Green Topics

Hippo-crisy?*

Today's conservation thinking is becoming increasingly polarised—a widening gap that could eventually be to the overall detriment of mankind, one way or the other. In one corner, stand the disciples of the untainted wilderness, moral protectors of the natural world who subscribe to the doctrine that the fragile balance of nature is threatened by man's very existence.

On the opposite side of the ring, stands the relentless developer, with the megalomaniac notion that nature is purely there to serve humanity and civilisation, under the auspices of 'progress'.

Of course, it is impossible to support either stance in the real world, and in the modern South Africa in particular, where the environment is coming under increasing pressure from the needs of an ever-increasing population, neither of these options is viable. It is perhaps in this country more than any other at present, that mining companies must ensure that the clamour for economic development is not at the expense of the environment. After all, whilst mining fulfils a short term requirement, it is our surroundings that have the most lasting effect on our lives. We all like to live in a 'nice' area, don't we?

When mining takes place in any district, it should be viewed as a phase of adolescence in its development. For whilst the operations may cause an unsightly blemish during their active life, this phase soon passes and with care and attention no visible sign need remain. Indeed, as is the case with most adolescent problems, the perception of their severity is generally far greater than the reality.

Taking this into consideration, this month's news that Richards Bay Minerals has had its permission denied to extend its mineral sand mining leases on the eastern shore of the hippopotami inhabited St Lucia estuary in Kwazulu-Natal, South Africa, is all the more disappointing

It has been a well chronicled, high profile case with six years of claim and counter claim, debate and deliberation eventually culminating in the governmental decision to decline the proposal and immediately request that the area be registered as a World Heritage Site. For the green activists, the result comes as a major victory although it may be that in this particular case, 'green' does not simply apply to their political leaning.

In the world of industrial minerals, a mine or quarry is only as good as its market place. In short, no applications, no use! This is not the cut-throat world of metal trading, where a garage full of gold can make a millionaire overnight, industrial minerals operations exist through necessity, and nothing else. For example, if everyone stopped painting their houses, driving cars with welded parts and ceased to eat from ceramic cups and plates, then the mineral sand industry would collapse overnight.

Of course, this is not going to happen. Mankind has evolved to the stage where such considerations are viewed as essentials if we are to maintain our desired standard of living. Only the staunchest hypocrite could argue the case otherwise. And if all that gives the campaigning environmentalist a headache, then they should think twice before resorting to any form of coated pharmaceutical, lest they prostitute their morals still further.

In the vast majority of cases, mining environments can be restored to as good, if not better, a condition as they were prior to work commencing. The ongoing rehabilitation work at RBM's current operations bears more than adequate testimony to that. In addition, the fact that 50 local and overseas experts contributed their findings to an intensive report on the proposed mine extension demonstrates the kind of commitment that a company can make to ensure that its actions do not lead to irreparable damage of an area. Additionally, RBM's proposed mining area would not have affected a pristine environment and would have had little or no impact on the lake or wetlands that are the crux of this case.

For real, irreversible devastation, look hard at the decimation of hardwood rainforests, where the destruction is purely so that someone, somewhere a long way away can lay their afternoon tea out on a mahogany table. Suddenly, a temporary blight on the landscape does not seem such a bad option after all.

It must be hoped that in future cases, common sense will prevail and companies will continue to have the chance to demonstrate how mining can not only provide obvious economic benefits during its production phase, but can also preserve the environment for the long term benefit of everyone.

* *Industrial Minerals No. 343, April 1996.* ◆

Basel Convention: An Update*

In September 1995, Parties to the Basel Convention agreed by consensus to amend the Convention to include a ban on the movement of hazardous waste recyclables from developed, effectively OECD countries, to developing countries. To date, few if any countries have ratified the amendment, which is supposed to come into effect 1 January 1998. Not surprisingly, many countries are waiting for guidance from the Convention's Technical Working Group (TWG) on what recyclables are covered or excluded by the ban so that its impact on each country's national economy can be determined. This uncertainty is compounded by the now-questioned status of the sovereign right of countries to trade in recyclables under bilateral and multilateral agreements (Article 11 agreements). Also at issue is whether a developing country will forfeit its right to trade with its non-OECD neighbours if, under the amendment, it seeks to join, and is accepted into, the group of developed countries which can trade among themselves.

The full scope of the recyclables ban will not be known until the fourth Conference of the Parties, scheduled for September/October 1997. In the interim, the TWG has been charged with the urgent task of characterizing hazardous waste recyclables and making recommendations on what recyclables should be covered by, or excluded from, the ban.

In December 1995, the TWG recommended that metal and metal alloy 'wastes' (recyclables) in metallic, non-dispersible form should **not** be covered by the Basel Convention provided they are scrap prepared to specifications and do not contain Basel waste constituents or contaminants making them hazardous. Such materials would include: precious metals; iron and steel; and, scraps of copper, nickel, aluminium, zinc, tin, tungsten, molybdenum and manganese. However, there remain many steps before the status of these recyclables, as well as metal-bearing slags, drosses, ashes and alloys containing lead and other Basel-listed metals and their compounds, will be known.

Significantly, the TWG is working on the so-called *de minimis* concept aimed at providing developing countries with a practical measure for determining the hazardousness of recyclables. This would specify values, such as concentration levels and particle size, for hazardous constituents or contaminants of recyclables. The TWG has asked industry sectors to come up with suggested *de minimis* levels or ranges for recyclables traded. The metals sector has stated that *de minimis* makes little sense as a meaningful and simple proxy for hazardousness, given the complexity of composition and form of recyclables and their many uses. While the metals sector is promoting a risk-based approach to the implementation of the Convention, it has, however, agreed to cooperate fully with the TWG in providing: timely information on priority trade streams of recyclables from developed to developing countries; commercial specifications for traded recyclables; known composition data for these materials; and, available data relating to toxicity. Additionally, the metals industry sector will undertake a program to determine the normal constituents of traded recyclables.

Within the TWG, the focus is very much on hazard characterization at the expense of risk assessment and risk management. Consequently, important risk-related factors are not being considered in the *de minimis* exercise, such as whether or not recyclables are going to a facility which can process these materials in an environmentally sound manner. Nevertheless, the TWG does seem willing to consider factors contributing to hazard characterization such as the physical form of materials, speciation and bioavailability. The TWG will also take into account national hazardous waste definitions, including lists.

Within the TWG a special sub-group on metals, established to advise on metal listings, will convene at the next TWG meeting to be hosted by the Malaysian Government in Kuala Lumpur, 22–26 April, 1996. This meeting is being funded by the European Commission. All of the industry sectors participating will report on progress in information and data gathering and will bring along experts to make representations on selected recyclables.

In March 1996, ICME published a booklet entitled *Non-Ferrous Metals Recycling: A Complement to Primary Metals Production* to provide a brief overview on the scope, characteristics and issues related to recycling. The recycling of metals has a long history and is a major commercial activity throughout the world. The recycling of non-ferrous and precious metals offers society the potential to extend the use of valuable materials, to conserve resources and energy and to minimize waste disposal.

* *International Council on Metals and the Environment. Newsletter vol. 4, no. 1, 1996. p. 5.* ◆

Environmental Case Studies *

In February 1996, ICME and the United Nations Environment Programme (UNEP) jointly published *Case Studies Illustrating Environmental Practices in Mining and Metallurgy.* The publication draws from 29 case studies to illustrate how good environmental performance is achieved through a combination of sound procedures, technology and good management, operating in a clear regulatory framework. Case studies were chosen by members of the UNEP/ICME Working Group on Environmental Protection in Mining and Metallurgy which comprises members from government, academia and industry.

The case studies include examples of environmental management systems, project approval procedures, regulatory development, good operations and techniques, training and education. They cover the main elements of the mining cycle including exploration, project approval, mining, primary metals processing, recycling, rehabilitation and closure. Examples are all of innovative approaches that can be used in countries other than in the ones illustrated. Each explains what was done, and the results achieved.

The publication provides useful information for a range of interests from government and industry. It is especially intended to motivate decision-makers by demonstrating what has been achieved elsewhere. However, it is not a technical manual, and for more detailed information, the reader is advised to follow up directly with the case study authors identified in the document. The publication is available from UNEP Industry and Environment Programme, Tour Mirabeau, 39–43, quai André Citroën, 756739 Paris CEDEX 15, France; fax: (33-1) 44 37 14 74. The cost is US$20. Concessional rates are available to UNEP network members and to ICME members.

The management of the Hog Ranch Gold Mine in Nevada encountered an early challenge when the operation was faced with exploring for ore in an area which was home to a rare plant called *Crosby's Buckwheat.* In order to save the population of this rare species, Western Mining Corporation, under the guidance of the US Bureau of Land Management, embarked on a project to transplant the plants to a nearby area where they are now thriving.

* *International Council on Metals and the Environment. Newsletter vol. 4, no. 1, 1996. p. 7.* ◆

Metals in the Environment: How much did we start with?* by Arthur G. Darnley†

To many people this might seem an obvious question; a question to be answered before making any assumptions about the quantities being added as a result of human activities. Yet acceptable safe levels of metals in the environment are being recommended with little or no consideration of the fact that metals have been in the environment since the beginning.

The millions of tons of ash pumped into the atmosphere by volcanic eruptions such as Mount Pinatubo and Mount St. Helens, and spread over thousands of square kilometres, probably contain all of the 92 elements in the Periodic Table. In addition to the elements known to be essential to life, such as carbon, nitrogen, oxygen, sodium, potassium, calcium, magnesium, iron, copper, zinc, phosphorus, sulphur and iodine, volcanoes also redistribute those elements which under certain conditions are regarded as harmful, such as arsenic, beryllium, cadmium, mercury, lead, radon and uranium plus the remaining 72 elements, many of which have still undetermined biological effects. Similar volcanic events have occurred every few years throughout geological history. *Indeed, all known elements are present at some level of concentration throughout the natural environment. They are present in animal, vegetable and mineral materials, and their beneficial and harmful effects have been present since evolution began.*

The question of natural background levels has important economic implications. Before governments commit scarce resources to clean up or protect the environment from man-made contamination, it would seem prudent to determine how much 'contamination' merely reflects the pre-existing natural background. Likewise, it would seem appropriate to assess how much the natural background varies from place to place as a consequence of differences in geology, soil,

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[1] 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 guidelines 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. ◆