BLAST MANAGEMENT STRATEGY

For Boggabri – Tarrawonga – Maules Creek Complex

FEBRUARY 2024

Idemitsu Australia Pty Ltd
Boggabri Coal Operations Pty Ltd

Whitehaven Coal Limited
Tarrawonga Coal Pty Ltd, Maules Creek Coal Pty Ltd

DOCUMENT CONTROL				
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Company	Position
BCOPL	Environment Superintendent
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Whitehaven Coal (Maules Creek)	Environment Superintendent
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Contents

Tables

Figures

Glossary

Glossary	
AEMR	Annual Environmental Management Report
BCEP	Boggabri Coal Expansion Project
BCM	Boggabri Coal Mine
BCOPL	Boggabri Coal Operations Pty Ltd
BLMP	Blast Management Plan
BLMS	Blast Management Strategy
BTM Complex	Boggabri-Tarrawonga-Maules Creek Complex
CCC	Community Consultative Committee
CL	Coal Lease
DAWE	Commonwealth Department of Agriculture, Water and Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DP&I	NSW Department of Planning and Infrastructure (now DPHI)
DPHI	NSW Department of Planning, Housing and Infrastructure
EA	Environmental Assessment
EP&A Act	*Environmental Planning and Assessment Act, 1979*
GHG	Greenhouse Gas
IAR	Idemitsu Australia Pty Limited
MCCM	Maules Creek Coal Mine
Mtpa	Million Tonnes Per Annum
OEH	NSW Office of Environment and Heritage
PAC	NSW Planning Assessment Commission
ROM	Run of Mine
TCM	Tarrawonga Coal Mine

1. Introduction

1.1 Background and purpose

The purpose of this cumulative Blast Management Strategy (BLMS) is to document the approach that will be taken by mines within the Boggabri-Tarrawonga-Maules Creek Complex (BTM Complex)[1] to monitor and collectively manage cumulative blasting impacts. This strategy details the relevant cumulative blasting impact assessment criteria for each mine and outlines the cumulative blast management protocols that will be implemented within the BTM Complex.

The BTM Complex is an existing mining precinct located within and around the Leard State Forest, approximately 15 kilometres (km) north-east of Boggabri in the Narrabri Local Government Area (LGA). The BTM Complex includes the Tarrawonga Coal Mine (TCM) in the south, the Boggabri Coal Mine (BCM) to the north and the Maules Creek Coal Mine (MCCM) to the north-west. The extent of the relevant tenements for each of the mines that comprise the BTM Complex are presented in Figure 1.1.

BCM is managed by Boggabri Coal Operations Pty Ltd (BCOPL), a wholly owned subsidiary of Idemitsu Australia Pty Limited (IAR).

TCM is managed by Tarrawonga Coal Pty Ltd, a wholly owned subsidiary of Whitehaven.

MCCM is managed by Maules Creek Coal Pty Ltd, and is a joint venture between Whitehaven Coal, J-Power and Itochu.

A summary of the ownership details for the mines within the BTM Complex is provided below in Table 1.1.

Table 1.1 Management and Ownership of BTM Complex Mines

Mine	Management	Ownership	Share
Boggabri Coal Mine	Boggabri Coal Operations Pty Ltd	Idemitsu Australia	80%
		Chugoku Electric Power	10%
		NS Boggabri Pty Limited	10%
Tarrawonga Coal Mine	Tarrawonga Coal Pty Limited	Whitehaven Coal Mining Limited	100%
Maules Creek Coal Mine	Maules Creek Coal Pty Limited	Aston Coal 2 Pty Limited (owned 100% by Whitehaven Coal Limited)	75%
		Itochu Coal Resources Australia Maules Creek Pty Ltd (ICRA MC)	15%
		J-Power Australia (J-Power)	10%

[1] In previous environmental assessments and approval documents this group of mines has been referred to as the Leard Forest Mining Precinct. For the purpose of this strategy and all other relevant cumulative impact management documents, all references to the 'Leard Forest Mining Precinct' have been replaced with the term 'BTM Complex'.

Development applications for the continued operation of the BCM (Project Approval 09_0182) and the development of the MCCM (Project Approval 10_0138) were determined by the NSW Planning Assessment Commission (PAC) in July and October 2012 respectively, under delegation by the NSW Minister for Planning and Infrastructure. Subsequent to this, the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (then the Commonwealth Department of Environment [DoE]), granted conditional approval for both the BCM (EPBC 2009/5256) and the MCCM (EPBC 2010/5566) on 11 February 2013. These projects were granted approval subject to stringent conditions related to the management of cumulative impacts.

The TCM application for continuation of mining was approved on 22 January 2013, with similar cumulative impact management conditions to those detailed in the BCM and MCCM. The (now) DCCEEW granted EPBC approval (EPBC 2011/5923) to the Tarrawonga project on 11th March 2013.

Approval conditions require the preparation of a suite of environmental strategies developed in partnership by all three mines of the BTM Complex. This BLMS has been developed to satisfy each mine's project approval conditions. Approval conditions relevant to the management of cumulative noise impacts within the BTM Complex are detailed in Table 1.2.

Table 1.2 Approval requirements for blasting impact management

Project/Approval	Condition	Details
Boggabri Coal Mine Project Approval 09_0182	Schedule 3, Condition 20	During mining operations on site, the Proponent shall… (b) co-ordinate the timing of blasting on site with the timing of blasting at other mines within the Leard Forest Mining Precinct to minimise the cumulative blasting impacts of the mines; and
	Schedule 3, Condition 22	The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. The plan must… (h) include a Leard Forest Mining Precinct Blast Management Strategy that has been prepared in consultation with other mines within the Leard Forest Mining Precinct to minimise cumulative blasting impacts*.
Tarrawonga Coal Mine Project Approval 11_0047	Schedule 3, Condition 19	During mining operations on site, the Proponent shall… (b) co-ordinate the timing of blasting on site with the timing of blasting at other mines within the Leard Forest Mining Precinct to minimise the cumulative blasting impacts of the mines;
	Schedule 3, Condition 21	The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. The plan must… (h) include a Leard Forest Mining Precinct Blast Management Strategy that has been prepared in

		consultation with other mines within the Leard Forest Mining Precinct to minimise cumulative blasting impacts*.
Maules Creek Coal Mine Project Project Approval 10-0138	Schedule 3, Condition 23	During mining operations on site, the Proponent shall… (b) co-ordinate the timing of blasting on site with the timing of blasting at other mines within the Leard Forest Mining Precinct to minimise the cumulative blasting impacts of the mines; and
	Schedule 3, Condition 25	The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Planning Secretary. The plan must… (h) include a Leard Forest Mining Precinct Blast Management Strategy that has been prepared in consultation with other mines within the Leard Forest Mining Precinct to minimise cumulative blasting impacts*.
*The Leard Forest Mining Precinct Blast Management Strategy can be developed in stages and will need to be subject to ongoing review dependent upon the determination of and commencement of other mining projects in the area		

1.2 Document structure

The structure of this strategy is as follows:

- **Section 1** provides an introduction to the BLMS, including the background to the BLMS, and the scope of the BLMS.
- **Section 2** provides an overview of the BTM Complex mines (BCM, TCM, MCCM).
- **Section 3** outlines the requirements for regional strategies.
- **Section 4** describes blast management criteria for each individual mine
- **Section 5** describes existing monitoring networks and the use of predictive metrological forecasting to guide blasting activities.
- **Section 6** outlines strategies for the cumulative impact management, communication, incident management and reporting.
- **Section 7** outlines strategies for the management of corrective and preventive actions.
- **Section 8** describes the document control process for this BLMS
- **Section 9** provides a list of references used in this document.

1.3 Scope

This document is the overarching strategy for management of blasting within the BTM Complex.

Individual mines will manage their ongoing operations and associated blast management impacts in accordance with their site specific BMPs. Statutory requirements relating to blasting will be provided in each individual site's management plan.

It is envisaged that any extensions to mining operations in the BTM Complex will be incorporated into this strategy in the future.

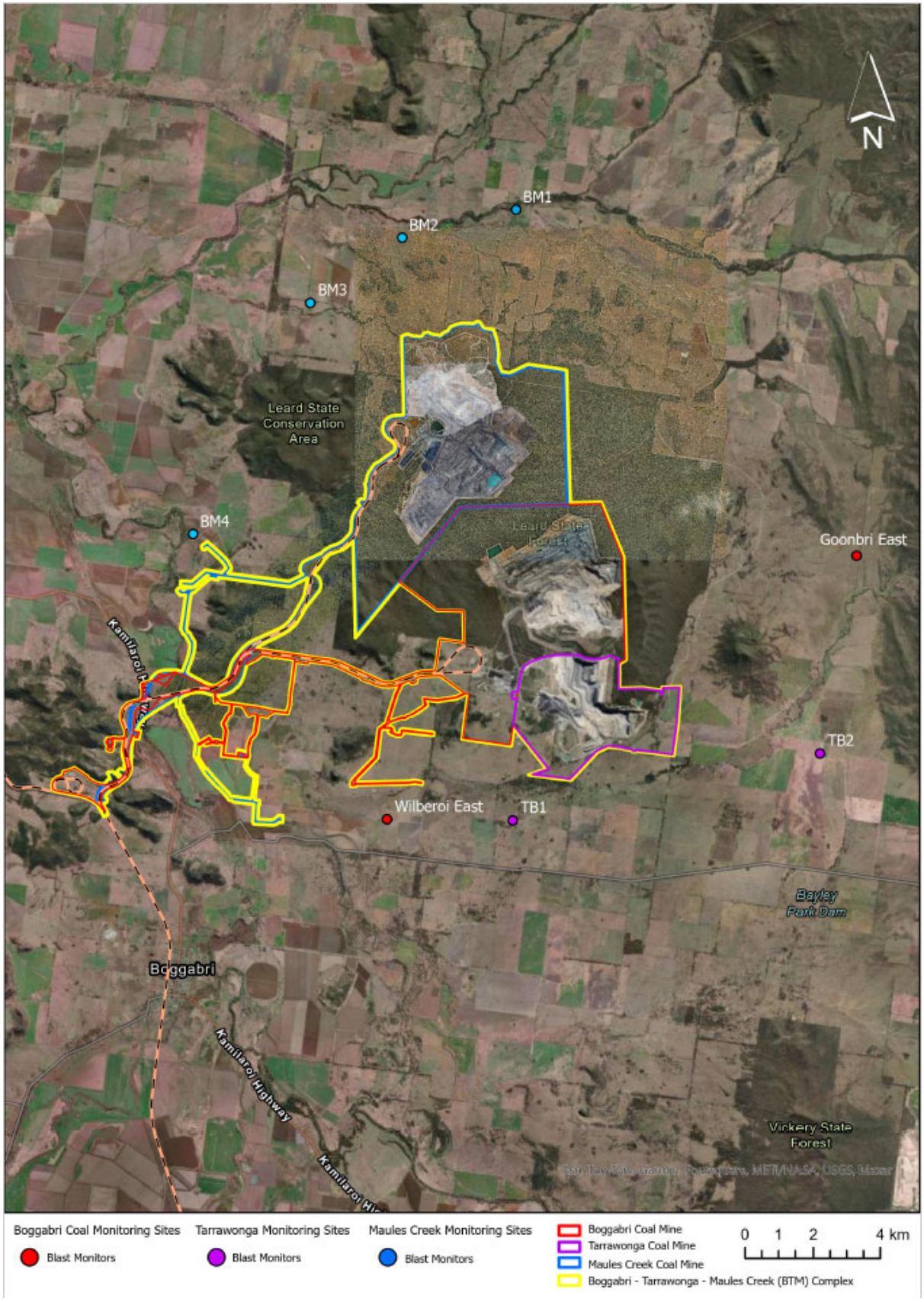

Figure 1.1 Location of the blast monitors at the BTM Complex mines

2. BTM Complex

The BTM Complex is located in the Narrabri LGA in the Northwest Slopes and Plains of New South Wales. The BTM Complex is located within and adjoining the Leard State Forest, north-east of Boggabri and south of Maules Creek. The major regional centres of Narrabri and Gunnedah are located approximately 50 km north-west and 40 km south-east of the BTM Complex, respectively.

2.1 Boggabri Coal Mine

BCM is an existing open cut mine that consists of an open cut pit, overburden dump, infrastructure area including coal processing facilities, water management structures, and a rail spur.

BCM obtained NSW State Government approval on the 18 July 2012, and Commonwealth Government approval on 11 February 2013. These approvals (as modified) allow operations at BCM to extend for a further 21 years at a rate of 8.6 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. The project approval for BCM provides for operation of existing ancillary equipment; construction and operation of a new coal handling and preparation plant (CHPP); 17 km rail spur line; bridges over the Namoi River and Kamilaroi Highway; a rail load-out facility located at the mine; upgrade of the overburden and coal extraction haulage fleet (with an option for a drag-line); upgrade of electricity transmission lines; and establishment of a water supply borefield and other ancillary infrastructure.

BCM have modified PA09_0182 on multiple occasions since approval with the most recent being in March 2023, relating to the relocation of pre shift infrastructure closer to the active mining area and operation of in-pit mobile crushing unit.

2.2 Tarrawonga Coal Mine

The TCM is an existing coal mining operation that was granted approval by the (now) DPI&E to extract 2 Mtpa of ROM coal in 2005 (DA88-4-2005). TCPL, a subsidiary of Whitehaven Coal, submitted a project application in July 2011 for an extension of open cut mining operations with an increased production rate to 3 Mtpa of ROM coal for a further 17 years from 2013 to 2030. This project application was determined by the PAC on 22 January 2013.TCM have modified Project Approval 11_0047 on a number of occasions since then, increasing coal extraction to a maximum of 3.5 million tonnes in 2020. The most recent modification was determined in December 2023 to increase the road haulage hours of operation. Maules Creek Coal Mine

A Project Application for the MCCM was submitted to the then NSW Department of Planning (now Department of Planning, Industry and Environment) in August 2010 under Part 3A of the EP&A Act. Project approval was granted by the Planning Assessment Commission under delegation of the Minister for Planning and Infrastructure on 23 October 2012. The project approval allows for the construction and operation of an open cut coal mine, with the recovery of up to 13 million tonnes per annum (Mtpa) of ROM coal for a period of 21 years. Key features of the project include transportation of coal by rail to Newcastle, and development of site infrastructure including a CHPP and associated facilities, a train loading facility and rail spur and loop, a mine access road, communications and power reticulation, explosives storage, and a water pipeline from the Namoi River.

MCCM have modified Project Approval 10_0138 on a number of occasions since then, with the most recent being in January 2022. This latest modification allows for the use of mobile coal sizing

equipment in the existing run-of-mine (ROM) coal stockpile area and the open cut pit, mobile rock crushing equipment in the Northern Emplacement Area, and disposal of used heavy vehicle tyres in waste rock emplacement areas.

3. Regional Strategies

The conditions of approval for the Boggabri Coal Mine and Maules Creek Coal specifically require the three mines of the BTM Complex produce joint strategies for:

- Noise management
- Blast management
- Air quality management
- Water management
- Regional biodiversity (developed over 3 stages)
- Biodiversity offsets

Additionally, the conditions require cooperation and consultation between the mines with respect to:

- Aboriginal heritage conservation
- Operational noise and air quality management, including online communications of onsite activities and monitoring; operating conditions and reactive dust management: and air quality and greenhouse gas (GHG) management
- Transport, specifically options for transporting workers
- Management of social impacts
- Membership of Community Consultative Committees (CCC).

This BLMS addresses the requirement for a BLMS over the BTM Complex area and outlines the process that will be followed to scope, select and deliver joint monitoring and data management for blasting.

4. Blasting Criteria

4.1 Boggabri Coal Mine

The relevant blasting criteria have been extracted from the most recent BCOP Project Approval (PA 09-0182) and are summarised in Table 4.1.

Table 4.1 Boggabri Coal Mine blasting assessment criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable exceedance
Residence on privately owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All Public infrastructure	-	50 (or alternatively a specific limit determined to the satisfaction of the Secretary by the structural design methodology in AS2187.3-2006, or its latest version)	0%

The process for day-to-day management of compliance with respect to these conditions is outlined in the BCOPL Blast Management Plan (BLMP).

4.2 Tarrawonga Coal Mine

The relevant blasting criteria have been extracted from the most recent Tarrawonga Coal Project Approval (PA11_0047) and are summarised in Table 4.2.

Table 4.2 Tarrawonga Coal Mine blasting assessment criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable exceedance
Residence on privately owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All Public infrastructure	-	50 (or alternatively a specific limit determined to the satisfaction of the Secretary by the structural design methodology in AS2187.3-2006, or its latest version)	0%

4.3 Maules Creek Coal Mine

The relevant blasting criteria have been extracted from the most recent Maules Creek Project Approval (PA10_0138) and are summarised in Table 4.3.

Table 4.3 Maules Creek Coal Mine blasting assessment criteria

Location	Airblast overpressure (dB(Lin Peak))	Ground Vibration (mm/s)	Allowable exceedance
Residence on privately owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All Public infrastructure	-	50 (or alternatively a specific limit determined to the satisfaction of the Secretary by the structural design methodology in AS2187.3-2006, or its latest version)	0%

The process for day-to-day management of compliance with respect to these conditions will be outlined in the MCCM BLMP.

4.4 BTM Complex

Table 4.4 summarises the current assessment criteria for the three mines of the BTM Complex.

Table 4.4 BTM Complex blasting assessment criteria

Criteria	Boggabri	Tarrawonga	Maules Creek
Blasting Hours	9AM – 5PM	9AM – 5PM	9AM – 5PM
Blasting Days	Monday to Saturday inclusive, and no blasting is allowed on Sundays, public holidays or at any other time without the written approval of the Secretary.	Monday to Saturday inclusive, and no blasting is allowed on Sundays, public holidays or at any other time without the written approval of the Secretary.	Monday to Saturday inclusive, and no blasting is allowed on Sundays, public holidays or at any other time without the written approval of the Secretary.
Blasting Frequency	1 Blast per day, unless an additional blast is required following a blast misfire; and 4 blasts a week, averaged over a calendar year.*	1 Blast per day, unless an additional blast is required following a blast misfire; and 4 blasts a week, averaged over a calendar year, for the project.*	1 Blast per day, unless an additional blast is required following a blast misfire; and 4 blasts a week, averaged over a calendar year.*

	* This condition does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, or to blasts required to ensure the safety of the mine or its workers.

The assessment criteria for the three mines, as outlined in Table 4.4, have been considered in preparation of the BLMS. Day to day management of blasting activities for the mines is detailed in their respective BLMPs.

5. Blast Monitoring

5.1 Existing Monitoring network

The mines of the BTM Complex already have comprehensive blast management systems in place. The existing blast monitoring network will continue to be used. The locations of monitors within the existing blast monitoring network are shown in Figure 1.1.

It is expected that little change will be required to the existing blast monitoring network to continue to ensure compliance with respect to blasting in the BTM Complex. However, there will need to be additional cooperation between mines of the BTM Complex, to minimise the potential for cumulative impacts. Protocols described in this BLMS will be used with the existing monitoring programs to ensure that blasting schedules are coordinated to avoid cumulative impacts on sensitive receivers.

5.2 Predictive forecast meteorology

Regular meetings will be held by the BTM Complex to discuss any concerns relating to cumulative impacts associated with blasting. Meeting minutes will be documented and distributed to each site.

Details of the predictive meteorology system are included in the approved BTM Complex Air Quality Management Strategy (2017). The forecast meteorology system gives hourly weather forecasts up to 48 hours in advance. This system prepares daily forecasts reports that are used to guide the planning of blasting activities.

As with any predictive forecast, confidence reduces with longer predictions, however the hourly 48-hour forecasts provide useful information for guiding the drilling and loading of blasts at each mine within the BTM Complex. The forecasts for the next 24-hour and 12-hour periods provides more confidence in predictions for the day ahead and how weather may affect the proposed schedule for firing a blast.

6. Cumulative blast management

6.1 Mitigation of cumulative blast impacts

The key management measure for the mitigation of cumulative blast impacts will be scheduling of blasts to ensure each mine fires their blast at separate times. Processes to mitigate blasting impacts associated with operations will be addressed in each mine's individual BLMPs. Each mine has developed a BLMP that outlines a consistent approach for the scheduling of blasts in consultation with other mines in the BTM Complex.

Blast notifications will be provided no later than the day prior to a proposed blast. If there is no conflict regarding the scheduled blast times, there will be no further correspondence. If there are conflicting blast times between the mines, a revised schedule for firing the blasts will be agreed upon. The schedule will be developed to ensure blasts are fired with a minimum 15-minute time gap between them to reduce any potential cumulative impacts.

6.2 Communication

Regular meetings will be held by the BTM Complex to discuss any concerns relating to cumulative impacts associated with blasting. Meeting minutes will be documented and distributed to each site.

6.2.1 Pre-blast communication

Each mine will send an email notification to the other mine advising date, blast ID number, exclusion zone map and estimated time of the blast. Other way of communication can also be used to discuss any conflictive date or time of blast.

Prior to blasting, if a dust and or fume event are likely to cross onto a neighbouring mine lease or operation area, an employee of the blasting mine will make positive contact with the neighbouring operation. It is expected that the Mining Superintendent or OCE will be contacted by phone and informed of what could potentially occur. If positive contact is not made, then the blast will not be fired until positive communication has occurred.

6.2.2 Post blast communication

When blasting criteria are identified as exceeded as a consequence of blasts from two or more mines, discussions will be held within the BTM Complex and the agencies and affected landholders (where an exceedance occurs on privately-owned land). This will include confirmation from the BTM Complex as to the blast time and identified time of exceedance from monitor reports to assist in identifying if the impact was due to more than one blast, or if it relates to single mine's blasting activities.

The mines of the BTM Complex will also, if required, share baseline property inspection reports that are completed at the request of neighbouring landholders, in accordance with each site's Project Approval process to identify the main source of blasting impacts.

If there is uncertainty around the source of a blasting related incident (e.g. exceedance of assessment criteria or damage to a neighbouring building or other infrastructure), a meeting will be held by the BTM Complex representatives to review relevant data and investigate the cause of the incident. If the cause cannot be determined, then the BTM Complex will engage a suitably qualified expert to undertake an

independent blast impact investigation. The outcomes of the investigation will help determine the responsibility of the mines for any corrective actions.

6.3 Blasting related incidents

Blasting related incidents such as misfires or exceedances of assessment criteria will be reported and managed in accordance with each mine's BLMP and incident management process. Incidents will be managed in accordance with the requirements of the *Protection of the Environment Operations Act 1997 and the Work Health and Safety (Mining) Act, 2013.*

6.4 Reporting

External reporting will include:

- Individual Company websites
- Community Consultive Committees (CCCs)
- Annual review (formerly AEMR)
- Annual returns
- Exceedance reporting

7. Corrective and preventative actions

7.1 Blasting criteria exceedance

If the monitoring results of a blast identify an exceedance of the mine's relevant criteria, written notification of the exceedance will be provided to the other mines within the BTM complex, in addition to any investigation undertaken according to the respective mine's BLMP.

7.2 Unpredicted contingency

Unpredicted events, such as storms or earth tremors, will be identified and reported as impacting on vibration results on a case-by-case basis.

8. Document control

The BLMS has been developed with the input of representatives of BCPL, TCM and MCC.

8.1 Review and revision

In accordance with the project approvals, the BMS will be reviewed within three months of:

- the submission of an annual review;
- a blasting incident that causes or threatens to cause material harm, requiring notification of the Secretary / relevant agencies;
- the submission of a statutory audit; and
- any modification of a project approval.

9. References

Project Approval PA11_0047 MOD6 (2018) for Tarrawonga Coal Mine

Notice of Modification DA 09_0182 MOD 6 for the Boggabri Coal Mine.

Project Approval 10_0138 for the Maules Creek Coal Project.

Boggabri Coal Pty Limited, Boggabri Coal Mine Blast Management Plan (2018), Boggabri Coal Pty Limited, NSW

Whitehaven Mining Pty Limited, Maules Creek Blast Management Plan (2018), Whitehaven Mining Pty Limited, NSW.

Whitehaven Mining Pty Limited, DRAFT Tarrawonga Blast Management Plan (2018),(still under review) Whitehaven Mining Pty Limited, NSW