
East Boggabri Coal Pty Ltd

ABN: 73 100 742 185

***Blasting Monitoring
Program
for the
East Boggabri Coal Mine***

Approved

Prepared by:



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East Boggabri Coal Mine***

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ACRONYMS USED THROUGHOUT THIS REPORT

| | | |
|-----------|---|---|
| DA | - | Development Application |
| DEC (EPA) | - | Department of Environment and Conservation (Environment Protection Authority) |
| EBC | - | East Boggabri Coal Pty Ltd |
| LALC | - | Local Aboriginal Land Council |
| IBC | - | Idemitsu Boggabri Coal Pty Ltd |



1 INTRODUCTION

This Blasting Monitoring Program for the East Boggabri Coal Mine has been prepared:

- in accordance with Condition 18 (Schedule 4) of DA 88-4-2005; and
- in consultation with DEC (EPA) Armidale.

The following sub-sections identify the monitoring locations and the nature of the monitoring equipment to be used, equipment set up and post-blasting procedures, and blast information analysis and reporting procedures. For completeness, and to ensure that this document represents an effective on-site management tool, blast notification procedures and complaint management procedures are also recorded.

2 MONITORING LOCATIONS

Table 1 identifies the three proposed blast monitoring locations and the range of distances between each nominated monitoring location and the blasts to be initiated over the life of the mine. Monitoring will be conducted at these three locations for all blasts throughout the life of the mine. The three nominated blast monitoring locations (referred to as EBB-1 to EBB-3) are shown on **Figure 1**.

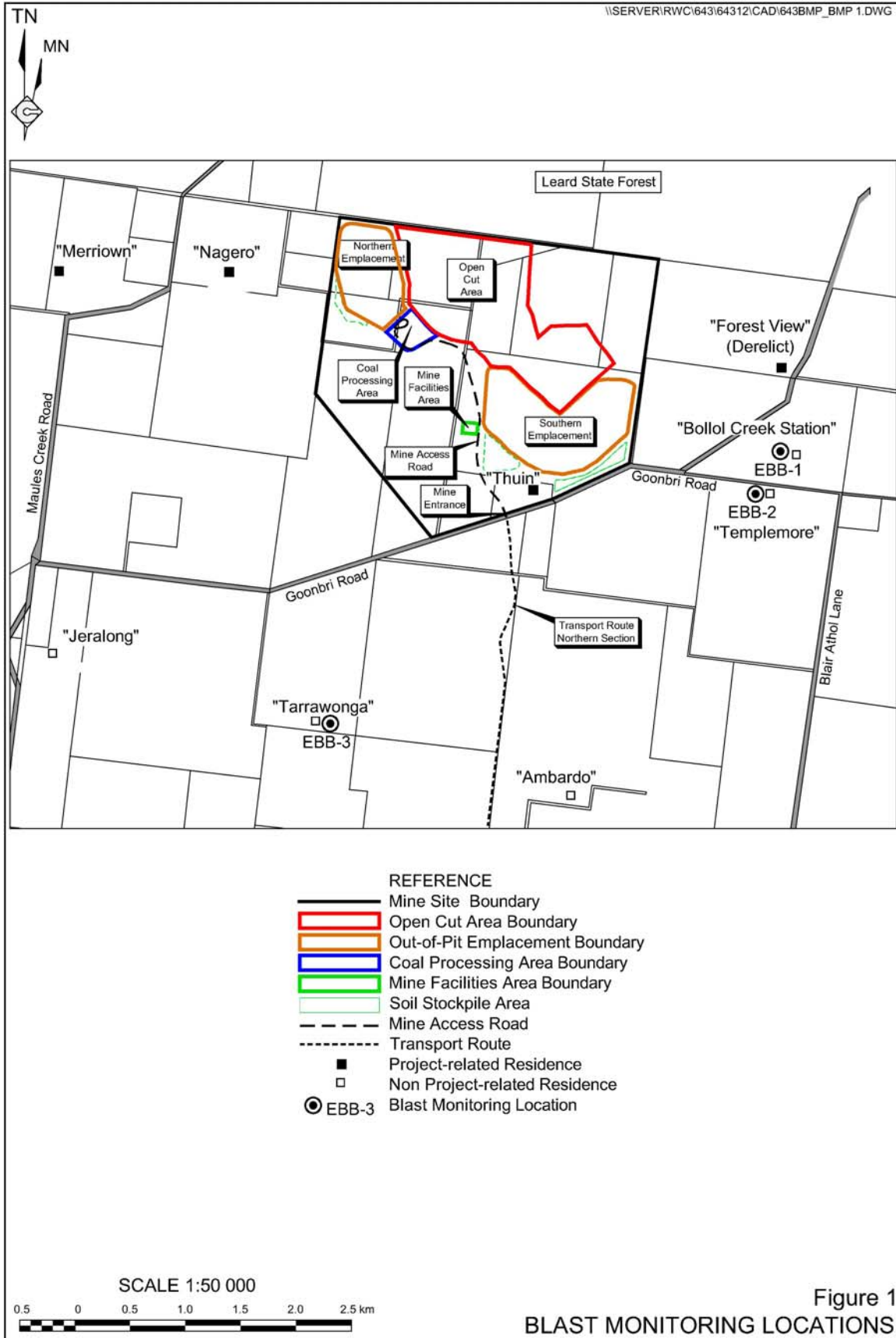
In addition to the nominated sites, EBC will also:

- observe flyrock / blast rock distribution for each blast; and
- video each blast to assist in the interpretation of results.

Table 1
Blast Monitoring Locations

| Site (see Figure 1) | Description | Distance to (km) | |
|------------------------|------------------------|------------------|--------------------|
| | | Closest Blast | Most Distant Blast |
| EBB-1 | "Bollol Creek Station" | 1.9 | 3.9 |
| EBB-2 | "Templemore" | 2.1 | 4.0 |
| EBB-3 | "Tarrowonga" | 3.5 | 4.7 |





3 BLAST MONITORS

A combination of Texcel μ Mx and Texcel Compact Monitors will be used at Sites EBB-1 to EBB-3 to monitor airblast overpressure (dBL) and peak particle velocity in a radial, vertical and transverse direction (mm/s), ie. ground vibration. All equipment for the measurement of airblast overpressure will have a lower cut-off frequency of 2Hz, and a frequency bandwidth of 2Hz to 500Hz.

Only calibrated monitors will be used for blast monitoring at the East Boggabri Coal Mine, with copies of calibration certificates or other means of verification available on site. The date of last calibration is automatically printed on each monitor print-out.

4 NEIGHBOUR NOTIFICATION

For each blast, EBC will undertake the following neighbour notifications, ie. to the owners/occupiers of “Bollol Creek Station”, “Templemore” and “Tarrowonga”.

- A letter nominating a planned blast will be delivered by hand to each letter box on the day before each blast. The letter would provide the indicative time for the blast.
- Each owner/occupier would be telephoned on the morning of the blast to confirm the blast will proceed at the nominated (or varied) time.

EBC will provide to IBC with a copy of its planned blasting schedule on a weekly basis to provide at least one week’s notice of blasts planned within the open cut area of the East Boggabri Coal Mine.

5 PROCEDURES

5.1 Standards

All aspects of blast monitoring will be undertaken by the blasting contractor in accordance with AS 2187.2-1993- Storage, Transport and Use – Use of Explosives, a copy of which will be retained at the mine office.

5.2 Trigger Levels

In recognition of the distance between the blast and the residences identified as monitoring locations (see **Table 1**), far field trigger levels of between 0.3mm/s and 0.4mm/s (for ground vibration) and 111.7dBL to 111.9dBL (for airblast overpressure) would be used. These triggers have been set based on the following rationale:



- The elevated airblast overpressure trigger has been set to minimise the occurrence of false triggering as a consequence of (primarily) wind.
- The blast monitors may trigger off ground vibration or airblast, with the monitors moving into a recording cycle of 20 seconds (for far field blasts – see **Table 2**) once triggered.
- The ground vibration trigger level is below that level of human sensory perception (0.5mm/s)
- As ground vibration waves travel substantially faster than the airblast waves, the airblast overpressure of the blast will be recorded if the blast monitor is triggered by ground vibration, even if overpressure is <111.7dBL.
- Only in the event that a blast does not trigger off ground vibration would triggering off airblast potentially occur ie. only once the 111.7dBL or 111.9dBL trigger level was reached.

Appendix 1 presents the results of Blast 139 of the Whitehaven Coal Mine at the “Gundawarra” residence which illustrates the recording of overpressure <111.9dBL, as a result of the ground vibration > 0.31 triggering the blast monitor. **Appendix 1** also represents a blast results report typical of that produced by the East Boggabri Coal Mine.

5.3 Pre-check

Prior to monitors being placed in the field, the following aspects will be verified for each instrument.

- (i) Battery is charged. Note: batteries will be placed on charge immediately following data downloading from each blast.
- (ii) Date and time are correct.
- (iii) Location (Site) for each monitor is marked on the carry case.
- (iv) Instrument “fields” are correctly set to reflect the distance from the blast site to identified monitor location. The instrument fields, ie. near, medium and far, determine the period of recording for airblast once the monitor is triggered on either ground vibration or airblast itself.

Table 2 identifies the distance range between the blast site and the monitor, the appropriate “field” setting and the duration of airblast (air pressure wave) recording. It is noted that the three proposed monitoring locations will require the instrument to be set on the “Far Field” setting.

Table 2
Monitor Settings and Airblast Recording Times

| Setting | Near Field | Mid Field | Far Field |
|---------------------------------|------------|------------|-----------|
| Distance (Monitor to Blast) (m) | <300 | 300 - 1000 | >1000 |
| Recording Time (sec) | 4 | 10 | 20 |



Ground vibration will be recorded for a period of 4 seconds following triggering.

- (v) Instrument trigger levels are set to minimize the potential for false initiation of the recording sequence by, for example, wind, but will record airblast or ground vibration events approaching or greater than the standard vibration criteria of 115dB_L and 5mm/s respectively. For the far field setting ie. at those residences in **Table 1**, triggers would typically be set between 0.3 – 0.4mm/s and 111.7 – 111.9dB_L.
- (vi) Setting adjustment as necessary.
- (vii) Print off a confirmation of settings from the logger.

To ensure consistency, a sheet identifying the monitor settings for each blast monitoring site will be retained at the site office and adjusted as necessary to reflect, for example, increasing or decreasing distances to the blast site and monitoring results, eg. false trigger frequency.

5.4 Field Set-up

The instrument will be set up at the pre-selected location at each monitoring point, between 3.5m and 30m from the residence or building to be monitored.

The instrument set-up procedures involve the following steps.

- (i) Insert the soil spike into the ground and level the geophone.
- (ii) Set up microphone.
- (iii) Connect microphone and geophone to the monitor.
- (iv) Turn power on. Powering up the monitor initiates a self check culminating in a VDU advice that the instrument is functioning properly.
- (v) Press “start”. Following a countdown sequence, the monitor moves into a “standby mode” awaiting triggering.

Prior to initiation, an East Boggabri Mine Site Blast Check List form which includes verification that the monitors are in place and records salient weather data, eg wind direction and cloud cover, will be completed and signed by the shotfirer.

5.5 Post-blast (in the Field)

Following the completion of each blast, the following activities will be undertaken prior to the monitor being returned to the office for data downloading.

- (i) Press “stop” button.
- (ii) Turn power off.
- (iii) Disconnect microphone and geophone
- (iv) Remove soil spike.
- (v) Pack instrument up.



5.6 Post-blast (at the Office)

On the return of each monitor to the site office, the blasting contractor will:

- (i) retrieve / download the data to the office computer;
- (ii) review the data and delete any data pertaining to false triggers, ie. triggers before the blast initiation time;
- (iii) generate a results print-out sheet (in Microsoft Word) and insert relevant data relating to the blast, eg blast pattern, hole spacing, number of rows, number of holes, blasthole diameter, stemming, MIC, explosives type and weight, delay type (interval and duration (ms)) and any relevant comments or observations. An example of a typical results sheet from the Whitehaven Coal Mine is attached as **Appendix 1**;
- (iv) print off and distribute the results to the nominated recipients. Prior to the commencement of blasting activities, the owner of each building where monitoring is undertaken, will be asked if they would like to receive copies of the relevant blast results. Result distribution may be by email, fax or in hardcopy as appropriate or requested.

Copies of the printouts, the mine site blast checklist and details such as blast design, charging and tie-in pattern are retained on the mine site files;

- (v) transfer the data for the blast to an Excel spreadsheet; and
- (vi) place monitor battery on charge to await the next blast.

6 FLYROCK DISTRIBUTION MONITORING

Following each blast, the area surrounding the blast site will be inspected and flyrock distribution to the front, rear and both sides of the blast site observed.

7 BLAST CRITERIA EXCEEDANCE MANAGEMENT AND REPORTING

In the event that the monitoring results of a blast identify an exceedance of:

- peak vector sum velocity (ground vibration) – 5mm/s (ppv); and/or
- peak overpressure – 115dB_L.

EBC, as the holder of an Environment Protection Licence under the *Protection of the Environment Operations Act 1997*, will report the incident to DEC (EPA) Armidale (6773 7000) and initiate investigations as to the cause. A written report will be provided to the DEC (EPA) within 7 days of the incident, if requested.



It is noted that the above criteria are able to be exceeded for up to 5% of blasts in any one year, but not to exceed a:

- peak vector sum velocity (ground vibration) – 10mm/s (ppv); and/or
- peak overpressure – 120dB.

In the event any blast causes these criteria to be exceeded, the DEC (EPA) will similarly be notified and a written report provided to the DEC (EPA) within 7 days of the incident.

8 BLAST COMPLAINT MANAGEMENT PROCEDURES

Any general complaint received relating to any blast will be managed in accordance with the complaints receipt and response procedure presented in the East Boggabri Coal Mine Environmental Management Strategy (Section 6.2) and summarised below.

- (i) Details of the complainant and complaint will be recorded in the complaints log.
- (ii) EBC representatives will liaise with the complainant to ascertain all details, to identify the nature and source of the complaint and provide supplementary information for the log.
- (iii) Investigations will be initiated to verify or otherwise the basis for the complaint.
- (iv) Results of the investigation will be provided to the complainant together with advice as to any changed blast management practices to be implemented as a consequence of the investigation.

Complaints pertaining to blast-related damage will be managed in accordance with *Condition 22* of DA 88-4-2005, viz:

“If any landowner within 2km of the development, or any other landowner nominated by the Director-General, claims that his/her property, including vibration-sensitive infrastructure such as water supply or underground irrigation mains, has been damaged as a result of blasting, EBC will, within 3 months of receiving this request:

- *commission a suitably qualified person whose appointment has been approved by the Director-General to investigate the claim; and*
- *give the landowner a copy of the property investigation report.”*

If this independent investigation confirms the landowner’s claim, and the complainant and EBC agree with the findings, then EBC will repair the damage to the satisfaction of the Director-General.

In the event of a disagreement by EBC or the complainant as to the findings of the independent property investigation, the matter may be referred to the Director-General. If the matter still cannot be resolved, the Director-General will initiate the Independent Dispute Resolution Process identified in Appendix 2 of DA 88-4-2005.



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Appendix 1

Typical Blast Results Sheet

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