COST EFFECTIVE REHABILITATION OF AN OPEN CAST CHROME MINE IN THE NORTH WEST PROVINCE

by

Nadia Catharina CROUS

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Supervisor: Prof J.T. Harmse

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ABSTRACT

A review done of earlier literature showed that areas disturbed by mining activities became the focus of attention only during the changing environmental consciousness that swept the world in the early eighties. Although revegetation attempts of such areas had already been initiated in the thirties, it was only during the early fifties that legal incentives were introduced to ensure sustainable practice and land rehabilitation. Most of the earlier research referring to such rehabilitation practices was conducted abroad and often had very little in common with indigenous vegetation or local aspects. Furthermore, most of the research conducted was based on, and mainly only applicable to, the revegetation of gold mine dumps.

Further research also showed that many other methodologies had been attempted, such as soil stability testing and chemical treatment to improve dust suppression in those areas, but it was ultimately agreed that the most effective way to achieve maximum results was to revegetate.

Internationally, legislation was passed in the fifties stipulating that disturbed areas due to mining activity, had to be revegetated to limit further impacts such as soil erosion and contamination. Similar legislation was passed in South Africa - The Mines and Works Act No 27 of 1956 was directly aimed at revegetation. In 1980, this legislation became far more stringent when it was realised that revegetation would not solve many of the other major problems associated with post-mining activity.

It only become evident in early 1984, when South African-based research had been conducted, that differences in climate, soil type, geology, topography and vegetation would influence the rehabilitation process, as this research was spread across many mines within South Africa and the borders of Leboa and Ka Ngwane. This lead to a major shift in rehabilitation practice when it was realised that individual solutions could be applicable only to site specific situations and conditions; and that no single recipe could suit all locations. Site specific applications were experimented with and yielded far more successful results than any earlier attempts.

From these investigations it became clear that the implementation of an indigenous grass species program rendered more successful results than previous cases, but also did not solve all the associated problems. This lead to a more holistic approach being followed by researchers and executors alike, taking into account soil and topography studies such as slope gradients and lengths, surface temperatures and associated aspects, which resulted in a more sustainable approach to rehabilitation strategies.

This study uncovers general ecological principles which, when incorporated in an holistic model, could ultimately be the solution to many of the rehabilitation issues facing mining companies today. In this study it becomes clear that every effort should be made to reinstate the environment to a condition as closely resembling the natural state as possible and proving benefits similar to those which it yielded before commencement of the mining disturbance. To create an environment which is both cost effective and self-sustaining, it is necessary to develop a habitat wherein ecological factors comply with the tolerance limits of the environment in which it is situated. This ultimately implies that the general terminology often referred to in rehabilitation processes would have to be revised to encompass all aspects of the process and of the environment alike. And the practice of rehabilitation be revised to become an holistic method aiming for sustainable best practice, especially when mining operators have cost effective program options available to them.