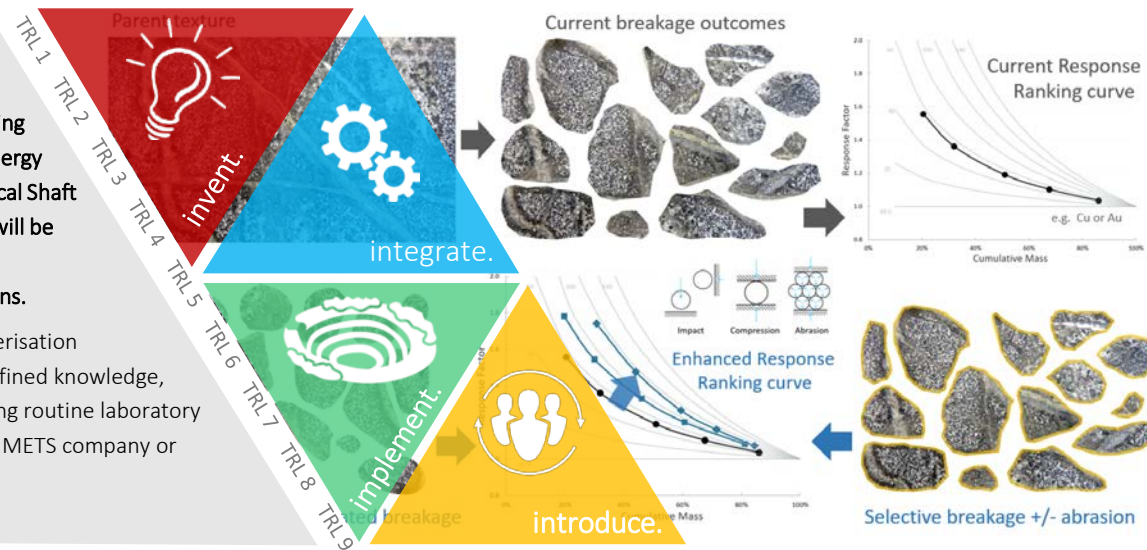


# Comminution optimisation for Grade Engineering®

PROJECT P3-008

This project undertakes extensive laboratory-based research into enhancing coarse liberation through controlled energy application using next generation Vertical Shaft Impactor (VSI) technologies. Testwork will be conducted on a range of selected ores from a number of mining operations.

The aim is to progress the ore characterisation component from TRL3 to TRL5 with defined knowledge, protocols and equipment for conducting routine laboratory tests capable of being transferred to a METS company or end-user mine site.



## Research collaboration

Next generation Vertical Shaft Impactor (VSI) breakage devices and well controlled abrasion have been identified in previous JKMRRC research as being capable of delivering the required selective, high-efficiency breakage and preferential liberation outcomes. These can be exploited in the context of Grade Engineering® and whole of system optimisation.

The JKMRRC team, plans to work together with METS organisations to develop the next generation of technology in this field.

The newly developed technology would then be tested live on sites. Some good prospective test sites have already been identified.

The project draws on the research expertise of The University of Queensland, equipment for testing from GEKKO and the site implementation expertise of CRC ORE.

**Program Coordinator:** Paul Revell, CRC ORE  
**Project Leader:** Dr Vladimir Jokovic, JKMRRC  
**Timing:** March 2018 – May 2020  
**Participants:** JKMRRC, The University of Queensland, CRC ORE and Gekko.  
Provisional sponsors:  
Anglo American and Sumitomo

Image above: Schematic illustration of enhanced Response Ranking objective for current project.

## Background & aims

Extensive work by CRC ORE to-date has shown that natural grade by size department during coarse rock breakage and screening is a key lever for generating high-value coarse separation in Grade Engineering® applications. For some sites, current outcomes are driving billion-dollar value propositions.

In work to-date, natural grade by size department is induced through routine blasting and primary crushing.

Exploiting inherent rock-property controls on department through application of more selective and energy efficient breakage mechanisms, offers the opportunity to further enhance the benefits of screening-based Grade Engineering outcomes. This includes generation of higher grade feed streams and step-change improvements in overall comminution energy intensity. Through development of next generation devices, significantly improved breakage efficiency and selective gangue rejection can be achieved.

## Focus on outcomes

- Defining knowledge, protocols and equipment for conducting routine laboratory tests to characterise a Grade Engineering® response capable of being transferred to a METS company or end-user mine site.
- Developing new laboratory ore characterisation protocols for VSI amenability.
- Benchmarking new technology against current screening-based Grade Engineering practice and outcomes.
- Developing cost integrated modelling of improved comminution energy efficiencies linked to coarse separation.