

# The Business of Mineral Exploration, Challenges and Future Trends

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## INTRODUCTION

Having experienced several “boom and bust” cycles during the past few decades, observations can be made concerning the consistent inability of the resources sector to deal with key issues effectively. Direct consequences of this are the rapidly decreasing discovery rate for major metal deposits and alarming rising exploration costs. There are a number of fundamental reasons why the global exploration industry remains in a crisis. These include very poor management of many major resource company by executives with limited understanding of how exploration should be directed and funded, increased levels of bureaucracy created by inexperienced policy makers resulting in reduced field time for capable explorers and the inability of many major and mid-tier mining companies to realize that mine site and exploration cultures are not the same, each operating with very different parameters and goals. Furthermore, the “herd mentality” and budget “knee jerk” reactions remain serial problems for many of the major resource companies, which directly impacts maintenance and training of the exploration teams expected to make the new discoveries. If current trends in declining resource discoveries continues, and demand for metals consistently rises then what are the consequences for society? Significant advances in geochemical, geophysical, remote sensing, drilling, metallurgical and mining technology are all contributing to more cost-effective exploration, however they do not substitute for the fundamental time-proven requirement to have highly experienced exploration teams in the field with “boots and hammer”.

## BOOM AND BUST CYCLES

A boom and bust cycle is a process of economic expansion and contraction that occurs repeatedly. This in turn directly affects stock market share prices, metal prices and the ability to raise capital. Further consequences are employment rates, consumer spending and gross domestic productivity. Unfortunately, the minerals sector is particularly vulnerable to such cycles. During a boom “The Good Times”, many large mining companies undertake expensive acquisitions at the inflated prices, only to incur massive losses in the subsequent bust “The Bad Times” Several recent examples are shown in table 1. These reckless actions directly impact exploration budgets, geosciences employment and global mineral discovery rates.

Company	Debt	Cause
BHP	\$ 21.8 B	US Oil Shale
Barrick	\$ 8.8 B	Equinox and Pascua Lama
Rio Tinto	\$ 20.8 B	Mozambique coal
Freeport	\$ 18.5 B	Oil Investments
Anglo American	\$ 14.5 B	Brazil Iron Deal
Teck	\$ 8.2 B	Canada Oil Sands
Rand Gold	Zero	CEO Focus

Table1. Major company corporate debts, 2016

Conversely, there are much more responsible companies, e.g., Rand Gold (Table 1). The company CEO, Mark Bristow was quoted as saying at a Denver Gold Forum, that Rand Gold’s annual exploration budgets were consistently \$30-\$40M regardless of cycles and gold price fluctuations. Furthermore, he stated that Rand Gold has never dismissed a single worker during softer gold prices.

## **POOR MANAGEMENT AT BOARD LEVEL**

The difference between highly successful and much less successful companies is the quality and experience of their CEO's and Board members. A 2017 survey by Paulson & Co. of CEO remuneration packages showed that for 13 major gold companies, the cumulative total was a staggering \$550 million. When one looks at the shareholder returns for these companies, only two had provided positive outcomes for their investors over a six-year period. Much the same applies for the minerals sector, and clearly there is a need for CEO's and Boards to be made accountable to the shareholders. The solution is to base executive remuneration on financial performance. In addition, some major companies have excessive numbers of Board members many of whom are non-technical, and therefore not qualified to represent the shareholders.

## **INCREASED BUREAUCRACY**

Large companies frequently have cumbersome management structures and volumes of policy manuals which greatly inhibit the ability of an exploration team to make decisions and operate effectively. A good example of this is the health and safety "culture" which now pervades resources sector. Nobody would deny the fundamental importance of employee health and safety; however, an industrial mine site is very different to an exploration camp in a remote area. All too often, voluminous policy manuals are compiled and enforced by individuals who have little or no understanding of practical requirements necessary to operate effectively and efficiently. This is especially the case in an exploration environment. A consequence of this is far less time in the field, inability to travel to prospective areas, and therefore less chance of making a discovery. Junior companies are more likely to make discoveries because they generally have far less bureaucracy than majors, and particularly those who have an experienced geologist as the CEO.

## **INNOVATION AND THE FUTURE**

Unless the decline in discoveries can be reversed (unlikely), then innovative ways of meeting future demands will need to take place. One example will be to significantly reduce mining and processing costs to allow extraction of lower grade deposit which are currently considered uneconomic. On the metals processing side, a number of new developments are taking place, e.g., advances in hydrometallurgy and reduction of milling costs with ore sorting. The application of robotics in mining is also likely to result in lower cost and more efficient operations. To some extent recycling of metals will become increasingly important. However, in order for Society to meet future demands, a pipeline of discoveries needs to occur. Inevitably exploration under cover and the drilling technology to do so, will become facts of life. Geologists need to become better explorers and be given the budgets, training and tools to do so.