**Acceptable Erosion Limits for Constructed Mine Landforms – A Literature Review**

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## Abstract

Constructed mine landforms are rehabilitated with the intent to provide a beneficial use that may include returning the land to premine vegetation, using the rehabilitated land for forestry, grazing or cropping or in some case utilising the land for alternate uses such as solar farms or hydro-pump back opportunities. In all cases and particularly in cases where the constructed mine landforms contain geochemically reactive material the surface material on the landform must remain geotechnically and erosionally stable.

The establishment of performance targets for rehabilitated landforms provides a measurable way of determining of the Design Objectives and Design Criteria have been achieved. In Queensland the performance targets are also framed as acceptable erosion limits.

Defining a one-size fits-all performance target for erosion rates or sediment yields is problematic due to the variability in landform design, material properties, and climatic conditions. This review evaluates published erosion benchmarks and the applicability of modelling tools—such as RUSLE, WEPP, MINErosion, GEOWEPP,SIBERIA and CAESARLISFOOD in setting site-specific erosion performance targets. Empirical estimates, including those from Lu et al. (2003), suggest average erosion rates of 4–5 t/ha/year across Australia. These values are often adopted as fixed targets, yet the original research cautions against their use at site scale due to landscape variability and model limitations. Similarly, the notion of aligning erosion rates with natural soil formation (<4 t/ha/year) oversimplifies the dynamic nature of rehabilitated landforms.

Process-based models, particularly when calibrated using site-specific data, offer a more robust approach. WEPP and MINErosion allow for annual and storm-scale erosion assessment, while SIBERIA provides long-term landform evolution projections. Together, these tools support the development of performance-based erosion thresholds that evolve with rehabilitation progress. The review recommends defining acceptable erosion rates as site-specific ranges, not fixed values, ensuring outcomes are scientifically defensible and operationally realistic within post-mining landscapes.