MANAGEMENT PLAN
Blast Management
MAC-ENC-MTP-015

Version: 5| **Released:** 06/12/2021 **Key Contact**: Environment Superintendent

Table of Contents

1 Preface

Hunter Valley Energy Coal Pty Ltd (HVEC) operates the MAC Mine Complex (MAC), which consists of approved open cut and underground mining operations, a rail loop and associated rail loading facilities. The operations are located in the Upper Hunter Valley, NSW approximately five kilometres south west of Muswellbrook.

To allow efficient recovery of the underlying coal MAC must undertake blasting of mine overburden. Blasting activities generate vibration through the air (overpressure) and earth (ground vibration), along with the generation of dust and fume, which have the potential to adversely impact the community, surrounding structures and environment. To minimise these impacts and meet statutory obligations MAC has established a Blast Management System (BMS) to control the design and implementation of blasting activities. The Blast Management Plan (BMP) describes these processes.

A full project description, including baseline data, history of operations, current operating philosophy and mining methods is provided in the Mining Operations Plan and the Mt Arthur Coal Open Cut Modification Environmental Assessment 2013.

2 Legislation, Standards and Regulations

2.1 Relevant Legislation and Regulations

Key legislation applicable to the management of water at MAC include but are not limited to:

- Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act);
- Protection of the Environment Operations Act 1997 (NSW) (PoEO Act);

Key statutory approvals associated with water management are:

- Mt Arthur Coal Mine Open Cut Consolidation Project Modification 1 (PA 09_0062 MOD 1) (the Project Approval); and
- Environmental Protection Licence 11457 (EPL).

2.2 Project Approval

The Project Approval was assessed under the EP&A Act and PA 09_0062) and granted on 26 September 2014. A list of the relevant conditions of the approval and where they are addressed in this Blast Management Plan (BMP) is found in Appendix 3, Table 1.

2.3 Environment Protection Licence

Environment Protection Licence 11457 (EPL11457) was granted under the PoEO Act and prescribes the times blasting may be undertaken, monitoring locations and associated limits. A list of the relevant conditions of the Licence and where they are addressed in this BMP is found in Appendix 3, Table 2.

2.4 Relevant Standards and Guidelines

MAC has well-established management systems that are aligned with the international environmental and safety management system standards ISO 14001 and ISO 45001. The management systems provide a framework to support the planning, implementation, monitoring and review of MAC's Blast Management processes, facilitating continual improvement in the performance of blasting activities. The management systems include internal policies, subordinate plans and technical procedures that are referenced within this BMP.

MAC applies the AEISG Code of Practice in its blasting practices. The Australian Explosives Industry and Safety Group (AEISG Inc) was formed in 1994. It was originally known as the Australian Explosives Manufacturers' Safety Committee and was initially comprised of representatives from Dyno Nobel Asia Pacific Ltd (previously Dyno Wesfarmers Limited), Orica Explosives (previously ICI Explosives), Union Explosives Español (UEE, previously ERT) and Total Energy Systems (TES). AEISG guidelines have been developed to assist the safe use of explosives in situations where a specific additional hazard may arise due to the generation of nitrogen oxides (NOx) within the post-blast gases. These oxides are generally regarded as products arising from imperfect decomposition of ammonium nitrate explosives during detonation. The purpose of these guidelines is to inform explosives users of:

- the hazards of NOx gases;
- the likely causes of their generation from blasting;
- possible measures to eliminate or minimize NOx generation; and
- to provide general management advice in the event of NOx incidents.

3 References

3.1 External Documents

- NSW EPA (24 August 2017) Environmental Protection Licence 11457
- Department of Planning, Minister of Planning's Project Approval document (dated 26 September 2014, Application Number 09-0062, Mt Arthur Coal Mine – Open Cut Consolidation Project.
- Hansen Bailey (2009), Mt Arthur Coal Consolidation Project Environmental Assessment. Prepared for Hunter Valley Energy Coal Pty Ltd.
- Resource Strategies (2013), Mt Arthur Coal Open Cut Modification – Prepared for Hunter Valley Energy Coal Pty Ltd.
- AEISG Code of Practice, Prevention and Management of Blast Generated NO_x Gasses in Surface Blasting (the AEISG Code).

3.2 Mt Arthur Coal Internal Documents

- MAC-ENC-MTP-041 Environmental Management Strategy
- MAC-STE-REG-013 Environment Compliance Register
- MAC-PRD-STD-014 Drill and Blast Design Standard
- MAC-ENC-PRO-042 Community Complaints Handling, Response and Reporting Procedure
- MAC-PRD-PRO-043 Blasting within 500m of Public Roads Procedure
- MAC-PRD-PRO-031 Blast Clearance and Communication
- MAC-PRD-PRO-106 Pre-Blasting Approval Procedure
- MAC-PRD-PRO-096 Clearing the Coal Hoppers
- NEC-STE-PRO-030 Management of Change Procedure
- NEC-STE-STD-016 Risk Management Standard
- MAC-PRD-MTP-003 Blast Sleep Time Management Plan
- NEC-STE-MTP-009 Pollution Incident Management Response Plan

4 Purpose

The purpose of this BMP is to provide an overview of, and direction to the systems, processes and documentation that have been established to:

- Facilitate the effective planning, implementation and monitoring of blasting activities at MAC to ensure compliance with statutory approvals is maintained;
- Minimise adverse impacts of blasting activities on the nearby residences, the environment, heritage sites and public infrastructure; and
- Maintain an effective response mechanism to deal with exceedances and complaints.

5 Scope

The scope of this BMP applies to the relevant blasting and vibration impact assessment criteria, compliance procedures and operational controls relating to open cut blasting activities. Secondary clearing activities, such as clearing blockages in the coal hoppers are managed in accordance with *Clearing the Coal Hoppers (MAC-PRD-PRO-096).*

6 Consultation and Communication

The original version of the BMP was prepared in 2011 in consultation with EPA and approved by the Department of Planning and Infrastructure (Department of Planning Industry and Environment DPIE) in 2012. Subsequent versions are submitted to the DPIE for review and approval.

In addition to formal consultation previously undertaken relating to the BMP, MAC has extensive consultation and communication processes, including:

- A comprehensive community engagement program which includes a Community Consultative Committee (CCC).
- Consultation and communication with the operators of neighbouring mines regarding future blasting schedules to ensure that blasts are coordinated and cumulative impacts minimised.
- Consultation with Muswellbrook Shire Council (MSC) and the NSW Roads and Maritime Services (RMS) (formerly NSW Roads and Traffic Authority (RTA)) to address the management of public road closures during any blasting.
- A publicly available blasting schedule (via the MSC blasting portal) and direct contact with certain residents and businesses listed on the Blast Notification Phone and Email List as requested.
- Ongoing consultation with major infrastructure operators.
- A community response line (1800 882 044) enables members of the community to contact community personnel directly to discuss concerns with blasting.
- Regular reporting on the environmental performance of the project on the BHP Mt Arthur Coal website.
- Publicly available project approvals, environmental and other related documentation (annual reports, complaints register, CCC minutes etc.) via the BHP Mt Arthur Coal website.

7 Roles and Responsibilities

The maintenance and update of this BMP is the responsibility of the HSE Manager.

Implementation of blasting operational controls is the responsibility of the Drill and Blast Superintendent. Responsibilities with respect to management of additional blasting related activities are defined within this plan, position descriptions and referenced operational control documentation.

8 Risk Management

MAC implements a comprehensive risk management system as documented in the *Risk Management Standard (NEC-STE-STD-016).* Identified blasting risks and their associated control measures are documented in the site Risk Register and summarised in Section 3.1 of this document. Operational and project related changes that have the potential to materially alter the risk profile of blasting activities are managed through the MAC *Management of Change Procedure (NEC-STE-PRO-030)*.

9 Blasting Hours

Blasting must only be carried out between 8am and 5pm, Monday to Saturday inclusive.

Blasting must not take place on Sundays or Public Holidays, or at any other time without the prior approval of the EPA, and the Secretary of the Department of Planning Industry and Environment (DPIE).

10 Blasting Frequency

The maximum number of blasts that may be fired is:

- 3 blasts a day;
- 4 blasts a day, on a maximum of 12 days each financial year; and
- 12 blasts a week, averaged over a financial year, on the site.

The requirement does not apply to blasts that generate ground vibration of 0.5 mm/s or less at any residence on privately-owned land, blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.

A blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

Should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.

In circumstances of recurring unfavourable weather conditions (following planned but not completed blast events), to avoid excess explosive sleep times and minimise any potential environmental impacts, agreement may be sort from the Secretary for additional blasts to be fired on a given day.

11 Blast limits

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 in a financial year
Public infrastructure	-	50	0%

However, these criteria do not apply if the Proponent has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

Note: An alternative limit for public infrastructure may be determined by the Secretary in accordance with the structural design methodology in AS 2187.2-2006, or another methodology acceptable to the Secretary.

Details of written agreements and any associated alternate criteria are documented within with Drill and Blast Design Standard (MAC-PRD-STD-014).

Blast impact assessment of heritage sites, including Edinglassie, Rous Lench, and Balmoral have determined that damage to the heritage sites will be prevented if the standard limits (see above) are complied with.

12 Operational Controls

Blast management procedures have been established and implemented at MAC to:

- Protect the safety of people and livestock in the area surrounding the blasting operations;
- Protect public and private infrastructure/property from blasting damage;
- Minimise dust and fume emissions, air blast overpressure, ground vibration levels and flyrock;
- Ensure blasting does not damage heritage sites, including Edinglassie, Rous Lench and Balmoral;
- Co-ordinate the timing of blasts at Drayton and Bengalla coal mines to minimise potential cumulative blasting impacts; and
- Enable the general public and surrounding landowners and tenants to get up-to-date information on the proposed blasting schedule via active participation in the Muswellbrook Shire Council online blasting portal.

Specific controls are required when blasting within the Blasting Control Area (see **Appendix 1)**, due to the proximity of public infrastructure, heritage sites and private residences. Operational controls include scheduling, spatial buffers and blast design controls defined within this plan and the following documentation:

- *Pre-Blasting Approval Procedure* (*MAC-PRD-PRO-106)* – Defines the process for conducting a pre-blast environmental assessment with consideration given to meteorological conditions and use of initiation systems that minimise adverse blast fume and dust impacts.

- *Drill and Blast Design Standard (MAC-PRD-STD-014)* – Defines blast design rules for minimising impacts; including, ensuring sufficient overburden is present to prevent blowouts and blast anomalies and use of suitable quality stemming material and adequate stemming lengths to ensure maximum confinement of explosive charges to minimise flyrock and overpressure.
- *Blast Sleep Time Management Plan (MAC-PRD-MTP-003)* – Specifies requirements for minimising excessive blast sleep times to reduce the likelihood of blast fume generation.
- *Blast Fume Predictive Model* – This model is used to predict the expected path and dispersion of fume from a blast based on factors, including but not limited to, meteorological and ground conditions, shot design, shot sleep time, explosives selection and on-bench practices.
- *Blast Permit (MAC-PRD-FRM-009)* – A Blast Permit requires completion and approval for all blasts and is informed by the proposed blast details, fume risk potential and predictive fume model.
- *Blast Clearance and Communication Procedure (MAC-PRD-PRO-031)* – This procedure defines requirements for securing the blast zone.

13 Blast Fume Management Strategy

MAC implements Blast fume management strategies to ensure Offensive blast fume is not be emitted from the premises.

MAC's Environment Protection licence defines offensive blast fume as post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances:

1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or
2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.

MAC's blast fume management strategy has been developed with reference to the AEISG Code of Practice for Prevention and Management of Blast Generated NOx Gases in Surface Blasting (the AEISG Code), to ensure nitrogen oxide (NOx) causes and mitigation measures are assessed to industry best practice standards.

This strategy provides an overview of the controls used to mitigate fume impacts. As quoted in the AEISG Code, "It should be understood that, given the complexity of the problem and the inherent variability in the blasting environment, NOx events may still occur even after prevention and mitigating actions have been put in place." Fume and dust are normally occurring by-products of any blasting operation. The quantities of each produced from a blast are determined by a large number of variables, some of which are better understood than others. The AEISG suggests fume generating conditions might be a result from one or many of the following conditions:

1. Explosive formulation and quality assurance.
2. Geological conditions.
3. Blast Design.
4. Explosive product selection.
5. On-bench practices.
6. Contamination of explosive in the blast-hole.

The objective is to take a pro-active approach that will assist in keeping fume generated from blasts to a low level. This pro-active approach requires considering the impacts that each decision throughout the whole process has on the potential to generate post blast fume in each shot. Through the assessment of causes and mitigating measures required to reduce to the generation of blast fume, MAC has developed the fume management strategy outlined in **Appendix 2**.

The strategy is structured by splitting the blasting process in relation to fume management into three main areas:

1. Pre-loading – Pro-active
2. On bench practices – Pro-active and Re-active (depending on the actions taken)
3. Post-blast – Re-active.

There are 9 areas that need to be focused on in mitigating fume for all blasts. These 9 areas are summarised in the sections below.

13.1 Horizon Risk

A common control to mitigate the cause of fume is to understand geology of each shot and design (timing and explosive product) to ensure adequate relief in weak/soft strata. To improve this understanding a blast horizon risk is determined for the strata that has been blasted at Mt Arthur Coal. The understanding of horizon risk is maintained and enhanced using historical fume data captured since July 2012.

13.2 Shot Design

Shot design is largely dictated by dig design. The primary focus is to provide the optimal fragmentation of the rock to enable the material to be loaded out safely and efficiently. Shot depth is determined by either the target coal seam, dig design or to limit blast vibration.

13.3 Sleep Time

Sleep time is defined on site as the time between loading the first explosive into the shot and the firing date measured in days. MAC targets a maximum sleep time of 14 days, which generally aligns with the explosive manufacturer's recommendation for products used at MAC at the time of writing this BMP. Where product development changes over time, the manufactures recommendation for each individual product will be adopted. Manufacturers determine sleep time based on factors other than fume creation; however it is generally accepted that an increase in sleep time causes an increase in fume creation. Once the shot is loaded, blasting will occur as promptly as possible subject to favourable weather conditions.

13.4 Explosive Quality

The quality of the explosive supplied to site is managed within the Explosives Supply contract in place at the time. The contract also details audit requirements and frequencies of inspections.

13.5 Explosive Selection

Outlined in the AEISG Code of Practice, a key contributor to post blast fume generation is the mismatch between explosive product and hole/ground conditions. At the time of writing the BMP the site uses the standard explosives available being ANFO, Heavy ANFO and emulsion, though this may change over time where improved products are identified. The initiating explosives used on site are those recommended by the manufacturer.

13.6 On-Bench Practices

Throughout the loading and firing processes of a blast there are a number of factors and consideration that need to be addressed in order to ensure that the risks around blast fume generation are controlled. These typical factors include the following:

1. Bench and Hole Conditions;
2. Weather Protection;
3. On Bench Quality Assurance of Selected Explosives;
4. Loading Sequencing; and
5. Loading Practices.

13.7 Blast Initiation

Once the blast has been loaded and stemmed, the next step in the process is to initiate the blast. While blasts are designed to ensure fume and dust generation is minimise as much as possible, blasts are initiated to ensure that potential fume or dust from a blast remains within the blast exclusion zone, which minimises impact on site personnel, surrounding neighbours and the local community. Once the shot is charged, the assessment of weather condition is undertaken to ensure blasts are fired during favourable weather conditions. Post 14 days minimising the impact fume is prioritised due to associated safety risk. Blast initiation during less favourable weather conditions must be approved by the General Manager. The following operational controls are key elements of the Blast Initiation process for the control of Fume impacts.

- *Pre-Blasting Approval Procedure* (*MAC-PRD-PRO-106)* – Defines the process for conducting a pre-blast environmental assessment with consideration given to meteorological conditions and use of initiation systems that minimise adverse blast fume and dust impacts.
- *Blast Fume Predictive Model* – This model is used to predict the expected path and dispersion of fume from a blast based on factors, including but not limited to, meteorological and ground conditions, shot design, shot sleep time, explosives selection and on-bench practices.

- *Blast Permit (MAC-PRD-FRM-009)* – A Blast Permit requires completion and approval for all blasts and is informed by the proposed blast details, fume risk potential and predictive fume model.

13.8 Reporting and Documenting

As a requirement on site, all blasts will be filmed and the records kept on site. Where the shot produces fume with a rating of 3 or higher, the video record will continue to capture the progression of the fume cloud tacking both its creation and dispersion and its direction of travel.

A feedback loop on the fume created from blasting will be available in the reporting structure. Should fume with a rating of 4 or 5 be created, the blast event will be reported to DPIE and an investigation into the generation of the fume will be undertaken and the resulting causal factors will be fed into future designs that match the criteria of the offending blast.

13.9 Training

All MAC employees are given general awareness information on blast fume in the MAC generic site induction. Training for relevant personnel will be undertaken to ensure adequate knowledge of blast fume generation, impacts and mitigation measures.

14 Management of Road Closures

Requirements for the management of blasting within 500 m of any public road or any land outside the site not owned by MAC are defined within the *Blasting within 500 Metres of Public Roads procedure (MAC-PRD-PRO-043)*. In addition, road closure management protocols have been prepared in consultation with MSC and the NSW RMS that provides a framework to coordinate safe and efficient road closures when blasting occurs within 500m of Denman Road or Edderton Road. These protocols have been included in the BMP. The primary objectives of these are to:

- Minimise potential impacts on roads users, local residents and businesses by minimising the duration of closures and avoiding peak traffic periods as far as practicable;
- Communicate with relevant stakeholders, including the public, in advance of any road closures; and
- Coordinate with neighbouring mines to minimise the cumulative effect of road closures.

14.1 Road Closure Protocol and Period

Road closures will occur prior to every blast within 500 metres of a public road. Closures will occur just prior to the blast, and reopening will occur only after a thorough safety inspection has been completed. Closures will occur at strategic locations along Denman Road that are highly visible to oncoming traffic and will seek to minimise potential impacts on road users accessing local properties and side roads (eg. Bengalla mine access road and Edderton Road). Closure locations will take into consideration the accumulated traffic volume so as where possible, normal traffic access to these side roads is not compromised. Closure locations will also allow for an appropriate stand-off distance for potential flyrock and fume from the blast. Specific locations of the closure points will be determined in consultation with the RMS during preparation of the Traffic Control Plan. Although MAC will endeavour to minimise the duration of closures, public safety is the primary objective and will not be compromised by efforts to reduce closure duration. Road closures will be scheduled to avoid peak traffic periods as far as practicable.

14.2 Signage

Permanent signs will be erected on both approaches to the road closure points. These signs will be approved by the RMS and will be displayed at least 48 hours in advance, with the date and time of the next blast, the anticipated delay and a contact telephone number for public enquiries. Signs will comply with AS 1743-2001, Road Signs Specifications and be erected in accordance with RMS Traffic Control Plan 47.

14.3 Traffic Control Personnel

Personnel appropriately trained and qualified in traffic control (as per requirements of the RMS) will be located at relevant locations to stop traffic prior to a blast. All personnel will utilise relevant communication devices and road closure equipment.

14.4 Notification of Road Closures

Notification of forthcoming road closures will generally be undertaken using existing blast notification channels. That is, the blast schedule will be mailed out on a weekly basis to residences on the effected stretch of Denman and Edderton Roads. The blast schedule will also be posted on the MAC webpage on a weekly basis. Specific notifications will be issued to affected residents on the morning of the blast via telephone or face-to-face communications. Notifications will also be issued on a weekly basis to local emergency services, MSC and neighbouring mines. Notification of forthcoming road closures will also be provided to the local community through appropriate local media channels. Specific inquiries in relation to road closures can also be made by calling the MAC Community Response Line on 1800 882 044, 24 hours a day, 7 days a week. MAC will communicate scheduled road closures with neighbouring mines so that road closures can be coordinated to minimise cumulative effects. All affected residents driveways within a road closure area will be closed by traffic control and managed as part of the road closure. Prior notification to all residents with driveways that will be affected by a road closure will be provided.

14.5 Emergency Services Notification and Access

Emergency services including Muswellbrook Fire Brigade, Rural Fire Service, Ambulance Service, Police and State Emergency Service will be advised of planned road closures, including proposed times, at least seven days in advance by mail/newsletter/electronic notification as determined in consultation with each authority. Local emergency services will also be notified of a planned road closure on the morning of the blast. In the event that emergency services vehicles require immediate access through the closed road, road closure personnel will immediately communicate with blasting personnel to ensure a safe thoroughfare is provided for emergency services vehicles. Where possible, and with the safety of all persons being maintained, blasting will be postponed until emergency services have passed safely.

14.6 Fly Rock Management

On completion of a blast, closed roads will be subjected to a thorough safety inspection. If fly rock or other debris has been emitted onto the road during the blast, a clean-up crew will immediately remove the material prior to the declaration of a safe thoroughfare. Where required, a grader will be made available for immediate clean-up of large debris. Manning and equipment will be used as required to ensure this occurs in a safe and efficient manner that does not affect the surface of the road. Once the road has been inspected and declared safe, road closure personnel will reopen the road to through traffic.

14.7 Road Repairs

Although not anticipated, any road damage incurred from blasting activities will be immediately reported to the RMS and MSC and appropriate traffic management and remediation works will be undertaken. Remediation works will be undertaken by qualified road repair personnel in consultation with MSC. All repairs will be undertaken in a timely manner so as to minimise disruptions to public thoroughfare.

15 Blast Monitoring Program

15.1 Blast Monitoring System

The MAC Blast Monitoring System covers the monitoring of both airblast overpressure and ground vibration from open cast blasting operations. Airblast overpressure is measured in dB (Linear Peak) and ground vibration is measured in peak particle velocity (mm/s). Project Approval and EPL Blast Assessment Criteria/Limits are defined in Section 11.

MAC has an approved web-based blast monitoring system that provides real time vibration and overpressure data from six permanently positioned blast monitoring units. In addition, portable attended monitoring units may be deployed to assist in monitoring at relevant locations surrounding the operation.

15.2 Blast Monitoring Methodology

All aspects of blast monitoring shall be conducted in accordance with the Project Approval and EPL. Blast monitors are calibrated in accordance with AS 2187.2 – 2006.

15.3 Blast Monitoring Locations

Blast monitoring locations are identified in **Appendix 1**. In the event that monitoring locations require changing to align with management needs, government requirements or to accommodate the progression of mining the MAC Management of Change process shall be followed.

Monitoring site BP08 is designated for internal use only to provide indicative measure of blasting impacts for management of historic heritage. Data from this monitoring location may not be included in statutory reporting.

15.4 Public Infrastructure

Public infrastructure to be monitored is lineal and hence the point which experiences peak vibration will differ for every blast; therefore, MAC utilise data from calibrated monitors to calculate the level of vibration using the criteria below.

Monitoring of ground vibration at public infrastructure is proposed under the following scenarios:

1. Blasting in Roxburgh Pit within 500m of 11kV feeder to Mount Arthur and Mount Arthur infrastructure.
2. Blasting in Windmill pit within 300m of 66kV twin feeder, optic fibre line along Denman Road and Denman Road.

The peak vibration experienced by the infrastructure will be calculated using the following:

- The ground vibration from the nearest monitor to the blast (monitored in accordance with the approved MAC Blast Monitoring Program), typically BP08 for Denman Road Infrastructure and BP09 for 11kV powerline to Mount Arthur and Mount Arthur infrastructure.
- The relevant distances from the blast to the monitor and nearest distance from the blast to the public infrastructure.
- The MAC Site law current at the time of the blast event.

MAC does not propose to measure the actual vibration at the closest infrastructure point for every blast. This would require a new monitoring location for every blast installed to relevant standards.

16 Response Procedures

16.1 Incident / Exceedance Protocol

Blast results are identified as exceeding the impact assessment criteria are classified as an Incident, incident protocols will be implemented in accordance with the MAC *Environmental Management Strategy (MAC-ENC-MTP-041).*

The exceedance will be reported to the relevant Regulatory Authority in accordance with the following protocol:

- An email and or verbal notification will be provided to the Regulatory Authority immediately after becoming aware of the incident;
- Exceedances of impact assessment criteria (as defined in the individual management plan) will be notified as an ‘interim exceedance’.
- An investigation will be conducted to determine the cause of the incident, and in the case of an exceedance, the monitoring result will also be validated. Blasting consultants may be engaged to provide expert analysis and interpretation of blasting results.
- A incident or hazard will be recorded in the site incident management system, this record will have an appointed Owner and Reviewer to ensure appropriate internal stakeholders are notified of the incident;
- A written report on the incident will be provided to the relevant Regulatory Authority within 7 days of becoming aware of the incident (or as otherwise directed by the Regulatory Authority).

In the event that any blast monitoring results exceed the individual agreement for public infrastructure, relevant agreement holders (Ausgrid, Telstra and RMS) will be notified in accordance with the agreements.

Mt Arthur Coal will implement recommendations resulting from investigations in order to minimise or prevent any future blast exceedances.

17 Emergency response

Emergencies associated with the operation and management of the environment at Mt Arthur Coal will be responded to in accordance with NEC-STE-MTP-009 Pollution Incident Management Response Plan. This plan ensures immediate and effective response to environmental emergency situations that occur on-site, the comprehensive and timely communication about a pollution incident to staff at the premises, the relevant authorities specified in the Protection of the Environment Operations Act 1997 and people outside the facility who may be affected by the impacts of the pollution incident. The MAC Community Response Line (1800 882 044) can be used 24 hours a day, 7 days a week by external stakeholders to contact Mt Arthur Coal in the event of an environmental emergency situation to report concerns or request additional information.

17.1 Complaint Handling

All complaints received regarding operational blast activities will be responded to in accordance with Mt Arthur Coal *Community Complaints Handling, Response and Reporting procedure (MAC-ENC-PRO-042)*. This procedure details Mt Arthur Coal's obligations in regards to receiving, handling, responding to, and recording details of all community complaints. Mt Arthur Coal records all community complaints in the site event management database.

17.2 Property Inspections and Property Investigations

Property inspections have been undertaken on privately-owned land within 3 kilometres of any approved open-cut mining pit when Mt Arthur Coal has received a written request. Independent property investigations will be undertaken if any landholder within 3 kilometres of any approved open-cut mining pit or any other landholder nominated by the Secretary, claims that buildings and / or structures on their land have been damaged as a result of blasting at the project. If the independent property investigation confirms the landowners claim, and both parties agree, the proponent shall repair the property to the satisfaction of the secretary. If there is any dispute, either party may refer the matter to the Secretary for resolution.

18 Review and Reporting

18.1 Data Analysis

Following completion of blasting, blast results are reviewed for compliance against the impact assessment criteria for ground vibration and air overpressure defined in Project Approval (see Section 11).

The percentage of blasts exceeding impact assessment criteria will be calculated at each monitoring location against the total number of blasts on a rolling twelve month basis.

18.2 Reporting

Mt Arthur Coal will report on the performance of the Blast Monitoring Program in the Annual Review, in accordance with Schedule 5, Condition 3 of the Project Approval; and will be submitted to the CCC and made available for public information at the MSC office and Mt Arthur Coal's website. The Annual Review will include:

- Blast monitoring results and comparison to performance criteria;
- Blast related complaints and the follow up management/mitigation measures undertaken to avoid recurrence;
- Exceedances of the performance criteria and follow up management/mitigation measures undertaken in the event of any confirmed exceedance of performance criteria to rectify and avoid recurrence; and
- Review of the performance of management/mitigation measures and the monitoring program.

MAC will also report results of any monitoring undertaken in accordance with the EPL conditions on the BHP MAC website (https://www.bhp.com/environment/regulatory-information) on a monthly basis.

18.3 Review

This BMP will be reviewed and evaluated to assess its adequacy and effectiveness, to the satisfaction of the Secretary (in consultation with relevant government agencies) in accordance with Condition 4 of Schedule 5 of the Project Approval. This requires that this is undertaken within 3 months of:

- The submission of the Annual Review;
- The submission of an incident report;
- The submission of an audit; and
- Any modifications to the conditions of the Approval.

If necessary this BMP will be revised to incorporate any recommended measures to improve the environmental performance of MAC resulting from audits, community complaints and incident investigation findings. In addition, the review process will include ongoing evaluation of operational modifications, alternative methodologies and new technologies that become available.

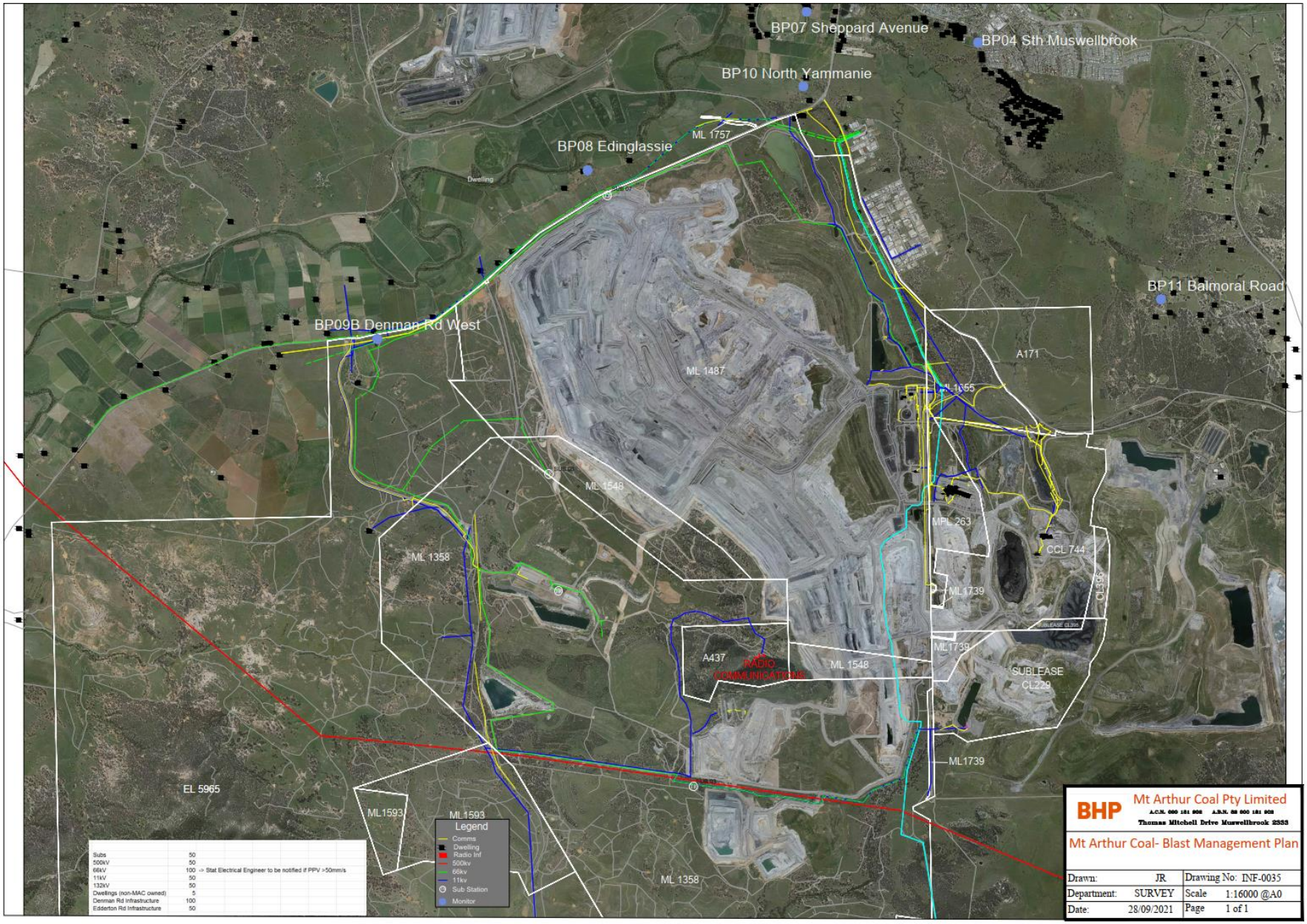
Version Management

Note:

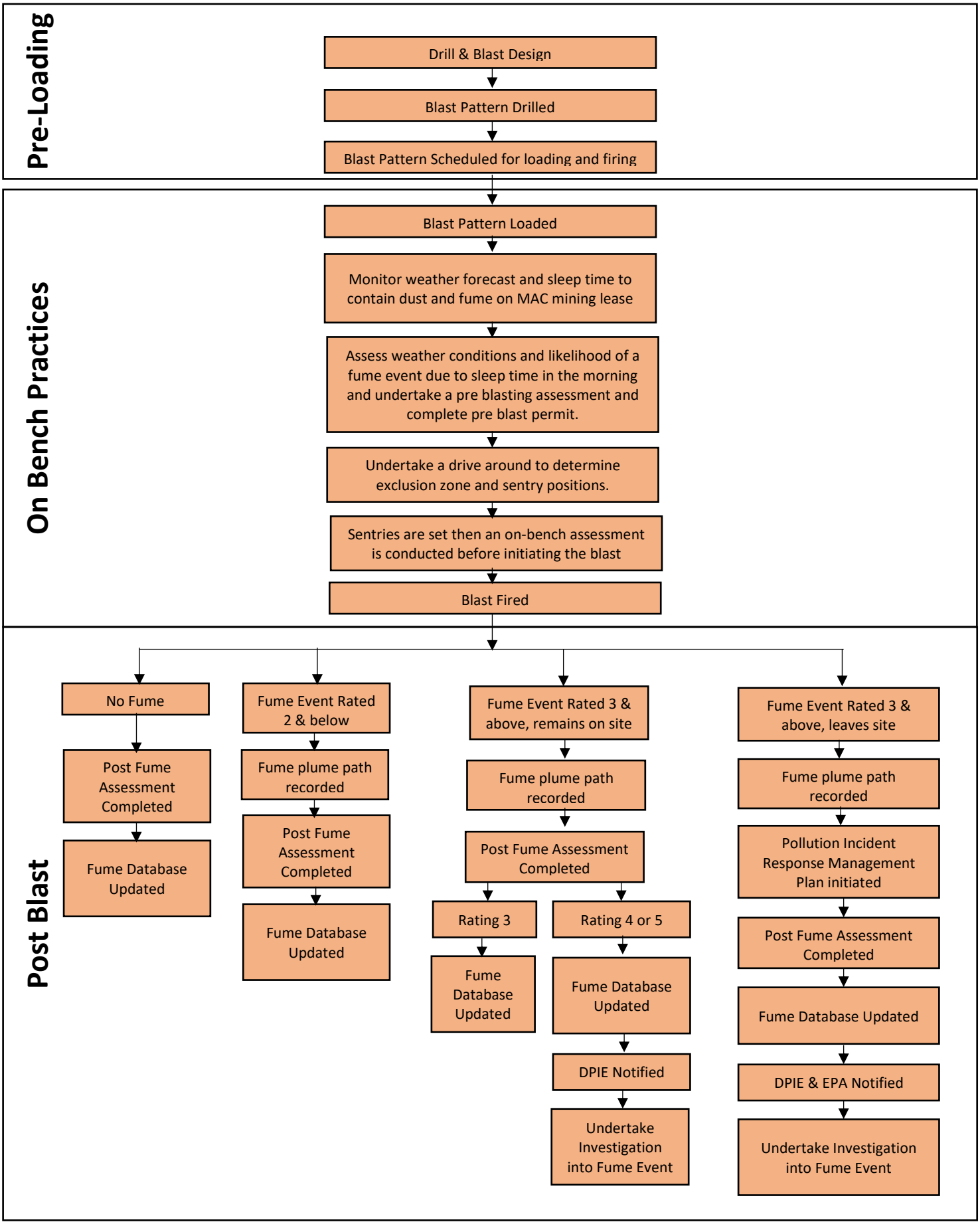
- **Major** versions (1.0, 2.0 etc.) are for changes after a significant event / incident or for a periodic review of the document.
- **Minor** versions (1.1, 1.2 etc.) are for small changes to a page or pages within a document.

Date	Version Control		Page(s)	Details
	Major	*Minor*		
14/11/2012	1.0			
27/5/2013	2.0			Changes to response procedures
30/6/2014	3.0			Changes made to Appendix 5: Blast Fume Management Plan
17/04/2018	4.0			Amended for DPE Review
06/12/21	5.0			Change in formatting to new BHP standard, minor review changes throughout document, relocation of blast monitor.

Appendix 1 – Monitoring Locations Plan



Appendix 2 – Blast Fume Management Strategy



Appendix 3 – Approval Conditions Compliance Tables

Table 1: Development Consent (09_0062) relevant conditions

<table>
<tr><th>Condition Number</th><th>Environmental Performance Condition</th><th>Addressed within</th></tr>
<tr><td colspan="3">Development Consent (09_0062)</td></tr>
<tr><td>Schedule 3
Condition 10</td><td>Impact Assessment Criteria

The Proponent shall ensure that blasts on site do not cause exceedances of the criteria in Table 5.

Table 5: Blasting impact assessment criteria
<table><tr><th>Location</th><th>Airblast overpressure (dB(Lin Peak))</th><th>Ground vibration (mm/s)</th><th>Allowable exceedance</th></tr><tr><td rowspan="2">Residence on privately owned land</td><td>120</td><td>10</td><td>0%</td></tr><tr><td>115</td><td>5</td><td>5% of the total number of blasts in a financial year</td></tr><tr><td>Public infrastructure</td><td>-</td><td>50</td><td>0%</td></tr></table>
However, these criteria do not apply if the Proponent has a written agreement with the relevant owner to exceed these criteria, and has advised the Department in writing of the terms of this agreement.

Note: An alternative limit for public infrastructure may be determined by the Secretary In accordance with the structural design methodology in AS 2187.2-2006, or another methodology acceptable to the Secretary.</td><td>Section 11</td></tr>
<tr><td>Schedule 3
Condition 11</td><td>Blasting Hours

The Proponent shall only carry out blasting on site between 8am and 5pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary.</td><td>Section 9</td></tr>
<tr><td>Schedule 3
Condition 12</td><td>Blasting Frequency

The Proponent may carry out a maximum of:

(a) 3 blasts a day;

(b) 4 blasts a day, on a maximum of 12 days each financial year; and

(c) 12 blasts a week, averaged over a financial year, on the site.

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, blast misfires or blasts required to ensure the safety of the mine, its workers or the general public.

Notes:

- For the purposes of this condition, a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

- For the avoidance of doubt, should an additional blast be required after a blast misfire, this additional blast and the blast misfire are counted as a single blast.

- In circumstances of recurring unfavourable weather conditions (following planned but not completed blast events), to avoid excess explosive sleep times and minimise any potential environmental impacts, the Proponent may seek agreement from the Secretary for additional blasts to be fired on a given day.</td><td>Section 10</td></tr>
</table>

Condition Number	Environmental Performance Condition	Addressed within
Development Consent (09_0062)		
Schedule 3 Condition 14	**Property Inspections** If the Proponent receives a written request from the owner of any privately-owned land within 3 kilometres of any approved open cut mining pit on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection updated, then within 2 months of receiving this request the Proponent shall: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties to: - establish the baseline condition of any buildings and other structures on the land, or update the previous property inspection report; and - identify measures that should be implemented to minimise the potential blasting impacts of the project on these buildings and/or structures; and (b) give the landowner a copy of the new or updated property inspection report. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or the landowner disagrees with the findings of the property inspection report, either party may refer the matter to the Secretary for resolution.	Section 17.2
Schedule 3 Condition 15	**Property Investigations** If any landowner of privately-owned land within 3 kilometres of any approved open cut mining pit on site (including the whole of the Racecourse Road area and the area southwest of Skellatar Stock Route), or on any other land where the Secretary agrees that a property inspection is warranted claims that buildings and/or structures on his/her land have been damaged as a result of blasting on the site, then the Proponent shall within 3 months of receiving this claim: (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and (b) give the landowner a copy of the property investigation report. If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damage to the satisfaction of the Secretary. If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Proponent or the landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Secretary for resolution.	Section 17.2

Condition Number	Environmental Performance Condition	Addressed within
Development Consent (09_0062)		
Schedule 3 Condition 16	**Operating Condition** During mining operations on site, the Proponent shall: (a) implement best blasting practice to: - protect the safety of people and livestock in the area surrounding blasting operations; - protect public or private infrastructure/property in the area surrounding blasting operations from blasting damage; and - minimise the dust and fume emissions from blasting at the Mt Arthur mine complex; (b) ensure that blasting on the site does not damage heritage sites, including Edinglassie, Rous Lench, and Balmoral; (c) co-ordinate the timing of blasting on site with the timing of blasting at the Drayton and Bengalla coal mines to minimise the potential cumulative blasting impacts of the three mines; and (d) operate a suitable system to enable the general public and surrounding landowners and tenants to get up-to-date information on the proposed blasting schedule on site, to the satisfaction of the Secretary.	This BMP Section 12 Section 13 Section 11 Section 15.3 Section 12 Appendix 1 Section 6 Section 6
Schedule 3 Condition 16A	The Proponent shall not undertake blasting on site within 500 metres of any public road or any land outside the site not owned by the Proponent unless the Proponent has: (a) demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the infrastructure or land without compromising the safety of people or livestock or damaging the infrastructure and/or other buildings and structures; and (b) updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the infrastructure or land; or (c) a written agreement with the relevant infrastructure owner or landowner to allow blasting to be carried out closer to the infrastructure or land, and the Proponent has advised the Department in writing of the terms of this agreement.	Section 14 Section 15.4

Condition Number	Environmental Performance Condition	Addressed within
Development Consent (09_0062)		
Schedule 3 Condition 17	**Blast Management Plan** The Proponent shall prepare and implement a Blast Management Plan for the project to the satisfaction of the Secretary. This plan must:	This BMP
	(a) describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of this approval, including:	Section 12
	- detailed demonstration that blasting within the blast control area shown in Appendix 5 can be undertaken in a manner that will meet the blast impact assessment criteria in Table 5 at all times; and	
	- a detailed blast fume management strategy to minimise and manage blast fumes;	Section 13
	(b) include a road closure management plan, prepared in consultation with the applicable roads authority, that includes provisions for:	Section 14
	- minimising the duration of closures, both on a per event basis and weekly basis;	
	- avoiding peak traffic periods as far as practicable; and	
	- coordinating with neighbouring mines to minimise the cumulative effect of road closures;	Section 6
	(c) include a blast monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions of this approval; and	Section 15
	(d) Include the requirement for Mt Arthur Coal to actively participate in Muswellbrook Council's online blasting portal.	Section 6

Table 2: EPL 11457 relevant conditions

Condition Number	Environmental Performance Condition	Addressed within
EPL 11457		
L6.1	Blasting in or on the premises must only be carried out between 8am and 5pm, Monday to Saturday inclusive. Blasting in or on the premises must not take place on Sundays or Public Holidays, or at any other time without the prior approval of the EPA.	Section 9
L6.2	The airblast overpressure level from blasting operations in or on the premises must not exceed: 115 dB (Lin Peak) for more than 5% of the total number of blasts during each reporting period; at either monitoring point 7, 8, 9 or 10 in Condition P1.4.	Section 11 Section 15.3
L6.3	The airblast overpressure level from blasting operations in or on the premises must not exceed: 120 dB (Lin Peak) at any time; at either monitoring point 7, 8, 9 or 10 in Condition P1.4	Section 11 Section 15.3
L6.4	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 7, 8, 9 or 10 in Condition P1 .4.	Section 11 Section 15.3
L6.5	The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 5 mm/second for more than 5% of the total number of blasts during each reporting period; at either monitoring point 7, 8, 9 or 10 in Condition P1 .4. The ground vibration peak particle velocity from blasting operations carried out in or on the premises must not exceed: 10 mm/second at any time; at either monitoring point 7, 8, 9 or 10 in Condition P1 .4.	Section 11 Section 15.3
L6.6	Offensive blast fume must not be emitted from the premises. Definition: Offensive blast fume means post-blast gases from the detonation of explosives at the premises that by reason of their nature, duration, character or quality, or the time at which they are emitted, or any other circumstances: 1. are harmful to (or likely to be harmful to) a person that is outside the premises from which it is emitted, or 2. interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted.	Section 13
M9.1		Section 15.3

Condition Number	Environmental Performance Condition	Addressed within
	To determine compliance with conditions L6.2 and L6.3: a) Airblast overpressure and ground vibration levels must be measured and electronically recorded for monitoring points 7, 8, 9 and 10 for the parameters specified in Column 1 of the table below; and b) The licensee must use the units of measure, sampling method, and sample at the frequency specified opposite in the other columns.	Appendix 1

Appendix 4 – Department Letter of Approval

To be inserted following approval of the plan by DPIE