



## **Drew Martin**

### **Principal Drill & Blast Engineer**

BEng (Mining Engineer) (Hons)

Unrestricted Western Australian Quarry Managers Certificate (Open Cut Manager)

Western Australian Shotfirer Permit

Cert IV Training & Assessment

Institute of Quarrying Australia (Member)

International Society of Explosives Engineers (Member) & Director of Australian Chapter

Industry Mentor to International Society of Explosives Engineers – WASM Student Chapter

### **Expertise**

Drew specialises in the field of open cut metalliferous mining, quarry and construction blasting technical support. Drew is a leader in the field of environmental blasting controls and advanced initiation sequencing to promote improved fragmentation, whilst still able to optimise results across all areas of open cut drill and blast methodologies.

Prior to forming Blast It Global, Drew was working for Technology and Innovation a business unit of Rio Tinto, where he used his specialist drill and blast skills to assist improving various sites drill and blast productivity, with a clear focus on cost down or productivity increase. Drew also provided advanced blast vibration analysis to assist several Rio Tinto Iron Ore sites.

To become a specialist in the above mentioned blasting applications, Drew has had to research and develop methods for analysing the influence that geology, ground conditions, explosive selection, blast parameters and detonation physics has on specific blast outcomes. This scientific approach is a key driver behind his ability to provide highly successful outcomes to customers across a broad sector of the resources and the construction industry.

### **Summary of Experience**

Drew has had a career dedicated to drill and blast, commencing his career learning on bench techniques as a shotfirer. Key positions include, blast crew at Kalgoorlie Consolidated Gold Mines and Granny Smith Gold Mine for 2 years, Drill & Blast Engineer at Cadia Valley Operation for a period of 2 years, Technical Services Engineer with Orica Mining Services for 7 years and 2 years as a Principal advisor-Drill & Blast for Technology and Innovation (Rio Tinto). Currently he is running his own consultancy, Blast It Global, as the Principal Drill and Blast Engineer. Some of the key projects that Drew has worked on over his career include:



## Key Blasting Projects

**Cadia Hill Gold Mine (Australia)** - Drill and Blast Engineer – Developing/implementing process improvements for quality control, production rate improvements, improve mill throughput and wall control.

**BGC The Lakes Quarry (Australia)** - Technical support to reduce vibration and airblast while maintaining fragmentation. Average vibration (PPV) reduced by 25%.

**Boddington Gold Mine (Australia)** - *Construction Area 6* (Newmont) – Blasting Risk Assessment, Blast Design and implementation of blasts within 8m of existing infrastructure.

**Penjom Gold Mine (Malaysia)** - Drill and Blast review of current practices. Provided recommendations to improve wall control, productivity improvements and optimise blasting practices.

**BHP Olympic Dam Backfill Quarry (Australia)** – Drill and Blast review of contractors current drill and blast practices and procedures. Identified AU\$1.3 M in saving that could be implemented immediately, combined with productivity improvements that would realise additional costs benefits.

**Boral Linwood Quarry (Australia)**.- Implementation of a Monte Carlo Vibration Model to reduce blast vibration whilst improving the site productions, increasing blast sizes and reducing fines in some sections of the quarry. (300m from neighbouring properties)

**Stirling Dam Upgrade Project (Australia)** – *Independent Blast Consultant Macmahon Limited*. Revision of blast design to ensure environmental compliance and fragmentation. Establishment and maintenance of site vibration equation to ensure vibration compliance and reduce blast design restrictions (MIC).

**Penrice Mine (Australia)** – Technical support to reduce vibration at closest monitoring station 290m. Blast analysis and initiation design for electronic initiation sequencing. Initial blast vibration reduced 50% through initiation sequencing and design application. Introduce wall control through pre-splitting and modified production holes to steepen walls and increase the sites resource reserves.

**Adelaide Aqua (Australia)** - Adelaide Desalination Project – Blast Consultant providing blast designs, initiation sequences, training, technical reports for the blasting of 2 shafts and 20m cavern.

**Grange Resources Southdown Magnetite Project (Australia)** - Blast Consultant providing concept blast designs, evaluation on impact of blasting on marine life and providing methodology for blasting an underwater channel.





**Newmont Buzwagi Gold Mine (Tanzania)** – Drill and Blast review of current practices. Provided recommendations to improve wall control, productivity improvements, training and optimise blasting practices.

**Hindustan Zinc- Vedanta Resources (India)** – Review of wall control blasting techniques, including site trials. Review trial results and make recommendations based on results to improve wall stability.

**Orica Mining Services (Malaysia/Philippines)** – Provide technical training (1 week course) for Orica Engineers\Technicians on the subjects of Hard Rock Blasting, Wall Control Blasting, Electronic Detonators to Promote Fragmentation, Use of Blasting Analysis Tools and Blast Modelling Tools to improve skill level of Orica Engineers\Technicians.

**Rio Tinto Iron Ore (Australia)** – Implement tactics to improve drill productivity at Brockman 4 mine, improving drill productivity by +15%. Enable site to meet increased planned production with no additional capital spend on drilling.

**Rio Tinto Iron Ore (Australia)** – Conduct desktop study on the potential effects of blasting on Orange Leaf Nosed Bat colony at green fields' site. Implement blasting trial to measure the influence the effects of blasting on the bat colony. Study data used in EPA licence application.

**Minjar Gold Mine (Australia)** – Identify blast optimisation requirements and provide recommendations to reduce ore dilution and improve wall control blasting techniques in gold mine operation.

**BGC Contracting (Australia)** – Evaluate blast exclusion zone and provide recommendations to ensure that safe and optimal blast exclusion zone is used at Iron Knob mine site, ensuring National Highway remains open during blasting operations.

**Karara Mining Limited (Australia)** – Work with client and contractor to optimise blasting practise to maximise throughput on magnetite processing plant, utilising specialised blast designs and unique electronic initiation sequencing. Optimise drill and blast costs to assist in ensuring the sustainability of the project. Doubled primary crusher throughput, which has currently been sustained for a period of 18 months.

**Hanson Construction Materials (Australia)** – Investigation of a flyrock event. Identify root causes and provide recommendations for improvement to enable blasting operations to recommence.

**Groundwork Plus (Australia)** – Blasting assessment of proposed mining activities, including drill and blast, on neighbouring properties. Recommendations to reduce the effects on neighbouring properties and infrastructure. Blasting within 5m of services.

**Groundwork Plus (China- Yunfu)** Quarry blast optimising through face profiling, blast design, bore tracking and initiation design.





**Groundwork Plus (Australia)** Quarry development for environmental approval. Establishment of a seed hole blasting program and data collection to establish a site blast vibration attenuation equation. Used to evaluate potential impacts of blast vibration on surrounding residence.

**Fortescue Metal Group Solomon Mine (Australia)** Auditing of clients blasting practise to maximise dig rates and throughout on processing plant utilising optimised blast designs. Optimise drill and blast costs through improving bulk explosive selection process, energy matching bulk explosives products.

**Hanson Construction Materials (Australia)** Establishment of a high precision displacement monitor at a heritage site to monitor the effects of natural heating and cooling on crack displacement versus affects of blasting. Used to evaluate the potential impact of quarry expansion on heritage site. Data was a key piece of information for regulators to approve quarry extraction limit expansion.

**Rio Tinto Iron Ore – Tom Price Mine (Australia)** Evaluation of current wall control blasting techniques and results. Provide recommendations and guidance for site to manage wall control blasting to achieve stable slopes to the required design.

**Explosive Manufacturing Services (Australia)** Technical support of packaged presplit product application and testing.

**Norton Gold Fields Enterprise Mine (Australia) (Subcontract to Nitro Sibir Australia)** Implementation and evaluation of introduction of lower density, lower water content Ammonium Nitrate based emulsion bulk explosives to reduce operating costs. Provide recommendations and guidance for site to manage wall control blasting (presplit) to achieve stable slopes to the required design.

**City of Darwin (Australia)** Close proximity blasting to methane gas generating cells (waste disposal site) and gas power plant. Blast design and risk evaluation, providing recommendations and supervision. Development of Blast Management Plan.

**Roy Hill Iron Ore Mine (Australia)** Evaluation of current drill and blast practices with aim of providing resultant fragmentation and dig rates to reach name plate crusher/sizer through put and budget load and haul rates.

**Norton Gold Fields Enterprise Mine (Australia) (Subcontract to Nitro Sibir Australia)** Project lead on Mine to Mill project. Optimise blast fragmentation from open pit where 60% of mill ore is sourced, to increase average mill throughput a target of 10%. (Current Project)

#### **Lucas Total Contract Solutions**

Close proximity blasting to rail and processing infrastructure at Iron Baron Mine. Blast design and risk evaluation, providing recommendations. Update the Blast Management Plan. Second project, close proximity blasting assess to heritage site, provide recommendations.

#### **MTI BLASTSHIELD**

Independent review of the MTI Blastshield hole lining system to reduce fume and increase explosives productivity.





### **Blast It Global Training**

- Development & supply of Nationally Accredited Surface Shotfirer training;
- Development & supply of Nationally Accredited Magazine Controller training;
- Development & supply of Blast Design and Application training;
- Development & supply of Initiation Sequencing training.

Blast It Global training services have been operating for over a period of 3 years (commenced December 2015) and has trained over 80 trainees during that period, with all candidates providing high levels of ratings, averaging 8.5 out of 10 (1 (bad) – 10 (excellent)).

### **Publications**

Providing Positive Returns for Community and Client, 2005, Quarry Magazine August 2005, Phoenix Magazines

Site Law Establishment Ensures Future of Quarry, 2007, Quarry Magazine February 2007, Phoenix Magazines

Removing Contamination Before Blasting Begins, 2007, Quarry Magazine August 2007, Phoenix Magazines

Working Together for a Close Proximity Blasting Solution, 2007, AusIMM Bulletin July 2007, RESolutions Publishing & Media Pty Ltd

Benefits of Electronic Delay Detonators, Martin.D Miller.D, 2007, Quarry Magazine February 2008, Phoenix Magazines

Exploring New Technology-Based Blasting Rules, 2009, Quarry Magazine August 2009, Phoenix Magazines

Penrice Quarry Seeks Good Vibrations, 2010, Quarry Magazine October 2010, Phoenix Magazines

Overpressure Control Through Innovation and Technology, 2011, Quarry Magazine October 2011, Phoenix Magazines

Blast Vibration Modelling – An Instrument to Optimise Quarry Production, 2012, 38th ISEE Annual Conference, Nashville TN US, International Society of Explosives Engineers

Scientific Evaluation of Fauna Sensitivity to Blasting, 2015, 11th International Symposium on Rock Fragmentation by Blasting, Sydney Australia, AusIMM

