

Critical Minerals

Australia's critical minerals sector is constantly growing in response to the increasing global need for a secure supply of these vital and strategic minerals.

Tonkin + Taylor's Environmental and Geotechnical teams support our clients through all stages of investigations and approvals processes.

A background illustration on a teal gradient. It features a large, green, stylized dragon-like creature with a yellow sun on its back and a yellow arrow pointing upwards. The dragon has a yellow sun on its back and a yellow arrow pointing upwards. The sun has a yellow center and yellow rays. The arrow is yellow and points upwards. The dragon is green and has a yellow sun on its back and a yellow arrow pointing upwards.

Tonkin + Taylor acknowledges the First Nations peoples of Australia as Traditional Custodians of the land and waterways on which we work and live, and recognise their continuing connection to land, water, and culture.

We pay our respects to their Elders past and present, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

About us

Tonkin + Taylor is a leading employee-owned environmental and engineering consultancy. With offices across Australia and New Zealand, we service these areas, the Pacific and SE Asia.

In Australia, our diverse team provide specialist services across a range of practice areas, including Coasts + Water, Geotechnical, Geosciences, Pavements and Waste. We are renowned among our diverse range of clients for delivering innovative, sustainable and resilient solutions.

Our reputation for professional excellence, strong collaboration and trusted partnerships is one we continue to be very proud of as we work with our clients and communities to embrace the challenges and opportunities around us as we strive to meet our purpose:

Together, we create and sustain a better world.

Our team are experienced, knowledgeable, and passionate about what they do. We look forward to being your partner of choice in finding sustainable solutions.



Our services

The mining of critical minerals is critical to the manufacture of advanced technologies, including mobile phones, computers, fibre-optic cables, semi-conductors, banknotes, and defence, aerospace, and medical applications. Many are used in low-emission technologies, such as electric vehicles, wind turbines, solar panels, and rechargeable batteries.

Our Environmental and Geotechnical teams have experience in the mining sector from geotechnical investigations to support pre-feasibility studies, through to contaminated land and groundwater assessments, air quality assessments, and human health and environmental risk assessments. We can support our clients through all stages of investigations and approvals processes.

We are specialists in the geotechnical, waste, air quality, human health risk assessment, and contaminated land space. We also understand regulatory approvals processes in Australian States and Territories which are regularly changing and are a complex landscape to navigate.

Our client-focused, strategic approach provides strong positive outcomes at a project level and allows us to build trusting relationships with our clients. Covering a wide range of expertise within the critical mineral sectors, we can provide our clients with strategic advice and technical excellence at all stages of the process.

Regulatory guidance

- Environment policy and regulatory expertise
- Social licence to operate

Environmental sciences

- Human health and environmental risk assessments
- Air quality modelling, analysis and control
- Noise assessments
- Contaminated land and groundwater investigations
- Soil Science
- Waste containment cell design
- Design and construction oversight / auditing

Geotechnical engineering

- Geotechnical peer review, assessment, and design for tailings storage facilities
- Geotechnical design for mine infrastructure
- General earthworks and stability assessments
- Evaporative pond cell design
- Geotextile and geomembrane liner design

Pavement engineering

- Pavement and haul road design purpose specs
- Near surface soil conditions

Geotechnics

- Fleet of versatile drilling rigs
- Site investigations & inspections
- Construction Advice Notices (CANs)
- ISO/IEC NATA Laboratory services for QA during delivery
- Instrumentation e.g. remote settlement monitoring
- Progressive site rehabilitation planning, implementation, and supervision



Track record

Phosphate Hill Phosphate Mine (QLD)

T+T provided geotechnical services at the Phosphate Hill phosphate mine site in Western Queensland to assist the mine owners in their plans for the continued development of the operation. T+T undertook geotechnical desktop studies for a concept level design for the potential to re-route an existing creek, including a section through an old mining pit and a concept level design for flood levees to protect proposed new pits. The design had to cater for variable subgrade conditions, including permeable ground conditions, and provide stability in sunny day, flood and post flood conditions.

Anthill Copper Mine (QLD)

Our clients were developing the Anthill copper mine in northwest Queensland. As part of the development the client needed to divert a creek on site and build associated flood levees. T+T provided geotechnical advice in the form of a preliminary design of the flood levees and also provided ecological advice on works to allow the re-establishment of vegetation in areas disturbed by the creek realignment.

Avonbank Mineral Sands Environmental Effects Statement (VIC)

T+T was engaged by WIM Resources to undertake an Air Quality Impact Assessment (AQIA) and Human Health Risk Assessment (HHRA) as part of the Environmental Effects Statement for their Avonbank Project. The AQIA assessed the impacts of emissions from the construction and operation of the mine during the 35 year mine life on the local communities. Mitigation measures were identified to minimise the emissions from the mine and included in the modelling. The modelling was conducted in accordance with the

EPA Guidance under the new Environment Protection Act (2017). The HHRA assessed the potential risks to public health due to exposure to dust, metals, noise, surface water and groundwater. The HHRA also assessed the impacts of dust and metals on surrounding agricultural industry and local water supplies, including private rainwater tanks and the risk to human health through consumption of produce and drinking water. It also considered the risk to human health from the consumption of meat (chicken and lamb) and eggs through the exposure of the animals to metals via the food chain and consumption by humans.

Wimmera Mineral Sands Environment Effects Statement (VIC)

T+T was engaged by Iluka Resources to undertake an Air Quality Impact Assessment (AQIA) and Greenhouse Gas Assessment as part of the Environmental Effects Statement for their Wimmera Project. The AQIA is assessing the impacts of emissions from the construction and operation of the mine during the 20 year mine life on the local air quality. Mitigation measures have been identified to minimise the emissions from the mine and included in the modelling. The modelling is being conducted in accordance with the EPA Guidance under the new Environment Protection Act (2017). The Greenhouse Gas Assessment is being undertaken to assess the GHG emissions from the Project's activities across the entire mine life. This includes construction and operations as well as transport emissions. The assessment also assesses the impact of vegetation clearance on GHG emissions. Mitigation measures to minimise GHG emissions are identified and alternative options are considered to enable choice of low emission scenarios for the mine operation.

Confidential Client (VIC)

T+T was engaged to undertake a Human Health Risk Assessment and Air Quality Assessment as part of a Planning Approvals process for the construction and operation of tailing storage facility for a gold mine. The HHRA will address the health impacts from emissions during the construction and operation of the tailings facility on the local community. Risks due to inhalation of particles (including those containing metals and respirable crystalline silica) as well as deposition into rainwater tanks and home grown produce and the risk to health through ingestion. The air quality assessment will assess the impacts of emissions from the construction and operation of the tailings facility on the local air quality. Mitigation measures will be identified to minimise the emissions from the tailings facility and included in the modelling. The modelling is being conducted in accordance with the EPA Guidance under the new Environment Protection Act (2017).

Confidential Client (NZ)

T+T has had long term involvement with the design, operation and closure of a gold tailings storage facility (TSF) in New Zealand. This work has included permitting / consenting, geotechnical stability assessments and designs, buttress designs, subsoil and surface drainage, closure designs, monitoring and surveillance. More recently T+T has been leading the path to compliance for both GISTM and NZ Dam Safety Regulations, with the work including dam breach assessments for the purposes of consequence classifications, and have been engaged to develop the OMS, DBR, DAR, FMEA and TARP for the facility. T+T have designed and implemented the automated real-time monitoring and reporting system, compliant with the current regulations.

Contact us



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