



Landform Design

Mining activities generally move substantial volumes of overburden and process significant quantities of minerals. This typically results in the construction of large waste rock and overburden dumps, and tailings dams that constitute lasting legacies of mining.

With increasing capacity to move material, the rate of construction and the size of such waste landforms has also increased. As well, stakeholder expectations with respect to the long-term stability and aesthetic quality of such landforms have become considerably more demanding, and this increases pressure on the mining industry to change the way in which waste landforms are constructed and rehabilitated. There is also a growing industry awareness that the costs of construction and rehabilitation of waste landforms can be extremely high if poorly planned and executed.

Current leading practice in waste landform design has moved far from the historical "standard". It is now widely accepted that:

- Waste landform designs should be site specific, tailored to local climate and materials; and
- Landform design is of major importance for achievement of closure criteria with respect to long-term stability and aesthetic requirements.

As such, successful landform design and rehabilitation is a site-specific activity that requires expert consideration of the interactions between material properties, hydrology and vegetation dynamics. To deal with the complexity of these interactions, Landloch has developed expertise in:

- Laboratory and field methods for measuring infiltration and erodibility characteristics of soil and waste materials;
- Methods for measuring sediment properties important in the design of sediment basins and other operational control structures;
- Assessing impacts of sediment generation on surrounding catchments;
- Use of a range of computer models to predict plant growth, soil water balances, runoff, and erosion for any given landform shape;
- Landform evolution simulations to consider longer term issues; and
- Using soil analyses to provide fertiliser, amendment and plant species recommendations to maximise potential establishment and growth of sustainable ecosystems.

Landloch staff have carried out landform design studies on numerous sites across Australia and internationally, and validation studies have clearly demonstrated the accuracy of our techniques. Important benefits of using Landloch's skills include the:

- Rapid and cost-effective testing of alternative landform designs relevant to prevailing climatic conditions prior to material movement taking place, which reduces double handling;
- Greater certainty for earthmoving contractors that the designs will provide stable sites;
- Identification of major issues for landform design and management in the planning phase;
- Demonstration and verification of output, which allows a transparent design process to aid acceptance by regulatory authorities;
- Significant improvements in environmental performance and rehabilitation success; and
- Potential for reducing environmental liabilities.

At all times, Landloch aims to use quality science to achieve practical, sustainable and cost-effective landform designs.