# Mira Geoscience
...modelling the earth

3D Geological Modelling Consulting Services
From mineral exploration to mining and geotechnical hazard assessment

Summary

As mineral exploration has become progressively more focused on deep, under-cover, and brownfields targeting, proper 3D geological modelling, analysis, and interpretation have become essential. Our team of experts provides an industry-leading capability for construction and interpretation of 3D models. For over a decade we have pioneered the cross-validation of 3D geological model concepts in the minerals industry, drawing on a wide range of geological, geophysical, geochemical, and geotechnical knowledge to build integrated, multi-disciplinary models of complete geological frameworks.

We have extensive experience working across a range of scales from regional to deposit, and across a range of business needs from mineral exploration to mining and geotechnical engineering. Our team works with a broad spectrum of modelling technology and data types to create and deliver meaningful, client-driven models that serve as the basis for decision making in drillhole targeting, mining, and geotechnical hazard evaluation.
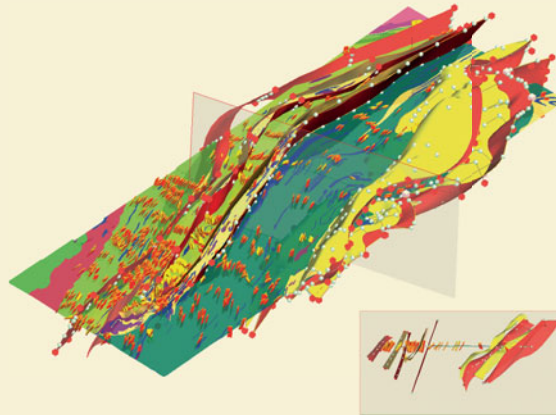
Our consulting services provide expertise in the following areas:

» 3D structural modelling of complete geological frameworks

» Translating business requirements into geological modelling requirements

» Objective-based 3D model design

» Data management, including time-dependent mining and geotechnical data

» Multi-scale models, merging local and regional

» Interpretation of geochemical data within a 3D earth model

» Physical property data management and interpretation

» Geostatistical estimation/simulation of physical properties, alteration, facies

» Geologically-constrained geophysical inversion

» 3D-GIS spatial analysis and query

» 3D data-driven and knowledge-driven exploration

» 4D quantitative back-analysis of geotechnical hazard in mining and civil applications

Mine development (coloured by relative rockburst hazard potential) intersected by 3D fault structure.
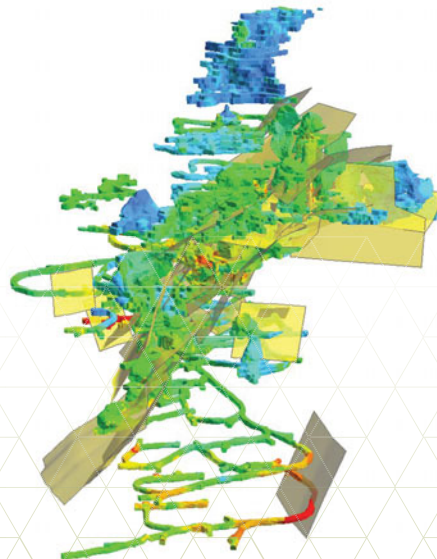
Geological modelling

- » Comprehensive modelling of complete 3D geological frameworks at any scale
- » The industry's most powerful 3D explicit and implicit geological modelling technologies
- » Interactive, interpretive parametric surface modelling
- » Structural vector field interpolation to guide geological surface construction
- » Implicit modelling of geological contact and grade surfaces

3D geophysical modelling and inversion

- » Geological model-based structural and petrophysical constraints
- » Gravity and magnetics
- » Resistivity and induced polarization
- » Electromagnetics
- » Seismic

Geochemistry

- » Direct 3D integration of geological and geochemical modelling

Spatial analysis and 3D-GIS

- » 3D exploratory data analysis
- » Linked spatial and tabular displays
- » Topological relationship analysis
- » Queries to investigate and understand complex 3D relationships

Exploration targeting

- » Drillhole targeting process design and solution strategy
- » Data-driven and knowledge-driven 3D expert systems

Geotechnical hazard evaluation

- » 4D evaluation of dynamic geotechnical mining and civil hazards
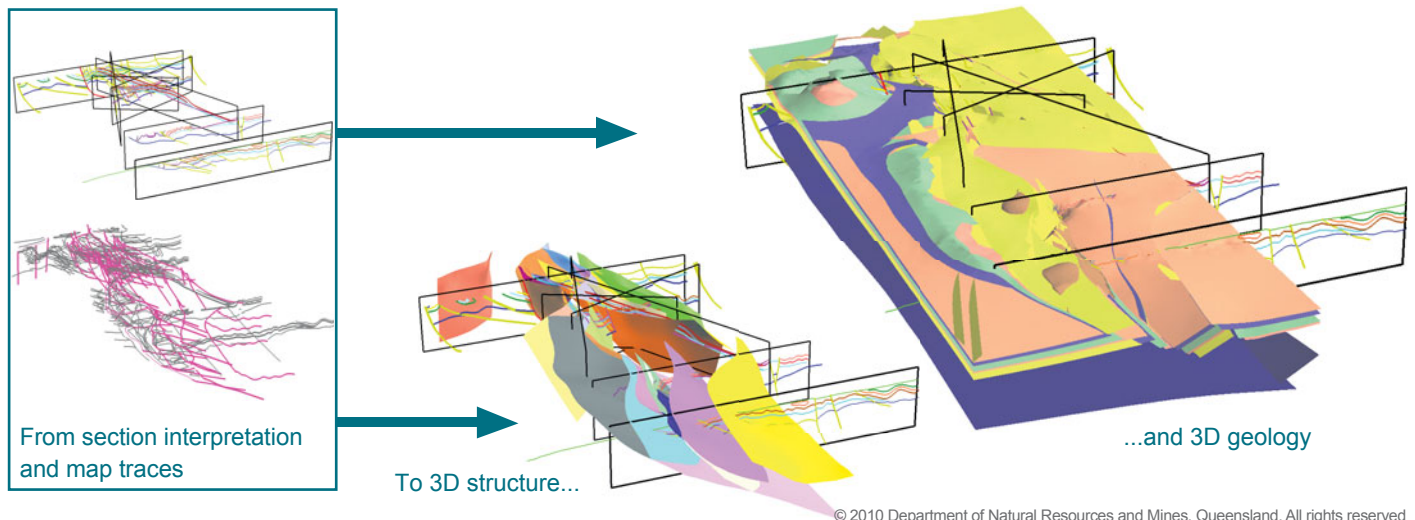
From section interpretation and map traces

To 3D structure...

...and 3D geology

3D geological modelling services

We work directly with clients around the world, from juniors to majors, and across all commodity types, to provide valuable 3D models and interpretation in common formats and a Geoscience ANALYST workspace for easy communication of results and ideas. Our team of experts delivers rapid model construction and integrated interpretation. A key component of the geological modelling service is the visualization and quantitative integration of geological, geophysical, and geochemical data sets.

We work with you in applying true 3D-GIS functionality to generate integrated, quantitative, multi-disciplinary models for successful mineral exploration, mining, and geotechnical hazard evaluation.

Data we work with

We ensure fast, intuitive, and accurate 3D earth models, regardless of your data types. We work with geological, geophysical, geochemical, and geotechnical data from standard mining industry formats: ArcGIS, MapInfo, AutoCAD, GOCAD/SKUA, Gemcom, Surpac, CAE Studio, Vulcan, Geosoft, Leapfrog, ER Mapper, ioGAS, UBC-GIF, VPmg, Profile Analyst, Maxwell, and others.

Mira Geoscience

...Montreal Vancouver Brisbane Perth

www.MiraGeoscience.com   @MiraGeoscience   info@mirageoscience.com