

## Green Topics

climate and topography, and to determine the extremes of natural variation in the chemistry of the environment and the tolerance of natural ecosystems for variations in geochemical background.

To determine natural background levels, it is necessary to undertake geochemical mapping of the land surface. This began 50 years ago to aid mineral prospecting. Only over the last 25 years, as a result of developments in analytical and computer technology, has it evolved into a specialization capable of revealing the complexities of the natural chemical environment. Unfortunately, geochemical mapping and the resulting database have evolved in different countries and under different organizations in a very *ad hoc* manner. As a result, it is virtually impossible to make a quantitative comparison of data from different sources.

In 1988, the International Union of Geological Sciences (IUGS) and United Nations Educational, Scientific and Cultural Organization (UNESCO) jointly authorized a project to review the situation. The outcome is a report published by UNESCO<sup>1</sup> in 1995. The report reviews, on a country-by-country basis, existing data and methods and has detailed recommendations both for the conduct of new work and for the establishment of a global geochemical reference network which is regarded as essential for standardizing future work. As this report illustrates, there are at present virtually no published geochemical data for 80 percent of the global land surface. Where data are available, they are inconsistent between countries and often within countries. There has been no standardization of methods or data sets, and no independent quality control.

This deficiency of knowledge should be of serious concern both to the mineral industry and to the public at large. A systematic geochemical database that is both standardized and comprehensive is essential for the establishment of sensible environmental policy decisions. The UNESCO report has identified the need for the establishment of an international network of reference samples, analogous to a topographic grid in geodetic surveys.

Environmental phenomena are complex, and it is necessary to ensure that all the variables have been identified and documented before too many conclusions are drawn and regulations written. On the particular topic of metals in the environment, before quantitative limits are established, a global geochemical reference network is essential to establish global background values and to ensure measurements can be correlated and compared, irrespective of jurisdiction.

### Reference

1. DARNLEY, A.G., *et al.* 1995. A global geochemical database for environmental and resource management: recommendations for international geochemical mapping. *Earth Science Report* 19. UNESCO Publishing, Paris, 33 figures, 8 colour plates, 122 pp. Price 100 FF. (ISBN 92-3-103085-X).
- \* *Previously published in* International Council on Metals and Environment, *Newsletter* vol. 4, no. 1. 1996, p. 4.
- † *Co-Chairman, International Union of Geological Sciences (IUGS) Working Group on Continental Geochemical Baselines.* ◆

## Environmental guidelines for mining projects: The African Development Bank

South Africa is now a member of this body, tailored on the World Bank, and headquartered in Abidjan—Côte d'Ivoire.

As a funding agency for capital projects within 59 member countries of the ADB it is to be expected that there are guide-

lines to the requirements for funding application and for project management and control.

One of the many advisory committees set up within the bank's headquarters is that of Environment. It is one of the bank's long-term strategic policies to integrate environmental concerns into its overall lending policy and to strengthen mining environmental management within Africa.

All projects fall into three category classes, the lowest (Category 3) which includes projects such as health programmes or education programmes, do not require formal environmental examination. If, however, such projects involve physical intervention in the environment then they immediately move to Category 2 and join the small-scale projects for Agriculture, Rural Development, Industry and Infrastructure. This category requires an impact assessment but if any of its projects is located in or close to an environmentally sensitive area, (listed by type) then it moves to Category 1. This is the most stringently controlled and contains such areas as large-scale agriculture, commercial logging, hydropower, roads and rail, ports and harbours, manufacture of hazardous materials, large-scale tourist development and, of course, mining.

Each of these has its own set of guide lines and under review here we examine those for mining projects.

This guideline document was funded by the Danish Government and drawn up by the Danish Environmental Technology Transfer (DETT), a Danish consulting company and Rock View International and published in June 1995. Among the literature consulted, reference is made to several papers produced by our own Department of Mineral and Energy Affairs during 1992 and 1993.

The first overriding impression from reading this 83-page document is one of clarity and simplicity of language. This is a document which meets its own objective of being easily understood by Bank staff, Government officials and the general public.

It is divided into nine clearly defined chapters and a detailed appendix. Perhaps the best summary of this guideline can be achieved by following its example and merely listing its chapters and sub-chapters.

1. Introduction.
2. Environmental impact monitoring and management during the project cycle.
3. Environmental assessment of small, medium and large-scale mining projects.
4. Outline for the Environmental Protection Aspect of the Project Feasibility Report. Sub chapters discuss the various phases of the project through to post-mining.
- 5/6. Special issues concerning small, medium, and large-scale mining projects are discussed.
7. Socio-economic and cultural issues. This chapter is very superficial and perhaps reflects on the lack of experience of the authors.
8. Recommendations for legislation in mining. A large proportion of this chapter is devoted to liability and compensation with the accent on the principle of 'the polluter pays'. To this end the idea of various bonds are discussed to ensure that the mining company keeps to its 'contract'. These include rehabilitation funds and bonds. The liability for disasters, it is suggested, should be covered by a 'liability insurance'.
9. Environmental checklist. Set out in the form of *aide memoir* tables, this chapter also includes sensitivity index score sheets.

Copies can be obtained from: African Development Bank, P.O. Box 01, Abidjan, Côte d'Ivoire, attention: E.H. Shannon Ph.D. Fax: 225 21 73 63. ◆