COAL PTY LTD

**Submission to the Queensland
Parliament's Coal Workers'
Pneumoconiosis Select Committee**

16 November 2016

1. Introduction

Anglo American Metallurgical Coal PTY LTD (hereafter Anglo American) is a globally diversified mining business and in Queensland, Anglo American currently operates three underground and two open cut coal mines.

The safety, health and well-being of our employees at all our operations is Anglo American's number one priority. We are committed to providing the safest possible work-places through effective technical and engineering support, risk based safety and health management systems, proactive leadership and ongoing consultation with our workforces.

Anglo American is concerned about the recent emergence of cases of Coal Worker's Pneumoconiosis (CWP) in Queensland. Clearly, this is a potentially serious and debilitating disease and Anglo American underground mines have taken very substantial actions on many fronts to ensure members of our workforces are not exposed to excess levels of dust. A range of these actions is detailed in this submission.

This submission will not deal with the historical issues of how it was believed that CWP had been eradicated in Queensland and how a number of cases have unexpectedly resurfaced in recent times. It is understood these issues have been dealt with extensively in the Queensland Resources Council (QRC) submission to the CWP select committee and Anglo American fundamentally supports the views of the QRC in this regard. It is sufficient to state that it would appear all parties who have or have had some role in the prevention, detection, communication and / or management of CWP including unions, various medical professionals, coal mine operators, mine site personnel, the Department of Natural Resources and Mines and its Health Services Unit were, until recently, totally unaware that a CWP issue existed in the Queensland coal mining industry.

As such, this submission will primarily address the actions Anglo American has taken since becoming aware of the emergence of the recent cases of CWP to ensure the continuing health and safety of the members of our workforces. These actions have included, inter alia, offering and arranging further chest x-rays for employees; improved processes for appointing and communicating with our Nominated Medical Advisers; substantially increased dust monitoring regimes at all underground mines; introduction of real time dust monitors; introduction of site dust committees; **very significant engineering and design improvements to further minimise dust emissions and/or personal exposures to dust**; improved respiratory protection equipment and personnel training.

Finally, it is assumed that the CWP select committee will have thoroughly reviewed the findings of the Federal Senate Select Committee on Health's inquiry into the 're-emergence of the pneumoconiosis disease'. As such, this submission will comment on a number of issues raised in the Senate Select Committee's report that Anglo American considers require further clarification.

2. QRC submission responses to the Monash / UIC review and the Senate Select Committee on Health's inquiry into the 're-emergence' of pneumoconiosis

In its submission to the CWP select committee, the QRC makes a number of responses and states its position with regards to the recommendations arising from the recent Monash / UIC 'Review of Respiratory Component of the Coal Mine Workers' Health Scheme for the Queensland Department of Natural Resources and Mines – Final Report', (12/July 2016) and the recommendations arising from the Senate Select Committee on Health's inquiry into the 're-emergence of pneumoconiosis'. Notwithstanding the succinct nature of these responses and position statements, Anglo American is generally aligned with and supportive of, the QRC responses and position statements to these recommendations.

3. Overview of Anglo American group underground operations in Queensland

Anglo American operates three underground coal mines in Queensland. These are:

- Grasstree Mine – located some 50 kilometres from the township of Middlemount;
- Moranbah North Mine – located some 20 kilometres from the town of Moranbah; and
- Grosvenor Mine – the recently developed mine that commenced mining operations in May this year – located some 5 kilometres west of Moranbah.

The collective production from these three mines is of the order of 14 million tonnes of saleable metallurgical coal, all of which is exported to various markets globally.

4. Anglo American improvement approaches / actions since becoming aware of the recent cases of CWP

4.1. Further chest x-rays for Anglo American coal mine workers / improved medical capability

4.1.1. Grasstree

Given the emerging concerns regarding the effectiveness of the respiratory component of the Coal Mines Health Scheme, all underground employees at Grasstree Mine were offered and subsequently accepted the opportunity to undergo a new chest x-ray in December 2015. The coordination of appointments for the x-ray process was managed by the site's regional Nominated Medical Adviser (NMA) through a private medical service provider (to deal with the relatively large numbers of persons in a concentrated time frame). A specialist radiologist was engaged to review all x-rays in accordance with the ILO International Classification of Radiographs of Pneumoconiosis.

All results were returned to the individual coal mine workers by the NMA and any follow-up investigations were advised by the NMA. A Coal Mine Workers Health Scheme 'Section 4'

report was provided to the site to advise the process had been completed for each underground coal mine worker.

In total, 295 underground coal mine workers underwent this x-ray process. Of these 295 x-rays, concerns were raised regarding the respiratory health of two coal mine workers. One was a known CWP case and the second was a new possible case that has not yet been confirmed as CWP. It is understood the x-rays of the other 293 coal mine workers were clear.

In addition to the above, Grasstree has recently offered all employees the opportunity to have the abovementioned chest x-rays read by a 'B Reader' as per the recently updated Coal Mine Worker Health Scheme's 'New Chest X-Ray (reading) Process'. However, uptake of this offer has been slow.

4.1.2. Moranbah North

Since December 2015 Moranbah North has been offering all employees the opportunity to undergo new chest x-rays. 122 employees have indicated they accepted the offer to date. The process implemented to have these further x-rays conducted was similar to that adopted at Grasstree with the x-rays being read by a specialist radiologist in accordance with the ILO Standard. To date, 68 coal mine workers have had further chest x-rays taken with no evidence of CWP being identified in any of these coal mine workers.

Subsequent to the Coal Mine Workers Health Scheme's 'New Chest X-Ray Process', further offers are being made to employees to have their x-rays read as per this two reader process. 53 employees accepted this offer and the further reading of these x-rays continues currently. To date, no cases of CWP have been identified by this second reader process.

4.1.3. Grosvenor

Grosvenor Mine has a relatively new workforce having commenced full operations in early 2016. All Anglo American employees and members of the contractor workforce have undergone full Coal Mine Worker pre-employment medical assessments within the last two years. Regardless, all employees and embedded contractors were offered the opportunity to undergo new chest x-rays. To date, almost 100 of these coal mine workers have had a further x-ray and a further 160 have received referrals for x-rays. Anglo American is not aware of any cases of CWP that have been identified as a result of these further x-rays to date.

4.1.4. Anglo American group open cut mines

Where any employee at Anglo American group open cut mines express concerns regarding their respiratory health, these employees are offered a chest x-ray as per the Coal Mine Workers Health Scheme's 'New Chest X-Ray Process'.

4.1.5. Ex-employees

Further to all of the above, Anglo American has recently instigated a process of offering chest x-rays for ex-employees who have concerns regarding their respiratory health. As part of this process, it will be ensured that any such chest x-rays will be read in accordance with the Coal Mine Workers Health Scheme 'New Chest X-Ray Process'. Appropriate individual information will be provided to the DNRM such that these can be subject to the second US reader process and the information captured in the DNRM database.

4.1.6. Rationalisation and communication with Nominated Medical Advisers / Improved medical capability

Earlier this year, Anglo American reviewed the numbers and geographical spread of each site's NMAs. As a result, the Anglo American coal mines' SSEs re-issued NMA appointments to only those medical practitioners whose services were specifically required for the purpose of management of the Coal Mine Workers Health Scheme. The DNRM has been provided with the updated rationalised of list Anglo American NMAs.

During the re-appointment process, Anglo American took the opportunity to ensure all of its NMAs were fully acquainted with the specific requirements and responsibilities inherent to the NMA role and that they are all fully appraised of the updated 'New Chest X-Ray Process'. All of these recently appointed / re-appointed NMAs have formally accepted these specific requirements and responsibilities.

In order to enhance occupational health and occupational medical capability for all Anglo American Australian mines, a Chief Medical Officer (CMO) has been appointed to advise and assist Anglo American and its mines on occupational health and medical matters. Dr Robert McCartney – a recognised specialist in occupational health and medicine with extensive experience in the coal mining industry is the Anglo American CMO. Dr McCartney is also appointed as an NMA for all Anglo American sites and, amongst other responsibilities, he is required to liaise closely with regional NMAs to assist and advise on occupational health and medical matters and to ensure high quality processes around the Coal Mine Workers Health Scheme are maintained.

In addition, the CMO provides Anglo American with current leading practice information and advice on occupational health and medical risks and their management.

4.2. Increased dust monitoring regimes and responses to exceedances

In order to obtain a more detailed understanding of dust emissions profiles at all Anglo American underground mines, the frequency of dust sampling campaigns and the numbers of dust samples taken during each dust sampling campaign period have been increased dramatically in the past two years. In 2016 dust sampling campaigns in Anglo American underground mines are typically conducted on a weekly or fortnightly basis during routine mine production periods.

Where any personal dust sampling result exceeds the site's dust exposure standards a formalised response to these exceedances has been implemented at each site. Whilst these responses differ slightly between sites – all essentially comprise the following steps:

- The exceedance is classified as an incident and hence an investigation is initiated;
- The personal dust sampling results of all persons who wore the dust samplers on the shift are reviewed to verify if the exceedance was an isolated case or whether more than one person experienced an exceedance;
- The personal dust results revealing the exceedance and the associated personal 'work activity log sheet' (Appendix I) and the Explosion Risk Zone (ERZ) Controller's¹ work activity log sheet for the shift are sent to and discussed with the affected coal mine worker/s; Discussions with the affected coal mine worker/s are conducted with the view to determining how / why there was a dust exceedance associated with the coal mine worker's activities on the shift when the sample was taken. As a result, contributing factors are identified and actions are taken to prevent a recurrence;
- A review of the effectiveness of dust mitigation engineering controls at the time of the exceedance is undertaken (as far as this is possible²) and checks are made to ensure any deficiencies have been corrected and/or identified improvements have been implemented;
- Arrangements are made such that the affected coal mine worker and / or that the activity where the exceedance was recorded, is subject to further sampling during the next dust sampling period to ensure no further exceedances occur; and
- A report on any dust sampling exceedance and the circumstances pertaining to this exceedance is tabled and reviewed by the site Dust Management Committee to ensure any further preventative actions are monitored for future effectiveness.

4.3. Introduction of real time dust monitors

There are several key issues that impact the effectiveness of traditional personal dust sampling devices. These include the fact there is a delay of up to 10 days between the time the sample is taken to the receipt of the dust sampling results back at the site and there is no real time indication of dust exposure levels given to the wearer during the dust sampling period. The implications of these issues with regards to the total dust mitigation and management strategies include:

- There is no real time warning to an operator that he or she may be in an environment where a dust exceedance could occur;
- It is not possible to accurately determine the optimum personal operating approaches (positioning, task / activity rotation timing) to minimise the potential for dust exceedances during the period of wearing the dust monitor;

¹ The ERZ Controller is the statutory mine official responsible for ensuring safety and legislative compliance in a specified area of the mine. The ERZ Controller was formerly known / called the 'Deputy'

² Note – typically, there is a delay of up to 10 days from the time of taking the sample to the time the sampling results are received back on site

- It is difficult to effectively and quickly evaluate the effectiveness of design / engineering dust mitigation efforts; and
- There is no opportunity to adjust operating practices during any given shift where operating circumstances give rise to potentially higher levels of dust generation.

As a result, Anglo American group underground coal mines have championed the introduction and use of real time dust monitors throughout its mines (and potentially the Queensland coal mining industry). This initiative commenced around May 2015 with trials of a number of different types of light scattering real time devices (AM 5110 and PRD – 1000 units). However, issues with accuracy and a lack of compliance of the units to certain Australian Standards led to trials of a different type of personal real time dust monitor. This type of dust monitor (known as a Thermo PDM 3700 personal dust monitor) is based on the widely recognised gravimetric dust sampling methodology³ and these have proved successful in providing accurate and compliance equivalent real time dust level readings that meet the relevant Australian dust measurements standards.

The benefits of real time dust monitoring devices are obvious and significant. For example, the optimum operating positions and approaches for coal mine workers working in various areas of the mine (primarily production areas) can be determined from a dust perspective, verified in real time and captured in operating procedures and associated training programs. Further, coal mine workers can monitor dust levels in their immediate work areas on an ongoing basis and react at the time if there is the potential for exposure to elevated dust levels and the effectiveness of existing or planned design / engineering dust mitigation measures can be instantly evaluated. Finally, more effective Safety and Health Management Systems (SHMS's) can be established by allowing site Trigger Action Response Plans (TARP's) to be developed using factual data with real time exposure readings as triggers for responses at various levels.

These PDM 3700 dust monitoring devices have been approved and indeed legislated in the USA (MSHA) as a replacement for the traditional gravimetric dust monitors⁴ for compliance determination in underground coal mines. However, their use in Queensland coal mines is currently restricted to use in 'Negligible Explosion Risk Zones' (NERZ) (where the concentration of methane is known to be or likely to be less than 0.5%). 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.

Regardless, these real time dust monitors have been introduced into all Anglo American group underground coal mines (for use in NERZ) with 4 units being allocated to each underground site (12 in total) at a cost of approximately \$A 25,000 (twenty-five thousand) per unit. Hence, the total cost of the units across the three underground sites is of the order of \$A 300,000.

³ The same type of methodology used in the 'traditional', currently approved and used personal dust sampling devices

⁴ The traditional gravimetric dust monitors remain the approved devices in the QLD Coal mining industry

4.4. Dust Management Resources / Dust Committees

Effective dust management involves a raft of design, technical and engineering approaches along with well-designed and managed operating practices. These approaches and practices are complimented by comprehensive dust monitoring programs. As such, dust management improvement measures must be well coordinated, well managed and involve input from the workforce, technical specialists and senior management team members.

Consequently, each Anglo American group underground mine has created a specific additional position (Dust Champion) and appointed specific persons to these positions. These persons have responsibility for overseeing, aligning and coordinating all of the various dust improvement management initiatives on the site. In addition, each site has a Dust Committee chaired by the SSE with representatives comprising coal mine workers, supervisors, process owners and technical specialists. These committees typically meet at least monthly and review / provide feedback on any dust sampling exceedances; monitor the close-out of scheduled actions with respect to dust controls; review the effectiveness of existing or newly implemented dust controls and consider / recommend further dust management improvements.

Dust management improvements and associated actions are formally tracked under mine site action tracking databases. Additionally, from a corporate governance perspective there is a fortnightly respirable dust meeting chaired by the Executive Head of Underground Operations which includes the site SSEs, Safety Health and Environment Managers, Operations Managers and other senior technical personnel. Progress against actions is monitored daily on site by the site SSE and by the Regional Dust Management Committee on a fortnightly basis.

4.5. Engineering and design improvements to further minimise dust emissions

A very substantial amount of time, effort and technical capability is devoted to the management of dusts and other hazards in underground coal mines operated by the Anglo American group.

Each of our mines has worked rapidly to implement industry best practice engineering controls to reduce dust generation, suppress and capture airborne dusts and remove dust deposits from underground equipment and roadways. Anglo American presented its learnings at the industry sharing session in Moranbah on the 19th of October with the intent of assisting the industry improve as a whole by learning through sharing. It is our belief that this session added tremendous value to the QLD coal industry and was well represented by all coal operators. Anglo American has assisted with the development of the proposed recognised standards for dust control and has pro-actively conducted gap analysis at each operation, going on to develop action plans to implement everything practically possible at each underground operation. Some of these best practice engineering controls include:-

- Full Longwall automation;
- Automated canopy, lemniscate, comp ram, side shield, AFC and leg sprays;
- Micro-mist and dry fog sprays for BSL, discharge hoods and conveyor transfers;

- Shearer / Chock washing sprays;
- High volume BSL scrubber systems;
- Water infusion of the coal seam; and
- Foam application.

More comprehensive listings of these improvements are summarised in Appendices II, III and IV (for Grasstree, Moranbah and Grosvenor respectively) and amount to capital / direct expenditure of approximately \$A 7 million across the three mines⁵. Our newest mine, the Grosvenor operation is also well underway in the introduction of its Remote Operating Centre (ROC) for the longwall which will allow fully remote operations from an outbye location and eventually the surface – a first for the Australian underground mining industry.

All improvement projects and actions are subject to formal change management to allow implementation, monitoring and review. The nature of dust mitigation or improvement actions and the status of their progression / close-out are formally monitored by site action tracking databases.

4.6. Respiratory Protective Equipment (RPE)

Regardless of the current and future ventilation / dust mitigation improvements, it is acknowledged there will continue to be some levels of dust in the underground coal mining environment. Hence, under the current operating requirements where coal mine workers have to physically be present in production areas, there will always be a requirement for personal protective equipment as a 'last line of defence' in the complete mitigation of exposure to dust (and other hazards). Whilst RPE and other forms of personal protective equipment (PPE) are the 'last lines of defence' in risk reduction strategies it needs to be recognised that items of PPE are legitimate and important forms of protection from many risks⁶. In this regard, it should be noted that all respiratory personal protective equipment utilised at Anglo American group mines sites is selected in accordance with *AS/NZS 1715:2009 – Australian / New Zealand Standard – Selection, use and maintenance of respiratory protective equipment* – ensuring the selection factors as noted in section 4.2 of the Standard are considered specifically for dust particulates in the coal mining environment.

Improvements in RPE at Anglo American group underground mines include:

- 'P3' Clean Space positive aspirated RPE and / or Air Stream Helmets are mandatory RPE for those coal mine workers whose primary activities are associated with longwall production;
- 'P2' classified RPE is the minimum mandatory RPE for all other production areas / activities and other areas of the mine where exposure to dust is possible;

⁵ It should be noted that many of the design / engineering dust mitigation improvements implemented at Grasstree and Moranbah in recent times were already incorporated into the design of longwall and development production units at the new Grosvenor Mine.

⁶ Note the universal mandatory acceptance and use of vehicle seat belts / air bags and a raft of other PPE used in daily work and domestic life

- Management / maintenance practices and processes around specialised RPE – Cleanspace and Airstream helmets have been upgraded;
- All coal mine workers have received comprehensive training in the use of RPE along with 'fit' testing of all employees to ensure RPE is worn and fits the user correctly; and
- Introduction of a 'clean shaven' policy for all underground workers to ensure good sealing of RPE with the user's face.

5. Clarification points on issues raised in the Senate Select Committee on Health's inquiry into the re-emergence of the pneumoconiosis disease

As referenced in the Introduction of this submission, it is assumed the CWP select committee has thoroughly reviewed the findings of the Senate Select Committee on Health's inquiry into the 're-emergence of the pneumoconiosis disease'. There are a number of issues raised in the Senate Select Committee's report that Anglo American considers require further clarification. This clarification is provided below.

5.1. Additional information, tabled document, correspondence and answers to questions on notice....

Page 2 (of the main body of the Senate Select Committee's Fifth Interim Report), section 1.7 states: *'Additional information, tabled documents, correspondence and answers to questions on notice received by the committee to date and related (to) Coal Worker Pneumoconiosis are listed at Appendix 3.* However, there is no reference in this Appendix to the comprehensive responses provided by Anglo American to the two sets of 'Questions on Notice' received from the committee.

As requested by the committee, Anglo American provided comprehensive responses to two sets of questions on notice it received from the committee. The first Anglo American response was sent via multiple emails to the committee's Principle Research Officer (as requested) and the Senate Select Committee's specific email address on the due date of 18th March 2016. The subsequent Anglo American response to the second set of Questions on Notice was again sent via multiple emails to the committee's Principle Research Officer and the Senate Select Committee's specific email address on the 5th April 2016.

However, no acknowledgement of receipt of these comprehensive responses was received and no mention of these responses to the committee's questions on notice is made in Appendix 3 of the committee's report.

5.2. Contrasting approaches to deal with the problem of workers being exposed to coal dust

Page 12 – section 2.22 of the Senate Select Committee’s report states: ‘.....there are contrasting approaches to deal with the problem of workers being exposed to coal dust. In some cases the focus is on measures to prevent workers inhaling the dust by way of Personal Protective Equipment (PPE) such as face masks. In other cases, the focus is on mitigating the dust levels, for example by using water sprays and/or ventilation to minimise workers exposure to consistently high levels of coal dust’.

With regards to the above referenced approaches to minimising workers exposure to coal dust in Anglo American group underground coal mines, the Anglo American approach is not one of engineering controls **or** PPE – the approach is always a combination of the two (coupled with other operating practice controls) with very substantial weighting towards engineering controls. The Anglo American response to the first set of questions on notice went to considerable lengths to explain some of the engineering dust control solutions and the recent substantial efforts to continually improve the engineering controls – many of which are summarised in Appendices II, III and IV. Both Anglo American responses to the committee’s questions on notice provided information on the use of PPE as an additional and complimentary approach to reducing personal dust exposures for employees.

5.3. Comments regarding the extent to which mining companies were working to mitigate dust levels in mines

On pages 16 and 17 (sections 2.36 to 2.39 inclusive) of the Senate Select Committee’s report, various comments are made regarding comments by the QRC on the substantial efforts undertaken by mining companies to manage dust risks. However, in section 2.39 the report states: ‘..... However, evidence taken during its public hearings contradicted the Queensland Resources Council’s submission in terms of the extent to which mining companies were working to mitigate dust levels in mines’.

In this regard, Anglo American provided comprehensive information in its response to the Committee’s first set of questions on notice with regards to the very considerable engineering efforts Anglo American is devoting to further minimise the potential for dust exposures for its employees. However, it would appear that these proactive initiatives (and the associated many millions of dollars of direct costs that have been incurred in these efforts) were not noted or acknowledged by the Committee. As presented above, over the last two years Anglo American group underground coal mines have spent in approximately \$A 7 million⁷ across its three mines in Queensland to further mitigate potential coal mine worker exposure to dust. This does not include the very substantial amounts of capital invested in the new mining equipment at the Grosvenor Mine which incorporates the latest design technology and engineering.

⁷ Direct / capital costs – no internal labour or downtime included

5.4. Assertions regarding dust monitoring on maintenance shifts

Page 28 / 29 – section 3.14 of the Senate Select Committee’s report deals with information provided verbally by a coal mine worker to the Committee where he asserts, inter alia, that dust monitoring at Grasstree Mine is primarily conducted on maintenance shifts. The Committee Chair is quoted as summing up this coal mine worker’s evidence as: *‘I am finding it a little hard to digest that information (that dust sampling primarily occurs on maintenance days). I am not normally a cynic, Mr Carter, but it would seem to me that the dust monitoring is being constructed to happen at a time when it is least likely to show up dust’*. The coal mine worker’s response to this summation was: *‘That is correct’*.

The assertion that dust monitoring surveys at Grasstree or indeed any of the Anglo American group’s coal mines are performed solely during maintenance activities is totally incorrect. Reviews of the specific comprehensive dust survey reports provided by the independent external service providers (SIMTARS and GCG Safety Health & Hygiene) and cross correlation of these to mine shift production reports reveal that the vast majority of dust sampling exercises occur during productive activities – refer Table 1 below.

Table 1 – Dust sampling vs mine activity

Mine	2015	2016 (to June 2016)
<i>Grasstree</i>	<i>102 samples of the total of 121 samples were taken during longwall production shifts / activities. The remainder were taken during scheduled or unplanned maintenance activities</i>	<i>219 samples of 244 were taken during production activities</i>
<i>Moranbah</i>	<i>105 samples of the total of 114 samples were taken during production activities</i>	<i>95 samples of 101 were taken during production activities</i>
<i>Total</i>	<i>207 samples of the total 235 (88%) samples were taken during production activities</i>	<i>314 samples of 345 (91%) were taken during production activities</i>

Hence, the overwhelming majority of dust surveys and samples taken occur during normal longwall production activities. It is difficult to understand how this particular coal mine worker could have formed the view that dust monitoring surveys were conducted primarily on maintenance days particularly when he underwent personal sampling on 15/10/2015 where he was performing productive activities on the Grasstree longwall during the shift. On the personal sampling work activity log sheet he completed, this coal mine worker notes inter alia, that the ventilation in the work areas was ‘good’ and that it was a routine day (i.e. no breakdowns etc).

This coal mine worker’s hand written personal sampling work activity log sheet confirming the most recent shift during which he underwent dust monitoring (15/10/2015) is available to the committee upon request.

Hence, in summary at the Grasstree Mine in 2015 and 2016 (to the end of June) some 84% and 90% of dust monitoring activities respectively occurred during normal longwall production shifts and therefore the information provided in the Senate Select Committee’s

report that asserts dust monitoring at Grasstree is conducted predominantly on maintenance shifts is totally incorrect.

5.5. Drs Plush, Ren and Aziz research paper – current dust monitoring methodologies

Page 33 – section 3.31 of the Senate Select Committee’s report deals with a research paper developed by Drs Plush, Ren and Aziz. In this regard the Committee’s report states: *‘While the industry itself provided little evidence to the Committee about current dust monitoring methodologies, Drs Plush, Ren and Aziz in their research paper found that.....’*

In its second response to the Committee’s second set of questions on notice, Anglo American provided very substantial information to the Committee regarding the measurement of dust methodologies. Included in this response were references to numerous other researchers who have variously studied coal dust measurement methodologies in underground coal mines internationally. These studies conclude, inter alia, that fixed location area samples (as proposed by Drs Plush, Ren and Aziz) cannot predict the personal dust exposure of underground mining equipment operators. However, unfortunately the Committee’s report makes no mention of this information or indeed of any other of the considerable number of research papers dealing with this topic, other than the singular paper developed by Drs Plush, Ren and Aziz.

I trust the above and attached information further assists the Committee in any further deliberations and / or recommendations it may make with regards to the re-emergence of coal workers pneumoconiosis in Queensland.

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APPENDICES

Appendix I: Example - Work Activity Log Sheet

PLEASE COMPLETE ALL APPLICABLE SECTIONS					
SIMTARS JOB NUMBER: OM18173F1		SIMTARS OFFICER: A Kelly			
NAME:		SITE: Grasstree		DATE: 14/10/15	OCCUPATION: MINER
WORK AREA: Longwall 11		EMPLOYEE #	CREW:	SHIFT: DAY AFTERNOON / NIGHT	SHIFT LENGTH + ROSTER: 7/7 9HRS
Time	Vehicle ID / Activity (Dust & noise generating activities conducted or worked adjacent to during survey period)	Material Being Handled (Stone / Coal)	Location (Location where work was being conducted)	Respiratory Protection Worn	
From	To			Yes	No
7am	7:30am			Yes <input type="checkbox"/>	No <input type="checkbox"/>
				Yes <input type="checkbox"/>	No <input type="checkbox"/>
7:30	7:45am			Yes <input type="checkbox"/>	No <input type="checkbox"/>
7:45am	7:50am			Yes <input type="checkbox"/>	No <input type="checkbox"/>
7:50am	10:45am	COAL	relocate #1190	Yes <input type="checkbox"/>	No <input type="checkbox"/>
10:45am	2:15pm	COAL	ES shows (1465min)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
2:15pm	2:45pm			Yes <input type="checkbox"/>	No <input type="checkbox"/>
2:45pm	4pm			Yes <input type="checkbox"/>	No <input type="checkbox"/>
Full completion of this work activity log sheet will assist in the evaluation of your exposure data					
Respiratory protection type / brand (eg. P2 Mask / 3M): P2 DUST MASK			Have you received training in respiratory protection use: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
Was the ventilation in your work area: GOOD <input checked="" type="checkbox"/> POOR / IMPROVED			Was it a routine day (e.g. No breakdowns, etc): NO Belt Down hill 15am		
Comments:					

PLEASE COMPLETE ALL APPLICABLE SECTIONS					
SIMTARS JOB NUMBER: OM18172F1		SIMTARS OFFICER: A Kelly			
NAME:		SITE: Grasstree		DATE: 14-10-15	OCCUPATION: LONGWALL OPERATOR
WORK AREA: 904 LONGWALL		EMPLOYEE #	CREW:	SHIFT: DAY AFTERNOON / NIGHT	SHIFT LENGTH + ROSTER: 9 HR
Time	Vehicle ID / Activity (Dust & noise generating activities conducted or worked adjacent to during survey period)	Material Being Handled (Stone / Coal)	Location (Location where work was being conducted)	Respiratory Protection Worn	
From	To			Yes	No
0700	0730		SURFACE THEN TRAVEL	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
0730	0745		904 CAB ROOM	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
0745	1045		904 MG LONGWALL FACE	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1045	1415	COAL	LONGWALL FACE	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
1415	1445		904 L/N CRIB ROOM	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
1445	1525		700 THROUGH 904 LONGWALL	Yes <input type="checkbox"/>	No <input type="checkbox"/>
1525	1555		904 - SURFACE	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Full completion of this work activity log sheet will assist in the evaluation of your exposure data					
Respiratory protection type / brand (eg. P2 Mask / 3M): P2 3M			Have you received training in respiratory protection use: YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
Was the ventilation in your work area: GOOD <input checked="" type="checkbox"/> POOR / IMPROVED			Was it a routine day (e.g. No breakdowns, etc): BELT OFF UNTIL 1045		
Comments:					

Appendix II: Summary of dust management design / engineering measures – Grasstree

RECENT RESPIRABLE DUST MITIGATION INITIATIVES

Grasstree Mine



RECENT / CURRENT GRASSTREE DUST INITIATIVES

- The following dust mitigation initiatives to date have been categorised into each underground operational area followed by a general slide for whole of mine initiatives
- Approximate costs are associated with actions and purchases where an external supplier has been engaged. Costs listed do not include internal resourcing / downtime costs
- **Total 'capital' / costs associated with the identified improvements to date = \$A 2.365 million**
- Further improvement initiatives to be identified and considered for implementation

LONGWALL CONTROL MODIFICATION PLAN

Action	Outcome	\$A	Timing / status
		(1000s)	
Installed face sprays along entire face	Installed on 904 and 905LW	20	Complete
Developed improved shearer sprays	Installed on 905LW	2	Complete
Included CH4 level on remotes	Installed on 905LW	1	Complete
Sourced improved shearer drums	Installed on 905LW	Negligible	Complete
Implement dust suppression Work Order	Started on 905LW	Negligible	Complete
Modify JFP95 Blue dust suppressant delivery canisters	Installed on 904 and 905LW	1	Complete
Develop operator rotation	Started on 904LW for heat	Negligible	Complete
Install transfer point (AFC to BSL) hood	Installed on 905LW	25	Complete
Conduct water quality test	Awaiting results	1	Awaiting results
Investigated MG foam delivery system	Abandoned due to costs > \$20m pa	Negligible	Complete
Install canopy venturis	Awaiting brackets	15	Complete
Investigate alternative dust suppressant	JFP95 Blue \$18m pa DustEze Superwet/Quaker \$1.2m pa	Negligible	Complete

LONGWALL CONTROL MODIFICATION PLAN (CONT)

Action	Outcome	\$A	Timing / status
		(1000s)	
Install 10 chock water curtain	Fitted	0.5	Complete
Conduct water flow study	Approved by MEM	30	Complete
Investigate venturi droplet size	Awaiting venturi install	Negligible	Awaiting venturi install
Investigate venturi effectiveness	Awaiting venturi install	Negligible	Awaiting venturi install
Investigate additional water delivery	In progress with E&M	Negligible	In progress with E&M
Use automation to reduce dust exposure	Adjusted TG automation and reduced chock lower sequence to minimise build ups on canopy	Negligible	Complete
Sealing on MG drive cover	Tar tape applied to seal openings	0.5	Complete
Ring main pan line face sprays	Increased pressure and flow on TG sprays	1	Complete
Centralise water spray manifold	All lines added to manifold at MG	1	Complete
Investigate directing arm sprays onto AFC	In design process	TBD	In design process
Improve dust mitigation at tripper installation	Fabricate and install covers to enclose the discharge side of the tripper installation and introduce extra sprays to combat dust within the enclosure	20	Complete
Trialled shearer clearer spray bars	Trialled shearer clearer spray bars	10	Done

LONGWALL CONTROL MODIFICATION PLAN (CONT)

Action	Outcome	\$A	Timing / status
		(1000s)	
Changed shearer picks from point attack to radial	Changed shearer picks from point attack to radial	Negligible	Complete
Changed shearer pick length from 100mm to 130mm	Changed shearer pick length from 100mm to 130mm	Negligible	Complete
Started producing in Bi-Di	Started producing in Bi-Di	Negligible	Complete
Introduction of Quaker dust suppressant to shearer boost pump	Introduction of Quaker dust suppressant to shearer boost pump	50 p.a.	Complete
Fitted additional venturis to shearer ranging arms	Fitted additional venturis to shearer ranging arms	10	Complete
Replace BSL intake and discharge curtains	Replace BSL intake and discharge curtains	0.5	Complete
Replace shearer dust suppressant pump	Replace shearer dust suppressant pump	Negligible	Complete
Trial alternative P2 and P3 dust masks	Trial alternative P2 and P3 dust masks	Negligible	Complete
Modify BSL scrubber assembly	Modify BSL scrubber assembly	5	Complete
Modify dust curtains on BSL intake and discharge	Modify dust curtains on BSL intake and discharge	0.5	Complete
Introduction of JFP95 Blue dust suppressant to entire water circuit	Introduction of JFP95 Blue dust suppressant to entire water circuit	500 p.a.	Complete
Implementation of CleanSpace Powered Air Purifying Respirators	Implementation of CleanSpace Powered Air Purifying Respirators	75	Complete

LONGWALL 906

Action	Outcome	\$A (1000s)	Timing / status
Procurement of Dry Fog Spray System	Purchase of control cabinet, spray nozzles, nozzle adapters and mounting brackets.	35	Complete
Procurement of foam generator system	Purchase of foam generator cabinet, distribution cabinet and foam concentrate	30	Complete
Upgrade for shearer water boost pump	Purchase and fit 65mm plunger upgrade to the shearer water boost pump to account for the increased water caused by the addition of the shearer clearer spray bar, shearer shield cleaning sprays, shearer chain sprays and reinstating the shield canopy spray circuits.	60	Complete
Shearer spray improvements	Procure shearer clearer spray bars (Maingate & Tailgate), procure shearer chain spray bars and required components to fit, procure shearer shield cleaning sprays	55	Complete
Reinstate/Commission PRS Canopy sprays	Ensure / upgrade longwall roof support canopy sprays to top condition on LW906 and connect to shearer water pump supply. This includes the below: - Labour to audit each individual circuit, replace components found to have failed the audit process, to replace water interchock hoses to align with MDG 41 with shearer water pressure being run through the system. - Procurement of replacement POCVs and hose/fitting replacement kits for every shield	580	Ongoing
Procurement of required components for the installation of additional dust suppression spray circuits.	Purchase of required components so that the following systems could be installed and have the majority automated to time in with the BSL chain operating function: - Dry Fog System – Turnaround, Crusher Entry Spray Bar & BSL discharge hood - Air Atomising Systems – Run of Face Panline Sprays, FMU Sprays, 2 x crusher Entry Spray bars - Panline Face Sprays - Foam Generation System – 2 x Sprays on Panline, Crusher Entry Spray Bar - Turnaround cover design and procurement - BSL and AFC Surfactant Systems	225	Ongoing for critical spares if trials are successful
Labour for the 906 Longwall Dust Mitigation Installation	Contract labour for the installation of all the above mentioned systems and modifications except for the PRS reinstatement/commissioning work.	120	Ongoing
Procure & Install Crusher Scrubber Upgrade	Engage contractor to procure and install crusher scrubber upgrade to increase the flow through and the efficiency of the crusher scrubber system	145	Complete
Total longwall		2,019	

DEVELOPMENT CONTROL MODIFICATION PLAN

Action	Outcome	\$A	Timing / status
		(1000s)	
Standing locations and mandatory Respiratory Protective Equipment	Communicated locations and RPE inbye LOC	Negligible	Complete
Investigate JFP95 effectiveness	Added to cutter heads of all continuous miners	50 p.a.	Complete
Investigate dust curtain effectiveness	No visible advantages and monitoring results inconclusive	0.2	No visible advantages and monitoring results inconclusive
Investigate venturi effectiveness	Venturis effective, vortex air coolers in process of trial	5	Venturis effective, vortex air coolers in process of trial
Investigate CM spray effectiveness	Improved tail spray arrangement on all continuous miners	5	Complete
Investigate water curtain to trap dust at face	Investigating water circuit and capacity for sprays		Investigating water circuit and capacity for sprays
Total		60.2	

GENERAL CONTROL MODIFICATION PLAN

Action	Outcome	\$A	Timing / status
		(1000s)	
Inline soap canister for 1" water hoses for hosing roads	Canisters fabricated to provide inline (1") soap delivery	0.5	Complete
Alternative road building material	Blended material gives more competent road surface.	Negligible	Complete
Improve dust awareness training	Video developed, in process of rolling out to crews	10	Video developed, in process of rolling out to crews
Investigate Clean Shaven Policy	Process being conducted in collaboration with MN & GRV	Negligible	Complete
Review Respirable Dust MP	Completed, in process of rolling out to crews	Negligible	Complete
Trial application of Dust-A-Side	Trialled successfully on surface, water cart modified	30	Complete
Implement PDM-3700 Dust Monitors	Trialled underground, in process of training crews	100	Trialled underground, in process of training crews
Total		140.5	

OUTBYE

Action	Outcome	\$A (1000s)	Timing / status
Procurement of Dry Fog Spray System	Purchase of control cabinet, spray nozzles, nozzle adapters and mounting brackets.	60	Complete
Conveyor spray improvements	Procure replacement self cleaning spray bars,	85	Complete
Total		145	

Appendix III: Summary of dust management design / engineering measures – Moranbah North

RECENT RESPIRABLE DUST MITIGATION INITIATIVES

Moranbah North



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RECENT MORANBAH NORTH MINE DUST INITIATIVES

- The following dust mitigation initiatives to date have been categorised into each underground operational area followed by a general slide for whole of mine initiatives
- Approximate costs are associated with actions and purchases where an external supplier has been engaged. Costs listed do not include internal resourcing / downtime costs
- **Total 'capital' / costs associated with the identified improvements = \$A 2.933 million**
- Further improvement initiatives to be identified and considered for implementation

LONGWALL

Action	Comments	\$A (1000s)	Timing / status
Longwall sprays	Reviewed work orders , conducted spray audits with industry expert to investigate spray types and effectiveness , chock spray bars trialled, AFC crusher sprays investigated	10	Complete
Trial of intrinsically safe Respirable Protective Equipment (RPE) – in addition to the current airstream helmets	Trial successful additional units ordered for longwall. Initiate mandating RPE for all shearer and shield operators 30 @ \$1600 each plus spares	50	Complete
Change to one shearer operator instead of two	Removal of one shearer operator reducing exposure	Nil	Complete
Increase usage of automation on shearer	Automation Engineer employed to incorporate automation on shearer. Crews advised to utilise automation – lessening exposure on the longwall face	Nil	Complete
Trial dust suppression water additive	Dust suppression water additive added to water for Longwall to suppress dust generated on Shearer	286	Complete
Investigate using front walkways in longwall	Rear walkway access and results have improved and there are a number of risks associated with using the front walkway which need to be considered. Action in progress	Nil	Complete
Pump water into 111 using existing UIS holes	Work to be undertaken during 111 block from 17 cut through	145	October 2016
Cat flaps for chock canopies Gap shield hinges being filled with updated superior foam compound	Cat flaps to be replaced by new style design to reduce material and dust ingress between the chocks Reduction in material and dust ingress between chocks when lowering and advancing	992	June 2016
Stage 1 comp cylinder sprays	30 supports fitted to end Oct	211	Nov 2016
Stage 2 comp cylinder sprays	To be fitted November /December 2016	372	Dec 2016
FOG Sprays	5 sprays – 3 utilised in L/wall; 2 utilised on Development	26	Complete

LONGWALL (CONT)

Action	Comments	\$A (1000s)	Timing / status
LOC spray bar set up		4	Complete
Rear dust curtains	Trial between #40 – 50 supports of a 2 metre rear dust curtain. Once trial complete fit to the entire face	10 136	Jan 2017
Rear lemniscate flaps	Trial between #40 – 50 supports of a 2 metre rear lemniscate poly flaps. Once trial complete fit to the entire face	10 134	Jan 2017
Lemniscate sprays	Sprays implemented in the rear links to mitigate build up of dust on the lemniscate	9	Complete
Total direct costs		2,395 (2.395 million)	

DEVELOPMENT

Action	Comments	\$A (1000s)	Timing / status
Trial Dust suppression water additive	Dust suppression additive added to water to suppress dust generated on the continuous miner	14.3	Complete and ongoing
Dust suppression sprays on tripper drives work	Dust Suppression sprays installed on tripper drives and is checked each week through a work order	Nil	Complete and ongoing
Spray review on miner	Added sprays at rear of continuous miner for loading out into shuttle car	4	Complete
Total cost		18.3	

OUTBYE

Action	Comments	\$A (1000s)	Timing / status
Conveyor sprays review	Action is in the process of being completed	Nil to date	May 2016
Roadway standards reviewed	Standards for roads reviewed , new salters and water carts	75	Complete
Roadways to have dust suppressant trial	Trail completed of an alternative road base that allows improved ability to grade and salt roads, as well as a trial on a new dustacide and suppression agent	150	Ongoing
Total Cost		175	

GENERAL

Action	Comments	\$A (1000s)	Timing / status
Organise respiratory awareness training for CMW's	IMO / health professional to present at crew training days	Nil	Complete and ongoing
Develop Dust TARP	TARP developed with focus on dust suppression equipment and operational parameters of longwall supports and longwall automation	Nil	Complete
Trips to other UG mines for information gathering / sharing	Trips completed to mines in the Bowen Basin	10	Complete
Increase of monitoring through contract environmental monitoring company	Increase of amount of data gathered to help assist in driving solutions	150	Complete
Dust mask fit testing	All crews trained in fitment of personal dust masks using 3M technique	5	Complete
Cleaning of RPE	Increase of number of RPE and associated extra cleaning to ensure masks/ units are personal use	80	Complete
Real time dust monitoring devices *4	Enables real time evaluation of effectiveness of dust control measures and specific coal mine worker exposures	100	Complete
Total Cost		345	

Appendix IV: Summary of dust management design / engineering measures – Grosvenor

RECENT RESPIRABLE DUST MITIGATION INITIATIVES

Grosvenor



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RECENT / CURRENT GROSVENOR DUST INITIATIVES

- It should be recognised that Grosvenor mine and all its mining equipment is new incorporating the latest design and technology and a multitude of safety and health improvements gained from Anglo American (and the OEMs) experience operating longwalls and associated equipment
- However, in addition to the above, further dust mitigation improvements have been made recently
- Approximate capital direct costs of these further improvements are indicated below. Costs do not include internal resourcing / downtime costs
- **Total 'capital' / costs associated with identified improvements to date = \$A 1.649 million**
- Further improvement initiatives are to be identified and considered for implementation

GROSVENOR MINE

Respirable Dust Control Costs

as of 09 Nov 2016

Installed Dust Mitigation Control	Comment	\$A (1000s)	Timing / Status
Four PDM 3700 real time dust monitors		100	Purchased / in use
UIS Water Infusion external labour		10	Complete
UIS Water Infusion Materials	Dosing pump and significant associated equipment purchased. Further funds available as required	7	Complete
BSL Re hose Projects (flow meter, flow control valves, etc)		10	Complete
Chock Washer 3000	Cost for two units (\$1,986 each)	4	Complete
Canopy Spray Bars (estimated)		2	Complete
MG Neoprene Covers	Brackets (\$14,850), Covers (\$26,000), Maint. Cost of 2 covers / month damaged	41 (2 per month)	Complete
Dust Grip Turbo Surfactant System (LW)	Pod (\$16,790) x 2, Flow meter (\$825) x 4, Pump (\$16, 160) x 4, Chemical (\$2,750) @ 1 per day	61 (83 per month)	Complete
Estimated dust grip product used to date	Confirm costs from supplier	150	Complete
BSL Discharge Flap	\$1,535 for purpose-built flap (not yet in service)	\$0	Nov 2016
Crusher Raised to 250mm		\$0	Complete
PRS Canopy Spray Automation (every 20 th PRS activated with AFC)	To be installed	\$0	Dec 2016
Lemniscate Spray Bars (300 qty)	Spray Systems Co. \$246.50 each x 300	74	Complete
Lemiscate Spray Bar Hoses/Fittings	All stocked items, but not costs for completeness	43	Complete

GROSVENOR MINE

Respirable Dust Control Costs

as of 09 Nov 2016

Installed Dust Mitigation Control	Comments	\$A (1000s)	Timing / Status
MincoMist Sprays (Phase 1 – Hood and Crusher Inlet)		48	Complete
Tableau support for Operator in Dust report		Nil	Complete
Creation of Respirable Dust SORD Database		4	Complete
CFD Modelling	CSIRO	40	Complete
Compensating Ram Spray Ring (TRIAL) (Key Solutions)	3 trial rings	6	Complete
Compensating Ram Spray Ring (TRIAL) (Spraying Systems Co)	6 trial rings	2	Complete
Miscellaneous Materials (sprays, nozzles, etc)		4	Complete
PDM3700s and filters		120	Complete
Increase in Respirable dust monitoring (personal and static)	Rough estimate, Justin to confirm (additional statics were \$35,000 alone)	100	Complete
Drift Sprays		1	Complete
MicroMist Sprays (Kit 2 BSL – Hood, Crusher sprays)		57	Complete
MicroMist Sprays (PRS Canopy Curtain for AFC)		16	Complete
MicroMist Sprays (Continuous Miner)		24	Complete
Modified scrubber ducting bends		8	Complete
Foam System	Not yet installed	29	Complete
Total direct costs		1,649	