





# 'Feeder Blockage Removal Device' Shane Phillips – Saraji Mine (BMA)



#### **Presentation Overview**



- Context for innovation (problem)
- Solution generation
- Innovative approach
- Opportunity for replication
- Acknowledgements

#### **Context for Innovation**



- Saraji Mine is one of BMA's 8 mines operating in the Bowen Basin – producer of high quality coking coal with a production name plate capacity of 8Mtpa
- As part of coal processing activities, coal is temporarily stored prior to treatment in the Preparation Plant, on the crushed coal stockpile
- Coal is extracted from the crushed coal stockpile and fed onto the Plant feed conveyor via 5 vibratory feeders located under the stockpile
- Feeders work to draw coal from the bottom of the stockpile onto the feed conveyor, located in a service tunnel

#### **Context for Innovation**

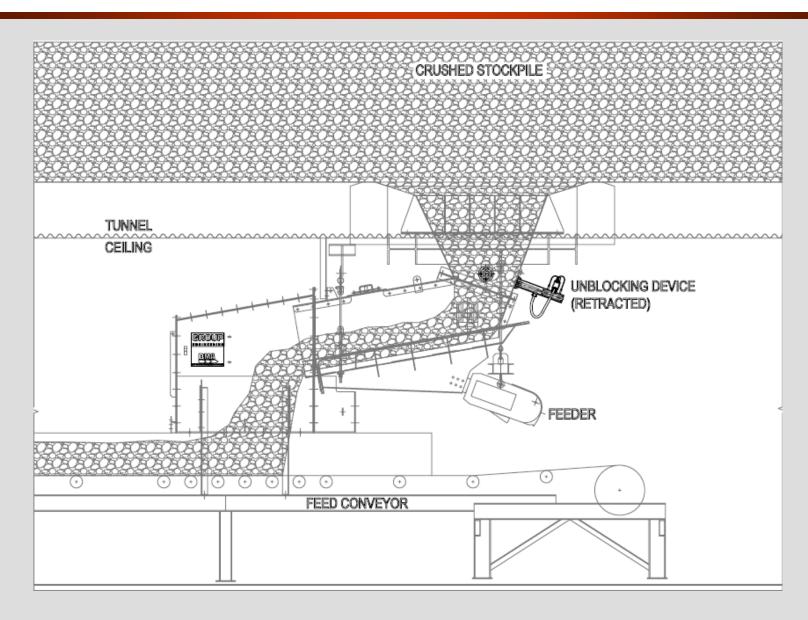


- Bridging occurs periodically in the hopper section of the feeders, disrupting the continuous supply of coal onto the feed conveyor
- An incident occurred in early 2008 which initiated a review of feeder unblocking practices
- Opportunity to review practices that had been in place for +30 years across the Industry and to initiate the development of a 'hard control' or 'engineered solution' to a long standing safety issue
- Feeders located in a difficult operational environment
  - limited access, high noise/dust/vibration level area

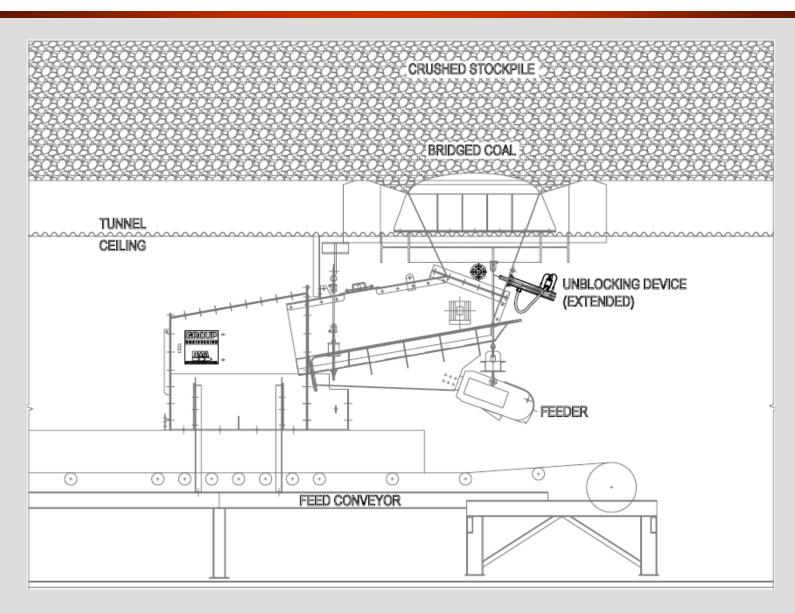


- Blockages previously removed via a manual water lance operated via an inspection hatch on the side of the feed chute section of the feeder
- Commenced 3 phase solution generation process:
  - Developed range of new 'safe' hand tools (short term action)
  - Developed a range of trial high pressure water based lances (medium term action)
  - Installation and automation of best performing trial lance (long term solution)
- Final solution: remotely operated, pneumatic ram driven water lance – removes personnel from the physical hazard associated with previous unblocking methods and the hazards associated with the work environment
- Solution fully installed and operational in June 2009

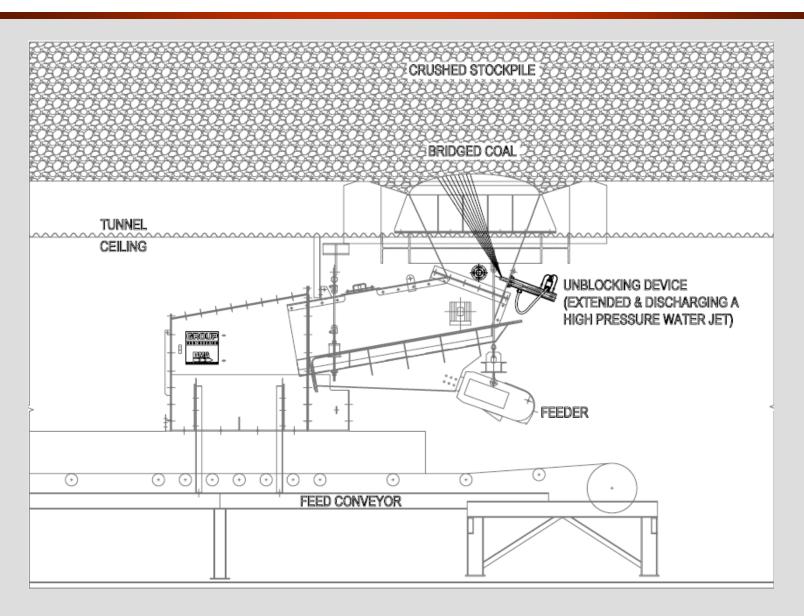




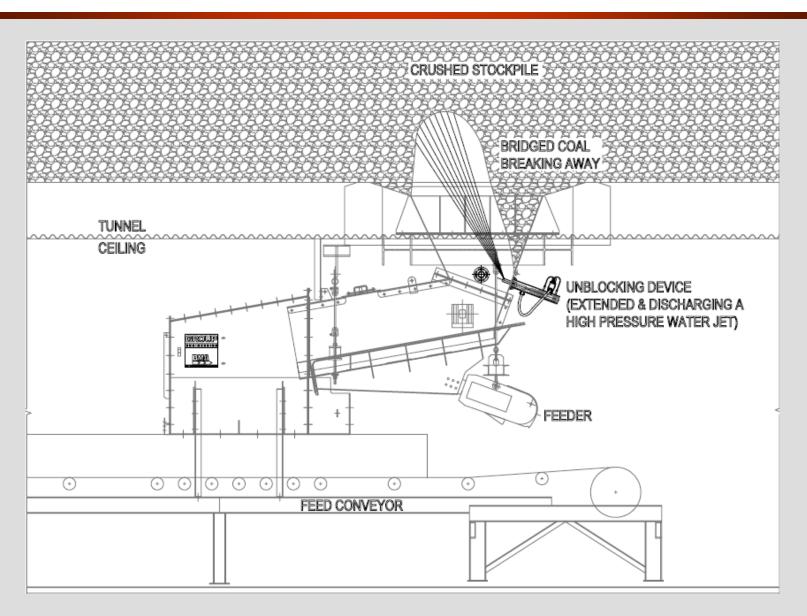




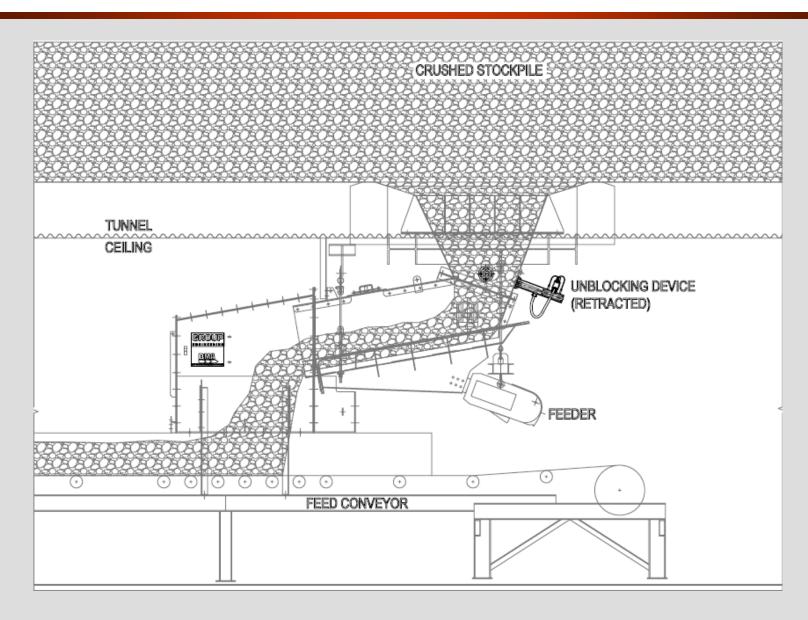




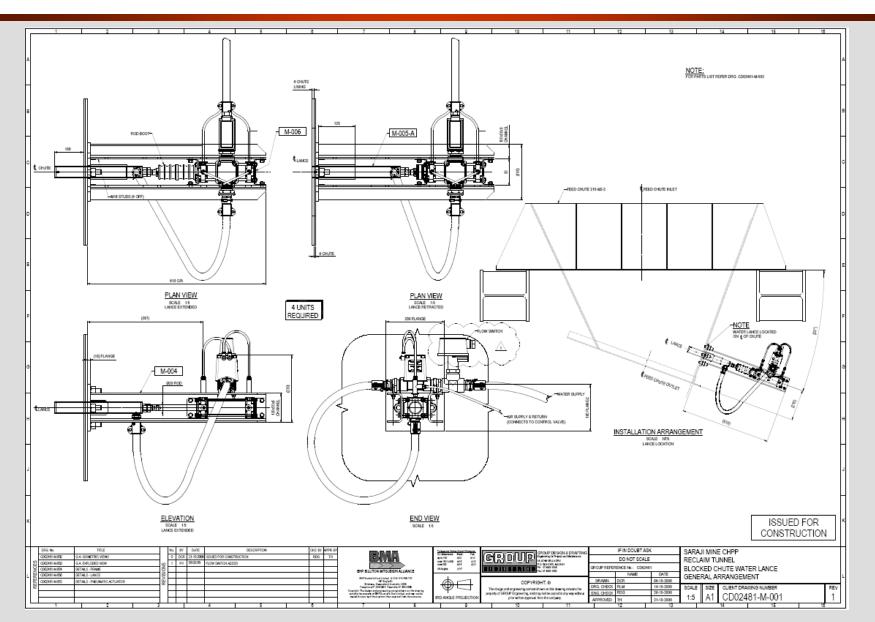




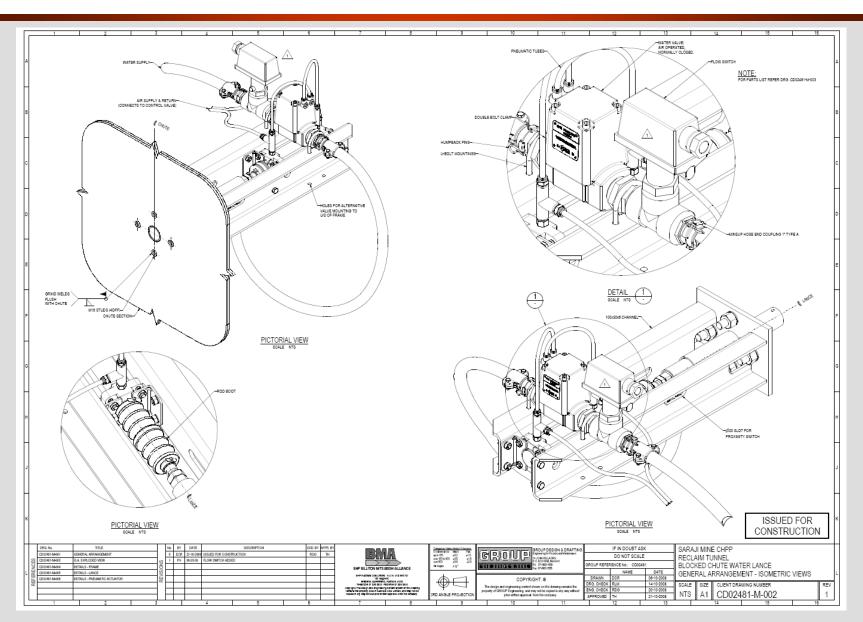




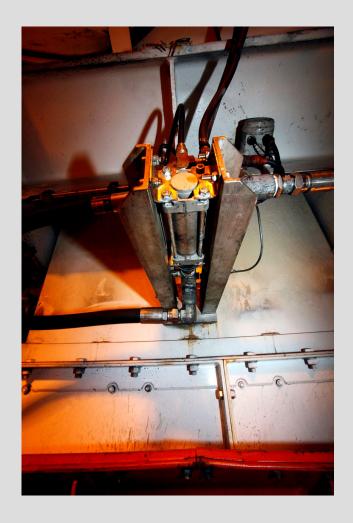














## Innovative Approach



- Benchmarked other Sites and engaged equipment manufacturer in devising final solution – no suggestions forthcoming for easy replication
- Solution to problem developed by Operations and Maintenance personnel on-Site
- Hand tools and trial water lances constructed using parts that were readily available on-Site
- Final solution scope:
  - Fix device that when not in use was fully retractable and did not impede coal flow through hopper section
  - Easily removable for repair/maintenance
  - Able to be automated and operated remotely (ie from Plant Control Room)
  - Able to use existing infrastructure (ie water supply)
- Final design and installation was a relatively low cost solution to a long standing HSEC issue

# **Opportunity for Replication**



- Innovation has been shared extensively throughout BMA/BHP Billiton (publications and web-site articles)
- Today is our opportunity to share information regarding our 'Feeder Blockage Removal Device' with personnel across the Industry for the purpose of replication where applicable
- Innovation originally devised for a specific feeder/coal operational scenario, but it has application in any situation in which water or air could be used to remove a blockage or build-up of material
- Devices can easily be retrofitted to existing installations, low cost and easily able to be maintained

### Acknowledgements



- Coal Handling and Preparation Department personnel at Saraji Mine would like to thank the following people and Companies for their assistance in making this project possible:
  - Department personnel Glen Althaus, Glenn Deaves, Matt Boswood, Dave Kilpatrick, Warren Borg, Max Fraser, Bob Eldridge
  - Group Engineering
  - Advanced Cutting Solutions