THE AUSTIN ADVANTAGE

REDEFINING PRECISION BLASTING: SOLUTIONS FOR LATIN AMERICA'S COPPER GIANT

GENERAL **INFORMATION**

Location: Panama

Industry: Copper Mining

Products Used: Paradigm, E*STAR

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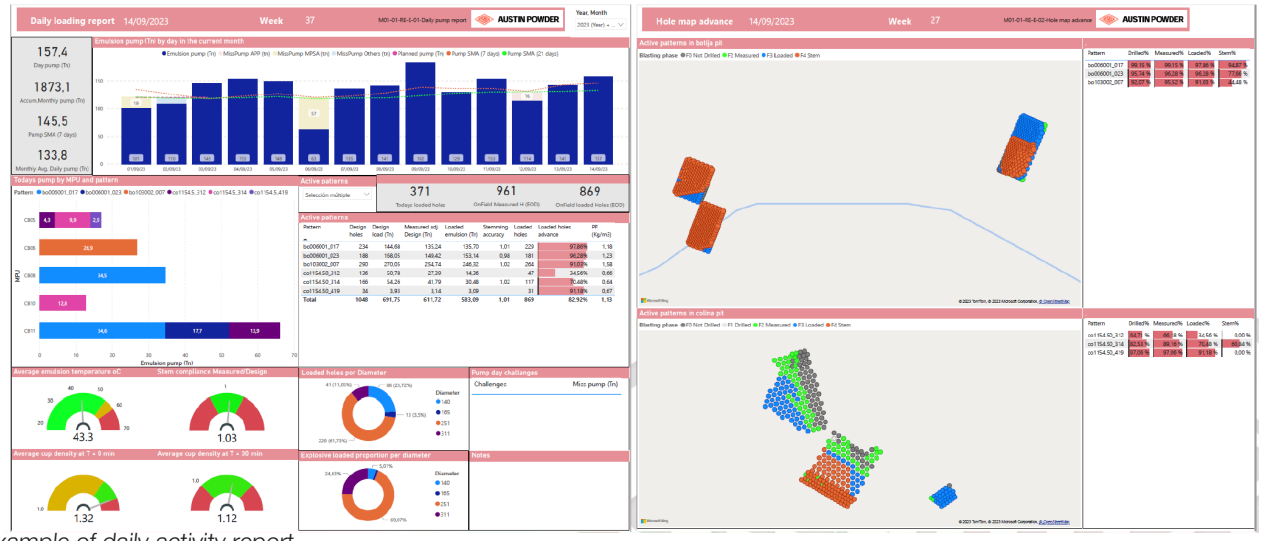
THE **HISTORY**

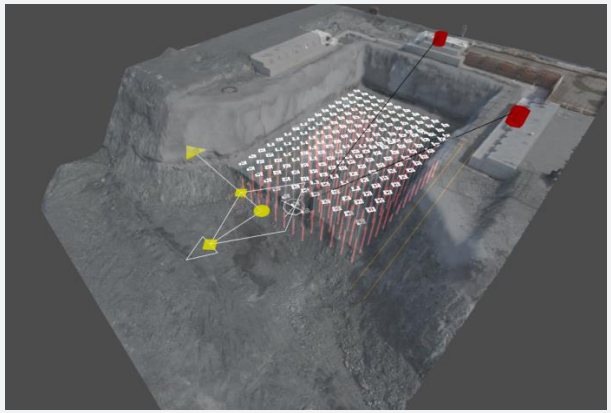
Since 2019, Austin Powder has supported one of Latin America's largest copper mines, delivering full-service explosives solutions from initial construction to ongoing production. The partnership included on-site emulsion manufacturing, blasting services, and integration of advanced digital technologies.



Example of daily activity report

THE **GOALS**

1. Ensure safe, efficient, and continuous blasting operations
2. Minimize environmental impact, especially nitrate leaching
3. Enhance fragmentation and wall control
4. Leverage digital tools for blast optimization and data-driven decisions



Paradigm Modeling - Box cut design

CUSTOMER **CHALLENGE**

Operating in a remote location presented demanding supply logistics, requiring careful coordination and contingency planning. Maintaining high production reliability was especially challenging due to varying terrain and complex rock conditions across the site. Additionally, managing blast-induced vibration, flyrock, and fragmentation in a large open-pit environment demanded advanced modeling and precision execution. Environmental responsibility added another layer of complexity, as the team worked to reduce nitrate leaching into surrounding water systems to protect local ecosystems.

THE **AUSTIN** SOLUTION

To address the complex challenges of the project, Austin Powder implemented a **comprehensive, integrated solution** built on reliability, innovation, and sustainability. At the core was a high-capacity on-site emulsion plant capable of producing 230 tons per shift, supported by six Mobile Processing Units (MPUs) delivering a steady supply of 5,400 tons of emulsion per month. All operations maintained strict quality assurance and quality control standards to ensure consistent performance.

Digital integration played a pivotal role in enhancing blast efficiency and safety. iBlast X enabled real-time blast data capture across all MPUs, while Paradigm software provided advanced simulation capabilities to predict and control flyrock, vibration, fragmentation, and wall stability. The E*STAR electronic initiation system, capable of managing up to 12,800 remote-enabled detonators, offered precise timing and enhanced safety during complex blasts.

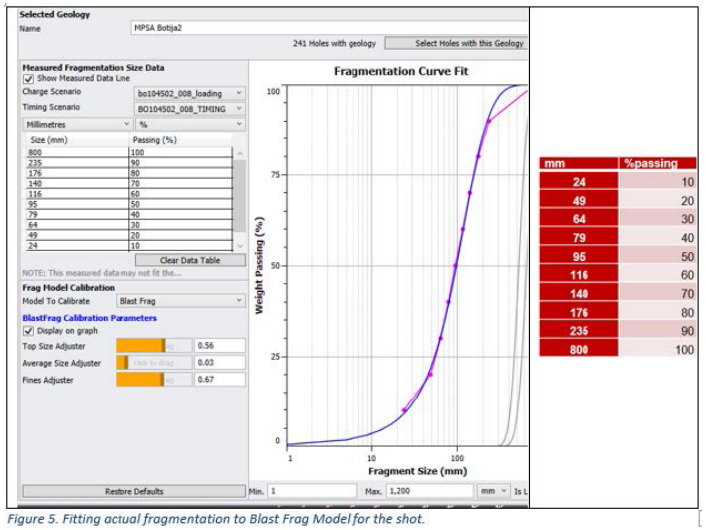


Figure 5. Fitting actual fragmentation to Blast Frag Model for the shot.

Paradigm Fragmentation Curve Calibration Chart
Timing Improvement Project

Drone with NOx Sensor Attached

THE **AUSTIN** SOLUTION (CONTINUED)

Austin's technical services team delivered **tailored engineering support,** including customized box cut designs and wall control optimization through seed wave analysis. Further mine-to-mill improvements were achieved using fragmentation modeling and delay timing adjustments. In addition, Austin developed and implemented nitrate-leaching controls through innovations such as sleeved boreholes and emulsion reformulation.

Finally, a **sustainable and resilient supply chain** was established through multi-sourcing of key raw materials and flexible logistics strategies, ensuring continuous operation even in the face of external disruptions. This holistic approach positioned Austin Powder as a trusted partner in delivering safe, efficient, and environmentally responsible blasting solutions.

THE **OUTCOME**

The success of this copper mine project is a testament to the value of Austin Powder's full-service approach—combining advanced technology, technical expertise, and a deep commitment to safety and sustainability. Through seamless integration of digital tools, reliable operations, and customized support, Austin Powder delivered measurable benefits across every key performance area—from blast execution to environmental protection and long-term collaboration.

1. **Safety:** Over 320 annual blasts fired remotely using ~6,000 E*STAR detonators per month with zero major incidents
2. **Efficiency:** Reduced downtime and improved fragmentation led to smoother operations and lower costs
3. **Precision:** Blast quality and wall stability improved with advanced modeling and measurement tools
4. **Sustainability:** Innovative nitrate mitigation strategies significantly reduced water contamination risks
5. **Partnership:** Austin Powder's integrated approach fostered long-term value and positioned them as a trusted mining partner

AUSTIN POWDER