



Newman Quarrying Pty Ltd

Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-
Jackybulbin Road, Mororo
Blast Management Plan

May 2017

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1. Introduction

This Blast Management Plan (BMP) forms part of the Environmental Management Strategy (EMS) for Sly's Quarry located at Lot 2 DP 1055044, Tullymorgan – Jackbulbin Road, Mororo. This BMP has been prepared to meet the requirements of the Ministers Conditions of Approval (CoA) outlined in Development Consent SSD 6624. This BMP addresses the CoA, the mitigation measures outlined in the Environmental Impact Statement (EIS) for Sly's Quarry and all relevant legislation.

Vibration may occur during blast events and potentially during excavation works. Potential impacts include disturbance to local residents from site operations and works outside of prescribed working hours increasing the impact.

1.1 Objectives

The key objective of the BMP is to ensure appropriate controls and procedures are implemented in order to minimise the impacts to the local community and the built environment from blasting and vibrations.

To achieve this objective, Newman Quarrying will undertake the following:

- Identify sensitive receivers and ensure appropriate environmental controls and procedures are implemented during operational activities
- Minimise potential adverse blasting impacts to the environment and community
- Manage impacts if they occur through a systematic analysis of mitigation strategies
- Ensure appropriate measures are implemented to address the relevant CoA
- Ensure appropriate measures are implemented to comply with all relevant legislation and other requirements as described in Section 2 of this BMP

1.2 Targets

The following targets have been established for the management of blasting and vibrations during the operational lifetime of Sly's Quarry:

- Ensure full compliance with the relevant legislative requirements and CoA
- No exceedance of the blasting criteria
- No justified complaints from adjacent residents in relation to blasting and vibrations

2. Environmental requirements

2.1 Legislation

Legislation relevant to blasting and vibration management includes:

- Protection of the Environment Operations Act 1997

Further discussion of the above legislation is covered in Section 2 of the EMS, as well as the EIS.

2.2 Guidelines

The following guidelines have been consulted during development of this BMP:

- Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration (ANZECC, 1990)

2.3 Conditions of approval

The consent conditions relevant to this BMP are listed in Table 2-1. A cross reference is also included to indicate where the condition is addressed in this BMP or other environmental management documents.

Table 2-1 Consent conditions relevant to the BMP

Condition No.	Requirement	Reference
Schedule 3, Condition 10	The Applicant must prepare a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:	Entire report
	(a) be submitted to the Secretary within 6 months of the date of this consent, unless otherwise agreed by the Secretary;	Noted
	(b) describe the measures that would be implemented to ensure compliance with the blast criteria and operating conditions of the consent;	Section 4
	(c) include measures to manage flyrock;	Section 4
	(d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria in this consent;	Section 5.1
	(e) include community notification procedures for the blasting schedule, in particular to nearby residences;	Section 4
Schedule 3, Condition 11	and (f) include a protocol for investigating and responding to complaints.	Section 5.1
	The Applicant must implement the approved Blast Management Plan as approved from time to time by the Secretary.	Noted
Schedule 5, Condition 3	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
	(a) detailed baseline data;	Section 3.1
	(b) a description of: <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	Section 2.1 Section 3.2.1 Section 0

Condition No.	Requirement	Reference
	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 4
	(d) a program to monitor and report on the: <ul style="list-style-type: none"> • impacts and environmental performance of the development; and • effectiveness of any management measures (see (c) above); 	Section 5.1
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 5.2
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 6
	(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and 	Section 5.3
	(h) a protocol for periodic review of the plan. <i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Section 6

3. Existing environment and impacts

3.1 Existing environment

The eleven sensitive receivers identified in the EIS as potentially being affected by noise impacts would also be potentially effected by blasting impacts.

Blast monitoring was conducted during a blast event at Sly's Quarry on the 13 November 2014. The aim of the monitoring was to measure ground vibration and overpressure results during a typical blast event and determine site constants for the area which can be used for blast predictions.

Blast monitoring was conducted by GHD at one location in the vicinity of residential sensitive receptor R2 during the blast event and supplemented with monitoring conducted by the blasting contractor. The blasting contractor recorded overpressure and ground vibration levels at two locations as shown on Figure 3-1 below.

A summary of the vibration measurement results recorded at the site are presented in Table 3-1.

Table 3-1 Blast monitoring results

Parameter	Approximate distance and direction to blast source	PPV (mm/s) Criteria: 5 mm/s	Overpressure dB(L) Criteria: 115 dBL
Location 1 (Blasting Contractor monitor near gate to quarry)	550 m North	0.78	88 ^a
Location 2 (Blasting Contractor monitor near Jackybulbin Road)	1030 m West	0.17	112
Location 3 (GHD monitor near sensitive receiver R2)	1860 m West-southwest	0.13	101

^a This result is not considered valid as it is the noise floor of the instrument, therefore it has not been used in this assessment.

The above results indicate that the criteria outlined below are met at all monitoring locations for both ground vibration and airblast overpressure.

3.2 Impacts

3.2.1 Blasting criteria

Blasting criteria for the project were provided in the EIS, development consent and EPL and are outlined in Table 3-2. Blasting on site must not exceed the criteria at any residence on privately-owned land.



NEWMAN QUARRYING
SLYS QUARRY

BLAST MONITORING LOCATIONS

Job Number | 22-17528
Revision | A
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Figure 3-1

Table 3-2 Blasting criteria

Receiver	Airblast overpressure (dB(Lin Peak))	Ground vibration (mm/s)	Allowable exceedance
Any residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months

3.2.2 Impact assessment

The EIS predicted blasting impacts using various modelling techniques. The estimated ground vibration and airblast levels from blasting suggest that, on average, the recommended limits of 5 mm/s and 115 dB(L) would be achieved at a minimum distance of approximately 250 metres and 650 metres respectively from the blast location. The nearest receivers are located approximately 1,200 metres from potential blasting locations. It is therefore expected that the blasting guidelines should be met at all receivers if blasting techniques are similar to those used during the blast in which measurement data was recorded at Sly's Quarry on 13 November 2014.

Air blast overpressure and ground vibration was also predicted for a range of charge masses for varying distances and assuming average blasting parameters. The distances to comply with the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) were also considered.

The predicted results indicate that blasting would be restricted by the air blast overpressure rather than the ground vibration levels. Although the exact location of blasting is not known at this stage of the project, if it were to occur it would most likely be located in areas moving further away from sensitive receptors than currently experienced. The nearest sensitive receivers are over 1,200 metres away, therefore blasting impacts based on the above parameters are expected to comply with the blasting criteria.

4. Environmental control measures

Environmental requirements and control measures are identified in the Conditions of Approval, EPL and the EIS. Specific measures and requirements to address blasting impacts are outlined in Table 4-1.

Table 4-1 Environmental controls and mitigation measures

EMS Ref.	Environmental Management Measure	Timing	Responsibility
B1	The operating hours specified in the development consent and in Section 2.5 of the EMS must be complied with. That is, blasting should only occur from 9 am to 3 pm, Monday to Friday, and should not generally take place more than once per day.	Operation	Quarry Manager
B2	Blasting on site must not exceed the criteria outlined in the consent conditions, which are presented in Table 3-2 of this BMP. The criteria do not apply if there is a written agreement with the relevant owner to exceed the limits.	Operation	Quarry Manager
B3	A maximum of 2 blasts may be carried out per calendar month, unless an additional blast is required following a blast misfire. This does not apply to blasts required to ensure the safety of the quarry or workers on site.	Operation	Quarry Manager
B4	Best practice management must be implemented to: <ul style="list-style-type: none"> • Protect the safety of people and livestock in the areas surrounding blasting operations • Protect public or private infrastructure/property in the surrounding area from damage from blasting operations • Minimise the dust and fume emissions of blasting 	Operation	Quarry Manager
B5	Blasting should not occur during times when winds are in the direction of the nearest receptors, and preferably occur during times when winds are calm or blowing away from the nearest receptors.	Operation	Quarry Manager
B6	Blast mats such as hessian or rubber matting are to be used to suppress impacts from blasting, including fly rock and particulate emissions.	Operation	Quarry Manager
B7	Measures to be taken to effectively reduce blasting impacts include, reducing charge mass and increasing the distance from sensitive receivers.	Operation	Quarry Manager
B8	Increase minimum uncharged collar lengths at all blastholes	Operation	Blasting Contractor
B9	Ensure all design criteria are measured, documented and adhered to prior to any blasting activity proceeding	Operation	Blasting Contractor
B10	A sign at the front gate is to provide up-to-date information for the local community on the proposed blasting schedule.	Operation	Quarry Manager
B11	All sensitive receivers are to be given at least 24 hours notice when blasting is to be undertaken	Operation	Quarry Manager

EMS Ref.	Environmental Management Measure	Timing	Responsibility
B12	Regular monitoring must be carried out to determine whether the development is complying with the relevant conditions of the consent.	Operation	Quarry Manager
B13	Due to variability in blasting impacts, monitoring is to be undertaken during initial blasts at the site to confirm predictions and assess compliance with the ground vibration and air blast overpressure limits.	Operation	Quarry Manager

5. Monitoring and reporting

5.1 Environmental inspections and monitoring

Blasting monitoring will occur throughout the operational lifetime of Sly's Quarry and will be undertaken by a suitably trained professional. Blasting monitoring will be undertaken:

- Every blast at receiver R3
- Following receipt of a justifiable blasting related complaint
- Following any change in operating conditions that are likely to increase blast impacts from the site

5.2 Contingency plan

If the above monitoring detects an impact or there is a justified community, blasting related, complaint, a contingency plan or trigger and response plan is to be implemented, as shown below.

Aspect	Trigger	Response
Compliance monitoring/Community complaint	Non-compliance with criteria	Identifying the source that has caused the exceedance. Reassess the mitigation measures employed at the site to reduce the impact of the blast Following the adoption of blast mitigation, conduct further blast monitoring to ensure the success of the mitigation measure

5.3 Reporting

A report will be prepared by the acoustic consultant following the compliance monitoring. This is to include, as a minimum:

- The date(s) of the monitoring
- The time(s) of the monitoring
- The location of the monitoring
- The activities occurring during the monitoring
- A comparison of the results with the adopted criteria

If an exceedance of the criteria is recorded, the affected resident is to be notified in writing and provided with regular monitoring results until the quarry is again complying with the relevant criteria.

A summary of these results will be presented in the Annual Report (refer to Section 8.5 of the EMS). All records will be:

- Maintained in a legible form
- Kept for at least 4 years
- Produced to any authorised officer of the EPA and/or DPE upon request

6. Review and improvement

Continuous improvement of this BMP will be achieved in accordance with Section 9 of the EMS, through the ongoing evaluation of environmental management performance against environmental policies, objectives and targets.

The continuous improvement process is designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement; and make comparisons with objectives and targets

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