

Characterising and Managing Mining Overburden Using Geological Data

Many mining operations involve excavation of enormous volumes of overburden. Increasingly, minesites are required to identify:

- estimated quantities of various overburden materials that will be excavated;
- the risks associated with each overburden type; and
- management methods to properly dispose of, or remediate, these materials.

Central to these requirements is interpretation of drill hole data to provide detailed information on the various lithologies that will be stripped as overburden. Characterisation of those materials can identify both risks and opportunities associated with the placement of various materials in constructed landforms.

Recently-released guidelines in Western Australia require characterisation of the overburden that will be excavated by mining. Although potential for acid mine drainage is a major concern, there are a number of other issues to be considered if successful rehabilitation of a constructed landform is to be achieved. These include the competence of rocky overburden, sodicity and tunnel erosion risk of oxidised materials, and hostility of growth media to plant growth due to salinity, pH imbalances, infertility, or micro-nutrient toxicities.



With the current shortages of experienced professional staff, it can be difficult for sites to place priority on full characterisation of the non-mineralised zone of proposed pits, yet that information can be a crucial component of mining proposals.



To assist mining projects, Landloch's experienced staff can:

- review and validate drilling logs;
- determine waste rock lithologies;
- develop geological cross-sections for proposed pit areas;
- produce an inventory of overburden types and volumes;
- assess overburden properties with a particular focus on their successful use in constructed landforms (competence, erosion potential, suitability for plant growth);
- identify constraints and opportunities for construction and remediation of landforms;
- develop guidelines for selective placement of overburden materials to address the range of risk factors identified; and



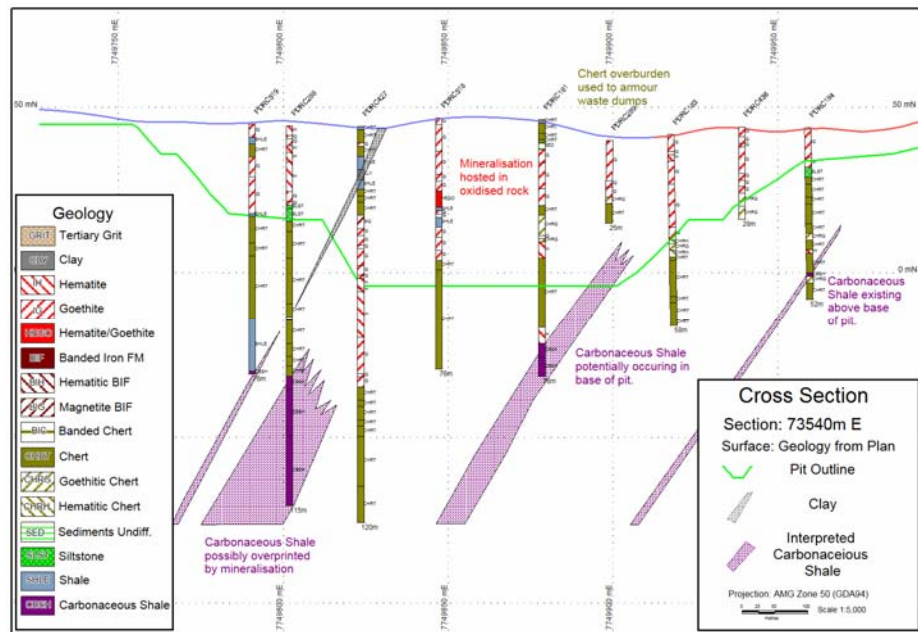
- provide landform designs consistent with site goals for safety, erosion stability, vegetation ecosystems, and water quality.

Landloch staff have backgrounds in geology, soil science, and engineering, and have extensive experience with operating minesites and proposed projects across Australia and overseas.



An important feature of Landloch’s approach to overburden characterisation is the potential to combine information on geology, material properties and erosion risk, vegetation and climate, and landscape processes. This allows us to provide guidance on the construction and remediation of waste rock landforms that are fully consistent with site constraints and requirements. It also allows crucial landform design decisions (that ultimately determine whether a site can be relinquished) to be made from the outset of a mining proposal, giving investors greater certainty as to the environmental liability of the project being proposed.

In Landloch’s experience, proper planning of waste rock dumps can drastically improve rehabilitation success, and reduce the costs of site remediation and closure. Repair of failed rehabilitation works can cost sites millions of dollars and delay site relinquishment by many years. Alternatively, lack of adequate information and planning may cause significant delays in the approval of mining proposals.



For assistance with collation, validation and interpretation of site geological data and/or planning for the effective management of overburden materials, contact :

John Clewett (B.App Sc (Hons), B.Ed)
Geological Consultant
clewettj@landloch.com.au

Dr Rob Loch (B.Agr Sc, B.A, Ph.D)
Principal Consultant
lochr@landloch.com.au



Landloch Pty Ltd
PO Box 57
HARLAXTON QLD 4350
Ph: (07) 4613 1825
Fax: (07) 4613 1826
Email: admin@landloch.com.au
Web: www.landloch.com.au