

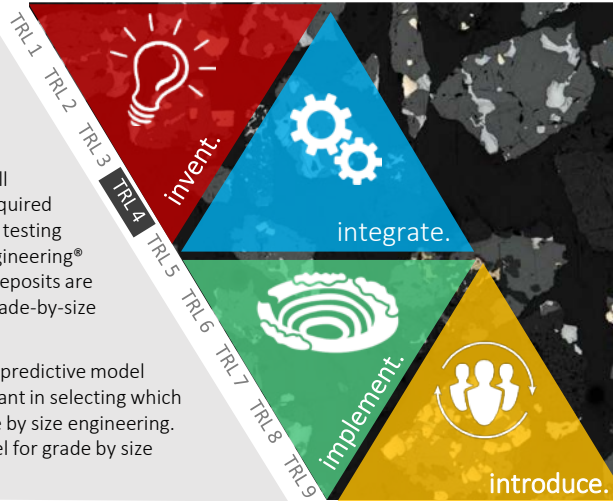
# Geological controls on grade by size department

PROJECT P1-006

**To identify a mineralogical and textural basis for preferential grade-by-size department.**

A predictive model of preferential grade-by-size department behaviour will dramatically increase the confidence required before committing to significant on-site testing of different mineral deposits. Grade Engineering® will only be successful when sufficient deposits are tested and the drivers of preferential grade-by-size are better understood.

Large scale testing is expensive and the predictive model under development here will be important in selecting which deposits are likely to benefit from grade by size engineering. The aim is to produce a predictive model for grade by size fractionation that reaches TRL 4.



## Research collaboration

The University of Tasmania hosts the world-leading ARC Centre of Excellence 'Centre in Ore Deposits' (CODES).



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CODES is led by Professor Bruce Gemmill, and includes the resources of 35 research staff and over 100 post graduate students. Since its inception in 1989, CODES has delivered outstanding research outcomes for the mining industry in the fields of ore economic geology and geometallurgy.

The CODES team involved in this project includes Professor Gemmill, a dedicated post-doctoral researcher and a number of RHD students. CRC ORE will provide additional support through the Innovation Delivery Group (IDG) by providing samples and linking the economic evaluation of grade-by-size to the research findings.

**Program Coordinator:** Paul Revell, CRC ORE  
**Project Leader:** Prof Bruce Gemmill, UTAS  
**Timing:** October 2016 – September 2019  
**Participants:** UTAS, CODES, CRC ORE

Image: Coarse mineral particles, supplied by UTAS.

CRC ORE

## Background & aims

CRC ORE has demonstrated preferential grade by size department in several deposits; however, on-going test programs have highlighted that the grade-size correlation is weak or non-existent in some mineralised systems. The underlying geological properties that give rise to a positive grade by size fractionation are not defined. For this preferential grade by size department to be economically exploited, a predictive understanding of the effect is required, providing input into spatial models and mine evaluation tools.

This project aims to improve understanding of preferential grade-by-size department and develop a standard test work protocol to identify why grade-by-size correlations exist in some mineralisation styles and not in others.

## Focus on outcomes

- Development and refinement of standard test work protocols.
- Multi-deposit testing and analysis of the grade-by-size effect identifying mineralogy, texture, alteration and ore genesis drivers.
- Development of predictive tools for classifying mineralised systems in terms of likely grade-by-size fractionation performance.
- Development of predictive tools for grade-by-size fractionation strength as input in to spatial and economic models.