

Acid Mine Drainage and Minesite Salinity in Australia. D.J. Williams.
Abstract: Acid mine drainage and minesite salinity are, arguably, the most serious threats posed to the environment by open-cut mining and mineral processing. Acid mine drainage arises when sulphur, usually in pyrite form, contained in the ore and/or waste materials, is exposed to oxidation, the products of which are subsequently leached out by water as acid. As the pH of the system drops, bacteria begin to catalyse the chemical reactions, and any metals present go into solution. Open-cut mining and mineral processing activities also lead to the storage of water on the surface, where evaporation and leaching raise its salinity. At many mines in Australia in dry climates, soil covers over potentially acid generating waste rock dumps are being actively trialed. The aim is to maintain the soil cover in a saturated state by covering it with a sacrificial mulch of loose-dumped inert material. The mulch also serves to take up rainfall, preventing excessive runoff which may cause erosion of the soil cover. In the coalfields of Queensland, Australia, measured pH and salinity levels have been found to vary widely between minesites, within any given minesite, and with changing climatic conditions.
Additional Key Words: dissolved metals, open-cut mines, pyrite oxidation, soil cover.

Organic Matter and Nutrient Accumulation in Reclaimed Kaolin Mine Soils of Georgia.

R. B. Haddock, L. A. Morris, R. L. Hendrick, and E. A. Ogden
Abstract: Deficiencies in soil nutrients, particularly nitrogen, commonly result from replacement of natural soil profiles by overburden low in organic matter and essential elements. Reclamation success depends largely upon creating nutrient reserves, establishing adequate nutrient cycles, and developing a functional soil profile. Loblolly pine (*Pinus taeda* L.) stand productivity and soil characteristics of reclaimed kaolin mines in Georgia were evaluated along a chronosequence. Estimated site index (age 25) ranged from 11.3 m on poor sites to 24.1 m on productive sites. Projected volume at age 25 ranged from 119 m³/ha on poor sites to 280 m³/ha on productive sites. These values indicate that growth on many mined lands is comparable to growth on adjacent non-mined lands. Soil profile development below the surface soil was nonexistent on all sites and differences in soil texture and color did not adequately explain observed differences in site productivity. Foliar deficiencies in phosphorus, potassium and several micronutrients suggest that availability of nutrients and potential mineralization explain the observed differences in site productivity.