

# **ABANDONED MINES**

## **Problems, Issues and Policy Challenges for Decision Makers**

**Santiago, Chile  
18 June 2001**

## **SUMMARY REPORT**



Chilean Copper  
Commission



**UNEP**

United Nations  
Environment Programme  
Division of Technology,  
Industry and Economics

## WORKSHOP REPORT

This report summarizes the presentations and discussions of the first Pan-American Workshop on Abandoned Mines, held in Santiago, Chile, 18 June 2001.

Copies of this Report and all the papers presented during the Workshop are available on the following websites:

- Mineral Resources Forum ([www.mineralresourcesforum.org](http://www.mineralresourcesforum.org))
- Chilean Copper Commission ([www.cochilco.cl](http://www.cochilco.cl))

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## **Preface**

In April 2001, the United Nations Environment Programme (UNEP) and the Chilean Copper Commission (COCHILCO) discussed the possibility of co-hosting a Workshop on Abandoned Mines, to be held just before a COCHILCO-Mining Ministries of the Americas (CAMMA) Pan-American Workshop on Mine Closure.

Mining is an economic activity that has been practised in the Americas for hundreds, and in some cases, thousands of years, attracted by the regions rich deposits which include gold, silver and copper. However, mine closure is an aspect of mining where historic practices and contemporary, evolving community and government expectations do not coincide. The need to deal with the closure issue is increasing, owing to public health and safety issues and, more recently, to increased awareness of environmental contamination and the importance of environmental preservation. Inadequate, improper or neglected mine closure results in abandoned mine site problems. Abandoned mines and mine closure issues can therefore be considered as two sides of the same coin.

The topic of abandoned mines is also difficult because of the associated financial and legal liability implications. UNEP has been trying to raise the profile of this important but so far neglected issue for a number of years, and was pleased to have the opportunity to co-sponsor this Workshop with COCHILCO.

The Workshop, which was attended by government representatives of ten countries, was the first international meeting to consider the many issues surrounding the topic of abandoned mines. What exactly are abandoned or orphaned mines? Are these terms interchangeable? What are the environmental and social risks related to abandoned mines? What kind of criteria are needed to prioritize these risks? Is a regional or global inventory a prerequisite for action? What are the legal liability issues? What types of financial mechanisms exist? And, most importantly, who will pay to mitigate these sites?

The Workshop questionnaire, papers and presentations, together with this Summary Report, provide a resource for all stakeholders who wish to carry this discussion forward, either nationally, regionally or internationally. All available papers are available on the websites of UNEP ([www.mineralresourcesforum.org](http://www.mineralresourcesforum.org)) and COCHILCO (<http://www.cochilco.cl>).

UNEP and COCHILCO hope that the summary of this Workshop will provide a good starting point for future international discussions, as it is only through partnerships that the goal of environmentally sensitive, socially responsible, sustainable mineral development will occur.

## ACKNOWLEDGEMENTS

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Chilean Sponsors:     Chilean Copper Commission (COCHILCO)  
                                 UN Economic Commission for Latin America and the Caribbean (CEPAL)

From Chile:             Mr Luis Maturana  
                                 Mr Patricio Cartagena  
                                 Mr Raúl F. Campusano  
                                 Mr Jorge E. Villablanca M.  
                                 Mr Eduardo Chaparro Avila  
                                 Ms Georgina Ortiz

From UNEP:             Ms Wanda Hoskin  
                                 Mr Fritz Balkau  
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## OVERVIEW OF WORKSHOP PROGRAMME AND DISCUSSIONS

This Overview describes the sequence of the workshop programme, the discussions and the questions raised. Because of the sensitivity of the topic of abandoned mines to both governments and industry, it was the consensus view that no conclusions would be attributed to the Workshop. As this was the first international meeting on the subject, it was considered more important to table as many of the issues as possible to set the stage for future meetings.

### Opening

The Workshop, co-hosted by the United Nations Environment Programme (UNEP) and the Chilean Copper Commission (COCHILCO) was held at the facilities of the United Nations Economic Commission for Latin America and the Caribbean (CEPAL). It was opened by representatives of the three organizations.

On behalf of the Executive Secretary, Mr Eduardo Chaparro (CEPAL) welcomed everyone to the CEPAL headquarters and went on to say that this was an important issue in a region where mining has been present for hundreds of years.

Mr Luis Maturana (COCHILCO) welcomed participants from ten nations on behalf of Mr Patricio Cartagena (Executive Vice-President COCHILCO) to Santiago, Chile, and said he welcomed the opportunity to co-host this important discussion.

Ms Wanda Hoskin (UNEP) welcomed everyone on behalf of UNEP and acknowledged COCHILCO for agreeing to co-sponsor this first international discussion on abandoned mines. In her opening remarks, Ms Hoskin indicated that remediation of abandoned mine sites is one of the major outstanding environmental problems related to mining. Even though it may be a legacy of inadequate or neglected mine closures in the past, it is an issue that has real environmental, social and economic implications today. Furthermore, the public image of mining today is shaped as much by its legacy as by today's much improved operating practices.

### Objective of the Workshop

The objective of this Workshop was to *start* discussion in several areas including:

- a) What is our current state of knowledge with respect to abandoned mines in each of our countries?
- b) What criteria should be used to prioritize remediation efforts (community safety issues, air and water pollution problems, environmental degradation, remediation to prepare the land for other uses, etc.)?
- c) How should responsibility and costs be shared—neither governments nor industry nor communities have the financial resources to solve this issue alone?
- d) What do you recommend as the next step in this discussion?

**Abandoned Mines Issue: Problems, Issues and Options.** The first presentation addressed the *Abandoned Mines Issue: Problems, Issues and Options*. Wanda Hoskin reflected on

some of the work UNEP has been doing for a number of years (see Appendix 1). Ms Hoskin noted that the causes of inaction and lack of real progress in addressing this issue relate to: the fact that mine closure practices have changed; that expectations related to proper mine closure have changed; the lack of clearly defined or assumed responsibility; the lack of definition of what *is* an abandoned mine site; the absence of criteria and standards of rehabilitation; and the real and perceived cost of rehabilitation.

The environmental, social and economic problems associated with abandoned mine sites are serious and global. They affect all former mining countries: Brazil, Canada, France, Philippines, South Africa, the United States, etc.

The physical impacts of abandoned mine sites include: altered landscape; unused pits and shafts; land no longer usable due to loss of soil, pH, or slope of land; abandoned tailings dumps; changes in groundwater regime; contaminated soils and aquatic sediments; subsidence; and changes in vegetation. These problems have social and economic impacts on countries and individual communities due to: loss of productive land; loss or degradation of groundwater; pollution of surface water by sediments or salts; fish affected by contaminated sediments; changes in river regimes; air pollution from dust or toxic gases; risk of falls into shafts and pits; and landslides.

Some countries are starting to address the issue and the purpose of the Workshop was to share what each of the Latin America and the Caribbean countries are doing, and to discuss how sharing of information could be mutually beneficial to countries in the region. Participants were challenged to explore innovative approaches to dealing with abandoned mine sites by considering, amongst other things:

- models of shared responsibility;
- how to turn liabilities into assets by governments making adjustments to land use, land occupancy or site ownership definitions;
- revision of the liability concepts associated with abandoned sites;
- maximizing potential for commercial exploitation;
- developing low-cost remediation procedures or techniques;
- scheduling remediation over a lengthy but pre-determined period; and
- new approaches to remediation funds.

The challenge to all stakeholders—governments, industry, communities and environmental groups—is to be creative in finding solutions to this issue and not to get bogged down in apportioning blame for past wrongs.

### **Overview and Status of this Issue in the Americas**

The second presentation was given by Eduardo Chaparro (CEPAL). CEPAL has done a significant amount of work in this area and has noted that the level of awareness about the issues associated with abandoned mine sites varies from 'some' (Caribbean, Colombia, Chile and Brazil) to 'none' (in the Andean region).

Mr Chaparro noted, however, that in Latin America and the Caribbean the fiscal aspects of the problem are more serious than expected, as the economic model does not allow

participation by the state in addressing certain issues. Where, therefore, will the financial resources come from? In addition, the majority of private sector companies consider the use of tax revenues to address this issue as regressive.

Some abandoned mine sites in Latin America and the Caribbean are the result of mining hundreds of years ago, meaning the owner is long gone. They are also the result of owners/operators going bankrupt. In addition, large cities now face the problem of their growth pushing outlying areas towards the edges of abandoned quarry sites. Related problems are now starting to affect people's quality of life. Although there has been some investigation of mining activities and of their environmental impacts over the past 50 to 60 years, it is only during the past 20 years that concepts such as mine closure have been added to the discussion. In this regard, the influence of NGOs and of the environmental policies of the most important mining companies have helped define these new elements, so as to prevent abandoned mines in the future.

### *Chile*

Ricardo Troncoso (Servicio Nacional de Geología y Minería – Sernageomin) presented the mining situation in Chile. Sernageomin's mission is to promote the development of the mining sector in accordance with the policies defined by the Ministry of Mines. It provides specialized services such as on-field studies, capacity building, and evaluation and control for mines, geology and environmental management. The ultimate goal is to create the conditions necessary to promote sustainable and environmentally-friendly development of the mining sector which has played such an important role in economic growth of the country, and is expected to continue to do so in the future.

Chile has been a major producer of copper and gold for hundreds of years, and still is today. Eighty per cent of its mines are in arid areas. At the moment, small-scale mines employing less than 80 workers are still the most common feature of the mining industry. In addition, out of 659 mines, 345 (52.4 per cent) are abandoned. This situation inevitably poses serious threats to the natural environment and community life. For this reason, Sernageomin is developing a system to collect data on mine site conditions. The information will cover general aspects as well as risk assessment analysis, the latter covering everything from workers' health to geophysical impact evaluations, ground and surface water resource contamination, and dust production and disposal. The aim is also to set up and train teams of experts able to carry out periodic site checks and to be consulted in case of need. A region-by-region study of the mining industry is scheduled and an upgraded version of the software

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