



MINING GEOTECHNICAL SERVICES

Piteau Associates provides specialist services in Mine Geotechnical Engineering and Waste Rock Management and is highly respected in the international mining community for our expertise in open pit slope design and mine waste dump design.

Our key areas of expertise include:

Field Investigation and Data Collection

- Geotechnical, structural and photogrammetric mapping;
- Geotechnical drilling, logging and core orientation;
- Hydrogeological testing (packer, airlift, percolation, response and pumping tests);
- Test Pitting, sampling and in-situ testing programs;
- Hydrogeological monitoring (piezometric level, and water quality readings);
- Instrumentation installation and monitoring (deep piezometer strings, TDR cable, inclinometers, extensometers);
- Terrain and natural hazard mapping;
- Quality assurance and quality control of data collection; and
- On-site training, workshops and seminars for field data collection methods, data reduction, validation and analysis.

Conceptual, Pre-feasibility, and Feasibility Slope Design Studies

- Audit of existing data and identification of data gaps;
- Development of targeted geotechnical and hydrogeological investigation programs;
- Development of geotechnical rock mass models and block models;
- Slope stability analysis, design and optimization;
- Groundwater assessments for slope design and pit dewatering; and
- Detailed limit equilibrium and numerical modelling assessments for slope design (2D and 3D).



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Our key areas of expertise also include:

Detailed Design of Pit Slopes and Operating Mine Optimization and Review

- Optimization of open pit slope designs;
- Slope failure prediction, back analysis and forensic studies;
- Detailed numerical modelling assessments (2D and 3D) for slope design, deformation assessment, interaction studies between critical infrastructure, and evaluation of mitigative strategies;
- Geotechnical performance reviews, audits and inspections;
- Technical Review Board participation and third-party audits of geotechnical and hydrogeological designs/reports; and
- On-site training, workshops and seminars for analysis and design theory, use of slope stability software.

Waste Dump Studies

- Site investigations for site selection and layout include airphoto interpretation, reconnaissance, test pitting, soils drilling and sampling, and laboratory testing;
- Static and pseudo-dynamic stability analysis methodologies and more advanced dynamic and deformation analyses, where necessary;
- Rock drain design;
- Evaluation of dumps and stockpiles in several progressive phases of development to verify the stability of the structure during and following mining; and
- Inspection and compliance review, performance reviews, geotechnical audits, and design of remedial measures.

Slope Monitoring

- Development of slope instrumentation and modelling programs;
- Audits of slope monitoring databases;
- Implementation of Piteau IMPRISM software and training;
- Assessment of monitoring threshold levels and integration into Trigger Action Response Plans (TARP) and Emergency Response Plans (ERPs);
- Development of geotechnical hazard maps; and
- Slope failure prediction (i.e., time of failure and runout).