

ENVIRONMENTAL MANAGEMENT IN THE CANADIAN MINING INDUSTRY

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ABSTRACT

This paper comments on the regulatory regime at the heart of the environmental movement in Canada and focuses on the implications for mining companies arising from increased environmental regulation. A survey of senior environmental representatives from major mining companies is presented to identify management approaches that are used to reduce environmental risk and a typology is developed of Canadian mining companies based on the environmental structures in place. Finally, a checklist of structures essential to the success of any mining environmental program is discussed. The paper concludes that regulatory and public pressures have forced Canadian mining companies to considerably enhance their environmental performance. It is expected that these pressures will not abate in the foreseeable future.

INTRODUCTION

In an era of escalating concern for the quality of the environment, Canada, like many countries worldwide, has moved aggressively in recent years to establish new environmental protection standards and to stiffen the penalties for those who fail to comply with those standards.

To operate successfully under these new rules, it is essential for mining companies to cultivate management practices that allow them to be proactive identifying environmental risks, translate those risks into an actionable business context and manage them.

REGULATORY REVIEW

It is instructive to preface any discussion of environmental regulation with an acknowledgement that such practices are relatively recent. In North America, regulation of practices with environmental consequences began in earnest in 1969 with passage of the National Environmental Policy Act (NEPA, United States). Since NEPA, there has been a rapid escalation in the number of environmental Bills or Acts passed, both in the United States and Canada. There has, as well, been a marked increase in the number of environmental requirements enshrined in provincial and state mining acts. The most significant of these in the Canadian context are the reclamation or rehabilitation provisions contained in Bill 56 (British Columbia) and Bill 71 (Ontario). The salient features of these new requirements are outlined below.

Bill 56 (British Columbia)

Among numerous requirements, the regulations included in Bill 56 provide for the following: (i) the submission of a mine reclamation plan which describes the proposed activities during mine operation and following mine closure; (ii) the establishment of mine specific reclamation funds; and (iii) the annual deposit of funds sufficient to ensure that all reclamation requirements can be carried out.

Bill 71 (Ontario)

Comprehensive rehabilitation standards have been developed in Ontario by a government-industry regulations committee. Under the new rules, a closure (rehabilitation) plan with financial assurances certified by a professional engineer or chartered accountant is required both for existing mines and advanced exploration projects. Important elements to be included in the closure plan include: (i) specific and alternative rehabilitation measures; (ii) an ongoing monitoring program; (iii) procedures for verifying the attainment of rehabilitation objectives; (iv) cost estimates; (v) timetables; and (vi) bond structure.

An on-site review of the closure plan will be performed annually by government authorities and the mine operator must submit an annual progress report on rehabilitation activities to the government (Ministry of Northern Development and Mines). Directors of Mine Rehabilitation will be appointed to regulate this process. If rehabilitation activities are not carried out, the government or an appointed agent may use the bond to do so.

Environmental Action Plan for British Columbia

The Ministry of the Environment, Lands and Parks has recently launched a program that will review and revise over 20 acts that relate to environmental management. The intent of this program, *the Environmental Action Plan for British Columbia*, is to consolidate the current legislative base into four new acts:

- The British Columbia Environmental Protection Act;
- The Wildlife, Fish and Endangered Species Act;
- The British Columbia Environmental Assessment Act; and
- The British Columbia Water Management Act.

As a first step, the Ministry intends to promulgate new environmental assessment legislation. In support of this initiative, a discussion paper, *Reforming Environmental Assessment in British Columbia*, has been released for public review. Recommendations emerging from the consultation process will be submitted for Cabinet consideration and inclusion in the proposed legislation, which is to be introduced into the Legislature this summer.

The following are the key principles contained in the discussion paper:

- an amalgamated, legislated, assessment process
- a single-window process
- enhanced public participation
- cost recovery from industry
- public hearings for major projects

It is important to note that the Ministry of Energy, Mines and Petroleum Resources, in view of its project review responsibilities, is a co-sponsor of this particular initiative.

IMPLICATIONS FOR MINING ARISING FROM ENVIRONMENTAL REGULATION

High Cost of Compliance

In the future, mining companies in Canada will be forced to incur increased costs to achieve and maintain compliance. The use of expensive pollution abatement or prevention technology will likely render many marginal mining operations non-viable.

Significant Fines

Jurisdictions throughout Canada have moved aggressively in recent years to stiffen the penalties for companies that fail to comply with environmental standards.

Cost of Litigation

A general increase in fines for environmental offenses, coupled with aggressive investigation and enforcement activities, has created a situation in which many companies will be forced to defend charges. The retention of legal counsel will become an increasingly familiar aspect of the mining business and will increase the costs of conducting that business.

Personal Risk

Company directors and officers now face extensive personal liability in many Canadian jurisdictions. In fact, section 122 of CEPA provides that: "Where a corporation commits an offense under this Act, any officer, director or agent of the corporation who directed, authorized, assented to, acquiesced in or participated in the commission of the offense is a party to and guilty of the offense, and is liable to the punishment provided for the offense, whether or not the corporation has been prosecuted or convicted."

Inherited Liabilities

Quite apart from managing its operations to ensure that new environmental problems do not develop, a mining company must also identify and manage environmental liabilities created by previous owners, operators or persons in charge of a property.

Public Image

It is incumbent on the industry to demonstrate its concern for the environment and its ability to manage its affairs so as to minimize adverse environmental impacts. Related to the issue of public image is the lack of investor confidence and depressed share prices that poor environmental performance or the perception of poor performance can bring to a company.

SURVEY OF CANADIAN PRACTICES

During the months of July and August 1991, senior environmental representatives from 22 Canadian mining companies responded to a questionnaire designed to establish current environmental practices. As shown in Figure 1, the companies surveyed include significant producers of base and precious metals, coal, uranium, potash and iron ore. In aggregate, these companies provide a representative cross section of the principal mining activities in Canada.

Findings of the survey are examined below and where possible, generalizations made for the Canadian mining industry.

Aur Resources Inc.	Iron Ore Company of Canada
Canamax Resources Inc.	Luscar Ltd.
Cambior Inc.	Manalta Coal Ltd.
CAMECO Corporation	Noranda Mines Inc.
Cominco Ltd.	Placer Dome Inc.
Echo Bay Mines Ltd.	Potash Corporation of Saskatchewan
Falconbridge Limited	Rio Algom Limited
Fording Coal Limited	Teck Corporation
Hudson Bay Mining and Smelting Co., Limited	Westar Mining Limited
Inco Limited	Westmin Resources Limited
International Corona Corporation	Westminer Canada Limited

Figure 1. List of companies surveyed

Policy

All companies surveyed have endorsed an environmental policy or are in the process of finalizing one. Seven companies have adopted the policy developed by the Mining

Association of Canada (MAC) whereas others have chosen to formulate a company specific policy. It should be noted that MAC claims to be the first mining association worldwide to release an environmental policy (1989). Each current MAC member is expected to adhere to the policy and its endorsement is required for new members.

Policies are widely circulated within each company with the objective of improving environmental awareness at both management and individual employee level. Shareholders of the vast majority of companies surveyed are made aware of the policy as a result of its publication in annual reports. Very few companies make a deliberate effort to disseminate their policy among the general public but some companies recognize that the public should be targeted in the near future.

Slightly less than half of the companies conduct a formal review of their environmental performance on a quarterly, annual or bi-annual basis, and compare it to the environmental policy. This re-examination varies from formal at the company board level to informal by company personnel assigned to environmental matters. A small group of companies rely exclusively on the MAC policy and are prepared to concur with subsequent amendments to it.

Procedures

With the exception of two companies, environmental management is spearheaded by an individual in a senior management position. Most of these positions have been created during the last five years. Often reporting directly to the company president, the person in charge of environmental management also interacts with the Environmental Committee at the Board level. These committees tend to be present only in the largest organizations.

In order to ensure compliance, three specific management procedures have been implemented by approximately half of the 22 companies:

- on-site environmental personnel dealing directly with environmental concerns and reporting to a corporate officer;
- ongoing monitoring; and
- audit programs.

Three companies stated that the methods of communicating effectively and reporting to regulatory authorities are an integral part of their management systems.

Communications with regulators

Regular communications with officials from the departments of Mines, Environment and others, are reported by an overwhelming majority of companies. The frequency of

these contacts depends on the number of government agencies involved with the corporation and its mine sites. A coal producing company disclosed the involvement of 28 government agencies to obtain the necessary permits and approvals at one of its operations. For that mine, daily telephone conversations with government authorities were required to complete the permitting process. Monthly contacts between operations management and regulators are the norm. At the corporate level, communications with representatives of regulatory agencies occur less than monthly.

Reporting

At four companies, incident occurrences are immediately reported to senior management (Vice President and above). Other companies indicated that incidents are reported to management but remained silent on the timing of this reporting. Written reports on environmental activities and issues are generally submitted on a monthly or quarterly basis.

Insurance

Almost half of the companies surveyed carry some form of environmental risk and/or pollution liability insurance. A very large base metal producer reported that self-insurance covered environmental risk. One junior mining company considered this type of insurance to be too expensive.

The amount insured ranges widely: from CAD \$2 million to CAD \$100 million. These insurance policies are normally restricted to accidental catastrophic incidents and exclude costs related to gradual pollution and the failure to comply with environmental regulations.

Considerations at the acquisition and feasibility stages

Prior to the acquisition or option of a mineral property, all companies interrogated recognized the need to assess environmental risk as part of its due diligence exercise. In-house experts or consultants assist companies in assessing the environmental risk of the subject property.

At the feasibility study stage, companies unanimously stated that environmental-related costs need to be included. However, what is encompassed by these costs varies significantly between companies. One company uses an exhaustive list of environmental costs and includes expenditures related to base line studies and public meetings. Another company excludes decommissioning costs.

MANAGEMENT OF KEY ENVIRONMENTAL ISSUES

Acid Mine Drainage

Decommissioning of operations where acid drainage occurs can be difficult to accomplish and cost prohibitive. About 60% of the companies responded that a potential or existing acid mine drainage problem has been identified at one or more mining operations. The two most commonly cited mitigation measures are: application of lime to neutralize acidic tailings, and saturation or permanent flooding of tailings. Several companies are participating in the national Mine Environmental Neutral Drainage (MEND) program to develop innovative approaches to this important problem.

Five companies provided annual costs incurred for the required treatment of acid mine drainage. Annual costs range from less than CAD \$1.0 million to several millions for one or more operations. One quarter of the companies admitted that post-closure costs to mitigate acid mine drainage were unknown.

Reclamation

Reclamation plans are required at all operating mines in Canada. However, in one Canadian province, plans need to be submitted only six months before closure. New reclamation regulations are now in place in most Canadian jurisdictions and this has forced companies to develop reclamation plans which are consistent with current mine plans.

Approximately one quarter of the companies surveyed have publicly disclosed the costs of performing progressive and post-closure reclamation activities at their operations. More than three quarters of the companies have financial provisions in place to ensure that reclamation will be performed. This reflects the requirement for making financial provisions both under the rules recently promulgated in several Canadian provinces, and under new guidelines of the Canadian Institute of Chartered Accountants. Publicly disclosed costs and provisions for individual companies vary from a few CAD \$ million to CAD \$128 million.

The overwhelming majority of companies review reclamation plans and related costs annually in parallel with changes to mine plans, available reclamation technology and relevant regulations.

Mixed opinions were expressed with regard to the estimated impact of reclamation costs on the life of mining projects and their carrying values. Approximately one half of the responding companies could not assess the magnitude of the impact or kept their views confidential. One quarter of the companies stated that the impact is variable to negligible whereas the remaining quarter of the companies are of the opinion that reclamation costs are having a significant impact. One company disclosed that reclamation costs represented from 8 to 18% of the total mining costs at its operations.

TYOLOGY

In 1991, H. Brehaut, Senior Vice-President Environment, Placer Dome Inc.¹ introduced a five stage scale designed to illustrate the effectiveness of environmental management systems within this major mining corporation and to identify management systems that could be improved. As shown in Figure 2, this scale has a continuum ranging from Red Neck to Clean & Green.

Mr. Brehaut applied his scale to six key elements of environmental management: policy, employees, audit, risk, environmental support and operating practices. Using the information provided by the questionnaire, respondents and company annual reports in conjunction with the Brehaut scale, an attempt was made to establish the profile of individual companies with regards to each of these six key elements. Finally, pooling of individual typologies allowed the generation of a typology for the 22 companies surveyed.

	STAGE				
	REDNECK	LIP SERVICE	CONCERNED	PROACTIVE	CLEAN & GREEN
POLICY	No policy	MAC policy	Company policy	Codes of conduct	Management system
EMPLOYEES	Unaware	Unaware	Brochure	Involved	Committed
AUDIT	No questions asked	Enquiries	Review	First audit	Specialized reviews/audits
RISK	No problems today	What is a risk	Identify obvious risks	Identify all risks	Comprehensive action plans
ENV. SUPPORT	No env. personnel	Limited skills	Some specialized skills	Broad env. skills	Senior executive
OPERATING PRACTICES	No change	No change	Formalize existing practices	Train, inspect, redesign	Best management practices

Figure 2. Typology of Canadian mining companies surveyed using Brehaut's scale for environmental management

If this typology is extrapolated to the entire Canadian mining industry, key environmental characteristics would include:

- the development and adoption of a company specific policy;
- the circulation of brochures, videos, etc. to create an awareness amongst the employees;
- the initiation of environmental audit program;
- the development of in-house environmental skills sometimes combined with the appointment of a senior executive responsible for environmental issues; and
- operating practices incorporating training, inspection and redesign.

These characteristics can be considered a checklist of core requirements for mining companies wishing to do business in Canada. On average, Canadian mining companies range between the Concerned stage and the Proactive stage, with room for improvement in reaching the Clean & Green stage.

CONCLUSION

The current Canadian regulatory regime and public pressure have left management of Canadian mining companies little choice but to escalate involvement in environmental issues.

A survey of environmental management practices was conducted and demonstrates that mining companies are significantly involved and are likely to enhance their environmental performance over the foreseeable future both in Canada and internationally.

REFERENCES

1. Brehaut, H., 1991. Improving your Environmental Performance - Environmental Management from a Corporate Perspective. Paper Presented at the Annual Meeting of the Canadian Institute of Mining, Metallurgy & Petroleum, Vancouver, B.C., May 1991. 22 p.