Mobile Health Units

Focus paper 5

NOT GOVERNMENT POLICY

Project Management Office

Queensland Government

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Introduction

The CWP select committee

On 15 September 2016, the Queensland Parliament established the Coal Workers' Pneumoconiosis Select Committee (CWP Select Committee) to conduct an inquiry into the re-emergence of coal workers' pneumoconiosis (CWP) in Queensland.

On 29 May 2017, the CWP Select Committee released its report no. 2 – *Inquiry into the re-identification of Coal Workers' Pneumoconiosis in Queensland* (report no.2). The report made 68 recommendations, a number of which relate to structural changes, funding for the resources safety and health regulator, and operational changes in relation to the Coal Mine Workers' Health Scheme (CMWHS).

The CWP Select Committee was clear in its report that existing arrangements were not fit for purpose:

> The committee found that there has been a catastrophic failure, at almost every level, of the regulatory system intended to protect the health and safety of coal workers in Queensland. As a result of that failure, 21 Queensland coal miners have now been diagnosed with CWP – an insidious but entirely preventable disease. […] An improved regulatory system, including a truly independent regulator and fully functional health scheme, is clearly needed.[1]

With specific reference to the importance of effective screening for early diagnosis, the CWP Select Committee noted that:

> Early detection of asymptomatic CWP is vital so that those still in the workforce can be removed from exposure and the possibility of their developing complex CWP reduced. Tragically, many sufferers of CWP continued to work in dusty conditions while their condition remained unidentified. A diagnosis may be easily missed, or assumptions made that the loss of function associated with CWP is due to reduced fitness, age, or lifestyle factors such [as] smoking.[2]

Accordingly, the CWP Select Committee made a range of recommendations to refine and enhance the CMWHS, with the aim of improving early detection.

This paper examines those recommendations specifically related to the provision of mobile health units as a means to deliver health assessments to coal mine workers.

The CWP Select Committee recommendations

The CWP Select Committee specified in recommendations 47-49 of report no. 2 that:

> **Recommendation 47**
> The Coal Workers' Health Scheme should obtain and utilise at least one Coal Workers' Health Mobile Unit, similar to those used by NIOSH [National Institute of Occupational Safety and Health], capable of delivering chest x-ray, spirometry, and general health assessments for coal workers and former coal workers in regional Queensland.

[1] Coal Workers' Pneumoconiosis Select Committee, 55th Queensland Parliament, "Black Lung White Lies: Inquiry into the re-identification of Coal Workers' Pneumoconiosis in Queensland", Report No.2, May 2017, p. 3-5.
[2] As above, p. 4.

Recommendation 48
The Coal Workers' Health Mobile Units should be properly staffed and maintained under the Coal Workers' Health Scheme, and operate out of the Scheme's headquarters in Mackay.

Recommendation 49
The cost of health assessments undertaken at the Coal Workers' Health Mobile Units should be met by the Coal Workers' Health Scheme.

As an addendum to recommendation 47, the CWP Select Committee "affirm[s] that it considers that high-resolution CT scanning equipment should be included in the mix of equipment engaged in these units."[3]

Queensland Government response

The Queensland Government response to these CWP Select Committee recommendations was 'supported in principle – further consultation required'.[4]

Specifically, in relation to recommendations 47 and 48, that:

> The Queensland Government supports the proposal to utilise mobile units and recognises the importance of ensuring health assessment services are accessible to all coal mine workers. The government acknowledges that further consideration will need to be given to how this proposal can be delivered to ensure the quality, efficiency and effectiveness of the service.[5]

And in relation to recommendation 49:

> The government considers that recommendations relating to further modifications to the Coal Mine Worker's Health Scheme over and above the Monash Review recommendations will require further consideration, in consultation with medical experts.[6]

Purpose of this paper

This paper is intended to help stakeholders better understand the implications of providing mobile health units, so they can provide informed feedback on the position proposed by the Project Management Office (PMO).

The PMO will describe the scope of the proposal with reference to current arrangements, existing research and advice, and the changes that are likely or required to satisfy the intent of the recommendations. Specifically, this paper will attempt to identify:

- relevant background information on the requirement for medical assessments
- the scope of the recommendation and issues arising
- the current arrangements for service delivery across the State
- how mobile health services operate in other jurisdictions
- challenges to be addressed in providing medical assessments in a mobile health unit
- associated costs.

[3] Coal Workers' Pneumoconiosis Select Committee, 55th Queensland Parliament, Report No. 5, "A Mine Safety and Health Authority for Queensland: A further response", October 2017, p. 15.
[4] Queensland Government, "Response to Coal Workers' Pneumoconiosis Select Committee report no. 2 – Inquiry into the re-identification of coal workers' pneumoconiosis in Queensland", September 2017, p. 27.
[5] As above, p. 27.
[6] As above, p. 27.

This paper provides the PMO's position on the advisability of adopting a mobile health unit approach to delivering medical assessments for the purposes of the Coal Mining Safety and Health Regulation 2017.

Note: This document provides general information only—it does not reflect government policy.

Background and current legislative requirements

The assessment of coal mine worker's health has been a feature of the regulatory system in Queensland for almost 40 years.

In 1982 the Queensland Coal Board issued two orders: one for pre-employment medicals to be performed for new entrants, the other for a compulsory survey of current employees conducted by Drs Rathus and Abrahams, medical consultants to the then Queensland Coal Board. This survey was also extended to include voluntary screening for retired coal miners. These orders commenced on 1 January 1983.

Nearly 8,000 employees and former employees were examined. The health assessments were mainly completed by a mobile clinic, which visited 33 mine sites and 6 towns. Of those examined, 499 abnormal cases were identified and appropriate action was taken with 102 receiving a more complete follow up. Pneumoconiosis or suspected pneumoconiosis cases totalled 75. [7]

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 CMWHS. [8]

Upon the abolition of the Queensland Coal Board in 1997-98, the Department of Natural Resources and Mines became responsible for administering the health scheme. Between 2002 - 2003 a tripartite group was established which reported to a steering committee of departmental executives, to investigate and make recommendations on future directions of health surveillance of mine workers.

In 2003 this working group reviewed the Health Surveillance Unit (HSU). Recommendations from this review included that:

- the HSU be focussed on the collection and analysis of health assessment data and reporting these findings to industry for preventive action
- 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. [9]

Only one of these recommendations was implemented. In 2004 an occupational physician was appointed to support the HSU on a part-time basis. There are no department records to explain why other recommendations were not fully implemented.

In 2013 the Department proposed changes to the CMWHS. A regulatory impact statement (RIS) was prepared which proposed, in summary:

> *'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*

[7] Abrahams, EW, and Rathus, EM, *Report on The Queensland Coal Miners' Health Scheme*, May 1984, p. 14
[8] Department of Natural Resources and Mines, "Submission to the Coal Workers' Pneumoconiosis Select Committee", 9 December 2016, p. 24.
[9] As above, p 24-25.

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. [10]

In May 2015 CWP was confirmed in Queensland for the first time in 30 years. The Coal Mining and Safety Regulation 2017 was amended on 1 January 2017 to include changes to the requirements for health assessments for workers, including requiring that all new coal mine workers will undergo a chest X-ray on entry into the coal mining industry. The regulation also requires mines to report cases of CWP to the inspectorate as they become known.

Understanding the scope of the recommendations and issues arising

What issues do the recommendations seek to address?

The CWP Select Committee notes the importance of early detection of CWP to safeguard workers, and former workers, from further harm. The Select Committee's intent is—in the PMO's interpretation—to ensure all workers have access to suitable and effective health assessments at appropriate intervals. These assessments should include general health assessments and screening technologies. The information obtained should be used to make informed clinical decisions as to the workers' health status and future needs.

The Review of the Respiratory Component of the Coal Mine Workers' Health Scheme (Monash Review),[11] Dr Robert Cohen and the CWP Select Committee all highlighted flaws in the system relating to technical competence in the performance of assessments, most particularly in relation to the conduct of spirometry and chest X-ray.

Work is ongoing within Department of Natural Resources Mines and Energy (DNRME) and Queensland Health, to complete the recommended actions in relation to quality of services for medical assessment.

It is the PMO's understanding that recommendation 47 seeks to offer the convenient provision of appropriate health assessment services at coal mine sites. The PMO notes, however, that the CWP Select Committee report provides no particular rationale for the recommendation and does not demonstrate that access to services is a challenge to be addressed.

Recommendations 48 and 49 deal with staffing and funding for the service. The PMO agrees that staffing and funding a mobile health service are important considerations.

Work in progress

It is noted by the PMO that the Occupational Health and Hygiene Unit within DNRME has undertaken work in related matters, including requiring:

- the completion of a revised health assessment form, in line with the new regulations
- that all new coal mine workers (to be employed for a task other than those that are low-risk) undergo a health assessment inclusive of respiratory function and chest X-ray examinations on entry into the coal mining industry
- the provision of retirement examinations for eligible workers, on request

[10] Department of Natural Resources and Mines, "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

[11] Monash Centre for Occupational and Environmental Health, *Review of the Respiratory Component of the Coal Mine Workers' Health Scheme*, 2016.

- respiratory function and chest X-ray examinations for above-ground coal mine workers occur at least once every 10 years
- respiratory function and chest X-ray examinations for underground coal mine workers (and former underground workers working above-ground) occur at least once every 5 years
- respiratory function examinations undertaken as part of periodic health assessments include a comparative assessment with previous respiratory function results when available
- X-ray examinations are performed in accordance with the International Labour Organization (ILO) *Guidelines for the Use of the ILO International Classification of Radiographs of Pneumoconioses.*
- that practitioners wishing to provide services (health assessments, X-ray, spirometry) to Queensland's coal miners demonstrate they meet the specified criteria prior to being included on the department's register.

These measures go some way to satisfying the intent of the CWP Select Committees recommendations (and also the Monash Review recommendations), by:

- expanding the scope of the health assessment
- introducing a comparative assessment level, providing the beginnings of a surveillance system
- requiring certain standards to be achieved in relation to the conduct and interpretation of health assessment data.

These improvements are being delivered via fixed location services – across the state – rather than in mobile units.

Why propose mobile health units?

The rationale for providing health services through mobile means is an issue that has been studied extensively. A recent literature review carried out by the Harvard Medical School concluded that:

> Mobile Health Clinics have been proven to be effective in reaching vulnerable populations who do not otherwise have a reliable source of healthcare, because mobile clinics reduce traditional barriers to access such as geographic isolation, transportation issues, time constraints, financial costs, complex administrative paperwork, and distrust of the healthcare system.[12]

This conclusion would seem to be supported in relation to the United States' National Institute of Occupational Safety and Health (NIOSH), whose services are highlighted by the CWP Select Committee. The aim of the NIOSH service is to encourage greater uptake of screening to support early diagnosis and effective management for those affected by coal mine dust lung diseases. However, the barriers highlighted by the Harvard Medical School that can be addressed by mobile units are largely inapplicable to the miner in Queensland. This is because it is the legislated responsibility of the employer to make arrangements for an assessment to be carried out, to pay for that assessment, and to pay the worker to attend the assessment (either during working hours, or at the ordinary rate in their non-rostered time). Additionally, and unlike the NIOSH scheme, the results of health assessments in Queensland must be provided to the employer and to DNRME. Put simply, a miner may not work in a coal mine without the appropriate health assessment.

[12] Mobile Health Map/Harvard Medical School, *A Literature Review of the Scope & Impact of Mobile Health Clinics 2016*, p. 1. https://static1.squarespace.com/static/509ab226e4b058edb8efe5a9/t/592ed75bc534a537fbb91943/1496242030963/A+Literature+Review+of+the+Scope+and+Impact+of+Mobile+Health+Clinics+2016.pdf (accessed 13 March 2018)

The PMO contends that the aim in Queensland then, is not to promote take-up; this is unnecessary as it is already compelled by the legislation. Rather, the aim is to improve the quality of the screening process and ensure effective mitigation is in place to minimise risk to workers.

Current arrangements

Prior investigation and consultation

It should be noted that the Monash Review provided a useful investigation of the purpose and efficacy of the existing health scheme and made a series of relevant recommendations (echoed by the CWP Select Committee) which were accepted by the Queensland Government.

Specifically, the Monash Review identified several improvements to the health assessment form as well as to medical practitioner training, to improve the effectiveness of health assessments. And, though not a formal recommendation, advised that an ideal Queensland coal mine workers' respiratory health assessment scheme would ensure that, "Doctors should be available in the main mining regions of Moranbah and Emerald, with additional offices sited in Mackay, Rockhampton and Brisbane for the convenience of drive-in-drive-out and fly-in-fly-out coal mine workers."[13]

Additionally, the PMO notes that consultation has already been undertaken in relation to this issue by the Occupational Health and Hygiene Unit within DNRME. This consultation has taken place as part of a broader assessment of the X-ray screening programme for the CMWHS.

The consultation was launched in October 2016 and sought feedback on regional access to imaging services, including mobile provision. There was a mixed response to the prospect of mobile health units. Both industry and employee representatives were broadly in favour of the measure. Providers of radiography services, however, were less favourably inclined, citing issues of quality, cost, staff attraction and retention, distance to be covered and the numbers of workers requiring X-rays.[14]

Requirements of the current health assessment

As noted above, the PMO is aware that changes have been made to the health assessment process since the re-identification of CWP in Queensland. This section reflects *current* requirements.

The Coal Mining Safety and Health Regulation provides for the requirement that employers must ensure health assessments are provided for each person who is to be employed, or is employed, by the employer as a coal mine worker for a task other than a low risk task.[15] Coal mine workers who are permanently retiring from the coal mining industry are also able to request a retirement examination to be carried out in accordance with the Coal Mining Safety and Health Regulations.[16]

Health assessments are required:

- before a person is employed as a coal mine worker
- periodically, as decided by the nominated medical adviser (NMA), but at least once every 5 years
- if the NMA decides it is necessary after receiving a notice under section 49(3) of the Coal Mining Safety and Health Regulation 2017 – periodically, as decided by the NMA.[17]

[13] Monash Centre for Occupational and Environmental Health, *Review of the Respiratory Component of the Coal Mine Workers' Health Scheme*, 2016, p. 73.
[14] Department of Natural Resources and Mines, "Chest X-ray screening for the Coal Mine Workers' Health Scheme", March 2017, p. 4.
[15] Section 46 of the Coal Mining Safety and Health Regulation 2017.
[16] Section 49A of the Coal Mining Safety and Health Regulation 2017.
[17] Section 46 of the Coal Mining Safety and Health Regulation 2017.

Composition of the health assessment

The health assessment comprises a four part form and practical testing.

Section one of the form is completed by the employer and notes the name of the employer, location of employment, the position of the worker and their similar exposure group[18]. It also requires information of previous health assessments, if known, and the reason for the health assessment.

Section two is completed by the worker. This part includes personal details, work history, vaccination status, and background health questionnaire.

Section three is completed by the examining medical officer, which may be the NMA, and includes the general health assessment, respiratory function testing, chest imaging and a considerations regarding fitness to work.

Section four of the form is the Health Assessment Report. This is completed by the NMA and provides a summary of the health assessment, including respiratory and x-ray testing, and a declaration on the worker's fitness for work and any necessary restrictions. This summary report is provided to the employer.

Conducting the health assessment/accessing services

It is understood that being able to access services in a convenient manner is a key consideration behind the CWP Select Committee's recommendations in relation to mobile health units. Therefore, understanding the availability and location of those involved in the provision of service under current arrangements is useful in determining the desirability of changing the model of provision to improve access.

There are a range of requirements and standards relating to the conduct of the health assessment.[19] NMAs, as medical practitioners, are considered competent to conduct all elements of the health assessment, except chest imaging, which must be performed by a practitioner registered with the Australian Health Practitioner Regulation Agency (AHPRA) as a radiographer or medical physicist.

The Department of Natural Resources, Mines and Energy maintains a register of doctors who have demonstrated that they meet particular qualification and experience standards for assessing the health of coal mine workers. The Department recommends that NMAs are appointed from this list. The geographic location of practicing NMAs represents a good spread across the main mining locations as well as major urban centres where many drive-in-drive-out (DIDO) and fly-in-fly-out (FIFO) workers live.

As workers are required to have chest imaging carried out by another health professional, the location of these services is also worthy of consideration.

Data held by DNRME identifies the locations of the medical practices used to deliver the chest X-ray component of the health assessment. This data, covering 18 months from August 2016 to February 2018, confirms that X-rays were provided at a wide range of locations across the state, covering thirty three local government areas.

Of the approximately 24,000 X-rays taken in the period, the most popular location was Mackay (with roughly one third of the total) followed by Emerald and Rockhampton. These three locations account

[18] Similar exposure groups (SEG) are used to identify a group of workers who have the same general exposure to risks. This can include: similarity and frequency of the tasks performed; the types of materials and processes used to complete tasks; and similarity in the way tasks are performed.
[19] These requirements are intended to provide quality assurance in relation to the provision of assessments. Detail on these are publicly available and can be found on the Queensland Government website https://www.business.qld.gov.au/industries/mining-energy-water/resources/safety-health/mining/medicals/coal-board

for more than half of all X-rays performed. There were more than 150 practices providing 10 or fewer X-rays in this time frame. This suggests that there is adequate supply of service across the state, with mining towns and hubs accounting for the majority of X-rays taken. It is assumed that those taken in and around Brisbane, the Gold Coast and Sunshine Coast likely reflect the preferences of FIFO/DIDO workers. More detail of chest imaging practice locations and volumes is available at Annex 2.

The available data demonstrate that access to health assessments is not currently problematic in Queensland. Indeed, the CWP Select Committee provides no evidence to suggest that access is a difficulty to be overcome, nor that mobile health units would serve to improve access. Bearing this in mind, it is not clear what particular improvement the CWP Select Committee seeks to achieve through the provision of mobile health services.

Comparison of similar services

US National Institute for Occupational Safety and Health

The CWP Select Committee specifically highlighted the service offered by NIOSH in the United States as an exemplar for Queensland to adopt. As such, it is useful to consider the NIOSH service in comparison with that already available under the Coal Mine Workers' Health Scheme, and attempt to determine the applicability of the US offering in Queensland.

The CWP Select Committee notes that: "NIOSH operates a fleet of mobile screening vans to coal mine workers in coal mining regions in the USA. At no cost to the worker, the screening includes a work history questionnaire, chest x-ray, spirometry testing and blood pressure testing. NIOSH provides this service to approximately one thousand mine workers per year."[20]

Furthermore, the CWP Select Committee explains that: "The mobile units are staffed by a small team of expert medical professionals employed and specifically trained by NIOSH. As a result, the data collected from these mobile units is of a high standard and is reliable for use in epidemiological research."[21]

The CWP Select Committee highlights some important positive points in relation to the service:

- it is free to the coal worker
- a comprehensive assessment is undertaken
- a fleet of 2 vans provides approximately 1,000 assessments per year
- assessments are made by experts with appropriate training, who collect high quality data.

When comparing these to the situation in Queensland, the current service is:

- free to the coal worker
- a comprehensive assessment
- providing 6,000 – 8,000 assessments annually, through fixed location services
- provided by registered NMAs, or under their supervision.

It should be noted that NIOSH anticipates providing 12 weeks of screening in 2018[22] and, according

[20] Coal Workers' Pneumoconiosis Select Committee, 55th Queensland Parliament, *Black Lung White Lies: Inquiry into the re-identification of Coal Workers' Pneumoconiosis in Queensland*, Report No.2, May 2017, p. 21.
[21] As above, p. 195-196.
[22] National Institute for Occupational Safety and Health, "NIOSH Announces Free, Confidential Screenings for Coal Miners", 1 March 2018 https://www.cdc.gov/niosh/updates/upd-03-01-18.html (accessed 11 April 2018)

to published data, will provide around one third of screenings at mine sites, and the rest in community locations.[23] In Queensland, assessments are provided at fixed locations with no restrictions on timing.

According to the U.S. Energy Information Administration (EIA), there were **853 coal mines** in the U.S. in 2015, employing around 50,000[24] coal miners across 25 states. In 2016, five states - Wyoming, West Virginia, Kentucky, Illinois, and Pennsylvania - produced approximately 70% of total coal production in the United States.[25]

In comparison, Queensland has **53** operational coal mines and a workforce roughly half the size of that in the United States, and covers a considerably smaller geographic footprint.

It is notable that NIOSH assesses roughly 2% of the workforce in a year, while in Queensland, almost a quarter of the workforce would expect to receive a health assessment in any given year (comprising assumed 1 in 5 requiring a surveillance assessment, new entrants to the industry and eligible retirees).

When comparing the NIOSH service with the existing service in Queensland, it is important to be aware that screening is not effectively mandatory in the United States: while a mandatory screening programme has been introduced, and initial screening is required on entry to the workforce, results are provided to the worker directly (not the employer) and there is no impact on a worker who fails to attend a follow-up screening. This is a small but very significant difference which clearly impacts on take-up of health assessments.

Coal Services New South Wales

Another, and perhaps more useful, comparator is Coal Services New South Wales (Coal Services), which currently operates a mobile health unit service and, like Queensland, requires that workers have a routine surveillance assessment on a regular basis.

Coal Services has a fleet of three mobile health units that service 23 of 41 operating mines in NSW. Mine operators must request the mobile units to visit the site, and the site managers must ensure there is a level parking area, of sufficient size, close to 15 amp power outlet(s), with easy access for workers.

Interestingly, Coal Services has opted not to include the provision of mobile X-ray, meaning workers still have to have these carried out separately. This is an operational decision made on the basis of cost and efficacy. Coal Services estimates adding X-ray would increase the cost of each mobile unit to approximately $1 million, and, based on service need, Coal Services estimates they would need two units, operating on a full time basis (excluding summer holidays) to provide adequate cover. The mobile units do not, therefore, provide a one-stop shop for health assessments. However, the Coal Services offering does include a range of assessments that are not specified by the CWP Select Committee, including fit-testing and vaccination clinics.

Notwithstanding the fact that the Coal Services mobile units do not offer chest X-ray, and around half the coal mine sites in NSW do not make use of the service, there are other issues to consider when comparing the states. Among the most salient are geography and infrastructure. It is worth bearing in mind that Queensland occupies an area more than twice the size of NSW, and its coal mines are more broadly dispersed. The major coal resources in NSW are located in a 500km x 150km corridor. While the majority of roads the Coal Services mobile units travel are paved, a significant quantity of the Queensland network has unsealed roads that are challenging to traverse in good weather, and

[23] National Institute for Occupational Safety and Health, "2018 Screenings WV" and "2018 Screenings PA", https://www.cdc.gov/niosh/topics/cwhsp/ecwhsp.html (accessed 11 April 2018)
[24] Federal Reserve Board of St. Louis, "Total employment: coal mining", March 2018, https://fred.stlouisfed.org/series/CEU1021210001#0 (accessed 11 April 2018)
[25] Energy Information Administration, *Which states produce the most coal?,* February 28, 2017, https://www.eia.gov/tools/faqs/faq.php?id=69&t=2 (accessed 11 April 2018)

even more difficult to negotiate in less favourable conditions. This has an impact in terms of driver safety, insurance and maintenance costs.

Costs

The likely costs of mobile health units are a relevant consideration in determining the effectiveness of the provision of service in this manner. The resources required will need to be sourced from the funding mechanism employed to support the operational needs of the regulator, which operates on a cost recovery basis from industry.

Current costs associated with the health assessment

In order to determine whether mobile provision represents an efficient delivery mechanism, it is necessary to understand both the projected costs of such service as well as the current costs associated with the health assessment. Some costs will be common to each, some unique to the delivery mechanism.

Common costs

The following have been identified as common costs:

- the costs associated with reading chest imaging outputs to the required ILO standard
- direct costs to industry in relation to payment of workers to attend a health assessment (it is expected that this would account for approximately 1 hour at ordinary time)
- any additional testing required as a result of abnormal results at the time of the assessment.

As these are common costs, applicable whether the service is delivered in fixed location or by mobile units, they have been excluded from further analysis.

Costs of fixed location service

These costs are approximations. They have been provided to assist stakeholders to understand the range of costs involved and how these may vary by service delivery mechanism.

The PMO has identified the following costs for fixed location services and travel and pay.

Fees charged for NMA consultations and radiography services vary widely. Estimates have been provided based on average figures gained from a small scale consultation with providers.

Fixed location service costs	**Cost**
NMA fee	$351
Radiography fee	$127
Total	**$478**

Similarly, as travel and payment rates vary significantly, hypotheticals have been provided.

Travel and pay	Cost
Travel expenses, if the assessment is to be undertaken in rostered time e.g. • return flight Emerald to Brisbane (flight time 1 hour 30 minutes each way) • taxi from airport to NMA office • taxi from NMA office to Radiography office • taxi from Radiography office to airport	 $350 $50 $5 $50
Cost of pay for the worker, if the assessment is undertaken in rostered time • $27 per hour[26] x 9 (NB 1 hr is accounted for in common costs)	 $243
The cost of replacing the absent worker for that shift, if required. • $27 per hour x10	 $270
Total	**$968**

While a figure for travel and pay costs has been provided, unlike NSW, there is no legislative requirement in Queensland that the assessment must be undertaken during shift time. It is the PMO's understanding that the majority of health assessments in Queensland are undertaken in 'off' time making the NMA and radiography fees the only substantive cost in the fixed location service.

On this basis, the current system incurs an estimated cost to the employer - in addition to common costs - of between $478 and $1,446 per assessment if undertaken during rostered hours; and $478 if undertaken in non-rostered time.

Predicted costs of a mobile service

The costs associated with a mobile health service can be broken down into four broad areas:

- vehicle costs
- equipment costs
- staff costs
- running costs.

Summary: Cost estimates

Establishment cost per vehicle

Item	Low estimate ($)	High estimate ($)	Source
Vehicle purchase and fit out	500,000	650,000	Breast Screen Queensland/NIOSH
Health assessment equipment	7,500	11,500	PMO estimate based on current health assessment and online pricing
Spirometry	2,500	3,500	PMO estimate - online pricing
High Resolution CT scanner	400,000	800,000	Consultation with the health care industry
TOTAL per vehicle	**910,000**	**1,465,000**	

[26] Based on the rate for a 'Mineworker' in the Fair Work Ombudsman's "Pay Guide – Black Coal Mining industry Award 2010", February 2017 (accessed 12 April 2018) and superannuation at 9.5%.

Ongoing costs per vehicle

Item	Low estimate ($)	High estimate ($)	Source
Vehicle maintenance	10,000	10,000	Breast Screen Queensland
Equipment maintenance	50,000	90,000	Consultation with the health care industry
Insurance	7,250	10,000	Breast Screen Queensland
Registration and Inspection	2,500	2,500	Queensland Department of Transport and Main Roads calculator
Fuel	$0.28 per km = 2,800 for 10,000 kms	$0.31 per km = 3,100 for 10,000 kms	BP/Caltex
Staffing	205,000 Doctor/Radiographer	308,000 Doctor/Radiographer/ Driver/Administrator	Payscale
Travel, accommodation and subsistence	59,000 (for 2 staff)	118,000 (for 4 staff)	Queensland Government travel and subsistence rates
Total, per vehicle	**336,550**	**541,600**	

Additionally, costs of $9,000 to $12,000 have been attributed to cover consumables utilised in health assessments. This is expected to cover the workload of 6,000 to 8,000 assessments required annually.

At this point it is worthwhile to sound a note of caution about the figures quoted above. These are drawn from a wide range of sources and generally refer to median costs which may not represent accurate estimates in relation to the specific requirements of the proposed service. Sources have been cited to allow stakeholders to perform further investigation if desired.

The PMO has based estimates on vehicle purchase and fit-out on figures from Breast Screen Queensland, who already deliver mobile health services across the state. Breast Screen Queensland advises their vehicles cost between $500,000 and $650,000 to build.

In relation to equipment, the CWP Select Committee recommends that the mobile units should be capable of delivering general health assessments, spirometry, and chest imaging, preferably using a High Resolution CT scanner.

The equipment required for general health assessments and spirometry is readily available, standardised and fairly low cost. It is expected that the costs associated with these requirements would be in the range of $10,000 per mobile health unit.

The equipment required for chest imaging is, by comparison, a major investment. A high resolution CT scanner can cost in the region of $400,000 to $800,000, depending on the nature of the technology and the requirements of the user. The latest models have eliminated the need for separate computers to operate the scanner, providing an all-in-one device that can be fitted in a mobile unit. There are additional challenges though, in terms of keeping the device in a climate controlled atmosphere (20-27 degrees Celsius, with less than 70% humidity), which may add to the running costs of the vehicle. Finally, in order to operate the equipment, the mobile health units would require access to phase three power. While it is expected that mine sites would have phase three power, ensuring this is available to the location where the mobile health unit would be situated (e.g. a car park) would be a matter for each individual mine site, potentially adding to the cost of provision.

How to appropriately staff a mobile health unit is a matter of debate. Coal Services vehicles are generally staffed by Registered Nurses, unless a doctor is requested by the individual mine. Notably, Coal Services do not offer mobile chest imaging – this service is provided in one of five fixed locations. NIOSH employs medical professionals specifically trained for the programme.

The PMO has determined a high and low value for staffing costs based on two models of provision, and using median Australian salaries for each profession. The low value range assumes there is a doctor to provide general health assessments and spirometry and a radiographer to conduct the CT scan. This assumes that one of the medical professionals would drive the vehicle (though does not ascribe any additional costs to that staff member). Based on median salaries, the cost would be $205,000. The high value assumes a driver for the vehicle is also required, and an administrator to manage admissions and paperwork. The cost in this instance would be $308,000. These estimates do not include the cost of interpreting scans to the required standard. This cost will be common whether the service is provided from a mobile service or fixed locations.

Finally, running costs would need to be considered as part of the operating cost of the service. This category includes:

- Vehicle maintenance and servicing
  - Based on Breast Screen Queensland figures, $10,000 per vehicle, per annum
- Equipment maintenance and servicing
  - Based on consultation with the healthcare industry, $50,000 - $90,000 per annum.
- Fuel
  - Providing a reliable estimate is challenging due to: (a) variability in route programming which will impact on distance travelled, (b) the volatility of pricing in the fuel market, and (c) uncertainty in relation to the total weight of the vehicles. On the basis of recent research, fuel efficiency of 4.5km per litre is assumed.[27] At today's prices ($.1.40 per litre, diesel[28]) the cost to travel 1km is $0.31. Wholesale pricing would represent a significant saving, at $1.28 per litre[29] producing a per kilometre cost of $0.28. This would require the regulator to have the facilities to store fuel, and the units to return to base for refuelling, limiting journey distance and duration. For the purposes of providing a figure, if a vehicle were to travel 10,000km in a year, the fuel cost would be $2,800 to $3,100.
- Registration
  - This will vary on the type and weight of vehicle. Estimated at $1,000 per vehicle.
- Insurance
  - In the case of insurance for heavy vehicles, the experience of the driver is a key variable. Also relevant is the distance to be covered, and the value of the goods on board. Estimated at $10,000 per vehicle, per annum, based on Breast Screen Queensland advice.
- Health assessment consumables
  - These are estimated to cost an additional $9,000 to $12,000 per year, to cover the expected workload of 6,000 to 8,000 health assessments.
- Travel, accommodation and subsistence costs for staff staying away from home
  - It is likely that staff will be required to stay away from home for at least some of the working year. On the basis of a 240 day work year30, an estimate of 120 days away

[27] Krishna Reddy, B. and Raghaveni, T., "Fuel consumption model of light commercial trucks", *International Journal of Science, Technology and Management,* Vol No. 4, Issue 11, November 2015, p. 446-451.
[28] Petrol Spy Australia, https://petrolspy.com.au/map/latlng/-21.14130296022844/149.17291978328956 (accessed 9 April 2018)
[29] BP Australia, "Terminal Gate Prices", https://www.bp.com/en_au/australia/products-services/pricing/terminal-gate-purchases.html (accessed 9 April 2018) NB Caltex prices also checked and found to be higher than BP on 9 April 2018
[30] Coal Services operates their vehicles for 46 weeks a year, it is anticipated the same would be true in Queensland.

from home, per staff member, has been made. The number is likely to vary. Staff will be provided a subsistence allowance to cover meal costs during times when they cannot access their own food preparation and storage facilities. Additionally, it may prove more economical to transport staff by air, rather than by road, to minimise the amount of time staff are paid to be in transit. An allowance of $2,500 per staff member has been included. Based on Government rates, an accommodation allowance of $120 per night and a meals allowance of $105 per day have been forecast.

Estimating fleet size

Clearly the number of mobile health units to be placed in operation will have an impact on the cost of the service. On this issue, estimates based on experience in NSW have been employed.

Coal Services estimates eight to ten health assessments are carried out in a ten hour shift. Assessments take 45-60 minutes and exclude X-ray. X-rays are performed separately at one of Coal Services five medical facilities. On the basis of eight assessments per day, five days per week for 46 weeks per year, one mobile health unit could process 1,840 health assessments each year. It is assumed that the process would be similar in Queensland and so this figure has been used to estimate potential fleet size. It should be noted though that this calculation is an optimistic one – it takes no account of additional time required to undertake the X-ray process, nor does it include time required to travel from site to site, or time for maintenance of the vehicle or equipment. On this very optimistic assessment, five mobile health units would be required to serve the current estimated need in Queensland of 6,000 – 8,000 assessments per year.

This means that the costs in year one will range from:

Low estimate:

5 vehicles with establishment costs of $910,000 each	= $4,550,000
5 x ongoing costs of $336,550	= $1,682,750
1 x consumables cost of $9,000	= $9,000
Total cost in year 1	= $6,241,750

High estimate:

5 vehicles with establishment costs of $1,465,000 each	= $7,325,000
5 x ongoing costs of $541,600	= $2,708,000
1 x consumables cost of $12,000	= $12,000
Total cost in year 1	= $10,045,000

Assuming 7,000 assessments in a year, this provides a cost per assessment in the range of $892 to $1,435. In year two, that cost drops significantly to between $242 and $389 per assessment, excluding the common costs of radiology assessment, workers' pay and additional testing. Importantly, this calculation does not account for vehicle depreciation over time. Consideration would need to be given to the likely lifespan of vehicles and equipment before they would need to be replaced, and the costs associated with doing so.

It should also be understood that, even with the capacity to deliver the required number of assessments on site, the logistics are complex and may further reduce actual capacity. For example,

the distribution of workers in need of an assessment at each site will be uneven. This will make planning the route and duration of health unit visits a potentially complex task. In addition to the mapping of need that would be required to deliver an efficient service, alternative arrangements would need to remain available to ensure compliance with the regulations.

Requirement for the continuation of fixed location services

Whether or not a mobile service is adopted, the PMO considers that it will be necessary to ensure that alternative arrangements remain available for those 'off-schedule' requirements for health assessments (i.e. for new starts and those due an assessment but are absent when the mobile health units visit their site). In this way, the CWP Select Committee's assumed intent that access to comprehensive health assessments at appropriate intervals will be satisfied and adherence to regulations achieved.

A final consideration then, is the impact on the existing system. Under the current system, NMAs provide the service. This would need to continue in a dual system to ensure timely coverage for all. However, the workload for NMAs would be likely to fall dramatically (depending on the number of mobile health units in operation) with a number of possible outcomes. First, a number of NMAs may voluntarily withdraw from the system. As reducing the number of NMAs is also a recommendation included in the Monash Review, this is not necessarily a negative outcome. However, the reduction may not be evenly spread across the state and could lead to a situation where the availability of NMAs in regional areas is compromised. Further, if NMAs see a significant drop in referrals, there is a slight concern that the necessary number of assessments to maintain skill levels may not be available. There is then, some limited potential that service provision may fall below expected levels as a result of reduced volume of work.

Consideration against key criteria

Providing mobile health units would ensure that health assessments are readily available to coal mine workers onsite. This has attractions in terms of convenience. However the recommendation presents a number of challenges to be weighed against this advantage.

- The costs associated with the introduction and maintenance of a sufficient number of mobile health units is significant. In the range of $4.5 million to $7 million for the purchase of vehicles and equipment in the first year, with ongoing costs estimated at approximately $1.8 million to $2.9 million per annum for staff and maintenance. These figures exclude the cost of X-ray reading to the required ILO standard.
- There will remain a need to provide an alternative arrangement for new entrants and those mine workers who are not rostered on-site when the mobile health unit visits. There will be costs associated with this.
- Feedback from radiography providers suggests that staff attraction and retention may be a difficulty. Consequently, remuneration above the median rate assumed in this paper may be required.
- There is a risk that transporting sensitive diagnostic equipment long distances over rough terrain will impair the function of the devices. While the newest equipment is more robust, it does require a climate controlled environment.
- The potential for 'monopoly' provision of this service - either by the state or under contract with a private sector provider - would remove from workers the existing element of choice over which medical practitioner to consult.
- The provision of a mobile service will not, in and of itself, improve the technical competence of those undertaking the assessments. This issue also needs to be addressed.

The provision of health assessment via mobile health units is, essentially, an issue of revised governance. As such, the PMO has considered this proposition in terms of key characteristics of successful administration (the same framework as was employed in Discussion paper 1).

The PMO considers that providing mobile health units will have the following impacts:

Accountability

Accountability is determined by structural arrangements that are consistent with the principle of responsible government, in that the entity's functions are accountable to the executive, which in turn is accountable to Parliament. Lines of accountability are clear and responsibilities are well understood. In terms of accountability, a single provider service may be more readily identifiable. In any scenario – whether public or private provision is preferred - the line of accountability would run from the provider to the scheme administrator to the Minister. Importantly though, accountability would not rest on the notion of mobile versus fixed provision and therefore the provision of mobile units would seem to have no impact on accountability.

Effectiveness

The effectiveness of an entity is determined by the extent to which it is able to successfully support the objectives of the relevant legislation and has access to appropriate levels of resources and expertise.

While mobile health units would be designed to meet the objects of the relevant legislation, it is not clear that such a service could confidently rely on sufficient resourcing and expertise. Providers have already suggested recruitment and retention could be a problem due to the nature of the employment on offer. This is significant in that one vacant position would prevent a unit from operating as intended (for example, without a properly trained radiographer, the X-ray portion would be missed, without a doctor, the rest of the assessment would be omitted), which could have unacceptable consequences for the mining workforce. Similar issues would be encountered in relation to periods of illness as well as scheduled absences, which would require a suitably qualified locum to step in.

Efficiency

An organisation's efficiency is related to the degree of overlap or duplication with other relevant bodies. The entity has flexibility to anticipate and respond quickly to emerging needs and changing regulatory issues.

The question of whether a mobile health unit service would demonstrate efficiency is contestable. While there is potential for a single provider to streamline systems and processes and to take ownership of a state-wide programme, which may lead to efficiencies, this arrangement is not dependent on the provision of a mobile service. A single fixed location provider would be similarly likely to achieve efficiencies. It is also true that there would continue to be a requirement for alternative arrangement to remain available, leading to an overlap in provision. In the event of a significant change in worker numbers, the units may be left idle, or, conversely, unable to meet demand, which in turn would lead to an increase in use of the alternate arrangements and associated costs.

Transparency

The transparency of an organisation is the extent to which government, stakeholders and the public are able to clearly identify the objectives of the entity and how it is performing against those objectives.

The transparency of a service is unlikely to be impacted by whether it is a mobile service or a fixed location service. It will be the responsibility of those administering the scheme to ensure that an appropriate level of transparency is achieved.

Independence

Independence is determined by the freedom with which the entity may carry out its functions.

In this case, it is not clear that a mobile health unit service could be determined to be truly independent. It will be fully funded by contributions from industry (as health assessments are now) and administered by the regulator (as now).

Public confidence

Public confidence is a function of trust in the capacity of a body to deliver its functions.

It is possible that a clearly branded and recognisable mobile health unit service may have a positive impact on public confidence in the health scheme's ability to carry out its functions. As before though, this characteristic is not tied to the mobility of the service and would be equally true for a fixed location service. Nevertheless, this could be useful tool in re-establishing trust in the scheme.

PMO position on recommendations

Recommendation 47

PMO position: The PMO does not consider that the case has been made for the introduction of mobile health units.

The CWP Select Committee has not presented a rationale for the recommendation or produced evidence of a particular issue that needs to be addressed. The efforts of NIOSH and Coal Services in NSW demonstrate considerable merit. It should, however, be borne in mind that, as noted above, both services operate in different circumstances to that of Queensland.

The existing arrangements for the provision of health assessments in Queensland, with the advantage of an element of compulsion, have not been demonstrated to be ineffective. There is no demonstrable issue with access to practitioners offering health assessments, including chest X-rays. Indeed, it is demonstrable that coal mine workers are accessing X-ray services in 33 different local government areas in the state.

It is clear that, rather than *access*, issues have occurred in relation to the *quality* of assessments being provided. Most specifically, in relation to technical competence in carrying out the practical elements of the assessment. For example, both the CWP Select Committee and the Monash Review pointed to a higher than acceptable proportion of X-rays with quality issues (20%) impacting on the ability to accurately assess and classify the images.[31] Similarly, both the Monash Review and the CWP Select Committee highlight deficiencies in spirometry, with limited training, inadequate equipment maintenance and low levels of accuracy in interpretation.[32]

The PMO is of the view that the critical element in providing a health scheme that is fit for purpose is ensuring the competence of practitioners carrying out assessments. The CWP Select Committee and the Monash Review both made recommendations in this respect, and work is well advanced in responding to these recommendations.

Recommendation 48

PMO position: While the PMO does not find the case has been made for the introduction of mobile health units, it is agreed that should such a service be introduced, it should be properly staffed and maintained, and that it is sensible to suggest this service be funded through the Coal Mine Workers' Health Scheme.

Recommendation 49

PMO position: As above, while the recommendation regarding mobile health units is not supported by the PMO's analysis, if such a service were to be provided, it is agreed that the cost of the health assessments should be met by the Coal Mine Workers' Health Scheme.

[31] Monash Centre for Occupational and Environmental Health, *Review of the Respiratory Component of the Coal Mine Workers' Health Scheme,* 2016, p. 50.
[32] As above, p. 55.

Have your say

If you have any feedback or comments on the positions presented in this focus paper, these may be made in writing to the Project Management Office by email or post:

Email: pmo.cwp@dnrme.qld.gov.au

Post: Project Management Office Department of Natural Resources, Mines and Energy PO Box 15216 City East QLD 4002

Feedback closes 5 pm, Friday 27 April 2018

For more information, contact the Project Management Office on 07 3199 8022.

Appendix 1 Detail on the geographic spread of known Queensland and NSW coal deposits

Queensland's coalfields

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 has not commenced (e.g. Galilee Basin), or else has ceased (e.g. Mt Mulligan).[33]

Queensland's major coal reserves are located in an area measuring approximately 400km by 1000km and covering roughly 450,000 square kilometres, as demonstred in the map[34] below.

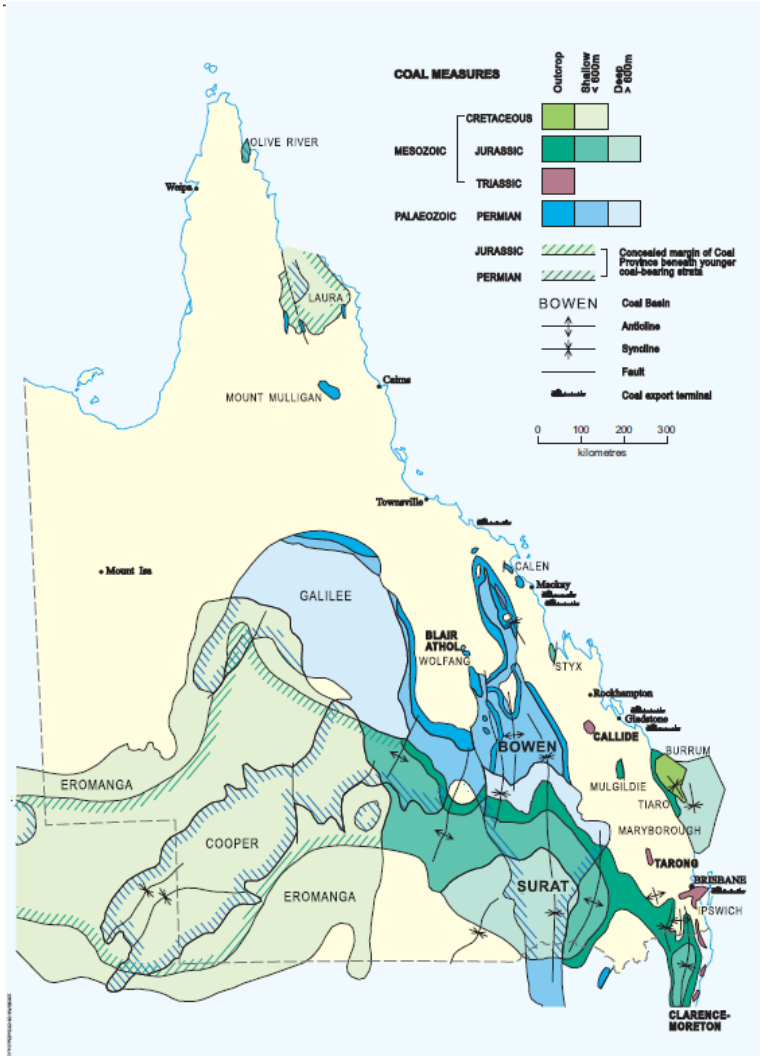


Figure 1: Queensland Sedimentary Basins

[33] Department of Natural Resources and Mines, "Submission to the Coal Workers' Pneumoconiosis Select Committee", 9 December 2016, p. 123.
[34] As above, p. 124.

New South Wales' coalfields

The major coal resources in NSW are located in the 500km long, 150km wide Sydney-Gunnedah Basin, covering an area of around 100,000 square kilometres. It extends from south of Wollongong to north of Newcastle and north-westerly through Narrabri into Queensland. There are five major coalfields within the basin: Hunter, Newcastle, Southern, Western and Gunnedah. Minor coal resources are also located in the Gloucester and Oaklands Basins.[35]

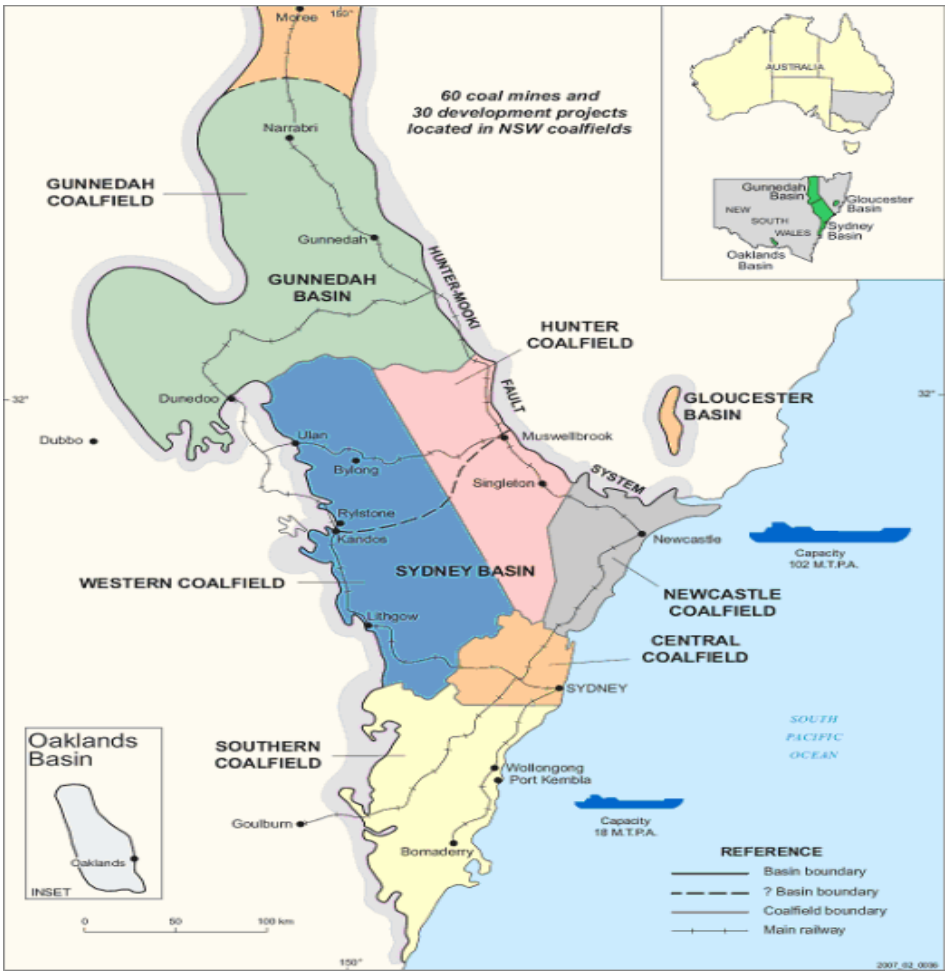
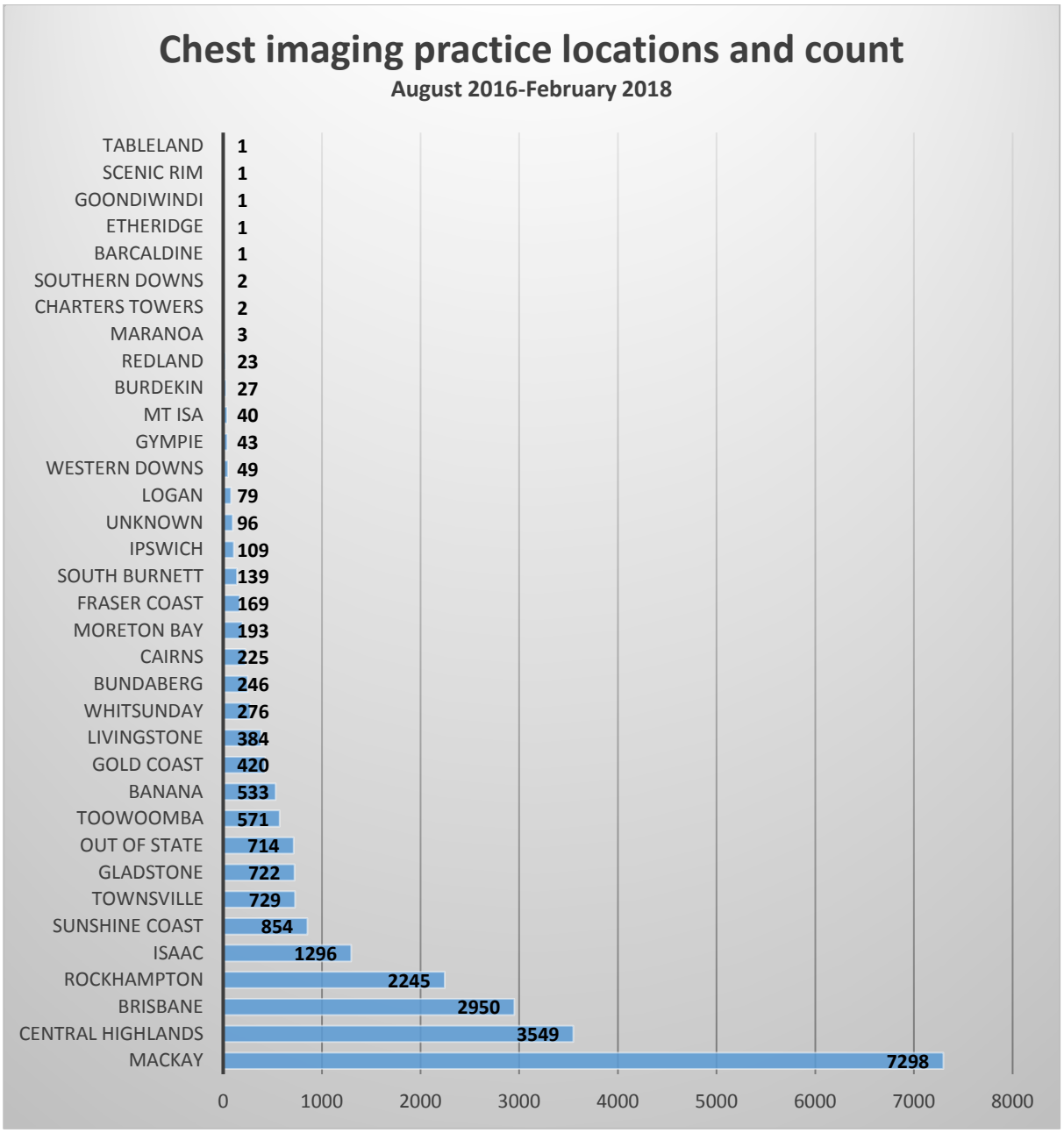


Figure 2: New South Wales Coal Fields[36]

[35] New South Wales Government, "NSW Coalfields" https://www.resourcesandenergy.nsw.gov.au/landholders-and-community/minerals-and-coal/geoscience-for-landholders/coalfields (accessed 27 February 2018)
[36] As above.

Appendix 2 Queensland chest imaging practice locations and count



Appendix 3 Components of the Coal Mine Workers' Health Assessment

Components of the Coal Mine Workers' Health Assessment

- Height
- Weight
- Vision
  - vision acuity
  - colour vision
  - work related colour vision (if the colour vision test is abnormal)
- Audiometry
  - audiogram
  - work related practical hearing test (if the audiogram is abnormal)
- Cardiovascular examination, including electrocardiogram (ECG) if required
- Respiratory function
  - questionnaire
  - chest examination
  - spirometry
  - lung function testing (if respiratory function results are abnormal)
  - Comparison of respiratory function results
- Chest Imaging
  - X-ray
  - A high resolution Computed Tomography (CT) scan (if X-ray results are abnormal)
- Musculoskeletal assessment
- Urinalysis and blood sugar testing
- Abdominal examination
- Skin examination
- Health/lifestyle considerations affecting fitness for work
- Consideration of circumstances in which the worker may not be fit for duty

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