



COLE MINING LTD

BLASTING DIVISION

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Darryn Shepherd
Woodstock Quarries
Oxford, Canterbury

Dear Darryn Shepherd:

As per the recent email I have received from you I can undertake Over pressure Calculations for blasting Activities at the Woodstock Quarry

Air-blast/ Over Pressure during the blasting comes from two sources.

- Surface delays/ detonating cord on the surface of the blast used for initiating the in-hole detonator.
- Air being displaced from rock movement/ stemming ejection and production gasses being released.

Blasting at the Woodstock Quarry will primarily be done for the production of over size (Rock greater than 0.2m³). Common blast practice to produce oversize is achieved by lowering the powder-factor (Woodstock quarry P.F range 0.05-0.2kg/m³), increased face burden (45-60 Hole Diameters), increased stemming heights (50-70 hole diameters), and utilizing decoupled charges. Blasting at Woodstock quarry is undertaken using single hole firing on the majority of shots and row-by-row initiation, with 5 gram detonating cord used for production on a limited scale.

Small volume shots of between 1-5 holes make up the majority of the blasting completed at the Woodstock quarry with production blasting expected to be undertaken 1-2 a year.

When considering the above points for potential Air-blast risk the greater over pressure value would be from the initial initiation of the detonating cord and not the production blast itself.

Currently the closest sensitive structure to the Quarry boundary is the dwelling belonging to the adjacent land owner at 1860m. Even though blasting has been completed at the quarry for a number of years, there has never been any complaint issues by this resident.

The AS2187.2 standard for estimating maximum Air-Blast Over pressure is as follows $P = A \cdot (D/Q^{1/3})^a$
Accepted base values for the site constant for unconfined surface detonation is as follows

- A= 185
- a= -1.2

A 5 gram detonating cord is expected to be used in a row-by-row initiation system with TLD/MS connectors for the inter-row delay. It is not expected that row length would be longer than 35m due to pit wall confinement.

Therefore Air-blast Over pressure from Surface detonating cord is not expected to exceed 114.8 Dbl in extreme circumstances. (Face burst/Stemming ejection combined with cloud cover, wind direction and thermal inversion)

During normal blasting activity's it is expected that a base value for the (A) constant be 3.3 in accordance with AS2187.2 and an expected MIC (Maximum instantaneous charge) of 160kg.

Therefore, under normal blasting activities Air-blast Over pressure is not expected to exceed 103.5 Dbl.

AS2187.2 states that during blasting Air-blast over pressure on sensitive structure (Adjacent dwelling) shall not exceed 115 Dbl for 90% of blast events and 120 Dbl for 100% of the blast events.

It is in my experience that the blasting undertaken at the Woodstock quarry completed within the parameters specified in this document, that in even the most extreme circumstance that Air-blast over pressure is still within the regulatory guidelines owing to the small scale and large distance to adjacent dwelling.

If you are requiring any additional information, please let me know.

Regards.

Wade

Wade Ashby

Blast Technician

Cole Mining Ltd (Blasting Division)