

1542 DIVERSITY IN THE RECLAMATION OF SURFACE COAL MINES IN SOUTH AFRICA¹

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Abstract. The coal mining industry in South Africa has been increasingly dominated by surface mining technologies since the early 1970's. In the initial phase reclamation guidelines placed the emphasis on the prevention of erosion on such disturbed areas. In this context landscape and soil aspects received minimal attention and the establishment of vegetation cover emphasized the prevention of erosion. Industry generated guidelines in the 1980's placed increasing emphasis on the restoration of productive capacity or land capability to pre-mining standards. These guidelines have subsequently been refined upon in co-operation with regulatory bodies and today environmental management plans must have a holistic approach to all natural resources (topography, soils, water and vegetation) which might be impacted by mining activities. The interaction between these components of the environment is of particular relevance, especially in terms of sustainability of land use systems post-mining. Although topographical landscaping has in most cases emphasized slope standards to reduce erosive impacts (runoff) and simplify agricultural operations there has been increased attention to drainage lines, wetlands, open water, water infiltration and deep percolation, which all interact with soil and plant factors to determine the water balance on mine operations. In a similar vein soil reclamation has moved from an emphasis on soil depth (as influenced by pre-stripping, placement and compaction) and chemical analysis to include biological parameters such as organic matter and soil fauna and flora. With respect to vegetation the original emphasis on perennial grass forages receiving N fertilization – at least for 3-5 years – is being broadened to include the use of forage legumes, annual row crops and trees in those situations where the land capability and climate conditions are able to sustain such land uses. Although the overall impression is one of increased diversity of land uses, there is also an increased awareness of the value of increased diversity within a specific land use. Hence: mono-specific grass pastures are increasingly being replaced by pastures incorporating other grasses and legumes; “range capability sites”, not warranting high inputs, are being oversown with more diverse native species or are being modified to provide savannah habitat and browse by planting of trees; high potential sites might be used for strip-cropping and/or crop rotations rather than mono-cultures. We are also seeing increasing use of irrigation (using mine water) for cropping systems. At the other end of the spectrum trees are being increasingly incorporated for screening purposes, as wind and shelter belts, for wildlife habitat, for commercial pulp or lumber and especially for their role in managing the water balance on mine properties. This diversification is aimed primarily at improving the viability and sustainability of land use systems in the post-mining phase.

Additional Key Words: sustainability, environmental resource management, land use

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