



## Services

### Critical Minerals

According to CSIRO, critical minerals are essential for modern technologies and economy, they are limited in their supply and are seeing a significant increase in demand. Assessments of how critical a mineral is are conducted based on market and political conditions at a particular point in time and are therefore subject to change. Critical minerals help create the essential everyday items we all use; we are now using more minerals and in greater volumes and this demand will increase even more over the next decades.

Examples of critical minerals currently listed by the Australian government include rare earth elements (REE), heavy mineral sands, lithium, cobalt, nickel, manganese, silicon, tungsten, titanium and vanadium, among others.

The handling of such materials is seeing an increase in Australia and globally, and as such there is a need to understand the handling characteristics of these materials for the appropriate design of storage and handling facilities.

TUNRA Bulk Solids can assist in characterising a range of critical minerals and provide expert assistance in the conceptual design or design review of materials handling systems.

### Flow Properties Testing:

TUNRA flow properties test work is required for the determination of optimum geometry parameters in order to promote flow, or to ensure safe transport and dust-free operations.

The materials testing services offered include, but are not limited to:

- ▶ Determination of Worst-Case Moisture Content
- ▶ Direct Shear Testing (low and high consolidation conditions)
- ▶ Testing with Undisturbed Storage Time
- ▶ Large Bulk Density / Compressibility Testing
- ▶ Wall Friction Testing
- ▶ Determination of critical outlet dimension and hopper angles for mass flow hoppers
- ▶ Transportable Moisture Limit (TML) testing for safe shipment of concentrates
- ▶ Dust Extinction Moisture (DEM) and Wind Tunnel Dust Lift-off testing to minimise dust emissions
- ▶ Stockpile Drainage Testing







## What engineering services are available for critical minerals?

- ▶ Transfer chute design and design review
- ▶ Bin and hopper conceptual design
- ▶ Belt and screw feeder design assessment
- ▶ Slurry pumping of minerals
- ▶ CFD, DEM and SPH Modelling

## Materials TUNRA is experienced in:

- ▶ Cobalt
- ▶ Manganese
- ▶ Mineral Sands
- ▶ Nickel
- ▶ Rare Earth Elements
- ▶ Silicon
- ▶ Spodumene / Lithium
- ▶ Titanium
- ▶ Tungsten
- ▶ Vanadium

## Why TUNRA Bulk Solids?

### Experience and Expertise

We have provided expert solutions to industry for over 45 years and are the leading organisation for materials handling research and consulting in Australia and internationally

### Research and Development

We have a proven track record in research and development through the close association with The University of Newcastle

### Quality Service

We have highly qualified, well-trained and specialist staff that are committed to delivering excellence

### First Class Facilities

Our laboratory is a state of the art facility located within the Newcastle Institute of Energy and Resources (NIER) at The University of Newcastle

### Industry Standards

We are accredited to ISO 9001, ISO 45001 and ISO 14001

### Independent

We are independent and not for profit



## Further information

- To access our Case Studies visit **[www.bulksolids.com.au](http://www.bulksolids.com.au)**
- To discuss your industry and business needs phone **02 4033 9055**